STATE OF THE SCIENCE

Mental Health Issues in Agricultural, Vulnerable, and Rural Communities

Southeastern Coastal Center for Agricultural Health and Safety

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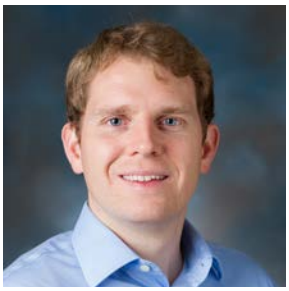

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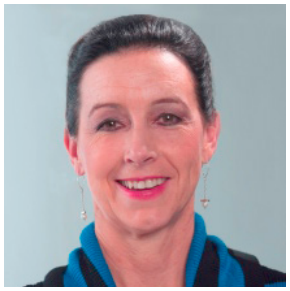

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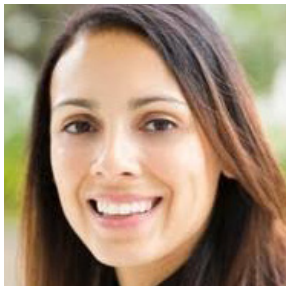

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FOR MORE INFORMATION

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Background

Stress and Resilience in Mental Health

Stress is a physiological and mental response that affects everyone, though certain populations are more susceptible to its effects. In this publication, the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS) highlights stressors that specifically affect populations in agricultural, vulnerable and rural communities (AVRCs)—including small farm owners and operators, Latino farmworkers, and horticultural nursery workers—and how these communities cope and recover from stressors through individual and community resilience.

The three main types of stress (NIMH, 2018) are chronic stress, acute stress, and traumatic stress. Chronic stress can include everyday pressures from work, relationships, and routine responsibilities. Other chronic stressors that affect AVRCs can include chronic illness, social isolation as a result of rurality (living in a rural area), weather, and farm finances, which often depend on loans. Acute stress is the result of unexpected negative changes, such as a divorce or job loss. AVRC-specific stressors can include injury or illness, fluctuation in crop prices, changing agricultural regulations, immigration, or changes in agricultural policy and legislation. Finally, traumatic stress is brought on by life-or-death situations, such as war, assault, and major accidents. Natural disasters are especially hard on AVRCs because they can cause the loss of homes and livelihoods, and, as in the case of Hurricane Michael in 2018, AVRCs are not prioritized in recovery efforts (NPR, 2019).

Those who experience traumatic stress may show symptoms of mental illness, but these symptoms are often short-term. Communities that learn to live with change and adapt to uncomfortable circumstances are more likely to improve their opportunity for resiliency (Magis, 2010). There are two main types of resilience: individual resilience and community resilience. Individual resilience reflects an individual's ability to overcome and function during and after a traumatic event (Bonanno, 2005). In order to build individual resilience, healthy social and physical environments are instrumental (Buikstra et al., 2010). Community resilience has a two-fold definition. Community resilience deals with a community's capacity to come together and thrive in an environment that faces change, uncertainty, unpredictability, and surprise (Magis, 2010), and also deals with personal attitudes, perceptions, and social coherence (Kimhi, 2016). A resilience activation framework has been proposed to integrate both individual and community resilience in public health (Abramson et al., 2015). Essentially the RAF specifies that an individual's resources for resilience may be activated and enhanced by social support and other community resources post-disaster.

Background on SCCAHS

SCCAHS was established in 2016 as part of a Centers for Disease Control and Prevention (CDC) / National Institute for Occupational Safety and Health (NIOSH) Agricultural Health and Safety Initiative. SCCAHS explores and addresses the occupational safety and health needs of people working in agriculture, fishing, and forestry

in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Puerto Rico, and the U.S. Virgin Islands. SCCAHS focuses specifically on the unique environments and occupational communities of this region. SCCAHS is a multidisciplinary partnership of academic institutions, community organizations, and industry representatives that brings together individuals and organizations that are already pursuing academic and applied basic research, intervention, translational, and outreach solutions for occupational illness and injuries. SCCAHS provides centralized regional infrastructure where these individuals, organizations, and companies can engage in mutual learning, leverage resources, build on previous efforts of colleagues, and promote new research.

Meeting Summary

The SCCAHS Outreach Core organized a State of the Science meeting, held September 26-27, 2019 in St. Petersburg, Florida. SCCAHS utilizes the state of the science approach as a key component of its community engaged research to practice model (See. Fig. 1). The focus of this meeting was to bring together a slate of esteemed presenters on mental health issues in agricultural, rural, vulnerable communities showcasing research at the intersections of mental health concerns pertinent to farm owner/operators and farmworkers. This crosscutting, one-day meeting brought together researchers from various fields to present current findings and begin the process of developing future research collaborations on mental health and resiliency. This white paper is based on a summary analysis of the meeting's findings, the audience for which includes meeting attendees, SCCAHS Community Stakeholder Advisory Board (CSAB), scientists, public agencies, and policymakers.

Objectives

Three objectives guided the development of this State of the Science meeting. The first was to identify mental health issues that farmworkers, farm operators, farm owners, and others in these communities' face. The second was to address social, environmental, and cultural challenges that impact mental health in rural communities. The third was to understand the inequities in farmworker/fishery/forestry community mental health, and how researchers can work to close these gaps and enhance individual-, family-, and community-level capacity and resilience.

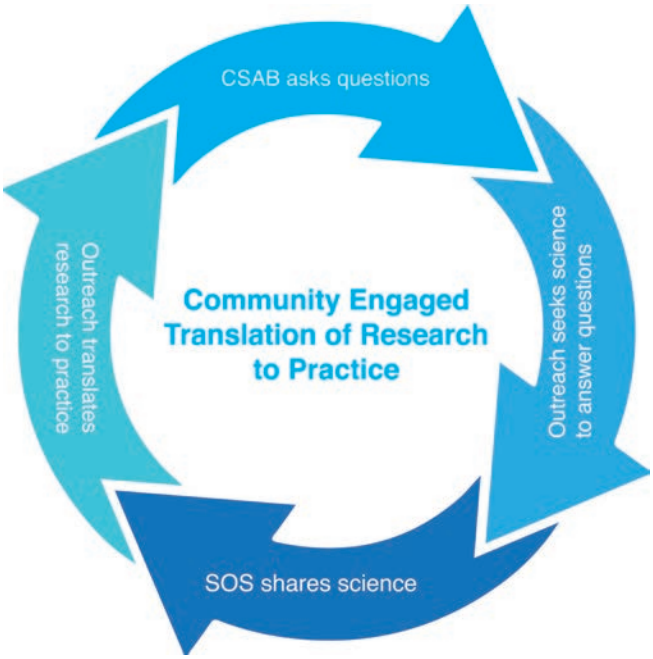

Figure 1. Cycle of Research, Outreach and the State of the Science Meeting.

Methods

The State of the Science Meeting consisted of a poster session on the evening of September 26, followed by a full-day meeting on September 27. Seven presenters, from the fields of counseling and psychology, health education and behavior, social work, nursing, community and population medicine, and neuropsychology presented their work to an invited audience of research colleagues, Center researchers, and regional stakeholders and students. SCCAHS Principal investigators participated in a highlighted lightning round session focused on mental health from their research projects. Participants were given the opportunity to ask questions following each presentation. Michael Perri, Dean of the College of Public Health and Health Professions at University of Florida, closed with a facilitated panel discussion that included the seven invited presenters.

All of the presentations were recorded and transcribed. Data were collected from a variety of sources, including online registration, sign-in sheets, meeting presentations, participant observation, presentation abstracts, notes from presentation question and answer sessions, and

notes from the panel discussion. These data were organized according to theme and category and details are summarized below.

Attendees

The Outreach Core invited researchers and students from mental health fields at the University of South Florida, the University of Central Florida, and the University of Florida to attend this meeting, as well as submit posters for the poster session. SCCAHS staff, including members of the Research, Outreach and Planning and Evaluation Cores, also attended. Of the 63 Eventbrite registrants, 50 attended the poster session and meeting.

Summary of Presentation Topics

While presentation topics were diverse, they fit into three main categories: mental health in agricultural communities, mental health in general, and individual and community resilience.

Affected Populations

Farm Owner/Operators

Agriculture plays a major role in the economy of the Southeast. The SCCAHS region includes Georgia, Alabama, Mississippi, South Carolina, and North Carolina, and these states have 51.8 million acres dedicated to farming, with the average farm covering 200 acres in size (USDA Census of Agriculture, 2017). Currently, there are almost 237,000 farms; however, this number has decreased for all of the states in the SCCAHS region with the exception of Florida, ranging from a loss of 2% of the number of farms in South Carolina to a loss of 8% of the number of farms in North Carolina and Mississippi.

Though grains, oilseeds and dried legumes are the top crops in four states in the SCCAHS region, nursery crops, cotton, and vegetables are also large earners. The State of Florida especially is a major agricultural center, with approximately 9.73 million acres in commercial agricultural production. It ranks second to California in total value of fresh market vegetable materials especially citrus, fresh market beans, cucumbers, and strawberries. In 2011, this market was estimated to have generated $3.5 billion in revenue (Wells & Fishel, 2011). Like nursery crops, vegetable and fruit planting, maintenance and harvesting is largely performed by hand instead of by machine. Florida is an outlier in the region in that it has the second-largest environmental horticulture industry in the nation, encompassing nursery and greenhouse operations and floriculture, though nursery crops play a large part in the agricultural economies of Alabama and South Carolina, as well. As for livestock, poultry and eggs are the top earners in almost all of the SCCAHS states, followed by cattle, dairy, and swine. According to the 2017 USDA Census of Agriculture, there are 379,757 producers in the SCCAHS region, with an average age of 58.3 years. Of these producers, 92% are white and 65% of them are male. About a quarter of these producers hire farm labor for production.

