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“We left the crop there lying in the field”: Agricultural worker experiences with the COVID-19 pandemic in a rural US-Mexico border region

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ABSTRACT

California agricultural workers are predominately Latino/a, are medically underserved, and reside in larger households, placing them at elevated COVID-19 risk at work and at home. While some research has examined COVID-19 among agricultural workers in the interior of the United States, little research exists on experiences of COVID-19 along the US-Mexico border. Grounded in resilience thinking, this study aims to understand how agricultural workers navigated their heightened risk to COVID-19 at work and at home, and made use of available resources in the context of a bi-national community. Our study utilized qualitative interviews with 12 agricultural workers to understanding the COVID-19 experiences of resident and daily migrant agricultural workers in Imperial County, California, located along the US-Mexico border. Findings suggest that agricultural workers faced significant impacts and risks at work (work stoppages, stress about bringing COVID-19 home to family) and at home (contracting COVID-19, loss of friends and family, and mental health challenges). Agricultural workers and their employers often implemented COVID-19 precautions such as social distancing measures, personal protective equipment, hand washing and hand sanitizers, and isolation. Many agricultural workers did access testing resources on either side of the US-Mexico border and worked with US-based Spanish-speaking community-based organizations to register for vaccine appointments. To better support agricultural workers and their employers in the future, we recommend the following: 1. Prioritize agricultural workplace conditions to increase agricultural worker physical and mental health, 2. Extend public health services into agricultural work sites of transit and the workplace, and 3. Lastly, trusted Spanish-speaking community-based organizations can play a critical role in public health outreach.

1. Introduction

“And my biggest stress was, although I took care of myself, I had to disinfect myself outside, take my clothes off on the porch, and my fear was to make my family, my wife, and my daughters sick.” – 52 year old agricultural worker living in the US

Agricultural workers are the foundation of the farming sector in the United States. This is particularly true in Imperial County, California, where in 2020 the agricultural sector boasted more than \$2 billion in agricultural sales ([Imperial County Farm Bureau](https://www.imperialcountyfarmbureau.com)). Despite adding to California’s overall \$50 billion agricultural industry, Imperial County, California, ranks third among California counties in the incidences of “high worker distress” ([Flores and Padilla, 2020](https://doi.org/10.1016/j.jrurstud.2022.09.039)). The COVID-19 crisis

has only exacerbated the burdens and stressors among agricultural workers, who may be more vulnerable to COVID-19 exposure due to their inability to socially distance at work ([Kerwin and Warren, 2020](https://doi.org/10.1016/j.jrurstud.2022.09.039)), often crowded accommodations, traveling together to work sites ([Reid et al., 2020](https://doi.org/10.1016/j.jrurstud.2022.09.039)), and lack of personal protective equipment ([Haley et al., 2020](https://doi.org/10.1016/j.jrurstud.2022.09.039)). For example, the agricultural workforce is predominantly composed of US and foreign-born Hispanic/Latino workers, and in California, Hispanic/Latinos accounted for 95% of COVID-19 deaths among agricultural workers within the state ([Flores and Padilla, 2020](https://doi.org/10.1016/j.jrurstud.2022.09.039)). It is well established, pre-COVID, that these essential workers are vulnerable to high-stress levels, which can lead to substance abuse, poor mental and physical health conditions, and high injury rates ([Grzywacz et al., 2010](https://doi.org/10.1016/j.jrurstud.2022.09.039); [Hovey and Magaña, 2000](https://doi.org/10.1016/j.jrurstud.2022.09.039); [Stallones et al., 2009](https://doi.org/10.1016/j.jrurstud.2022.09.039)) and are

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often systematically excluded from vital safety net programs and resources (COVID-19 Farmworker Study, 2020).

In this study, our objective is to draw from the cross-disciplinary concept of resilience to better understand how agricultural workers navigated the heightened risks during the COVID-19 pandemic, and did or did not access available resources and programs. Uniquely situated on the US-Mexico border, agricultural workers in Imperial County live on both sides of the border with Mexican residents commuting across the border daily. This may lead to distinct experiences, risks, and access to resources compared to agricultural workers not situated in a border region.

Resilience refers to the ability of an individual, community, or system to cope, adapt, and transform from a disturbance (Walker and Salt, 2006). We utilize a resilience framework to understand how agricultural workers experienced COVID-19 risks, as well as the resources they used to cope and adapt in the context of a US-Mexico border region, where both exposure to risk and access to resources may be unique. Resilience-focused research has shown that when faced with a hazard or disturbance (such as COVID-19, natural disasters, economic disruptions, etc.) access to a diverse and redundant suite of resources and assets can help increase the resilience of individuals, households, and communities (Leslie and McCabe, 2013). While the resilience field has grown significantly among scholars in the last decade, it is also relevant to practitioners and policy makers working to address many different human challenges, and the COVID-19 pandemic has increased the growth of resilience-based projects and investments (Jones et al., 2021). The COVID-19 pandemic has exposed the interconnected weaknesses of our agricultural systems (Klassen and Murphy, 2020), and this paper aims to offer lessons learned to help build a more resilient system.

To-date, most published academic literature about agricultural workers during the COVID-19 pandemic has studied the experiences of agricultural workers in California's central and northern regions, and of workers of food processing plants in the American plains and south. Moreover, much of this literature has been in the form of commentaries, perspectives, or opinion pieces (Flocks, 2020; Haley et al., 2020; Klassen and Murphy, 2020; Reid et al., 2020; Hill and Martin, 2021), based on secondary data sources (Farnsworth, 2020; Fielding-Miller et al., 2020; Ramos et al., 2020; Villarejo, 2020; Chen et al., 2021), collected quantitative data in the form of surveys or questionnaires (Chicas et al., 2021), or focused on H-2A agricultural workers (Flocks, 2020; Hill and Martin, 2021). In non-border areas, Latino/a agricultural workers faced COVID-19 risk related to congregate housing or large household sizes, the inability to social distance at work and home, and from a lack of culturally appropriate social supports. Our study adds to this body of research by using qualitative inquiry to understand the lived-experiences of agricultural workers in a *border* region over the first 16 months of the COVID-19 pandemic (March 2020 to June 2021)—where agricultural workers had access to housing, healthcare, and social supports on two sides of the US-Mexico border. Our study leverages this site of migrant fluidity and flexibility to examine agricultural worker experiences, both at work and at home, related to three major topics: (1) impacts of COVID-19, (2) precautions taken, and (3) access to testing and vaccines.

