

AN ABSTRACT OF THE DISSERTATION OF

Briana E. Rockler for the degree of Doctor of Philosophy in Public Health presented on June 2, 2021.

Title: Food Insecurity and Food Assistance: The Lived Experiences of Food Insecurity and Participation in SNAP among Oregon Farmers and Farmworkers

Abstract approved: _____

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Farmers and migrant and seasonal farmworkers (F/MSFW) dedicate their livelihoods to the production of food for consumers, yet they may struggle to access food to feed themselves. Rural residents, immigrants, and Hispanic/Latinx individuals all have higher risk for food insecurity, yet little is known about the unique contexts through which F/MSFW experience FI as food producers. Further, limited participation in the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) by F/MSFW suggests that the federal food safety net does not sufficiently serve farming communities. The factors that drive F/MSFW participation in SNAP and WIC are unknown. As legal status structures access to health-promoting public resources like SNAP and WIC, MSFW may encounter additional barriers to the use of SNAP and WIC. The full extent to which legal status shapes MSFW health status is understudied. To address these gaps, I used a mixed-methods approach to examine the unique contexts through which the farm workforce experiences FI and the factors contributing to their participation in programs that may provide them food assistance. I conducted in-depth interviews with small- to mid-sized farmers and MSFW in Oregon and analyzed them using a modified grounded theory approach. In addition, I used quantitative methods to examine the associations between legal status and MSFW health with data from the U.S. Department of Labor's National Agricultural Workers Survey (NAWS).

The first study described the contextual factors contributing to F/MSFW experiences of FI, including seasonal gaps in income, high work demand in response to low wages, minimal and reluctant use of food assistance, and a tendency to downplay the hardships they encountered. The second study demonstrated inequitable access to SNAP through the central role psychosocial factors (attitudes, program knowledge, norms, and control) play in F/MSFW decisions to use SNAP. Farming participants struggled with needs that often mismatched their eligibility to participate in SNAP, and pervasive internal and external stigmas associated with FI and SNAP participation among farming communities also deterred F/MSFW from program utilization. The final study provided evidence of disparities in MSFW self-reported health by race and ethnicity. Among MSFW who participated in SNAP, Hispanic/Latinx MSFW had higher odds of reporting excellent or good self-reported health than non-Hispanic/Latinx White MSFW who participated in SNAP or WIC. Findings highlighted the potential health benefits of expanding access to the two programs, especially among Hispanic/Latinx MSFW.

Policies and programs intended to support the health of the farm workforce should be responsive to the nature of farm livelihoods and the unique vulnerabilities and experiences of F/MSFW. The three studies contained within this dissertation provide evidence that expansion of SNAP eligibility may help support the lives of those individuals who dedicate their livelihoods to produce food for others. More research is needed to test the relationships and theoretical processes that describe F/MSFW experiences with FI, their access to and use of SNAP, and the impacts of policies that use legal status to limit access to economic, social, and health resources.

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Food Insecurity and Food Assistance: The Lived Experiences of Food Insecurity
and Participation in SNAP among Oregon Farmers and Farmworkers

by

Briana E. Rockler

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APPROVED:

Major Professor, representing Public Health

Head of the School of Biological and Population Health Sciences

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes the release of my dissertation to any reader upon request.

Briana E. Rockler, Author

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DEDICATION

I dedicate this dissertation to the farmers and farmworkers who devote their livelihoods to nourish the world.

CHAPTER 1. INTRODUCTION

Despite the essential role of the farm workforce in the function and output of the food system, farm owners¹ and migrant and seasonal farmworkers (F/MSFW) who labor to produce food for consumers may struggle to access food to feed themselves. Among MSFW, estimated rates of food insecurity (FI) are consistently higher than the national average (45-82% vs. 10.5%), particularly for Hispanic/Latinx and undocumented MSFW (Kiehne & Mendoza, 2015; Ip et al., 2015). Although FI among U.S. farm owners has not received much attention in the academic literature, elevated rates of FI within rural agrarian communities (13.3%) provide some insight into the circumstances encountered by some farmers and their families (Dewitt et al., 2020; United States Department of Agriculture, 2019a). As the health of the farm workforce has a significant influence upon the well-being of farm businesses, farm families, and the rural communities where agriculture is a powerful driver of local economic activity (Brumby, Willder, & Martin, 2009; Isserman, Feser, & Warren, 2009), researchers and public health practitioners have emphasized the importance of responsive policies that target the health and well-being of F/MSFW while remaining sensitive to the unique characteristics of life on the farm (American Public Health Association, 2017; Braun, 2019).

Migrant and Seasonal Farmworkers

The National Center for Farmworker Health (2015) has estimated that there are over three million MSFW in the U.S. and up to 180,000 in Oregon each year. MSFW households may be more likely to experience FI due to a lack of control over occupational and housing conditions, low wages, low literacy, remittance obligations to family in other countries, racialized legal status, and residence in isolated rural regions (Arcury & Marín, 2009; Borre, Ertle, & Graff, 2010; Brown & Getz, 2020; Hamilton, Hale, & Savinar, 2019; Minkoff-Zern, 2014; Sano, Garasky, Greder, Cook, & Browder, 2011). Household FI is

¹ The terms “farmer,” “farmworker,” “worker,” and “laborer” are not mutually exclusive categories. Though every individual who works on a farm could be considered a farmer by trade, for the purposes of this study the terms “farm owner” or “farmer” are used to describe farm owners and “migrant and seasonal farmworker” or “MSFW” are used to describe those who work on farms but do not have ownership responsibilities, often in a seasonal or migrant capacity. While this terminology is consistent with the literature, it is noted that these titles do not fully capture the nuances and nature of life on the farm.

associated with poor overall health, high rates of chronic and acute health conditions, and increased use of emergency health services among children (Thomas, Miller, & Morrissey, 2019). As the most prevalent health conditions diagnosed among MSFW are diet-related chronic diseases like overweight/obesity, hypertension, and diabetes (Farmworker Justice & The National Center for Farmworker Health, 2015), interventions that target nutritional outcomes are needed.

Farm Owners

While U.S. farmers are not generally regarded as a population at exceptionally high risk of FI, farmers experience unique challenges that impact farm viability and may lead to FI. Such challenges include fluctuating commodity prices, reduced sales attributable to political tariffs, federal policies that have reduced the availability of immigrant farm labor, natural disasters that impact crop and animal yields, and rising levels of farm debt (Braun, 2019). Although it stands to reason that farmers and their families may be protected from FI as food producers, some evidence suggests that this may not be the case. For example, while many farm families have land and possess the skill to grow a family garden that provides fresh food for household consumption, the added investment of time and energy required to engage in subsistence agriculture may prevent an already overextended farm family from maintaining a garden (McIntyre, Thille, & Rondeau, 2009). Because even marginal FI has direct and indirect impacts on physical and mental health, a better understanding of farmers' encounters with FI, informed by their beliefs and behaviors, may clarify all of the risks and opportunities experienced by the farming community.

The Safety Net

Safety net programs that provide food assistance like the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) are designed to enhance household resources to obtain food and improve nutrition. As such, participation in SNAP or WIC may address diet-related chronic disease and FI jointly (Basiotis, Kramer-LeBlanc, & Kennedy, 1998). In line with federal eligibility guidelines, U.S. citizens and qualified

noncitizens can participate in SNAP. Qualified noncitizens include lawfully present immigrant adults who have been in the U.S. for at least five years, lawfully present immigrant children, refugees, and asylees. There are also specific income, asset, age, disability, work, and time-limit eligibility criteria that vary state-to-state (United States Department of Agriculture, 2021). WIC eligibility criteria do not exclude noncitizens, but eligible individuals must fall below specific income limits and qualify categorically. WIC is intended for pregnant and breastfeeding mothers, infants under one year old, and children under five. Depending upon the circumstances of F/MSFW, both groups may find themselves ineligible for SNAP or WIC for various reasons.

Although MSFW are considered essential workers whose services and functions are necessary to maintain the health and welfare of the public (USAID, 2009), the Migration Policy Institute (2016) estimated 74,000 farmworkers in Oregon alone were ineligible for participation in federal safety net programs like SNAP and WIC. Farmworkers are primarily (76%) Hispanic/Latinx immigrants to the U.S., with the vast majority immigrating from Mexico (Hernandez & Gabbard, 2018). Although it is challenging to assess MSFW documentation status, it is estimated that 49-70% are immigrants who are not considered to be lawfully present (Farmworker Justice, 2019).

MSFW experience a range of risks and stressors that limit their access to and eligibility for the formal safety net, many of which correspond to their poverty status, Hispanic/Latinx ethnicity, and immigration status, including challenging living conditions, fear of public charge, and immigration enforcement, frequent mobility, low literacy, lack of transportation, lack of insurance, and language barriers (Health Resources and Services Administration, 2018). Further, MSFW may be affected by racialized legal status (RLS), a concept that refers to ostensibly race-neutral legal stratifications that disproportionately disadvantage racial and ethnic minorities (Asad & Clair, 2018). As such, RLS may function as a social determinant of health for most MSFW. The policies that use legal status to restrict access to public assistance programs, like SNAP, may disproportionately disadvantage Hispanic/Latinx MSFW, limiting participation by eligible households (Asad & Clair, 2018). Acknowledging the need for

improving FI and health outcomes among farmworker households, researchers have called for greater availability of safety net programs like SNAP and WIC (Ip et al., 2015).

Although farmers encounter fewer SNAP and WIC eligibility barriers, income requirements can be challenging to meet given farm income's unpredictable and market-dependent nature. Providing proof of SNAP eligibility may be complicated for self-employed farmers who must present evidence of net income for caseworkers to verify. This process can be time-consuming and is prone to calculation errors (Food Research & Action Center, 2019). Even eligible farmers may not participate in SNAP or WIC due to a lack of program awareness, confusion about eligibility status, stigma related to program participation, and benefit inadequacy (Weedall FitzSimons, Weill, & Parker, 2011).

While existing policies and programs intended to support farms have previously been designed to mitigate farm business risk with financial supports, high rates of diet-related chronic disease, stress, injury, mental illness, substance abuse, and suicide among F/MSFW highlight the need for policies intended to improve health and well-being for farmers, farmworkers, and their families (Braun, 2019). Although existing safety net policies and programs may address some of the issues F/MSFW encounter, there are gaps in utilization for both groups (Gundersen & Offutt, 2005; Padilla, Scott, & Lopez, 2014).

Gaps in the Research

Though high rates of FI are documented among MSFW, estimates vary considerably depending on the methodology of the study (45-82%) (Kiehne & Mendoza, 2015; Ip et al., 2015). While researchers have documented the characteristics that predict MSFW encounters with FI, our understanding of their experiences with FI is limited. Researchers have described the various coping mechanisms employed by MSFW to mitigate FI; however, we know little about the experiences that inform those actions and how they shape MSFW point of view. Simultaneously, there is a gap in the research investigating FI among U.S. farmers. Despite calls for health policies uniquely suited for farming communities, little is known about the collective experiences of F/MSFW, making it difficult to create responsive policies and

programs. As such, the first manuscript of this dissertation explores the unique contexts through which F/MSFW experience FI.

Gaps in SNAP participation among F/MSFW call for evidence-based solutions. The demographic profiles included among the USDA SNAP annual program reports consistently show high rates of SNAP participation among non-Hispanic/Latinx Black and Hispanic/Latinx households and low participation among eligible adults over 60 and the working poor² (Cronquist, 2021; Cunnynggham, 2021; Vigil, 2019). Approximately 16% of individuals residing within rural communities live below the federal poverty line, and 90% of the rural households that qualify for SNAP participate in the program (DeWitt et al., 2020). Despite high participation rates among rural residents, comparisons of SNAP enrollment by occupation show that agricultural workers have some of the lowest rates of SNAP participation in the U.S. workforce (Hall, 2020). The factors that drive SNAP participation among F/MSFW have yet to be explored in the literature. Thus, my second manuscript proposes a theoretical model to describe the salient psychosocial, predisposing, enabling, need, and use factors associated with SNAP use.

While F/MSFW share some social determinants of health, like rural residency, the two groups experience some social determinants differently. For MSFW, RLS may function as a social determinant of health, which would help explain high rates of FI, diet-related chronic diseases, and gaps in SNAP/WIC participation. While immigrant legal status, race, and ethnicity are separately recognized as social determinants of health (Castañeda et al., 2015; Phelan & Link, 2015; Williams, Lawrence, Davis, & Vu, 2019), research focusing on RLS (i.e., the extent to which immigrant legal status shapes racial and ethnic health disparities) is limited. Because the majority of MSFW are Hispanic/Latinx immigrants, and many are undocumented, studying the associations between race, ethnicity, legal status, and health among MSFW may clarify the ways in which RLS affects health. To better understand the role of RLS as a social

² SNAP annual program reports released by the USDA use the terminology “Hispanic” to refer to individuals of Hispanic/Latinx/mestizo ethnicity, and term “working poor” to describe individuals who spend 27 weeks or more per year in the labor force either working, or looking for work, but whose incomes fall below the federal poverty level. It is likely that many F/MSFW would fall into this category.

determinant of health on the farm, my research focused on the intersectionality between MSFW legal status, race/ethnicity, health status, and the mechanisms through which legal status structures the differential health risks encountered by MSFW, such as participation in health-promoting public resources like SNAP and WIC. In my third manuscript, I use a quantitative approach to explore how race, ethnicity, and legal status relate to self-reported health and how SNAP and WIC influence the associations between race, ethnicity, legal status, and self-reported health in a nationally representative sample of MSFW. As the first two manuscripts address the experiences, beliefs, and behaviors of F/MSFW jointly, it is essential to acknowledge that F/MSFW are not one homogenous population. The two groups encounter different circumstances for various reasons, most notably, their immigration status, race, and ethnicity. The third manuscript helps us understand the extent to which MSFW health is rooted in race, ethnicity, and legal status.

Central Aim

The central aim of this body of work is to build a foundation that will allow us to identify actionable ways in which we can support farm livelihoods and promote health on the farm through food security. Findings from these studies have implications for policymakers, agriculture and health educators, and Extension professionals working to cultivate health and well-being in agricultural communities.

Specific Aims

Aim 1: Describe the unique contexts through which small- to mid-sized farmers and migrant and seasonal farmworkers in Oregon experience food insecurity.

Aim 1.1 Using the USDA 6-Item Household Food Security Survey Module, examine the alignment between evaluated food security status and the lived experiences of food insecurity among farmers and migrant and seasonal farmworkers.

Aim 1.2 Using the framework developed by Hamelin, Beaudry, and Habicht (2002), characterize the core experiences of food insecurity among farmers and migrant and seasonal farmworkers.

Aim 2: Explore the factors that drive SNAP participation among small- to mid-sized farmers and migrant and seasonal farmworkers in Oregon.

Aim 2.1 Guided by the Andersen Model of Health Service Utilization, organize the psychosocial, predisposing, enabling, need, and use factors associated with SNAP participation among farmers and migrant and seasonal farmworkers.

Aim 2.2 Build a theoretical framework that describes SNAP utilization among farmers and migrant and seasonal farmworkers, organized by psychosocial, predisposing, enabling, need, and use factors.

Aim 2.3 Identify the most salient psychosocial factors associated with SNAP participation among farmers and migrant and seasonal farmworkers.

Aim 3: Document how race, ethnicity, and legal status relate to farmworker health and examine how the use of health-promoting public resources, specifically SNAP and WIC, influences the associations among race, ethnicity, legal status, and health using the 2009/2010 National Agricultural Workers Survey occupational health supplement.

Hypothesis 3.1 Hispanic farmworkers will have lower odds of reporting excellent or good self-reported health status compared to non-Hispanic non-White and non-Hispanic White farmworkers.

Hypothesis 3.2 Unauthorized farmworkers will have lower odds of reporting excellent or good self-reported health status compared to lawfully present farmworkers.

CHAPTER 2. FIRST MANUSCRIPT

Something to Eat: Experiences of Food Insecurity among
Migrant and Seasonal Farmworkers and Farm Owners in Oregon

Abstract

Introduction: The health of farmers and migrant and seasonal farmworkers (F/MSFW) has significant impacts on farm businesses, farming families, and local rural communities where agriculture is an important driver of social and economic activity. Rural residents and MSFW have higher rates of food insecurity, but little is known about food insecurity among farmers and the collective experiences of F/MSFW. Researchers and public health practitioners have stressed the need for policies that target the health and well-being of F/MSFW while remaining sensitive to the nature of life on the farm, yet F/MSFW lived experiences have been understudied.

Methods: In-depth qualitative interviews were conducted with 13 farmers and 18 MSFW in Oregon. Modified grounded theory was used to analyze interview data. Data were coded using a three-stage process to identify salient core characteristics of food insecurity.

Results: Participants ranged in age from 30-75 and included 16 females and 15 males. All MSFW were Hispanic/Latinx, 11 farmers were non-Hispanic White, and two farmers were Asian. Most participants (68%) reported work instability characterized by seasonal income. Sixty-one percent had full food security, 16% had marginal food security, and 19% had low food security. F/MSFW meanings and interpretations of their food insecurity were often misaligned with their evaluated food security scores. Experiences with FI were characterized by seasonal food shortages, stretching resources to support farm households year-round, working extended hours most days of the week earning low wages, limited use of food assistance, and the tendency to downplay hardship.

Discussion: These unique contextual factors have important implications for developing responsive policies and programs to support the health and well-being of farm livelihoods. Future studies to test the relationships between the core characteristics of FI identified in this study and F/MSFW meanings and interpretations of FI, hunger, and nourishment are warranted.

Introduction

Farming is associated with environmental, financial, and social risks and stressors that ultimately impact the health and well-being of every individual employed on the farm (Health Resources and Services Administration, 2019b). While farmers and migrant and seasonal farmworkers (F/MSFW) play a critical role in the production of food, often working long hours in hazardous conditions among isolated rural areas (Brotherson, 2016), low availability of household resources and limited access to food retailers may lead to inadequate access to food at home (Braun, 2019; Health Resources and Services Administration, 2019a). Among migrant and seasonal farmworkers (MSFW), food insecurity (FI) is widely documented across the U.S., particularly for Hispanic/Latinx MSFW (Kiehne & Mendoza, 2015; Ip et al., 2015). While FI among U.S. farmers has not been examined in the academic literature, high rates of FI within rural agricultural communities may provide insight into the circumstances faced by farmers and their families (Dewitt et al., 2020).

The literature on FI among MSFW includes data on the prevalence of FI and identifies the risk factors (Borre et al., 2010; Hill, Moloney, Mize, Himelick, & Guest, 2011; Kandel, 2008; Kilanowski & Moore, 2010; Quandt, Arcury, Early, Tapia, & Davis, 2004; Weigel, Armijos, Hall, Ramirez, & Orozco, 2007; Wirth, Strohlic, & Getz, 2007), health consequences (Kilanowski & Moore, 2010; Quandt et al., 2006; Weigel et al., 2007) and coping strategies (Borre et al., 2010; Meierotto & Som Castellano, 2020; Quandt et al., 2004; Weigel et al., 2007; Wirth et al., 2007) of FI among MSFW. Though rates of FI vary by study due to methodological differences like sampling frame and low response rates (45-82%), estimates are consistently higher than the general population by generous margins (Kiehne & Mendoza, 2015; Ip et al., 2015). Some of the factors that make MSFW more likely to experience FI include a lack of control over occupational and housing conditions, low wages, low literacy, financial remittance obligations, a lack of legal protections, and a lack of access to public assistance related to their legal immigration status, and residing in isolated rural regions (Allen, 2008; Arcury & Marín, 2009; Borre et al., 2010; Brown & Getz, 2020; Minkoff-Zern, 2014; Sano et al., 2011). While this foundational evidence

details the conditions that predict MSFW FI, we know little about the psychosocial experiences and core characteristics of FI among MSFW.

Meanwhile, the body of research on the well-being of U.S. farmers takes a less biosocial approach (Hadley & Crooks, 2012) by focusing on farm outputs, economies, and agribusiness (Rissing, Inwood, & Stengel, 2020). Small- and mid-sized farms that focus on food production for local markets are more likely to encounter issues with farm profitability due to a lack of infrastructure to process, market, and distribute their products (Berkey, 2014). Although the pathways that connect farm operations with the well-being of farm households are not well established (Rissing et al., 2020), farmers that struggle to make ends meet may also confront FI. Research among small- to mid-sized farmers would help clarify FI on the farm. Further, little is known about the experiences of F/MSFW jointly. Considering the lived experiences of farmers and MSFW together may help provide a more comprehensive understanding of the difficulties encountered by farming communities who share many of the same unique vulnerabilities and may be affected by some of the same environmental changes, interventions, and policies.

As the health of F/MSFW has consequential impacts for farm businesses, farming families, and local rural communities where agriculture is a significant driver of social and economic activity (Brumby et al., 2009; Isserman et al., 2009), researchers and public health practitioners have stressed the need for dynamic policies that target the health and well-being of F/MSFW while remaining sensitive to the nature of life on the farm (American Public Health Association, 2017; Braun, 2019). Though many farmers possess distinctly different characteristics from MSFW, the farming communities to which they belong are vulnerable to agricultural market uncertainties, increasingly unpredictable weather, social isolation, physical hazards of farm labor, a lack of health insurance, among others (Ketterman, Braun, & Pippidis, 2021). Further, both farmer and MSFW well-being are influenced by the viability of farm businesses; thus, F/MSFW well-being may be inextricably linked (Berkey & Schusler, 2016). When farmers struggle to provide a living for themselves and their families, they may also struggle to provide just working

conditions for MSFW (Berkey & Schusler, 2016). Studies show that farm size and farming business practices affect the working conditions and fringe benefits offered to MSFW (Arcury & Marín, 2009; Shreck et al., 2006). MSFW employed on smaller farms (< \$250,000 in annual sales) have reported poorer health compared to MSFW employed on larger farms (Villarejo, 2012). The health of U.S. farmers on smaller farms has not been documented in the published literature. Such lived experiences have been understudied, making it challenging to create responsive policies and programs for farming communities.

Measures of Food Insecurity

Some measures of FI do not capture the full spectrum of the experience of FI, and this issue may be salient among F/MSFW who experience unique vulnerabilities and stressors related to farm livelihoods. Previous studies have estimated rates of FI among MSFW using the U.S. Department of Agriculture Household Food Security Survey Module (HFSSM) (Allen, 2008; Arcury & Marín, 2009; Borre et al., 2010; Brown & Getz, 2020; Minkoff-Zern, 2014; United States Department of Agriculture, 2012). The HFSSM is a valuable, widely trusted tool that the federal government has utilized to monitor national food security annually since 1998. The HFSSM has been adapted and validated for use across diverse cultures and settings (Perez-Escamilla & Segall-Correa, 2008). As the HFSSM assesses food security with subjective experience-based quantitative measures of FI, it has been regarded as a conservative measure to capture severe cases of FI, such as circumstances in which individuals skip meals or eat so little they lose weight (Johnson et al., 2020). As such, the HFSSM may best identify households that experience more severe FI but overlook those who experience less severe, borderline or variable FI. Other researchers have noted these limitations. In an ethnographic study of two low-income populations in rural Oregon, Gross and Rosenberger (2005) found that participants' evaluated FS (indicated by their HFSSM score) did not align with their lived experiences as many study participants evaluated as food secure, shared experiences akin to FI. For example, evaluated food secure participants in their study reported living on macaroni and cheese or ramen noodles to make ends meet until they had the resources to obtain healthier food options. While the HFSSM helps provide standardized data, complementary measures may provide a more comprehensive picture to capture the full spectrum of lived experiences of

FI/FS (Maynard et al., 2019). To better understand FI/FS, Radimer et al. (1990) described the lived experiences of FI with quantitative, qualitative, social, and psychological elements. Building on Radimer's research, Hamelin, Beaudry, and Habicht (2002) developed a framework to characterize the core experiences of FI among low-income households in Canada. The Hamelin framework includes the following characteristics: a lack of food in the present and the future, including a shortage of food (quantitative), unsuitability of food and diet (qualitative), and preoccupation with access to food (psychological); and alienation, including: a lack of control over the food situation and the need to hide FI (psychosocial) (Hamelin et al., 2002; Johnson et al., 2020).

The present study applies Hamelin et al.'s framework (2002) to characterize the unique lived experiences of FI for 31 MSFW and small-to-medium scale farmers working in Oregon. As such, this study aims to provide a better understanding of the experiences of FI among farm communities in Oregon.

