2019/2020 Annual Report

Southeastern Coastal Center for Agricultural Health and Safety

For More Information

Contact the Southeastern Coastal Center for Agricultural Health and Safety at http://sccahs.org

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Contents

Section I – Who We Are

Center Summary

The **Southeastern Coastal Center for Agricultural Health and Safety** (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. The University of Florida is the lead institution of this center, partnering with the University of South Florida (USF), Florida State University (FSU), Florida A&M University (FAMU), Georgia Southern University (GSU), Emory University, and the University of the Virgin Islands. These universities are working together on a range of interdisciplinary research and educational projects designed to promote occupational health and safety among the 240,000 farms — estimated by U.S. Department of Agriculture — to be operating in the region, their operators, families, employees, and contractors, as well as those in the forestry and fishery industries.

Our Focus Areas

- Coastal fishery worker safety and health
- Heat stress and related illness
- Pesticide/herbicide exposure
- Opioid epidemic impact on farming communities
- Disaster vulnerability of migrant and seasonal farmworkers
- Feasibility of using electronic health records to describe the health of migrant and seasonal farmworkers, inform research and measure impact of interventions.
- Geospatial Analysis of agricultural worker and fisher health: Partnering to map regional clinical indicators and neighborhood environments
- Development and implementation of training programs
- Innovative approaches to foster research to practice

Goals of the Center

- Provide occupational safety and health education and training to the agriculture, fishing, and forestry workforce.
- Bring evidence-based, safety and health programs, developed through the other NIOSH-funded agricultural centers into the southeastern coastal region.
- When appropriate, translate programs into Spanish, and assist in supporting multilingual training efforts throughout the region.
- Conduct research to practice projects focused on:
  - Evaluating whether safety and education materials produce changes in safety behaviors.
  - Documenting hazards and risks in fishery workers; testing training materials aimed at reducing injuries.
  - Utilizing remote sensing technology to map pesticide uses.
  - Looking at heat stress tolerance.
- Conduct further research and applied projects based on needs as they arise.

Key Personnel

Planning and Evaluation Core

Center Administration

J. Glenn Morris, Center Director
University of Florida, jgmorris@epi.ufl.edu

Andrew Kane, Deputy Director
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Tara Sabo-Attwood, Senior Advisor
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Evaluation Program

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Key Personnel

Research Core

Occupational Health and Safety Surveillance of Gulf Seafood Workers
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Extent of Agricultural Pesticide Applications in Florida Using Best Practices
Gregory Glass, Research Project PI.
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Jane Southworth, Co-Investigator
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PISCA: Pesticide & Heat Stress Education for Latino Farmworkers That is Culturally Appropriate
Joseph Grzywacz, Research Project PI
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Heat Stress and Biomarkers of Renal Disease
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Valerie Mac, Co-Investigator
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Using Social Marketing to Prevent HRI and Improve Productivity Among Farmworkers
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Maria Morera, Co-Investigator
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Key Personnel

Research Core

Agricultural chemical exposure impact on kidney function in farmworkers

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Stephen Roberts, Co-Investigator
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Pilot/Feasibility Program

Pilot study of the acute psychological and health impacts of Hurricane Irma in UFAS extension workers

Lynn Grattan, Pilot Project PI
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Uncovering patterns of mental, physical, and occupational health issues among migrant farmworkers with different socio-cultural networks: A pilot study among Haitian and Mexican farm workers in Immokalee, FL

Gülcan Önel, Pilot Project PI
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Chronic low back pain in seafood workers: a pilot intervention study to identify modifiable work and movement solutions

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Pilot study of mobile app monitoring to prevent heat-related symptoms among Hispanic farmworkers

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Understanding the scope of the opioid epidemic for agricultural industries

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A novel approach (sweat patches) to monitoring pesticide exposure in farmworkers

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Agro-ecological practices in the face of climate change: Resilience, sustainability, and preparedness in Puerto Rico

Antonio Tovar-Aguilar, Pilot Project PI
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Key Personnel

Pilot/Feasibility Program

Field evaluation of N95 filtering facepiece respirators against airborne dust and microorganisms during cotton harvest
Atin Adhikari, Pilot Project PI
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A pilot study to assess personal PM2.5 exposure and respiratory virus Infections among farmworkers in the Southeast
Eric Coker, Pilot Project PI
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Developing an integrated decision support tool and network for WPS respirator compliance in Florida agricultural industries
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Exploring mental health and natural disasters in agricultural communities in Puerto Rico
Marysel Pagán-Santana, Pilot Project PI
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Section II – Planning and Evaluation Core

Administration

Overview

Led by Dr. J. Glenn Morris, Administration manages the overall activities of the Center to ensure the administrative structure (Figure 1) works synergistically to accomplish the following, 1) the coordination and integration of the Core Center grant components and activities; 2) oversight of the utilization of funds, including funds for pilot and feasibility studies; and 3) support active interaction among the Director, Core leaders, research project Principal Investigators, relevant institutional Division of Sponsored Programs personnel and the CDC/NIOSH Program Officer/Grants Management Specialist.

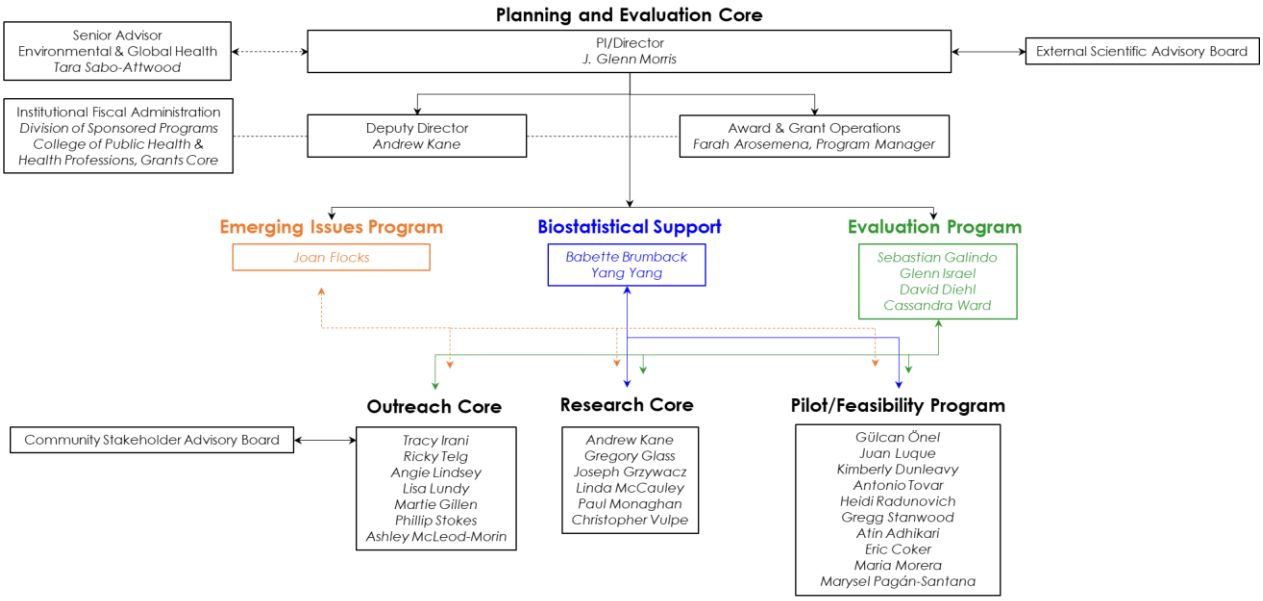

FIGURE 1. Organizational Chart, Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS)

Key Accomplishments in 2019-2020

Throughout Year 4, Administration provided project coordination for faculty/staff to manage their programs and research studies – guiding decisions and allocating resources where most strategically needed. The administration component of the Planning and Evaluation Core fulfills many organizational objectives, bringing together internal collaborators, such as biostatisticians, data managers/analysts, evaluation/content area specialists, budget management and information technology, with external collaborators who include study investigators, pilot awardees, and advisory board members.

The roles of data management, analysis, and administration expanded from the monthly IOC meetings and bi-quarterly PI-to-PI/Program Director meetings to include an annual retreat in Year 4, specifically in monitoring the quality of the data and adherence to study protocols and procedures, standard and ad hoc reporting, and working with biostatisticians to generate analysis data sets as Research Core and Pilot projects matured.

Increasing Connectivity & Assessing Future Objectives
Wednesday, December 4, 2019
9:30AM – 4:00PM

9:30AM	Continental Breakfast
9:45AM	Introductions/Welcome J. Glenn Morris, Director/Principal Investigator • Review of Retreat Goals • Summary of NIOSH Agriculture/Fishing/Forestry Priorities for 2019-2023 and New NIOSH Approaches to Outcome Evaluation
10:15AM	Research Core: Results and Impact Linda McCauley, Joseph Grzywacz, Gregory Glass, Andy Kane, Paul Monaghan, Chris Vulpe *10-minute presentations with 5 minutes of questions for each R01/R21 project*
12:00PM	Working Lunch
12:15PM	Pilot/Feasibility Program Presentations: Results and Impact Atin Adhikari, Gregg Stanwood, John Luque, Gülcan Önel, Heidi Radunovich, Kimberly Dunleavy, Antonio Tovar, Eric Coker *5-minute lightening round presentations for each Pilot*
1:15PM	Emerging Issues Programs: Joan Flocks, EIP Director
1:30PM	Evaluation Program: Sebastian Galinda, Evaluation Director and Glenn Israel, Deputy Director
1:45PM	Outreach Core: Tracy Irani, Director
2:00PM	Break
2:15PM	Results from Strategic Planning Process Sebastian Galinda, Evaluation Director and Haal's Saqib, Graduate Research Assistant
2:30PM	Discussion on SCCAHS Strengths and Weaknesses
3:30PM	Discussion of Areas of Focus for Resubmission
4:00PM	Adjourn

After the Retreat
A report will be developed that identifies specific actions and timelines for accomplishing the goals identified.

SCCAHS Investigative Team Retreat Agenda

Surveillance

The Center has made surveillance a priority in Year 4 and is laying the foundation to have a stronger baseline profile of the state of farmworker and fisher health so that we can improve on impact evaluation and better design activities and projects that have the greater potential to lead to the prevention of injury and disease. Although projects in the Research Core offer active, population-based surveillance, the Center is exploring the geographic distribution of chronic disease/injury and associated cultural, occupational, environmental health and built-environment factors of Florida farmworkers. Establishing a surveillance program that partners with UFs One Florida, the Florida Department of Health and Federally Qualified Health Centers will help support outreach, the pilot/feasibility program and the renewal application to identify and examine emerging patterns in agricultural/fisher worker health. Ongoing activities include,

- Mapping farmworker housing sites with built environment factors and Florida Department of Health inspection report variables for a more comprehensive view of health risk/vulnerability of agricultural workers who reside in employer-owned housing.
- Systematic review of literature to identify promising interventions (addressing built-environment) that strengthen public health recovery and adaptation based on the most current evidence.

Covid-19 Pandemic

COVID-19 had a major impact on research from March through October. Although research activities were suspended, CDC/NIOSH flexibilities allowed SCCAHS to mobilize and respond to the emerging needs of our Southeast communities. Throughout the crisis the Planning and Evaluation Core supported a Center-wide strategic plan (Figure 2) to partner and invest in activities to explore the differential burden experienced by farmworker/fisher communities and agricultural extension workers, create a repository of outreach materials to improve access to fundamental COVID-19 knowledge and prevention strategies, and to enhance testing of our Southeast underserved, under-resourced populations. SCCAHS key personnel have played leadership roles in the response to better understand the 2019 Novel Coronavirus, have initiated research partnerships and have collaborated in the set-up of a high-volume testing facility for SARS CoV-2 that served as a base for testing and associated outreach programs in farmworker and fisher community settings.

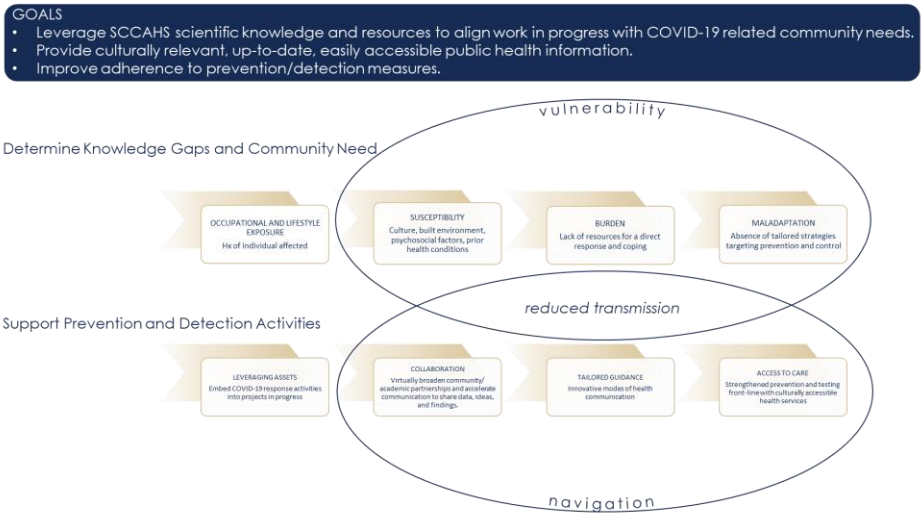

Figure 2. Adaptations to facilitate essential action: Implemented strategies to mitigate the COVID-19 impact on SCCAHS

Emerging Issues

Overview

The Emerging Issues Program (EIP) assists SCCAHS in addressing new, emerging and re-emerging problems within their region. EIP works within the center to maintain connections with all projects, cores, advisory boards and other stakeholders to identify, prioritize, and address issues that appear during the life of the center. The tasks of the EIP include: identifying new AgFF worker safety and health issues in the region; prioritizing these issues; addressing prioritized emerging issues through small investments; and referring other emerging issues to appropriate

Key Accomplishments in 2019-2020

Effort during Year 4 reflects the specific aims as initially stated. The EIP continues to work within the Center, maintaining connections will all projects; cores; advisory boards; and other stakeholders to identify, prioritize, and address issues that appear during the life of the Center. The activities to date demonstrate progress within each of the program's four primary tasks.

Task 1. Identify new agriculture, forestry and fishing worker safety and health problems in the SCCAHS region.
Task 2. Prioritize emerging issues.
Task 3. Address prioritized emerging issues through small investments.
Task 4. Refer other emerging issues to appropriate resources.

Identify, Prioritize and Address Arising Concerns

The unique design of EIP allows SCCAHS to streamline the identification of new occupational health and safety issues, map their geographic/demographic span, assess the significance of the problem(s), and respond accordingly. EIP work coincides with the Pilot/Feasibility Program to target relevant, real-time need for research and encourage new investigators to apply for pilot funding to address emerging issues; contributes to the Outreach Core by promoting SCCAHS at meetings and conferences and participating in the development of materials; and, when necessary, rapidly funds programs to improve the health and well-being of disproportionately affected agricultural, fishery, and forestry communities.

Joan Flocks, Director, plays an integral role in exploring critical community concerns. EIP is credited with providing a better understanding of the nature and cause of farmworker health disparities so that research PIs and the Outreach Core can have a better understanding of community priorities and work synergistically to address health and safety concerns and develop solutions. During Year 4 EIP contacted all research and pilot project PIs for feedback on emerging issues and compiled their responses into a document for further prioritization. The following is a summary of issues reported by key personnel to date:

• COVID-19 prevention and testing needs	• Heat related illness.
• Sugar cane burning.	• Farmworker health in the Caribbean
• H-2A Temporary Agricultural Workers.	• Occurrence and management of pterygium and pinguecula in Caribbean and Florida fishers and agricultural workers.
• Sun damage to eyes of fishers, especially in Caribbean.	• Mental health among Agriculture, Forestry and Fishing workers.
• Farmworker housing.	• Disaster relief in the agricultural industry.

• Forestry sector - building an informational network with regional forest service programs.	• Transferring research-knowledge of musculoskeletal and repetitive injury among seafood workers to Agricultural workers.
• Characterization of the citrus-associated resistome (antibiotic resistant bacteria + antibiotic- resistance genes) for citrus groves where antibiotic spraying is occurring.	• Haitian farmworkers.

Report on emerging issues to SCCAHS personnel and prioritize emerging issues. Emerging issues were discussed across all monthly IOC meetings during Year 4 through February 2020. Additionally, Dr. Flocks attended the following meetings to share her findings and discuss with local, regional and national experts in agriculture, forestry and fishing occupational health –

- Annual Public Interest Environmental Conference, February 2020.
- University of South Florida Sunshine Education and Research Center's State of the Science Meeting: Pregnant at Work
- *American Public Health Association Annual Meeting*, Philadelphia, PA, November 2019.
- SCCAHS State of the Science meeting, St. Petersburg, FL, September 2019.

Outreach. Throughout Year 4 EIP's Director, Joan Flocks, attended local meetings, regional symposia and national conferences as a frontline method to identify new agricultural and fishery worker safety and health problems. EIP participated in meetings and collaborated with external organizations and SCCAHS stakeholders such as: the nationwide NIOSH Ag Center Directors; the Agricultural Safety and Health Council of America; the East Coast Migrant Stream Forum; Florida Department of Agriculture and Consumer Services (FDACS); the Farmworker Association of Florida; the Rural Women's Health Project; the University of Florida's Institute of Food and Agricultural Sciences (UF IFAS) Extension; the University of Florida Health Street; and the Southwest Center for Agricultural Health, Injury Prevention and Education to promote SCCAHS' goals and develop its regional and national networks.

COVID-19 response funding. By April, 2020 Joan Flocks was rapidly reaching out to community-based organizations working with farmworkers and fisher populations to learn how they had been impacted by COVID-19 and identify priority areas of need. Throughout April – August, 2020 EIP focused on support for nonprofit organizations working directly to respond to the pandemic among farmworker and fisher populations in order to build capacity to address the burden. Four agency proposals for emergency funding were awarded and on August 28, 2020 an EIP manuscript was published in the Journal of Agromedicine on documenting the impacts of the pandemic on H-2A agricultural workers.

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The Potential Impact of COVID-19 on H-2A Agricultural Workers

Joan Flocks

Center for Governmental Responsibility, Levin College of Law, University of Florida, Gainesville, USA

ABSTRACT

The disproportionate impact of COVID-19 on farmworker communities has been well documented by the media. The virus overlays existing health disparities among farmworkers, but the population is not homogenous. One group of workers that may be even more vulnerable to the transmission of COVID-19 is the H-2A temporary worker population, because they have less control over their physical environments than domestic farmworkers, who may obtain their own housing and transportation. The H-2A program was recently altered at the federal level to ensure a steady flow of essential workers that can protect the nation's food supply during a crisis. Yet, in spite of increasing numbers of COVID-19 cases in states with significant H-2A worker populations, the federal rule that temporarily expanded the H-2A program did not address needs to protect workers' health. Although the CDC has developed recommendations for the agricultural industry to safeguard against COVID-19, most health and safety regulation for farmworkers are left to state and local agencies that may lack knowledge or resources to effectively address the needs of a specialized growing workforce such as H-2A workers. More research is needed on the disparate health and safety needs of H-2A workers to assess how policy can be tailored to reduce the transmission of the COVID-19 virus among the population.