1.1. Background

Foreign-born or migrant agricultural workers have long suffered from deep inequities, such as isolation, overcrowded living conditions, lack of access to field sanitation, difficulty accessing health care and workers' compensation, and power differentials or a lack of job security that may make workers feel unable or unwilling to speak up about working conditions or workplace violations (Haley et al., 2020; Handel et al., 2020). For 'essential' workers, the COVID-19 pandemic has exacerbated health, social, and economic inequities—particularly for Black and Hispanic/Latino populations (Handel et al., 2020).

Studies of agricultural worker experiences of the COVID-19

pandemic have centered on populations of migrant workers living in the interior of the United States. This research has emphasized the risk to COVID-19 infection in group housing arrangements—at motels, farm housing, rooming houses—where long-term or seasonal migrants reside. A report from Monterey County, California, which hosts the largest number of H-2A seasonal agricultural workers, found COVID-19 outbreaks in motels where workers slept, up to five to a room (Botts and Cimini, 2020). In rural Washington, Miller et al. (2021) found that workers living in a community had higher rates of infection than workers living in farm housing. Handel et al. (2020) argued that agricultural workers in Michigan were poorly protected by housing and workplace safety standards. While in a study of COVID-19 beliefs and preventative behaviors among North Carolina Latino/a agricultural workers, Quandt et al. (2020) found that despite knowledge of the severity of COVID-19, agricultural workers' families were less likely to practice social distancing and masking around family members than at work. In California's Central Valley, large household sizes of Latino/a families and high worker distress shaped agricultural workers' COVID-19 infection and mortality rates (Flores and Padilla, 2020).

Few academic studies have looked at the experience of agricultural workers in areas along the US-Mexico border. While similar in many respects to other agricultural communities, borderland communities differ in ways that may shape agricultural worker experiences at work and during the COVID-19 pandemic. In border areas, workers can often choose between commuting daily from Mexico or seek housing on the US side of the border, allowing forms of flexibility in navigating housing markets, different systems of social service and healthcare provision, and the benefit of earning US dollars but buying staples in Mexican pesos. However, such borderland flexibility may come at high costs, as daily commuting agricultural workers wait long hours at international crossings, leaving little time for much else—including time for family and medical care. Extant research suggests the need for studying experiences of COVID-19 in border contexts. A study by Filosa et al. (2022) which studied COVID-19 cases, deaths, and vaccinations in dyads of cities along the US/Mexico border found that border counties exhibited higher rates of COVID-19 mortality but also vaccination when compared to non-border counties in the United States. Our previous work in Imperial County, California, has shown that 40% of the daytime and resident agricultural workforce reported high-stress levels that pose significant mental health risks, as measured by the Migrant Farm Worker Stress Inventory (Keeney et al., 2022a).

In the United States, and particularly in California, agricultural workers were targeted with extended paid sick leave benefits, quarantine housing programs, free testing, and early access to vaccinations. In the border county of Imperial, until the summer of 2021 there were two state-sponsored "OptumServe" testing sites providing free tests, and in December 2020 the Imperial County Public Health Department launched a set of mobile testing locations, including on the grounds of a large packing facility, as well as public libraries and community centers (Kiel, 2020). In July 2020, California Governor Newsom launched the 'Housing for the Harvest' Program offering free hotel housing and daily meals for agricultural workers who tested positive. However, it was not until October 2020 that the program was expanded to Imperial County, and ultimately the inability to secure a local organization to administer the program resulted in underutilization (Bowman, 2022; California Department of Food and Agriculture, 2020). Governor Newsom also passed an emergency order giving localities the authority to pass local eviction moratoria, and while Imperial County Supervisors did pass an eviction moratorium in unincorporated areas outside major towns, no Imperial County City chose to do so (Kirby, 2020). In September 2020, an agricultural workers' protections bill passed in California that included paid sick leave for workers with COVID-19. Importantly, when vaccine distribution first began, agricultural workers were added to the priority list, and in Imperial County, the first agricultural workers are documented to have received vaccines on February 22, 2021 (Brown, 2021a). Resources to address workplace risk of COVID-19 infection

came from a variety of sources, including the Imperial Agricultural Commission and Comite Civico distributing masks and CAL-OSHA providing safety checklists and guidance to employers.

Despite some efforts to promote COVID-19 health and safety precautions, agricultural workers have suffered from increased COVID-19 illness and mortality rates. As of October 12, 2022, over 5 million agricultural workers in the United States have tested positive for COVID-19, with over 347,000 cases and 3267 deaths in California specifically (Purdue Food and Agriculture Vulnerability Index, 2022). Furthermore, in Monterey County, California, Chen et al. (2021) found that Hispanic/Latino food/agriculture employees had the highest excess mortality rate of all groups (59%; 97 per 100,000). In September/October 2020, the COVID-19 mortality rate in Imperial County was more than double the second highest county in the state and Imperial County had one of the highest hospitalization and death rates in the US (D'Agostino and Benichou; Jervis et al., 2020).

1.2. Resilience thinking

Resilience is a cross-disciplinary, complex, and often-debated topic of study (see Folke et al., 2021 for a recent and concise summary). The concept of resilience is used as both an evocative metaphor as well as a potentially measurable attribute of a system (Leslie and McCabe, 2013). In aiming to understand resilience, scholars often assess an individual or households' access to resources or assets (Carpenter et al., 2005; Quandt, 2018). However, recent work exploring more 'subjective' approaches to resilience acknowledges that people have an understanding of the risks they face and what factors contribute to their ability to anticipate, buffer, and adapt to disturbance (Jones and Tanner, 2017; Quandt and Paderes, 2022). Additionally, there are lessons learned from psychological-notions of resilience. For example, Scheper-Hughes (2008) identified strategies used to foster resilience included normalization, narrativization, and reframing where survivors depict themselves as survivors of hardship, and not as victims.

Particularly relevant to our study, Leslie and McCabe (2013) argue that diversity and redundancy have important implications for resilience. We hypothesize that having access to diverse, as well as redundant and overlapping, resources may help border serving agricultural workers navigate the risks of COVID-19 and resources used to cope and adapt. The US-Mexico border region provides an ideal setting to explore this idea, as many agricultural workers can access resources on either side of the border. This may be different from their non-border counterparts. However, we do not aim to measure or assess the resilience of our research participants. Instead, we utilize resilience thinking as a theoretical grounding to frame our study, its findings, and the policy implications.