Methods

Data Collection and Participants

A convenience sample of 31 MSFW (n=18) and farmers (n=13) was recruited between 2018 and 2020. Each participant was offered a snack and received \$25 for their time. MSFW were recruited from social service agencies or orchards using informational brochures and on-site. Farmers were recruited from farmers markets, local farm directories, and Oregon State University (OSU) Cooperative Extension contacts and listservs. The researchers' affiliation with OSU Cooperative Extension was advantageous, as Extension staff had a trusted reputation within rural communities who may have otherwise not agreed to participate.

In-depth, semi-structured interviews were conducted in Spanish or English. Informed consent was obtained verbally from MSFW and in written form from farmers before their interview. Interviews ranged between 40 and 159 minutes. The Oregon State University Institutional Review Board approved this study.

Measures

A semi-structured interview guide was designed to explore FI among F/MSFW and the mechanisms F/MSFW use to cope with FI as central phenomena (Creswell, Hanson, Clark Plano, & Morales, 2007). Participants were encouraged to share relevant narratives and anecdotes, and interviewers were trained to use follow-up questions to explore emerging theoretical constructs and topics that captured practices, relevant terminology, and the complexities of participants' perceptions and experiences (Patton, 2002). For interviews with farmers, the primary author refined questions within the interview guide in an iterative process to reflect emerging themes (Agee, 2009; Charmaz, 2004; Creswell et al., 2007).

The 6-Item HFSSM Short Form was derived from the 18-item HFSSM. The 6-item HFSSM has been described as a robust tool to identify food insecure households and households with very low FI with high specificity (92%) and sensitivity (98%), and minimal bias relative to the 18-item measure (Blumberg, Bialostosky, Hamilton, & Briefel, 1999). The HFSSM scoring system evaluated food security with four categories: full food security (0 affirmative answers), marginal food security (1 affirmative answer), low food security (2-4 affirmative answers), and very low food security (5-6 affirmative answers). The 6-Item HFSSM in the current study was intended to complement study findings by providing a demographic descriptor of the study population and informing quantitative elements of FI using a widely utilized and accepted scale.

Analysis

Interviews were digitally recorded and transcribed verbatim in the language of the interview using a professional transcription service. Spanish language interviews were translated into English, and English transcripts were used for coding.

The authors analyzed the data using a modified grounded theory approach. The goal was to create a description of FI among the farm workforce grounded in or emerged from interview data. We used Hamelin et al.'s framework to organize core characteristics of household FI. Codes designated

characterization of FI: a shortage of food, unsuitability of diet, preoccupation with access to food, alienation, lack of control over food, and the need to hide FI. Emergent codes designated F/MSFW experiences that misaligned with their evaluated HFSSM score, for example, when a participant who was evaluated as food secure shared experiences that suggested s/he encountered periods of FI.

Using MAXQDA, data were coded in three stages. First, the primary author conducted open coding interview transcripts during which emerging themes were identified and sorted into elements. Next, axial coding allowed for a more extensive analysis of each element and the interrelations between each. The primary and senior authors convened to discuss emergent codes, consider alternatives and determine selective codes. Last, the primary author conducted selective coding to reveal the core characteristics of FI using Hamelin's framework (Saldaña, 2016; Hamelin et al., 2002).

The strategy of data collection, analysis, and interpretation of findings for this study was designed with respect to the rigor and trustworthiness of this qualitative study using established quality criteria (Korstjens & Moser, 2018; Krefting, 1991). Some farmers were recruited through a nominated sample by OSU Extension Agents with whom they had pre-established relationships to strengthen the transferability of the study. Interview techniques promoted study credibility with time sampling and open-ended questions reframed and repeated in various ways. The engagement of three interviewers and two researchers for data analysis encouraged triangulation of investigators' thoughts and codes, which allowed for the consideration of differing interpretations of study findings. The primary author used a code-recode process for the first stages of analysis where data was open-coded, coded again two weeks later, and then findings were compared for consistency to ensure study dependability. Last, to increase study confirmability, the primary author shared post-interview reflections with the senior author to consider emerging themes and the influence of the authors' lens and interests with respect to the study participants' experiences.

Results

Sample Characteristics

Participants (N=31) included 18 MSFW and 13 farmers in Oregon (Table 1.1). The sample included 16 females and 15 males aged 30-75 years (M=49, SD=13.3). The majority (58%) were Hispanic/Latinx and born outside of the U.S. Over two-thirds were married and cohabitating, and 45% were parents of children under 18 years old. Most (68%) reported work instability characterized by seasonal income. Fifty-five percent were fully food secure as evaluated by the 6-item HFSSM, while 16% were marginally food secure, and 29% had low food security.

Evaluated Food Security versus Experienced Food Insecurity

The USDA's 6-item Household Food Security Survey Module

As the HFSSM was administered during participant interviews and F/MSFW were provided the opportunity to discuss their responses to quantitative survey measures, participants could add context or personal anecdotes to support their answers. Context revealed participant experiences that frequently misaligned with their evaluated food security score. For example, one HFSSM question states, “In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food?” Response options included yes, no, or don’t know. The following statements show how two participants responded to this question:

A 40-year-old female farmer with low evaluated food security responded, “yes”:

Absolutely. Yeah. We have, like, survival food is what we call it, so we'll have things that are cheaper that we'll make to subsidize the real food. Like popcorn, we'll supplement with popcorn or something.

A 63-year-old female farmer with low evaluated food security responded, “no”:

I would say no. But what I'd do is I just try to be more creative, like, how to get enough without it costing a lot. I make a big thing of rice and doctor it up and do things to be frugal.

Although the two farmers responded differently to the HFSSM question about reducing food intake, their narratives revealed comparable experiences of reducing dietary variety to manage food shortages, highlighting how participant experiences added context to evaluated food security.

Specifically, one individual interpreted her variety reduction as a necessity cued by the need to reduce food intake. In contrast, the other individual interpreted the same strategy as a coping mechanism that helped her avoid reducing food intake.

The following characteristics of FI reflect the ways in which F/MSFW with a range (full, marginal, and low) of evaluated food security scores shared similar experiences with FI/FS.

Characteristics of Food Insecurity

According to F/MSFW descriptions of their experiences, their core characteristics of household food insecurity (Hamelin et al., 2002) revolved around seasonal resource shortages that resulted in a lack of food at some point during the year, the related mechanisms they used to stretch resources to sustain the household year-round, and the tendency to downplay their circumstances (Table 1.2).

A Lack of Food in the Present and the Future. The primary referent for F/MSFW conceptualizations of FI was a distinct shortage of food and related experiences of hunger. Many participants shared characteristic experiences of FI that were not perceived as such, possibly because these experiences were more moderate or variable than their understanding of FI.

Shortage of food. Participants commonly encountered predictable but difficult food shortages during the winter, a season of limited or non-existent earning opportunities in agriculture. During this agricultural off-season, F/MSFW employed various coping strategies. Some participants prepared for the winter by budgeting and setting aside money to support their food access through the winter. One participant noted how saving money helped him sustain a regular diet during the winter: “I try to save a lot of money. When you don’t have any money, you don’t eat the same things you eat when you have money.” (58-year-old male MSFW, full evaluated food security). Participants also reported making trade-offs to address their food shortages. For example, a 36-year-old male farmer with full evaluated food security lived in an on-farm shed without electricity, yet, he emphasized that he and his wife were “eating what we want to be eating.” Another farmer, a 31-year-old female with full evaluated food security stated, “[My husband and I] have really crappy cars, but we eat well.” MSFW also made trade-offs between paying bills or buying groceries. One MSFW prioritized her food needs above paying her bills on time:

If I [only] have [enough] money to [pay my electricity bill], and I have to pay electricity on the 12th, or 13th, even if I pass the bill [due date] by a day or two, I'd rather pay the electric bill later and have something to eat. (50-year-old female MSFW, marginal evaluated food security)

Whereas another MSFW prioritized paying her bills on time above her food needs:

I have to save money and only spend it on the most important things. When we have to pay rent, I have to use that money to pay for rent and to pay the electric bill... And that is how we have been able to make it through the winter. Sometimes we have just a few dollars left to buy groceries. (50-year-old female MSFW, low evaluated food security)

While farmers' trade-offs centered upon cost savings which enabled them to participate in the economy year-round, MSFW trade-offs involved immediate needs with individuals choosing between food access or electricity. MSFW who encountered overdue bills risked a loss of electricity and impeded their opportunity to engage with formal financial institutions, build credit, and engage with the economy. Established credit proved to be essential for farmers who relied on taking out loans to get through the winter:

We have no actual real money in the bank right now, but we are doing that – I mean, seasonally, we've used a line of credit many years to get us from November, kind of when our income stops, until February. (56-year-old female farmer, marginal evaluated food security).

Instead of formal loans, MSFW described utilizing informal resources like visiting the local food bank or taking out personal loans with family members, friends, or employers: "My husband's family helps us with food. Sometimes I borrow money for groceries, and I pay them back later. And sometimes they give me food." (50-year-old female MSFW, low evaluated food security). Finances permitting, MSFW also provided loans to other members of their community in need of assistance: "I feel good being able to help another person. When they ask for a loan, if you have [money available], then you can lend it to them, then they'll pay you back." (73-year-old male, low evaluated food security). Such strategies

highlighted the importance of a robust social network and community resources for the MSFW community.

Although seasonal food shortages affected F/MSFW throughout the year, many participants explained that they always have *something to eat* or food available to sustain them until they can access more.

One MSFW with full evaluated food security explained:

When there are not enough resources [to get food], it's stressful. I get a little stressed. But it almost never happens, you know? It has not happened that we get to the extreme of saying, "oh, I don't have anything to eat today." At all times, there is something, something to eat. (43-year-old male)

Another MSFW with low evaluated food security shared similar sentiments:

Well, there have been times that we do not have, let's say, money to buy food, but almost always, we have had something to eat. (73-year-old male)

Participants who had *something to eat* grounded the appraisals of their experiences with FI. While objective definitions of FI are characterized by reducing the size and variety of foods, the F/MSFW in this study favored meanings of FI that related to experiences with hunger. As most F/MSFW always had *something to eat*, this food safeguarded them from experiences with hunger.

Unsuitability of Food and Diet. Hamelin's framework includes severe monotony of diet and nutritional compromises as part of an unsuitable diet related to FI. While food variety is often considered a vital component of a quality diet (Murphy et al., 2006), it emerged as a less important feature of F/MSFW perceptions of their FI.

Building upon the significance of *something to eat* as a safeguard against hunger, participants referenced the go-to staple foods they kept in the cupboard, including beans, rice, eggs, bread, potatoes, and oatmeal. Staple foods were framed as an asset rather than monotonous and nutritionally compromising. One farmer with high evaluated food security explained: "For me, if I have nothing else to eat, I can eat a can of beans, I can eat them every day, and I'd be happy." (60-year-old female). Staple

foods provided F/MSFW security from experiences of hunger during the temporary periods in which they found themselves short on food: “Thank God I have never gone without food. I always have beans or eggs available.” (35-year-old male MSFW, low evaluated food security). These staple foods were consumed throughout the year and allowed participants to live frugally, which enabled them to save money for the winter. One farmer with low evaluated food security described how she purchased beans and rice in bulk and prepared them at the beginning of the week to eat through the week. She explained: “I’m not starving or anything. But I am very careful. I just eat beans and rice. It’s never gotten to the point where I’ve not been able to find enough food.” (63-year-old female). The salient theme among these experiences was that staple foods protected F/MSFW from experiencing hunger and severe FI.

Although staple foods provided security, many MSFW recognized that access to nutritious foods came at an out-of-reach price tag. One participant shared, “There are things that provide more nutrition to your body, but they’re worth more money. [We] can’t buy it because we don’t make enough.” (30-year-old male MSFW, high evaluated food security). Many shared their preference for fresh, non-processed fruits and vegetables, many of which they could grow themselves like tomatoes, chili peppers, salad greens, onions, squash, and cucumbers. It was notable that none of these preferred fresh foods were included as staples, suggesting that when F/MSFW have to or choose to rely upon staple foods, they may make sacrifices to their diet by selecting foods they know to be less nutritious and preferred. Still, most F/MSFW reported that they could access the quality and types of food they preferred, even those who relied on staple foods at times. As food shortages were primarily reported during the agricultural off-season, the temporary nature of the sacrifices F/MSFW make to their diet may have minimized participant concerns regarding the unsuitability of their foods.

Participants did share some concerns related to food unsuitability for their children. Parents voiced their worries regarding the quality of their children’s diets and the health impacts of processed and fast foods. Many F/MSFW parents also reported that their family qualified for free and reduced-price school lunches but that their children did not enjoy the foods offered to them at school. One MSFW explained: “There are times when he arrives [back home] very hungry and says ‘I didn’t eat. The food

wasn't good. I just drank my milk'." (54-year-old male MSFW, full evaluated food security). Due to these experiences, few parents relied on the school lunch program to feed their children; thus, the program did little to address the household burdens of FI.

Preoccupation with Access to Enough Food. Hamelin's framework describes "uncertainty about tonight" (current uncertainty) and "uncertainty about next week and the following weeks" (future uncertainty) as characteristics of preoccupations with access to food. Provided the unique vulnerabilities encountered by farming communities, participants stressed over a range of factors that contributed to, and overshadowed, preoccupations with access to enough food. The salient vulnerabilities that emerged were associated with farm labor, immigration, and low-wage employment.

Farm labor is filled with risks. F/MSFW had endless farm responsibilities, many of which were physically demanding and filled with occupational hazards like operating farm machinery and exposure to noxious chemicals. Threats to farm profitability included reduced sales from trade wars and tariffs, falling commodity prices, crop loss to wildlife and climate variability, water insecurity, and inconsistent income from season to season. Farm labor contributed to F/MSFW preoccupation with access to enough food for some participants. For example, one 65-year-old MSFW with low evaluated food security described how injuries in the field prompted his early retirement, which led to his experiences with FI. He shared his reflections about farm labor: "They were long and hard hours, but what can I tell you? Nothing in life is easy. All of the things you have to earn through hard work. The thing that [has] damaged me the most are the work-related injuries. Unfortunately, I had three accidents in the field." Though many farm risks increased F/MSFW vulnerability to FI, particularly those that decreased household income, sometimes preoccupations with access to enough food fell secondary to farm burdens: "I'm not sad about our food... [I'm sad because] we are spending money, our resources, and our lives to grow food that we're not being compensated for in a way that is fair." (31-year-old female farmer, full evaluated food security). While unfair compensation may have contributed to a lack of resources and experiences with FI, this farmer's comment highlights her frustrations with the food system instead of her food access.

Issues related to immigration also burdened participants. MSFW reported fears of losing their U.S. residency, language barriers, and related physical and psychological stress. Immigration-related factors added to the financial encumbrances of MSFW. One participant described how he struggled to stretch his farm income to support his family living with him in the U.S. and his family residing in Mexico, which resulted in uncertainty regarding food: “I have to help my parents, who are in Mexico. From my check, I send a little bit for them. And to buy food for me, sometimes, that worries you. You go to the store, and you barely have enough.” (54-year-old male MSFW, full evaluated food security). For MSFW who earned a modest income, the added burden of remittances contributed to their financial precarity and the resultant preoccupations with access to enough food. The structural impact of immigration enforcement on farming communities was another source of stress for F/MSFW. One MSFW with marginal evaluated food security shared how changes to immigration policy and heightened enforcement affected MSFW capacity to work: “At work, they’ve told us they’re going to check the [social security numbers] this coming year. Thank God, we have [social security numbers], but those who don’t? They [will] let them go.” (50-year-old female). Connected with these fears of deportation that reduced MSFW capacity to work, fewer individuals were available to maintain basic farm functions. One farmer demonstrated the essential role MSFW play on the farm: “We can grow the fruit, and it can sit on the trees. But unless we have people to prune, or thin, or pick, or do all the jobs we need to do, it’s just gonna sit on the trees. It’s gonna be a waste.” (35-year-old female with high evaluated food security). Fewer MSFW active in the farm workforce affects farm maintenance and farm profits. Diminished farm profits harm F/MSFW, whose well-being is contingent upon productivity, work, and a successful harvest. While such issues may overshadow preoccupations with food access, reductions in income may add to F/MSFW worries regarding their access to food.

For F/MSFW living in rural areas earning low wages, preoccupations with access to food may be heightened. One MSFW with marginal evaluated food security explained how low wages combined with higher food costs in the rural setting affected her ability to access food: “There is very little work, sometimes, [and] things are very expensive. I think it affects me that sometimes, I can’t take enough food

home due to food being too expensive.” (38-year-old female). F/MSFW who earn low wages may also have trouble making ends meet in other ways. Another MSFW with high evaluated food security described how she struggled with paying for necessary medical treatment: “I stretch [my income] a little bit so I can make ends meet. Sometimes [it] feel[s] like a nightmare because I do not have enough money to cover my expenses because I [have to] take a lot of medicine.” She followed this statement by explaining why she doesn’t have preoccupations with her food access: “Sometimes we see difficult times, but saying that we don’t have [food in the home], that we *don’t have*? No.” (73-year-old female). For this MSFW, preoccupations with the costs of prescriptions may have overshadowed concerns with food access. Her feelings also demonstrate how experiences of FI are possibly conflated with experiences of hunger among those who must prioritize their basic needs. Without the physical experience of hunger, food concerns may be set aside.

Psychological fatigue from co-occurring stressors grounded participants' tendency to minimize the emotional toll from their experiences: “If you’ve been farming for a while, you get used to handling failure.” (56-year-old female farmer, marginal evaluated food security). Participants minimized the importance and impact of their experiences and resigned themselves to their conditions. For example, one MSFW with low evaluated food security acknowledged his family’s FI but was quick to shift his narrative from beginning to end to minimize the experience of suffering that FI caused.

Sometimes we don’t have enough money to buy the [food] that we want. But we are used to suffering, and it doesn’t matter. We are used to eating beans and tortillas, and that is something. And my entire family is used to that. We don’t suffer, and we don’t worry about that too much (65-year-old male).

Provided this mindset, even acknowledged experiences of FI might prompt F/MSFW to respond to food security assessments in ways that reflect their behaviors around FI but may not necessarily reflect their beliefs regarding their circumstances.

Alienation. Subjective social status framed the state of alienation experienced by F/MSFW. Alienation reflects the tension between a household's control over their food access and the degree of

control they think they should have (Hamelin et al., 2002). Among F/MSFW, such perceptions of control were socially informed through relative comparisons. Subjective social status refers to one's appraised position within the social hierarchy relative to the social status of a comparator (Jackman & Jackman, 1973). Applied to F/MSFW, comparisons between their social position and circumstances (the control they do have) and the social position and circumstances of others (the comparative control they think they should have) influenced their experiences of alienation. Participants' interpretations of subjective social status were influenced by how they viewed their position and experiences with FI compared to others which influenced how they viewed their control over FI. For example, one 40-year-old female farmer with low evaluated food security compared her circumstances to what she believed her advantages should be provided the low level of structural barriers keeping her down.

I'm, like, a 40-year-old, well-educated, white woman in the United States, and I look at [those factors], and I'm like, there's not a lot keeping me down. I think, in my ideal world, I'd have a little bit more to spend on food, but I don't, so I end up being like, well, whatever. We're eating rice and beans tonight.

By selecting a demographically similar group to inform her interpretations of social position, she experienced feelings of alienation (a low level of actual control versus a high level of expected control) intertwined with the resignation that her current circumstances could be worse.

One 44-year-old female MSFW with low evaluated food security formed her subjective social status with comparisons to individuals with greater need, which influenced her use of informal food safety net resources like food banks:

I would never go to a [food bank] to get food when I still have some beans left. I say, "at least I have beans, tortillas, and cheese, and I can have those." But that is my way of thinking, that [food banks] are for people who really don't have anything to eat.

Selecting a worse-off group to inform her perceptions of FI minimized her state of alienation (low level of actual control versus the potential for a lower level of control) and consequently the difficulty of her own experiences. As a result, she was hesitant to use the resources available that may help her manage FI.

Comparisons of subjective social status relative to past social status and experiences of FI influenced appraisals of current FI. Participants described past experiences in which they encountered food shortages that were comparably worse than the seasonal hardships they experienced in their current circumstances. A 65-year-old male MSFW with low evaluated food security described his experiences before immigration to the U.S.:

Our situation in Mexico was precarious. We were poor. We suffered a lot more due to a lack of food. What can I tell you? You can't have [all] of the things that you want. My situation is not that serious.

Drawing on difficult experiences as a baseline for his current subjective social status and experiences with FI, he regarded his current food insecurity as an improvement. Similar to the selection of a worse-off comparator, his state of alienation was minimized (low level of actual control versus previously experienced lower control).

A Lack of Control Over the Food Situation. Participants maintained control over their food availability primarily through labor. “It’s something that we all know. We have to work in order to eat. If you don’t work – it’s a normal thing [to not have food].” (45-year-old male MSFW, low evaluated food security). His comments reveal the intersection between work and control, a viewpoint this MSFW believed was widely accepted. Work provided F/MSFW power over their circumstances. When asked if his food sources were enough to cover his needs, one 72-year-old male MSFW with low evaluated food security explained the role his ability to work played:

Well yes! More or less, we get by. Sometimes, you barely get enough [income] for food [and] for one's expenses, like bills. It's a lot. Sometimes life is hard, but then being able to work, having work, everything is fine.

When work was unavailable, like during the winter, F/MSFW and farmers experienced a lack of control over their food shortages due to the subsequent loss of income. One participant shared, “In the winter, work gets scarce, and you work less hours, it’s more difficult to get food.” (30-year-old male MSFW, full evaluated food security). To regain control, many participants coped with their FI by taking on additional

work. For MSFW, this was often extra work in agriculture or construction. One MSFW with low evaluated food security said, “I go out to the field to work a day or two someplace [else] where they have work [available].” (72-year-old male). Meanwhile, additional work to farmers meant engaging in the non-farm workforce. A 35-year-old male farmer and small business owner with high evaluated food security explained, “Being a small farmer on its own is hard enough, and if you don't have another source of income, it can be pretty tough [to afford food].”

Sixty-eight percent of participants worked six to seven days per week during the agriculturally productive seasons, frequently at multiple jobs and typically exceeding a 40-hour-work week. This intensive engagement in the workforce was often necessary to ensure that participants had access to enough food. For example, a 40-year-old female farmer with low evaluated food security shared her frustrations with the amount of work demanded for her family to have enough food:

Why are we [living] paycheck to paycheck? We work so hard. My husband, his typical work week is 70 hours. I'm not exaggerating. I'm also working and dragging my kids with me. Our biggest expense, hands down, is food.

Her exasperation demonstrated the feelings of powerlessness experienced by overworked farmers and MSFW, who perceived an insufficient return (income, food) on their investments (the time and energy dedicated to working).

The Need to Hide Food Insecurity. The desire to hide FI relates to the concealment of alienation, a lack of control, or disempowerment. Feelings of embarrassment regarding a lack of control over food often grounded rationale for use or non-use of food assistance resources. Participants valued assistance that granted them privacy and independence, which protects them from judgment. One MSFW with low evaluated food security shared his concerns of judgment from his community, saying, “Do not go knocking on so-and-so's house. ‘Hey (knocks on table) Give me money to go buy tortillas or bread, chicken, beans...’ And that friend will say, ‘That lazy [person] doesn't work’.” (56-year-old male). F/MSFW can control their FI with work, which lends to the viewpoint that those who cannot control their experiences with FI must be too lazy to work harder. While informal food assistance, like food banks and

charitable food distributions, were essential resources for F/MSFW, their highly visible and community-based nature made it difficult for participants to use them in privacy.

We've thought about [utilizing the food bank]. But I guess there is still some pride [preventing us]. We don't want neighbors seeing us going in. Other people at our church use it, and some help in there, too. I don't know. We just haven't felt comfortable about that source. Everybody draws lines, I'm sure, as to what they will and won't do (75-year-old male farmer, high evaluated food security).

Some farmers contributed produce to their local food banks, which complicated their decision to use the food bank when they didn't have enough food. One female farmer with low evaluated food security shared her feelings as a contributor and customer of her local food bank. She said, "It's kind of embarrassing. One year, you're dropping stuff off for them, and then the next year, you're asking for help." (63-year-old female farmer)

Overview. The organization of core characteristics of FI among F/MSFW using the Hamelin framework added to the USDA HFSSM evaluated food security scores by incorporating contextual descriptors. For example, we can return to the same two farmers quoted at the beginning of this analysis; while the HFSSM categorized their two "Yes" or "No" responses as separate, distinct experiences, the Hamelin framework allowed us to characterize their two responses as congruent experiences in which they both reduced the variety of their diet in response to food shortages. Still, like how the HFSSM scores misaligned with participants' narratives, we also find that some categories from the Hamelin framework misalign with participant perspectives. We characterized behaviors related to experiences of FI according to technical definitions of FI/FS that use availability, access, utilization, and stability as pillars of FS, while F/MSFW perspectives did not always match those characterizations. In the absence of a severe lack of food or physical cues of hunger, most F/MSFW did not perceive their routine and widely accepted experiences, like the drive to over-work to meet food needs throughout the year, as experiences related to FI. As such, the HFSSM and Hamelin framework may have been more sensitive to F/MSFW experiences of FI (according to technical definitions) than the participants were.