KEYWORDS

Farmworkers; H-2A program; health disparities

The disproportionate impact of COVID-19 on farmworkers has been well-documented by the media. For example, in June the New York Times reported on several Florida agricultural communities with higher than average confirmed cases of the virus, including the rural town of Immokalee, home to more than 20,000 farmworkers, which had one of the highest rates of COVID-19 in the state.[1]

The virus overlays existing disparate health outcomes among farmworkers, who are routinely exposed to environmental hazards such as pesticides and excessive heat, and who experience occupational health issues such as arthritis and other musculoskeletal disorders and kidney injury.[2,3] These adverse health outcomes are compounded if farmworkers do not seek out health care due to fear of deportation, language barriers, lack of transportation, and other social/cultural barriers.[4] During the COVID-19 pandemic, typical work and living environments for farmworkers put them at higher risk of exposure. For example, many harvesters must work side-by-side, share transportation and living quarters, migrate between farms, and may have inadequate access to facilities where they can clean their hands and clothing.

In response to the special concerns facing farmworkers during the pandemic, the Centers for Disease Control and Prevention (CDC) and the US Department of Labor (DOL), in consultation with NIOSH Centers for Agricultural Safety and Health, developed a COVID-19 Guidance for Agricultural Workers and Employers. The document includes recommendations for safety practices in worksites, transportation vehicles, and shared housing.[5] These recommendations are best implemented when workers have some agency over their working and living conditions. However, farmworkers are not homogeneous, and there are subsets of the population, such as the H-2A temporary worker population, that may be even more vulnerable.

The H-2A program allows US employers, associations of employers, farm labor contractors, or other authorized agents ("petitioners") to apply for permits to bring workers from certain countries to fill temporary or seasonal agricultural jobs. These

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Photographs. COVID-19 PPE packets distributed to grocers and farmworkers throughout Southeast Georgia.

1. **Southeast Georgia Communities Project, Inc. (SEGCP)**
   Through the help of volunteers, 1,500 bags containing COVID-19 information in English and Spanish, face masks and hand sanitizer were prepared and distributed to local farmworkers and delivered to local farms for H-2A workers in Toombs, Candler, Tattnall and Appling Counties. Due to the easy spread of COVID, farmers frequently requested for SEGCP to work with liaison in charge of worker's needs to organize the dissemination of prevention and virus summary fact sheets and supplies.

   Toombs County:
   - Mexican grocers and restaurants (n=5) were visited and COVID-19 posters (n=10) were posted. 50 fliers were left for distribution per store.
   - H2A buses providing farmworker transportation to Walmart were accessed and 111 workers received information on COVID-19 and testing locations. COVID-19 bags were distributed with masks, hand sanitizer and agency information for interpreter services if needed to make appointments.
   - Farms (n=5) received prepared prevention packets for workers. (630 packets distributed)

   Tattnall County:
   - Mexican grocers received and posted 4 COVID-19 posters and 50 fliers were left for daily distribution.
   - Farms (n=2) received prepared prevention packets for workers. (50 packets distributed) Posters were posted and informational fliers and hand sanitizer made available in break areas.

   Appling County:
   - A Mexican grocer received 4 posters and 20 fliers.
   - Pine straw farm received 6 posters/10 hand sanitizer dispensers/ 85 prevention packets for 85 H-2A workers.

   Candler County:
   20 migrant farmworkers were provided with prevention packets.

   Montgomery County:
   15 Pine straw workers received prevention posters and fliers.

   In addition to the above work by SEGCP, their daily curbside food basket distribution recorded 24 farmworker encounters. A packet was provided to these individuals and SEGCP provided a mask for every household member.

2. **Florida Institute for Community Studies (FCIS)**
   FCIS identified COVID-19 related efforts are based in Wimauma area of Hillsborough County, home to many of the county's farmworkers. In Wimauma, FICS worked primarily at the La Estancia Apartment complex, which is designated farmworker housing.

   - Cleaning supplies for farmworker families at La Estancia were distributed (N=60 families). Distribution included disinfecting wipes, bleach, paper towels, hand sanitizer, baby wipes, garbage bags, laundry detergent.
   - PPE was provided -1,000 disposable masks, gloves.

   FCIS coordinates a summer youth camp for farmworker children. Education was impacted with school closures and emergency support was needed to provide adequate, safe supervision of children when parents were working on the farms.

   - Alcohol and tech cleaner for supplies.
   - Bilingual tutoring services.
   - Personal school supply kits for each child receiving tutoring and learning supervision (n=60) - notebooks, reading logs, pencils, erasers, highlighters and pencil cases.

3. **Franklin's Promise Coalition**
   The Franklin's Promise Coalition was supported through SCCAHS to deploy their Conservation Youth Corps to respond to the COVID-19 crisis in their coastal community of Apalachicola, Florida. Emergency funds were utilized to provide public health safety measures for the continuation of their food pantry distributions and Gulf Coast Restoration Youth Corps during the COVID-19 pandemic.

4. **Hispanic Health Initiatives (HHI)**
   Hispanic Health Initiatives utilized emergency funding to conduct community outreach and distribute PPE to community residents in Orange, Seminole, Osceola, and Volusia counties. HHI launched a grass roots Community Health Workers (CHWs) COVID-19 awareness, education, outreach and prevention campaign during the month of June in Central Florida (Orange, Osceola, Seminole and Volusia Counties) to help the community understand the importance of following CDC's guidelines and protocols in an effort to encourage adherence. 10,000 "hygiene prep" bags containing: a digital thermometer, hand sanitizer, gloves, mask, and a package of tissues were distributed to CHWs as a tool to help explain the use of each item as it relates to CDC's guidelines. The bags were given to CHW clients with CDC guidelines. Dissemination of the hygiene prep bags occurred at worksites and in open air neighborhood parking lots of supermarkets, churches, and food pantries.

Ancillary Project Funds

Sugar Cane Burning

EIP is funding systematic literature review on sugar cane burning and respiratory health. An expected product is a publication on the state of the problem globally and domestically and how interventions can be applied regionally.

H-2A Temporary Agricultural Worker Visas

EIP continues efforts to research the impact of the significant increase of H-2A workers by distributing a policy brief on the impact of the H-2A visa program on the health and safety of agricultural workers. An expected product is a Year 4 publication on this topic.

Heat-related Illness

EIP continues to promote SCCAHS extensive research on heat-related illness (HRI) among agricultural workers by supporting R2P efforts by SCCAHS researchers. In Year 4, EIP motivated and helped organize SCCAHS researchers in an application for extramural funding to create, apply, and evaluate field-based interventions to prevent HRI among agricultural workers. EIP continues to contribute to the literature in this area and consults regularly with ongoing HRI researchers affiliated with SCCAHS.

Farmworker Health in the Caribbean

EIP continues to work with Marysel Pagan-Santana of the Migrant Clinicians Network in Puerto Rico. Dr. Pagan-Santana is a new SCCAHS pilot award and was recently connected through EIP with the UF Levin College of Law Annual Public Interest Environmental Conference (PIEC) - *Feeding the Future: Shrinking Resources, Growing Population and a Warming Planet* - to serve as a speaker. The 20th annual PIEC focused on the legal and environmental challenges that a growing population, a rapidly changing climate and shrinking natural resources present.

Publications and Presentations

Flocks J. (2020). The Potential Impact of COVID-19 on H-2A Agricultural Workers. *Journal of Agromedicine*, 1–3. doi: 10.1080/1059924X.2020.1814922. Epub ahead of print. PMID: 32856557.

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Presentations

Flocks, J. "Prevention of Heat Stress among Farmworkers" (roundtable discussion moderator) *Western Agriculture Safety & Health Conference*, Seattle, WA, August 7-9, 2019.

Flocks, J., Saville, A., & Economos, J. "Differing Reponses and Perspective to Environmental Justice, Lessons from Lake Apopka, FL" (panel) with A Saville and J Economos. *Association for Environmental Studies and Sciences Annual Conference*, Orlando, FL, June 27, 2019.

Flocks J. "Immigration Policy and Agricultural Labor in Florida" *University of Florida, Department of Agricultural Education and Communications Seminar Series,* Gainesville, FL, October 27, 2017.

Mutic A, Mix J, Elon L, Tovar J, **Flocks J**, Economos E, and McCauley L. "Classification of Heat Related Illness Symptoms among Florida Farmworkers." *American Public Health Association Annual Meeting,* Atlanta, GA, November 7, 2017.

Tovar J, Economos E, and **Flocks J**. "Community Based Research on Heat-Related Illness in Florida Farmworkers." *American Public Health Association Annual Meeting,* Atlanta, GA, November 7, 2017.

Flocks J. "Immigration, Farm Labor, and Food Justice" *University of Florida, Center for the Study of Race and Race Relations, Race Matters in the News Seminar Series,* Gainesville, FL, November 9, 2017.

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Flocks J. "Immigration, Farm Labor, and Food Justice" *University of Florida, Center for the Study of Race and Race Relations, Race Matters in the News Seminar Series,* Gainesville, FL, November 9, 2017.

Mutic A, Mix J, Elon L, Tovar J, **Flocks J**, Economos E, and McCauley L. "Classification of Heat Related Illness Symptoms among Florida Farmworkers." *American Public Health Association Annual Meeting,* Atlanta, GA, November 7, 2017.

Tovar J, Economos E, and **Flocks J**. "Community Based Research on Heat-Related Illness in Florida Farmworkers." *American Public Health Association Annual Meeting,* Atlanta, GA, November 7, 2017.

Flocks J. "Immigration Policy and Agricultural Labor in Florida" *University of Florida, Department of Agricultural Education and Communications Seminar Series,* Gainesville, FL, October 27, 2017.

Evaluation Program

Overview

A formal monitoring and evaluation strategy is an interwoven component of SCCAHS. The Evaluation Program provides a framework for longitudinal, center-wide evaluations to assess the processes, outcomes, and impact of program and core activities; assists the leadership team in developing and implementing evaluation plans/logic models; and provides timely reporting as well as accountability information to the sponsoring agency.

The Evaluation Program aims to 1) Engage stakeholders to maintain a responsive and focused evaluation program; 2) Collect relevant monitoring and evaluation data from the center as a whole, the Outreach Core, and individual research projects; 3) Analyze and interpret data to establish the quality and effectiveness of the center as a whole, the Outreach Core, and the individual research projects; 4) Report and share evaluation findings and recommendations with key stakeholders; and 5) Maintain an open line of communication and engagement with other Ag Centers across the country.

Key Accomplishments in 2019-2020

Economic Evaluation: Return on Investment

Dr. Karam Diaby and his team of health economists completed the study funded by the Evaluation Program and presented their report, "Economic impact of heat-related illness on the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS)'s catchment area" to the team in November 2019. This research closed an existing gap in the literature by developing a model that assesses the total effects of heat-related illness (HRI) on the GDP of SCCAHS catchment area for both the agricultural and health care industries. An Input-Output (I-O) economic impact model was developed that can be used to evaluate effects of exogenous shocks on varying economic scales over time (Figure 3). Models are then utilized to predict the direct and indirect benefits resulting from increases in economic output derived from implementation of policies aimed at reducing the prevalence of HRI among different sectors for each state (Figure 4).

The I-O models and annual economic growth rates provide the necessary baseline to produce policy simulations and projections for different scenarios representing the range of potential increases in the economic output of the agricultural sector from a reduction in the prevalence of HRI for both the entire US (Figure 5) and the individual states (Figure 6). These models were produced under the assumption that full policy implementation would take place in 2021 and show potential economic benefits through 2030. Communications with Dr. Diaby and his team continued throughout Year 4 to strategize next steps for expanding this model to issues beyond HRI and future studies. The evaluation program anticipates utilizing these models to inform its impact evaluation activities related to HRI research and outreach.

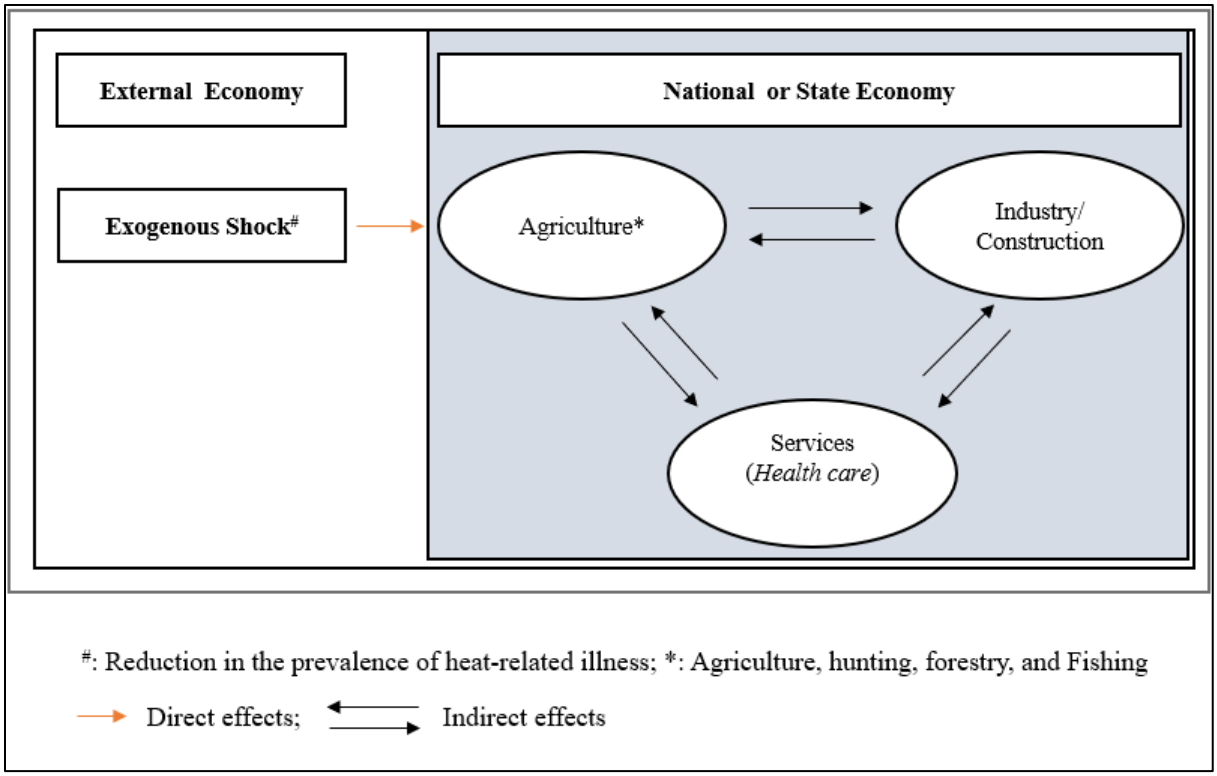

FIGURE 3. Return on Investment Input-Output Model

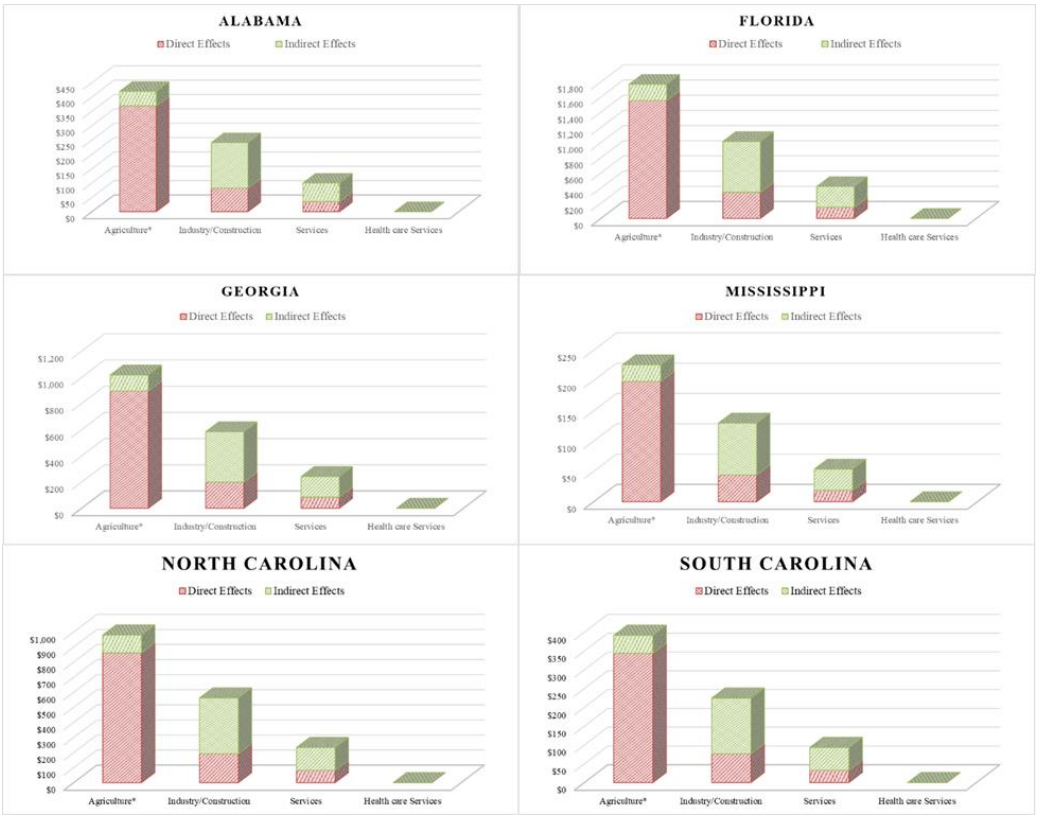

FIGURE 4. Total, direct, and indirect effects of a 5 percent increase in demand on sectors of states in SCCAHS region following reduction in prevalence of HRI