2. Methods

Our research draws from an interpretive constructivist methodological approach to capture the 'lived experiences' of agricultural workers in Imperial County, California during the COVID-19 pandemic. This approach allows research participants to see and interpret reality through their own lenses and perspectives, as is encouraged in 'subjective' approaches to understanding resilience (Rubin and Rubin, 2012; Quandt and Paderes, 2022). To capture these lived experiences and perspectives, we conducted 12 semi-structured interviews with agricultural workers. We acquired Institutional Review Board (IRB) approval from San Diego State University's IRB before all interviews (Protocol Number: HS-2021-0093).

2.1. Study area

Imperial County lies in the Southeast-most corner of California, extending 50 miles from the southern end of the Salton Sea into Mexico. It is one of California's hottest and driest regions, receiving an annual

rainfall of only three inches per year and daytime highs well over 100 °F during the summer months (Hopkins, 2018). By utilizing water from the Colorado River for irrigation and due to its unique environmental conditions, much of the vegetable farming occurs during the winter months, and Imperial County supplies two-thirds of the vegetables eaten during the winter in the US. Despite high agricultural sales, Imperial County is one of the poorest areas in California and ranks highest within the state in injury deaths, income inequality, unemployment, and children in poverty (Marshall, 2017; Singh et al., 2018). Imperial County also has the highest proportion of non-white residents in California; approximately 81% of the population identifies as Hispanic/Latino (Marshall, 2017).

Situated on the US-Mexico Border, Imperial County agriculture is dependent on agricultural workers residing on both sides of the border, including a Mexican labor-force that commutes across the border daily. The daytime agricultural workforce resides in or near Mexicali, Baja California, and are typically in the US daily from 2-3 am to 4-6pm as many of the work shifts begin early to avoid the extreme heat that persists in Imperial County throughout much of the year. The bi-national fluidity available to many workers in this border area poses both unique challenges, like long commutes to cross the border, but also makes available strategies for bi-national resilience, like proximity to extended kin, access to the Mexican healthcare system and housing market, and a lower cost of living.

2.2. Data collection

In our study, we conducted six interviews with US nighttime-residents and six interviews with Mexico nighttime-residents, for a total of 12 interviews. According to Bernard (2018), a handful of knowledgeable people are enough to uncover the core categories in any study of lived experiences. In qualitative studies, data saturation of $\leq 5\%$ new information threshold is typically reached after 6-7 interviews (Guest et al., 2020). For example, research by Guest et al. (2006) found that in their 30 interviews, 70% of the themes and ideas extracted from the interviews were discovered in the first six interviews, 19% in the second six interviews, and only 5% in the remaining interviews. Thus, a small sample size is appropriate and effective to uncover the major themes and topics relevant to the research topic. Importantly, the overarching goal of this qualitative research is to focus on a depth of understanding, rather than breadth. Thus, the interviews aim to understand the perspectives of several agricultural workers in depth, instead of covering the entire breadth of perspectives and experiences that likely exist (Rubin and Rubin, 2012).

Interview participants were recruited from the contacts collected by the Imperial Valley Equity and Justice Coalition (IVEJC), a local community-based organization, during their work in assisting agricultural workers obtain COVID-19 vaccine appointments. Interviews took place over the phone and interview participants were compensated with a \$40 gift card for their participation. Interviews took place during June and July of 2021 and each took between 30 and 60 min. Interviews were conducted in Spanish by native Spanish speakers, and all interviews were recorded with consent from the participant. Each interview was transcribed verbatim and translated into English.

The semi-structured interviews followed a guide of five major topics for discussion but remained open-ended to allow the interviewees to respond in any way they choose, elaborate on their answers, and raise new issues or questions. The questions focused on three major topics: the impacts of COVID-19 at work and home, COVID-19 testing access, and COVID-19 vaccine access. Sample questions included "In what new ways did COVID-19 introduce stress into your life?", "What was your experience getting a test, and accessing your test results?", and "Tell me about your experience trying to get your COVID-19 vaccine."

2.3. Data analysis

Analysis of the interview data drew from inductive grounded theory analytical methods (Bernard, 2018). We used QSR NVivo (1.5.1, 940) software as a tool for coding. In grounded theory analysis, we identified analytic categories (or codes) that emerged from within the text (Bernard, 2018). We also drew from a priori assumptions about categories based on the discussion topics within the semi-structured interview. Coding was conducted by Keeney and Quandt. To examine inter-coder reliability, the two sets of codes were compared to come up with the final organization of the results as presented below.

3. Results

Table 1 summarizes the major themes discussed during the 12 interviews. These themes are discussed in more detail in the following sections.

Table 1
Major results from the 12 interviews.

COVID- 19 Impacts	Work	Work coming to stop either temporarily or permanently Reduced work hours Continuing to work as normal as an 'essential' worker Stress of contracting COVID-19 at work and bringing it home Co-workers continuing to work when infected for need of a paycheck Coping with support from friends and family Utilizing savings and unemployment to get by financially
	Home	Friends and family sick or passed away from COVID-19 Contracting COVID-19 themselves Treatments for COVID-19 Housing issues Mental health issues Coping with stress through exercise Coping with stress through prayer and faith in God
COVID-19 Precautions	Work	Trying to social distance when crossing US-Mexico border Personal protective equipment, masks, and hand sanitizer Social distancing at work Ineffective social distancing at work Quarantine protocols and employer compensation
	Home	Handwashing and hand sanitizer Sanitizing and cleaning the house Use of facemasks Social distancing and quarantining at home Cooking more at home
COVID-19 Testing and Vaccine Access	Testing	Access to testing resources on both sides of the border Paying for testing at private clinics in Mexico Need for fast results to take precautions and start treatment Testing access through mobile clinics at work Employers paying for testing
	Vaccine	Importance of community-based organizations for gaining access Sharing of phone numbers for vaccine registration at work Organized and easy to actually go receive the vaccine Challenges including traveling to vaccine site, long lines, sites running out of vaccines, not easy to use online registration portals Concerns over vaccine reliability

3.1. Interview participants

Semi-structured interviews were conducted with 12 agricultural workers working in Imperial County, California. 50% (n = 6) identified their nighttime residence as Mexico, and 50% identified their nighttime residence as the US (n = 6). All participants (92%, n = 11) except one, were born in Mexico. Ages ranged from 20 to 71, with an average age of 54. Seven (58%) identified as male and five (42%) identified as female. All participants identified as Hispanic/Latino and four (33%) indicated having tested positive with COVID-19.

3.2. COVID impacts

“And we were all afraid, really, we stopped working. The first year that COVID happened, we were working broccoli. And we stopped working because you see that workers cross [the US-Mexico border] daily, they bump into many people, and we were being cautious with each other because we didn’t know, really, who could carry it ... and the truth is, we were scared. I’ve gone by bus to other places to work and we’ve been all bunched up there in the bus; although we all have our own seat ... now with COVID, it seems to me it’s a risk.”

