

Californian Farmworker Vulnerabilities: Community Health Challenges in a Changing Climate



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dawn, toil under unforgiving conditions, and endure hardships that many cannot imagine, all to ensure that families across the nation have food on their tables. Their sacrifices and humanity inspire this work, which is humbly dedicated to amplifying their voices and shining a light on the inequities they confront daily. It is both a privilege and a moral obligation to advocate for systemic changes that recognize their dignity, honor their contributions, and safeguard their health and well-being.



Executive Summary

Jana Schmidt, Bianca Hooper, Chance Lengyel, & Sydney Stedman

Climate change is one of the most pressing global challenges of the 21st century, with far-reaching consequences for both human and environmental systems. Rising temperatures, unpredictable weather patterns, and the increasing frequency of extreme weather events, such as droughts and wildfires, threaten communities worldwide. Among the most vulnerable to these challenges is the agricultural sector, specifically farmworkers and their families, whose livelihood and health outcomes are deeply influenced by environmental conditions. Farmworkers endure long hours of physically demanding labor, often in outdoor environments directly impacted by climate change. To address these challenges, our Task Force split up into three groups: the Risks group, focused on identifying vulnerabilities farmworkers face; the Remedies Group, which worked on creating communication strategies and gathering personal stories to inform and support farmworker communities; and the Retraining Group, which is all about promoting resilience and empowering farmworkers with sustainable skills and alternative opportunities to adapt to the impact of climate change.

The “Risks” chapter of this paper aims to examine and contextualize the health risks faced by farmworkers in California as a result of climate change. The escalating effects of extreme heat, poor air and water quality, pesticide exposure, and other environmental hazards compounded by systemic burdens – including low wages, limited access to healthcare, minimal legal protections, and overall poor working conditions – disproportionately affect marginalized communities and exacerbate farmworkers' vulnerability to climate-related stressors. To further explore these vulnerabilities, this chapter includes a literature review that compiles existing

research alongside an adapted environmental structural vulnerabilities checklist to gauge how systemic burdens amplify overlapping risks. Additionally, educational powerpoints were developed to help communicate these findings and raise awareness within farmworker communities. Altogether, these tools aim to identify areas of disparity and provide resources to empower affected communities, emphasizing the urgency of addressing climate change not only as an environmental issue, but also as a social justice and public health crisis.

Given these various struggles related to the changing environment, people are facing difficulties adapting to these changes. Farmworkers, called *promotores*, are being trained to educate others on important information regarding what should be done in order to keep themselves safe in their home and workplace. There are many stories to be shared by farmworkers, *promotores*, and partners on this project such as Sally Triado. These stories regard their experiences regarding how their lives are changing with the climate, a comparison between the most prevalent struggles in the Central Valley and Central Coast, and dealing with OSHA and reporting an unsafe workplace.

Building on the understanding of climate change's widespread impacts, this paper also illustrates how these environmental risks intersect with systemic inequities to shape the lives of farmworkers in California. For many, especially those who are undocumented, these issues become very difficult to solve because they are so deep-rooted. This paper focuses on addressing these challenges through six essential resources: housing, mother/child care, food security, healthcare, legal resources, and education, all of which are essential for improving the quality of life of farmworkers overall. Even so, accessibility to these resources often remains unevenly distributed across various regions in California. For the Remedies Communications group, the focus was to develop brochures tailored specifically to farmworker communities in six different

Californian cities: Gilroy, Huron, Greenfield, Salinas, Soledad, and Watsonville. These resource brochures provide localized, bilingual information on available services for farmworker families in these communities. Not only are these resources on paper, but they also integrate with the Campo-Sano app that this task force has helped create. The app features an interactive map of California, ensuring that the developed resources are permanently accessible to farmworkers and their families in a digital format. By exploring the challenges farmworkers face and offering practical solutions, this paper seeks to advocate for equity and resilience. Through tools like these in-person brochures and the Campo-Sano app, we aim to empower farmworker communities while simultaneously addressing these systemic challenges that threaten their livelihoods.