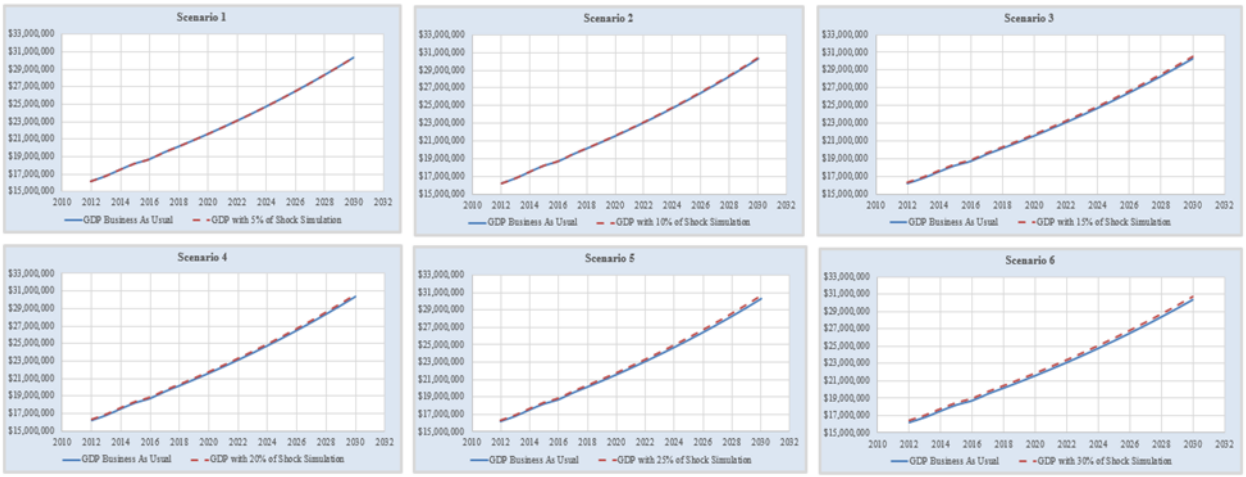

FIGURE 5. National comparisons of the net economic impact of six policy simulations

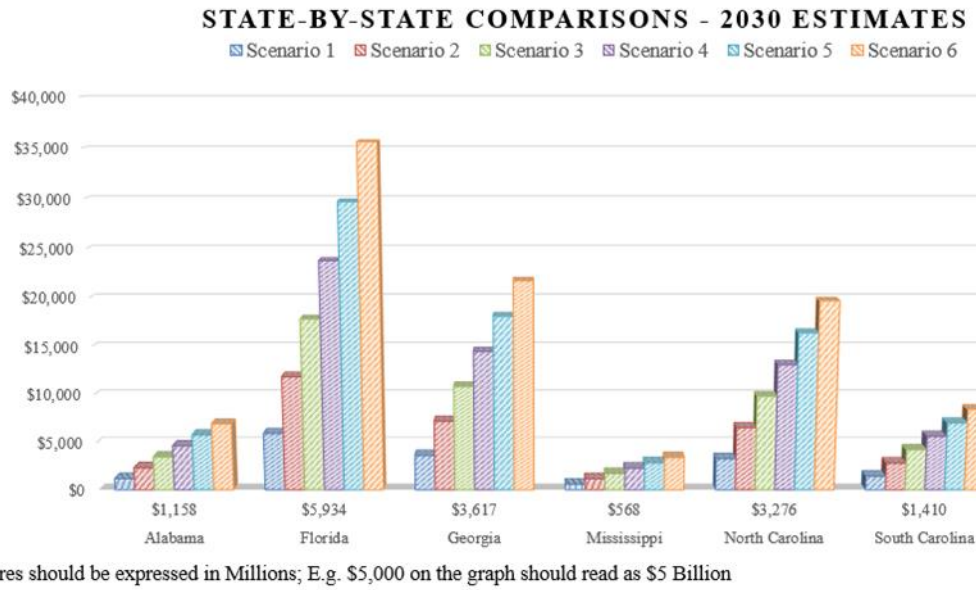

FIGURE 6. SCCAHS region state-by-state comparisons of the net economic impact of six policy simulations

Strategic Planning Process

To assist in SCCAHS strategic planning, the surfacing activity findings were disseminated amongst a select group of Center PIs and core/program leaders. Additionally, an activity to further identify and refine strategic issues was conducted online obtaining key stakeholders' feedback on the surfacing results. The findings from this Strategic Issues activity were shared at the SCCAHS retreat in December 2019. The Surfacing Activity results were made available for SCCAHS cores/programs to utilize while planning for the grant reapplication. Following the retreat, the evaluation team held meetings with interested Center researchers and staff to further discuss results and assist with individual strategic planning efforts. The Evaluation Program is interested in further aligning next steps in strategic planning with the Administration Core as the Center moves towards its first reapplication.

Outputs

- A poster/3-minute lightning talk abstract was accepted for the 2020 ASCHA March meeting in Las Vegas: "*Surfacing for Strategy: Organizational Learning for the Strategic Development of an Expanding NIOSH AgFF Occupational Health and Safety Research and Outreach Center.*"

- Results were presented virtually at the 2020 ISASH Conference in Asheville, North Carolina in June 2020: "*Strategic Planning: A Surfacing Activity for the Development of an Expanding NIOSH AgFF Health and Safety Center.*" (Figure 7).

- A final report of the Surfacing Activity was written by Haaris Saqib as part of the final report for his Master of Sustainable Development Practice field practicum. The final report was reviewed and approved by his graduate committee in July 2020.

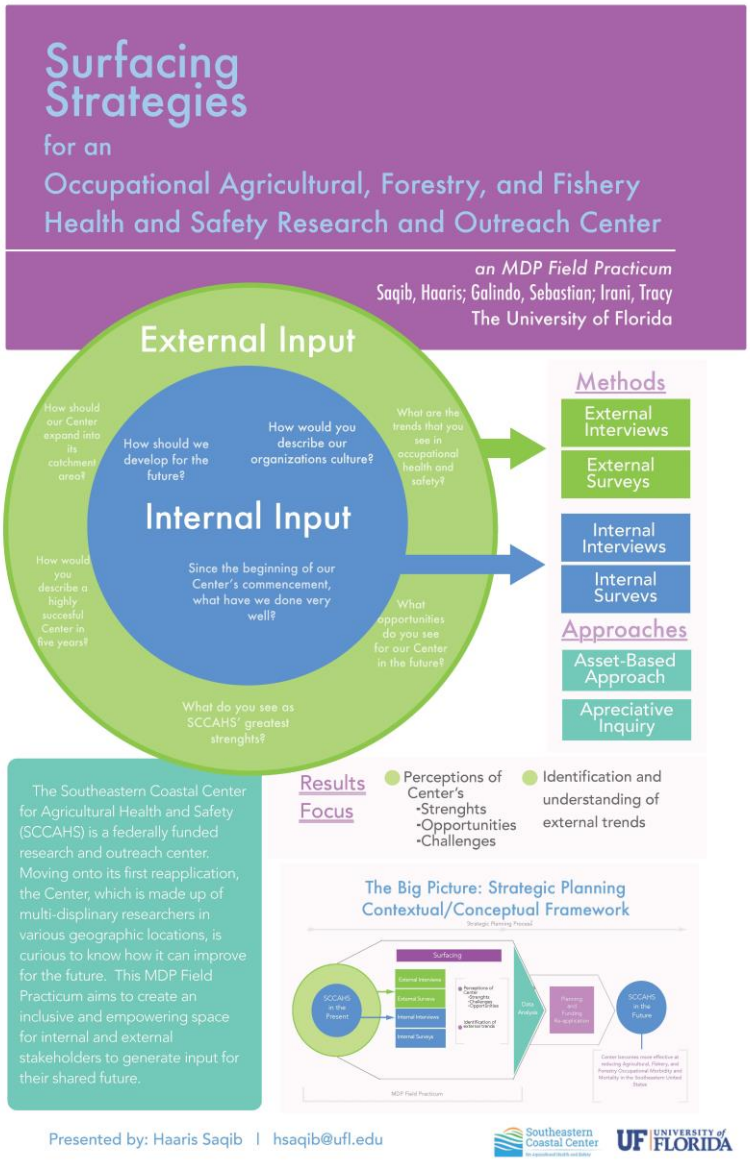

FIGURE 7. Full Concept

Impact Assessment

In January 2020, the thematic areas to be focused on across the NIOSH AgFF Centers for contribution analysis were identified: heat-related illnesses (HRI), rollover protective structures (ROPS) and livestock hazards. SCCAHS was selected to collaborate with four other agricultural centers to develop evidence packages and a collective logic model for HRI for the Evaluation Summit in Las Vegas March 18, 2020. Evaluation team members attended monthly NIOSH ECO meetings and additional meetings with the HRI contribution analysis sub-group throughout Year 4 to complete the contribution evidence table and logic model for the HRI contribution analysis. July Nelson, a PhD student working under Dr. Galindo's guidance, is also conducting a complementary project to NIOSH's common evaluation framework. She has narrowed the focus on three key areas of SCCAHS research: HRI, pesticide exposure, and mental health. July's study adds a problem-focused level of evidence to further strengthen the contribution analysis method. This effort will test and enhance the alignment between program theory and the impact pathways from a particular problem as identified in the literature. As part of this effort, July and members of the evaluation team began conducting in-depth literature reviews in the summer of 2020 on the identified thematic areas. Experts from outside of the evaluation program were invited and volunteered to provide critical insight and guidance throughout the process.

Mental health experts:

- Dr. Amy Pekol
- Dr. Megan Schossow
- Dr. Florence Becot
- Dr. Lynn Grattan
- Dr. Heidi Radunovich
- Teresa Younker

Pesticide exposure experts:

- Dr. Jay Ferrell
- Dr. Eric Coker
- Dr. Joe Bisesi
- Dr. Gregg Stanwood

HRI experts:

- Dr. John Luque

The systematic approach to conducting each literature review includes consulting experts, identifying relevant publications, and utilizing NVivo - a qualitative data analysis software - to build connections, identify relationships and ultimately reveal impact pathways. Four key questions were identified to drive these initial steps:

1. What is the problem within the context of agriculture, fishing, and forestry?
2. What are the root causes of the problem and the contributing factors?
3. What consequences result from problem?
4. What works to address the problem?

These activities support communication, build synergy and strengthen SCCAHS' interconnectedness with programs internally and externally across all NIOSH Agricultural Safety and Health Centers.

COVID-19 Response: Cross-Center COVID-19 Evaluation Task Force

Sebastian Galindo and Cassandra Ward of the Evaluation Program initiated and implemented a COVID-19 Evaluation Task Force with evaluation and outreach professionals from NIOSH and all 11 NIOSH Agricultural Health and Safety Centers. Beginning in early April 2020, the group met each Friday to address the urgent matter of identifying and responding to impacts of the COVID-19 pandemic on AgFF workers across the US. During these meetings, ideas, resources, and plans were shared, discussions ensued, and tools to collect useful, relevant data were developed to assess impacts and identify existing needs of target audiences related to COVID-19. Two survey questionnaires were created by SCCAHS evaluation and distributed online through Qualtrics.

Extension Professionals

Purpose/Methods. Extension is a key partner of the Center that serves as reliable source of evidence-based information for AgFF workers that can help provide critical insight in understanding emerging issues and challenges spawned by the COVID-19 pandemic. To gauge perceptions of how the pandemic has impacted their personal and professional lives and the audiences they serve, an online questionnaire was developed. During the summer of 2020, the survey was distributed in 18 states and territories across the nation (Table 1) to explore preferred current Ag safety and health concerns communication methods, training needs and organizational capacity, effects on mental health, and the preparedness to respond to this unique emergency situation. In the SCCAHS region, recruiting support of Extension leadership, use of personalized links and sending strategically planned reminder messages to complete the survey - including exploiting the FL-GA football rivalry - were utilized to boost response rates. Data collected provides SCCAHS and Extension leadership with information that can be used for planning and development in addressing the needs of extension professionals and enhance their frontline response to the communities they serve now and during future emergencies.

TABLE 1. COVID-19 Extension Survey Distribution, Usable Responses, and Response Rate by Center

Center	States and territories with respondents	Email list	Usable responses	Response rate
Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS)	FL, GA, SC, VI	1,501	831	55.4%
Central States Center for Agricultural Safety and Health (CS-CASH)	KS, MO, NE	597[a]	76	12.7%
Pacific Northwest Agricultural Safety and Health Center (PNASH)	AK, ID, WA	1,075	139	12.9%
Southeast Center for Agricultural Health and Injury Prevention (SCAHIP)	KY, TN	871	212	24.3%
Great Plains Center for Agricultural Health (GPCAH)	IL, KY, MN, OH, WI, WV	– [b]	135	– [b]
Total		4,044[c]	1,393	31.1%

[a]A link was also shared through a Facebook post.
[b]Distribution methods included listservs for some states, newsletter for others, direct email in yet others; therefore the number invited is unknown.
[c]Totals are based on known counts from four centers.

Results. The following summary of findings is based on study participants from the SCCAHS catchment area (n=831). The majority of respondents were County Agents and State Specialists, but many roles across Extension were represented from Administrators to Support Staff (Figure 8). Primary programmatic areas of focus were Agriculture (49.9%) and Youth (33.2%). The primary methods Extension professionals used to learn about COVID-19 were formal guidance documents, web-based platforms, and mass media (Figure 9). While 'health-care providers' was the primary source used by less than 1% of respondents, it was the most trusted source of information for COVID-19 prevention and treatment, followed by Extension and University administrators. Based on these findings, it is unsurprising that most respondents feel they have the information needed and were practicing strategies to protect themselves from contracting COVID-19. Only 13.5% reported visiting a NIOSH Agricultural Safety and Health Center website for information or resources on COVID-19. While this is not a positive finding, it reveals an opportunity to improve the reach and use of resources offered by the Center. Although little trust existed for 'social media influencers' as a source of information, social media was the most frequently used method to share information regarding COVID-19 (Figure 10).

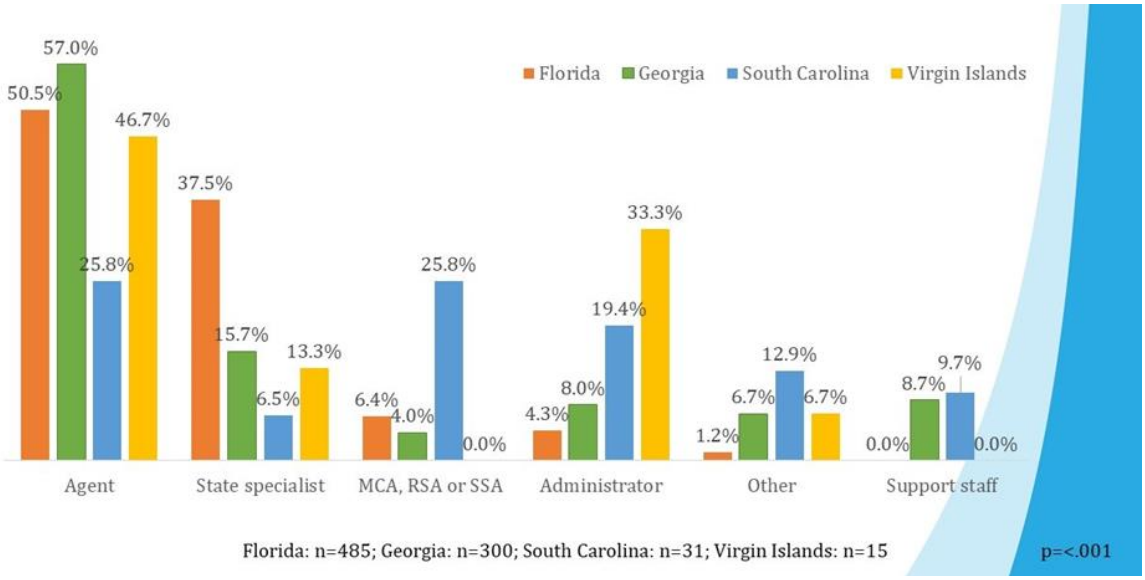

FIGURE 8. Distribution of Extension Respondents by Role in SCCAHS's catchment area

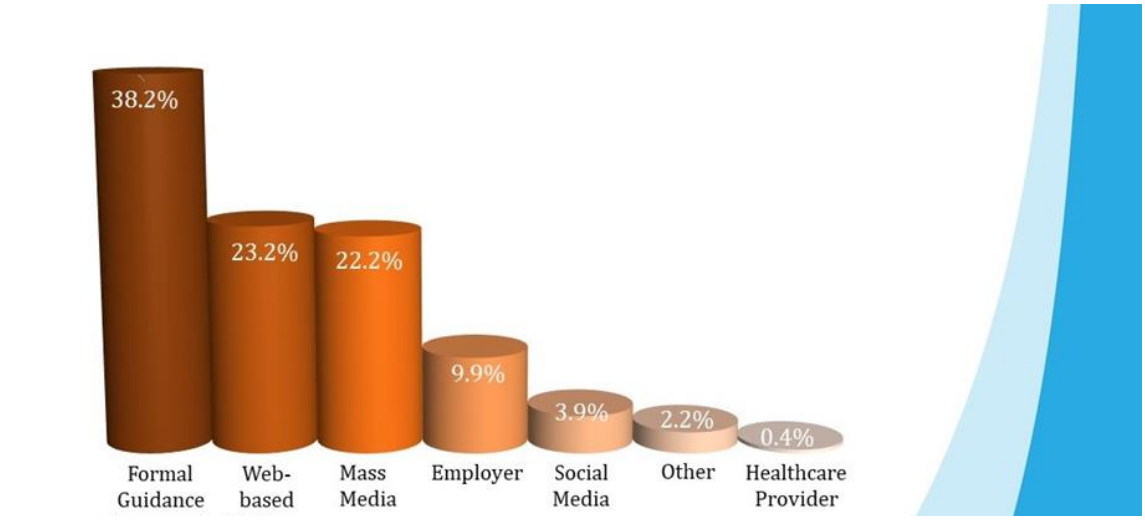

FIGURE 9. Primary Methods Extension Professionals Used to Learn About COVID-19

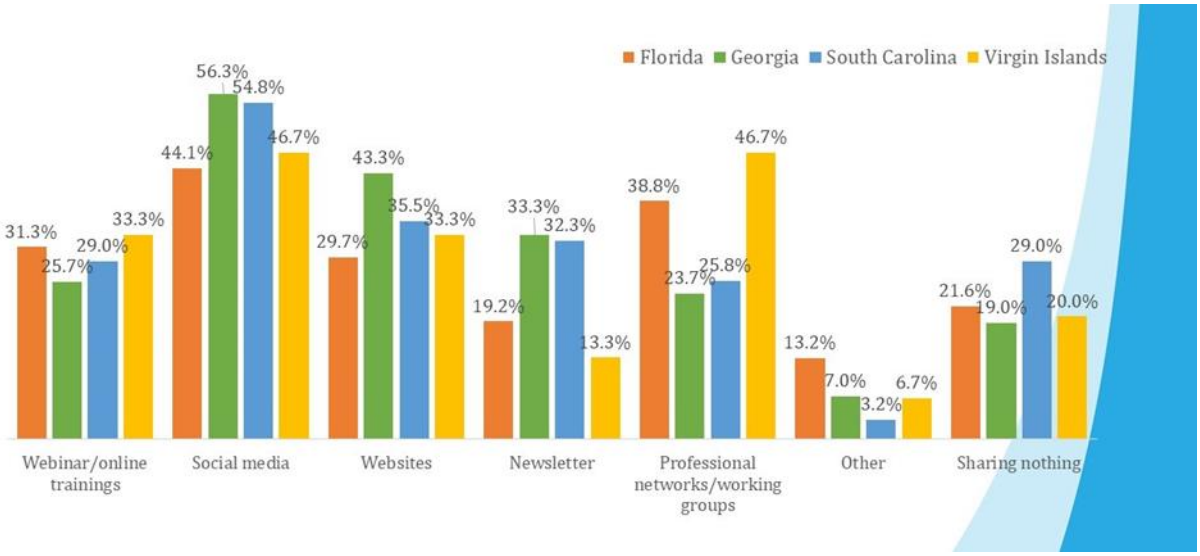

FIGURE 10. Methods used by Extension Professionals in the SCCAHS region to share information regarding COVID-19

Three in four respondents reported observing signs of stress or emotional symptoms to some degree during the COVID-19 pandemic among their clientele (Figure 11). Similarly, a concerning number of Extension professionals were facing challenges with work-life balance and working remotely with family needs, as well as experiencing elevated levels of worry and anxiety (Figure 12). This may be attributed to nearly three quarters respondents working from home during the pandemic while maintaining regular hours or in many cases, working more hours and facing challenges like arranging childcare while schools were closed. However, the majority felt prepared to address professional challenges and they were getting the support they needed. Overall, Extension professionals feel prepared and are adapting approaches to meet the needs of audiences they serve. Given the uncertainty of the COVID-19 pandemic timeline and unanticipated effects that will likely continue to emerge, additional support will be needed to mitigate the impacts on Extension professionals and the different audiences they serve.