The quote above is from a US-resident about her experiences at work when COVID-19 first hit. The following sub-sections include results from our interviewees about the general impacts COVID-19 had on them both at work and at home in their personal lives.

3.2.1. At work

Interviewees discussed the stressors and impacts of COVID-19 at work, as well as how they coped with these impacts. For some, work came to a stop, either temporarily or for the season, and for others work hours were reduced. Interviewees also dealt with the stress of potentially bringing COVID-19 home from work and of coworkers contracting COVID-19. One US-resident discussed how *“we left the crop there lying in the field ... because many people didn’t want to work, for fear of the disease.”* Another interviewee talked about her own fears at work when the pandemic first started:

“Whenever I went to work, I felt like I was even sick just for having to go to work ... There came a moment when I thought, I told a coworker, I told her ‘Aye, not me.’ That day, the day that I told her that in the morning, I said, ‘I don’t think I can bear it anymore ... Every time I come, I come with more fear. I feel like if they don’t stop us I am going to quit.’ That day that I said that in the morning, in the afternoon at the end of the shift they held a meeting and they stopped us from working for two weeks because the pandemic was really bad.”

However, as agricultural workers were deemed ‘essential’ workers, many continued working through their fears of contracting COVID-19 themselves at work and bringing it home to their families. One US-resident described his stress, *“I felt psychological stress because I have children, I have daughters, I have my wife ... and my fear was to make my family, my wife, and my daughters sick.”* For many interviewees, this stress was intensified as their co-workers were contracting COVID-19. A Mexico-resident described how *“in my work about 4 to 5 got it. And at the company, several people got it ... one of my crew passed away.”* Another US-resident interviewee who contracted COVID-19 described how, *“We started testing positive and [there] were more each time ... and there was more stress because we were all there getting infected. Many friends of mine got COVID at the border crossing, standing in line to cross.”* Interviewees also talked about how some co-workers had to continue working in order to support themselves. According to a younger Mexico-resident, *“I’m going to be honest ... a lot of people knew that they had the virus and they kept going to work. Many times, I put myself in their place, I thank God my husband is the head of the house. But in the fields there are also many single mothers and this means for many of them, losing a day of work means that perhaps they will not have enough for their rent at the end of the month.”*

To cope with these impacts, interviewees relied on various strategies including support from friends and family, savings, and unemployment. Support from family and friends is certainly not unique to the pandemic, but as described by one interviewee, “since I have my children and family, brothers, everything was mutual support, right?” Another interviewee talked about how “when I work, I save money. I save money for these moments over here, it’s not that expensive in Mexico. And I save money, and you get by with that.” Others described how, at least financially, they were not impacted because they kept working during the pandemic. For example, a Mexico-resident discussed how “there was never lack of food, or money, thank God. So no, I can’t complain.”

For seasonal agricultural workers, unemployment can be a critical tool, and it became particularly important to cope with COVID-19 as well. Interviewees who reside in Mexico highlighted how unemployment was particularly useful for them as their cost of living is lower than their co-workers who live in the US. This was highlighted by one interviewee who told us that she supported herself with “just the assistance that the government from the United States sent us, which was, it was a big help, of course. Since we went back to Mexicali, it was a big help. It went farther over there.”

3.2.2. At home

Interviewees spent much time discussing friends and family who contracted COVID-19, as well as themselves as four interviewees had tested positive. Some interviewees experienced significant losses in their family. For example, one interviewee said that “I lost three sisters. Yes, they got it and they died because they didn’t take care of themselves.” Another interviewee discussed how his brother-in-law was “unconscious for about three months. One is wary of the disease; one is wary of that, seeing people and friends of mine here in Mexicali who passed away.” For many, watching close family and friends become sick with COVID-19 was incredibly stressful. For example, a female Mexico-resident told us in great detail about her experiences with her sick father:

“When I found out that my dad had been told that he had tested positive, I did get depressed because my first thought was ... ‘He’s a smoker’, and they said that people who smoked were hit harder ... He was alone and he was my concern. I was dialing him every few minutes, ‘Hey, man, how are you doing? What did you eat? How have you been feeling?’ My fear was that something would happen to him when he was alone, that no one would be able to help him or even when he was asleep. There was one day at night, that was the day that I was most worried, because I dialed him, I was dialing and dialing and he didn’t answer. I was almost ready to call an Uber and take off for his house. In fact, I even said, ‘I feel like getting an ambulance or something. I burst out crying and I remember that I dialed my mom. So she tried to call him and he didn’t answer either. It was about 10 minutes later, I think, when I was getting changed to leave when suddenly he called me back. I calmed down, I said, ‘Why didn’t you answer me.’ ‘No, I fell asleep ... No, I’m fine, don’t worry.’ I feel like that’s one of the times that I got the most stressed out, that I got to a point where I was crying because I imagined a lot of things and more ...”

The four interviewees who tested positive also discussed their own experiences. A US-resident described how “I got sick here at home, but I did have the symptoms, because you know that we lose our sense of taste, and then a little tickle in your throat, cough, fever, body aches. I think that yes, I got it like the flu.” It was also common for multiple people in one household to become sick, and a Mexico-resident described how one by one his whole family tested positive for COVID-19. This led to each household member trying to quarantine separately in his or her own rooms in order to not spread the virus any further. Another Mexico-resident described in detail his own battle with COVID-19:

“A nephew of mine that came ... I got cable and I wanted him to program the TV for me. And he came, I didn’t even get close. And three days later, he got it, COVID. And no, he says he got it three days later and a week later I started to ... I got up and I started sweating, sweating, like bouts of

sweat, and it went away. And bouts of sweat and I was drenched in sweat, and I didn’t like it. I said ‘Gosh! What is going on?’ I went to the doctor ... and told him. ‘No’, he said, ‘you are stressed’. I got scared. No, it’s because COVID, and I was left traumatized. I did lose my appetite. I lost my appetite completely; I wasn’t hungry at all. But thank God, my sisters here, a few blocks away, made me broths just broths, broths. And I started having them, I forced myself to eat them, I forced myself, and I checked my blood pressure, I checked my blood sugar and everything And then I went to see a doctor and she gave me a vitamin treatment and all that; vitamin C, vitamin ... all that is what she gave me more of. I started taking it and I got better ...”