Although foundational corrections addressing systemic issues may be more sustainable and broadly applicable in the long run, the fact stands that many farmworkers are facing immediate health threats due to their working and living conditions. As a short-term measure, moving farmworkers away from lower-skilled farm jobs through education and retraining is one potential pathway to improving their safety and quality of life. Other jobs have the potential to provide higher wages, reduced occupational risk, and improved upward mobility. However, two main issues prevail with reskilling. First of all, there are significant barriers to access for many farmworkers seeking educational opportunities and other forms of employment. Factors such as immigration status, socioeconomic status, language barriers, lack of support, and access to basic needs can all serve as barriers to access. Additionally, another issue lies in the inherent nature of the cycle of exploitation that is perpetuated as newer farmworkers will inevitably replace those who leave. Although reskilling can improve wellbeing for those who have moved out of farmwork, those who still work on farms will still be subjected to the same risks as those prior.

The “Reskilling” chapter of this report will examine reskilling from a multifaceted perspective to identify its core issues as well as describe the present condition of reskilling and education in the Central Coast area of California.



Chapter 1: Risks

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Introduction

This chapter examines the multifaceted health risks often faced by farmworkers in California. In this state, agriculture is vital to the economy but remains particularly susceptible to the effects of climate change. Through the lens of ecosyndemics, this paper contextualizes how biophysical factors such as heat stress, air quality, and pesticide exposure interact with social vulnerabilities to worsen health outcomes. It includes a literature review that compiles existing research alongside an adapted environmental structural vulnerabilities checklist to evaluate how systemic disparities amplify these overlapping risks and related powerpoints to support community education. By addressing these interconnections, this chapter highlights the urgent need for policy reforms and protective measures to safeguard farmworker communities while promoting a more equitable and sustainable agricultural system in California.

Literature Review

Current literature on climate change and farmworker health highlights the complex interplay of environmental hazards and social vulnerabilities that place this population at a heightened risk. Occupational heat stress, poor air quality, and pesticide exposure are identified as some of the major environmental threats (El Khayat et al. 2022; Von Glascoe and Schwartz 2019; Hoppin et al. 2006); These risks rarely occur in isolation. Instead, they converge and interact with systemic inequities—such as poverty, limited access to healthcare, and immigration status—within the framework of ecosyndemics. Ecosyndemics describes how environmental

changes and social inequities compound to harm vulnerable populations disproportionately, intensifying health disparities and perpetuating cycles of poor outcomes. For farmworkers, this means facing overlapping challenges such as respiratory illnesses, infectious disease risks, and other climate-related health risks, all exacerbated by inadequate protections and resources. This review synthesizes research on key risks, particularly heat stress, air quality, and pesticide exposure, while also considering related environmental risks like water quality and mental health to underscore the interconnected nature of these challenges and establish a more comprehensive context of farmworkers’ realities.