Latino Farmworkers

Fruit, vegetable, and dairy production are not entirely mechanized, and require manual labor done by farmworkers. These workers plant, cultivate, harvest, and process crops for sale on produce farms, and care for animals on dairy farms (Arcury & Quandt, 2009). In the U.S., 82% of these workers are Latinos, coming mostly from Mexico and Central America. However, this is not a uniform population. Some workers are stationary, having settled in the U.S. for years, with and without legal status, doing agricultural work in the same geographic area on a seasonal basis. Some workers have settled in the U.S., with and without legal status. Some workers migrate to follow agricultural harvests, moving with their families from early season harvests in the South towards later northern harvests. Some of these migrant workers have legal status, some do not. Other workers have H2A guestworker status, meaning that they are employed in the U.S. for up to ten months out of the year. U.S. employers use third party recruiters to find workers in Latin America, then employers pay for worker visas, travel expenses, and housing. H2A workers return to their home country after their contract is over.

In the CDC/NIOSH National Occupational Research Agenda (NORA) for Agriculture, Forestry and Fishing (2018), foreign-born and recent immigrants are considered to be vulnerable populations. Worker legal status, language (Spanish and Central American Indigenous), low education level, and

extreme poverty put them at special occupational risk that other worker populations in the U.S. do not experience.

Other Populations

Nursery and Landscape Workers

The environmental horticulture industry includes workers at plant nurseries, growing operations and landscape workers. Growing operations can include "foliage, woody ornamental, citrus nurseries, floriculture producers, interiorscapers, retailers, allied suppliers" (FNGLA, 2019). According to Bureau of Labor Statistics data, Florida employs the second-highest amount of landscaping and groundskeeping workers, totaling 84,490 workers (BLS, 2018). The entire SCCAHS region employs just shy of 170,000 workers in this field. Many nursery and landscape workers are Latino with varying legal statuses. The Florida Nursery, Growers and Landscape Association (FNGLA) published a policy paper supporting immigration reform because many growers are concerned about maintaining a reliable labor force (FNGLA, 2019). Nursery and landscape workers can be undocumented, and guestworker visa programs like H-2A for agricultural workers and H-2B for non-agricultural workers can be challenging in securing a consistent labor force.

Seafood Workers

Seafood harvesting industries provide hundreds of thousands of jobs in the United States, and a primary economic engine for many coastal communities around the world (FAO, 2018; NOAA 2009). Workplace-related illness, injuries, and deaths are not uncommon in the commercial marine fishing industry. The Gulf of Mexico supports remarkably fertile commercial fishing grounds, and Gulf harvests supply a large portion of local, regional, and national seafood demand. Gulf fisheries provide the largest national harvest (by weight) of wild shrimp and oysters and are an important source for other commercially harvested shellfish and finfish (NOAA, 2008). Fishing and seafood industries in the region have historically shaped the local economies of many communities along the Gulf Coast. Many of these fishers are third- or fourth-generation seafood workers. Fishing and seafood industries in Gulf coastal communities, therefore, play a central role in the culture of the region.

A combination of environmental and human factors can serve as important risk factors for common workplace hazards of minor to moderate severity (e.g., trips, falls, cuts, sprains, chronic lower back pain, minor fractures), and for hazards that may be less common but that have more severe outcomes that often require medical attention or hospitalization, and time off the water (e.g., amputation of digit or limb, traumatic punctures, falls overboard, concussions, and death).

Declining domestic seafood landings, coupled with challenges in today's global economy affecting seafood industries, have led to reduction of the number of vessels fishing, and have forced many fishers to change jobs and/or move to other regions for work. For those still fishing, many study participants indicated that mental health issues have been on the rise. Alcohol and drug abuse, domestic violence and divorce, and depression and

anxiety, are mostly associated with loss of income and broken connections to regional environmental capital.

Seafood workers are highly capable professionals although their jobs typically require no formal education (Bureau of Labor Statistics, U.S. Department of Labor, 2019). Most seafood workers are self-employed and self-insured.

Extension Agents

The Cooperative Extension System was established to use new agricultural research to educate farmers and rural residents. Today, Extension still operates as a cooperative between land grant universities and county offices, providing non-formal education to both rural and urban residents. As the United States has changed from a rural, agrarian society to an urban, technological society, so has the work of Extension. According to the National Institute of Food and Agriculture (2019), Extension works to:

- Translate science for practical application.
- Identify emerging research questions, find answers and encourage application of science and technology to improve agricultural, economic, and social conditions.
- Prepare people to break the cycle of poverty, encourage healthful lifestyles, and prepare youth for responsible adulthood.
- Provide rapid response regarding disasters and emergencies.
- Connect people to information and assistance.
- Extension agents can be employees of a land-grant university or employees of a county Extension office or both. County Extension staff live in the communities they work in, and are familiar with the needs and particularities of AVRCs in their region.

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Mental Health Stressors in AVRCs

Demographic Risk Factors

Owner/operators

Demographic characteristics of farmers can affect farmer mental health. In the U.S., 86% of principal farm operators are male, and the average age of U.S. farmers is 59.4 years (USDA, 2014; USDA Census of Agriculture, 2017). In their 2003 study, Diala and Muntaner found that more rural men reported having mood and anxiety disorders than urban men, and concluded that this could be a result of flagging rural economies and increased financial stress. Both old age and masculinity are linked to mental health issues related to suicide. Physical decline and health problems, often associated with old age, are risk factors for suicide and there is a general view that farmers should be traditionally masculine, meant to work relentlessly through personal struggles to provide for their families (Garnham & Bryant, 2014; Roy, Tremblay, Robertson & Houle, 2017). These stereotypes of

masculinity can be problematic when work stress accumulates and farmers are left with no coping mechanisms to mitigate the effects of this stress.

Latino farmworkers

Latinos make up the largest population of rural minorities in the U.S. and face unique mental health stressors that can be described in the political, social class, and individual context (Stacciarini, et al., 2016). In the political context, Latino workers face fears of deportation and family separation due to their immigration status, fears which have increased in the current political climate, which is hyper-focused on the immigration debate. Living in majority white areas can lead to concerns about discrimination based on their physical appearance due to racism. Another political implication for rural Latino farmworkers is the lack of geographic mobility, due to insufficient public transportation in rural settings and prohibition of private transportation. Depending on legal status, workers cannot obtain driver's licenses, leaving them isolated even from other Latinos who might be relatively close by.

Within the social class context, social and health inequities dominate concerns about mental health stressors. Latinos face "racism, exploitation in the work environment, dearth of continuing education, lack of health services information/resources, and absence of cultural communication exchanges among communities" (Stacciarini et. al, 2016, p. 22). These stressors affect rural Latinos even more so than their urban counterparts. Rural Latinos also have fewer opportunities to learn English, which affects their ability to build relationships in their personal and professional networks and to become acculturated in their communities.

Finally, individual behaviors affect rural Latinos' mental health risk factors. Some individuals lack the motivation or personal responsibility to improve their lives in their new setting, and tend to make decisions that inhibit healthy lifestyles like engaging in extramarital affairs or choosing not to learn English (Stacciarini et. al, 2016). Additionally, self-esteem and self-efficacy have been found to be protective factors for mental health stressors among farmworkers (Crain, et al., 2012).

Rurality and Social Isolation

Living in a rural community can confer several risk factors for mental health. First, lack of infrastructure to provide mental healthcare is common in rural areas. Geographic distances and mobility are a major factor influencing whether members of AVRCs seek mental healthcare. It is difficult to make appointments when a counselor is an hour away and the patient lacks reliable transportation (Byrne, et al., 2017). Furthermore, there are not as many mental health professionals practicing in rural areas as in urban areas, so counselors and appointments are limited. Even if mental healthcare is available in an area, mental health services are often not covered by insurance, meaning the insured and uninsured must pay for expensive services out of pocket, which is a major barrier for seeking treatment for mental health issues (Bolin & Gamm, 2010). Rural residents also view mental health issues differently, sometimes with a lack of awareness of problems prevalent in their communities. Issues like depression or alcohol abuse are normalized as a part of rural living instead of identified as conditions that can be changed with treatment (Broffman, et al., 2017).

Social isolation is also an important factor in rural mental health. It is difficult to maintain a sense of anonymity in rural areas, which can affect decisions to seek mental health treatment in the face of stigma (Kennedy, et al., 2014). Social support and a sense of belonging are major protective factors against suicide among rural farmers but maintaining connectedness in changing rural communities can be challenging as small farms amalgamate into larger holdings, employment opportunities decrease, rural poverty increases, and younger generations move to urban areas (McLaren & Challis, 2009; Kennedy et. al, 2009).

State of the Science Presentations

Rural Latino Communities

Social isolation can take a heavy toll on Latino AVRCs. State of the Science meeting presenter Jeanne-Marie Stacciarini researches rural Latino immigrants' perceptions of their rural social environment and social isolation, and how these perceptions affect their mental well-being. Her research also describes how rurality and social networks act as social health determinants in rural Latinos. In her studies, participants were asked to describe their rural patterns of travelling in the previous two weeks in order to understand how they navigated in the area where they were living. Researchers also used a family environment scale, a mental and physical survey, the social isolation survey, social network analysis, and ethnographic interviews to determine the effects of social isolation on rural Latinos' mental health.

Stacciarini's study participants described their personal networks to be trustworthy, but not supportive, mostly because of participants' lack of social capital. When asked, "Do you have support from the members of your network in terms of health, financial issues, or emotional distress?", participants responded "rarely" or "never" on surveys.