Other interviewees described the treatment they received after testing positive for COVID-19. A Mexico-resident talked about receiving hydroxychloroquine, as well as vitamins such as Vitamin D and Zinc. Another interviewee expressed confidence that the vitamins he took helped him recover: “I started taking the vitamins, pure Vitamin D, C, and vitamins, all that to strengthen your body. About 15 days later, I went [back] to work.”

However, the stress and impacts of COVID-19 went beyond contracting the virus itself. Interviewees also discussed issues with housing and mental health. One interviewee was kicked out of her rental unit in the US and was forced to move back to Mexicali because “the owner of the house was afraid of getting infected with COVID ... so she asked us to move out, to look for another rental.” Other interviewees discussed mental health issues experienced by their families and themselves. A US-resident described how her son started having panic attacks and had to see a psychologist. She spoke about how “he had to go see a psychologist so she could give him medication to be able to control the anxiety that set in, he even wanted to kill himself. Although you may not believe me, my son, a 30-year-old man, crying because of the impact ... My son did suffer from stress, he got panic attacks.”

Interviewees relied on a variety of coping strategies to deal with the stress of COVID-19, including exercise and their faith in God. A US-resident described how he would exercise on his treadmill because it helped put him in a better mood and feel healthier. A Mexico-resident chose to cope through fishing: “I go fishing and I forget about everything. Since there is nobody there, we go, so you unwind and you are relaxed, you are not that stressed.” Many interviewees also discussed turning to their faith in God as a way to relieve stress and pray for their loved ones.

3.3. COVID-19 precautions

Interviewees discussed the precautions taken both at home and at work to prevent contracting and spreading COVID-19. This included precautions to prevent bringing COVID-19 home from work, which was a major concern for several interviewees who developed specific routines when arriving home from work. In this section, we outline the precautions taken by the interviewees at home and in their personal lives, as well as precautions taken by themselves and their employers at work.

3.3.1. At work

While at work, interviewees discussed precautions taken by their employers, places of work, and themselves, including precautions taken by Mexico-residents when crossing the US-Mexican border on their commute to work. PPE and hand sanitizer, social distancing, and other health and safety protocols, quarantine protocols and employer compensation when quarantining were all identified as COVID-19 precautions among participants. Others discussed their dissatisfaction with safety protocols and how they were often unrealistic, given the nature of their work. For example, maintaining social distance while commuting and during work was a priority for many interviewees and their employers, but often difficult to accomplish in practice. Mexico-residents discussed their fears about contracting COVID-19 during their commute across the US-Mexico border due to a lack of social distancing.

One interviewee discussed how he would “*stay in line, but I step to the side, I mean, I’m not close [to others]. You see how people bunch up, I don’t, I stay away from the line or if they are not following the one and a half rule, I stay away from the line and I stay on the side.*” While at work, a US-resident discussed how her employer “*had a designated area for each person. On the dining room tables, they had dividers, we couldn’t sit together, we couldn’t get very close with co-workers.*” Lastly, another interviewee described how social distancing was not practical given the realities of farm work. She told us that “*In the field, it is a lie that you can keep your 6 feet distance. You cannot. There you are working back-to-back, shoulder to shoulder, elbow to elbow.*”

Interviewees discussed the use of facemasks, hand sanitizers, and other health and safety protocols at work. For example, one interviewee told us that, “*yes, well, you see they gave us hand sanitizer everywhere, face masks to cover ourselves, they gave us isolation classes, how we should distance ourselves from people ... wash your hands before going to the bathroom, before eating, after eating.*” Interviewees expressed different experiences with mask wearing at work – some positive and some negative. A US-resident described some of the additional benefits of wearing masks while working in the fields which included helping him not breath in agricultural chemicals. Alternatively, farm work can be physically demanding and another US-resident described how the pace of work and breathing hard can make wearing a mask agitating.

Lastly, interviewees discussed their employer’s protocols for quarantining. A US-resident described how,

“*The Human Resources Worker who gave me the [COVID-19 test] results, she also told me what I had to do ... They told me that the company was paying the amount of 80 hours of work for the hours I was not working. And if I went over that time, I could apply for unemployment ...*”

However, other interviewees did express that their employers were hesitant to pay workers who quarantined and stayed at home, and one interviewee noted that “*a lot of people knew that they had the virus and they kept going to work ... because at work one lives day to day.*”

3.3.2. At home

Interviewees highlighted the precautions they took in their personal lives to lower the likelihood of contracting COVID-19, including increasing handwashing and hand sanitizer use, sanitizing and cleaning their homes, the use of facemasks, social distancing, and cooking and spending more time at home. For example, an interviewee living in Mexico told us, “*there were very tough months when you did have to take care ... you had to take very good care of yourself ... with your facemask and your hand sanitizer in your pocket.*” These sentiments also echoed across the border as an interviewee in the US described how she once “*arrived at Costco and the young lady told me that if I wanted to wear a facemask, that I could wear it; if not, then don’t. But I put it on regardless.*” These precautions also extended into the home and efforts to sanitize and keep the home clean. One interviewee discussed how “*We paid to have our house fumigated every 15 days ... and washing things, food, we washed with soap everything at home, the bathroom, everything, everything.*”

In addition to these precautions related to increased hygiene and wearing facemasks, interviewees discussed their efforts to socially distance and quarantine at home. This was highlighted by a US-based interviewee, “*I told my wife that we have to calm down and face this directly. Some people brought us food and left it at the door. I mean we did not go out for absolutely anything.*” Another interviewee discussed how their family stopped eating out because they were “*afraid that somebody who buys food on the street may be infected.*”

Even when taking these precautions, interviewees still expressed fear about contracting COVID-19. As described by an interviewee in the US,

“*So it was - that is we took a lot of care of ourselves here at home. Trying not to go out, trying to eh wash our hands - everything that was recommended to us, but well yea, the stressful thing was that at any given*

moment one would hear of a peer having COVID and one having been with him the day prior. I probably have it.”

3.4. COVID-19 testing and vaccine access

In general, our interviewees expressed that they were able to access COVID-19 testing and vaccine services relatively easy. However, this is to be expected as all interviewees were part of COVID-19 outreach efforts by community-based organizations such as the Imperial Valley Equity and Justice Coalition and Salud Sin Fronteras. Additionally, the US-Mexico border in Imperial County is often described as “fluid” given that US and Mexico residents move across the border regularly, have family and friends on both sides, and pursue education and career opportunities on either side. As such, many participants had access to testing and vaccine resources on both sides of the US-Mexico Border.