FIGURE 11. Extension Observation of Stress or Emotional Symptoms Among Clientele During the COVID-19 Pandemic

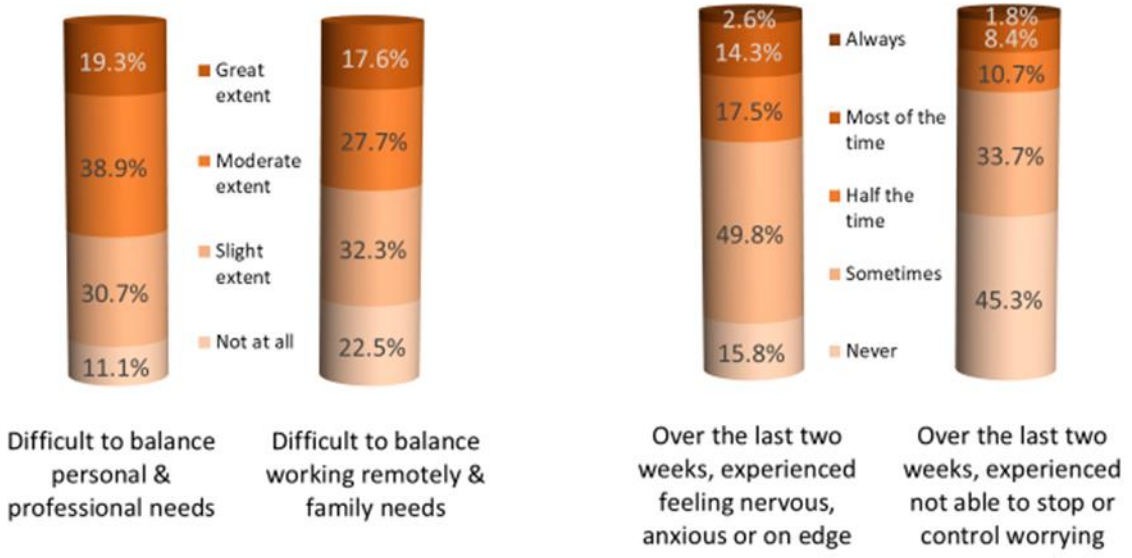

FIGURE 12. Indicators of Stress and Mental Health Among Extension Professionals in the SCCAHS region

Dissemination. Throughout Quarter 4, Year 4, evaluation translation/dissemination activities included:

- Article in American Evaluation Association (AEA) Extension Education Evaluation (EEE) Topical Interest Group (TIG) Newsletter, June 2020
- Commentary in Journal of Agromedicine – Co-publication with SCAHIP
- SCCAHS Webinar – "Impacts of COVID-19 on Extension" – Dr. Sebastian Galindo & Dr. Glenn Israel
- 2020 State of the Science Meeting Roundtable Presentation – Dr. Galindo, Dr. Sampson (SCAHIP) and Dr. Ramos (CS-CASH)
- Summary of findings were shared with Florida and Georgia Extension leadership
- Collaborated with Dr. Angela Lindsey and Heidi Radunovich to coordinate the mental health first-aid trainings for Extension organizations across the Southeast region.

Next steps:

- Provide technical reports for each state/territory that participated in the study – in progress
- Follow-up surveys

SCCAHS Stakeholders

The second COVID-19 questionnaire developed contained similar components of the Extension survey at a reduced length and considered the perspective from a broader audience. The survey was distributed to existing contacts in the SCCAHS and PIE Center list servs provided by the Outreach core beginning in July 2020. Similar to the approach for the Extension survey, a series of strategically crafted and timed reminder messages was sent before closing the survey in August 2020. Data collection is complete, and analysis of substantial 494 responses (454 complete, 40 partial) is currently in progress.

Outreach/ECO. Throughout Year 4, monthly internal ECO group meetings were attended by members of the administration, evaluation and the outreach cores to foster internal communication, offer support and strategize opportunities for participatory evaluation of Outreach activities. As a result, the Evaluation Program developed several tools to monitor the quality and effectiveness of various products. Data collected will contribute to enhancing the relevance and potential value of future webinars, SOS meetings and other products developed by the Center. The evaluation team is currently implementing steps to use information collected from these activities beginning with sharing findings that provide insight on reach and engagement during SCCAHS Internal Operations Communications (IOC) calls and ECO meetings.

- Webinars (2) – SCCAHS Webinar attendees are invited to complete two surveys through Qualtrics. The first is automatically presented immediately after the webinar and a follow-up is sent 3 months after the webinar takes place.

- State of the Science meeting (2) – collaborated with the Outreach Coordinator to develop post surveys for 2020 SOS meeting attendees for both September 11th and 18th. Sending an additional follow-up survey is under consideration by the Evaluation team.

- COVID-19 Toolkit Training (2)

    1. Toolkit webinar evaluation – target audience is Extension and other professionals interested in or currently conducting COVID-19 training programs to agriculture, forestry, and fishery (AFF) supervisors and workers. The online survey was sent to all attendees in September and data collection is in progress.
    2. Post-training assessments (4) – trainers who choose to incorporate the COVID-19 Toolkit in their programs can request access to surveys for training participants to complete. Available in English and Spanish, the surveys are available electronically through Qualtrics or a PDF can be printed to be completed by hand.

Expanding Partnerships

Pesticide Application Training

Dr. Jay Ferrell, Professor and Director of the Center for Aquatic and Invasive Plants and Pesticide Information Office for UF/IFAS approached Dr. Galindo in October of 2019 to discuss approaches to evaluate the impact of county faculty providing pesticide license certification training. There is a lack of quality and effectiveness evaluation protocols in this specialized area among many US states, including two in our region: Florida and North Carolina. The evaluation team met with Dr. Ferrell in January 2020, to begin planning the approach and identify needs. Dr. Galindo invited Dr. Karam Diaby (Health Economist) and Dr. Tara Sabo-Attwood (Environmental & Global Health) to support this effort, who both expressed interest in participating in a project focused on evaluating the impacts of pesticide training programs. Dr. Ferrell also recruited county agents to assist in the planning, development and execution of such a program. Due to the COVID-19 pandemic, this effort has been paused, but the team hopes to resume planning activities in Year 5.

AgriSafe
After facilitating the connection and collaboration between AgriSafe and the SCCAHS Outreach Core, the Evaluation Director and Coordinator attended the trainings led by Knesha Rose-Davidson from Agrisafe, supported by Dr. Ricky Telg in March 2020, held at the Florida Farm Bureau office in Gainesville, FL. The purpose of attending was to become more familiar with their training content and procedures to later provide informed recommendations and assist in creating relevant evaluation instruments. The partnership expanded with the development of a grant proposal to obtain funding from USDA to address existing mental health issues.

Agricultural and Biological Engineering
Dr. Serap Gorucu, Assistant Professor, Risk Analysis, Safety, and Health of Agricultural Systems began attending Evaluation Program weekly meetings in July 2020. Dr. Gorucu is a new hire in the Institute of Food and Agricultural Sciences, Agricultural and Biological Engineering who has a focus in injury surveillance and coding schemes.

Publications and Presentations

Israel, G., Galindo, S., & Ward, C. (2020, June). Maximizing Response to Surveys of Extension Professionals: The Case of the COVID-19 Impacts Survey. *EEE TIG NEWS: AEA Extension Education Evaluation TIG Newsletter*, 3.

Mitchell, R.C., Israel, G.D., Diehl, D.C., & Galindo-Gonzalez, S. (2020). From Plan to Action: Adapting Evaluation to Serve the Developmental Needs of a Newly-Funded Multidisciplinary Research Center. *Evaluation and Program Planning*, 78, 101729. PMID: 31698318 DOI: 10.1016/j.evalprogplan.2019.101729

Mitchell, C., Israel, G. D., Galindo, S. & Diehl, D. C. (February, 2020). From Plan to Action: Adapting Evaluation to Serve the Developmental Needs of a Newly-Funded Multidisciplinary Research Center. *Evaluation and Program Planning*. 78. ISSN 0149-7189

Halverson, C. & S. Galindo. (2019, April). Creating an Organizational Culture Responsive to Emerging Public Health Threats. Presented at the 2019 National Conference of the American Association of Occupational Health Nurses (AAOHN), Jacksonville, Florida.

Galindo, S., Sampson, S., & Ramos, A. (2020). Agricultural Centers Roundtable – Impacts of COVID-19 on Extension Agents. 2020 State of the Science Meeting focused on Global Pandemics and the Agricultural Workforce: Research and Policy Implications, Virtual, Sept 18. http://www.sccahs.org/wp-content/uploads/2020/09/SOS-Impacts-of-Covid-19-on-Extension-Session7-compressed.pdf.

Galindo, S., & Israel, G. (2020, August 20). Impacts on COVID-19 Extension [Webinar]. Southeastern Coastal Center for Agricultural Health and Safety. http://www.sccahs.org/index.php/2020/07/29/august-20-2020-webinar/.

Galindo, S., Mitchell, C., Saqib, H., Israel, G. D., & Diehl, D. C. (2019). Assessing SCCAHS' economic impact: Return on investment thematic approach for heat-related illness. Poster presented at the annual conference of the International Society for Agricultural Safety and Health, Des Moines, Iowa, June, 2019.

Nelson, J. D., Galindo, S., Israel, G. D., & Diehl, D. C. (2019). Developing a Common Evaluation Framework for the Centers for Agricultural Safety and Health. Oral presentation at the annual conference of the International Society for Agricultural Safety and Health, Des Moines, Iowa, June, 2019.

Sampson, S., Mazur, J., Israel, G., Galindo, S. & Ward, C. (2020). Competing Roles and Expectations: Preliminary Data from an Agricultural Extension Survey on COVID-19 Impacts. *Journal of Agromedicine*. DOI: 10.1080/1059924X.2020.1815619

Saqib, Harris. Strategic Planning: A Surfacing Activity for the Development of an Expanding NIOSH AgFF Health and Safety Center. Poster presented at: ISASH Conference. July 8-9, 2020; Virtual.

Saqib, H., Galindo, S., & Irani, T. Surfacing for Strategy: Organizational Learning for the Strategic Development of an Expanding NIOSH AgFF Occupational Health and Safety Research and Outreach Center. Poster and lightning talk session accepted, but not presented at: ASHCA Conference; March 19–20, 2020; Las Vegas, Nevada. (Conference canceled)

Saqib H, Galindo S, & Irani T. Surfacing Strategies: Organizational Learning for the Strategic Development of an Agriculture, Forestry, and Fishing Occupational Health and Safety Research and Outreach Center. Poster presented at: International Conference on Sustainable Development; September 23-24, 2019; Columbia University, New York.

Section III – Research Projects

Pesticide & Heat Stress Education for Latino Farmworkers That is Culturally Appropriate

PD/PI: Joseph Grzywacz
Co-PD/PI: Antonio Tovar-Aguilar

Overview

Farmworkers, the majority of whom are Latino immigrants from Mexico, experience elevated rates of occupational injury and illness. Chronic low-dose exposure to pesticides and extreme heat and humidity are major sources of poor occupational health outcomes. Recent revisions to the EPA's Worker Protection Standard (WPS-r) and growing concern over heat-related illness (HRI) necessitate the creation of safety education curricula that to minimize pesticide exposure and the deleterious effects of exposure to heat and humidity. Use of community health workers or *promotoras de Salud* (*promotoras*) is common in farmworker occupational health, but few WPS or HRI curricula have been developed for dissemination by *promotoras*, and there is scant evidence that *promotoras* are equally effective as "professional educators" who often have college degrees or highly specialized training in the cognate material. The growing concern over heat illness and recent revisions to the U.S. Environmental Protection Agency (EPA) Worker Protection Standard focused on pesticide exposure training led to PISCA's work on a new safety education tool.

PISCA's overall goal is to reduce the burden of poor occupational health outcomes among Latino farmworkers resulting from pesticide exposure and heat illness. To achieve this goal the proposed project has built a community-advocate-university partnership to accomplish three primary aims –

1. Create reproducible, culturally- and contextually-appropriate curricula for Latino farmworkers targeting pesticide exposure (suitable for meeting employer requirements under the revised WPS) and heat-related illness (HRI).

2. Determine the effectiveness of the developed pesticide and HRI curricula implemented by professional educators in promoting advocated safety behaviors.

3. Identify the comparative effectiveness of promotora-based implementation of developed pesticide and HRI curricula relative to the use of professional educators.

Key Accomplishments 2019-2020

The PISCA project continued to accomplish its specific aims in three distinct phases demonstrating NIOSH's emphasis on Research to Practice (r2p). Each of the three phases used distinct methods. Phases 1 and 2 will determine the effectiveness of developed pesticide safety curricula (reflecting revisions required by the Revised Worker Protection Standards; WPS-r) and heat-related illness (HRI) curricula in a controlled environment where professional bilingual research associates disseminate all training materials to farmworkers under controlled conditions. Although research paused from March – October, the PISCA team will continue to complete Phase 3 – demonstrating the value of using trained lay community health educators or promotoras to change knowledge, attitudes, and behaviors pertaining to pesticide safety and heat stress prevention under less controlled environments.

Specific Aim 1. Create reproducible, culturally- and contextually – appropriate curricula for Latino farmworkers targeting pesticide exposure; suitable for meeting employer requirements under the revised Worker Protection Standard (WPS), and heat-related illness (HRI).

The developed curriculum earned EPA certification as meeting the training requirements of the revised Worker Protection Standard (EPA WPS Worker PST 00036). Project curricula, in the form of PowerPoint presentations and facilitator guides, were distributed to participants of the East Coast Migrant Stream Forum Workshop (see productivity section below) A comic book, containing ancillary material for the EPA-certified curriculum, was finalized and printed. In January, 2020, community outreach workers employed by migrant health centers across the state of Georgia were trained to deploy the PISCA curriculum.

Specific Aim 2. Determine the effectiveness of the developed pesticide and HRI curricula implemented by professional educators in promoting advocated safety behaviors.

All Phase 2 data are entered and are undergoing analysis. Preliminary analyses support the study hypotheses, that the PISCA curriculum perform better than the EPA-supported video training. Abstracts are under-preparation for submission to the American Public Health Association for its 2020 meeting in San Francisco, as well as 2020 meetings of the East Coast Migrant Stream Forum.

Specific Aim 3. Identify the comparative effectiveness of promotora-based implementation of developed pesticide and HRI curricula relative to the use of professional educators.

- *Launched in fall of 2019. All IRB materials have been updated, all study instruments have been reviewed, pilot tested, and updated.*
- *Community mapping of farmworker camps in the study region, and contacts with crew leaders have been completed.*
- *Additional promotoras have been hired and trained*
- *One practice training session has been completed (N=8 farmworkers)*

Year 4 of the PISCA project was focused on the field procedures necessary for Phase III of the project, that will now move into Year 5. The PISCA curriculum was deployed using a *promotora* model to N=400 farmworkers and collecting pre-and post-training assessments of knowledge, attitudes and behavioral intentions related to pesticide safety and heat-related illness. The investigate team focused on the PISCA curriculum because preliminary analyses of Phase II data indicated the PISCA WPS performed better than the EPA-video. Year 4 data collected will be used in the final project year to accomplish Specific Aim 3 of the project.

During Year 4 PISCA expanded the scientific underpinnings of Phase III. Specifically, the scientific evidence underlying the effectiveness of *promotoras* is scant – particularly as it relates to *promotora* experience, training, and qualifications. Inattentiveness to this issue is problematic as the Affordable Care Act escalated the use of Community Health Workers in diverse forms of public health practice. One casualty of increased reliance on Community Health Workers is the possibility that "formalizing" the position of a Community Health Worker may inadvertently result in diminishment of their effectiveness. Just as Crandall and colleagues (2003) noted that medical students' attitudes regarding disadvantaged groups decline as they traverse medical school, it is possible that formalization of community health workers may also result is less commitment to the community they serve. Indeed, simple things like holding a valid driver's license or having 100 hours of community experience may disqualify individuals who might otherwise be effective *promotoras*. Thus, PISCA decided to randomly assign half the targeted sample of Phase III (i.e., 400) to "novice" promotoras who have no experience delivering the PISCA curriculum (but may have delivered other curricula), and the other half to "experienced" promotoras who have been involved in the PISCA project (although not delivering curricula) since the project's inception. This feature will allow tacit evaluation of whether "deep" inculcation in the curriculum (i.e., theory underlying its development, stories and rationale for why the curriculum progresses the way it does, theory of adult learning underlying the curriculum) results in different outcomes.

Crandall SJS, Volk RJ, Loemker V. Medical Students' Attitudes Toward Providing Care for the Underserved: Are We Training Socially Responsible Physicians? *JAMA*. 1993;269(19):2519–2523. doi:10.1001/jama.1993.03500190063036

Specific key activities were:

1. Schedule and complete all necessary training sessions.
2. Recruit, enroll, and collect pretest and posttest data from farmworkers to achieve the recruitment goal of N=400.
3. Complete all data entry, data cleaning, and measurement construction.

COVID-19 Response

A large influx of H-2A workers into the Southeast region creates an increased need for WPS training immediately to enable their ability to start working the fields. Although ever-present, this challenge was not anticipated to become an impediment because the PISCA project has built strong and trusted relationships among farmworker communities, and with farm owners/ operators in the region. As the COVID-19 Pandemic worsened and research protocols were halted, PISCA was not able to continue into Phase III. PISCA did however transition to work virtually with communities, and these trusted academic-community partnerships offered the project flexibility to continue with the development and implementation of a COVID-19 survey (N=123, one-third were employed in crop agriculture).