Discussion

Results of this study offer a better understanding of the experiences of FI among F/MSFW in Oregon. According to initial analysis using the USDA 6-Item HFSSM, most (61%) participants had full food security, 16% had marginal food security, and 19% had low food security. Ensuing qualitative analyses using the Hamelin framework (2002) revealed core characteristics of FI that revolved around seasonal resource shortages resulting in food shortages at some point during the year, strategies to stretch resources to support farm households year-round, and the tendency to downplay hardship. From the perspectives of many F/MSFW, they always had *something to eat*. Research with small-to-midsized farmers and MSFW has approached the two communities as separate entities despite interconnected vulnerabilities (Berkey & Schusler, 2016; Villarejo, 2012). The results suggest that the two groups also share many of the same characteristics of FI. To the authors' knowledge, this is the first time that experiences with FI have been documented among the published literature for small-to-midsized farmers in the U.S., and the first time they have been examined parallel to the experiences of MSFW. Considering the lived experiences of F/MSFW together responds to the call for policies intended to address the health and well-being of F/MSFW while remaining sensitive to the nature of life on the farm (American Public Health Association, 2017; Braun, 2019). Findings provide a more comprehensive understanding of the difficulties encountered by the farm workforce to help inform more responsive policies and programs.

The HFSSM is a trusted tool that researchers have used to measure FI among MSFW previously (Allen, 2008; Borre et al., 2010; Brown & Getz, 2020; Minkoff-Zern, 2014; United States Department of Agriculture, 2012). Findings from this current study revealed evaluated food security scores that were sometimes misaligned with F/MSFW narrative experiences. One explanation is that the HFSSM was less sensitive to the moderate and variable cases of FI common among our sample, which is consistent with research that shows the HFSSM to be sensitive toward more severe cases of FI, but less sensitive to inconsistent experiences of FI (Johnson et al., 2020). A second explanation is that participant responses to the six-question survey were subject to F/MSFW interpretations of the words, questions, and concepts

intended to be captured. Because this study sample included F/MSFW from varying ethnic and cultural contexts, the embodied experiences of food adequacy, fullness, and nourishment (Napier et al., 2014), likely differed from the technical definitions of FI that the HFSSM is designed to capture. A third explanation is that the HFSSM cannot capture and reflect the unique circumstances encountered by the farm workforce. These explanations are not mutually exclusive, and each may play some part in the misalignment between HFSSM measures and the participants' narrative experiences. As such, the use of measures that more comprehensively capture the lived experiences of FI helped clarify the role of FI among F/MSFW.

One of the most salient characteristics of F/MSFW FI using the Hamelin framework was the seasonal resource shortages that resulted in a lack of food, particularly during the winter months that fall in between growing seasons. This finding complements research identifying the increased prevalence of winter hunger among MSFW (Wirth et al., 2007). Further, it is consistent with studies documenting seasonal food shortages among farming households in low-income countries (Devereux & Taveners-Smith, 2019; Hirvonen, Taffesse, & Worku Hassen, 2016). Provided the seasonality of farm work, experiences of FI among F/MSFW are likely to rise during the winter and fall during the summer. As these experiences are inconsistent, F/MSFW may be less likely to seek assistance when they foresee a solution to their food struggles in the future. In consideration of evidence of seasonal FI, the time of year that FS was evaluated with the HFSSM and the Hamelin framework may have changed how individuals responded to survey questions, which could explain some differences between evaluated and experienced FI. Interviews for this study were conducted during the agricultural off-seasons, as F/MSFW had more time available to meet with the researchers on this study. Results reflect experiences during a period where food shortages were more common.

Participants primarily maintained control over their food situation through employment. F/MSFW were tasked with stretching their notoriously low wages (Hernandez & Gabbard, 2018; Berkey & Schusler, 2016) to make them last. Like Meierotto and Som Castellano's study on Latinx farmworkers in

Idaho (2020), participants in this study worked long hours almost every day of the week to generate sufficient income to support their current food needs and save for the winter. Consistent with the literature describing values of self-reliance and a sense of shame associated with the use of food assistance resources among rural populations (Andress & Fitch, 2016), participants grappled with their use of food assistance and preferred to use programs with discretion within their small farming communities. Participants also engaged in financial management strategies like those documented by Quandt et al.'s (2004) research on MSFW in North Carolina. Consistent with Quandt's findings, F/MSFW sustained themselves through the winter by budgeting to save money and reduce food variety. While dietary variety is an indicator of a nutritionally adequate diet (Drewnowski, Henderson, Driscoll, & Rolls, 1997), participants emphasized the importance of the key staple foods that provided them *something to eat* and protected them from hunger.

Not all characteristics of FI were shared between the two groups (farmers and MSFW), as some factors affected farmers differently than they affected MSFW and vice versa. Farmers leaned on formal debts, such as lines of credit, to get them through the winter. Farmers' credit supported living expenses, including access to food and the purchase of agricultural inputs to run their farms, which are standard practices among U.S. farmers (Harvie, 2017). Separately, informal loans from family, friends and employers supported MSFW in the winter months. One explanation for these differences is that formal lines of credit may be available to farmers with established credit but not MSFW, many of whom face immigration-related barriers to establishing credit. Studies among undocumented immigrants suggest hesitancy towards financial institutions for logical reasons. Though some financial institutions will grant lines of credit to those with little to no established credit score, these debts likely entail high-interest rates that can make paying them off more difficult (Martin, 2015). For MSFW who were faced with the choice to buy food or pay utility bills, the decision to buy food instead of paying an electricity bill could harm MSFW credit. The inability to make bill payments further complicated MSFW opportunity to participate in the U.S. economy fully.

Study participants' concerns about food accompanied a host of risks and stressors that farming communities experience (Braun, 2019). Overburdened and overworked F/MSFW are vulnerable to psychological fatigue (Garaika, 2019), characterized by a diminution of the attitudinal, emotional, and spiritual elements of one's skills, contributions, and outputs (Pritchard & Eliot, 2012). The current study found that F/MSFW minimized the severity and difficulty of their FI through suggestions that their experiences were quotidian and inconsequential. Ultimately, many participants downplayed their circumstances. Similar cognitive processes have been identified among other food insecure populations (Dryland, Carroll, & Gallegos, 2020; Hamelin et al., 2002).

Implications

Programs designed to reduce food insecurity among farming communities are critical to support a robust food system. As farming communities are unique in many ways, policies that target the health and wellbeing of F/MSFW must remain sensitive to the nature of life on the farm. Although in many ways F/MSFW have experiences with FI similar to other low-income and immigrant groups (De Marco, Thorburn, & Kue, 2009; Munger, Lloyd, Speirs, Riera, & Grutzmacher, 2015; Quandt et al., 2006), their experience is rooted in the unique elements specific to the farm workforce. Seasonal differences, resource stretching, downplaying the severity of their needs, and reluctance to seek assistance should be considered when planning interventions and outreach.

Most MSFW and small-to-midsized farmers experienced distinct seasonal food shortages but were cautious about the types of food assistance they sought and utilized. Policies and programs could be designed to provide standardized seasonal wages or resource supplements for the farm workforce. U.S. farmers are known to value self-reliance and independence, and they are unlikely to ask for assistance (Farm Aid, 2018). Thus, automatic program enrollment for agricultural workers could obviate the need for F/MSFW to request assistance. Additionally, providing a standardized payment for all agricultural workers would support rural farm economies by increasing the food purchasing power of farming

families. Other solutions include financial institutions and fair financing options accessible to MSFW to help workers establish and build credit and support during the agricultural off-season. The feasibility and effectiveness of such programs on experiences of FI among F/MSFW warrant further exploration.

Longer-term solutions demand improvements to economic conditions among vulnerable F/MSFW. Addressing persistent poverty among farming communities requires substantial economic and infrastructural changes in the production of food. Labor law exemptions granted to the agricultural industry need to be re-examined, namely those related to piece systems and overtime pay. Further, the allocation of more substantial resources is necessary to strengthen the market infrastructure that supports the profitability of small-to-midsized farms.

Findings from this study demonstrate the benefits offered by pairing two measures to capture FI among F/MSFW comprehensively. Still, the measures, the HFSSM and the Hamelin framework, capture experiences of FI that are specific to technical definitions of FI and may not represent the perspectives of F/MSFW. Misalignment between objective and subjective experiences of FI may lead to policies and programs that do not reflect the attitudes of the target population. Thus, it may be beneficial to identify and engage key community stakeholders in policy and program development. Future studies on FI among F/MSFW may benefit from an investigation into the variations in interpretation and understanding of FI and HFSSM survey items and Hamelin et al.'s core characteristics.

Limitations

This study had several limitations. First, the sample included MSFW and small-to-midsized farmers in Oregon, limiting the transferability of these findings to other groups in other regions among the farm workforce. Additionally, interviews were conducted before the COVID-19 pandemic, which had significant social, economic, and health impacts on the farm workforce, thus limiting the transferability of these findings to post-COVID farm conditions. Provided the importance of work to support the livelihoods of F/MSFW, their position as essential workers during the global pandemic allowed them to

continue to earn an income during the economic recession. Still, F/MSFW conditions on the farm and in housing put them at high risk of contracting and transmitting COVID-19. In addition, F/MSFW who experience COVID-19 symptoms may encounter barriers to accessing healthcare for testing, contact tracing, and quarantining guidelines. F/MSFW who encounter stigma related to a culture of hard work and independence that demand engagement in the workforce now face stigma as a community that continues to work during the pandemic, thus potentially contributing to the spread of COVID-19 (Bottemiller Evich, Bustillo, & Crampton, 2020). Future research is needed to understand F/MSFW experiences of FI after the COVID-19 pandemic.

The interviewers were two White women and one Puerto Rican Latina woman connected with a public health program at a large public university. None of the interviewers worked on a farm, which may have impacted the information participants elected to share. Differences in race, ethnicity, education, citizenship, social class, and other perspectives and experiences between the interviewers and study participants may have influenced the direction and depth of each interview. Further, one of the interview sites took place on an orchard where the employer was present, which may have limited the candid experiences of some MSFW participants. Last, as most farmers in the study sample were White, and all MSFW were Hispanic/Latinx, it would be worthwhile to conduct research with a sample of the farm workforce with broader diversity to understand the influence of this demographic diversity on FI.

Conclusion

Our study sought to better understand the experiences of FI among the farm workforce in Oregon. We found evidence that F/MSFW perspectives of their lived experiences with FI were often misaligned with evaluated food security status and characterizations of FI. While this may signal that the tools we use to measure FI among F/MSFW are more sensitive to the experiences of FI than those who encounter them, both measured FI and perspectives of FI provide valuable information. Measured food security and core characteristics of FI connected to farm livelihoods underscore the need for farm policies and programs designed to address FI in consideration of the unique contextual factors that contribute to

limited food access, including seasonal gaps in income, low wages, over-working, downplayed experiences of hardship, and limited use of food assistance. Further, F/MSFW perspectives of FI highlight the importance of community engagement in developing policy and programs intended to serve farming communities.

Table 1.1 Migrant and seasonal farmworker and farmer demographics (N=31)

	<i>Sample total (N=31, col. %)</i>	<i>Migrant and seasonal farmworkers (n=18, row %)</i>	<i>Farmers (n=13, row %)</i>
Age			
< 35	3 (10)	1 (33)	2 (75)
35-49	13 (43)	7 (54)	6 (46)
50-59	8 (26)	7 (88)	1 (13)
60+ ^a	7 (23)	3 (43)	4 (57)
Sex			
Female	16 (52)	6 (38)	10 (63)
Male	15 (48)	12 (80)	3 (20)
Race/Ethnicity			
Hispanic/Latinx	18 (58)	18 (100)	0 (0)
White, Non-Hispanic/Latinx	11 (35)	0 (0)	11 (100)
Asian, Non-Hispanic/Latinx	2 (7)	0 (0)	2 (100)
Born in the U.S.	12 (39)	0 (0)	12 (100)
Marital Status			
Yes, living together in U.S.	21 (68)	13 (62)	8 (38)
No	10 (32)	5 (50)	5 (50)
Household size (people in the home)			
1	3 (10)	2 (75)	1 (33)
2-3	21 (68)	10 (48)	11 (52)
4+	6 (19)	5 (83)	1 (17)
Children in the home	14 (45)	13 (93)	1 (7)
Health concerns			
Child	7 (23)	6 (86)	1 (14)
Self	16 (52)	7 (44)	9 (56)
Language Preference			
Spanish	18 (58)	18 (100)	0 (0)
English	13 (42)	0 (0)	13 (100)
Financial Stability			
Work instability	21 (68)	17 (81)	4 (19)
Days worked per week			
5 days or less	10 (32)	9 (90)	1 (10)
6-7 days	21 (68)	9 (43)	12 (57)
Financial remittances	7 (23)	7 (100)	0 (0)
Off-farm income	7 (23)	1 (14)	6 (86)
Food Assistance			
Informal	11 (36)	10 (91)	1 (9)
Formal	8 (26)	7 (88)	1 (13)
<i>Subjective Food Security</i>			
Adequate quantity	27 (87)	15 (56)	12 (44)
Meets food preferences	22 (71)	12 (55)	10 (45)
<i>Evaluated Food Security</i>			
Full	17 (55)	9 (53)	8 (47)
Marginal	5 (16)	4 (80)	1 (20)
Low	9 (29)	5 (56)	4 (44)

Table 1.2 Experience of household food insecurity among farm owners and migrant and seasonal farmworkers in Oregon (N=31)

USDA 6-item Household Food Security Survey	
Evaluated Food Security Scores Based Upon Quantitative Measures	61% Full: 0 affirmative responses 16% Marginal: 1 affirmative response 19% Low: 2-3 affirmative responses 0% Very Low: 4+ affirmative responses
Hamelin's Characteristics of Food Insecurity	
A Lack of Food in the Present and in the Future	Seasonal food shortages affected food behaviors year-round
<i>Shortage of Food</i>	<i>Experiences of food insecurity during the agricultural off-season, typically December-February</i>
<i>Unsuitability of Food and Diet</i>	<i>Reliance on unvaried staple foods like beans and rice, often expressed as an asset</i>
<i>Preoccupation with Access to Enough Food</i>	<i>Preoccupation with food may be overshadowed by experiences with co-occurring, unique stressors rooted in farm labor, immigration, low wages</i>
Alienation	Appraisals of food insecurity were informed by Subjective Social Status (social comparisons)
<i>A Lack of Control Over the Food Situation</i>	<i>Work provided control over difficult circumstances and access to food</i>
<i>The Need to Hide Food Insecurity</i>	<i>Rooted in individualism, obstructed confidence in utilization of formal and informal food assistance</i>
Dynamic Nature of the Whole Experience	

CHAPTER 3. SECOND MANUSCRIPT

The Central Role of Psychosocial Factors in Determining SNAP Participation
Among Migrant and Seasonal Farmworkers and Farm Owners in Oregon

Abstract

Introduction: Rural residents, immigrants, and Latinx individuals all have higher risk for food insecurity.

Additionally, their eligibility for and rates of enrollment in food safety net programs like the Supplemental Nutrition Assistance Program (SNAP) may be limited. Because these groups may be overrepresented among farmers and migrant and seasonal farmworkers (F/MSFW), it is worthwhile to explore the determinants of F/MSFW participation in SNAP to clarify the role of the food safety net within farming families and identify opportunities for improvement.

Methods: In-depth interviews were conducted with 31 F/MSFW in Oregon. The Andersen Model of Health Service Utilization was adapted to organize and interpret patterns and predictors of SNAP participation among F/MSFW by psychosocial, predisposing, enabling, need and use factors. Modified grounded theory was used to analyze interview data. Data were coded using a three-stage process to identify salient themes.

Results: Participants were small- to mid-sized farm owners or worked on farms, orchards, vineyards, and fruit packing facilities. Over half were MSFW of Mexican origin (58%) and female (58%). Ages ranged from 30-75. About a third of participants (34%) were categorized as having marginal or low food security. The key finding of this qualitative inquiry was the central role psychosocial factors played in participants' use of SNAP. The three most salient predictors of SNAP participation included (1) perceptions of specific, compounded, comparative needs, (2) misalignment of needs and SNAP eligibility, and (3) pervasive internal and external stigmas associated with SNAP participation.

Discussion: Broad federal policies may not reach uniquely vulnerable populations like F/MSFW. Opportunities to improve the design and delivery of SNAP include expanded SNAP eligibility cut-offs and targeted community engagement mechanisms to facilitate participation.

Introduction

Policies and programs that effectively target food insecurity (FI) are critical in ensuring access to healthful food for all U.S. residents. The Supplemental Nutrition Assistance Program (SNAP), the most extensive federal food safety net program, is designed to increase low-income households' food purchasing power. According to the USDA's databases, SNAP served 84 percent of all eligible individuals in 2017 (United States Department of Agriculture, 2019b). While such safety net resources are ostensibly available to all eligible individuals, participation rates differ across diverse sectors of the eligible population, revealing distinctly vulnerable subgroups (McDaniel, Woods, Pratt, Simms, & Simms, 2017), namely, Hispanic/Latinx households, elderly adults without dependents (United States Department of Agriculture, 2019b) and both non-citizen and naturalized immigrant households (Twersky, 2019). Tailored engagement of specific racial, age and geographic groups may augment the food safety net's reach. Informed by evidence, this engagement must focus on underserved communities' unique needs and factors that drive utilization. In this study, we explore SNAP utilization through the experiences of a particularly important vulnerable subgroup, the farm workforce.

Residents of rural agricultural communities face food insecurity at higher rates than those who reside in urban areas. Living in a rural setting presents unique challenges that may lead to inadequate access to food at home, including geographical isolation, limited job opportunities, low availability of household resources, and limited access to food retailers (Braun, 2019; Health Resources and Services Administration, 2019a; Ip et al., 2015). In addition, those individuals who work on a farm, including farm owners and migrant and seasonal farmworkers (F/MSFW), encounter added risks to their health and well-being due to the environmental, financial, and social factors that are characteristic of farm labor (Health Resources and Services Administration, 2019b). High prevalence of FI has been documented among MSFW, and Latinx MSFW encounter even greater rates of FI (Hill et al., 2011; Ip et al., 2015; Kiehne & Mendoza, 2015; Kilanowski & Moore, 2010; Quandt et al., 2004; Villarejo, 2012; Weigel et al., 2007; Wirth et al., 2007). Although formal and informal food safety net programs and resources, like SNAP,

may enable F/MSFW access to food, their eligibility for and access to the food safety net may be limited (Medel-Herrero & Leigh, 2018; Gundersen & Ziliak, 2015; Padilla et al., 2014).

According to federal guidelines, only U.S. citizens and qualified noncitizens can participate in SNAP. Eligible noncitizens include lawfully present immigrant children, refugees, asylees, and qualified legal immigrant adults in the U.S. for a minimum of five years. There are also specific income, asset, age, disability, work, and time-limit eligibility criteria that can vary between states (United States Department of Agriculture Food and Nutrition Service, 2021). Both F/MSFW with economic hardship may find themselves ineligible for SNAP. Undocumented MSFW and those who have held lawful worker status for less than five years are not eligible to participate. Still, many MSFW households receive SNAP for eligible children or other household members. SNAP participation is low among lawfully present and undocumented MSFW and Hispanic/Latinx citizen MSFW compared to non-Hispanic/Latinx White citizen MSFW (Medel-Herrero & Leigh, 2018). Although farmers face fewer eligibility restrictions, seasonal and market-dependent income fluctuations can result in periods of eligibility and ineligibility throughout the year. Self-employed farmers must also provide proof of net income, which can be complicated and time-consuming to verify and is prone to calculation errors (Food Research & Action Center, 2019). Further, even eligible F/MSFW may not participate for a variety of reasons, including lack of awareness of SNAP, confusion about eligibility status, stigma related to program participation, fear of immigration consequences, benefit inadequacy, among others (Pelto et al., 2019; Weedall FitzSimons et al., 2011).

Previous studies have identified predictors of SNAP participation (Mabli, Ohls, & Dragoset, 2013; Pinard et al., 2017; Strickhouser Vega, Hinojosa, & Nguyen, 2017). The most consistent and robust predictor of SNAP participation is poverty status. In line with income-based eligibility guidelines, this includes households with gross monthly income less than 130% of the federal poverty level (Strickhouser Vega et al., 2016). Strickhouser Vega et al. (2016) used an adapted version of the Andersen Behavioral Model of Health Service Utilization to confirm the following predictors of SNAP participation among the general population: females, under 35, non-Hispanic/Latinx Black, Hispanic/Latinx, not married,

households with kids or a disabled family member, less than high school education, and those with higher perceived food need. These attributes largely mirror the demographic profiles included in the SNAP annual program reports, consistently showing the highest participation rates among non-Hispanic/Latinx Black and Hispanic/Latinx households and low participation among eligible adults over age 60 and the working poor (Cronquist, 2021; Cunyningham, 2020). Still, little is known about the factors that drive SNAP participation among vulnerable populations with low program utilization rates, like F/MSFW.

To build upon the existing knowledge that predicts SNAP utilization among the general population this study uses the Andersen model as a framework to better understand the issues that lead to low SNAP participation among F/MSFW. We adapt and propose a new theoretical model that depicts the patterns of SNAP participation and considers the unique vulnerabilities of F/MSFW. In doing so, we aim to identify the factors that drive SNAP participation among F/MSFW. Study findings may clarify the role of SNAP within farming communities to inform tailored engagement mechanisms and identify opportunities for policy improvement.

The current study was conducted as part of a broader research project that aimed to investigate the ways in which F/MSFW utilize formal and informal food safety nets to cope with hardship.

Materials and Methods

Conceptual Framework

The Andersen Behavioral Model of Health Service Utilization has been widely used to study health services and adapted to assess SNAP use (Redmond & Fuller-Thomson, 2009; Strickhouser Vega et al., 2017). According to the model, one's use of health care services can be predicted by predisposing, enabling, and need factors. The framework evaluates access (i.e., equity, efficacy, efficiency) and the environmental conditions that impact access and use. According to Andersen (1995), the model reveals equitable and inequitable access to a health service. Access driven by demographic characteristics signals equity, whereas access influenced by psychosocial and enabling resources suggests inequity. As the purpose of our study was to understand low participation, the Andersen framework helped us qualitatively

explore issues of SNAP access and equity. Acknowledging that the original model may not fully capture the psychosocial factors that determine service access and equity, Bradley et al. (Bradley et al., 2002) expanded the Andersen model in their study on the role of race and ethnicity in health service utilization. When aggregated, the original and adapted Andersen models provide a comprehensive framework to organize the demographic, social, and situational factors and domains that drive SNAP participation. *Predisposing factors* are the sociodemographic characteristics that influence an individual or household's likeliness to participate in SNAP (Andersen, 1995). *Psychosocial factors* are those that influence decision-making related to the intended behavior. Derived from the Theory of Planned Behavior (Ajzen, 1991), the model incorporates four psychosocial domains: attitudes, knowledge, subjective norms, and perceived control (Bradley, 2002). *Enabling factors* are the community and policy-level resources necessary for SNAP participation. *Need factors* are individual perceptions of their state or their household's needs. Finally, *use factors* are the perceived value and experiences of SNAP participation.

Study Design

This qualitative study of F/MSFW (N=31) in Oregon uses a modified grounded theory approach (LaRossa, 2005) to create a description of SNAP use among the farm workforce that was grounded in or emerged from interview data. A modified grounded theory methodology uses an inductive approach to build evidence and a deductive process to make predictions about other experiences (Clandinin, 2004). Credibility, dependability, and confirmability strategies were integrated into the study design to promote rigor and trustworthiness using established quality criteria (Korstjens & Moser, 2016). Methods included time sampling, repetition and reframing of questions, reflexivity assessments, and dense descriptions of each interview (Korstjens & Moser, 2018; Kretting, 1991).

Sample

Using convenience sampling methods, individuals from the farm workforce who may experience FI or who work with or employ others who experience FI were recruited to participate in in-depth, face-

to-face, semi-structured interviews. MSFW (n=18) were recruited from a social service agency (n=9) and an orchard (n=9) in one Oregon county in March and April 2018. At the social service agency, a staff member recruited using informational flyers, and the study team recruited on-site for same-day interviews. Participants interviewed at the agency were employed on varying surrounding farms. On the orchard, the owners provided recruitment materials to employees to participate. Farmers (n=13) were recruited from local direct-to-consumer markets, Cooperative Extension contact lists, or Extension Agent nomination to participate in interviews between December 2019 and March 2020. Farms were in various counties throughout Oregon. As Extension staff had a reputable presence within rural farm communities, their involvement fostered credibility and trustworthiness among participants who may have been reluctant to participate in research.