Results from Stacciarini's studies found that social isolation is a considerable social risk factor for mental wellbeing among mothers, fathers and adolescents. Latino women, in particular, are especially vulnerable to social isolation: 30% had higher scores on social isolation, and 31% had lower scores on mental well-being compared to women in the general U.S. population.

Chronic Pain

Persisting chronic pain is a common and disabling condition that has significant effects on personal health and community health services (Smith, Penny, Elliott, Chambers, & Smith, 2001). Agricultural and seafood workers are frequently affected by chronic pain due to the arduous nature of their occupation that can have negative and devastating impacts on their bodies and minds (Xiao, Mccurdy, Stoecklin-Marois, Li, & Schenker, 2013) impacting productivity and occupational longevity. In Florida, SCCAHS studies have identified chronic low back pain as a devastating stressor that influences seafood worker productivity, psychological and physical health (Myers, Kane, & Durborow, 2018). The repetitive movement and prolonged flexed positions as well as lifting task requirements for both groups of workers contribute to development of musculoskeletal disorders.. Stressors such as chronic pain often lead to mental health issues such as depression, fear of loss of income, risk of alcohol and other substance misuse in farmworkers and seafood workers (Hovey & Seligman, 2005)In light of these risks and the current opioid crisis (see section on Opioids), seeking alternative methods of coping and self-management for chronic pain are critical in the industry for worker health, longevity, and productivity.

Impact of Natural and Man-Made Disasters

The Southeastern United States often experiences the negative effects of natural disasters due to increased temperatures and more sporadic weather patterns across the Southeastern region of the United States. According to the Environmental Protection Agency (EPA), the Southeast is likely to be affected by increased incidences of extreme weather, increased temperatures, and flooding, which will likely impact human health, infrastructure, and agriculture (Climate Impacts in the Southeast, 2016). As the Southeastern climate continues to change, extreme weather events and natural disasters are only going to become more frequent (Misra, 2018). Furthermore, residents who live in disaster-prone areas are likely to experience disasters on multiple occasions. However, prior experience with the same kind of disaster can act

as a buffer to the trauma experienced by disaster victims (Cherry, Sampson, Galea, Marks, Baudoin, Nezat, & Stanko, 2017; Felix & Afifi, 2015).

Florida, in particular, is vulnerable to the effects of natural disasters, especially the agricultural sector. From 2017-2018, Florida's agricultural industry experienced $1.3 billion in estimated losses due to Hurricane Irma and $1.4 billion in estimated losses due to Hurricane Michael (Hodges, et al., 2018; Alvarez, 2018).

Psychosocial and behavioral disruptions are a predictable outcome of any disaster (Services & Burkle, 1994). Depending on the severity of the disaster, length of impact varies. In addition to individuals and communities, natural disasters often leave negative emotional and behavioral impacts on public health workers, hospital staff, first responder groups, and others who assist in restoration efforts (Benedek, Fullerton, & Ursano, 2007), which affect mental and physical health. There is a wide range of psychological reactivity associated with disasters, including natural hazards such as hurricanes. While the initial symptoms of impacted people are minimally known, theoretically, Acute Stress Disorders emerge during the first month, triggering later diagnoses of Post Traumatic Stress Disorder (PTSD), generalized anxiety disorder, depressive episodes or other behavioral problems for up to 30% of exposed people in the months and years to follow.

In addition to natural disasters, the U.S. experiences man-made disasters, which are disastrous events that are caused by human hazards and human error (Smith, Smith, & Ashcroft, 2011). In 2010, the Southeastern region of the U.S. was devastated by the Deepwater Horizon oil spill, during which approximately 5 million barrels of oil spilled into the Gulf of Mexico along 600 miles of coastline of Alabama, Mississippi, and Florida. This man-made disaster is estimated to have cost the US approximately $36.9 billion (Smith, Smith, & Ashcroft, 2011). Mental health issues among Gulf Coast residents were documented as calls to mental health and domestic violence hotlines increased in the year after the disaster (Buckingham-Howes, Sreekumar, Morris, & Grattan, 2017). Follow-up studies found that

Figure 2. SCCAHS social media graphic about substance abuse.

one year after the event, mental health problems continued for residents whose income was affected by the spill, with scores for anxiety and depression remaining elevated in that population (Morris, Grattan, Mayer, & Blackburn, 2013).

Negative Coping Strategies Resulting from Stress

Substance Use Disorders

Over 20 million people in the U.S. suffered from a substance use disorder (SUD) in 2016 (Chasek, 2019). Fifteen percent of these struggled with alcohol, and 7.4% struggled with illicit drugs, including marijuana, prescription pain relievers, and cocaine. Very few people who need treatment for SUD actually receive it. Of adults aged 18 to 25 years, 15.5% need treatment for SUD, but only 1.8% of them receive it (Chasek, 2019).

Alcohol

Stress leads to a negative mood, which is associated with alcohol use (Bolger, et al., 1989; Jackson & Sher, 2003). Unfortunately, alcohol does not alleviate the stress leading to the negative mood; instead alcohol has a negative effect on a person's stress response, cyclically leading to negative mood (Sher, et al., 2007). In the U.S., 19% of adults engaged in binge drinking (Chasek, 2019). Because of the many definitions of "rural" across government agencies, it is difficult to compare urban to rural alcohol use (Dixon & Chartier, 2016) but there is some evidence that supports binge drinking being more prevalent in rural areas of the United States (Borders & Booth, 2007; Substance Abuse and Mental Health Services Administration, 2012). Nationally, an average of 19% of the

population drinks excessively, but in the SCCAHS region, 12.2-17.4% of the population engages in excessive drinking. Non-metro populations also have higher percentages of alcohol use by youths ages 12-20, and binge alcohol use by youths ages 12-17 (National Survey on Drug Use and Health, 2016).

Opioids

The rising instances of opioid misuse and their aftermath have been termed a public health crisis in the U.S. (Center for Disease Control and Prevention [CDC], 2017a; Hodge, Wetter, & Noe, 2017). The term "opioid" encompasses prescription opioid medication (used to treat pain), the synthetic opioid fentanyl (used for severe pain), and heroin (an illegal opioid in the US), (National Institute on Drug Abuse [NIDA], 2015). An unfortunate result of high levels of opioid abuse is the number of associated deaths. The majority of drug overdose deaths in the U.S. in 2015, approximately 63%, were associated with opioid use, accounting for over 33,000 deaths (CDC, 2017a). According to the CDC, the number of deaths associated with opioid use more than tripled from 2000-2015 (Rudd, et al., 2016). In the state of Florida alone there was a nearly 23% increase in opioid related deaths just from 2014 to 2015 (CDC, 2017b). Non-fatal overdoses are also worrisome. Opioid overdose led to 92,000 emergency room visits, and caused 53,000 hospitalizations in 2014 (CDC, 2017a). There is also evidence that ability to work, as well as the quality of work is significantly impacted by opioid abuse (Perlmutter, et al., 2017; Sansone, et al., 2012; Van Hasselt, et al., 2015).

Levels of opioid addiction vary tremendously by location, even within a state. Individuals in rural counties are at much greater risk for opioid abuse, and these counties often have fewer resources to deal with the negative outcomes associated with opioid abuse (Andrilla, et al., 2017; Keyes, et al., 2014). In a recent survey conducted for the American Farm Bureau Federation, around 45% of adults living in rural areas reported being directly affected by opioid abuse (American Farm Bureau Federation, 2017). Even more telling, around 74% of those in the agricultural industry reported being directly impacted by opioid abuse (American

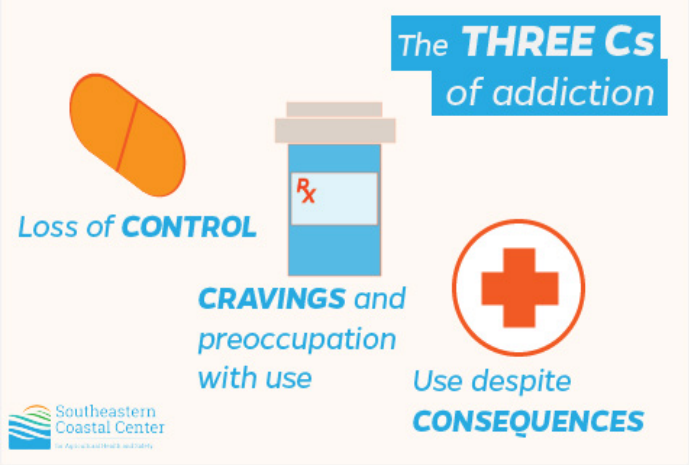

Figure 3. SCCAHS social media graphic about addiction.

Farm Bureau Federation, 2017). Opioid abuse has the potential to reduce the available workforce, increase safety hazards at the worksite, increase worker turnover, and increase health issues for workers and their families.

Suicide

Suicide is the 10th-leading cause of death in the United States, and often relates back to causes such as relationships, substance abuse, physical health, job, money, legal, or housing stress (Center for Disease Control [CDC], 2018). Research shows that suicide rates are higher in rural areas, as compared to urban areas, with those in the farming, fishing, and forestry occupation having the third-highest suicide rate of any occupation (Fiske, et al., 2005; CDC, 2018; Levin & Leyland, 2005). Males are at a greater risk for suicide than women (Bertolote & Leo Prof., 2012). Particularly, older male farmers are most at-risk of suicide (Garnham & Bryant, 2014). In farmers and farmworkers, physical stresses like climate conditions and geographic isolation cause greater stress and sometimes lead to suicide (McShane & Quirk, 2009). Other contributing factors include cultural isolation, withdrawal of healthcare, family problems, and lack of income (Kennedy et al., 2014). Oftentimes people living in areas of low population densities lack confidentiality and can lead to a heightened fear of stigma, which discourages individuals from seeking help in dealing with their mental health disorder (Hoyt et al., 1997).