- Three-times more farmworkers than non-farmworkers reported not having what they needed at home to support their children's schooling.
- The most frequently missing items were: #1-printer, #2 computer, #3 internet access.
- Farmworkers were more likely than other immigrant Latinos to embrace false beliefs about COVID-19, including mega-doses of Vitamin C prevents COVID-19
- Individuals who get COVID-19 will probably die
- COVID-19 only affects rich people (important because the President of Mexico expressed this belief on social media), and social media was the primary source of information about COVID19 for farmworkers whereas other immigrant Latinos reported a wider set of resources.
- Hot beverages like green tea, chamomile or apple cider prevent COVID19

- Relative to immigrant Latinos in other occupations, more farmworkers than non-farmworkers were tested for COVID-19. Of the 18 individuals tested, 4 tested positive, three of whom were farmworkers.
- Despite the fact that farmworkers were classified as "essential" workers, there was no difference in the percentage of immigrants reporting being told they were an essential worker by farmworker versus not.
- PISCA found no evidence that farmworkers ability to work was more or less hampered by COVID-19.
- Farmworkers were more likely than non-farmworkers to report an increase in handwashing.
- Farmworkers were less likely than non-farmworkers to avoid contact with sick people.
- Farmworkers were less likely than non-farmworkers to social distance.
- Farmworkers were more likely than non-farmworkers to wear a face mask.
- Farmworkers were more likely than non-farmworkers to wash hands immediately after coughing or sneezing.

Publications and Presentations

Tovar, A., Trejo, M. PISCA: Entrenamiento en Pesticidas e Insolación que es Culturalmente Apropiado – Community Health Workers (CHW) Training on the Delivery of the updated Workers Protection Standard (WPS).

Liebman, A.K., Marin, A.J., Hopewell, J., Trejo, M., Tovar Aguilar, A., OrdazGudino, C., Garcia Rendon, M., & Grzywacz, J.G. (2018). Normas de Protección al Trabajador Agrícola, [Kit]. Tallahassee, FL: Florida State University.

Denis-Luque, M., Luque, J., Sanit-Louis, C. Tovar, A., & Grzywacz, J.G. (November, 2019). Research to practice (R2P in occupational safety and health: Reducing pesticide exposure and preventing heat-related illness.Presented as a round table at the American Public Health Association Meeting, Philadelphia, PA.

Luque, J., Becker, A., Bossak, B., Grzywacz, J.G., Tovar, A. & Guo, Y. (October, 2019). Knowledge and practices for adapting to working in the heat among Latino farmworkers in the Florida-Georgia border region. Presented as a round table at the East Coast Migrant Stream Forum, San Juan, Puerto Rico.

Comic Book - Juan Abre los Ojos, Como Protegerse de los Pesticidas. Authors: Amy K. Liebman, Salvador Sáenz, Antonio Marín, Maribel Trejo, J. Antonio Tovar-Aguilar and Joseph G. Grzywacz. Arte y Diseño: Salvador Sáenz, Asistente de arte: Uriel Sáenz, 2019

Tovar, A., Trejo, M. PISCA: Entrenamiento en Pesticidas e Insolación que es Culturalmente Apropiado – Community Health Workers (CHW) Training on the Delivery of the updated Workers Protection Standard (WPS).

Grzywacz, J., Gonzales-Backen, M., Liebman, A., Marin, A., Trejo, M., Gudino, C.O., Economos, J. and Tovar-Aguilar, J.A. (2019). Attending to Pesticide Exposure & Heat Illness among Farmworkers: Results from an Attention Placebo-Controlled Evaluation Design. *Journal of Occupational and Environmental Medicine*. *61*(9): 735-742.

Denis-Luque, M., Luque J., Saint-Louis, C., Tovar, A. and Grzywacz, J.G. (November 2019). *Research to Practice (R2P) in occupational safety among South Florida Haitian workers.* Roundtable presentation at the meeting of the American Public Health Association. Philadelphia, PA. East Coast Migrant Stream Forum. San Juan, PR.

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Grzywacz, J.G., Luque, J., Becker, A. (2018). *Pesticide exposure and its health effects among Latino and other farmworkers.* In R. Burke & A. Richardsen (eds.), Increasing occupational health and safety in workplaces: Research and practice. Edward Elgar Publishing.

Grzywacz, J. G., & Allen, J. W. (2017). Adapting the Ideas of Translational Science for Translational Family Science. *Family relations*, *66*(4): 568-583. PMID: 29422702

Grzywacz, J.G., Gonzales-Backen, M.A., Aguilar Tovar, A., Marin, A., Trejo, M., Ordaz Gudino, C., Garcia Rendon, M., & Liebman, A.K. (November 2018*). Improving pesticide and heat stress knowledge among Latino farmworkers: Phase I of PISCA*. American Public Health Association Annual Meeting. San Diego, CA.

Tovar-Aguilar, A., (April 10, 2018). A Web of Immigration and Labor Regulation and How it Binds Farmworkers. *American Association of Geographers Annual Meeting*. New Orleans, LA.

Tovar-Aguilar, A., (April 4, 2018). Translating Scientific Research on Heat Related Illness into Extension Education for Florida Farmworkers. *Society for Applied Anthropology Annual Meeting.* Philadelphia, PA.

Using Social Marketing to Prevent HRI and Improve Productivity among Farmworkers

PD/PI: Paul Monaghan
Co-I: Maria Morera
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Co-I: Antonio Tovar

Overview

Ongoing heat-related illnesses (HRI) and fatalities among Florida farmworkers underscore the need to identify economic incentives to occupational heat safety implementation in agriculture. Although culturally- and linguistically- responsive safety promotion interventions have proven effective in delivering important agricultural safety information to diverse farmworker populations, workplace barriers, such as piece-rate pay and limited access to rest breaks, continue to discourage HRI preventive practices. Three key problems limiting greater investment in heat safety are: i) insufficient documentation of the comparative effectiveness of competing models of farmworker safety promotion, ii) a paucity of observational data linking safety behaviors to health outcomes, and iii) a lack of translation between health outcomes and industry benefits.

The overall goal of this research project is to elucidate factors linked to organizational demand for farmworker safety. The project is guided by the following three aims:

1. Utilize social marketing research to educate and motivate field supervisors and piece rate harvesters to follow HRI recommendations, including through culturally appropriate social media platforms to reinforce behavior adoption in the field.

2. Determine the effectiveness of the social marketing approach in comparison to existing HRI educational programming currently used in Extension and employer-based models of safety promotion.

3. Establish the relationship between hydration interventions, changes in safety culture and productivity levels by measuring output per worker in order to incentivize investment in farmworker safety.

Key Accomplishments in 2019-2020

Focus Group Research

Focus group research with Florida tomato harvesters was conducted as part of the project effort to create a social marketing campaign for HRI prevention that is tailored to their needs, culture, and language. The goal of the research was to identify the opportunities and constraints harvesters face in implementing HRI prevention practices and explore their receptivity to a social marketing campaign. Project personnel, in partnership with the Farmworker Association of Florida, conducted the focus groups in Immokalee, Florida from February 15 to 16, 2020.

Research Methods. Drawing on the Health Belief Model (HBM), an explanatory framework that postulates health-related behavior depends on the desire to avoid illness and the belief that a specific health action will prevent it, a twelve-question focus group guide was constructed to explore tomato harvesters' perceptions and practices regarding HRI prevention. Focus group questions elicited baseline heat safety practices, benefits and barriers to staying hydrated at work, and opportunities for broader implementation of fluid-intake strategies. The focus group guide is illustrated in Table 1.

Using techniques outlined by Krueger (2014), the focus group questions were designed for a flexible conversation to allow deeper examination of topics respondents expressed particular interest in and further exploration of new issues they introduced. The instrument, originally developed in English, was translated to Spanish by a bilingual native Spanish speaker with experience working with farmworkers throughout Florida. The translation was reviewed by two biliterate members of the research team.

TABLE 1. Focus group guide used in discussions with Florida tomato harvesters.

Influential factor	**Focus group question**
Baseline behaviors	What is one thing you do to avoid becoming overheated at work?
Contextual factors	Walk us through a typical workday harvesting tomatoes from the moment you leave your home until you return.
Fieldwork conditions	Describe what your lunch break is ordinarily like. Is there shade? How long does it last?
Situational opportunities	What other opportunities do you have throughout your workday to drink fluids?
Baseline behaviors	What kinds of beverages do you typically consume throughout the workday?
Perceived/situational barriers	Name one factor that keeps you from drinking more fluids at work.
Perceived severity	What do you think might happen if you do not drink enough fluids while working?
Perceived benefits	What are some benefits to staying hydrated at work?
Cues to action	Is there anything that would personally motivate you to drink more fluids while working?
Facilitators	If you were a grower, what would you do at the farm that would make it easier for workers to drink more water?
Safety climate	What kind of role do you think a crew leader can play in hydration strategies for workers?
Receptivity to social marketing campaign	Do you feel a heat safety *promotor* would be a helpful strategy for improving fluid-intake practices at work?

Sampling and Recruitment. Focus group participants were recruited by the farmworker association. Convenience sampling was used to select the participants. Three focus groups, comprised of three moderators and eight to ten participants each, were conducted during the study period. All participants gave their informed consent for inclusion before participating in the study. A total of 25 tomato harvesters participated in the focus group discussions. The discussions lasted approximately one hour and were audio recorded. Following each discussion, demographic information including age, gender, birthplace, education, and work experience was collected confidentially with the use of audience-response technology. Audio recordings were transcribed by a professional transcription company.

Data Analysis. Focus group transcripts were coded using MaxQDA software for qualitative data analysis (version 11; VERBI GmbH, Berlin, Germany). Two research assistants used a constant comparative method of analysis: reading the transcripts, organizing quotes into themes, re-reading all of the quotes in a single theme and looking for additional sub-categories or collapsing categories together (Bernard, 2018). The research assistants employed this approach to develop and refine a thematic codebook. The process was repeated until no additional themes were identified and consensus on the codebook was reached.

Preliminary Results. Focus group participants were all Latino farmworkers. Approximately three quarters had worked in US agriculture for at least 16 years and 44% had worked in agriculture for more than 20 years regardless of location. All participants were foreign-born from Mexico and Guatemala. The sex ratio of focus group participation was close to 50:50. Half of the participants were aged 36 or older whereas a little more than a third were aged 26-35. The majority reported 6 years or less of schooling. All participants had received some form of heat safety training. Fifty-two percent were trained by their employers, 40% by UF/IFAS or PISCA, and 28% by the Coalition of Immokalee Workers, with some workers trained by more than one of these.

The themes that emerged from the focus group discussions fell into four key domains, reflecting the various internal and external factors that drive protective behaviors in the field: 1) baseline heat safety and fluid intake practices, 2) perceptions and contextual factors shaping hydration routines, 3) situational, economic, and social constraints to implementation of HRI-prevention measures, and 4) opportunities for improved hydration strategies. An overview of the thematic codebook is illustrated in Table 1.

Baseline heat safety and fluid intake practices

Tomato harvesters applied a variety of strategies for cooling and hydrating throughout the day. These included using protective clothing, bringing their own beverages, drinking water when emptying harvest bins, and taking strategic breaks. Long-sleeved shirts, hats, and scarves were commonly used to protect against the sun and sweat.

> (FG1P8) *Siempre tengo la camisa manga larga, luego el paño nada más solo se lo amarra uno aquí, me lo amarró yo aquí no se si los demás lo hacen, me lo amarró para que el sudor no le caiga a uno en la cara, luego como guantes y todo, y ya.*
> I always have a long-sleeved shirt, then I just tie a scarf here, I tie it here. I do not know if the others do it, I tie it so that the sweat does not fall on my face, then I put some gloves and everything, and that's it.

Yet, some cooling strategies were, paradoxically, unsafe and reflected the risk conditions and lack of protective equipment encountered in field production. For example, several focus group participants reported the common practice of seeking shade underneath a truck.

(FG1P9) *Me iba abajo del troque—se va uno abajo del troque a mediodía mejor—porque no hay sombra.*
I would go under the truck – at noon one is better off going under the truck—because there is no shade.
(FG1P4) *No porque si te metes adentro del tomate es peor, porque el tomate esta alto te ahogas más.*
No because if you get inside the tomato field it is worse, because the tomato is high up, so you suffocate more.

(FG1P9) *Te ahogas y tienes que irte mejor abajito del troque o a veces así que le pega un tantito, o se va donde le dé un-- O hasta se va y se acuesta uno por el calor.*
You suffocate and you have to go under the truck, or sometimes when it hits you a bit, or you go where – Or you even leave and lay down because of the heat.

Perceptions and contextual factors shaping hydration routines
Focus group participants indicated that they were aware of the importance of hydrating and reported fluid intake routines. One male participant explained that his supervisor would warn the harvesters in advance when work was expected to be particularly grueling and he would prepare accordingly.

(FG3P9) *Yo voy preparado. Voy con mi barrilete, más bebida y todo ya. Ya estoy listo."*
I go prepared. I go with my cooler, more drinks and everything ready. Good to go.

A female participant listed the various beverages she prepared regularly.

(FG3P5) *Yo lo preparo un día antes, lo paso en la licuadora. Cuando yo me aburro del pepino [en agua]—porque se aburre también del diario—cuando me aburro ya no llevo, ya llevo nada más agua de limón, pero sin azúcar, nada más puro limón. Cuando ya no quiero, llevo puro agua. Voy cambiando porque me canso de tomar nomás solo una cosa.*

I prepare it a day before, I run it through the blender. When I get bored of cucumber water —because you also get bored if you drink it daily — when I get bored I no longer bring it, I only carry lemon water, but without sugar, just pure lemon. When I no longer want that, then I carry just water. I change beverages because I get tired of drinking just one thing.

Several focus group participants pointed out that their pre-existing health conditions put them at higher risk of suffering negative impacts from heat stress and dehydration.

(FG3P1) *Que tomen sus aguas, porque si no se van a deshidratar y algunos pueden morirse porque les ha dado infarto del corazón…*
Let them drink their water, because if they don't, they will dehydrate and some may die because they've had a heart attack ...
(FG3P6) *Si ya no puedo mejor descanso, porque el calor y la presión se sube y no puede uno continuar si está fuerte el calor.*
If I cannot continue working I better rest, because the heat and the blood pressure rises and you cannot continue working if the heat is strong.

Yet, several expressed concern about drinking too much water or very cold water, reporting doing so results in illness.

(FG1P4) *Yo como siempre tengo la maña de cargar un botecito vacío, pero lleno de agua, de esos de soda o lo que sea, pero si me asoleé por lo mismo que le falta a uno agua a veces, pero también, no puedes tomar mucha agua.*
As always, I have the habit of carrying an empty bottle, but full of water, like a soda bottle or whatever, in case I get too much sun and there isn't enough water, but also, you can't drink too much water.

(FG3P6) *Si está demasiado fuerte el calor, tomaba un descanso de cinco minutos y vuelve a tomar agua; un poquito, no mucho, porque te hace vomitar.*
If the heat is too strong, I take a five-minute break and drink water again; a little bit, not a lot, because it makes you vomit.

Situational, economic, and social constraints to implementation of HRI-prevention measures
Focus group participants identified a series of workplace factors that prevent them from hydrating or staying cool. These included long distances to water coolers, piece work arrangements that discouraged water and rest breaks, lack of shade in the fields, and harvesting at midday when temperatures are highest due to the type of tomato or harvesting operation.

(FG1P9) *Ahí empieza uno bien tarde a pizcar, a veces empieza uno a las 10:00, 11:00 AM a veces a pizcar, sí en la mañana y es cuando está el calor.*
There one begins harvesting very late, sometimes one starts at 10:00, 11:00 AM sometimes to harvest, yes in the morning and that is when it is hot.

Participants in all three discussion groups indicated that their fluid intake practices depended in large part on the actions and attitudes of their employers or supervisors. Several expressed a reluctance to pause for water and some felt harassed by supervisors for taking breaks. Others reported cases where drinking water had either run out or was not available when needed.

(FG1P10) *Estábamos sacando plástico, y me dejaron sin agua, y el señor que manda ahí, me espantó, porque yo iba cortando—pero el tomate no lo corta, tiene que sacar así nomás—me dejaron allí solita…*
We were taking out plastic, and they left me without water, and the man who is in charge there scared me, because I was cutting—but in tomato you don't cut the plastic, you have to remove it just like that—they left me there alone ...

(FG1FP) *Si está lejos el agua no vas a tomar.*
If the water is far away you are not going to drink any.

A few reported supervisors were attentive to their water needs by bringing the water closer to them or supplying additional beverages, particularly in smaller harvesting operations.

(FG1MP) *Le voy a decir que los patrones a veces sí que andan con el agua por donde quiera, ahí también porque yo en el que he trabajado, ahí llevan todo la yoga de aguas, terminó el agua, ahí viene y va con el otro…*
I'm going to tell you that sometimes the supervisors do go around with the water everywhere, there too because the place where I have worked, they carry all the water coolers, if the water runs out, they bring another one…

(FG3P7) *Lo que es normal, casi todos los pinteros llevan soda y agua.*

What is normal, almost all the smaller operations carry soft drinks and water. Nonetheless, approximately half of focus group participants felt that their rest and hydration needs went largely overlooked. Several described instances in which workers fell ill yet transportation was not available to bring them to a clinic or their home. A recurring response was that they felt they needed to endure these conditions in order to avoid being fired.

Opportunities for improved hydration strategies

Participants were receptive to a *promotor*-based social marketing campaign. One participant noted a *promotor* would legitimize rest and water breaks.

> (FG1P6) *Hay veces la persona va con un miedo que me pueden correr en el trabajo y cuando hay una persona agarra uno más confianza.*
> Sometimes you go [drink water] with the fear that they can fire you from your job, and when there is a person there [promotor], you gain more confidence.