Measures

Semi-structured interview guides were designed to capture participant experiences managing food hardship as a central phenomenon (Creswell, 2009). The interview guide for MSFW (Appendix A) contained 51 multi-part questions. It covered three topical domains: food security status, perceptions of food access and available resources, and food safety net utilization. The MSFW guide was developed over one-year using stakeholder input and a review of both gaps in the literature and published instruments (Blumberg et al., 1999). One member of the research team translated the instrument into Spanish, another member translated it back into English, and the final Spanish translation was checked for accuracy. The U.S. Department of Agriculture (USDA) Household Food Security Survey Module (HFSSM) 6-item Short Form was selected as a descriptive measure to capture food insecurity among the participants.³ The interview guide for farmers (Appendix B) contained 49 multi-part questions. It covered four topical domains: farmer food security status, farm characteristics, MSFW food security, community food security, and the food system. The farmer guide was derived from the MSFW interview guide. It

³ Food insecurity within U.S. households has been monitored using the USDA's 18-item HFSSM, from which the 6-item HFSSM is derived, since 1995 (Hamilton et al., 1997). The 6-item HFSSM is a robust tool to identify food insecurity among households. Compared to the 18-item HFSSM, the 6-item has minimal bias, a specificity of 92%, and sensitivity of 98% (Blumberg, 1999). The 6-Item HFSSM designates individuals using three categories of food insecurity: high or marginal food security (0-1 affirmative responses), low food security (2-4 affirmative responses), and very-low food security (5-6 affirmative responses) (USDA, 2012).

included new questions after conferring with Oregon State University faculty from Cooperative Extension and a review of gaps in the literature. The farmer guide excluded components related explicitly to the MSFW role and included questions about the farm ownership role. Questions that prompted farmers to talk about their financial challenges and hardships were drawn from interview-based research with farmers in Oregon (Trant, 2017).

For both interview guides, questions were iteratively redeveloped and refined in consideration of emerging themes, evolving perspectives, and the positionality of the researchers regarding the influence of their roles, attitudes, and biases in the inquiry process as community outsiders (Agee, 2009; Charmaz, 2004; Creswell et al., 2007).

Procedures

Interviews were conducted in Spanish or English, depending on the preference of the interviewee. Demographic information and the USDA HFSSM were also collected. Informed consent was obtained verbally from MSFW and in written form from farmers before their interview. Each participant received \$25 cash for their time. F/MSFW were offered snacks during their interviews conducted in spaces convenient for participants, including on the farm, in farmers' homes, community meeting spaces, and Extension offices. The Oregon State University Institutional Review Board approved study procedures.

Data Collection

Interviews ranged between 40 and 159 minutes. Interviews were digitally recorded then transcribed verbatim in the language of recording by a professional transcription service. The transcription service then translated Spanish language interviews into English. Participants were encouraged to share any experiences or ideas inspired by the interview questions (Creswell et al., 2007). Interviewers were trained to use follow-up questions to pursue emerging theoretical constructs, practices, relevant terminology, and insights (Patton, 2002).

Analysis

A priori code families designated 1) SNAP participation, 2) individual values and beliefs as they relate to SNAP, and 3) sociocultural and community assets and vulnerabilities (Bowen, 2006). Emergent codes (e.g., dimensions of participation like program helpfulness, purpose, stigma, hassle burden, etc.) were developed as they occurred in the data and organized by factors, domains, and themes adapted from the Andersen models. Using MAXQDA, data were coded in three stages. First, the primary author open-coded interview transcripts to identify and sort concepts. Second, the primary and senior authors convened over several sessions to review, consider alternatives and agree upon codes. Axial coding followed to organize related themes, allowing for a deeper analysis of the process that determined SNAP participation. Themes emerged around cognitive, affective, and evaluative processes related to the intent to use SNAP. Some themes were interrelated, overlapping within and between categorical domains, and each domain was linked by pathways of influence, revealing a process through which the intent to use SNAP progressed. Data were not mutually exclusive to one factor or domain and could have been coded under multiple domains. In the final step, the primary author used selective coding to develop a theoretical model that depicted the factors contributing to SNAP use among F/MSFW (Saldaña, 2016).

Results

Sample Characteristics

The sample included F/MSFW in Oregon between the ages of 30 to 75 years old ($M=49$, $SD=13.3$). Over half of the participants (58%) were MSFW and identified as Hispanic or Latinx, 35% identified as White, and 6% as Asian. Most participants were born outside of the U.S. (61%). The preferred language of their interview was distinctly divided between Spanish language interviews for MSFW and English language interviews for farmers. Just over half (52%) of the sample was female. More were married and living with their spouse (68%), 45% reported at least one dependent child living in the home. Twenty-three percent of participants said that they provide financial support to families residing in their country of origin. Over two-thirds of the sample (68%) reported work instability, and the same amount reported working most or every day of the week. Most participants (71%) reported that they

grew produce for home consumption. Eighty-seven percent said that they have access to adequate quantities of food, but less (71%) reported that their food preferences were met. Most had full food security (55%), less had marginal food security (16%), and under one-third (29%) had low food security as evaluated by the USDA HFSSM. Twenty-six percent were currently participating in SNAP, 32% previously used SNAP, and 42% reported never using SNAP. While participant income was not objectively measured, 25% of participants said that they were income-eligible (with income <130% of the federal poverty level) for SNAP.

Predisposing Characteristics

Table 2.1 provides the differences in characteristics of F/MSFW in Oregon by SNAP participation and non-SNAP participation, organized by variables adapted from the original Andersen model. Consistent with the literature, higher proportions of SNAP use were reported among Hispanic/Latinx participants and those with children living in the home (Smith et al., 2016). Incongruent with the literature, we found higher proportions of SNAP reported by F/MSFW who preferred to speak Spanish during their interview, those aged 60 and older, male, married, and that lived with immediate family only, compared to F/MSFW who were not currently using SNAP. There were also higher proportions of SNAP participation reported by F/MSFW who experienced work instability, those who worked five or fewer days per week, and individuals who provided financial support to family living in their country of origin (most non-U.S. born participants in the sample immigrated from Mexico). Regarding food acquisition strategies, SNAP participants reported growing vegetables for home consumption, using informal food assistance like food pantries, and using federal aid that is not food-related (e.g., unemployment insurance) more frequently than individuals who did not use SNAP. Concerns about their children's health and access to preferred foods but inadequate quantities of food were also reported more often among SNAP participants than non-participants. Last, more F/MSFW using SNAP had evaluated food security scores indicative of full or marginal food security versus F/MSFW who were not using SNAP.

Factors, Domains, and Major Themes of the Theoretical Model

The emergent factors, domains, and major themes identified in this study are summarized in Table 2.2. As the expanded Andersen model (Bradley, 2002) and subsequent applications of it (Travers, 2020) have focused upon health service utilization, some elements were modified or shifted to capture the use of a public resource (SNAP) as opposed to seeking a health service. The theoretical model connecting each element is depicted in Figure 2.1.

Predisposing characteristics (Andersen, 1995) were aggregated with behavioral health factors (Bradley, 2002) to describe the elements that drive MSFW and farmer participation in SNAP: predisposing and psychosocial, enabling, and need factors. Findings suggested that previous use of SNAP informed one's intent to use SNAP in the future through an iterative process. In the following sections, we discuss these findings.

Psychosocial Factors. Psychosocial factors played a central role in determining SNAP participation. Attitudes, knowledge, normative beliefs, and perceived control were the psychosocial domains identified as key variables that had a core influence upon intent to participate in SNAP. In addition, participants' experiences or the experiences of others with social proximity, such as friends or coworkers, informed psychosocial factors associated with SNAP.

Attitudes Shaped Perceived Value and Drawbacks of SNAP Participation. SNAP helpfulness was the most salient theme by which F/MSFW formed program appraisals. Current or previous SNAP participants' estimations of helpfulness ranged from neutral to very helpful and were related to the adequacy of the benefits they were allotted. Some farmers who did not use SNAP theorized about potential helpfulness, but these thoughts did not necessarily spur individuals to participate in SNAP. Two farmers shared how SNAP benefits would have helped them had they decided to use the program:

[SNAP] would have been gratefully helpful to everybody on the farm, and then I would have gone to vendors at the farmers' market... I could have been buying vegetables from some of my friends [to support their farm business] and maybe even getting [nutrition incentive vouchers] from the market to buy more vegetables. (36-year-old male farmer)

It certainly would have been tremendously helpful when we were working on the farm that we were living at before and not making much money, and then [when we were] starting our own farm. Our main costs were food. (32-year-old female farmer)

The rationale for SNAP participation emerged from dialogue regarding previous SNAP participation. Some participants were compelled to defend their use of SNAP by justifying their needs, “[The times] that we don’t have [money] for food, we go to the [agency], they gave us food stamps... but it’s only when we really need them, not... I tell you, it’s only when there’s not a lot of work.” (43-year-old male MSFW). Some also emphasized the temporary nature of their use, “I had an accident, and I injured this leg. And [SNAP] helped me for a short while. Like one year and that’s all.” (58-year-old male MSFW).

Knowledge of SNAP Guided Psychosocial Experiences of Hesitancy, Guilt, and Fear.

Hesitation to use SNAP and feelings of guilt or fear due to structural and economic constraints were drivers of SNAP participation among F/MSFW. The content of information was structured by participants’ knowledge of SNAP’s purpose, program audience, eligibility rules, legal issues, and the supply of available resources. Program purpose and program audience (who gets to use SNAP) jointly influenced views of program fit and alignment with participants’ specific set of needs (Fig. 2.1). Individuals who believed the purpose of SNAP was to supply food for those without any were hesitant to participate in SNAP if they did not perceive a need for food themselves. One participant who viewed SNAP as a food access program had never used the program herself because: “I think the people [who] do not have food, if they qualify, they go to the stamps.” (73-year-old female MSFW). Some individuals believed the purpose of SNAP was to provide aid for low-income individuals and families. A 54-year-old male MSFW explained that he participated in SNAP because it was a program intended for families like his: “These programs are given to those with low incomes... like us here. If you don’t qualify, they won’t give you anything.” (54-year-old male). The supply of available SNAP benefits also influenced decisions to participate. Concerns about exhausting a perceived limited resource led to feelings of guilt from F/MSFW who believed SNAP should be allocated to individuals with comparatively greater need: “I am

somewhat relieved that I'm off [SNAP] because I felt so much guilt around it, and I always was like this really needs to go to someone who is like super down and out.” (40-year-old female farmer).

Key sources of information were friends, community members, and agency personnel who informed study participants' knowledge and attitudes. For example, it was common for individuals to encounter hardship, like an injury or job loss, and be referred to apply for SNAP, “I first heard about this program through [several] friends once I got injured... And I applied immediately.” (65-year-old male MSFW). While referents sharing information related to public charge and SNAP use specifically centered around losing the authorization to live and work in the U.S. were not explicitly revealed, the feelings conveyed by some participants suggested an atmosphere of collective fear that impeded SNAP participation. For example:

[There is] too much fear [in the community]. Yes, you don't know when you can receive a call, or you have to go to court or something like that. I know people who are needy and who receive food stamps during the winter season when we don't have too much work, and they were saying that [using SNAP] would affect them, that the green card would not be renewed, and those who are trying to obtain their documents won't be able to [obtain them if they use SNAP]. It's very tense. Some people are in need, [but] that's why they have not requested food assistance. (35-year-old male MSFW)

Concerns about public charge and U.S. residency were limited to MSFW participants.

Stigma and Stereotypes Structured Participants' Normative Beliefs. Normative beliefs were formed by psychosocial interpretations of SNAP shaped by political stereotypes and stigma, socially informed by the community, SNAP caseworkers, and family. Among farmers, some named SNAP stigma as a primary barrier to their participation. One farmer who previously used SNAP recognized how social stigma affected her participation, “In my mind, my intelligent mind is like, yes. You should be using these food stamps for good, quality food, but I just had this weird social stigma around it.” (40-year-old female farmer). Even among participants who conveyed that they did not hold stigmatizing beliefs toward others' participation in SNAP, they still did not feel they could use SNAP because of the social stigmas attached

to program use and the potential for judgment from others. Both groups stigmatized SNAP participation because they related it to political narratives of program abuse and stereotypical welfare dependency. F/MSFW shared beliefs that individuals do not need SNAP but use it anyway or that individuals who need to participate in SNAP are not diligent or must not work hard enough.

There are people who abuse [SNAP]. [They] have [money], and to avoid spending, they lie. (56-year-old male MSFW)

Yes, there are people that I know don't need it. There are many people who don't work and get food stamps. These are just people who don't like to work, and they get food stamps. I mean, it's obvious that they are going to get food stamps. I don't like that. I like to work, and I'd rather work to earn my money. (44-year-old female MSFW)

For F/MSFW, who took pride in their identities as ingenuous hard workers, “You just go hard seven days a week, sun-up to sundown to make this farm happen.” (36-year-old female farmer), the decision to use SNAP likely conflicted with their core identity.

Referents, including family, community, and SNAP caseworkers, played a crucial role in perpetuating SNAP stigma. For some, stigma was common among their community, or it was intergenerational. For example, one 32-year-old female farmer raised on a family farm discussed her inability to bring herself to apply for SNAP due to “a family history of shame.” Notably, another 31-year-old female farmer who previously participated in SNAP after her husband lost his job mentioned a SNAP caseworker sharing narratives related to program abuse:

The [caseworker] actually told him in a surprised voice, “I can't believe that you're cutting this off—because so many people try to use it even after they don't need it” the guy was thankful [that my husband went in to discontinue SNAP].

As caseworkers coordinate access to SNAP (enabling), the normative beliefs they perpetuate may be interpreted as fact rather than opinions, thus maintaining narratives of widespread abuse of SNAP.

Ideologies of Independence, Privacy and Dignity Shaped Participants' Perceived Control. Self-determination centered around participants' locus of control over covering their basic needs and the ability to maintain their independence, privacy, and dignity in that process. Considering the pervasive stigmatizing beliefs associated with SNAP, the program simultaneously preserved and threatened the value farming communities place upon independence. Although SNAP provided a resource that gave participants more control over their needs, it required them to relinquish control over how they are treated or view themselves. Most F/MSFW conveyed that it would be preferable and more dignified to maintain their food needs independently without using SNAP, but SNAP was better than having no access to food. One farming couple explained the value they derived from SNAP despite their internalized stigmas: "One thing that we were quite embarrassed to do, and we still are somewhat embarrassed because of the lack of income...we went ahead and got the [EBT] card. So, we use that and it's such a blessing." (Farmer couple in their 70's who were participating in SNAP).

Related to independence and dignity, one advantage of SNAP was the privacy it granted participants. One MSFW who was participating in SNAP explained that the program allowed him to keep his struggles private, "[It is better to] not bother other people ... you can go to ask for stamps, right? It is confidential." (56-year-old male). In addition, farmers appreciated the transition to electronic balance transfer (EBT) cards from physical food stamps. The card provided them more privacy at store checkout counters and helped preserve their dignity among rural communities.

Other loss of control was unrelated to stigma. Despite the assistance that SNAP provides, some participants still experienced a loss of power compared to those occasions in which they did not need help. One comment highlighted the ways in which SNAP represented a loss of autonomy over food choice:

I used to eat full meals and was able to decide what I wanted to eat. Now I can still decide, but it's not the same... Because we took a big hit [so], I get [food] stamps. (65-year-old male MSFW who was participating in SNAP)

F/MSFW participation in SNAP represented disempowerment from stigma or choice. F/MSFW who opted out of SNAP were disempowered from making ends meet or finding alternative ways to get by. Some F/MSFW opted to use alternative sources of assistance in lieu of, or along with, SNAP. Support from family, debt accumulation, and informal personal loans were common resources. One farmer who was relieved she no longer participated in SNAP explained how she makes ends meet, “I have just been putting things on a credit card, so do I have the money for food? No, but do I have access to it? Yes.” (40-year-old female).

Need Factors. Perceptions of need were informed by interpersonal, intrapersonal, and community level appraisals and comparisons of need. Participants’ recognition and appreciation of their own or their household’s need prompted the intent to participate.

Experiential and Social Inventory Justified Participants’ Perceived Need. Participants’ perceived needs were based upon personal and collective social experiences of food insecurity and hardship. Perceptions of need emerged in three ways: specific need, compounded need, and comparative need. Some MSFW were prompted to use SNAP by a perceived need for food in the home, specifically. Many F/MSFW experienced compounded needs and simultaneous burdens, which motivated participants’ intentions to use SNAP. Finally, participation in SNAP represented relief from unmet needs. One MSFW described how SNAP helped when his household bills piled up, “Now I have to pay rent, electric bill, and other bills, so right now, we are getting food stamps.” (42-year-old male). One female farmer described how the compounded needs experienced among farming communities are more difficult to manage during the agricultural off-season:

I might look into [SNAP] if, as the winter goes on and I’m really struggling, you just never know what kind of expenses. Two years ago, my horse had two abscessed feet. And between my dog that died and my horse being sick, the vet bills almost ruined me. So, I’ll just have to see. If it goes on [and] everything is okay, I’ll probably eek by this winter. But if I have any kind of major expense that comes up, I might be in there applying for food stamps. (63-year-old female)

Comparative needs, participants' comparisons of their current needs versus past needs or the needs of others, often deterred F/MSFW from using SNAP. For MSFW, difficult experiences during immigration and knowledge of the hardships endured in their country of origin, in this case, Mexico, sometimes overshadowed their current needs (i.e., it is not as bad now as it was then, or it is not as bad for me as it is for them). For example, one MSFW who was not participating in SNAP shared his assessment of comparative needs among his community, "I think that there aren't as many people in need here [compared to Mexico]." (45-year-old male). His comment highlights how comparative need can challenge an individual's capacity to appreciate their current needs provided comparatively better circumstances.

Enabling Factors. The alignment between SNAP eligibility and accessibility and the inconsistent nature of agricultural work reveals the ways in which SNAP is an unreliable and burdensome resource for F/MSFW. While the availability of support is required for SNAP participation, the link between availability and participation is mediated by psychosocial factors.

Experiences of Uncertainty and Frustration Characterized Availability of Support. After the intent to participate in SNAP was formed, eligibility guidelines determined program use. As such, eligibility was a barrier to some who wanted to participate but believed they did not qualify, "If I could, I would like to... get [SNAP]." (73-year-old female MSFW who had never used SNAP). In addition, the inconsistent, seasonal, and hazardous nature of farm labor made it difficult for many F/MSFW to meet SNAP eligibility rules, "what they don't understand is that the work in the field is temporary. Packaging [fruit] is temporary too." (72-year-old male MSFW). This mismatch led to periods of eligibility and ineligibility throughout the year, and many F/MSFW were uncertain about their eligibility. One MSFW explained how her husband's work-related injury affected his ability to meet SNAP work eligibility rules:

I was saying [to my husband], go and see if you qualify for [food] stamps... because you haven't [been able to] work for so long. But [because it had been so long since he worked] he does not qualify. (73-year-old female who had never used in SNAP)

Participants' uncertainty regarding their eligibility suggests that SNAP is an unreliable resource for F/MSFW who experience inconsistent work. As such, psychosocial factors, like program appraisals of

helpfulness, knowledge of eligibility, and perceived control (ability to plan for future needs), may be affected by the availability of support.

Low income-based eligibility cutoffs and interim proof of eligibility checks frustrated participants who occasionally earned extra income from off-farm jobs or worked long hours over the growing season to arrive at a more sustainable income, only to result in a loss of SNAP benefits.

Now that my husband is doing more construction and his focuses aren't solely on the farm, we don't qualify for food stamps anymore, and that's been really hard, too, because our main – I mean, we are just like incredulous every month. We are down to dollars in our account. (40-year-old female farmer)

SNAP accessibility referenced the experiences participants had with SNAP administration, including applying or reapplying for SNAP and their encounters with caseworkers. Many participants expressed that the application process was too burdensome. Seasonality is just one issue F/MSFW encounter when applying or recertifying for SNAP. One farmer described the high hassle burden he encountered with providing proof of his self-employment on the farm.

I was on food stamps. It was just, like, a hassle to apply again, or like, it's kind of a unique situation with the farm. They think I wasn't trying to find work or something. There was something where I had to find work as a fully employed [person], and I was just like, "[Expletive] it." So, I didn't even [apply again] (36-year-old male).

Many participants also raised challenges communicating with SNAP caseworkers who did not understand the unique fluctuating circumstances of farming communities, "I talk to [agency personnel] and then, they say to me, "Why don't you get a stable job?" (72-year-old male MSFW), and an interrogative interview process that left them feeling undignified or disrespected. One MSFW who previously used SNAP explained how the effort of proving her need for assistance was not worth the benefits provided by SNAP:

I used to get food stamps... they ask you all sorts of questions, and they want to know everything about you. You have to fill out so much paperwork and provide information

about everything, and in the end, they just give you \$50.00. To be honest, that is the reason why I no longer request them... If they are going to help us then they should just help you instead of telling you, "You have this much money. How much do you make? Why can't you make ends meet?" (44-year-old female)

Use Factors. The lived experiences of those who used SNAP provided essential feedback to psychosocial factors that directed continued participation. Positive experiences may have also prompted program referrals between community members.

Program Value and Experiences of Shame Directed Future Use. Lived experiences from previous SNAP participation influenced one's intent to use SNAP in the future through an iterative process in which experiences from use informed participants' attitudes, knowledge, norms, and perceived control (psychosocial) and perceived hassle burden (enabling factors). Positive experiences were vital to determining intentions to use and continued use of SNAP.

Feelings of shame and experienced stigma were described exclusively by farmers. Shame affected the ways they used SNAP. One farming couple described the efforts they would go through to hide SNAP use from members of their small local community:

We still feel a little [shameful using SNAP]. I used to take the [EBT card] out, and I kind of wouldn't necessarily show what it was. When we first used it, we actually went to another little town to use it. (Farmer couple in their 70's)

Another farmer explained how her experiences with stigma using SNAP at the grocery store prompted her to end her participation in the program altogether.

SNAP is great, but I would feel weird. I'm not kidding. I would see like looks. You know, like, someone picking up my can of, like, organic soup or something and... being like, "Oh, you're buying a \$4.00 can of soup when you could buy a \$2.00 [can of soup]." (40-year-old female)

The value participants derived from their SNAP benefit allotment led to continued program participation. Comparing the experiences of current SNAP participants to previous SNAP participants

demonstrated the influence of adequacy on participation. Those who were currently participating in SNAP at the time of the study commonly shared positive program feedback: “They’re more than generous.” (75-year-old male farmer). Those who no longer participated in SNAP shared more critical program feedback: “To be honest, it’s not worth it.” (44-year-old female MSFW).

Discussion

Findings from this study revealed the central role that psychosocial factors played in the determinants of F/MSFW participation in SNAP, including predisposing characteristics, enabling, need, and use factors. Program determinants were different from those among the general SNAP population (Cronquist, 2021; Strickhouser Vega, 2016). Three salient themes emerged, highlighting the ways in which broad federal policies may not reach uniquely vulnerable populations. Themes included varied needs (specific, compounded, comparative), misalignment of need and eligibility, and pervasive internal and external stigmas associated with SNAP participation.

Study participants’ nuanced perceptions of need played a role in deciding to participate in SNAP and experiences using the program. Types of perceived needs included specific, compounded, and comparative needs. Specific need directly indicated FI and hunger. Most study participants who used SNAP reported their food needs were not met, or there was not enough to eat, consistent with research detailing the predictive power of specific need on SNAP participation among the general population (Strickhouser Vega et al., 2016). Simultaneously, more SNAP participants had evaluated food security scores that indicated full or marginal food security (versus low food security), which was consistent with the research that documents the association between SNAP and greater food security (Gundersen & Ziliak, 2015). Notably, evaluated scores indicating low food security among those who were not using SNAP may be attributed to a loss of SNAP benefits among those who previously used the program. The loss of SNAP has been associated with FI (de Cuba et al., 2019). Farming communities experience multiple distinct vulnerabilities, such as immigration, isolated rural residency, harsh working conditions, and unpredictable and variable stressors, such as seasonal and market-related fluctuations in work

availability, among others (Brotherson, 2016; Health Resources and Services Administration, 2019b). We found that SNAP may help alleviate some of the burdens from compounded needs among this chronically overextended and often low-income community. Despite these struggles, F/MSFW appraisals of their comparative needs elicited feelings of guilt among some SNAP participants and deterred others from using SNAP entirely. Such feelings occurred when study participants' cognitive evaluations of need were based upon their prior hardships or struggles of others who may be worse off, paired with the belief that SNAP should only be distributed to those with the greatest need. As none of our study participants perceived themselves to be in great need, this resulted in a misalignment between their understanding of the intended audience for SNAP and how they identified with that audience.