In her research focusing on farmer suicides in Georgia, State of the Science meeting presenter

Anna Scheyett found several situations linked to suicide in that state. Relationship issues and health problems, particularly problems linked with loss of functioning, were the most commonly associated factors., Financial stress was less frequently mentioned in suicide cases than expected; however, Scheyett (2019) noted that financial stress could underlie other related issues, such as health concerns. In 20% of cases, victims expressed suicidal threats or ideas; in very few of these cases was it noted that families took their family member for treatment. In 21.4% of cases, victims showed signs of suicidal thoughts without direct threats (21.4%), these were seldom recognized and responded to. Only 29% of cases had shown mental health problems at any point in time.

Interventions and Strategies

Prevention Strategies

Behavioral Strategies to Decrease Substance Use Due to Chronic Pain

Given the rigorous lifting and sustained positions required of Gulf seafood workers, chronic low back pain has been reported as a major issue. Ergonomic interventions are used frequently in manufacturing and corporate settings where repetitive strain injuries are common. Finding solutions to address musculoskeletal disorders can range from developing alternate work processes to adjusting the job environment and equipment. Participatory ergonomic approaches also involve workers in options for adjusting movement and postures for lifting or repetitive tasks, changing work processes to decrease stress accumulation, adjusting work stations or equipment organization, and maximizing equipment and team contributions. Micro-breaks and position reversals, may also be useful and important for workers to control their pain.

Kim Dunleavy, SCCAHS pilot project principle investigator, presented on the characteristics of seafood workers who select teamwork, movement and equipment modification options to address chronic low back pain. The purpose of the study was to determine if disability, pain, and psychological factors differed between seafood workers who chose from a variety of self-management solutions. Clam workers with chronic low back pain (n=22) were recruited for a participatory ergonomics intervention study. Participants completed the Pain Anxiety Symptom Scale, Pain Self-Efficacy, Pain Coping Strategies and Fear Avoidance questionnaires, as well as disability measures, and pain visual analogue scales. Participants selected three preferred options to use during work. Psychological, disability, and pain characteristics were compared between individuals who preferred teamwork, individual movement modification, or a combination.

Overall, workers reported relatively mild to moderate disability, pain and difficulty with work activities. Pain anxiety was relatively low, with desirable self-efficacy and minimal fear avoidance. However, participants did report limited coping ability to control or manage pain. The only differences between groups who selected team versus individual strategies was on average pain and coping. Participants who chose options from all categories reported the least coping or ability to decrease pain. Individuals who chose teamwork strategies had the lowest average pain, and there was no difference in coping between those selecting movement and teamwork solutions. While the sample was small, these results may indicate that individuals with limited ability to control and manage pain relied less on team approaches for assistance or perceived that individual strategies were not feasible as compared to those who expected that team strategies or individual movement strategies might impact their pain. These preliminary results will need to be confirmed in larger studies and related to successful adoption and outcomes of the self-management interventions.

The preliminary results from the baseline data collection for this intervention study found that this group of clam workers reported different psychological constructs compared to other chronic pain populations where typically chronic pain patients are more likely to exhibit fear avoidance, lower self-efficacy, and pain anxiety. However, low to moderate ability to control or decrease pain is consistent with acceptance of pain as "part of the job." Different management strategies are therefore needed, compared to other chronic pain groups, and further investigation of individualized approaches including teamwork and movement modification are needed to establish if it is feasible to improve coping strategies and ability to manage pain. The outcomes of the intervention study are currently being analyzed for the extent of adoption, impact on pain, and disability for workers who adopted the self-management strategies and if there was any impact on attitudes towards pain, pain anxiety, fear, self-efficacy, and coping.

Technological Strategies to Decrease Substance Use in Rural Populations

Robert Leeman, a State of the Science presenter, conducts ongoing research on technology use to support the implementation of cognitive behavioral strategies aimed at reducing alcohol use and related negative consequences. These include direct strategies – counting drinks, setting a drink limit, spacing out drinks, and alternating between alcohol and water – and indirect strategies – looking out for friends, carrying protection,

pre-planning transportation, and designating a driver. From survey data collected from young adults (DeMartini, Palmer, Leeman et al., 2013), researchers found that direct strategies use was associated with lower levels of alcohol use; however, actually executing direct strategies is difficult. Slowing the pace of drinking goes up against the immediate reward that alcohol offers.

Leeman and colleagues conducted research comparing a brief, web-based screening and intervention, including personalized feedback on alcohol use patterns and protective behavioral strategies, to a control condition providing standard alcohol education (Leeman et al., 2016). Three variants of the web-based intervention were tested, which differed based on the types of protective behavioral strategies provided. In one variant, participants received information about direct strategies only. In another, they received information about indirect strategies only. In the third variant, participants learned about both types of strategies. At follow-up, participants randomly assigned to receive both types of strategies or indirect-only reported significantly fewer drinks per week and number of drinks on one's peak drinking day compared to the control condition. Those randomized to the direct-only condition did not differ significantly from control on any outcome. Leeman and colleagues interpreted these findings to indicate that direct strategies might be more effective to curb drinking, but only if they are implemented correctly. Direct strategies are difficult to implement, and people need help when they are drinking in the moment in order to do so.

One way to help people implement direct strategies is through technology. One gap in knowledge identified by Leeman's research, pertains to blood alcohol content (BAC). While some people might be aware that the legal BAC limit for driving is .08%, many do not know how many drinks over time will get them to that limit. One tool used in Leeman's research was the BACTrack Mobile Pro, which is a smartphone breathalyzer device with an associated app. It is small enough to fit in a pocket, and tracks drinking over time in both single and multiple drinking events. Another tool is IntelliDrink, a blood alcohol estimator app. While the app does not measure BAC directly, it estimates BAC based on sex, weight, type of alcohol, number of drinks, and time. It also displays graphs of estimated BAC over time, and has the advantage of being discreet. When users enter their drinking information into the app, it looks like they are texting, instead of needing to blow into a breathalyzer.

The study that used these apps recruited participants who were non-treatment-seeking, heavy-drinking young adults. Over a two-week period, participants were invited to use the BACTrack or IntelliDrink or directed to simply text themselves when they got a drink and count their texts when making a decision about whether to get another. The main purpose of this two-week trial period was to determine the usability and acceptability of the technology, how people implemented the technology, and the extent to which they liked the technology. Participants were compensated $20 when they used each of the three technologies (i.e., the BACTrack, Intelidrink, and self-texting procedure) at least once. During those two weeks, they used the technology an average of nine times overall. That means these heavy-drinking young adults, who typically do not have motivation to moderate drinking, used the technology an average of six times without compensation. The results of the study found that on days that participants drank, they drank about one drink less, on average, during the technology trial period than during their baseline period. They also reduced their number of heavy drinking days from about once every three days to about once every four days.

While this research is still preliminary, the technologies' usability and effects on heavy drinking are very promising. However, it is important to ensure that technology-based interventions are applicable to AVRCs.

Leeman collaborates on another study with fellow UF faculty member Janice Krieger and doctoral students Rachel Damiani and Neo Gebru concerning tobacco use among rural populations. One of the specific goals of this study is to learn about rural tobacco users' views regarding research and ways to quit tobacco use, including through the use of technology. This research is theoretically grounded in health communication

and behavioral science frameworks. Researchers use semi-structured interviews to address attitudes toward participation in research, adopting healthy behavior, as well as message-delivery preferences. By working with Extension in rural counties, the researchers found that rural participants have access to the internet and are mostly open to the use of technology and research. Participants indicated that health-related smartphone apps should use clear and large fonts, include videos, limit advertising, and not ask too much personal information up front. They also indicated that they would like downloadable features to be accessible offline and for customization of experience when using the app.

Interventions that are designed based on motivational interviewing point to the value of personalized feedback to motivate people's use of their own resources for change. However, with reliable internet access as a challenge for many rural individuals, interventions that do not require regular and/or high-speed internet access or a lot of cellular data are of value.

Community-based Outreach Strategies

The Community Health Worker Model

According to the American Public Health Association's Community Health Workers Section, the definition of a community health worker (CHW) is "a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery." CHW is an umbrella term that can include "promotores" in the Latino community, "outreach worker," and "patient-health navigator."

CHWs promote health by serving as a bridge between healthcare systems and communities, providing health education and coaching by working with clients in the context of their lives to help them change health behaviors. CHWs also provide social support and build capacity for clients, and advocate for individual and community needs.

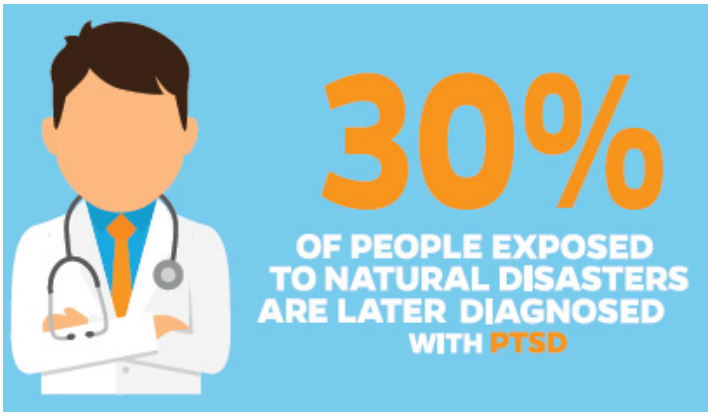

Figure 4. SCCAHS social media graphic about mental health.