3.4.1. COVID-19 testing

Interviewees discussed access to COVID-19 testing on both sides of the border, the speed of getting back results, and testing efforts at work. Six interviewees talked about how they or family members had access to testing in Mexico through private medical clinics. A farmworker residing in Mexicali, Mexico talked about his experience at a private clinic, “*I went to Mexicali to a private clinic and I got tested for COVID and I tested positive. They charged me too much, I got it for about \$200 [US] dollars; it’s a very good hospital, it’s a private clinic. Going to Mexicali was easier for me since I don’t know how to read or write or any of that. They gave it [results] to me in 6 hours*” Another Mexico resident told us “*No, we paid money for it, it was not free. I mean, we paid, I think it was \$3000 pesos per person ... because we went to the doctor that we have.*” These interviewees described how accessing testing was easier for them in Mexico, over free testing sites in the US, because they were able to obtain test results faster and with current trusted, Spanish-speaking, doctors and clinics.

The desire to obtain test results quickly was not only expressed by Mexico-residents, but also US-residents. For example, a US-resident discussed his dissatisfaction waiting for results,

“*It was easy but many times one expects a result to be maybe a little sooner to take the precautions maybe, on some occasions at certain locations where they took COVID tests, the results took 24 hours, some up to two days, some even up to three days. So 3 days of uncertainty or it is 2-3 days that you lose before starting a treatment right ... I think the longest it should take is 24 hours.*”

Interviewees also discussed testing access at work through their employers and at mobile testing sites where they could be tested for free. A female US-resident farmworker discussed her experience with the mobile office, “*At the end of the day, the company brought a mobile office where there is a doctor with his team and they did test right outside the company. So, they told us, before we left, that whoever wanted to get tested, that the doctor was going to be there, right? It was voluntary, nobody forced us.*” Another US-resident described how their employer offered to pay for any COVID-19 testing costs if workers went to be tested in local clinics.

3.4.2. COVID-19 vaccine

Even though our interviewees generally expressed easy access to COVID-19 vaccines due to the outreach efforts of local Spanish-speaking community-based organizations, many also spoke about the issues or concerns expressed by themselves, their family, and friends, having faster access in Mexico, and vaccine hesitancy. Nine of our 12 interviewees discussed the help they received from community-based organizations being critical to vaccine access, regardless of their residence. As explained by one interviewee, “*They signed me up early morning, 3:00 to 4:00 in the morning they signed me up there, and the same day I arrived in the evening and they called me to let me know that I had an appointment to go and get vaccinated. I think it was the following week.*” As described here,

organizations would register farm workers in the morning in Calexico where they often wait for transit to work sites after crossing the border. Additionally, interviewees discussed how supervisors and co-workers shared the phone numbers for these organizations, and that they were able to call and register themselves.

The assistance and ease of vaccine access was nicely summarized by a US-resident:

“We went looking - in fact I used to call you [IVEJC] a lot, hey, do you have the vaccine? I mean, you all behaved very well. I mean, I really appreciate you all. Always being attentive, always calling us, always being aware of when there are going to be vaccines, notifying us, all that kind of thing. So in that moment I feel less stressed right ... I mean I was surprised by the organization because I got the first dose in Heber right, everything well controlled, everything very fast and the people were attentive, at least what you did with your program, for me was perfect.”

In addition to the assistance from community organizations, many interviewees discussed the ease and effective organization of actually getting the vaccine. On the US side of the border, one interviewee described how *“They let a few come in, then they let another, but we all left in 1 hour, and everything was calm, really; very accessible. They treat people very kindly.”* Another interviewee, who is currently a US-resident, was able to get the vaccine in Mexico due to his previous work experience there. He told us that *“... the same people from social security here [Mexico] informed me that I had the opportunity to get vaccinated as the first ones who were vaccinated here were the elderly.”*

However, despite these experiences by some, other workers did discuss challenges, as well as those faced by their family and friends. Some of these challenges included having to travel before work to get to the vaccination site in the US, long lines on both sides of the border, vaccination sites running out of vaccines or not having the preferred vaccines, and challenges accessing online sign-up portals. An interviewee also discussed how he felt uncomfortable getting his vaccine because in the same location were also people getting COVID-19 tests. He spoke how *“Although ones goes with their face mask, if you are going to take a test it is because you have the possibility or maybe you have some symptoms or something that you have COVID. That was the only think I didn't like. Scramble people, testing with vaccines.”*

Lastly, one interviewee did express concern about vaccine safety and has chosen to not get vaccinated. She expressed concerns about the speed the vaccine was made and had a family member who was vaccinated but still became sick with COVID-19:

“I'm always a little afraid of getting it because it's a vaccine that was made very fast and one is always afraid of getting vaccinated with the virus, getting a shot of the virus, because that's what it is, they inject the virus in your body. Look, I have a relative of mine who got vaccinated already in Mexicali ... and right now she's on oxygen, she got COVID ... And you do get scared, because you see, so many things that you hear and I think the vaccine is not that reliable.”

4. Discussion

Grounded in resilience thinking, our study draws from 12 in-depth qualitative interviews with agricultural workers employed in Imperial County, California, to highlight how agricultural workers navigated the heightened risks they faced during the COVID-19 pandemic, as well as if they did or did not access available resources. Agricultural workers in our study faced significant impacts at work, including work stoppages, reduced hours, stress about contracting COVID-19 and bringing it home to family, as well as at home stressors including experiences with contracting COVID-19, loss of friends and family, housing issues, and mental health challenges. Agricultural workers and their employers often implemented COVID-19 precautions too, such as social distancing measures, personal protective equipment, increased hand washing and the use of hand sanitizers, and staying at home while not at work.

Importantly, our study expands our understanding of the unique impacts of COVID-19 and the diverse and redundant resources accessed by agricultural workers in a US-Mexico border region.

4.1. COVID-19 impacts and experiences

The agricultural workers who participated in our study highlighted their experiences with the COVID-19 pandemic and the various ways they were impacted, which was likely influenced by their occupation, rural location, and other environmental and social factors. Indeed, a heightened risk of COVID-19 exposure and mortality were seen throughout California (Chen et al., 2021). Nation-wide, rural residents experienced an increased risk for severe COVID-19 morbidity and mortality and in September of 2020, COVID-19 incidence in rural counties surpassed that of urban counties (Murthy, 2021). While not specifically mentioned by the interviewees, Imperial County also experiences poor air quality, thus likely increasing the risk factor of severe COVID-19 infection (Crawford et al., 2021).