These findings suggest the importance of balancing the needs of F/MSFW, benefits offered by SNAP, and reluctance to participate in the program. Local and streamlined outreach and enrollment/re-enrollment efforts may help facilitate SNAP participation among overburdened farming communities. As mobile medical clinics have successfully provided medical care among farming communities (Yu, Hill, Ricks, Bennet, & Oriol, 2017), a similar approach may provide a good model for SNAP personnel to engage locally and normalize SNAP use.

Program eligibility was a key driver of SNAP participation. Consistent with the research, this study demonstrated that despite the needs that farming households may have, eligibility contingencies prevent them from participating in the formal safety net to cope with FI (Weedall FitzSimons et al., 2011). Although need factors and psychosocial factors affect F/MSFW intent to participate in SNAP, federal and state program eligibility guidelines must be satisfied to use the program. Among individuals who were income- or categorically eligible, more participated in SNAP than those who did not participate. Still, several MSFW reported a desire to participate in SNAP but unable to do so because of ineligibility. SNAP presumes a steady set of circumstances that farming does not fit. Employment-based eligibility criteria were particularly problematic, as they did not reflect the occupational inconsistency, seasonal fluctuations, or time off for work-related injuries common in farm employment (Health

Resources and Services Administration, 2019b; Quandt et al., 2004), which lead to periods of eligibility and ineligibility throughout each year. In addition, income thresholds do not consider varying expense burdens that households may have. Immigrant households, for example, may have added costs of supporting family members living in their country of origin. Further, low eligibility thresholds cut off benefits to families whose incomes are just above the threshold but are nevertheless food insecure (Balasuriya, Berkowitz, & Seligman, 2021). Even among F/MSFW who were eligible for SNAP, the process of providing evidence of employment was a hassle or even impossible to prove among informal work agreements and self-employment. Public charge prompted other eligible MSFW to discontinue program participation for fear of losing legal residency within the U.S. Better alignment of SNAP eligibility inconsideration of occupational circumstances, removal of interim proof of eligibility, and abolishing public charge rules could help bridge eligibility gaps among F/MSFW.

Stigma and shame influenced the factors that determine SNAP participation on multiple levels. A “culture of work” (Bolwerk, 2002), rooted in hard labor, independence, autonomy, and self-sufficiency, was evident among F/MSFW in this study. As such, stigmas that reflected associations of SNAP with laziness and welfare dependency were particularly obstructive. Such external stigmas conflicted with participants’ self-identities as fastidious workers, prompting experiences of shame using SNAP and affecting their intent to participate. This finding is consistent with research showing that SNAP beneficiaries perceived as “less deserving” are more likely to internalize SNAP stigmas and experience diminished feelings of self-worth (Pak, 2020). Although one benefit of participating in SNAP was its relatively confidential nature, some participants remained reluctant to use their benefits at their local grocery. Some SNAP participants experienced intrapersonal stigma from store clerks, fellow shoppers, and SNAP agency personnel, which further disincentivized and hindered SNAP access. These findings align with previous studies on the stigmatization of SNAP participants by the general population (Gaines-Turner, 2019; Pak, 2020; Carper, 2021). Stigma has been previously identified as a barrier to safety net participation among low-income farming households (Weedall FitzSimons et al., 2011). Policy initiatives

directed at reducing shame and stigma are essential to support SNAP participation. Community-engaged outreach mechanisms may help shift social norms around SNAP. For example, it may be beneficial to recruit trusted members of the community to conduct preliminary screening for SNAP and connect individuals and families to services. Encounters with SNAP agency personnel may be improved by cultural competency and empathy skills training for staff and by hiring local community members who reflect the demographic characteristics and backgrounds of the eligible population, such as those who are SNAP participants themselves.

Theoretical Contributions

In this study of the farm workforce, we adapted the Andersen models (Andersen, 1995; Bradley et al., 2002) to create a theoretical framework that comprehensively captured the relationships among sociodemographic, psychosocial, cultural community-level factors, and SNAP participation. To the authors' knowledge, this study is the first to aggregate the Andersen models toward an analysis of public assistance utilization. The model revealed the driving variables associated with the intent to and actual participation in SNAP and mechanisms by which psychosocial, need, and enabling factors may be related. As potential access and realized access is signaled by enabling factors and participation, the issues with SNAP eligibility, accessibility, and a low number of participants who currently used SNAP suggests that F/MSFW experienced low access. Further, the central role of psychosocial factors in the model provides evidence of inequitable program access (Andersen, 1995).

Adaptations from the original model (Appendix C) included the intent to participate as a step towards participation. In addition, a use factor was added to incorporate the experiences from actual SNAP participation. As the Andersen models have been defined as recursive (Andersen 1995; Bradley et al. 2002), the importance of use factors and depiction of the model as an iterative cycle, not a linear process, were essential to the proposed model. These findings suggest that SNAP participation may mediate the effect of psychosocial determinants for future SNAP participation through an iterative

process. Understanding these relationships is fundamental to help identify appropriate strategies to address FI among farming households.

Strengths and Limitations

While this study is among the first to explore SNAP participation among a sample of MSFW and farm owners together, several limitations should be acknowledged. First, the present study analyzes data from a more extensive study using open-ended, semi-structured questions; as such, the study protocol was not designed to examine F/MSFW SNAP participation using the Andersen model specifically. Second, although many participants discussed needs, domains, and major themes related to their participation in SNAP, the focus of the study protocol on FI and coping strategies likely limited the depth of conversations related to the SNAP specifically. Finally, F/MSFW were not explicitly asked about the factors they considered when making decisions about SNAP. As previously discussed, these factors enable the examination of the driving variables associated with the intent to participate and actual participation in SNAP and mechanisms by which psychosocial, need, and enabling factors may be related.

Second, the study sample included a limited sample of F/MSFW living in one state in the U.S. As all MSFW in this study were Hispanic/Latinx and Spanish speaking and recruited from one Oregon county. Most farm owners were White and English speaking, and these attributes may limit the transferability of these findings to farming communities in other regions in Oregon and other states. Further, interviews were conducted before the COVID-19 pandemic, which had a substantial impact on F/MSFW. These findings reflect pre-pandemic vulnerabilities and coping mechanisms, limiting the dependability of findings to post-pandemic F/MSFW. For example, the F/MSFW role as essential workers during a global pandemic placed them at higher risk for exposure and transmission of COVID-19. The work-related stigmas evidenced in this current study conflict with emergent stigmas related to farm work in field conditions that may not adhere to public health guidelines intended to limit the spread of COVID-19, like social distancing or proper use of personal protective equipment. More directly, while F/MSFW who could not work may have experienced shame related to the subsequent decrease in income

and self-sufficiency, whereas F/MSFW who could work may have experienced shame associated with the potential of spreading the deadly virus (Bottemiller Evich, Bustillo, & Crampton, 2020). Future research is needed to understand the role of SNAP among farming communities after the COVID-19 pandemic.

Lastly, two White women and one Puerto Rican Latina connected with a public health program at a major public university conducted participant interviews. As with any research, the difference in gender, race/ethnicity, and social positioning between the interviewers and participants may have influenced the course and content of the interview. For example, participants' comfort, openness, and responses may have been impacted by the social differences between the participants and the interviewers, which may have resulted in underreporting of SNAP among F/MSFW.

To our knowledge, no studies to date specifically examine the factors that contribute to SNAP participation among the farm workforce. A better understanding of the role of SNAP among F/MSFW enables the development of more responsive interventions to alleviate food insecurity for uniquely vulnerable farming communities. While this study contributes to our understanding of F/MSFW decisions to participate in SNAP, further research is needed to document F/MSFW experiences using SNAP and complementary social safety net programs to help cope with FI. Future research would benefit from more rigorous sampling methods to test the relationships between psychosocial factors and SNAP use with greater precision. Additionally, future studies could test the strength of the adapted theoretical model used here to predict SNAP participation among MSFW or farmers separately to understand both groups better and make distinctions between them. Finally, quantitative analysis of the predictive power of the sociodemographic, predisposing, enabling, and need factors would help determine the reasons some choose not to participate.

Conclusion

Gaps in SNAP participation among MSFW and farm owners mandate evidence-based policy solutions. In this qualitative study of MSFW and farmers in Oregon, we found consistent evidence of inequitable access to SNAP. Unique sociodemographic, psychosocial, and community level cultural

factors help explain reasons for SNAP participation or non-participation specific to F/MSFW. Moreover, this work highlights the importance of including use factors in applying the Andersen model to safety net programs. These findings underscore the need for expanded SNAP eligibility cut-offs and targeted community engagement mechanisms to facilitate participation.

Table 1.1 Migrant and seasonal farmworker and farmer characteristics by SNAP participation (N=31), Oregon

<i>Factors</i>	<i>Sample total N=31 (col. %)</i>	<i>SNAP participation n=8 (row %)</i>	<i>Non-participation n=23 (row %)</i>
Predisposing			
Migrant and seasonal farmworker	18 (58)	5 (28)	13 (72)
Farm owner	13 (43)	3 (23)	10 (77)
Age			
< 35	3 (10)	0 (0)	3 (1)
35-49	13 (43)	3 (23)	10 (77)
50-59	8 (26)	2 (25)	6 (75)
60+ ^a	7 (23)	3 (43)	4 (57)
Sex			
Female	16 (52)	2 (13)	14 (88)
Male	15 (48)	6 (40)	9 (60)
Race/Ethnicity			
Hispanic/Latinx	15 (48)	6 (40)	9 (60)
White, Non-Hispanic/Latinx	14 (45)	2 (14)	12 (86)
Asian, Non-Hispanic/Latinx	7 (2)	0 (0)	2 (1)
Born in the U.S.	12 (39)	2 (17)	10 (83)
Marital Status			
Yes, living together in U.S.	21 (68)	8 (38)	13 (62)
No	7 (23)	0 (0)	7 (1)
Household size (people in the home)			
1	3 (10)	0 (0)	3 (1)
2-3	21 (68)	6 (29)	15 (71)
4+	6 (19)	2 (33)	4 (67)
Health concerns			
Child	7 (23)	3 (43)	4 (57)
Self	16 (52)	4 (25)	12 (75)
Language Preference			
Spanish	18 (58)	6 (33)	12 (67)
English	13 (42)	2 (15)	11 (85)
Financial Stability			
Work instability	21 (68)	7 (33)	14 (67)
Days worked per week			
5 days or less	10 (32)	3 (30)	7 (70)
6-7 days	21 (68)	5 (24)	16 (76)
Financially support family not in home	7 (23)	3 (43)	4 (57)
Off-farm income	7 (23)	0 (0)	7 (1)
Protective Assets			
Grows food in a garden	22 (71)	6 (27)	6 (73)
Other safety net resources			
Informal food resources	11 (36)	5 (45)	6 (55)
Federal non-food programs	11 (36)	4 (36)	7 (64)
Enabling			
Eligibility			
Income eligible ^b	8 (26)	4 (50)	4 (50)
Children < 18	14 (45)	5 (36)	9 (64)
Disability	2 (7)	1 (50)	1 (50)
60+ ^a	7 (23)	3 (43)	4 (57)
Need			
<i>Subjective Food Security</i>			
Adequate quantity	27 (87)	6 (22)	21 (78)
Meets food preferences	22 (71)	6 (27)	16 (73)
<i>Evaluated Food Security</i>			
Fully or marginally food secure	22 (71)	6 (27)	16 (73)
Low food secure	9 (29)	2 (22)	7 (78)
Use			
Current use of SNAP	8 (26)	8 (1)	NA
Previously used SNAP	10 (32)	NA	10 (1)
Never used SNAP	13 (42)	NA	13 (1)

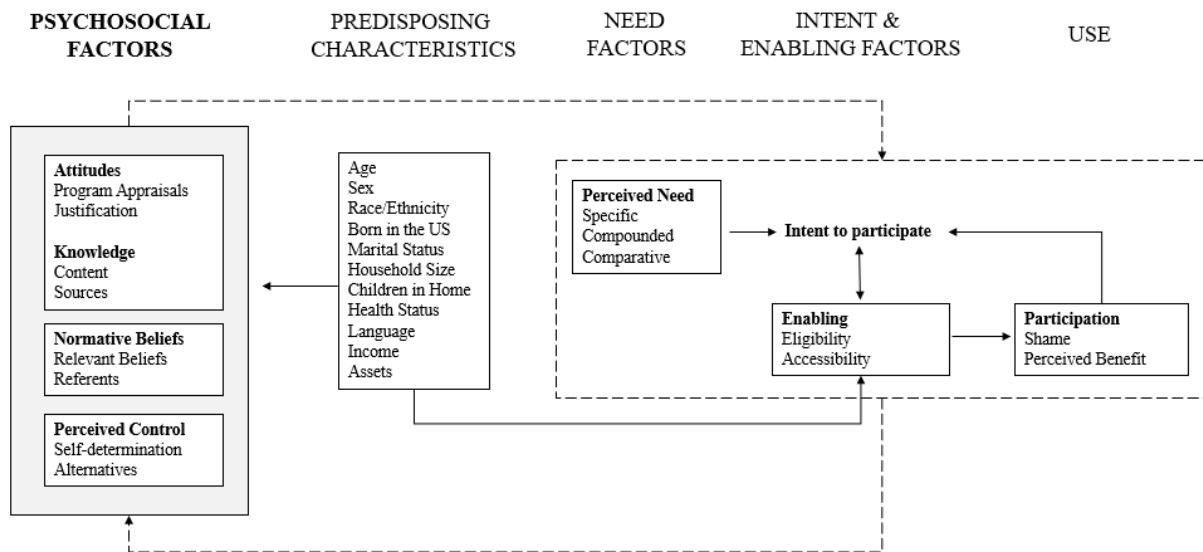
a. As individuals age 60 are categorically eligible to participate in SNAP, this characteristic is both predisposing and enabling.

b. As income of MSFW was not measured, this variable includes individuals who reported low-income as the reason they are eligible for SNAP.

Table 2.2 Summary of emergent factors, domains, and major themes of an Andersen model of SNAP/WIC participation among Oregon farm owners and farm workers

<i>Factors</i>	<i>Domains</i>	<i>Major Themes and Their Dimensions</i>
Psychosocial	Attitudes	Program Appraisals Helpfulness Rationale Justification of use Abbreviated use
	Knowledge	Content of Information Program purpose Intended audience Supply of available resources Eligibility & Legal Issues (Public Charge) Sources of Information Friends Community
	Normative Beliefs	Relevant Normative Beliefs Stigma Systematic program abuse Associations with welfare dependency Referents Family Community Agency personnel
	Perceived Control	Self-determination Locus of control Independence Dignity Privacy Alternatives Family support Debt accumulation Informal loans
	Perceived Need	Specific need Food security Financial strain Compounded need Competing hardship Comparative need Past hardship Witnessed hardship
Enabling	Availability of Support	Eligibility Income Eligible children Disability Over age 60 Accessibility Hassle burden of application and recertification Agency personnel
Use	Participation	Shame Experienced stigma Value Adequacy of benefits allotted

Figure 2.1 Adapted theoretical framework to depict the central role of psychosocial factors on need, enabling, and use factors in SNAP participation among farm owners and migrant and seasonal farmworkers in Oregon



CHAPTER 4. THIRD MANUSCRIPT

The Role of SNAP and WIC Participation and Racialized Legal Status in U.S. Farmworker Health

Abstract

Background: Policies that restrict access to and use of SNAP and WIC by legal status may disproportionately disadvantage racial and ethnic minorities. While immigrant legal status, race, and ethnicity are recognized as independent social determinants of health, studies examining the extent to which legal status structures racial and ethnic health disparities are limited. Research is needed to identify factors that mitigate disparate health outcomes, such as SNAP and WIC.

Methods: Cross-sectional data from the 2009/2010 National Agricultural Workers Survey (N=3,961) were analyzed. Chi-square tests and logistic regressions examined associations among self-reported health, race, ethnicity, legal status, and SNAP/WIC participation.

Results: Farmworkers reporting excellent health were more likely to be non-Hispanic White, aged 18-25, single, male, educated beyond primary school, and living without chronic health conditions. Hispanic farmworkers had lower odds of reporting good (OR 0.46, 95% CI 0.23-0.91) or excellent health (OR 0.28, 95% CI 0.13-0.59). Among SNAP/WIC participants, Hispanic farmworkers had higher odds of reporting good (OR 18.36, 95% CI 4.54-74.19) or excellent health (OR 10.02, 95% CI 1.79-56.23) compared to non-Hispanic White farmworkers. There were no differences in health by legal status.

Discussion: This study complements the extant literature showing racial and ethnic health disparities among the U.S. farmworker population. Results provide valuable insight on the health-protective potential of programs like SNAP and WIC, particularly among Hispanic farmworkers, who may be both less likely to be eligible and hesitant to participate. These findings underscore the need to expand U.S. farmworkers' eligibility and participation in SNAP and WIC.

Key words: Racialized legal status, farmworkers, self-reported health, SNAP participation, WIC participation

Background

Recent estimates show a record number of immigrants living in the U.S., comprising 13.7% of the population. While most are in the country legally, unauthorized immigrants comprise almost a quarter (23%) of the U.S. foreign-born population (Budiman, Tamir, Mora, & Noe-Bustamante, 2020) and 4.8% of the workforce (Passel & Cohn, 2018). Seventy-four percent of unauthorized immigrants work in essential jobs (Kerwin, Nicholson, Alulema, & Warren, 2020), yet many lack access to fundamental rights and resources. Many unauthorized immigrant workers remain subject to workplace discrimination, have few occupational protections, face ongoing detention and deportation threats, and hold little power in the workplace (Waters & Pineau, 2016). Legal status also governs citizens' access to rights (Waters & Pineau, 2016) and social resources through exclusion, stigmatization, and discrimination (Hamilton et al., 2019). As such, legal status structures the differential health risks encountered by immigrants (e.g., stress, occupational conditions), resources available to manage those risks (e.g., income, education), and access to health-promoting resources (e.g., public assistance, health care) (Philbin, Flake, Hatzenbuehler, & Hirsch, 2018; Torres & Young, 2016). Simultaneously, significant health disparities persist among marginalized racial and ethnic groups in the U.S., including higher rates of chronic disease and premature death than the non-Hispanic White population (James et al., 2017).

Hierarchies of legal stratification shape the social, political, and economic conditions that influence health outcomes and health inequities. In recognition of this influence, racialized legal status (RLS) has been identified as an emerging social determinant of health. RLS refers to the effect of ostensibly race-neutral legal stratifications that disproportionately disadvantage racial and ethnic minorities (Asad & Clair, 2018). While immigrant legal status, race, and ethnicity are recognized as independent social determinants of health (Castañeda et al., 2015; Martinez et al., 2015; Phelan & Link, 2015; Williams et al., 2019), research examining the extent to which legal status shapes racial/ethnic health disparities is limited. To better understand RLS as a health determinant, research must focus on the intersectionality between legal status, race, health, and the mechanisms through which legal status functions as a health determinant, such as participation in public assistance programs and resources.

Two public assistance programs that have demonstrated health benefits for low-income communities (Basiotis, Kramer-LeBlanc, & Kennedy, 1998) are the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC). Participation in SNAP and WIC may be affected by RLS through federal eligibility policies. Eligibility guidelines limit SNAP participation by legal status. Qualified individuals include U.S. citizens and qualified noncitizens, including children, refugees, asylees, and qualified immigrant adults in the U.S. for at least five years. In addition, SNAP eligibility is contingent upon criteria that vary between states, including income, asset, age, disability, work, and participation time limits. Though there are no legal status restrictions to be eligible for WIC, the program is specific for pregnant and breastfeeding mothers, infants under one year old, and children under five who fall below specified income limits (United States Department of Agriculture Food and Nutrition Service, 2021).

Nationally, approximately one-quarter of farmworkers are unauthorized, and 83% are Hispanic/Latinx (Passel & Cohn, 2018). As the agricultural workforce has a high concentration of unauthorized Hispanic/Latinx immigrants (Hernandez & Gabbard, 2018), studying U.S. farmworkers may help clarify how RLS affects health. The current study sought to (1) document how race, ethnicity, and legal status influence farmworker health and (2) examine how the use of health-promoting public resources, specifically the Supplemental Nutrition Assistance Program (SNAP) or Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC), influences the associations among race, ethnicity, legal status, and health. Results from this study may clarify the role of RLS as a social determinant of farmworker health and provide recommendations for SNAP and WIC to improve farmworker health outcomes.

Conceptual Framework

There are three pathways through which RLS contributes to racial/ethnic health disparities (Asad & Clair, 2018). The primary path is direct, representing the impacts of RLS upon the health of individuals who hold discredited legal status, like unauthorized immigrants, through policies that limit access to

economic, social, and health resources, multilevel discrimination and stress, and the psychosocial consequences of stigma rooted in anti-immigrant rhetoric (Morey, 2018). Two spillover pathways, individual and collateral, explain how RLS affects those with social and cultural proximity to individuals with discredited legal status, such as racial and ethnic in-group members. Individual spillover affects family members and neighbors through shared proximate risk factors such as stress or forced family separation. Collateral spillover impacts racial/ethnic group members who are misidentified as holding discredited legal status and are subject to comparable discrimination and enforcement. If RLS is a social determinant of health, we expect that adverse health outcomes influenced by legal status impact the entire social and cultural group. For example, policies that restrict access to and use of SNAP and WIC under the auspice of legal status would not only affect unauthorized immigrants, but they would affect racial and ethnic groups with shared social proximity, thus limiting the role that SNAP and WIC play in health promotion among vulnerable communities. As such, a comparison of health across legal strata within a distinct group, like U.S. farmworkers, may clarify the role of RLS as a health determinant.

Methods

Using a cross-sectional study design, we analyzed data from the National Agricultural Workers Survey (NAWS), a nationally representative survey of U.S. farmworkers, and the National Institute of Occupational Safety and Health (NIOSH) Mental Health Supplement. The NAWS is an annual employment-based probability sample survey of farmworkers sponsored by the U.S. Department of Labor. In 2009 and 2010, NIOSH included a Mental Health Supplement to capture the prevalence and predictors of poor mental health symptoms among farmworkers. As such, we analyzed data from 2009 and 2010 only. The NAWS and NIOSH Mental Health Supplement data are publicly available from the U.S. Department of Labor Employment and Training Administration.

Participants

A total of 3,691 farmworkers participated in the 2009-2010 NAWS and NIOSH Mental Health Supplement. Eligible individuals were employed in crop agriculture and worked at least four hours over

the 15 days before the survey date. The sample was composed of farmworkers aged 14-81 years old across six geographic regions, including California (29.9%), Northwest (18.2%), Midwest (19.5%), Southwest (7.1%), Southeast (12.5%), and East (12.7%).

Data Collection

The NAWS staff conducted face-to-face interviews with farmworkers at their workplace in English or Spanish. Interviews lasted an average of 60 minutes, and farmworkers were paid \$20 cash for their participation. The NAWS utilized multistage sampling to account for regional and seasonal fluctuations in agriculture. The sampling year was divided into three seasonal interviewing cycles in February, June, and October. The stages of sampling included geographic region, county or farm labor area, employer, and participant. At the employer sampling stage, a simple random sample of farmworkers was selected. The number of interviews conducted at each site was proportional to the number of farmworkers employed. During the 2009-2010 NAWS, there was a 66% response rate from employers recruited and a 92% response rate from farmworkers agreeing to be interviewed (Grzywacz et al., 2014).

Measures

Since farmworkers have various linguistic and cultural backgrounds, the NAWS and NIOSH Mental Health Supplement have been pilot tested to evaluate the appropriateness, internal reliability, and validity of the questionnaire items for their use in the target population (Grzywacz, 2019). Independent and predictor variables were drawn from the NAWS, and the dependent variable was obtained from the NIOSH Mental Health Supplement.

The dependent variable, self-reported health (SRH), is known to be a valid indicator of general health and a robust predictor of significant health events, including all-cause mortality across diverse cultural and demographic populations and communities (Fayers & Sprangers, 2002; Lorem, Cook, Leon, Emaus, & Schirmer, 2020; Moore, Mercado, Hill, & Katz, 2016). SRH was assessed by asking individuals to categorize their health status as excellent, good, fair, poor, or don't know. Most participants rated their health as excellent (20.24%), good (57.32%), or fair (21.98%). The number of individuals who rated their health as poor (n=14, 0.38%) or don't know (n=3, 0.08%) was too small to contribute

statistically to our analyses. Fair and poor responses were collapsed into a single category, and don't know responses were considered missing. The original measure has good construct validity, internal consistency, and test-retest reliability (Grzywacz, 2019).