CHW model used after natural disaster

State of the Science presenter Ashley Wennerstrom spoke about her experience with the REACH NOLA Mental Health Infrastructure and Training (MHIT) Project, formed in New Orleans as a collaboration between community and academic agencies after Hurricane Katrina. Funding for the program came from the American Red Cross Hurricane Recovery Program and the Robert Wood Johnson Foundation. After the storm, 80% of the city was underwater, and there were tremendously high rates of depression and post-traumatic stress disorder. Simultaneously, as there was an increased need for mental health services, there was a significant decrease in the number of providers and clinical agencies that were available to meet those needs. The focus of the MHIT Project was to increase access to mental health services for underserved populations, particularly through outreach. During the development of this project, the partnership extended the use of evidence-based services for mental health and also created innovative ways to reach populations that would otherwise not be served.

MHIT partnered with community organizations, such as neighborhood associations, federally qualified health centers, and a counseling center, to hire professionals to help address the mental health services need. The project also funded the hiring and training of CHWs to address this unmet mental health-service need. Over 400 CHW participants were trained in seven sessions over the course of two years. Using the collaborative care model, in which primary care physicians, psychiatrists, and social services work together to provide coordinated care for patients, MHIT

partnered with CHWs and case managers to develop a CHW training curriculum (Wennerstrom et al., 2011).

The 16-hour training covered the following topics:
- Client education
- Addressing stigma
- Conducting screenings (PHQ-2, PHQ-9)
- Facilitated referrals and follow-up
- Basic behavioral activation
- Problem solving
- Cultural competence
- Substance abuse
- Serious mental illness
- Handling emergencies

CHWs in this project did door-to-door outreach, which involved engaging with individuals who behavioral health specialists normally would not encounter. Outreach also involved going out to community settings – such as faith communities, community centers, and neighborhood associations – talking about behavioral health issues. CHWs provided referrals to services in these settings, both for primary care and other mental health services, as well as provided for care management and social support.

CHW model used in a community-based health organization

State of the Science presenter Julie Smithwick helped found PASOs, a community-based organization of CHWs that addresses the needs of the growing Latino population in South Carolina. Their mission is to build a stronger South Carolina by supporting Latino communities with education, advocacy, and leadership development. Challenges faced by Latino families in South Carolina include English and Spanish language proficiency, poverty, lack of health insurance, confusing health and behavioral health care systems, transportation, fear and discrimination, anti-immigrant laws and policies, and the stress/trauma of family separation. PASOs operates in 23 South Carolina counties, serving the immigrant population, including the agricultural-worker population. Populations at some sites fluctuate during the migrant season.

PASOs' team of over 30 CHWs work in different capacities throughout the state. Some partner with federally qualified health centers, some of which have migrant programs. CHWs are able to work directly with migrant health workers or are migrant health workers themselves. CHWs also work in hospital systems, community-based organizations, and state early-childhood programs. The majority of PASOs' CHWs speak Spanish as a first language. Many are first- or second-generation immigrants themselves, immigrating within the last 10 to 15 years to the U.S. They have had to overcome some of the same barriers faced by the clients they are engaging with, and are able to develop trust with participants (PASOs' word for "clients") rather than to be seen as an outsider. They are better able to partner with clients through relationships of

trust, and with a focus on strengths, to fostering communication and action about health and social concerns in a natural, organic way that feels safe to the participants and their families.

In 2016, after getting feedback that the mental health system in South Carolina was not adequately serving the needs of the Latino population, CHWs and allies led an initiative called Mental Health Access and the Latino Communities of South Carolina: An Assessment of Needs, Existing Resources and Current Challenges. Key informants in the study reported that there are some mental health services available to Latinos in South Carolina, including organizations that connect Latino clients with medical, legal, social, and school services; mental health staff that are culturally competent or identify as Latino/Hispanic; and existing mental and physical health educational services for Latino communities. However, Latinas and Latinos identified many challenges that affected the groups differently. Feedback from women was that there are insufficient culturally and linguistically appropriate mental health services to reach all parts of the state as well as a lack of bilingual, bicultural providers. Additionally, women identified a large mental health stigma in Latino communities. Men stated that alcohol and drug use was high among their peers. Both sexes reported fear related to discrimination, deportation, and the police.

An additional finding from the assessment was related to data received from the Health and Demographics section of the Revenue and Fiscal Affairs Office. The population of South Carolina in 2016 was 64% White, 27% Black and 5.4% Hispanic. However, the mental and behavior disorder diagnoses were 70% White, 29% Black and only 1.7% Hispanic or Latino. This analysis suggests that Latinos are underrepresented among people who received diagnoses of mental health and behavior disorders within South Carolina.

Based on these results, PASOs worked with the South Carolina Department of Mental Health to develop a cultural and linguistic-competency strategic plan to address mental needs of Latino communities. Some of the activities developed to address these goals include workforce development and hiring more culturally-competent staff. It also includes a component for community outreach and education through community-based organizations led by CHWs.

Mental Health Support for Extension Agents

In her State of the Science presentation, Lynn Grattan described her work profiling Extension agents who acted as first responders following a natural disaster, Hurricane Irma in September 2017. Hurricane Irma struck Florida as category 4 storm that left the entire state of Florida designated a disaster region. The immediate death toll was 75, and more than 38 million residents were without power. Residents were forced to deal with structural damage to their homes, property, and workplace and faced fuel, food, and construction material shortages.

There were also extensive agricultural losses of fields, orchards, and livestock. These regions represent the core of Florida's agricultural industry and sustained estimated agricultural loss due to Hurricane Irma exceeded $2.5 billion. This includes losses to Florida's iconic citrus producers as well as sugarcane, avocado, dairy and beef cattle operations all of which will likely take years to recover fields, orchards and livestock.

UF/IFAS Extension agents and staff were involved in emergency operations and control by leading and managing shelters, operating points of distribution for food and water for residents and livestock, helping to dispose of dead livestock, and providing emotional support to distraught farm owners. Meanwhile, their own homes and workplaces were also damaged in the storm.

In her SCCAHS pilot study, Grattan

1. Discussed the stresses, medical symptoms, and behavioral health status of Florida county Extension agents six to eight weeks and one-year post-Hurricane Irma, in order to increase understanding of the acute psychological impacts of a severe hurricane.
2. Identified the short- and long-term predictors of mental health outcome.
3. Discussed baseline data for monitoring recovery over time.

Thirty-six UF agricultural Extension agents were recruited for the study, coming from counties that were most heavily impacted from Irma and comparison communities that had minimal impact. Grattan held two listening sessions with Extension agent communities to identify stressors and reactivity four weeks post-hurricane. A subset of the agents and staff (80%) received resilience training, and all participants received $25 compensation for participation.

Along with questionnaires about demographics and medical symptoms and several mental health screeners, agents were how the hurricane impacted them, both personally and professionally. As disaster research is moving forward, it's important to collect data regarding the impact of that particular event on victims. Agents were specifically asked if they were physically present, if they received a physical injury or saw anyone receive an injury, and if they suffered any personal property losses. They were then asked about how the hurricane affected their work: if they were able to work, the nature and extent of any additional work duties they needed to perform, and their greatest work-related stressors.

Results from the first phase of the study demonstrated that the agents' overall level of hurricane impact was significantly correlated with elevated depression scores, post-traumatic stress and number of medical symptoms six to 10 weeks after the storm. All coping strategies, including problem focused, emotion focused, and disengagement strategies, were equally and actively used by study participants. Agents reported medical symptoms that included fatigue, irritability, problems concentrating, losing or misplacing things, sleep disturbance, lower back pain, and headache. The use of multiple coping strategies and medical symptoms that were reported are considered typical in disaster settings.

One year after Hurricane Irma, Grattan surveyed the same agents with the same measures. She found that symptoms of depression and the use of "disengagement" had increased over time for some people. As a coping strategy, some use of "disengagement" or escape is essential in the immediate aftermath of disaster. It allows one to take a break from the immediate, severe distress and facilitates perspective taking and problem solving. However, "disengagement" is not effective in the long term. In this case, it can lead to avoidance, and get in the way of actively doing things that need to be done for adequate disaster recovery. Having a partner and good workplace recovery from the hurricane were considered to be protective factors. Most participants (55%) felt "back to normal" four months post impact, but

20% were still feeling hurricane-related distress one-year post-landfall.

Substance Use Disorder Screening and Referral in Non-traditional settings

State of the Science meeting presenter Christine Chasek tested the feasibility of conducting alcohol and SUD screening in both clinical and non-clinical settings in a pilot project funded by the NIOSH Central States Center for Agricultural Safety and Health.

In the first part of the study, medical providers in a rural medical clinic in Lexington, Nebraska, gave their patients substance use screenings as part of routine care. The population of Lexington is 10,230. Hispanics made up 60% of the population, followed by whites (58%) and African Americans (10%). The largest employers in the area are agriculture and Tyson Foods.

In the second part of the study, researchers tested the feasibility of conducting alcohol and SUD screening in non-clinical settings. Eligible participants were adult agricultural workers in Nebraska, Iowa, and Missouri. Data were collected using anonymous alcohol and SUD screeners, distributed with both paper and pencil and mobile surveys. Pilot project staff attended over 10 regional farm shows and educational events to reach their target sample size of 300 participants.