Importantly, interviewees expressed concern about contracting COVID-19 at work and bringing it home to their families. This is supported by Gonzalez et al. (2021), who found that 59% of adults in California immigrant families were very or somewhat worried about exposure to COVID-19 at their place of employment, compared to 45% of adults in non-immigrant families. The study results support findings from our quantitative study of agricultural workers in Imperial Valley (Keeney et al. 2022a, 2022b), which found that foreign-born workers, regardless of citizenship status or current country of residence, experienced higher levels of stress. Although interviewees did discuss a wide variety of available resources and programs aimed to assist them during the pandemic, they did not mention the ‘Housing for the Harvest’ program as an option to help protect their families by quarantining away from them. This program has been widely criticized for being underutilized, and the same is true in Imperial County where the program was largely ineffective (Bowman, 2022). Our study did contain one eviction case of a worker from a rental unit in the US. While cities in the Imperial Valley did not pass local eviction moratoria, renters should have been protected by a California Judicial Council emergency rule that barred local courts with hearing most eviction cases, and by a state eviction ban passed in September 2020. However, the unknown numbers of out-of-court evictions during the pandemic likely exacerbated housing insecurity for agricultural workers (Levin, 2020).

4.2. COVID-19 precautions

Agricultural workers took a variety of precautions both at work and at home including the use of personal protective equipment, hand sanitizers, and social distancing. This is similar to findings from Chicas and colleagues (2020) who found that the majority (87%) of agricultural workers in Central Florida reported being able to socially distance at work. While a major concern for Mexican residents was contracting COVID-19 during their daily border crossing into the US for work, to our knowledge, there is no empirical evidence to support these claims. Indeed, fluid movement across the border also meant having access to COVID-19 resources and services on either side of the border.

Interviewees discussed the preventative measures taken by their employers at work including providing personal protective equipment, enforcing social distancing, and bringing testing trucks to worksites. However, as noted by Klassen and Murphy (2020), many employers offered benefits that were voluntary and temporary. For example, while in June 2020, the Centers for Disease Control and Prevention did offer recommendations to employers on how to protect agricultural workers from COVID-19, employers were not required to implement these suggestions and the Occupational Safety and Health Administration (OSHA) remained relatively silent on worker protections from COVID-19 beyond providing safety checklists and guidelines (Liebman et al., 2021). However, as supported by our findings, enforcement of guidelines and

regulations was uneven, and several larger agricultural processing companies in Imperial County did receive fines for negligence in protecting workers (Calexico Chronical, 2021).

4.3. COVID-19 testing and vaccination

Interviewees discussed their experiences with accessing COVID-19 testing and vaccines, including paying for faster testing results in Mexico and relying on local community-based organizations to sign up for vaccine appointments. Our interviewees were selected from a pool of agricultural workers who registered for vaccine appointments with the Imperial Valley Equity and Justice Coalition, so their high vaccination rates are likely not representative of the Imperial County agricultural community. For instance, nationally, as of August 11, 2021 only 45.8% of adults in rural counties had been fully vaccinated (Sun and Monnat, 2021). Chicas et al. (2021) found that of agricultural workers in Central Florida, only 53% reported being vaccinated as of July 2021. One interviewee did discuss their hesitancy to get vaccinated, and in Central California, Mondal (2021) found that half of the farmworkers in their study expressed vaccine hesitancy due to a lack of trust in the government. In Imperial County, barriers to vaccine access for agricultural workers included inconvenient locations, such as Imperial Valley College, online registration for appointments in English, and appointments filling up quickly (Brown, 2021b). In a study of the vaccine rollout among Hispanic/Latino communities in southern San Diego, California, Sobo et al. (2022) identified the cultural standpoint of *aguantarismo*, which celebrates human resilience in the face of hardship, as both undermining and supporting vaccine uptake. This supports the need for culturally-responsive interventions, and not just interventions that address the structural barriers identified in our study.

In order to reach agricultural workers, Thomas et al. (2021) highlight the importance of vaccine distribution through partnerships among health authorities, community- and faith-based groups, and health centers with trusted community relationships. Indeed, Liebman et al. (2021) discuss how the COVID-19 pandemic has brought out new and unprecedented partnerships and efforts to support the health and safety of agricultural workers in the absence of a sufficient government response. This certainly includes the ‘hyper local’ efforts of the Imperial Valley Equity and Justice Coalition and Salud Sin Fronteras in securing vaccine appointments for agricultural workers in our study area (Brown, 2021b). Additionally, it is important that COVID-19 outreach and education activities come from trusted sources and are not simply translated into Spanish (or other languages) but also consider culture, language, and literacy levels (Ramos et al., 2020; AuYoung et al., 2022). Recognizing the value of community engagement and true bi-directional partnership is critical to successful public health messaging (AuYoung et al., 2022), and our research emphasizes these points.

4.4. Resilience in a border region

Our study provides insight into the concept of resilience, and particularly the relevance of access to diverse and redundant/overlapping resources on both sides of the US-Mexico border. On one hand, compared to agricultural workers in a non-border region, workers along the border may have faced increased risks as many workers cross the border on their daily commute to work. While our study only provides anecdotal perceptions of such risks, work by Filosa and colleagues (2022) found that on average, US counties along the border had higher mortality rates than the national average, while on the Mexican side of the border mortality rates were not significantly different. While the causes of this are complex, Filosa and colleagues (2022) hypothesize that movement across the border may be one contributing factor.

On the other hand, the agricultural workers in our study clearly discuss multiple occasions where the diversity and redundancy of resources available to them were helpful. For example, several agricultural workers discussed accessing testing and vaccine resources on both sides

of the border. Indeed, they were sometimes willing to pay for testing at private clinics in Mexico to get fast results and receive the services in Spanish. Interestingly, Filosa and colleagues (2022) also found that vaccination rates in counties/municipalities on both sides the US-Mexico border were higher than non-border counties/municipalities in both countries. This diverse access to resources on either side of the border may have improved the efficacy of the testing and vaccine roll outs. In non-border regions, agricultural workers contend with less diversity and redundancy of available resources, with less flexibility in housing and consumer choices, while often depending on English-language services and the American healthcare system (Handel et al. 2020). This aligns with Leslie and McCabe (2013) who hypothesize that diversity and redundancy are important aspects of resilience. Our results also highlight the importance of diversity and redundancy across scale as agricultural workers discussed local community-based organizations, statewide resources, and national rules and regulations. However, while the diversity and redundancy of resources available certainly helped, we in no way claim that the agricultural workers nor the agricultural system in our study were particularly resilient in the face of the COVID-19 pandemic due to the pre-existing systemic, economic, and social inequities (Xiuhtecutili and Shattuck, 2021; Sobo et al., 2022). Rather, the experiences, choices, and strategies of borderland agricultural workers can inform how we can design more equitable and accessible systems of agricultural worker healthcare and workplace protections.