Race, ethnicity, and legal status were key independent variables. To assess participant race, participants were prompted, "which of the following do you consider yourself? White; Black or African American; Asian; American Indian or Alaskan Native; Native Hawaiian or Pacific Islander; or other." Ethnicity was assessed by asking participants, "which of the following describes you? Mexican-American; Mexican; Chicano; other Hispanic; Puerto Rican; or not Hispanic or Latino." Racial and ethnic identities were organized into four distinct categories: Hispanic, non-Hispanic non-White, and non-Hispanic White. Legal status was assessed directly by asking, "what is your current legal status in the U.S? U.S. citizen by birth, naturalized U.S. citizen, permanent resident/green card, border crossing/commuter card, pending status, undocumented, temporary resident, or other." Participants were also asked if they had "general work authorization" with yes/no/don't know response options. Participants were categorized as unauthorized immigrants if they were not citizens and did not have work authorization, authorized immigrants if they were not citizens and did have work authorization, and U.S. citizens.

Farmworker participation in SNAP and WIC was captured by their response to the prompt, "within the last two years, has anyone in your household received benefits from or used the services of any of the following programs?" with yes/no response options for "food stamps" and WIC. Farmworkers were designated by program participation and non-participation. Participant demographic characteristics were self-reported, including age, sex, country of birth, marital status, number and age of children in the home, and education level. Participants were categorized as migrant workers if they reported travel to engage in farm work 12 months before their interview. Participants who reported a diagnosis of one or more chronic health conditions (asthma, diabetes, hypertension, tuberculosis, heart disease, urinary tract infections, or an unspecified condition) were grouped for analysis. Family poverty level was defined using farmworker income and household size to estimate family income. Families were considered below

the poverty level if family income fell below the federal poverty level in 2009 or 2010. The location of the interview determined the sampling region.

Analysis

Our analysis included cross-tabulations with Chi-square tests of independence and multinomial logistic regressions using SAS statistical software (version 9.4, SAS Institute, Cary, NC, 2016). We ran Chi-square tests to analyze between-group differences in SRH by farmworker characteristics. To examine the associations between SRH, race/ethnicity, and legal status, we used unadjusted multinomial logistic regression models for SRH and race/ethnicity and SRH and legal status. We adjusted multinomial logistic regression models to include all predictor variables (see Table 3.1 for complete list) and, using backward elimination we retained only significant predictors ($p < 0.05$) and those that were important within the study, i.e., those variables that may impact eligibility, to obtain the most parsimonious estimates. The tables documenting these analytical steps are contained in Appendix C. We analyzed associations between SNAP/WIC participation, SRH, and race/ethnicity by stratifying the adjusted model by farmworkers who did participate in SNAP/WIC and farmworkers who did not participate in SNAP/WIC. Our final multinomial logistic regressions calculated unadjusted and adjusted odds ratios of SNAP/WIC participation by race/ethnicity. The NAWS-generated composite weight variable was used for descriptive frequencies and multinomial regression models. The composite weight uses sampling, non-response, and post-sampling factors and adjusts for the number of days worked per week, season, and sampling region to construct weights for calculating unbiased population estimates (U.S. Department of Labor, 2018).

This research was approved as exempt by the Oregon State University Institutional Review Board.

Results

Descriptive statistics on selected variables by SRH are presented in Table 3.1. Participants were predominantly Hispanic (82.0%), male (76.0%), and between the ages of 26-35 years old (26.9%); had less than a high school education (53.4%); and had no known chronic health conditions (80.4%). Most

lived with their spouse (48.7%) and without kids (72.7%). Approximately half (51.8%) were unauthorized immigrants. Although nearly a third of farmworkers lived below the poverty level, only 12.2% reported SNAP participation, and 18.0% participated in WIC. More unauthorized farmworkers participated in WIC (12.3%) than SNAP (8.2%), of authorized non-citizen farmworkers, 3.5% used WIC and 1.8% used SNAP, and of citizen farmworkers, 2.2% used WIC and the same amount used SNAP. Few (7.1%) farmworkers reported participation in both SNAP and WIC.

There were significant differences in SRH by race/ethnicity, age, education, chronic health conditions, and marital status. More non-Hispanic White farmworkers reported excellent SRH compared to good or fair/poor SRH. The inverse was found among Hispanic farmworkers, who most frequently reported fair or poor SRH. Differences in SRH by legal status approached significance ($p=0.07$). There were no statistically significant differences by legal status, sex, number or age of children in the household, family poverty level, SNAP participation, or WIC participation.

Table 3.2 shows the odds ratios (OR) corresponding to SRH by race and ethnicity. Compared to non-Hispanic White farmworkers, those who identified as Hispanic were less likely to report good (OR 0.37, 95% CI 0.15-0.92) or excellent SRH (OR 0.23, 95% CI 0.08-0.67). Similar findings were estimated for Non-Hispanic non-White farmworkers, who were less likely to report good (OR: 0.32, 95% CI 0.14-0.73) or excellent SRH (OR: 0.30, 95% CI 0.12-0.73) than non-Hispanic White farmworkers. Multinomial logistic regression models examining SRH by legal status revealed no differences in SRH among unauthorized immigrants (Good: OR 1.70, 95% CI 0.65-1.75; Excellent: OR 0.66, 95% CI 0.40-1.10) and authorized non-citizens (Good: OR 0.74, 95% CI 0.46-1.19; Excellent: OR 0.55, 95% CI 0.30-1.02) compared to U.S. citizens.

Figure 3.1 illustrates the relationship between SRH by race/ethnicity and the use of SNAP or WIC. When the sample was stratified by participation in SNAP or WIC, there was significant effect modification ($p<0.001$) in the model (Table 3.3). Among farmworkers who did not participate in SNAP/WIC, we found racial/ethnic trends consistent with the non-stratified model (Table 3.2). Participation in SNAP/WIC appeared to reverse this association. After adjusting for significant predictor

variables, the model produced greater odds of reporting good (OR 18.36, 95% CI 4.54-74.19) or excellent (OR 10.02, 95% CI 1.79-56.23) SRH among Hispanic farmworkers who participated in SNAP/WIC compared to non-Hispanic White farmworkers. Among SNAP/WIC participants, unauthorized farmworkers had lower odds of reporting good health compared to citizen farmworkers (OR 0.23, 95% CI 0.06-0.84). No significant differences were found for non-Hispanic, non-White farmworkers who participated in SNAP/WIC.

Discussion

This study provided two main findings regarding RLS as a social determinant of farmworker health. First, results confirmed disparities in farmworker SRH by race/ethnicity, while the association between SRH and legal status was near significant. Second, SNAP/WIC participation may reverse the negative association between SRH and race/ethnicity.

Consistent with previous studies on farmworker health disparities, Hispanic and non-Hispanic non-White farmworkers had a lower likelihood of reporting good or excellent health than White farmworkers (Grzywacz et al., 2014; Moore et al., 2016). Still, there was no association between SRH and legal status. These findings add to the limited body of research examining legal status and health, which offers mixed evidence. One meta-analysis of 40 studies showed direct relationships between both unauthorized legal status and poor mental health outcomes like depression, anxiety, and post-traumatic stress disorder and also unauthorized legal status and suppressed access to health services (Martinez et al., 2015). Other studies suggest that unauthorized immigrants may experience better physical health than authorized immigrants (Hamilton et al., 2019). Such inconsistencies may result from methodological limitations, including the use of measures adjacent to legal status and health and small, non-representative sample sizes (Grzywacz et al., 2014; Villarejo, 2003).

The absence of any significant association between SRH and legal status identified in the current study may be related to the Latinx health paradox (Acevedo-Garcia & Bates, 2008). This phenomenon describes the relative health advantage observed among Latinx populations, including those with

unauthorized legal status, despite social or economic disadvantage. There are several explanations for this phenomenon both generally and among farmworkers (Riosmena, Kuhn, & Jochem, 2017), including self-selection of immigrants healthy enough to immigrate and engage in physical farm labor (Hamilton et al., 2019) and cultural and social protective factors that may taper over time due to acculturation, cumulative disadvantage, and stress (Acevedo-Garcia & Bates, 2008; Riosmena et al., 2017). Another explanation posits that the Latinx health paradox is simply a consequence of studies that undercount deaths, use inconsistent definitions of Latinx identity, and are limited by the underreporting of health problems (Acevedo-Garcia & Bates, 2008). Further, immigrant mistrust may result in measurement errors such as underreporting unauthorized status. Considering these factors, the current study controlled variables that may contribute to health advantages, including country of origin, family characteristics, sampling region, and more (see Table 3.1 for a complete list of predictor variables). Although this study's findings are congruent with research identifying few health disparities by legal status among U.S. immigrants (Young & Madrigal, 2017), the lack of association between SRH and legal status may strengthen the case for RLS as a social determinant of health among farmworkers, as it could provide evidence that any adverse health outcomes influenced by legal status have impacted the entire community. Farmworker legal status may be so interconnected with the racial/ethnic, social, and cultural narratives ascribed to farmworkers that RLS shapes farmworker health through spillover and collateral pathways (Asad & Clair, 2018), regardless of individuals' legal status.

We found that the Hispanic farmworkers who indicated participation in SNAP/WIC were more likely to report good or excellent SRH than non-Hispanic White farmworkers using the same programs. This finding is compelling as it may reveal one specific pathway through which RLS determines Hispanic farmworkers' health irrespective of their legal status. As demonstrated in Asad et al.'s conceptual model, policies that restrict the use of public assistance by legal status may impact the racial/ethnic groups with social proximity through community-level shifts in social and cultural norms, stigma, policy acceptance, and knowledge of available assistance (Carney & Krause, 2020). These findings are consistent with

literature that documents the positive roles that SNAP and WIC play in health promotion and their impact on SRH (Gregory & Deb, 2015).

Though SNAP and WIC are ostensibly available to all eligible individuals, underutilization persists among distinctly vulnerable subgroups, including Latinx immigrants and, more specifically, farmworkers (Beatty & Hill, 2019; Hernandez & Gabbard, 2018). The 12.2% SNAP and 18.0% WIC participation measured in this study are on the low end of recent estimates for U.S. farmworkers, ranging from 15-32% for SNAP and 13-22% for WIC (Beatty & Hill, 2019). Several studies using the NAWS have found that legal status has little direct effect on SNAP and WIC participation rates among farmworkers (Chung & Leigh, 2015; Leigh & Medel-Herrero, 2015; Medel-Herrero & Leigh, 2018). Still, it may be challenging to capture unbiased SNAP/WIC participation rates. Farmworkers who openly disclose unauthorized status may experience less mistrust and be more likely to utilize public assistance. Many barriers that limit SNAP and WIC participation, including misconceptions about program eligibility and anxieties about the threats imposed by immigration enforcement and anti-immigrant rhetoric, may be reasonably attributed to RLS (Carney & Krause, 2020; Henchy, 2019; Perreira & Pedroza, 2019; Wadsworth, Rittenhouse, & Cain, 2016). Notably, the public charge rule, which included the use of public benefits and determinations of admission and permanent residency in the U.S., deters participation in SNAP and WIC. Recent changes to the public charge rule, widespread confusion, and misinformation regarding which programs would be affected have resulted in many immigrants, including lawful permanent residents, terminating their benefits rather than threatening their own or family members' legal status (Bernstein, Gonzalez, Karpman, McTarnaghan, & Zuckerman, 2019; Kaiser Family Foundation, 2019; Katz & Chokshi, 2018; Perreira, Yoshikawa, & Oberlander, 2018).

This research has some limitations. First, the cross-sectional study design limits the ability to determine causality. Second, as the NAWS sampling methods rely on employer permission to recruit and conduct interviews on-site, farms in compliance with occupational health mandates may have been more likely to host NAWS researchers. Thus, farmworkers in this study may have had lower occupational health risks than farmworkers on non-compliant farms. Further, the variables examined in this study were

based on self-reported data collected on-site, which may have undermined internal validity. For example, participants might have over-rated their health if their employers or supervisors were present. Next, as the NIOSH Mental Health Supplement was only collected over two years, we only had SRH data from 2009/2010, limiting the sample size and restricting our ability to explore changes in RLS and SRH coinciding with shifts in the policy climate. Last, as the sample size of non-Hispanic White SNAP/WIC participants was small ($n=27$), we note that the role of SNAP/WIC as an effect modifier should be interpreted with caution, as estimates may be unstable.

The measure of health included in the current study, SRH, is a proxy measure based upon participants' subjective interpretations of health. While SRH, health, and chronic disease are related factors discussed throughout this paper, it is important to note that they are distinct characteristics. SRH is dependent upon participants' subjective interpretations of the health they experience. In contrast, the term "health" generically represents a state of being free from illness or injury but is also subject interpretation. How health is embodied may vary by cultural context (Napier et al., 2014), which may have affected the ways that farmworkers responded to the SRH measure. Chronic disease refers to persistent conditions or diseases that often require a clinical diagnosis and ongoing medical attention, such as diabetes, hypertension, or heart disease.

Future studies on RLS as a social determinant of farmworker health using NAWS would be strengthened with an amended survey that includes SRH as a standard measure to be collected annually. It is critical to further explore the value of SNAP and WIC participation among a broader sample of farmworkers. Cluster sampling may clarify the relationship between race/ethnicity, SRH, and program participation. We can generate more stable estimates by purposefully balancing the sample across demographic characteristics, particularly racial and ethnic groups, to make accurate comparisons. Longitudinal studies that explore farmworker SRH before and after SNAP or WIC participation may strengthen our understanding of the role SNAP and WIC play in overall health. Additional research is needed to explore how access to and use of health-promoting public programs and resources function as pathways through which RLS influences farmworker health.

New Contribution to the Literature

RLS may be a fundamental social determinant of health among farmworkers. This study explored differences in SRH by individual and household characteristics in a nationally representative sample of farmworkers, a predominantly Hispanic immigrant workforce. Study findings provide valuable information regarding the relationships among legal status, race, ethnicity, health, and public assistance participation. The racial and ethnic health disparities in farmworker SRH found in this study suggest that legal status has no direct influence upon farmworker SRH. Instead, RLS may influence Hispanic farmworker health regardless of legal status. Evidence of effect modification by SNAP and WIC participation highlights the potential to improve farmworker SRH by expanding access to and utilization of existing resources. Hispanic farmworkers who rated their health as fair or poor may derive the most benefit from participation in SNAP and WIC. These findings underscore the need to expand U.S. farmworkers' eligibility for and facilitate participation in SNAP and WIC.

Table 3.1 Characteristics of U.S. farmworkers by self-reported health status: National Agricultural Workers Survey, 2009/2010 (n=3691)

	Total Column % (n) ^a	Excellent Health Column % (n) ^a	Good Health Column % (n) ^a	Fair or Poor Health Column % (n) ^a	p-value ^b
Race/Ethnicity					
Hispanic, all races	82.0% (3068)	73.9% (556)	82.6% (1779)	87.5% (733)	p<0.0001
Non-Hispanic non-White	3.6% (146)	3.5% (26)	3.1% (82)	5.1% (38)	
Non-Hispanic White	14.4% (463)	22.6% (162)	14.4% (247)	7.3% (54)	
Legal status					
Unauthorized immigrant	51.8% (1883)	45.5% (349)	54.7% (1102)	49.5% (432)	p=0.07
Authorized immigrant	20.6% (838)	19.4% (132)	19.2% (481)	25.2% (225)	
U.S. citizen	27.7% (946)	35.1% (262)	26.1% (520)	25.3% (164)	
Age (range), years					
18-25	23.0% (705)	36.4% (200)	21.1% (402)	16.29% (103)	p<0.0001
26-35	26.9% (1008)	25.8% (223)	27.8% (601)	25.5% (184)	
36-45	22.8% (871)	16.2% (144)	24.2% (510)	24.9% (217)	
46-59	20.2% (828)	14.2% (131)	19.4% (438)	27.6% (259)	
60+	5.4% (233)	3.6% (31)	6.1% (142)	5.3% (60)	
Sex					
Female	24.0% (639)	22.8% (183)	23.2% (557)	27.0% (251)	p=0.67
Male	76.0% (3051)	77.2% (619)	76.8% (1840)	73.0% (676)	
Education					
Primary school or less ^c	53.4% (2044)	37.0% (319)	53.8% (1153)	66.5% (572)	p<0.0001
Beyond primary school	46.6% (1646)	63.0% (428)	46.2% (962)	33.5% (256)	
Chronic health conditions ^d					
None	80.4% (2956)	90.8% (678)	82.4% (1744)	66.0% (534)	p<0.0001
One or more chronic conditions	19.6% (734)	9.2% (69)	17.6% (371)	34.0% (294)	
Marital status					
Single	36.4% (1281)	49.6% (398)	34.5% (826)	29.9% (277)	p<0.001
Married, living with spouse	48.7% (1803)	37.3% (299)	51.0% (1222)	52.6% (488)	
Married, not living with spouse	12.9% (533)	12.0% (96)	12.0% (288)	16.0% (148)	
Other	2.0% (72)	1.1% (9)	2.5% (59)	1.5% (14)	
Children in household					
No children	72.7% (2227)	77.4% (482)	70.3% (1241)	74.5% (504)	p=0.86
Children under 6	17.6% (342)	15.6% (70)	18.8% (210)	16.4% (62)	
Children aged 6-17	5.8% (211)	3.9% (28)	6.6% (131)	5.5% (52)	
Children under 6 and aged 6-17	3.9% (109)	3.0% (21)	4.4% (60)	3.6% (28)	
Family poverty					
Below poverty level	31.0% (972)	31.0% (191)	32.7% (550)	26.5% (231)	p=0.29
At or above poverty level	69.0% (2710)	69.0% (553)	67.3% (1562)	73.5% (595)	
Migrant					
Does not travel for work	72.7% (2950)	80.6% (610)	70.6% (1693)	71.1% (647)	p=0.10
Travels for work	27.3% (737)	19.4% (137)	29.4% (419)	28.9% (181)	
SNAP					
Participates in SNAP	386 (12.2%)	67 (9.8%)	210 (13.1%)	109 (11.8%)	p=0.60
Does not participate in SNAP	3302 (87.8%)	680 (90.2%)	1903 (86.9%)	719 (88.2%)	
WIC					
Participates in WIC	18.0% (641)	17.3% (126)	19.8% (389)	13.8% (126)	p=0.16
Does not participate in WIC	82.0% (3047)	82.7% (621)	80.2% (1724)	86.2% (702)	
Sampling Region					
East	12.7% (477)	15.7% (97)	12.0% (281)	12.1% (99)	p=0.60
Southeast	12.5% (691)	12.7% (137)	12.6% (367)	11.9% (187)	
Midwest	19.5% (357)	21.3% (112)	20.5% (194)	15.3% (51)	
Southwest	7.1% (271)	7.9% (50)	6.0% (160)	9.4% (61)	
Northwest	18.2% (529)	13.4% (108)	18.8% (310)	21.0% (111)	
California	29.9% (1365)	29.1% (243)	30.0% (803)	30.2% (319)	

^a Column percentages show weighted frequencies, sample sizes are unweighted

^b P-values reflect the significance of Rao-Scott Chi-square between self-reported health and the farmworker characteristic

^c Primary school or less includes individuals who had no formal schooling and any education through 8th grade

^d Has been diagnosed with asthma, diabetes, hypertension, tuberculosis, heart disease, urinary tract infections, or unspecified

Table 3.2 Odds of self-reporting excellent or good health vs. fair or poor health among U.S. farmworkers by race and ethnicity: National Agricultural Workers Survey (NAWS), 2009/2010 (n=3691)

	Unadjusted Odds Ratio ^b (95% CI)		Adjusted ^a Odds Ratio ^b (95% CI)	
	Excellent	Good	Excellent	Good
Race/Ethnicity				
Hispanic, all races	0.27*** (0.15-0.50)	0.48** (0.27-0.86)	0.23** (0.08-0.67)	0.37* (0.15-0.92)
Non-Hispanic non-White	0.22*** (0.09-0.55)	0.30** (0.14-0.68)	0.30** (0.12-0.73)	0.32** (0.14-0.73)
Non-Hispanic White			1.0	1.0
Legal Status				
Unauthorized immigrant			1.59 (0.58-4.34)	1.20 (0.59-2.48)
Authorized immigrant			1.13 (0.42-3.08)	1.46 (0.66-3.21)
U.S. citizen			1.0	1.0
Age (range), years				
18-25			1.0	1.0
26-35			0.55 (0.26-1.16)	0.93 (0.44-1.96)
36-45			0.39** (0.19-0.81)	0.99 (0.51-1.92)
46-59			0.32** (0.13-0.70)	0.81 (0.40-1.65)
60+			0.48 (0.18-1.32)	1.59 (0.71-3.58)
Education				
Primary school or less ^c			1.0	1.0
Beyond primary school			2.40*** (1.49-3.87)	1.60* (1.05-2.45)
Chronic health conditions^d				
One or more chronic condition			0.19*** (0.10-0.36)	0.41*** (0.28-0.59)
None			1.0	1.0
SNAP				
Participates in SNAP			0.75 (0.38-1.46)	0.90 (0.52-1.55)
Does not participate in SNAP			1.0	1.0
WIC				
Participates in WIC			1.67* (0.99-2.81)	1.62* (1.00-2.62)
Does not participate in WIC			1.0	1.0

^a Adjusted for legal status, age, education, and chronic health conditions

^b P-values reflect the significance of the association between self-reported health and race/ethnicity *p<0.05 **p<0.01 ***p<0.001

^c Primary school or less includes individuals who had no formal schooling and any education through 8th grade

^d Has been diagnosed with asthma, diabetes, hypertension, tuberculosis, heart disease, urinary tract infections, or unspecified

Table 3.3 Odds of self-reporting excellent or good health vs. fair or poor among U.S. farmworkers by race and ethnicity, stratified by participation in SNAP or WIC^a: National Agricultural Workers Survey (NAWS), 2009/2010 (n=3691)

	Unadjusted Odds Ratio ^c (95% CI)		Adjusted ^b Odds Ratio ^c (95% CI)	
	Excellent	Good	Excellent	Good
Participated in SNAP or WIC^a				
Race/Ethnicity				
Hispanic, all races	5.09 (0.84-30.71)	2.68 (0.45-15.83)	10.02* (1.78-56.22)	18.34*** (4.54-74.18)
Non-Hispanic non-White	1.62 (0.11-24.37)	1.27 (0.12-13.78)	0.42 (0.04-4.83)	0.15 (0.01-2.51)
Non-Hispanic White	1.0	1.0	1.0	1.0
Legal Status				
Unauthorized immigrant			0.37 (0.07-1.90)	0.23* (0.06-0.84)
Authorized immigrant			0.30 (0.07-1.38)	0.42 (0.12-1.51)
U.S. citizen			1.0	1.0
Age (range), years				
18-25			1.0	1.0
26-35			0.70 (0.23-2.12)	1.03 (0.39-2.73)
36-45			0.20** (0.05-0.70)	0.75 (0.21-2.63)
46-59			0.35 (0.06-1.98)	0.48 (0.11-2.12)
60+			NA ^f	0.41 (0.04-4.15)
Education				
Primary school or less ^d			1.0	1.0
Beyond primary school			3.74** (1.47-9.49)	3.26** (1.43-7.43)
Chronic health conditions^e				
One or more chronic condition			0.38 (0.13-1.12)	0.32** (0.15-0.70)
None			1.0	1.0
Did not participate in SNAP or WIC^a				
Race/Ethnicity				
Hispanic, all races	0.19*** (0.11-0.35)	0.35*** (0.20-0.61)	0.16*** (0.05-0.48)	0.25** (0.10-0.63)
Non-Hispanic non-White	0.17*** (0.07-0.44)	0.229*** (0.10-0.52)	0.27** (0.11-0.69)	0.31** (0.14-0.71)
Non-Hispanic White	1.0	1.0	1.0	1.0
Legal Status				
Unauthorized immigrant			1.54 (0.52-4.52)	1.30 (0.60-2.80)
Authorized immigrant			1.10 (0.36-3.31)	1.42 (0.61-3.30)
U.S. citizen			1.0	1.0
Age (range), years				
18-25			1.0	1.0
26-35			0.53 (0.23-1.26)	0.95 (0.40-2.27)
36-45			0.46 (0.21-1.03)	1.06 (0.50-2.26)
46-59			0.33** (0.15-0.76)	0.83 (0.38-1.81)
60+			0.53	1.56