This study employed an evidence-based practice called SBIRT, which stands for "screening, brief intervention, and referral to treatment." It is used to identify, reduce, and prevent problematic use, abuse, and dependence on alcohol and illicit drugs, and is endorsed by several medical associations, including Medicare and Medicaid, the American Medical Association, and the Institute of Medicine (Chasek, 2019). In the screening portion of the SBIRT method, a participant is quickly assessed for the severity of substance use and the appropriate level of treatment is identified. Next, the survey administrator provides a brief intervention focusing on increasing insight and awareness regarding substance use and motivation toward behavioral change. Finally, the participant is referred to treatment if they are identified as needing more extensive treatment with access to specialty care.

Preliminary results from Dr. Chasek's pilot study found that in clinical settings, though over 4,600 patients were seen by doctors, only 65 patients were given the SBIRT screener. Of those, 48 were referred to and saw a behavioral health provider, who were housed in the same building as the medical clinic. Of these patients, 38% were referred for alcohol misuse, followed by tobacco (37%), stimulants (37%), opioids (35%) and marijuana (29%). In non-clinical settings, five study participants out of 45 were found to be moderate or high risk according to their SBIRT scores.

Key Findings and Recommendations

Redefining Rural

Rural residents face different challenges than their urban counterparts, but it is important to remember that in the U.S., "rurality" is not a homogenous condition or attribute. Different government agencies, as well as researchers, define "rural" differently, and, therefore, it can be difficult to draw across-the-board conclusions about populations throughout the country (Dixon & Chartier, 2016). Rurality can be affected by other important demographic factors, like age, region of residence, race, and ethnicity, as well as social and cultural factors. For example, in Chasek's presentation on SUD in Nebraska, findings showed that 21.7% of residents in that state engage in above average rates of excessive drinking, and these rates are similar in other rural

states in the Midwest and Upper Midwest regions (Chasek, 2019). However, in the SCCAHS region in the Southeast, excessive drinking is below the U.S. average, and this region consistently shows the lowest rates of lifetime drinking. This can be attributed to cultural factors, specifically the prevalence of protestant religion that encourages alcohol abstinence and lower drinking (Dixon & Chartier, 2016).

In addition, Stacciarini presented findings at the State of the Science meeting that show how rural Latinos experience rurality differently even within the same ZIP codes. Most measures of rurality are determined as a property of places, such as counties, census tracts, and cell locations. Therefore, it is difficult to capture the breadth of variations of rural areas, as well as how individuals experience rurality. Stacciarini's research uses a new individual-based rurality that is defined as the social and environmental spaces that rural Latinos live in and travel to, a combination of macro components and individual activity space. Macro components include demographics, socio-economic status, and accessibility. Individual activity spaces include participants' home location and the places they reported to travel. This new definition can show researchers which individuals within certain communities experience higher levels of social isolation and mental stress, and, therefore, develop more targeted interventions to reach these individuals. Overall, Stacciarini's studies found that social isolation can be related to cultural, linguistic, and geographic aspects. Even if a family is living in the same home, family members can experience rurality differently, with factors like access to transportation, the strength of their social network, and opportunity to see and communicate with others are all influences on how isolated one may feel.

AVRCs are affected by a multitude of factors: macro factors like region of residence, gender, age, and race, as well as individual factors that limit access to social support and mental health services. Those developing mental health interventions targeted towards AVRCs need to take many factors into consideration in order to be effective.

Behavioral and Technological SUD Prevention Strategies

State of the Science research has shown that even if prevention strategies have been shown to be effective, individuals may not necessarily be aware of them or may not use them correctly. Dunleavy's study of behavioral strategies for chronic pain management among seafood workers shows that individuals who choose teamwork to mitigate pain had the highest levels of coping strategies. Though Dunleavy's study is still in its preliminary stages, it provides a platform to investigate self-management and impact on attitude towards pain, coping and control over pain in a context-specific

manner for workers with high physical demands and to develop participatory processes to help workers identify options to adjust work ergonomics and manage their chronic pain.

Leeman's study of using technology to aid heavy drinkers in moderating their alcohol intake shows that though direct interventions to curb alcohol use are more difficult to implement, the instant gratification offered by alcohol consumption can be tempered by the assistance of technology. When given free access to apps that track alcohol consumption and blood alcohol levels, young heavy drinkers reduced their consumption in preliminary studies. Drawing on experience in developing technological interventions in rural settings, these apps could be framed and adjusted for use by an expanded rural audience. Future research on this topic could include focus groups for rural residents to ascertain reasons for alcohol consumption, barriers to moderation, and appropriate messaging to encourage adoption of technologies for rural residents in particular.

Connecting AVRCs to Mental Health Services

The issue of stigma was highlighted by multiple presenters at the State of the Science meeting. People do not like to open up about mental health, so the question becomes, "How do we talk about mental health issues without talking about mental health?" Based on the research presented, the strategies that follow are recommended.

Addressing mental health issues requires larger community support, beyond the purview of mental health specialists. While it is apparent that mental health specialists are the best professionals to provide mental health care, connecting people who have mental health issues with care providers can be very challenging because of stigma. This is especially true in AVRCs, where an individual's car might be recognized at the counselor's office, or mental health conditions like depression or alcohol abuse might be considered as part of the culture.

Wennerstrom and Smithwick both highlighted the important roles of community health workers in the mental health field, both in that CHWs are from the communities they serve and have a basis of familiarity with their populations, which helps to establish trust between professionals and clients. CHWs can also reach populations in non-traditional settings, and specialize in mental health outreach and connecting patients with resources and services.

There is great potential in AVRCs to build on the CHW model to include other professionals who might interact with rural residents experiencing mental health issues. For example, some participants in Chasek's studies were given substance abuse screenings at their primary care providers. They were quickly and discreetly assessed for levels of substance abuse and referred to mental health specialists if needed. Scheyett

called for different targets for mental health interventions outside of the mental health setting. Stressors that have effects on farmer suicide include health, relationships and loss, and financial stress. She recommended that non-traditional professionals who work to address these issues, such as primary care doctors, faith leaders, divorce lawyers, and employees of assisted living facilities, funeral homes, and banks, could all be trained to look for and respond to the signs of suicide among AVRCs with whom they interact.

Physical setting is also important when reaching audiences who are the target of mental health interventions. In Stacciarini's research, rural Latino participants, who were often undocumented, described living in constant fear because of the threat of deportation. However, they considered churches to be safe spaces, so much of her study recruitment occurred at churches. Participants felt comfortable to open up about political conditions they faced, as well as the work they performed, family issues, domestic violence, and substance abuse. Again in Chasek's research, some studies took place at popular agricultural fairs, reaching AVRCs who might not necessarily be presented with opportunities to assess possible SUDs or be referred to treatment.

Extension agents have played a vital role in rural and agriculture communities for over 100 years, and are well-situated to be an integral part of this proposed model of a community coalition for mental health. Agents already interact with AVRCs in providing extended services related to agriculture, family and consumer sciences, and youth development. Furthermore, Extension has offices in every state in the SCCAHS region, which could provide alternative physical settings to connect clients with mental health assistance. As society has changed, Extension has also changed to meet current challenges that develop in AVRCs. In this situation, agents could play an important leadership role in addressing mental health problems by catalyzing community change to support those with mental health concerns.

Lessons Learned from CHW Programs in Fostering Community Resilience

CHWs are very successful with navigating services, addressing social determinants of health, and connecting with people from their communities, but they also have a very important role in advocacy and systems change. They are able to convey the strengths in their communities, as well as the challenges and barriers their communities face. CHWs are a resource for agencies to provide ideas in the community context in addressing behavioral health issues.

Major lessons learned from projects based on the CHW model include buy-in from healthcare providers and collaboration, rather than territorializing. CHWs can serve as a unique resource to help address behavioral health and social needs of the patients they provide outreach to. However, everyone involved in providing collaborative care to patients needs to understand each other's roles so as to not conflict with other members of the care team and to clearly communicate with others on the care team. Another important lesson was to provide additional training for CHWs in their new roles in providing

behavioral health, and to recognize the importance of supporting CHWs as caregivers themselves by facilitating monthly support meetings for CHWs.

Similarly, because Extension agents live and work in the communities they serve, it is also important to provide them with support after traumatic disaster and recognize their unofficial roles as first responders. The conclusions drawn from Grattan's study are that Extension agents' objective measures of rudimentary attention and concentration skills were adequate during the aftermath of the storm, but the ability to apply them under stressful circumstances was difficult. Agents surveyed showed that hurricane impact in both the personal and work setting combine to contribute to symptoms of depression and anxiety in the short term, but reduced hurricane impact in the work setting is associated with better outcomes in the long run. It is important to highlight that stability in the work setting is important to mental health outcomes post hurricane-related disaster.

There are some suggestions for practical interventions that emerged from Grattan's study which are applicable to Extension, community leaders, and others engaged in first response and mental health support. One intervention is to conduct programs to build confidence among affected Extension agents so. Such a program would reinforce that they indeed have the cognitive resources to withstand stressful demands. In addition, it would provide them with tools to enhance organizational and time management skills so they are better equipped to work in future disasters settings where multi-taking is inevitable. These agents would be further supported if agents in surrounding counties not affected by disaster could step in and provide additional assistance. Finally, given that lower hurricane impact in the workplace was associated with better mental health outcomes, stabilizing the work environment for Extension agents should be a priority in future disasters.

Community Mental Health Intervention: Mental Health Disaster Response and Recovery Mental Health Workshop

Out of the lessons learned from hurricanes Michael and Irma, a Disaster Response and Recovery Mental Health workshop was developed by University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), the UF Department of Family, Youth and Community Sciences (FYCS), and the Florida State Agricultural Response Team (SART) to support those engaged in first responder work. These workshops could be adapted to educate a diverse array of professionals working in AVRCs, enhancing community support to connect people in AVRCs with mental health services.