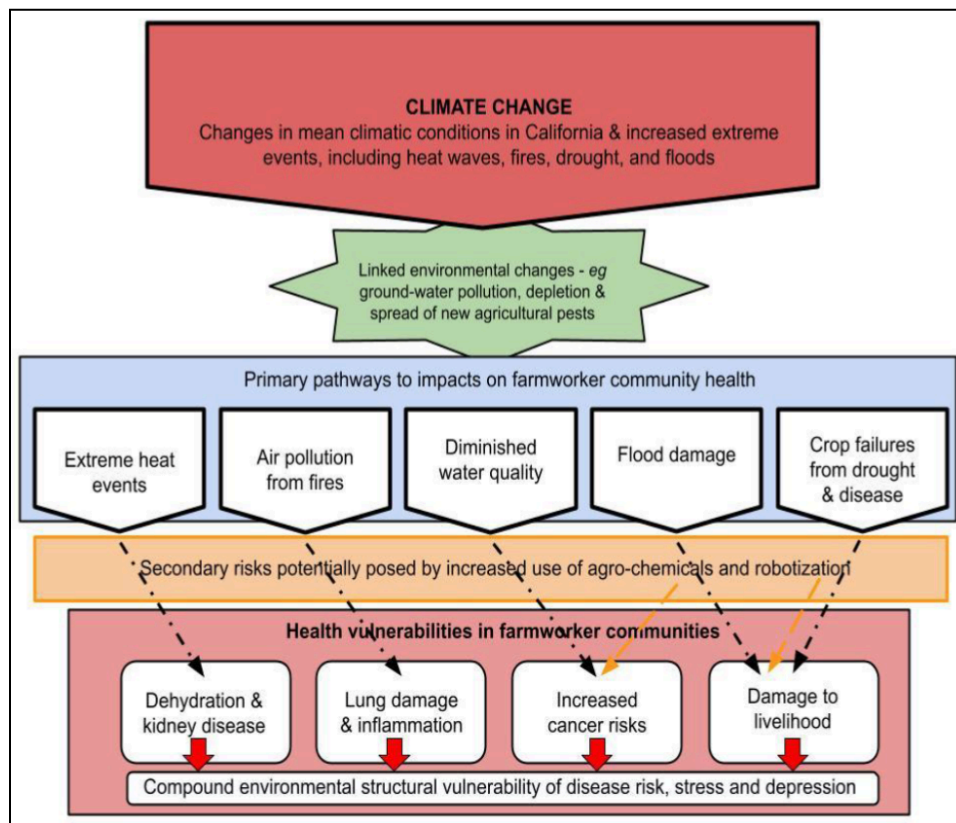


Figure 1: Diagram of pathways to health vulnerability for farmworkers from climate change (following [Bourgeois et al, 2017](#); [Castillo et al, 2021](#); [El Khayat et al, 2022](#); [EPA, 2021](#); [Guthman, 2019](#); [Frumkin & Haines, 2019](#); [Marlier et al, 2022](#); & [vonGlascoe & Schwartz, 2019](#))

Heat Stress

Heat stress occurs when the body cannot cool itself effectively due to the interaction and combination of multiple factors, including metabolic heat, environmental heat, and wearing restrictive clothing or personal protective equipment (PPE) (National Institute of Occupational Safety and Health 2024). This condition can lead to heat-related illnesses, such as heat exhaustion, heat cramps, and heat stroke, which can be life-threatening. For farmworkers, who often perform physically demanding tasks outdoors, heat stress is a prevalent occupational hazard exacerbated by climate change.

El Khayat et al. (2022) identified dehydration, heat strain, productivity-based payment systems, inadequate clothing, and limited access to both shade and medical care as key risk factors for heat stress among farmworkers. Vulnerable populations, such as migrant and child farmworkers, are particularly at risk due to unsafe working conditions and limited labor protections, highlighting the intersection of occupational hazards and social inequities.

Carr et al. (2022) explored the compounded risks of extreme heat and COVID-19, noting that heat stress can exacerbate kidney damage, while COVID-19 amplifies symptoms. This combined burden overwhelms the body's ability to cope, increasing the risk of severe illness and long-term organ damage. Additionally, the economic pressures of the pandemic forced many farmworkers to work while ill, reducing productivity, delaying recovery, and heightening the spread of infection within the agricultural sector.

Moyce et al. (2018) further emphasized the socioeconomic dimensions of heat stress, finding that California farmworkers paid by the amount of produce harvested faced a higher risk of acute kidney injury (AKI). Female farmworkers were disproportionately affected, likely

because breaks for cooling or hydration directly reduced their earnings, linking financial pressures to heightened health risks.

Prolonged exposure to high temperatures not only affects farmworkers' physical health but also reduces their productivity and increases the risk of occupational accidents. Spector et al. (2016) highlighted the elevated risk of occupational injuries among farmworkers performing cherry harvesting during June and July, particularly under warm conditions. Physical tasks, such as climbing ladders while carrying bags of fruit, generate internal metabolic heat, which, combined with high environmental temperatures, contributes to fatigue and heat stress. This combination of heat exposure, dehydration, and fatigue can impair concentration and increase the risk of accidents, suggesting that the timing and nature of work can amplify heat-related occupational risks.

Air Quality

Wildfire activity in the U.S., particularly in western states like California, has created significant air quality challenges, disproportionately affecting farmworkers. Climate change has intensified wildfire activity, leading to elevated levels of fine particulate matter (PM_{2.5}), which poses serious health risks. Farmworkers, often working outdoors in poor air quality, face unique vulnerabilities due to systemic inequities, inadequate protective measures, and limited access to healthcare (Environmental Protection Agency 2021).