			(0.19-1.50)	(0.65-3.77)
Education				
Primary school or less ^d			1.0	1.0
Beyond primary school			2.23** (1.31-3.80)	1.48 (0.92-2.39)
Chronic health conditions ^e				
One or more chronic condition			0.14*** (0.08-0.25)	0.41*** (0.27-0.61)
None			1.0	1.0

^a Indicated use of SNAP or WIC within two years prior

^b Adjusted for legal status, age, education, and chronic health conditions

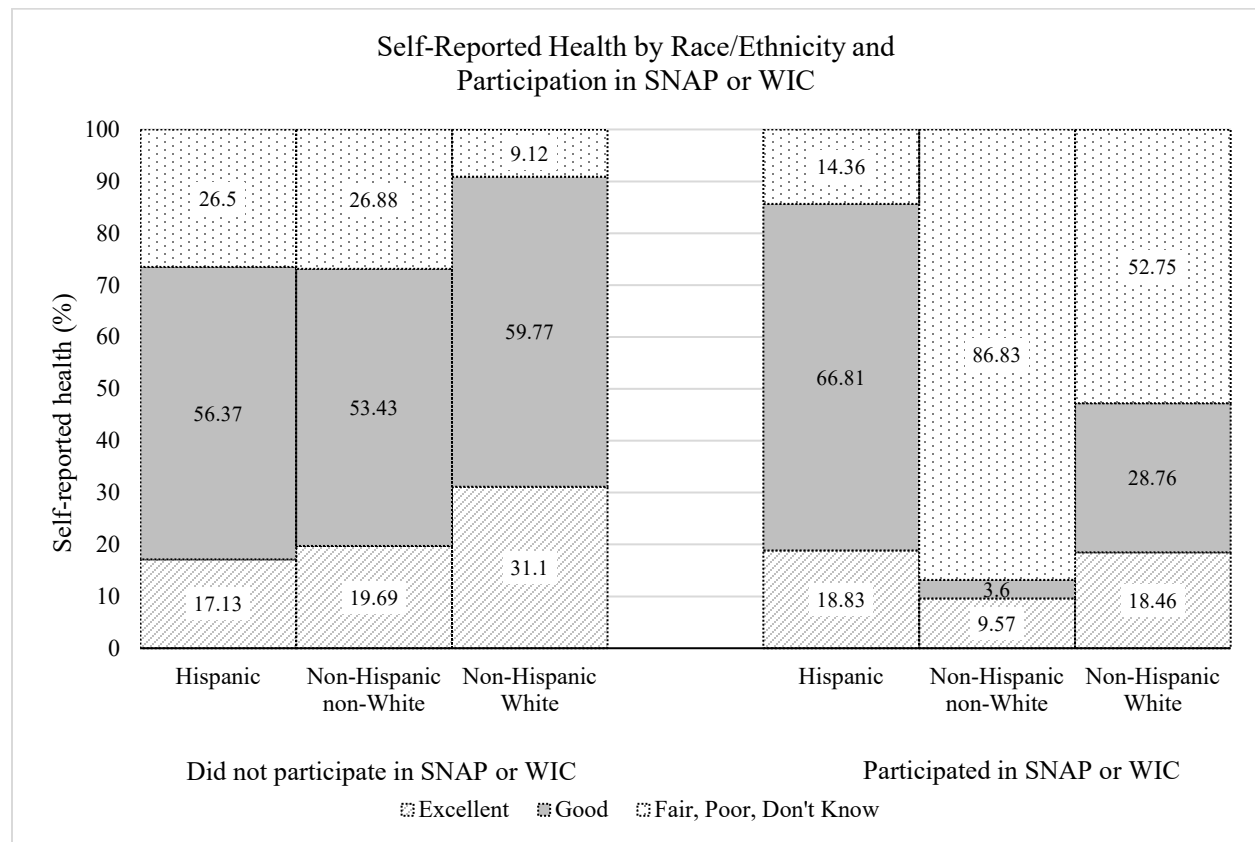
^c P-values reflect the significance of the association between self-reported health and race ethnicity *p<0.05 **p<0.01 ***p<0.001

^d Primary school or less includes individuals who had no formal schooling and any education through 8th grade

^e Has been diagnosed with asthma, diabetes, hypertension, tuberculosis, heart disease, urinary tract infections, or unspecified

^f Too few cases to estimate odds

Figure 3.1 U.S. farmworker self-reported health status by race/ethnicity and SNAP or WIC participation: National Agricultural Workers Survey, 2009/2010 (n=3691)



^a Indicated use of SNAP or WIC within two years prior

CHAPTER 5. CONCLUSION

The central purpose of this dissertation was to describe the lived experiences of FI/FS among the farm workforce and identify ways in which policies and programs can better support farm livelihoods to promote health on the farm, including improved connections to public resources that are intended to provide assistance. Throughout the previous three chapters, I aimed to (1) described the unique contexts through which small- to mid-sized farmers and migrant and seasonal farmworkers in Oregon experienced FI, (2) identify the drivers of SNAP participation among F/MSFW in Oregon, and (3) document how race, ethnicity, and legal status relate to MSFW health and examine how SNAP and WIC influence the associations between race, ethnicity, legal status, and health. Results from these three aims provided valuable insight into the ways in which F/MSFW interpret and experience FI, the determinants of SNAP participation among F/MSFW, and the racial and ethnic disparities in self-reported health among MSFW and the associations between SNAP/WIC participation and health among Latinx MSFW. Findings suggest opportunities for more responsive program and policy approaches that are sensitive to farm laborers' unique vulnerabilities and assets.

This dissertation was a mixed-methods project that used two data sources: in-depth interview data from a study intended to determine when, how, and why agricultural workers utilize formal and informal safety nets to access food and the National Agricultural Workers Survey. The first qualitative aim examined the lived experiences of FI among a sample of small- to mid-sized farmers and MSFW in Oregon. I found a misalignment between F/MSFW perspectives of their lived experiences of FI and assessments of their FI using a widely utilized and validated measure. Though misalignment was likely attributable to the differences between F/MSFW interpretations of FI versus the constructs of FI that the tools were designed to measure, it demonstrated the importance of community-engaged approaches to policy and program design to amplify community voices and elicit buy-in. In addition, evidence provided by evaluated food security scores and the core characteristics of FI highlighted the contextual factors that contribute to F/MSFW FI, which included seasonal gaps in income, excessive work demand in response

to low wages, minimal and reluctant use of food assistance, and the tendency to downplay experiences of hardship. As such, policies intended to address F/MSFW FI must remain sensitive to these unique characteristics.

The second qualitative aim explored the patterns of SNAP participation among the same sample of small- to mid-sized farmers and MSFW. I adapted the Andersen Model of Health Service Utilization and included components derived from another adapted Andersen model to build a theoretical framework that described SNAP utilization among farmers and MSFW. The framework is organized by psychosocial, predisposing, enabling, need, and use factors. Psychosocial factors (attitudes, program knowledge, norms, and control) emerged as a central determinant of SNAP participation. Three salient themes provided insight into the ways in which federal policies may not address the needs of this unique population. The first and second themes, mixed needs (specific, compounded, comparative) and misalignment of need and eligibility highlight the importance of expanding SNAP eligibility cut-offs. The third theme, pervasive internal and external stigmas associated with SNAP participation, points to the need for targeted community engagement mechanisms to facilitate program participation.

The quantitative aim of this dissertation used data from a nationally representative sample of MSFW to explore how race, ethnicity, and legal status related to MSFW health and examine how the use of SNAP and WIC influences the associations among race, ethnicity, legal status, and health. The hypotheses were that Hispanic/Latinx MSFW would have lower odds of reporting excellent or good self-reported health compared to non-Hispanic/Latinx non-White and non-Hispanic/Latinx White MSFW, and unauthorized MSFW would have lower odds of reporting excellent or good self-reported health compared to lawfully present MSFW and citizen MSFW. As hypothesized, there was evidence of disparities in self-reported health by race and ethnicity, as Hispanic/Latinx MSFW had lower odds of reporting excellent or good self-reported health compared to non-Hispanic/Latinx White MSFW. However, there were no significant differences in self-reported health by race and ethnicity between Hispanic/Latinx MSFW and non-Hispanic/Latinx White MSFW. In addition, there were no differences in self-reported health by legal

status, which may indicate that RLS had no direct influence on self-reported health among MSFW. Still, RLS may influence Hispanic/Latinx MSFW health through spillover pathways. Hispanic/Latinx MSFW who participated in SNAP or WIC had higher odds of reporting excellent or good self-reported health compared to non-Hispanic White MSFW who participated in SNAP or WIC. This evidence of effect modification by SNAP/WIC participation highlighted the potential health benefits of expanding access to the two programs, especially among MSFW who experience fair or poor health. These findings underscore the need to expand SNAP eligibility for MSFW.

Recommendations for Future Research

Recommendations for future research, practice, and policy are discussed across each manuscript that comprises this dissertation. The results from these studies suggest directions for further exploration and opportunities for programs and policies. As the sample of F/MSFW that participated in this study represented a very limited sample of the agricultural workforce in Oregon, recruitment of a more extensive and diverse sample, in and out of Oregon, may clarify the transferability of study findings. Future studies of FI among F/MSFW may benefit from an investigation into the variations in interpretation and understanding of FI, as well as the USDA Household Food Security Survey Module. The literature would be strengthened with qualitative approaches to understand the embodiment of health, FI, hunger, and nourishment among F/MSFW. An exploration of policies and programs that are responsive to the characteristics of FI among F/MSFW is also warranted. Possibilities include standardized seasonal wage or resource supplements, longer recertification windows, automatic program enrollment, and innovative approaches with financial institutions to help MSFW establish credit.

There are several opportunities to advance the research on SNAP participation among farming communities using the proposed theoretical model developed to achieve Aim 2. First, it would be helpful to test the model's strength using more rigorous sampling techniques to predict SNAP participation among MSFW or farmers separately, which would help us understand both groups better and make distinctions between them. Second, quantitative analysis of the predictive power of the sociodemographic,

predisposing, enabling, and need factors would be helpful to determine when F/MSFW elect not to participate.

It is critical to further explore the impact of SNAP and WIC participation on MSFW health status. Longitudinal studies to explore MSFW health before program participation and after program participation could clarify SNAP and WIC's role in overall health. Efforts can be made to stabilize quantitative inquiries using cluster sampling to balance the sample across demographic characteristics. It is also critical that future studies continue to explore the ways in which legal status determines health among racial and ethnic groups using more refined study techniques. Additional research is needed to explore the pathways through which RLS influences MSFW health.

Finally, the COVID-19 pandemic had significant health, economic, and social impacts on the farm workforce. Like many essential workers, F/MSFW were at increased risk of viral exposure and transmission. Rural isolation, the physical nature of farm labor, and characteristic barriers to adequate health services may have put F/MSFW at even greater risk. Like many essential workers, F/MSFW were celebrated for their role in food production amidst a global pandemic and simultaneously stigmatized for engaging in work where conditions may contribute to the spread of COVID-19 (Bottemiller Evich, Bustillo, & Crampton, 2020). Workers experiencing symptoms of COVID-19 were faced with the decision to take time off work, which may have encountered FI due to a loss of income. Future research is needed to unpack the experiences of F/MSFW and FI after the COVID-19 pandemic.

Final Conclusions

The ways in which F/MSFW interpret and experience FI and the determinants of SNAP participation among F/MSFW demonstrate the unique contextual and psychosocial factors that contribute to limited food access and provide insight into the ways in which federal policies may not address the needs of the farm workforce. F/MSFW encounter seasonal gaps in income, work long hours almost every day, earn low wages, and downplay their experiences of hardship. Experiences with FI and MSFW health status are also rooted in race and ethnicity and the policies that limit access to economic, social, and

health resources. Participation in SNAP and WIC may be constructive for improving health outcomes among MSFW who disproportionately experience poorer health. However, both F/MSFW encounter inequitable access to SNAP. The farm workforce struggles with needs that are often mismatched with their eligibility to participate in SNAP. Pervasive internal and external stigmas associated with FI and SNAP among farming communities often deter F/MSFW from program participation. These findings underscore the need to expand SNAP eligibility to fully support the lives of those who labor to provide food for others. SNAP and WIC are mutable programs that hold the potential to improve health on the farm without reinventing the wheel. Still, novel policy and programs intended to support farm livelihoods require innovative approaches that are sensitive to farm laborers' unique contexts and vulnerabilities, like those presented in this body of work, and include targeted community engagement mechanisms.

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APPENDICES

A. Farmworker Interview Protocol – English Version

Food Security Among Oregon Latino Food System Workers

Interview Protocol

Demographic Information

1. How do you describe your race/ethnicity?

- | | |
|--|---|
| ☐ Black or African American | ☐ Asian or Pacific Islander |
| ☐ Hispanic or Latino | ☐ American Indian or Alaska Native |
| ☐ White | ☐ Other: _____ |

2. What is your preferred language?

- | | | |
|----------------------------------|----------------------------------|--------------------------------|
| ☐ English | ☐ Spanish | ☐ Other |
|----------------------------------|----------------------------------|--------------------------------|

3. What is your age? _____

4. What is your sex?

- | | | |
|---------------------------------|-------------------------------|--------------------------------|
| ☐ Female | ☐ Male | ☐ Other |
|---------------------------------|-------------------------------|--------------------------------|

5. What type of food operation do you work for? What is your role there? (Check all that apply).

- | | | |
|---|--|---|
| <ul style="list-style-type: none">• Farm<ul style="list-style-type: none">☐ Picking produce☐ Planting produce☐ End of year maintenance☐ Selling at markets☐ Machinery operation☐ Manage livestock☐ Management• Orchard<ul style="list-style-type: none">☐ Picking☐ Tree maintenance☐ Selling at markets☐ Machinery operation☐ Grounds supervisor• Nursery<ul style="list-style-type: none">• Planting• Harvesting• Customer service• Management | <ul style="list-style-type: none">• Processing Factory<ul style="list-style-type: none">☐ Sorting☐ Packing☐ Butchering☐ Machinery operation☐ Management• Restaurant<ul style="list-style-type: none">☐ Dishwasher☐ Cook☐ Waiter/Waitress☐ Busser☐ Janitorial staff☐ Management• School/workplace cafeteria<ul style="list-style-type: none">☐ Serving food☐ Preparing food☐ Dishwasher☐ Janitorial staff☐ Management | <ul style="list-style-type: none">• Grocery Store<ul style="list-style-type: none">☐ Cashier☐ Receiving/stocking☐ Deli☐ Butcher☐ Produce☐ Management• Vineyard<ul style="list-style-type: none">☐ Picking☐ Vine maintenance☐ Tasting room☐ Machinery operation☐ Grounds supervisor |
|---|--|---|

6. How many jobs do you currently work?

- | | |
|----------------------------|------------------------------------|
| ☐ 1 | ☐ 3 |
| ☐ 2 | ☐ 4 or more |

7. How many days per week do you typically work?

- | | | | |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| ☐ 1 day | ☐ 3 days | ☐ 5 days | ☐ 7 days |
| ☐ 2 days | ☐ 4 days | ☐ 6 days | |

Begin Six-Item Food Security Module

Intro: I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).

1. **The first statement is, "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more." Was that often, sometimes, or never true for (you/your household) in the last 12 months?**
 - ☐ Often true
 - ☐ Sometimes true
 - ☐ Never true
 - ☐ Don't know or Refused

2. **"(I/we) couldn't afford to eat balanced meals." Was that often, sometimes, or never true for (you/your household) in the last 12 months?**
 - ☐ Often true
 - ☐ Sometimes true
 - ☐ Never true
 - ☐ Don't know or Refused

3. **In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?**
 - ☐ Yes
 - ☐ No (Skip to 5)
 - ☐ Don't know (Skip to 5)

4. **[IF YES ABOVE, ASK] How often did this happen—every month, some months but not every month, or in only 1 or 2 months?**
 - ☐ Every month
 - ☐ Some months but not every month
 - ☐ Only 1 or 2 months
 - ☐ Don't know

5. **In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?**
 - ☐ Yes
 - ☐ No
 - ☐ Don't know

6. **In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?**
 - ☐ Yes
 - ☐ No
 - ☐ Don't know

Migration and Migrant Work

1. Where were you born? (If born in U.S., go to Q2).
 - a. What did you do for work before coming here?
 - b. When did you come to the U.S.?
 - c. Is your family with you in the U.S.?
 - d. How did you decide where to go within the U.S.?
2. Do you travel or move around to work? (If no, go to Q3).
 - a. In a typical year, describe where you go, when you go there, and what you do for work there.
 - b. What is it like to move this often and adapt to new communities?
 - i. Do you have family or friends in each community?
 - ii. Does anyone move with you? (If family is in country of origin OR does not move, go to 2c).
 - iii. How does it affect your family to move often for work? (e.g., children in school, other family members' work options, housing, etc.) Skip to 3.
 - c. How did you make the decision to work away from your family?
 - i. How does it affect you and your family to be apart?
 - ii. When you are without your family, are there other people you rely on for support and sharing?
 - iii. When you are moving around for work, do you have enough money and support to meet your basic needs?
 - iv. Do you send money to your family while you are away?

Food Acquisition

3. Where do you typically get your food?
 - a. How did you learn about these stores, markets, restaurants, food pantries, farms, and other sources of food?
 - b. What do you like and dislike about these food sources?
 - c. Do these sources meet your food needs? Why/why not?
 - d. Are there other ways you get food (e.g., bartering, growing food, gathering, foraging, hunting, fishing, etc.)? How do you feel about these ways of getting food?
4. How do you choose what food you buy at the store? (*Probe: What else do you think about when you choose foods?*)
 - a. What foods do you typically buy at the grocery store?

- b. What foods do you typically get to eat away from home, like food stands, fast food restaurants, vending machines, etc.?
 - c. What foods do you typically get from the food pantry (or other charity food distribution)?
 - i. What are your experiences using the food pantry like?
 - ii. How often do you use the food pantry?
 - d. What foods do you typically get from friends, family, or bartering?
 - e. What foods do you grow, find, hunt, etc.?
 - f. From what other places or people do you get food (e.g., family, friends)?
 - i. Probe: How often do others in your community come to you for food because they worry about not having enough?
 - ii. Probe: How often do you or your family go to others' houses to eat because you worry about not having enough?
 - g. Do the foods you get from these sources provide *enough* food to meet your needs?
 - h. Do the foods you get from these sources reflect your food preferences?
 - i. Do the foods you get seem healthy to you and meet your nutritional needs?
 - j. Are the foods you get from these sources available to you consistently?
 - k. Do you have the space, appliances, and equipment you need to store and prepare these foods?
 - l. In what ways do you think could community food resources be improved?
 - i. What really works well for you in using community food resources?
 - m. Are there foods you would like to have but aren't able to get? Why aren't you able to get these foods?
 - n. Who in your household is responsible for getting and preparing food?
5. Can you tell me a little about what you ate yesterday? What was the first thing you ate, and where did you get it? What did you eat after that?
- a. How did you choose each of these foods?
 - b. What are the reasons you decide to eat food at home or food away from home?
6. If there are children in your household, can you tell me a little about what your children ate yesterday?
- a. How did you or your child choose these foods?
 - b. Do these foods provide enough to meet your child's needs?
 - i. Are there times when your child is hungry, but there is not enough food available?
 - ii. How do you and your child feel about times when there is not enough food available?

- c. Do these foods reflect what your child likes to eat?
- d. Do you think that these foods seem healthy and meet your child's nutritional needs?
- e. Are there times that your child eats without you? What do you think about the foods your child gets when s/he is with other adults, at school, on his/her own, etc.?
- f. Do you have any concerns about your child's health?

Coping with Food Insecurity – Resources, Social Networks, and Experiences

- 7. What strategies are you using to make ends meet?
 - a. Are there times of the month or times of the year when food is harder for you to get?
 - i. What makes it harder?
 - b. What do you do once you start to run out of food?
 - c. What options are available in your community to help people who might need more food?
 - i. Have you utilized (each of) these resources? Why or why not?
 - d. Do you or your children participate in SNAP, WIC, school meals, or any other food programs? Why or why not?
 - e. Does your workplace have any food resources that you can use? (e.g., daily meal, second quality items, leftovers/excess yield, etc.)
 - i. How are these resources distributed? (Formally, informally; what are the rules, etc.?)
 - f. In general, to what extent do you think the resources available to you help or hurt your ability to make ends meet?
- 8. Do you have family, friends, or other individuals or organizations that help you get more food?
 - a. Tell me more about how this works.
 - b. How do you feel about getting this type of support?
- 9. Do you help any friends, family, or other individuals get food?
 - a. Tell me more about how this works.
 - b. How do you feel about giving this type of support?
- 10. Do you feel worried, stressed, or sad about getting enough food for yourself and your family?

Working Conditions and Context

- 11. You work in the food system. What is it like to work around food and struggle to have enough food to meet your needs?
- 12. Tell me more about your working conditions. Do you have any safety concerns about your work?
 - a. What does your employer do to make sure you are safe at work?
 - b. Do you get breaks at work? Do you have access to bathrooms? Are you able to eat and drink during your time at work? Are you able to take shelter from bad weather and heat?
- 13. Have there been times when work is not available? What do you do when this happens?
- 14. Are there differences between the jobs that men and women do at your workplace?

- a. Do men and women make different amounts of money at your workplace?
 - b. Do you think men and women are treated differently at your workplace?
 - i. Can you tell me about a time when you feel like you were treated a certain way because of your sex?
 - ii. Have there been times when you felt unsafe or worried at work because of your sex?
15. There have been some incidents when both citizens/documentated immigrants and undocumented immigrants have been targeted by ICE in Oregon. Do you worry about problems with immigration officials?
- a. Has the current climate around immigration affected you or your family and friends? In what ways?
 - b. Has the current climate affected your ability to work?
 - c. Has the current climate affected your ability to meet food or other basic needs?

Perceived Safety Scale

Please indicate how much you agree or disagree with each of the following statements about safety on your most recent job. Circle one answer on the scale for each question:

	Strongly disagree (SD)	Disagree (D)	Agree (A)	Strongly agree (SA)
1. New workers quickly learn that they are expected to follow good safety practices.				
2. There are no significant compromises or shortcuts taken when worker safety is at stake.				
3. Where I work, workers and supervisors work together to ensure the safest possible working conditions.				
4. Workers are told when they do not follow good safety practices.				
5. The safety of workers is a big priority with the supervisors where I work.				
6. I feel free to report safety violations where I work.				
7. Safety remains a priority even when the job runs behind schedule.				

EXERCISE RIGHTS.

Indicate how often you can exercise the following rights without obstacles...

1. Weekly days free (e.g. weekends)	Always (0)	Many times (1)	Sometimes (2)	Only one time (3)	Never (4)
2. Take sick leave	Always (0)	Many times (1)	Sometimes (2)	Only one time (3)	Never (4)
3. Go to the doctor	Always (0)	Many times (1)	Sometimes (2)	Only one time (3)	Never (4)
4. Take vacations	Always (0)	Many times (1)	Sometimes (2)	Only one time (3)	Never (4)
5. Request a day off for personal reasons when needed	Always (0)	Many times (1)	Sometimes (2)	Only one time (3)	Never (4)
6. Request a day off for family reasons when needed	Always (0)	Many times (1)	Sometimes (2)	Only one time (3)	Never (4)

Employment Precariousness Scale 2010**EPRES-2010**

TEMPORARINESS					
What is the duration of your contract?	Perman ent (0)	1 yr or more (1)	Tempor ary, non- fixed term (2)	6-12 mo (3)	<6 mo (4)
How long have you been working for this company?	1 yr or more (0)	<2 mo (1)	2-3 mo (2)	3-6 mo (3)	6-12 mo (4)
DISEMPOWERMENT					
How did you settle the following employment conditions?					
Workplace schedule		Collective agreement (0)	By the employer (1)	Doesn't know (3)	
Wages or salary		Collective agreement (0)	By the employer (1)	Doesn't know (3)	
VULNERABILITY					
In relation to the way you are treated at work, can you tell me whether...					
You are able to demand better working conditions without being exposed to reprisals?	Never (0)	Only one time (1)	Someti mes (2)	Many times (3)	Always (4)

You are defenseless towards unfair treatment by your superiors?	Never (0)	Only one time (1)	Sometimes (2)	Many times (3)	Always (4)
You would be fired for not doing all what you are asked to do?	Never (0)	Only one time (1)	Sometimes (2)	Many times (3)	Always (4)
You are treated in a discriminatory and unjust manner?	Never (0)	Only one time (1)	Sometimes (2)	Many times (3)	Always (4)
You are made to feel you can be easily replaced?	Never (0)	Only one time (1)	Sometimes (2)	Many times (3)	Always (4)
WAGES					
10. Does your current salary allow you to cover your basic needs?	Yes (0)	A good amount (1)	A little (2)	Not at all (3)	
11. Does your current salary allow you to cover unexpected expenses?	Always (0)	Many times (1)	Sometimes (2)	Only one time (3)	
RIGHTS. Of the following benefits, which do you have a right to...					
Pensions for old age or disability	Yes (0)	No (1)	Doesn't know (2)		
Severance pay	Yes (0)	No (1)	Doesn't know (2)		
Maternity/paternity leave	Yes (0)	No (1)	Doesn't know (2)		
Unemployment benefit / compensation	Yes (0)	No (1)	Doesn't know (2)		

Conclusion

Thank you very much for taking the time to speak with me today. I very much appreciate you sharing your experiences. We may want to contact you again for another interview or an activity where we map some of the food resources you use together. Are you willing to participate again? If yes, complete contact form). If you have any questions, you can the person in charge of this project here (distribute Stephanie's business card). Give participant their incentive, complete the incentive receipt, and thank them again.