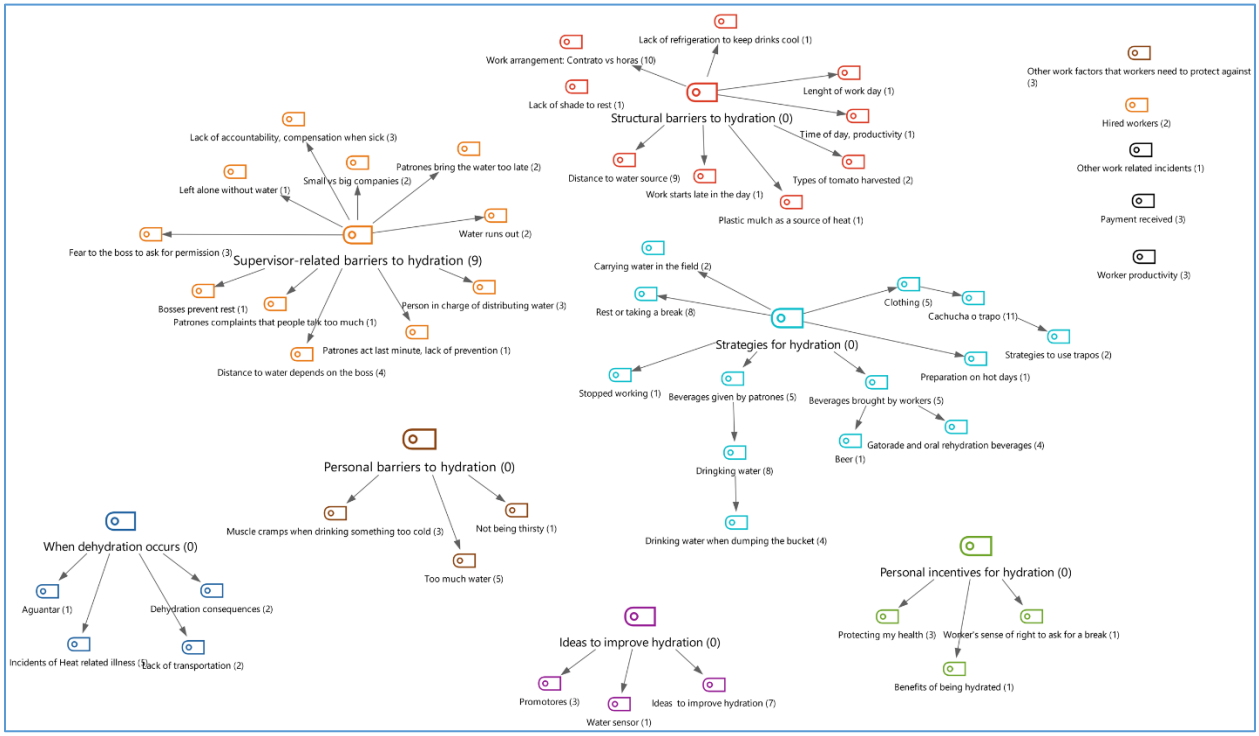

FIGURE 1. Graphic representation of preliminary analysis of focus group data using MAXQDA software.

Survey Research

Development of research instruments and procedures. Research instruments designed to conduct a needs assessment for agricultural safety during COVID-19 and gauge the impacts of the crisis on HRI prevention were developed during the summer of 2020. The instruments included a qualitative survey for growers, contractors, and labor supervisors and a quantitative survey for farm workers. Procedures for the collection and analysis of the data were also developed at this time. The qualitative data will help generate a hypothesis regarding the mechanisms of effective implementation of disease and injury prevention measures in the agricultural workplace. The quantitative data will track trends in 1) health beliefs and knowledge, 2) local factors structuring workplace behaviors, and 3) impacts of equipment and supplies shortages. Data collection will begin upon IRB approval, expected mid-October, 2020.

Publications and Presentations

Co-Investigators Maria Morera and J. Antonio Tovar-Aguilar attended and contributed to the 2020 Meeting of the Society for Applied Anthropology and the 2020 North American Agricultural Safely Summit of the Agricultural Safety and Health Council of America. Project investigators also published the results of focus group research conducted in central and southwest Florida.

Morera, M.C., Gusto, C., Monaghan, P.F., Tovar-Aguilar, J.A., & Roka, F.M. (2020). "We force ourselves": Productivity, workplace culture, and HRI prevention in Florida's citrus groves. *Safety,* 6(3), 41. doi:10.3390/safety6030041

Morera, M.C., Monaghan, P.F., Tovar-Aguilar, J.A., & Roka, F.M. (in press). JA:2021-19. Developing a social marketing intervention for heat safety among Florida tomato harvesters: Preliminary findings of formative research. Presented at the Agricultural Safety and Health Council of America 2020 North American Agricultural Safely Summit. *Journal of Agromedicine*. doi:10.1080/1059924X.2020.1763752

Morera, M.C., Tovar-Aguilar, J.A., Monaghan, P.F., Roka, F.M., & Gusto, C. (April, 2020). Resisting heat-related illness in a changing Florida climate. Presented at the 2020 Virtual Meeting of the Society for Applied Anthropology, April 15, https://www.appliedanthro.org/annual-meeting/2020-virtual-meeting.

Morera, M.C., Tovar-Aguilar, J.A., & Gonzalez, R.J. (2019). Hydration and productivity: Creating incentives for heat safety among H2A workers through social marketing. Workshop delivered at the 32nd Annual East Coast Migrant Stream Forum, October 11, Carolina, Puerto Rico.

Morera, M.C. (2020). Personalizing safety: Integrating culture and technology to incentivize injury prevention in Florida agriculture. Seminar presented to the Department of Agricultural and Biological Engineering, University of Florida, January 21, Gainesville, Florida.

Morera, M.C. (2020). Using a client-centered approach to move research into practice for injury prevention in Florida agriculture. Seminar presented to the Department of Agricultural Education and Communication, University of Florida, February 24, Gainesville, Florida.

Morera, M.C., Monaghan, P.F., Tovar-Aguilar, J.A., & Roka, F.M. (March, 2020). Developing a social marketing intervention for heat safety among Florida tomato harvesters: Preliminary findings of formative research. Poster presentation at 2020 North American Agricultural Safety Summit, March 19, Las Vegas, Nevada.

Morera, M.C., Monaghan, P.F., Tovar-Aguilar, J.A., & Roka, F.M. (2020). Resisting heat-related illness in a changing Florida climate. Oral presentation at 80th Annual Meeting of the Society for Applied Anthropology, March 20, Albuquerque, New Mexico.

Occupational Health and Safety Surveillance of Gulf Seafood Workers

Project PI: Andy Kane, Principle Investigator, UF Environmental and Global Health
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Overview

Commercial fishing represents some of the most dangerous work sectors in the world. Occupational fatalities and injuries in the fishing sector occur at rates much higher than national averages for all occupational fatalities and injuries. In the southeastern US, Florida has the highest fatality rate for seafood workers, and this third nationally only to Alaska and Massachusetts. Non-fatal, work-related injuries and negative health outcomes are common in many of the highly productive fishery sectors in the Southeast, including traumatic injuries including amputations and fractures, trunk and lower back strains; sprains; skin cancers; infections due to cuts, bites, punctures, entanglement; thermal exposure; inflammatory and rheumatoid conditions associated with repetitive motion; and work-related stress outcomes including depression, anxiety, fatigue, and alcohol and drug abuse (which, in turn, serve as secondary risk factors).

The overarching goal of this community-based research project is to support the safety and well-being of our fishery workforce through collaborative engagement with coastal seafood workers in Florida, Alabama and Mississippi, using a translational research-to-practice approach. This Ag Center project has two specific aims focusing on surveillance and hazard intervention. Surveillance will be conducted using in-person survey interviews, and by making direct field observations to discern workplace hazards and risk factors associated with the dominant Gulf coast fishery subsectors: shrimping, fishing, crabbing, and oyster and clam harvesting. Surveillance data will be used to identify and support relevant points of intervention for hazards in the different fishery subsectors throughout the study region. Through our Ag Center Outreach Core, we will engage with regional extension agents and fishery associations to translate project-related support materials, and lessons learned and intervention tools (from this project and from other NIOSH centers), to extended networking capacity and provide sustainable support for fishery workers in the study region and nationally. Specific aims for the proposed efforts are described below, and represent T0 (surveillance) to T2 (intervention and evaluation) phase contributions in translational public health research.

Specific Aim 1: Conduct surveillance to discern occupational hazards and risk factors, history of injuries, and knowledge of co-worker deaths for workers engaged in multiple fishery subsectors along the Gulf coast of Florida and Alabama. Focus will be in Cedar Key, Steinhatchee, Apalachicola, Eastpoint, Carrabelle, Pensacola and Mobile, where we have established community partnerships and working relationships with seafood workers.

Aim 1a: Establish project-specific working relationships with community partners and seafood workers in the five port cities within the study area to facilitate participant recruitment, survey piloting and implementation, collection of workplace observational data, and engaging with the seafood worker community to provide project-related feedback and support.

Aim 1b: Develop, pilot, validate and implement a questionnaire instrument in Gulf coast fishery communities to relate occupational health and safety with environmental and personal risk factors.

Aim 1c: Conduct workplace observations with fishery workers on boats, in fish, crab, oyster and clam processing facilities, and at points of distribution, to supplement questionnaire-based health and safety data; and

Aim 1d: Analyze survey and observational data to examine industry-related injuries, illnesses and mortalities as related to risk factors, past experiences and perceptions, individual understanding of best practices and protective technologies, and demographic attributes.

Specific Aim 2: Assess the potential to apply functional intervention(s) to address risk factors associated with specific hazards and negative health outcomes in the different fishery subsectors in the study region.

Aim 2a: Guided by outcomes of Aim 1, collaboratively engineer behavioral and/or mechanical interventions with community partners and seafood workers, and conduct field piloting. Points of intervention for outcomes that have greatest adverse impacts (morbidity, death), and that are common and contribute to (a) lost productivity and/or (b) reduced quality of life, will serve as a focus;

Aim 2b: Implement a limited number of hazard interventions germane to the occupational health and safety of the eastern Gulf coast seafood worker community, and provide metrics to discern acceptance tonality of the interventions.

Key Accomplishments in 2019-2020

This community-based surveillance project focuses on filling an important gap on non-fatal injuries health outcomes for Gulf coastal commercial fishers. Data from in-person interviews and workplace observations will provide feedback, empowerment, and some interventions to support a culture of safety and reduce the burden of injuries and medical care for this vulnerable and mostly self-insured population.

Specific Aim 1a. Establish project-specific working relationships with community partners and seafood workers in participating port cities within the study area. These partnerships are critical to gain trust in the community, facilitate participant enrollment, support the project team in piloting and implementing in-person interviews, conduct workplace observations, and engagement with the seafood worker community to develop community-specific project feedback and support.

- Attended Mississippi Commercial Fisheries United annual meeting providing an outreach program recapping project goals and benefits, and future opportunities to enroll in this study.

- Presented at the 4th Annual Oyster South Conference, Wilmington, NC, February 20-22, 2020. Excellent engagement with stakeholders - oyster and clam farmers across all Gulf states, Georgia, South Carolina and North Carolina.

Specific Aim 1b. Develop, pilot, validate and implement an in-person questionnaire in Gulf coast fishery communities to relate occupational health and safety with environmental and personal risk factors.

Implemented 34 in-person surveys with commercial fishers, Pensacola, FL to Pass Christian, MS.

Specific Aim 1c. Conduct workplace observations with fishery workers on boats, in processing facilities, and at points of distribution to supplement questionnaire-based health and safety. Workplace observations were recorded using photos and video, and when possible, engine room noise levels were measured.

Progress is reported across four key activity indicators:

1. Community engagement with project partners and stakeholders
2. Questionnaire development and pilot testing
3. Implementation of in-person interviews and workplace observations
4. COVID-19 response

Community engagement with project partners and stakeholders. This project relies on community partnerships to foster stakeholder engagement and trust. Objectives include: (1) develop and maintain communications and functional working relationships with community partners in participating communities through in-person and teleconferencing throughout the project; (2) work with community partners to facilitate participant recruitment and data collection, and (3) to develop outreach and intervention strategies specific to respective communities and fishing sectors.

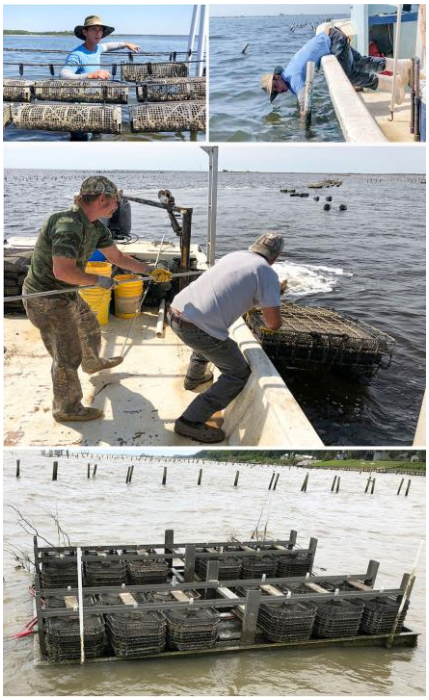
Questionnaire development and pilot testing. Surveillance is the primary thrust of this project in order to understand non-fatal injury outcomes, and risk factors, for Gulf seafood workers. Objectives include: (1) develop an in-person questionnaire tool to capture occupational injuries and close calls, and associated risk factors; (2) pilot/test the survey and have IRB-approval to permit implementation and data collection remotely in the field; and (3) include workplace observations as a subset of data collection.

Implementation of in-person interviews and workplace observations. This project will conduct surveillance with Gulf coast seafood workers focusing on non-fatal injuries and risk factors. Objectives include: (1) implementing surveys with Gulf seafood workers in the project region representing multiple work sectors including fishing, shrimping, crabbing, oystering, and oyster and clam farming; and (2) implementing workplace observations from a subset of participants, representing the different work sectors.

COVID-19 response. In collaboration with the Emerging Pathogens Institute, Dr. Kane developed and implemented a protocol to test for COVID-19 virus and antibody response in target communities within and surrounding Cedar Key, FL. 504 residents were tested. In early May 2020, results indicated a 0.4% infection rate.

Results

Study recruitment. We recruited 34 additional participants into the study during the first half of Year 04. Participants contributed survey and workplace data from Panacea FL (n=13), Apalachicola and Eastpoint FL (12), Coden AL (2), and Bay St. Louis and Pass Christian MS (7). Participant data spans multiple sectors: fishing (n=10), shrimping (16), crabbing (8), clamming (1), oyster tonging (15) and oyster culture (15). Workplace observations were conducted on shrimp boats in Mississippi and oyster farms in Panacea FL. Observations were recorded using photos and video, and when possible, engine room noise levels were measured. This surveillance study addresses the data gap for non-fatal injuries in these important work sectors, and support our examination of risk factors that affect the health and safety of Gulf seafood workers, and provide feedback that has value to the fishers and the industry.



Lessons learned in occupational health risks based on variations oyster farming technology throughout the SE region. *Top:* Oyster farmer using SEPA long line cages in shallow waters in Panacea, FL. ***Middle:*** Floating cage systems in Wakulla County, FL tended from boat. ***Bottom:*** "The Shellovator," an Alabama innovation that sinks and raises grow-out cages remotely using compressed air. The system also can rock the oysters back and forth to "tumble" them, without requiring growers to get into the water (compared with long lines) and alleviating having to lift or flip heavy floating cages. Remote product management greatly reduces risk of lower back pain and traumatic stingray puncture injuries. Photos AS Kane.

Stakeholder meetings and community outreach events.

- Mississippi Commercial Fisheries United annual meeting, 12/20/19. Dr. Kane engaged with attendees (n=65); Ryan Bradley, president, introduced Dr. Kane who provided an outreach program recapping project goals, lessons learned thus far and benefits, and future opportunities to enroll in this study.

- *"Extending Oyster Farmer Shelf life: Staying Safe and Healthy Working on the Water."* Andy Kane and Bob Durborow presented at the 4th Annual Oyster South conference, Wilmington, NC, February 20-22, 2020. Meeting registrants (n=245) represented oyster and clam farmers across all Gulf states, Georgia, South Carolina and North Carolina. Excellent engagement with stakeholders based on direct positive feedback at the conference.

- SCCAHS Community Stakeholder Advisory Board Meeting, March 12th, 2020, Straughn IFAS Extension Professional Development Center, Gainesville, FL. Engaged with regional stakeholders and advisors relative to YR03-04 project aims and progress.

Community engagement with project partners and stakeholders. Dr. Kane and project team members engaged with community partners in multiple participating communities in Florida, Alabama and Mississippi:

- Cedar Key, FL (R Cantwell, S Colson; 3/14/19, 4/17/19, 4/29/19, 7/22/19, 9/6/19, 10/23/19, 1/6/20, 1/28/20 and 2/17/20: community needs, data summaries, assisting with recruitment, launching subproject on traumatic stingray puncture injuries. On 2/22/20 Dr. Kane and Rebecca Rash presented project updates at the Cedar Key Aquaculture Association annual meeting on 2/22/20 to an attending membership of 62 clam and oyster harvesters.

- Panacea, FL (T Jordan; 4/25/19, 12/18/19, 2/22/20: scheduling and additional participant recruitment from adjacent Alligator Harbor.

- Apalachicola, FL (S Hartsfield, S Rash, and Apalachicola Bay Oyster Management Group; 2/24/19, 4/3/19, 9/20/19, 11/21/19: project updates and outreach, and recruitment support).

- Pensacola, FL (Robert Turpin; 4/9/19; recruitment opportunities).

- Wilmington, NC (Oyster South, B Walton; 1/20/20, 1/28/20: Integration of project presentation at annual Oyster South conference (2/20/20-2/22/20); providing support for recruitment of additional participants into the study. Oyster and clam farmers are important stakeholders, representing emerging commercial fishing sectors in the Gulf of Mexico.

- Biloxi, MS (MS Commercial Fisheries United, R Bradley president, 5/9/19, 11/14/19, 12/19/19, 2/19/20; Project partnership, recruitment and scheduling, presenting at annual meeting; inclusion of Vietnamese-American fishers/shrimpers, and new Alabama partners.

Questionnaire development and pilot testing. Survey instrument piloting and revisions were completed. The current, revised instrument has been approved by the UF IRB. REDCap is providing data security, field transmission capacity, translation and data backup needs.

Implementation of in-person interviews and workplace observations.

- In-person interviews and workplace observations were conducted in Florida (Cedar Key, Pensacola), Alabama (Mobile Bay) and Mississippi (Pass Christian, Bay St Louis, Biloxi), representing fishers, shrimpers, crabbers, oysterers, and oyster and clam farmers.

- Workplace observation approaches have continued to evolve to account for differences in vessel design and gear across fishing sectors.

- Khai Nguyen, has agreed to join the project research team to liaison with the Vietnamese fishing community in Mississippi. This will support inclusion of the Vietnamese workforce that represents a substantial portion of the regional fleet, and regional shrimp and oyster landings.

COVID-19 response. 504 residents of Cedar Key and the surrounding area within the 32625 zip code received a COVID-19 testing. Two of those tested were found to be COVID-19 positive, indicating a 0.4% infection rate at the time of sampling. Test results were sent to all of the participants by email, telephone or mail. Those with positive test results self-isolated and received follow up by the Florida Department of Health in Levy County. The collaborative effort involved over 80 volunteer doctors, nurses and medical and public health graduate students working closely with the Cedar Key City Commission, the Cedar Key Arts Center, and the EPI COVID-19 research study team. Dr. Kane coordinated the Cedar Key arm of this study as a supplemental project to his ongoing work with the clamming industry and other local seafood workers, based on concerns in the industry. The team of local volunteers scheduled every available time slot in less than six hours and provided logistics for turning Downtown Historic 2nd Street into a mobile field-testing facility with four parallel testing zones, each with three independent testing stations. J. Glenn Morris Jr., M.D., SCCAHS PI and Director of Emerging Pathogens Institute, stressed the importance of gaining valuable information about the health of those in and around Cedar Key. The study team continues to work on validating the serum antibody tests specific to COVID-19. Results from the serum testing will be made available after analyses are completed.