The workshops were developed to bring awareness to mental health issues that can arise in individuals before, during, and after disasters. The workshop's goals are to help develop an understanding of mental health in individuals and communities leading up to and following disasters, and how to provide support before, during, and after a disaster. Resiliency can potentially decrease community risks and vulnerability and enhance community resiliency to future disasters. Seven

total trainings, funded by SART, were held throughout Florida in 2018-2019. Each training took place over the course of two days, with 12 hours total. There were 112 total participants, 16 of whom where Extension agents, who received a Mental Health First Aid certification upon completion of the training.

The first portion of the training included mental health first aid training, which is a course developed by the National Council for Behavioral Health. The course provides attendees with an understanding of mental health, and how to support those with mental health challenges. More information about this training can be found at www.mentalhealthfirstaid.org. The second portion of training focused on understanding needs of individuals, families, and community members during a disaster, and how to best support individuals in the context of a disaster. With appropriate funding, there are major opportunities to expand the Disasters and Mental Health workshop throughout Florida and Extension systems in the SCCAHS region.

Conclusion

Based on the research presented at the State of the Science meeting, it is apparent that there are many different approaches to addressing mental health issues in AVRCs. In order for these strategies to be effective, a more concerted effort should be developed to support mental health programs that can mobilize entire communities. There is also a need for adequate support for mental health, including sufficient funding resources to provide services to those who need them, as well as to establish dedicated statewide mental health departments in states that do not have them.

While alternative models of mental health care have developed, like mobile crisis services, intensive community treatment, and income and housing assistance, mental health funding has become more fragmented. Critics argue that because of inadequate state funding, those with mental illnesses have wound up receiving care in emergency rooms, prisons, and nursing homes instead (Pew Trusts, 2015).

Given the number of AVRCs in the SCCAHS region and the intensity of the stressors they face, a policy implication is the critical need for more funding for rural mental health programs in these communities. This can be accomplished by giving more individuals financial access to mental healthcare providers through Medicaid as a part of Medicaid expansion, as well as increased state funding for community mental health programs that connect rural individuals with mental health services and resources through rural outreach.

Recommendations

Given the rural state of the SCCAHS region, several actions need to be taken in order to combat the presence of mental health illnesses in rural communities. Some of the recommended solutions are:

- Reduce stigma to allow individuals to feel more comfortable discussing their mental health so that they can be connected with healthcare professionals and resources.
- Reduce stigma by offering mental health counseling and support in non-traditional settings and providing training for mental health first aid (Wennerstrom & Smithwick, 2019). This includes training professionals, like primary care doctors, faith leaders, divorce lawyers, Extension agents, and employees of assisted living facilities, funeral homes, and banks.
- Avoid a one-size-fits-all approach by redefining “rural” and taking an individual-based rurality approach which allows researchers to identify individuals within certain communities that experience higher levels of social isolation and mental stress and allows researchers to develop more targeted interventions to reach these individuals (Stacciarini, 2019).
- Take action to collect more data on mental health stressors and patients in rural areas.
- Address misconceptions.
- Acquire funding for training, services, and additional support in rural areas.

NOTES

NOTES

REFERENCES

Abramson, D. M., Grattan, L. M., Mayer, B., Colten, C. E., Arosemena, F. A., Bedimo-Rung, A., & Lichtveld, M. (2014). The resilience activation framework: A conceptual model of how access to social resources promotes adaptation and rapid recovery in post-disaster settings. Journal of Behavioral Health Services and Research, 42(1), 42–57. https://doi.org/10.1007/s11414-014-9410-2

Alvarez, S. (2018). Hurricane Michael's Damage to Florida Agriculture.https://www.nass.usda.gov/Statistics_by_State/Florida/index.php

Andrilla, C. H. A., Coulthard, C., & Larson, E. H. (2017). Barriers rural physicians face prescribing buprenorphine for opioid use disorder. Annals of Family Medicine, 15(4), 359–362. https://doi.org/10.1370/afm.2099

American Farm Bureau. (2017). The opioid impact in farm country, USA [Infographic]. Morning Consult. https://www.fb.org/files/171122_sc_afb-no_cta.pdf

Arcury, T. A., & Quandt, S. A. (2009). Latino farmworkers in the Eastern United States: Health, Safety, and Justice. New York: Springer.

Bertolote, J. M., & Leo Prof., D. De. (2012). Global suicidemortality rates-a light at the end of the tunnel? Crisis, 33(5), 249–253. https://doi.org/10.1027/0227-5910/a000180

Benedek, D. M., Fullerton, C., & Ursano, R. J. (2007). First Responders: Mental Health Consequences of Natural and Human-Made Disasters for Public Health and Public Safety Workers. Annual Review of Public Health, 28(1), 55–68. https://doi.org/10.1146/annurev.publhealth.28.021406.144037

Bolin, J., & Gamm, L. (2010). Access to quality health services in rural areas-insurance: A literature review. Rural healthy people, 201(0).

Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. Journal of personality and social psychology, 57(5), 808.

Bonanno, G. A. (2005). Resilience in the Face of Potential Trauma.

Borders, T. F., Booth, B. M., Falck, R. S., Leukefeld, C., Wang, J., & Carlson, R. G. (2009). Longitudinal changes in drug use severity and physical health-related quality of life among untreated stimulant users. Addictive Behaviors, 34(11), 959–964. https://doi.org/10.1016/j.addbeh.2009.06.002

Broffman, L., Spurlock, M., Dulacki, K., Campbell, A., Rodriguez, F., Wright, B., . . . Davis, M. M. (2017). Understanding treatment gaps for mental health, alcohol, and drug use in South Dakota: A qualitative study of rural perspectives. The Journal of Rural Health, 33, 71– 81.

Buckingham-Howes, S., Sreekumar, P., Morris, G., & Grattan, L. M. (2017). Resilience after the Deepwater Horizon oil spill. Disaster Prevention and Management, 26(5), 597-610.

Buikstra, E., Ross, H., King, C. A., Baker, P. G., Hegney, D., McLachlan, K., & Rogers-Clark, C. (2010). The components of resilience-perceptions of an Australian rural community. Journal of Community Psychology, 38(8), 975–991. https://doi.org/10.1002/jcop.20409

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Fishing and Hunting Workers, (2019). Retreived from: https://www.bls.gov/ooh/farming-fishing-and-forestry/fishers-and-related-fishing-workers.htm (visited October 07, 2019).

Byrne, L., Happell, B., & Reid-Searl, K. (2017). Acknowledging rural disadvantage in mental health: Views of peer workers. Perspectives in Psychiatric Care, 53, 259–265.

Center for Disease Control and Prevention. (2017a). Annual surveillance report of drug related risks and outcomes – United States, 2017. Surveillance Special Report 1. Retrieved from https://www.cdc.gov/drugoverdose/pdf/pubs/2017-cdc-drug-surveillancereport.pdf

Center for Disease Control and Prevention. (2017b). Drug overdose death data. Retrieved from https://www.cdc.gov/drugoverdose/data/statedeaths.html

Centers for Disease Control and Prevention (CDC). (2018). Suicide rising across the U.S. Retrieved from https://www.cdc.gov/vitalsigns/suicide/index.html

Chasek, C.L. (2019). Investigating opioid and alcohol risk and misuse among rural agricultural workers [PowerPoint slides]. Retrieved from: http://www.sccahs.org/wp-content/uploads/2019/10/Chasek.pdf

Cherry, K. E., Sampson, L., Galea, S., Marks, L. D., Baudoin, K. H., Nezat, P. F., & Stanko, K. E. (2017). Health-related quality of life in older coastal residents after multiple disasters. *Disaster Medicine and Public Health Preparedness, 11*(1), 90-96.

Crain, R., Grzywacz, J. G., Schwantes, M., Isom, S., Quandt, S. A., & Arcury, T. A. (2012). Correlates of mental health among Latino farmworkers in North Carolina. The Journal of Rural Health, 28(3), 277-285.

DeMartini, K. S., Palmer, R. S., Leeman, R. F., Corbin, W. C., Toll, B. A., Fucito, L. M., & O'Malley, S. S. (2013). Drinking less and drinking smarter: Direct and indirect protective strategies in young adults. Psychology of Addictive Behaviors, 27, 615-626. Correction on p. 626. doi: 10.1037/a0030475

Dixon, M. A., & Chartier, K. G. (2016). Alcohol use patterns among urban and rural residents: demographic and social influences. *Alcohol Research: Current Reviews, 38*(1), 69.

U.S. Environmental Protection Agency. (2016). Climate Impacts in the Southeast. https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-southeast_.html.

Evans, A. R., Tait, R., Harvey, P., & Newbury, J. (2005). Recreational drug use within the employees of the mariculture and seafood industry in South Australia. Drug and Alcohol Review, Vol. 24, pp. 67–68. https://doi.org/10.1080/09595230500125211

Felix, E. D., & Afifi, W. (2015). The role of social support on mental health after multiple wildfire disasters. Journal of Community Psychology, 43(2), 156-170.