B. Farmer Interview Protocol

Food Security in the Oregon Food System

Owner/Operator Interview Protocol

Part I. Demographic Information

1. How do you describe your race/ethnicity?

- | | |
|--|---|
| ☐ Black or African American | ☐ Asian or Pacific Islander |
| ☐ Hispanic or Latino | ☐ American Indian or Alaska Native |
| ☐ White | ☐ Other: _____ |

2. What is your age? _____

3. What is your sex?

- | | | |
|---------------------------------|-------------------------------|--------------------------------|
| ☐ Female | ☐ Male | ☐ Other |
|---------------------------------|-------------------------------|--------------------------------|

4. Who lives in your household? How many people total live with you? _____

5. What is the approximate annual income of your household?

- | | | |
|--|--|---|
| ☐ Under \$10,000 | ☐ \$25,000-\$39,999 | ☐ More than \$55,000 |
| ☐ \$10,000-\$24,999 | ☐ \$40,000-\$54,999 | |

6. How much of your annual household income is from a farm operation?

7. What type of food operation are you involved with? (Check all that apply)

- | | | |
|---|----------------------------------|---------------------------------------|
| ☐ Single crop farm | ☐ Orchard | ☐ Vineyard |
| ☐ Multi crop farm | ☐ Nursery | ☐ Other: _____ |
| ☐ Ranch/Livestock | ☐ Dairy | ☐ Other: _____ |

8. What is your role in the operation?

• Farm ☐ Picking produce ☐ Planting produce ☐ End of year maintenance ☐ Selling at markets ☐ Machinery operation ☐ Manage livestock ☐ Management ☐ Owner	• Orchard ☐ Picking ☐ Tree maintenance ☐ Selling at markets ☐ Machinery operation ☐ Grounds supervisor ☐ Owner	• Nursery ☐ Planting ☐ Harvesting ☐ Customer service ☐ Management ☐ Owner	• Vineyard ☐ Picking ☐ Vine maintenance ☐ Tasting room ☐ Machinery operation ☐ Grounds supervisor ☐ Owner
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9. Is farming your primary occupation? Yes No

10. What other jobs or income do you and people in your household have besides farming?

11. (If off-farm work is indicated), tell me about the decision for you or someone else in your household to work off-farm.

12. How many days a week do you typically work?

- | | | | |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| ☐ 1 day | ☐ 3 days | ☐ 5 days | ☐ 7 days |
| ☐ 2 days | ☐ 4 days | ☐ 6 days | |

Part II. Farm Characteristics

1. Please describe your farm operation.

- a. What do you produce?
- b. What size is your operation?
- c. What avenues do you use to sell your products?
- d. What are your beliefs about the farming that you do? (e.g., growing practices, labor practices, what it contributes, the importance of farming, beliefs about land, work, etc.)

2. Who works on your farm?

- a. Is everyone who works on the farm paid by you?
 - i. Are workers on your farm employees?
 - ii. Are they paid by hour, salary, or piece/pound?
 - iii. Are they contracted for their work? On what basis?
 - iv. Do you screen workers for eligibility to work (e.g., process I-9 documents)?
 - v. Do you file payroll/employment documentation for them or pay them under the table?
- b. Can you describe the decisions behind hiring?
 - i. What are the benefits and costs that you weigh when deciding to hire workers?
 - ii. How do you determine what they will do and when/how long they will work?
- c. Tell me about your hiring process
 - i. How do you find and select a good employee?
 - ii. How do you decide how and how much to pay them?
- d. Will you hire more employees in the near future?

3. Is your farm economically viable?

- a. Have there been times when your farm is not providing enough income for you and your household?
 - i. If so, what do you think makes the operation viable (e.g., business model, crop insurance, tax credits, land values, grants, in-kind contributions, labor costs)?
 - ii. If so, what do you do when this happens?
- b. If no, what factors make it difficult for you to profit from your farming?
 - i. How and why do you continue to farm?

Part III. Farmers and Food Security

Food security refers to lacking physical, social, and economic access to sufficient, safe, and nutritious food that meets someone's dietary needs and food preferences for an active and healthy life (United Nations Committee on World Food Security). As a producer, food security is probably relevant to you personally (e.g., providing food for yourself and your household) and professionally (e.g., providing food to others that is affordable to them and profitable to you). I'd like to ask you questions about your own process in providing food for your household.

A. Farmer Food Acquisition

1. Where do you typically get your food?

- a. Do you get food from grocery stores, markets, restaurants, food pantries, farms, friends/neighbors, etc.?
 - b. What do you like and dislike about these food sources?
 - c. Do these sources meet your food needs? Why or why not?
 - d. Are there other ways you get food (e.g., bartering, growing food, foraging, hunting, fishing, etc.)? How do you feel about these ways of getting food?
2. How do you choose what food you buy at the store?
 - a. What foods do you typically buy at the grocery store?
 - b. What foods do you typically get to eat away from home, like food stands, restaurants, vending machines, etc.?
 - c. What foods do you typically get from the food pantry (or other charitable food distribution sources)?
 - i. What are your experiences using the food pantry?
 - ii. How often do you use the food pantry?
 - d. What foods do you typically get from friends, family, or other personal sources?
 - e. What foods do you grow, find, hunt, etc. for yourself and your family?
 - f. From what other places or people do you get food?
 - g. Do the foods you get from these sources provide enough food to meet your needs?
 - h. Do the foods you get from these sources reflect your food preferences?
 - i. Do the foods you get from these sources seem healthy to you and meet your nutritional needs?
 - j. Are the foods you get from these sources available to you consistently?
 - i. Are there differences in what you can get during different seasons?
 - k. Do you have the space, appliances, and equipment you need to store and prepare the foods?
 3. Can you tell me a little about what you ate yesterday/ What was the first thing you ate, and where did you get it?
 - a. What did you eat after that?
 - b. How did you choose each of these foods?
 - c. What are the reasons you decide to eat food at home or food away from home?
 4. (If there are children in the household), can you tell me a little about what your child/children ate yesterday?
 - a. How did you or your child choose these foods?
 - b. Do these foods provide enough to meet your child's needs?
 - i. Are there times when your child is hungry, but there is not enough food available?
 - ii. How do you and your child feel about times when there is not enough food available?
 - c. Do these foods reflect what your child likes to eat?
 - d. Do you think that these foods seem healthy and meet your child's nutritional needs?
 - e. Are there times when your child eats without you? What do you think about the foods your child gets when s/he is with other adults, at school, or on his/her own?
 - f. Do you have any concerns about your child's health?

B. Farmer Food Security

1. Do you feel worried, stressed, or sad about getting enough food for yourself and your family?
 - a. If yes, what's it like to work with/around food and struggle to meet your food needs?
2. Are there times of the month or times of the year when food is harder for you to get?
 - a. What makes it harder?
3. What strategies do you use to make ends meet?
 - a. What do you do if you start to run out of food?
 - b. Have you used any community resources that help people who need more food?

- i. If yes, how do you feel about these sources of support? In what ways do they work or not work for you and your family?
- ii. In what ways so you think these resources could be improved?
- iii. Are there foods you would like to have but aren't able to get?
- c. Have you gotten help from any friends, family, other individuals, or any organizations to get more food?
- d. Do you or your children participate in SNAP (food stamps), WIC, school meals, or any other food programs? Why or why not?
 - i. If yes, how do you feel about these sources of support? In what ways do they work or not work for you and your family?

C. Six-Item Food Security Module

Intro: I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).

10. **The first statement is, “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?**
 - ☐ Often true
 - ☐ Sometimes true
 - ☐ Never true
 - ☐ Don’t know or Refused
11. **“(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?**
 - ☐ Often true
 - ☐ Sometimes true
 - ☐ Never true
 - ☐ Don’t know or Refused
12. **In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn’t enough money for food?**
 - ☐ Yes
 - ☐ No (Skip to 5)
 - ☐ Don’t know (Skip to 5)
13. **[IF YES ABOVE, ASK] How often did this happen—every month, some months but not every month, or in only 1 or 2 months?**
 - ☐ Every month
 - ☐ Some months but not every month
 - ☐ Only 1 or 2 months
 - ☐ Don’t know
14. **In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?**
 - ☐ Yes
 - ☐ No
 - ☐ Don’t know

15. In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?

- ☐ Yes
- ☐ No
- ☐ Don't know

Part IV. Farmer's Perspectives on Others' Food Security

I'd like to ask you questions about your views on other farmers and your workers' ability to provide food for themselves and their households and some of your thoughts about the food system and how it's working for producers and consumers.

A. Perceptions of Food Security in the Community

For these statements, please tell me whether the statement was often true, sometimes true, or never true based on your observations of the Latino food system workers in your community.

1. I see individuals and families manage with less than enough food.

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ Don't know or Refused

2. I am aware of individuals skipping meals because they do not have enough to eat.

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ Don't know or Refused

3. I see individuals/families eat mostly packaged food or food that may not meet nutritional needs (e.g., no fruits/vegetables).

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ Don't know or Refused

4. I see individuals not receiving food that they want or will eat.

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ Don't know or Refused

5. I see individuals and families trade food and/or share amongst themselves.

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ Don't know or Refused

6. I see individuals receive food in exchange for services provided (ex: childcare, chores).

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ Don't know or Refused

7. Please rate the severity of food insecurity that you see in your community:

- ☐ Extreme
- ☐ Moderate
- ☐ Low
- ☐ Non-existent

B. Other Farmers' and Farm Workers' Food Security

1. Do you know whether any of your own workers struggle with food security? Do you know other farmers who struggle to afford enough food?
 - a. Do you think these struggles affect their ability to run or work on farm operations?
2. Do other farmers or your workers come to you for food because they worry about having enough?
 - a. Tell me more about how this happens.
 - b. How do you feel about giving this type of support?
 - c. (If no one has ever come to them): If one of your workers or a fellow farmer came to you and asked for help with food, what would you do?
3. What options are available in your community to help people who might need more food? (e.g., from businesses, organizations, individuals, etc.)
 - a. What have you heard from people about these sources?
 - b. What are your opinions about these sources?
 - c. Are there ways you think these sources could be improved?
 - d. Do your workers or other farmers know about these resources? Have you told any of your workers or other farmers about these resources?
4. What other strategies have you seen other farmers, or your own workers use to make ends meet?
5. What role do you think you or your farm business play in helping other farmers or your own workers be food secure?
 - a. Are there any resources available to you that you think could help your workers be more food secure?
 - b. Have you thought about increasing your workers' wages or providing some food from the farm? Do you think this would work for you and be helpful to others?
 - c. What do you wish you could provide that you currently aren't providing or aren't able to provide?

C. Community Food Security and the Food System

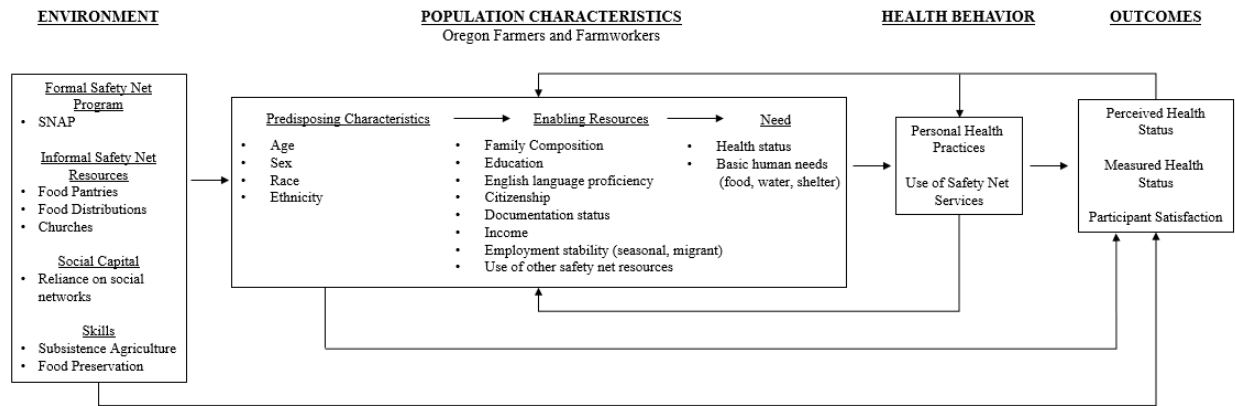
1. Do you know other families or community members who struggle with food security?
 - a. In what ways have you seen food insecurity affect your community?
2. Do others in your community come to you for food because they worry about having enough?
 - a. Tell me more about how this happens.
 - b. How do you feel about giving this type of support?
3. What role do you think you or your farm business play in ensuring food security in the broader community?
 - a. Do you currently donate any of your products or sell them at reduced cost?

- b. Are there other ways you have thought about or tried to address food insecurity in your community?
4. What do you think are the main causes of food insecurity in your community?
- a. Why do you think these issues or challenges exist?
5. What changes would you like to see in your community or in the food system that would help more people be food secure?

D. Immigrant and Migrant Workers

1. How many of your workers are immigrants to the United States?
- a. What countries did they come from?
 - b. How long have they been in the U.S.?
 - c. Do you know about their documentation status? Do they have work permits, are they undocumented, or are you unsure of their status?
2. How many of your workers are migrant workers, in other words, they move around to work at various operations throughout the year?
- a. What are their living conditions? Do they live on or near your property?
 - b. If you provide housing for your workers, how would you describe that housing?
 - c. Do these workers and their families have space, appliances, and equipment necessary to store and prepare food?
 - d. Do you know about how these workers and their families get connected to education, health care, and other basic needs and resources?
3. There is a lot of tension that has resulted from recent immigration and enforcement policy changes in the U.S.
- a. What are your thoughts about these policies?
 - b. Have these policies affected you, your family and friends, or your workers?
 - c. How do these policies affect your farm business?
 - d. Have these policies affected people's food security or the food system?
 - e. What changes would you like to see in immigration policy?
4. There have been some incidents in which both citizens/documented immigrants and undocumented immigrants have been targeted by ICE in Oregon. Do you worry about problems with immigration officials at your farm business?
- a. Has the current climate affected your ability to run your operation?
 - b. Has the current climate affected your ability to meet food or other basic needs

C. Andersen's Behavioral Model for Health Services Utilization, for Farmers and Migrant and Seasonal Farmworker SNAP Participation, unadapted



D. Multinomial Logistic Regression Tables – NAWS Analyses

Multinomial Logistic Regression Analysis with Authorization Status Independent Variable

Logistic regressions for farmworker self-rated health status: National Agricultural Workers Survey (NAWS), 2009/2010						
	Model 1 Unadjusted Odds Ratio (95% CI) p-value		Model 2 Adjusted all covariates Odds Ratio (95% CI) p-value		Model 3 Adjusted sig covariates Odds Ratio (95% CI) p-value	
	Excellent	Good	Excellent	Good	Excellent	Good
Legal status						
Unauthorized	0.66 (0.39-1.10) p = 0.11	1.07 (0.65-1.75) p = 0.79	1.08 (0.39-2.96) p = 0.89	1.47 (0.65-3.30) p = 0.36	1.14 (0.42-3.14) p = 0.79	1.48 (0.67-3.28) p = 0.33
Authorized	0.55 (0.30-1.02) p = 0.06	0.74 (0.46-1.19) p = 0.21	1.57 (0.59-4.22) p = 0.37	1.18 (0.57-2.48) p = 0.66	1.63 (0.59-4.50) p = 0.35	1.22 (0.59-2.51) p = 0.60
Citizen	-	-	-	-	-	-
Race Ethnicity						
Hispanic, all races			0.24 (0.08-0.71) p < 0.01	0.40 (0.16-1.04) p = 0.06	0.24 (0.08-0.69) p < 0.01	0.38 (0.15-0.94) p < 0.05
Non-Hispanic non-white			0.27 (0.10-0.75) p = 0.01	0.28 (0.11-0.72) p < 0.01	0.32 (0.13-0.80) p < 0.05	0.29 (0.13-0.68) p < 0.01
Non-Hispanic other			0.21 (0.03-1.61) p = 0.13	0.54 (0.10-2.95) p = 0.48	0.229 (0.03-1.64) p = 0.14	0.485 (0.09-2.67) p = 0.41
Non-Hispanic white	-	-	-	-	-	-
Age (range)						
26-35			0.60 (0.29-1.21) p = 0.15	1.01 (0.49-2.06) p = 0.98	0.54 (0.25-1.16) p = 0.12	0.93 (0.44-1.97) p = 0.85
36-45			0.44 (0.22-0.87) p < 0.05	1.02 (0.52-1.99) p = 0.95	0.38 (0.19-0.79) p < 0.01	1.00 (0.51-1.97) p = 1.0
46-59			0.36 (0.17-0.78) p < 0.01	0.87 (0.42-1.78) p = 0.70	0.30 (0.14-0.65) p < 0.01	0.76 (0.38-1.52) p = 0.44
60+			0.50 (0.18-1.38) p = 0.18	1.55 (0.67-3.59) p = 0.30	0.44 (0.16-1.21) p = 0.11	1.4 (0.66-3.22) p = 0.35
Female			0.80 (0.44-1.45) p = 0.46	0.71 (0.41-1.23) p = 0.30		
Education beyond primary school ^a			2.42 (1.51-3.86) p < 0.01	1.62 (1.08-2.43) p < 0.01	2.38 (1.47-3.86) p < 0.01	1.59 (1.04-2.44) p < 0.05
One or more chronic health condition ^b			0.20 (0.11-0.37) p < 0.001	0.42 (0.29-0.61) p < 0.001	0.20 (0.10-0.38) p < 0.001	0.42 (0.29-0.60) p < 0.001
Marital Status						
Single, no spouse in household			2.18 (0.47-10.02) p = 0.75	0.79 (0.19-3.32) p = 0.62		
Married, spouse in household			1.47 (0.32-6.79) p = 0.79	0.82 (0.20-3.44) p = 0.49		
Married, spouse not in household			1.73 (0.36-8.29) p = 0.49	0.53 (0.12-2.29) p = 0.40		
Children in household						
Children under age 6			1.41 (0.69-2.85) p = 0.34	1.04 (0.61-1.76) p = 0.89		
Children aged 6-17			1.11 (0.60-2.07)	1.20 (0.76-1.90)		

			p = 0.74 1.08 (0.64-1.81) p = 0.79	p = 0.44 1.32 (0.81-2.14) p = 0.27		
Family below poverty level						
Region						
East			1.01 (0.56-1.81) p = 0.98	0.87 (0.53-1.43) p = 0.58		
Southeast			0.83 (0.47-1.46) p = 0.51	0.98 (0.65-1.47) p = 0.92		
Midwest			0.78 (0.33-1.86) p = 0.58	0.94 (0.40-2.23) p = 0.89		
Southwest			0.91 (0.44-1.91) p = 0.80	0.72 (0.41-1.25) p = 0.24		
Northwest			0.57 (0.27-1.19) p = 0.14	0.83 (0.47-1.44) p = 0.50		
p-values reflect the significance of the association between self-rated health and legal status and ethnicity:						
^a Primary school = From no schooling to 8th grade						
^b Has been diagnosed with asthma, diabetes, hypertension, tuberculosis, heart disease, urinary tract infections, or unspecified						

Multinomial Logistic Regression Analysis Process for Race & Ethnicity Combined Independent Variable

Logistic regressions for farmworker self-rated health status: National Agricultural Workers Survey (NAWS), 2009/2010						
	Model 1 Unadjusted Odds Ratio (95% CI) p-value		Model 2 Adjusted all covariates Odds Ratio (95% CI) p-value		Model 3 Adjusted sig covariates Odds Ratio (95% CI) p-value	
	Excellent	Good	Excellent	Good	Excellent	Good
Race Ethnicity						
Hispanic, all races	0.27 (0.15-0.50) p < 0.001	0.48 (0.27-0.86) p < 0.05	0.24 (0.08-0.71) p < 0.01	0.40 (0.16-1.04) p = 0.06	0.23 (0.08-0.67)	0.37 (0.15-0.92)
Non-Hispanic non-white	0.22 (0.09-0.55) p = 0.001	0.27 (0.12-0.62) p < 0.01	0.27 (0.10-0.75) p = 0.01	0.28 (0.11-0.72) p < 0.01	0.30 (0.12-0.73)	0.32 (0.14-0.73)
Non-Hispanic other	0.26 (0.03-2.54) p = 0.24	0.48 (0.07-3.29) p = 0.45	0.21 (0.03-1.61) p = 0.13	0.54 (0.10-2.95) p = 0.48	0.26 (0.04-1.86)	0.52 (0.10-2.81)
Non-Hispanic white			-	-	-	-
Legal status						
Unauthorized			1.08 (0.3-2.96) p = 0.89	1.47 (0.65-3.30) p = 0.36		
Authorized			1.57 (0.59-4.22) p = 0.37	1.18 (0.57-2.48) p = 0.66		
Age (range)						
26-35			0.44 (0.22-0.87) p = 0.15	1.02 (0.52-1.99) p = 0.98	0.93 (0.44-1.96)	0.93 (0.44-1.96)
36-45			0.36 (0.17-0.78) p < 0.05	0.87 (0.42-1.78) p = 0.95	0.99 (0.51-1.92)	0.99 (0.51-1.92)
46-59			0.50 (0.18-1.38) p < 0.01	1.55 (0.67-3.59) p = 0.70	0.81 (0.40-1.65)	0.81 (0.40-1.65)
60+			0.80 (0.44-1.45) p = 0.18	0.71 (0.41-1.23) p = 0.30	1.59 (0.71-3.58)	1.59 (0.71-3.58)
Female			0.80 (0.44-1.45) p = 0.50	1.62 (1.08-2.43) p = 0.23		
Education beyond primary school ^a			2.42 (1.51-3.86) p < 0.01	1.62 (1.08-2.43) p < 0.05	2.40 (1.49-3.87)	1.60 (1.05-2.45)
One or more chronic health condition ^b			0.20 (0.11-0.37) p < 0.001	0.42 (0.29-0.61) p < 0.001	0.19 (0.10-0.36)	0.41 (0.28-0.59)
Marital Status						
Single, no spouse in household			2.18 (0.47-10.02) p = 0.32	0.79 (0.19 3.32) p = 0.75		
Married, spouse in household			1.47 (0.32-6.79) p = 0.62	0.82 (0.20 3.44) p = 0.79		
Married, spouse not in household			1.73 (0.36-8.29) p = 0.49	0.53 (0.12-2.29) p = 0.40		
Children in household						
Children under age 6			1.41 (0.69-2.85) p = 0.34	1.11 (0.60-2.07) p = 0.89		
Children aged 6-17			1.11 (0.60-2.07) p = 0.74	1.20 (0.76-1.90) p = 0.44		
Family below poverty level			1.08 (0.64-1.81) p = 0.79	1.32 (0.81-2.14) p = 0.27		
Region						

East			1.01 (0.56-1.81) p = 0.98	0.87 (0.53-1.43) p = 0.58		
Southeast			0.83 (0.47-1.46) p = 0.51	0.98 (0.65-1.47) p = 0.92		
Midwest			0.78 (0.33-1.86) p = 0.58	0.94 (0.40-2.23) p = 0.89		
Southwest			0.91 (0.44-1.91) p = 0.81	0.72 (0.41-1.25) p = 0.24		
Northwest			0.57 (0.27-1.19) p = 0.14	0.83 (0.47-1.44) p = 0.50		
p-values reflect the significance of the association between self-rated health and legal status and ethnicity: ^a Primary school = From no schooling to 8th grade ^b Has been diagnosed with asthma, diabetes, hypertension, tuberculosis, heart disease, urinary tract infections, or unspecified						