Coordinated efforts in rural Cedar Key, FL response to clam aquaculture stakeholder concerns and supported COVID-19 testing for the community. Left: *Community partner, Sue Colson, talks to locals on the porch of the Welcome Center adjacent to field testing locations.* ***Right:*** *Andy Kane, project PI, coordinates timing, communications and supplies at each intake station to collect data, nasopharyngeal swabs and blood samples from 504 participants.*

Conclusions

Occupational health and safety surveillance data has been collected from commercial fisheries along the southeastern Gulf coast. Input from over 90 stakeholders represents multiple sectors including fishing, shrimping, crabbing, oyster dredging, oyster tonging, oyster farming and clam farming. Injury outcome data have been configured to be consistent with the CDC Occupational Injury and Illness Classification System (OIICS), and hazard data is being fitted into Haddon matrices to support sector-specific needs and inform risk intervention strategies. IRB protocol amendments to support project translation and data collection from coastal Vietnamese fishers within the region will provide opportunity for expanded stakeholder benefits and understanding within-sector challenges and solutions based on culturally separated subpopulations in the regional workforce.

Project Year 5 will focus on adding surveillance data, including surveys and workplace observations, across fishing sectors and communities in the SCCAHS region. Hazard and risk analyses will inform interventions in years 5 and 6, and discern sector-specific industry needs, considering the COVID pandemic. Video graphic workplace observation data will be storyboarded and developed to produce project- and sector-specific video vignettes that highlight health and safety challenges in the industry, and personify the hard working folks who harvest fresh, nutritious seafood that contributes quality protein resources to the domestic market. Prioritize intervention opportunities informed by project surveillance data, input from community partners, and social marketing constructs collaboratively shared by the Northeast Ag Center for Occupational Health and Safety.

Publications and Presentations

Myers ML, Kane AS and Durborow RM. 2018. Gulf of Mexico Seafood Harvesters: Part 1. Occupational Injury and Fatigue Risk Factors. Safety doi:10.3390/safety4030031.

Myers ML, Durborow RM, Kane AS. 2018. Gulf of Mexico Seafood Harvesters, Part 2: Occupational Health-Related Risk Factors. Safety doi: 10.3390/safety4030027.

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Dunleavy, K., Bishop, M.D., Coffman, A., Reidy, J., and Kane, A.S. 2020. Chronic low back pain in seafood workers: feasibility and acceptability of a rapid prototype participatory ergonomic self-management approach. *International Journal of Occupational Safety and Ergonomics.* (In review).

Dunleavy, K., Kane, A.S., Coffman, AB, Reidy, J., and Bishop, M.D. 2020. Effectiveness of participatory ergonomic self-management for chronic low back pain in seafood workers. *Journal of Occupational Rehabilitation* (In review).

Year 4 Regional Conferences.
Kane AS. 2020. *The Southeastern Coastal Ag Center, and Seafood and Seafood Worker Health in the Gulf of Mexico*. Southeastern States Occupational Network (SouthON) Annual Meeting and SEER Annual Meeting. Birmingham, AL. February 25-28, 2020.

Kane AS, Myers M, Durborow R, Dunleavy K, Rash R and Brooks R. 2020. Extending Oyster Farmer Shelf life: Staying Safe and Healthy Working on the Water. 4th Annual meeting of Oyster South, Wilmington, NC February 20-22, 2020.

Kane AS, Myers M, Durborow R, Dunleavy K, Rash R and Brooks R. 2020. *The Tough People Behind the Tender Clams: Occupational Health and Safety Support for Clam Mariculturists in Cedar Key, FL*, National Shellfisheries Association Annual Meeting, Baltimore, MD March 30-April 2, 2020.

Heat and Pesticide Stress in the Kidney

PD/PI: Christopher Vulpe

Overview

Agricultural workers in hot and humid climates are subjected to a unique combination of occupational stressors that impact health. An epidemic of chronic renal disease of unknown etiology in primarily young agricultural workers of Central America and other countries has focused concern on potential occupational hazards affecting kidney function. Specifically, heat stress in agricultural workers may alter and interact with chemical exposure to impact kidney function. However, no study to date has examined whether heat stress increases the renal toxicity of agricultural chemicals to which farmworkers are exposed. Ultimately, it will be important to determine whether such an interaction occurs among workers under field conditions. A first step is demonstration under controlled conditions whether or not this interaction exists in a systematic animal study. The central hypothesis in this two-year exploratory study is that heat stress comparable to that experienced by farmworkers increases the renal injury from nephrotoxic insecticides and herbicides.

Aim 1: Characterize the nephrotoxicity of the most commonly used formulations of an insecticide, permethrin, and two herbicides, paraquat and glyphosate in the rat. These pesticides are chosen based upon existing evidence of nephrotoxicity in laboratory animals, evidence of an association between exposure and renal disease in farmworkers, and extensive agricultural use in the Southeastern U.S.

Hypothesis: Sub-chronic exposure to permethrin, paraquat, and glyphosate commercial formulations produces renal injury in the rat.
The study team will: a) establish dose-response relationships for nephrotoxicity of each pesticide formulation; b) develop a descriptive profile of the renal toxicity of each agent based upon histopathology and patterns of elevation of existing renal injury biomarkers; c) comprehensively assess the biological response of the exposed kidney through coordinated assessment of changes in gene expression and metabolism.

Aim 2: Develop a model of hyperthermia and mild dehydration in the rat resembling heat stress in Southeastern US agricultural workers.

Hypothesis: Hyperthermia and dehydration comparable to that observed in Southeastern U.S. farmworkers produces minimal evidence of renal injury using standard assessment methods.
The study team will: a) determine the influence of elevated ambient temperature on core body temperature and dehydration in rats; b) develop a set of exposure conditions producing core body temperature elevations and dehydration comparable to those observed in farmworkers in the ongoing NIOSH Girasoles study; and c) determine whether hyperthermia produced in the model is associated with renal injury, and if so, develop a descriptive and molecular profile of renal toxicity as in Aim 1.

Aim 3: Determine the combined effect of heat stress and pesticide exposure on renal injury in rats.

Hypothesis: Heat stress produces a significant increase in the renal injury produced by pesticides.
The study team will: a) assess the nephrotoxicity of permethrin, paraquat, and glyphosate in the presence and absence of heat stress using doses and conditions established in Aims 1 and 2; b) determine whether the effects of heat stress and pesticides on the kidney are interactive, i.e., greater than additive; c) evaluate the biological and pathological effects using both traditional and molecular endpoints. Together, this two-year study will provide a critically needed animal

study on the potential role of two commonly encountered conditions for Southeastern farmworkers, heat stress and pesticide exposure, on kidney function. This effort will inform the development of mitigation strategies, if necessary, to prevent or minimize risk to farmworkers. In addition, this work establishes a framework for the subsequent evaluation of additional pesticides of concern identified by ongoing work within the NIOSH Agricultural Health Center at the University of Florida.

Key Accomplishments in 2019-2020

Chronic Kidney Disease of Unknown Etiology is unexplained disease impacting farmworkers in regions with climates similar to Florida. Heat Stress and/or Pesticide Exposure may play a role in the development of kidney disease in Farm Workers. Farmworkers are subject to both heat and pesticides - both could independently affect Kidney Function. Combined exposure may lead to more adverse effects. The project goal is to assess the independent and combined effects of pesticide exposure and heat stress on kidney function in a controlled model system.

During project Year 1/Center Year 4, quarters 1 and 2, the investigative team has received IACUC protocol approval, purchased environmental chamber for controlled studies and is in the process of renovating space for the installation of chamber. Although securing the infrastructure has been the lead priority the first 6 months of the study, the investigative team has initiated initial dose finding studies for pesticides.

Aims 1-3.

Install the necessary environmental chamber for controlled temperature regulation in rats.

Aim 1.

- Pilot study of the three pesticides, permethrin, paraquat, and glyphosate with 3 doses and two time points which has informed a refined experimental design.
- Developed histopathological assessment approaches for acute toxicity assessment of renal toxicity including glomerulus size.
- Carried out multiplex biomarker analysis of toxicity endpoints to identify responsive biomarkers for future studies.
- Developed protocols for novel biomarker identification based on urinary exosomes including exosome characterization and lipidomics analysis.

Results

Aim 1. Each of the chemicals resulted in observable but subtle phenotypic differences at the dose and time points utilized. Each chemical appeared to result in unique changes. It was concluded that additional exposure time will be needed to develop a more robust model and we are carrying out follow up studies based on the initial findings. The biomarker studies have identified candidates which appear to be responsive to acute kidney injury for each chemical, again with some chemical specificity. Additional dose response work is necessary to refine these findings for use in our study. We have developed a robust exosome isolation and characterization protocol and demonstrated the use of lipidomics analysis for development of novel biomarkers. The study team will utilize these approaches in our ongoing studies.

Conclusions

Preliminary results support a role for these chemicals in the development of acute kidney injury. Further work is ongoing to assess if heat stress independently results in kidney injury in the rat model and if heat stress synergizes with chemical toxicity.

Pilot/Feasibility Program

J. Glenn Morris, Jr.
Farah A. Arosemena

Overview

The Pilot/Feasibility Program is a key component of the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS). This program provides seed funds to stimulate original projects relevant to health and safety in the agricultural, forestry, and fishery (AFF) industries. The Pilot Program awards high quality research that promotes collaboration between the Center and the Southeast partner communities, as well as builds a nexus for mentorship and development of new/early-stage investigators as they aspire to establish independent research. Projects may include basic/etiologic research, translational research, intervention studies, and/or surveillance.

The goal is to provide seed support to projects that ask innovative and important questions, and which lay the groundwork for subsequent research grant submissions or interventions. Successful implementation of the Pilot/Feasibility Program will ultimately expand research in health surveillance, air quality, respiratory health, pesticide exposure, mental health and health disparities of migrant and seasonal farmworkers and/or fishers. Some of the projects selected will be "high risk, high reward" novel ideas and approaches, with limited preliminary data, but with the potential for having a major impact. Cumulatively, across years 1 through 3, the *Southeastern Coastal Center for Agricultural Health and Safety* awarded 9 pilot research projects to improve the safety and health of agricultural workers.

Pilot Grant Awards

Cumulatively, the Southeastern Coastal Center for Agricultural Health and Safety has awarded a total of 11 pilot awards across the University of Florida, Florida State University, Florida A&M University, University of Maryland, Georgia Southern University and Migrant Clinicians Network.

Lynn Grattan, MD – Professor, Neuropsychology, University of Maryland

Pilot study of the acute psychological and health impacts of hurricane Irma in UFAS extension workers

Dr. Grattan examined 36 IFAS Extension Agents to explore Hurricane Irma's impact on health-related quality of life 6 to 8 weeks and at 1-year post disaster. Findings demonstrate that hurricane impact (exposure high versus low) predicted depression and PTSD. All participants obtained scores within the high average to very superior range on the Symbol Digits Modalities Test. Greater Hurricane Impact (home+work) was associated with elevated Depression, PTSD sx, Medical Symptoms 6- 10 weeks post hurricane (controlling for age and prior hurricane exposure).

TABLE 1. Depression, PTSD, No. of Medical Symptoms and Exposure (n=36).

	Beck Depression Inventory total score		Post Traumatic Checklist-5 Total Score		Total Number of Medical Symptoms	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
Model 1:						
Exposure High vs. low	5.111111	0.036	11.22222	.01	5.111111	.002
Model 2:						
Exposure High vs. low	5.228696	.04	10.97848	.06	4.906668	.005
Past exposure	5.228696	.27	-.0248143	.97	.0126636	.57
Age	-.051819	.25	-.1153924	.47	.0126636	.83

John Luque, PhD – Associate Professor, Behavioral Sciences/Health Education, Florida A&M University

Aplicación Movil para Prevenir Agotamiento por Calor (AMPAC)

Pilot study of mobile app monitoring to prevent heat-related symptoms among Hispanic Farmworkers Farmworkers and supervisors or crew leaders showed enthusiasm for using the Heat Safety Tool. Since most farmworkers have smartphones, downloading the free app is feasible for them to download in most instances. Crew leaders using the heat safety app rated the app very highly on relevance, functionality, value and privacy. Farmworkers did not report being overly concerned about HRI based on their survey responses. Nevertheless, 19% of farmworkers had experienced nonspecific symptoms from working in the heat, such as headache, dizziness, and nausea. In the multivariate linear regression model, farmworkers had lower heat safety knowledge scores if they were H-2A visa holders, female, and only "a little bit concerned," compared to others who were "very concerned" about working in the heat. The results of this study indicate the need for continued heat safety training for both crew leaders and farmworkers to reduce the risk of HRI, especially among less experienced farmworkers.

Gülcan Önel, PhD – Assistant Professor, Food and Resource Economics, University of Florida

Uncovering patterns of mental, physical and occupational health issues among migrant farmworkers with different sociocultural networks: A pilot study among Haitian and Mexican farmworkers in Immokalee, FL

Dr. Önel will established her team in the data collection phase during Year 3 Quarter 4 to explore theextent to which migrant farmworkers with different ethnic backgrounds and social networks face higher risks of mental, physical and occupational health issues. The following marked key progress – 1) The study team completed interviews with 80 Hispanic workers, 2) Culturally-appropriate Haitian Creole translations of questionnaires, including mental health measures PHQ-9, GAD-7, and PROMIS-Social Isolation, and 3) CBPR: Better understanding of underlying socio-economic and cultural differences between Hispanic and Haitian farmworkers as they relate to mental and occupational health.

Kimberly Dunleavy, PhD – Associate Clinical Professor, Physical Therapy, University of Florida

*Chronic low back pain in seafood workers: a pilot intervention study to identify modifiable work and movement solutions*Dr. Dunleavy has enrolled 28 subjects to conduct research on chronic low back pain in seafood workers. She will research clam workers in Cedar Key, Florida, to identify work-related movements and positions that aggravate or contribute to low back pain. Data analysis is in progress.

Antonio Tovar, PhD – Director, Farmworker Association of Florida

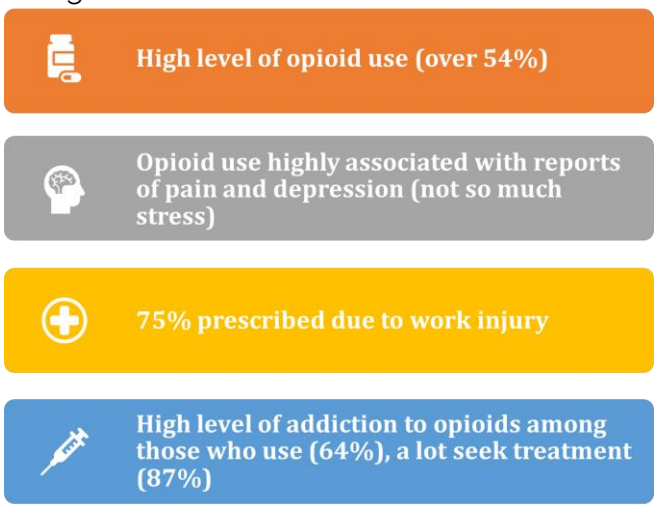
Agroecological practice in the face of climate change: Resilience, sustainability, and preparedness in Puerto Rico

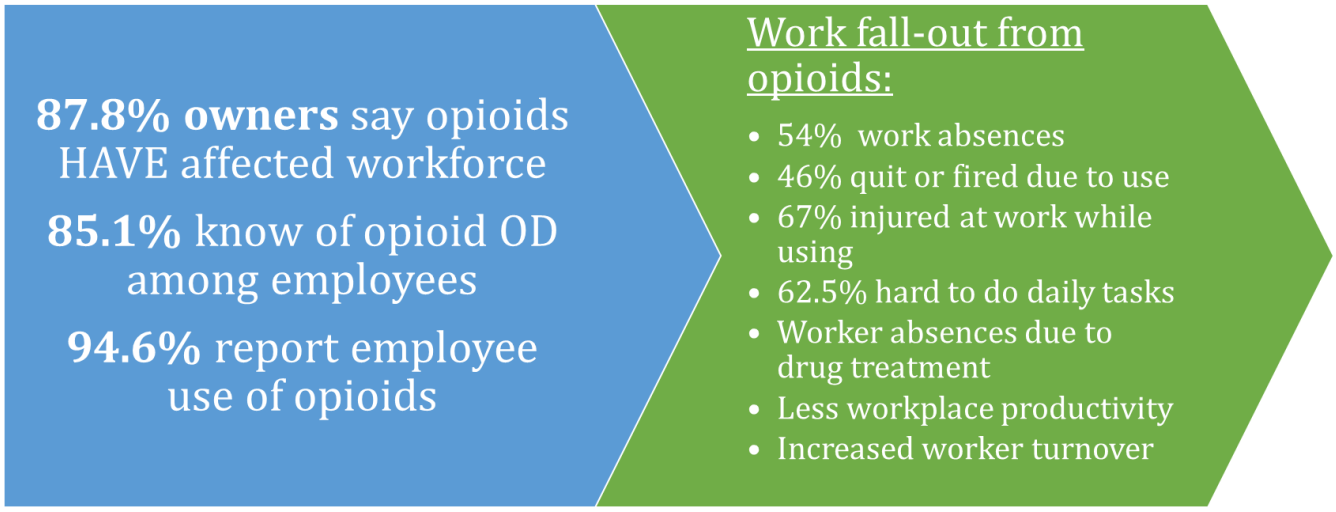
Dr. Tovar has completed training of study field assistants and data collection. The team surveyed the 5 geographical regions of Puerto Rico and compiled a list of 29 agroecology farmers, 15 conventional small-scale farmers, and additional 17 potential partners (i.e. extension officers, agricultural officials, and farmers associations). 50 surveys were completed by small farmers (<10 acreage): agroecology farmers, conventional farmers, and farmers using mix practices were interviewed. Data analysis is in progress.

Heidi Radunovich, PhD – Associate Professor, Family, Youth and Community Sciences, University of Florida

Understanding the scope of the opioid epidemic for agricultural industries

Data collection is in process and the total subjects to date are 132. Preliminary findings show that opioid use is strongly associated with pain among agricultural workers – of the people reporting opioid use, nearly 93% are reporting pain. However, pain is common for this population, with 86% of the total population reporting pain. Many who are experiencing pain do not take opioids (68%), so this begs the question: how are they managing their pain instead? The study team continues to observe a difference among the industries, with those in the nursery/landscape industry reporting much higher use of opiates (54%) than those in the livestock (7%) or crops (nearly 12%).





Gregg Stanwood, PhD – Associate Professor, Biomedical Sciences & Neuroscience

A novel approach to monitoring pesticide exposure in farmworkers

The goal of this study is to determine the feasibility of using sweat patches for biomonitoring pesticide exposure among immigrant Latino farmworkers. Laboratory experiments are underway to develop and assess the accuracy and precision of analytical techniques for assessing pesticide metabolites from sweat patches. Sweat and urine were monitored over a 1-week period (Sweat was sampled every 2 days and first void urines were collected every day. Only 1 sample each is being analyzed initially, but the PI will retain the ability to expand the analysis if warranted.