Fiske, A., Gatz, M., & Hannell, E. (2005). Rural suicide rates and availability of health care providers. Journal of Community Psychology, 33(5), 537–543. https://doi.org/10.1002/jcop.20069

Florida Nursery, Growers adn Landscape Association. (2019). History. https://www.fngla.org/about-fngla/history

REFERENCES

Food and Agriculture Organization of the United Nations. Fisheries and Aquaculture Department. (2018). The state of world fisheries and aquaculture 2018: meeting the sustainable development goals. http://www.fao.org/3/i9540en/i9540en.pdf

Garnham, B., & Bryant, L. (2014). Problematising the suicides of older male farmers: Subjective, social and cultural considerations. *Sociologia Ruralis, 54*(2), 227–240. https://doi.org/10.1111/soru.12029

Hodge, J.G., Wetter, S.A., & Noe, S.A. (2017). Emerging legal responses to curb the opioid epidemic. *Journal of Law, Medicine & Ethics, 45*, 460-463. https://doi.org/10.1177/1073110517737547

Hodges, A.W., Court, C.D., Clouser, R.L., Vansickle, J.J., & Stefanou, S.E., (2018). Economic Losses of Hurricane Irma on Agriculture in Florida Counties. https://fred.ifas.ufl.edu/destudio/t4/pdf/Economic%20Losses%20of%20Hurricane%20Irma%20on%20ag%20in%20Florida%20counties%2010-26-2018.pdf

Hovey, J. D., & Seligman, L. D. (2005). The mental health of agricultural workers. In *Agricultural Medicine* (pp. 282 -299).

Hoyt, D. R., Conger, R. D., Valde, J. G., & Weihs, K. (1997). Psychological Distress and Help Seeking in Rural America. *American Journal of Community Psychology, 25*(4), 449-470.

Jackson, K. M., & Sher, K. J. (2003). Alcohol use disorders and psychological distress: A prospective state-trait analysis. *Journal of Abnormal Psychology, 112*(4), 599-613.

Kennedy, A. J., Maple, M. J., McKay, K., & Brumby, S. A. (2014). Suicide and accidental death in Australia's rural farming communities: A review of the literature. Rural and Remote Health, 14, 2517–2530.

Keyes, K. M., Cerdá, M., Brady, J. E., Havens, J. R., & Galea, S. (n.d.). Understanding the Rural-Urban Differences in Nonmedical Prescription Opioid Use and Abuse in the United States. https://doi.org/10.2105/AJPH

Kimhi, S. (2016). Levels of resilience: Associations among individual, community, and national resilience. Journal of Health Psychology, 21(2), 164–170. https://doi.org/10.1177/1359105314524009

Leeman, R. F., DeMartini, K. S., Gueorguieva, R., Nogueira, C., Corbin, W. R., Neighbors, C., & O'Malley, S. S. (2016). Randomized controlled trial of a very brief, multicomponent web-based alcohol intervention for undergraduates with a focus on protective behavioral strategies. *Journal of Consulting and Clinical Psychology, 84*(11), 1008-1015. https://doi.org/10.1037/ccp0000132

Levin, K. A., & Leyland, A. H. (2005). Urban/rural inequalities in suicide in Scotland, 1981-1999. *Social Science and Medicine, 60*(12), 2877-2890. https://doi.org/10.1016/j.socscimed.2004.11.025

Magis, K. (2010). Community resilience: An indicator of social sustainability. *Society and Natural Resources, 23*(5), 401–416. https://doi.org/10.1080/08941920903305674

McLaren, S., & Challis, C. (2009). Resilience among men farmers: The protective roles of social support and sense of belonging in the depression–suicidal ideation relation. *Death Studies, 33*(3), 262–276.

McShane, C. J., & Quirk, F. (2009). Mediating and moderating effects of work-home interference upon farm stresses and psychological distress. *Australian Journal of Rural Health, 17*(5), 244–250. https://doi.org/10.1111/j.1440-1584.2009.01085.x

Misra, V., (2018). Heat related illness in a changing climate and demography of Florida [PowerPoint slides]. http://www.sccahs.org/wp-content/uploads/2018/11/misra1.pdf

Morris Jr, J. G., Grattan, L. M., Mayer, B. M., & Blackburn, J. K. (2013). Psychological responses and resilience of people and communities impacted by the deepwater horizon oil spill. *Transactions of the American Clinical and Climatological Association, 124*, 191.

National Institute on Drug Abuse. (2015). Prescription opioids and heroin. Research Report Series. https://www.drugabuse.gov/publications/researchreports/relationship-between-prescription-drug-abuse-heroin-use/introduction

National Oceanic and Atmospheric Administration (NOAA). (2009). Fishing Communities of the United States, 2006. U.S. Department of Commerce, NOAA National Marine Fisheries Service. https://www.st.nmfs.noaa.gov/st5/publication/communities/CommunitiesReport_ALL.pdf

National Institute of Food and Agriculture. (2019). Extension. https://nifa.usda.gov/extension

National Institute of Mental Health. (2018). Stress. https://www.nimh.nih.gov/health/publications/stress/index.shtml

Sullivan, B., Caldwell, N., & Shapiro, A. (2019). National Public Radio. https://www.npr.org/2019/05/31/727905462/nearly-8-months-after-hurricane-michael-florida-panhandle-feels-left-behind

Perlmutter, A., Conner, S., Savone, M., Kim, J., Segura, L., Martins, S., . . . Martins, S.S. (2017). Is employment status in adults over 25 years old associated with nonmedical prescription opioid and stimulant use? *Social Psychiatry & Psychiatric Epidemiology, 52*(3), 291-298. doi:10.1007/s00127-016-1312-

Pew Trusts. (2015). Mental Health and the Role of States. https://www.pewtrusts.org/~/media/assets/2015/06/mentalhealthandroleofstatesreport.pdf

Roy, P., Tremblay, G., Robertson, S., & Houle, J. (2017). "Do it All by Myself": A Salutogenic Approach of Masculine Health Practice Among Farming Men Coping With Stress. *American Journal of Men's Health, 11*(5), 1536–1546. https://doi.org/10.1177/1557988315619677

Rudd, R.A., Seth, P., David, F., & Scholl, L. (2016). Increases in drug and opioid-involved overdose deaths – United States, 2010-2015. *Morbidity and Mortality Weekly Report, 65* (50-51), 1445-1452. Doi: 10.15585/mmwr.mm655051e1

Sansone, R. A., Leung, J. S., & Wiederman, M. W. (2012). Five forms of childhood trauma: Relationships with employment in adulthood. *Child Abuse and Neglect, 36*(9), 676–679. https://doi.org/10.1016/j.chiabu.2012.07.007

Services, M., & Burkle, F. M. (1994). Acute-phase Mental Health Consequences of Disasters: Implications for Triage and Emergency.

Scheyett, A. (2019). Characteristics and contextual stressors in farmers and agricultural worker suicides in Georgia, 2008-2017 [PowerPoint slides]. http://www.sccahs.org/wp-content/uploads/2019/10/Scheyette.pdf

Sher, K. J., Bartholow, B. D., Peuser, K., Erickson, D. J., & Wood, M. D. (2007). Stress-response-dampening effects of alcohol: Attention as a mediator and moderator. *Journal of Abnormal Psychology, 116*(2), 362.

REFERENCES

Smith, B. H., Penny, K. I., Elliott, A. M., Chambers, W. A., & Smith, W. C. (2001). The level of expressed need - A measure of help-seeking behavior for chronic pain in the community. *European Journal of Pain, 5*(3), 257–266. https://doi.org/10.1053/eujp.2001.0244

Smith, L. C., Smith, M., & Ashcroft, P. (2011). Analysis of environmental and economic damages from British Petroleum's Deepwater Horizon oil spill. *Albany Law Review, 74*(1), 563-585.

Stacciarini, J.M. (2019). CBPR: Rurality, Social Networks and Mental Well-being in Rural Latinos [PowerPoint slides]. http://www.sccahs.org/wp-content/uploads/2019/10/Stacciarini.pdf

Stacciarini, J. M. R., Vacca, R., Wiens, B., Loe, E., LaFlam, M., Pérez, A., & Locke, B. (2016). FBO leaders' perceptions of the psycho-social contexts for rural Latinos. *Issues in Mental Health Nursing, 37*(1), 19-25.

Substance Abuse and Mental Health Services Administration. (2012). Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings. https://www.samhsa.gov/data/sites/default/files/NSDUHresults2012/NSDUHresults2012.pdf

Swiss Re Institute. (2018) Natural catastrophes and man-made disasters in 2017: a year of record-breaking losses. https://reliefweb.int/sites/reliefweb.int/files/resources/sigma1_2018_en.pdf

United States Department of Agriculture. (2014). Farm demographics. https://www.nass.usda.gov/Publications/Highlights/2014/Farm_Demographics/index.php#how_many

United States Department of Agriculture. (2017). Census of Agriculture. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_US/usv1.pdf

Van Hasselt, M., Keyes, V., Bray, J., & Miller, T. (2015). Prescription Drug Abuse and Workplace Absenteeism: Evidence from the 2008–2012 National Survey on Drug Use and Health. Journal of Workplace Behavioral Health, 30(4), 379–392. https://doi.org/10.1080/15555240.2015.1047499

Wells, B FM Fishel. (2011). Agricultural pesticide use in Florida: q summary, 2007-2009. IFAS Circular PI-235.

Wennerstrom, A., & Smithwick, J. (2019). Community health workers in mental health: a powerful resource for improving behavioral health and improving community resilience [PowerPoint Slides]. http://www.sccahs.org/wp-content/uploads/2019/10/Wennerstrom-and-Smithwick-SOS-presentation.pdf

Wennerstrom A, Vannoy S, Allen C, Meyers D, O'Toole E, Wells K, Springgate B. (2011). Community-based participatory development of community health worker mental health outreach role to extend collaborative care in post-Katrina New Orleans. *Ethnicity and Disease, 21*(3). 45-51. PMID: 22352080.

Xiao, H., Mccurdy, S. A., Stoecklin-Marois, M. T., Li, C.-S., & Schenker, M. B. (2013). Agricultural Work and Chronic Musculoskeletal Pain Among Latino Farm Workers: The Micasa Study. *American Journal of Industrial Medicine, 56*(2), 216-225.