4.5. Policy solutions and recommendations

Stemming from our findings of how agricultural workers navigated the COVID-19 pandemic and did or did not access available resources, we make three recommendations for policy solutions to more effectively support agricultural workers and build their resilience to future disturbances:

1. Prioritize agricultural workplace safety conditions to increase agricultural worker physical and mental health. Our study found that long international commutes, lack of access to clean bathrooms, as well as the difficulty of following social distancing at work shaped agricultural workers’ COVID-19 experiences. This suggests that prioritizing workplace conditions can have an impact on worker physical and mental health. Even before the COVID-19 pandemic, agricultural workers were vulnerable to poor workplace conditions, high stress levels leading to substance abuse, poor mental and physical health conditions, and high injury rates (Grzywacz et al., 2010; Hovey and Magaña, 2000; Stallones et al., 2009). In Imperial, the local healthcare system lacks the capacity to provide care for residents and the migrant daytime worker population. According to 2020 County Health Rankings and Roadmaps data, there is approximately one mental health provider for every 713 Imperial County residents, which is much lower than the statewide average of one for every 283 residents—numbers that do not count non-resident migrant workers. Our study, among others, has shown that the COVID-19 pandemic has certainly exacerbated chronic health issues (Kerwin and Warren, 2020; Haley et al., 2020; Reid et al., 2020; Keeney et al., 2022a, 2022b). Addressing issues of workplace conditions is context specific, but generally is more straightforward than improving access to mental and physical health resources.
2. Extend public health services into agricultural work sites of transit and the workplace. Our study found that the perceived accessibility of agricultural worker resources was shaped by language, trust, as well as the location and hours of services. Services targeting locations and times that align with the agricultural worker workday can increase diversity and redundancy in the government response and available resources to agricultural workers. Our research found that agricultural workers often chose higher cost private alternatives in Mexico for testing and similarly sought support and housing

assistance in family networks, outside California's agricultural worker housing programs. As our study highlights, and has been documented elsewhere, government response to protect agricultural workers and provide education and resources to both workers and employers was often slow and ineffective (Bowman, 2022). While agricultural workers in our study did take advantage of some resources (e.g., unemployment benefits), many did not take advantage of statewide or top-down programs resources including hotel rooms for quarantine and additional paid sick leave. However, agricultural workers expressed ease of access from mobile testing sites located outside their workplace and relied on workplace staff for phone numbers for clinic hotlines and information about unemployment benefits. By making social and healthcare services available at familiar points of transit and at work, agricultural workers may be more willing to make use of these resources.

3. Lastly, as highlighted by the agricultural workers in our study, trusted Spanish-speaking community-based organizations can play a critical role in public health outreach. In this context, community is not just a geographic community, but also an ideological, social, and cultural community (Brown, 2021b; Sobo et al., 2022). As highlighted by Au Young and colleagues (2022), it is these types of organizations that are best positioned for effective, culturally- and contextually appropriate education and action as they are often trusted more by community members than the government. When it comes to agricultural workers and Spanish-speaking essential workers, community organizations play a central role in public health provision for the hardest to reach. Therefore, increasing funding opportunities to these local organizations to secure resources and integrating them into the design of public health interventions is another critical step to reaching agricultural workers in Imperial County, California, and beyond. As with the recommendations above, these organizations have a critical role to play in reducing inequities not only during a pandemic, but every day.

4.5. Limitations

Despite the potential implications of our findings, it is important to acknowledge two limitations of our methodology. First, while a qualitative approach can provide depth in understanding of the lived experiences of agricultural workers during the COVID-19 pandemic, our study only included the experiences and perspectives of 12 agricultural workers. While these experiences are likely somewhat representative, they are specific to these individuals. Second, our study explores the specific case of agricultural workers in Imperial County, California. The experiences of agricultural workers in other parts of California, or the United States, may have been vastly different. Thus, to address these two limitations, future research could involve a cross-case comparison, interviewing agricultural workers in multiple different regions.

5. Conclusions

Through a qualitative study of agricultural workers employed in Imperial County, California, our results highlight COVID-19 impacts, COVID-19 health and safety precautions, and experiences with accessing COVID-19 testing and vaccines. Our research provides a lens into why agricultural workers sometimes adopted resilient and adaptive strategies that were distinct from the programs designed to assist them, and that many kinds of assistance remained physically, socially, and/or culturally inaccessible or poorly communicated to agricultural workers. In other cases, interviewees highlighted models of programs that did actually work to help them.

Grounded in resilience thinking, our study fills an important gap in understanding the lived-experiences of agricultural workers in a US-Mexico border region in navigating the heightened risks and available resources during the first 16 months of the COVID-19 pandemic. Our findings support three policy recommendations to improve agricultural

worker health and safety in the future: 1. Prioritize agricultural workplace conditions to increase agricultural worker physical and mental health, 2. Extend public health services into agricultural work sites of transit and the workplace, and 3. Lastly, trusted Spanish-speaking community-based organizations can play a critical role in public health outreach. While our study focuses on Imperial County, California, these recommendations may also improve responses to future public health responses, and improve overall wellbeing and resilience more generally, in other agricultural communities throughout the United States. However, how each recommendation is achieved will be context-dependent.

The COVID-19 pandemic has exacerbated the already existing burdens and stressors of agricultural workers (Keeney et al., 2022a; COVID-19 Farmworker Study, 2020; Kerwin and Warren 2020; Reid et al., 2020; Haley et al., 2020). To improve the quality of lives of these critical workers, much work is still needed. There is an opportunity for the COVID-19 pandemic to serve as a transformative event that improves the resilience of the agricultural sector for the better, emphasizing the importance of this workforce to the food security of the country and world.

Author statement

Amy Quandt: Conceptualization; Methodology; Data Formal analysis; Writing – original draft, Annie J Keeney: Conceptualization; Methodology; Data Formal analysis; Project administration; Writing – original draft, Luis Flores Jr: Conceptualization; Methodology; Data collection; Writing – review & editing; Daniela Flores: Conceptualization; Methodology; Data collection; Writing – review & editing; Mercy Villaseñor: Data collection; Writing – review & editing.

Institutional Review Board statement

All research procedures in this study involving human participants were in accordance with the ethical standards of the (blinded for review) Institutional Review Board and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This study was approved by the Institutional Review Board (Protocol Number: HS-2021-0093).

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Declaration of competing interest

The authors have no competing interests to declare.

Data availability

Data will be made available on request.

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