Atin Adhikari, PhD – Assistant Professor, Environmental Health Sciences, Georgia Southern University

Field evaluation of N95 filtering facepiece respirators against airborne dust and microorganisms during cotton harvesting

Dr. Adhikari has collected control air samples from three cotton farm locations and analyzed them for PM and culturable microorganisms. Respiratory deposition modeling data for PM was presented in the inhaled aerosol dosimetry conference in Irvine, CA. Air sampling other field experiments at cotton farms continue during harvesting (by combine harvesters). To date, sampling at two locations are complete. In addition to proposed tasks in the proposal, the investigative team is also evaluating N95 respirators for respiratory protections against culturable microorganisms.

Eric Coker, Assistant Professor, University of Florida, Environmental and Global Health

A Pilot Study to Assess Personal PM2.5 Exposure and Respiratory Virus Infections among Farmworkers in the Southeast

The pilot is generating new PM2.5 exposure assessment data among farmworkers within the southeastern U.S., including exposure data among those working on different types of crops. The investigative team is using a real-time exposure monitoring device (MicroPEM). Real-time exposure monitoring data will enable us to not only determine the distribution of farmworker exposures and differences in exposure between the types of crops worked on, but also to assess within-day variability of personal PM2.5 exposures. Capturing within-day variability could be important in terms of pinpointing high-exposure episodes that could eventually lead to more targeted investigations aimed at identifying exposure-mitigation strategies.

The collection and analysis of farmworker nasal swab samples for the detection of viral carriage is another innovative approach characterizing viral carriage for multiple respiratory pathogens provides important baseline data. This is the first study that will characterize upper airway viral infection and co-infections among agricultural farmworkers using a highly sensitive, specific and state-of-the-art molecular detection technique. In addition, this pilot study will explore the feasibility of accessing and utilizing electronic medical records from MHCs for the purposes of active surveillance of ARIs among agricultural workers in the southeastern U.S.

Burden: Respiratory infections and dust exposure

- NIOSH data suggests elevated respiratory infection mortality rates among crop farmworkers
- Emerging evidence suggests respiratory risks associated with exposure to respirable agricultural dusts

Need: Fill knowledge gaps by generating preliminary data

- Occupational exposure to respirable particulate matter (PM2.5) is poorly understood among crop farmworkers in the southeast
- Little is known regarding types of respiratory infections as well as respiratory infection burden among crop farmworkers

Impact: Lead to follow up research to build on findings – CDC/NIOSH R01 November, 2020 submission (PAR-18-812), *Assess Personal Air Particulate Exposure and Respiratory Virus Infections among Farmworkers in the Southeast*

Preliminary Results. A standardized questionnaire that addresses farmworker sociodemographic characteristics, types of work-related agricultural crop/s and tasks, pesticide application, self-report of frequency and severity of ARI symptoms and related risk factors (e.g., smoking and family size), and self-report of medical diagnosis for chronic respiratory conditions was administered and personal PM2.5 air monitoring was implemented among Florida farmworker populations. Between January 10th through February 15th 2020, the study team recruited nine farmworkers who worked on fern harvesting in Pierson, Florida. Most participants were female (77%) and had a household income below $30,000 (55%). All participants self-identified as Mexican or Chicano and spoke Spanish fluently with only two who reported speaking English "well". More than half (55%) of participants reported having at least one ARI symptom in the past year and one participant reported wheezing in the past year. Less than half (n=4) reported having received an influenza vaccination in the past year. Preliminary data from eight participants resulted in an average work-shift PM2.5 concentration of 23.8 µg/m3 (sd=17.6; range=7.4, 56.3).

Publications

Coker E, Cavalli L, Fabrizi E, Guastella G, Lippo E, Parisi ML, *et al.* The effects of air pollution on COVID-19 related mortality in Northern Italy. *Environ Resour Econ* 2020; In Press

Marysel Pagán-Santana – Program Manager, Migrant Clinicians Network

Exploring mental health and natural disasters in agricultural communities in Puerto Rico

The overarching goal of this project is to adapt and pilot an assessment tool to explore mental health status using previously developed resources. The investigative team expects that the implementation and use of the developed tools will provide a pathway to effectively assess the mental health and resilience of agricultural workers in Puerto Rico as it relates to climate change and disasters (e.g. earthquakes). During Year 4, Dr. Pagán-Santana continued to identify culturally appropriate research methods and tools to better understand agricultural workers' mental health as it relates to natural disasters and climate change. The team analyzed/classified validated instruments related to agricultural workers health, climate perception, mental and behavioral health, and resilience using the following variables:

- Purpose description: Source, purpose, type of document (report, journal), topic
- Population description: literacy level, intended population, locations where it has been used
- Survey description: language, length (amount of questions), metrics

Next steps are to finish the analysis and classification and begin identification of key questions and indicators in the available tools by creating a questions bank for appropriate terminology and concepts for tool adaptation regarding culture and language. The study team will incorporate indicators to explore the effects of stressors (e.g. evacuation, displacement, housing damage, injuries and death, job insecurity, water, and crop loss) caused by disasters related to the climate crisis. In addition, they will look to incorporate indicators to explore the effects of stressors (e.g. evacuation, displacement, housing damage, injuries and death, job insecurity, water, and crop loss) caused by disasters related to the climate crisis.

Maria Morera – Assistant Research Scientist, University of Florida, Agricultural Education and Communication

Developing an Integrated Decision Support Tool and Network for WPS Respirator Compliance in Florida Agricultural Industries

The objective of this pilot is to develop customized decision support tools that address the complexities of new regulations on respirator selection, medical evaluation, and fit testing. The project is guided by the following four aims, (1) Evaluate needs for translational materials in respiratory protection through a survey of key stakeholders; (2) Pilot-test the use of socially marketed audience-tailored decision support tools to clarify hazard communication labels, respirator selection, medical evaluation procedures, and fit testing; (3) Perform an outcome evaluation to asses usage of translational materials per audience; (4) Apply for funding to transition the support tool to a web-based format, scale up the intervention, and evaluate its impact on respiratory safety in Florida's agricultural workforce.

Initial results indicate levels of comfort selecting proper respiratory protection equipment for work needs vary, ranging from somewhat uncomfortable to extremely comfortable. Responses regarding the importance of select information sources indicate UF/IFAS, FDACS, and retailers/dealers of farm equipment and chemical supplies were rated highest. The internet, family, friends, and colleagues were rated lower in importance, overall. UF/IFAS was referenced in open-ended responses regarding the types of guidance workplaces rely on to correctly implement the components of their respiratory protection programs. Challenges acquiring respirators for agricultural use during the COVID-19 pandemic have not yet been reported and cost was identified as a challenge experienced prior to the pandemic.

Highlights

Publications and Presentations

Campoverde, E.V. and Morera, M. (2020). Personal protective equipment: Respirators. Continuing education workshops to delivered online in English and Spanish at the UF/IFAS Extension Miami-Dade County office, October 22 and November 5, Homestead, Florida.

Adhikari, A. Contributions of pets to indoor environment exposome: hypothetical links with cancers and respiratory disorders. 2020 Mount Sinai Exposome Symposium (March 2020), New York, NY.

Tovar, A. Society for Applied Anthropology Annual Meeting. Agricultural Practices and Climate Change in Puerto Rico: Lessons from Maria. (March 2020) Albuquerque, NW.

Citrus Industry News: Florida Crop Workers at Risk. (2020, October 1). *Citrus Industry Magazine is a publication of AgNet Media, Inc.* Interview with **Dr. Gülcan Önel** retrieved from https://citrusindustry.net/2020/10/01/florida-crop-workers-at-risk/.

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Adhikari, A, Dotherow, JE. Respiratory deposition modeling for PM10, PM2.5, and PM1 exposure in cotton farms for standard and heavy workers. Third Aerosol Dosimetry Conference, Inhaled Aerosol Dosimetry: Models, Applications and Impact (October 2019), Irvine, CA.

Stacciarini, J.M., **Önel, Gülcan**, & **Tovar, A.** A Rural State of Mind: Addressing Mental, Physical, and Economic Health of Farm Communities in Florida. *East Coast Migrant Stream Forum.* (October 2019), San Juan, Puerto Rico.

Honors/Awards

Maria Morera. Promotion to Assistant Research Scientist. (2020) Agricultural Education and Communication at the University of Florida, Institute of Food and Agricultural Sciences.

Heidi Radunovich. Co-Investigator. (2019). Agrisafe Network, Inc. (PI: Natalie Roy) *Southern region farm and ranch stress assistance network.* Develop a clearinghouse of farmer assistance programs in the region inclusive of programs providing professional agricultural behavioral health counseling and referral.

Heidi Radunovich. (2018). Research Enhancement Award. Florida Nursery, Growers and Landscape Association (FNGLA). Endowed Research Fund.

Gülcan Önel and **Antonio Tovar**. (2018). Robert Wood Johnson Foundation. Interdisciplinary Research Leaders Award. The broad goal of the Interdisciplinary Research Leaders (IRL) program is to produce diverse interdisciplinary leaders who conduct and apply high-quality, community-engaged, action-oriented, equity-focused health research in order to drive improvements in the health of communities.

Section III – Outreach Core

Project PI: Tracy Irani
Ricky Telg; Lisa K. Lundy; Angela B. Lindsey; Martie Gillen

Overview

The Outreach Team leads a comprehensive Core, providing knowledge transfer support for the Research Core and Pilot/Feasibility Program, integration with all proposed educational and extension activities, and effective and culturally competent communication, and information dissemination to stakeholders across the six-state region. The Outreach Core activities consist of disseminating relevant risk reduction interventions and research findings and promoting adoption of best practices in the agricultural and fishery workplaces.

Community Stakeholder Advisory Board

The Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS) is committed to stakeholder involvement. The Outreach Core prioritizes community-based participatory research, and has included representatives from Extension, industry, public agencies, regulatory agencies, academia, advocacy organizations, and medicine on our Center's Community Stakeholder Advisory Board. A high-functioning CSAB allows our Center to better engage stakeholders in receiving input on research findings, educational and communications materials and message testing to make our work accessible to the community at large.

Communications

The Outreach Core prioritizes a connection with center leadership to develop messages for farm families, laborers, supervisors, and company owners (all the stakeholders) to communicate important points about workplace safety. These messages are developed with different frames to ascertain which frame will be most effective. SCCAHS seminars/webinars in agricultural safety and health/occupational health have proven reach to all stakeholders and academic partners. The seminar/webinar series adds to the library of outreach materials and is intended to draw on SCCAHS investigators as well as external speakers. Seminars are webcast and archived on the SCCAHS website to facilitate inclusion of investigators at collaborating institutions.

State of the Science Meeting

Hosted by the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS) headquartered at the University of Florida in Gainesville, FL, the annual State of the Science Meetings combine esteemed speakers to present research relevant to 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.

State of the Science 2020 featured researchers and scientists from various fields from across the United States, who presented their findings on COVID-19 and its impact on agricultural workers and farmers and paved the way for future research collaborations

Key Accomplishments 2019-2020

Community Stakeholder Advisory Board

After significant discussion, the SCCAHS administration decided to move the center's Community Stakeholder Advisory Board (CSAB) meeting to a **virtual meeting.** The meeting date did not change and it was convened on Thursday, March 12, 2020 from 10:00 a.m. to 12:00 p.m.

Communications

The SCCAHS Outreach Core annually develops and updates multilevel outreach and educational resources that in Year 4 included:

- Up-to-date webinar schedule and archived webinar repository
- Social Media Messages
- 2019 State of the Science White Paper
- COVID-19-Specific Outreach

Ten webinars were released October 2019 through September 2020. The below 2019-2020 list of speakers highlights the multidisciplinary specialty areas that address health and safety issues in agricultural and fishing industries.

Sebastian Galindo Impacts of COVID-19 on Extension

Ricky Telg, Saqib Mukhtar, Cindy Prins COVID-19 Training Toolkit for Extension in Agriculture

Jeffrey Lindsey Preparing for the 2020 Hurricane Season in the Midst of a Pandemic

Jeanne-Marie Stacciarini Rurality, Social Networks and Mental Well-being in Rural Latinos

Robert Leeman Stressors, Resilience Factors and Applicability of New Interventions for Substance Misuse

Gülcan Önel Uncovering Patterns of Mental, Physical, and Occupational Health Issues Among Migrant Farmworkers with Different Socio-Cultural Networks

Anna M. Scheyett Death on the Farm: Characteristics and Contextual Factors in Farmer and Agricultural Worker Suicide in Georgia from 2008-2015

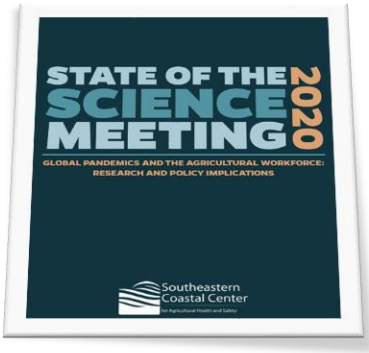
Christine Chasek Investigating Opioid and Alcohol Risk and Misuse Among Agricultural Workers

Vasubandhu Misra Heat-related Illness in a Changing Climate and Demography of Florida

Kim Dunleavy Chronic Low Back Pain in Seafood Workers: A Pilot Intervention Study to Identify Modifiable Work and Movement Solutions

Screening and Testing of Agriculture Farm Workers and Employers for COVID-19. Dr. Morris discusses testing and screening of agriculture farm workers and employers for COVID-19, and the necessary actions if testing positive.

Communication media strategies maintained an objective to develop fewer posts on social media that had more substance to promote the SCCAHS and affiliate research, provide resources on agricultural health and safety topics, and strengthen the public health response to COVID-19. Reducing the burden of the pandemic on agricultural and fishery workers through public awareness was a Year 4 priority and this resulted in the *COVID-19 Training Toolkit for Extension*.
As federal and state officials continued to monitor the COVID-19 situation, intensifying in March 2020, it was an Outreach priority to share consistent, accurate, culturally appropriate, multilingual information. The team mobilized to review resources from the Centers for Disease Control and Prevention and Departments of Health. These resources included social media messaging, images, videos, and infographics. The *COVID-19 Training Toolkit for Extension* packages PowerPoint presentations, videos, and print materials to inform agricultural owners and workers about best practices to prevent COVID-19 in the agricultural workplace. Additionally, Dr. Glenn Morris, physician /epidemiologist, Director of SCCAHS and the Emerging Pathogens Institute discusses COVID-19 testing and screening for agricultural workers in a video produced by Outreach Core partner, the Center for Public Issues Education.



State of the Science Meeting

There has been an increased focus on moving beyond generating evidence to translating evidence into practice and policy actions to ensure that scientific discoveries actually reach the populations for whom they are intended and are implemented with fidelity. The State of the Science meetings were developed in response to this increased focus, and the dissemination approach is accomplishing its work by deepening multidisciplinary relationships, building capacity for public health professionals to collaborate effectively with other–related disciplines, and developing a research agenda on farmworker/fisher/forestry health translation, dissemination, and implementation through interdisciplinary collaboration. Although effort was dedicated to the planning/implementation of an in-person meeting, the event was moved to a virtual format. The State of the Science meetings have become a special, more regionally coveted space for the dissemination of new scientific knowledge across disciplines, as well as for the establishment and development of social networks among scientists across U.S. academic institutions and community partners. However, the virtual dimension of conferences, was a challenge in ensuring effectiveness and relied on a different framing of events, the teams' comfort navigating the multiple facets of technology and the chosen platform, Zoom.

The **2020 State of the Science Meeting focused on Global Pandemics and the Agricultural Workforce: Research and Policy Implications** was delivered via Zoom on Friday, September 11 and 18, 2020. The annual meeting combined esteemed speakers to present research relevant to occupational safety and health needs of people working in agriculture, fishing, and forestry. The featured researchers and scientists from various fields from across the United States, presented their findings on COVID-19 and its impact on agricultural workers and farmers and paved the way for future research collaborations that can address the long-lasting effects this pandemic will have on the industry.

Global Pandemics and the Agricultural Workforce: Research and Policy Implications, September 11-18, 2020

Keynote Speakers

SARS-CoV-2: Transmission and Human Health presented by J. Glenn Morris, Jr., MD, MPH&TM, from University of Florida's Emerging Pathogen Institute and the Southeastern Coastal Center for Agricultural Health and Safety

Development and Deployment of Farmworker Housing Simulator for COVID-19 Risk Mitigation presented by Leigh McCue, PhD, from George Mason University, Department of Mechanical Engineering

Facilitating Pandemic Preparedness in Agricultural Industry via COVID-19 Hazard Assessment and Mitigation Plan (CHAMP) e-tool presented by Melissa Millerick-May, PhD, MSC from Michigan State University, Department of Medicine, Extension, Environmental Health and Safety

Sterilization technology presented by Ying (Sarah) Zhong, PhD, from University of South Florida, Department of Mechanical Engineering

Fit Testing in Agricultural Respirator Communities: Helping Fight the Enemy We Cannot See presented by Charlotte Halverson, BSN, COHN-S from AgriSafe Network

Communication during COVID-19: Trust in Science, Vaccine Adoption and Cultural Implications presented by Lauri M. Baker, PhD from University of Florida's Center for Public Issues Education in Agricultural and Natural Resources (PIE Center)

Farm To You: Necessity as the mother of invention presented by Danielle Andrews from the Florida Department of Agriculture and Consumer Services

COVID-19 and Resilience in Food Supply Chains presented by David Abler, PhD from Pennsylvania State University, Department of Economics, Sociology and Education

Impact of COVID-19 of Florida's Agriculture and Marine Industries presented by Christa Court, PhD from University of Florida, Department of Food and Resources Economics

Agricultural Centers Roundtable – Impacts of COVID-19 on Extension Agents presented by Sebastian Galindo, PhD from University of Florida, Southeastern Coastal Center for Agricultural Health and Safety; Athena K. Ramos, PhD, MBA, MS, CPM from the University of Nebraska and Central States Center for Agricultural Safety and Health; and Shannon Sampson, PhD, from the University of Kentucky, Department of Education Policy Studies and Evaluation & Southeast Center for Agricultural Health and Injury Prevention (SCAHIP)

Publications and Presentations

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Section IV – Year 4 Publications

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Luque, J. S., Becker, A., Bossak, B. H., Grzywacz, J. G., Tovar-Aguilar, J. A., & Guo, Y. (2020). Knowledge and Practices to Avoid Heat-Related Illness among Hispanic Farmworkers along the Florida-Georgia Line. *Journal of agromedicine*, *25*(2), 190–200. doi: 10.1080/1059924X.2019.1670312. Epub 2019 Sep 23. PMID: 31544652; PMCID: PMC7075471.

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