Marlier et al. (2022) predicted that under future climate conditions, farmworkers in California will experience a 35% increase in wildfire smoke exposure days, with a 190% rise in days deemed “unhealthy for sensitive groups.” Despite these hazards, farmworkers are often expected to continue working during extreme conditions to meet productivity demands, and

PM2.5 monitoring networks often fail to accurately measure exposure levels in agricultural areas. This lack of protection leaves farmworkers especially vulnerable to adverse health effects.

Prolonged exposure to wildfire smoke exacerbates pre-existing health conditions, such as asthma or diabetes, particularly among those with limited access to healthcare and protective measures like air conditioning and face masks (Environmental Protection Agency 2021). Structural barriers—including poor housing and financial instability—further compound these risks, creating cycles of vulnerability. (Von Glascoe and Schwartz 2019, 10) documented exceptionally high rates of asthma among children of Mexican-origin farmworkers in California’s San Joaquin Valley, a region plagued with some of the worst air quality in the country. Compounding this crisis, agricultural practices such as field burning and pesticide exposure contribute to a respiratory ecosyndemic, in which environmental, social, and systemic injustices interact to exacerbate health disparities.

In addition to physical risks, language barriers and mistrust of authorities further marginalize farmworkers during wildfire emergencies. Davies et al. (2018) found that many Hispanic farmworkers across the U.S. fail to receive evacuation notifications due to inadequate bilingual resources. Furthermore, undocumented workers in California often avoid seeking aid from emergency services, including the U.S. National Guard, fearing deportation rather than viewing these agencies as a source of assistance.

Pesticide Exposure

While wildfire smoke and poor air quality significantly impact the respiratory health of farmworkers, these risks often intersect with exposure to pesticides, another pervasive environmental hazard in the agricultural sector. Curl et al. (2020) identify associations between occupational pesticide exposure and various adverse health outcomes, such as increased risks of

certain cancers, neurological and neuropsychiatric disorders, and respiratory issues.

Organophosphates (OPs), one of the most widely used classes of pesticides, are particularly harmful, with long-term exposure linked to neurological disorders and impaired pulmonary function. The respiratory risks of OPs are further emphasized by von Glascoe et al. (2019), who highlight that chlorpyrifos, a commonly used organophosphate, has toxic effects that can exacerbate or trigger asthma.

Hoppin et al. (2006) highlight that farmworkers face pesticide exposure in both occupational and residential settings. While occupational exposure during farming activities results in acute, episodic exposures, chronic, low-level exposures also occur through contaminated drinking water, food and pesticides tracked into homes through hair, skin, and clothing. This is a significant concern for farmworker families, especially vulnerable family members, as it extends the harmful effects of pesticides beyond the workplace. Children are particularly at risk due to their developing immune and nervous systems, alongside their overall smaller body composition, making them more susceptible to the toxic effects of pesticides. This also demonstrates the interplay of environmental hazards, as pesticide contamination of water supplies amplifies the cumulative burden of exposure for farmworkers.

Research Gaps

Despite the growing recognition of the health risks farmworkers face due to environmental and occupational factors, significant gaps remain in the existing literature. One significant gap is the lack of attention to the psychological burden farmworkers face due to climate change-related risks. While physical health effects are well-documented, the mental health impacts of chronic exposure to environmental hazards, compounded by socioeconomic insecurity, remain underexplored. Psychological well-being is arguably just as important as

physical, as both can compound overall health vulnerabilities, highlighting the need for more research in this area.

Another critical gap is the lack of integrated studies examining how multiple environmental stressors—such as heat, pesticide exposure, and poor air quality—combine to impact farmworker health. These stressors do not act in isolation, but instead, interact in ways that amplify their harmful effects, referred to as ecosyndemics. Ecosyndemics encapsulate the interconnected nature of biophysical and social factors, especially how environmental hazards combine with social inequities to worsen health outcomes. Most studies focus on individual factors, leaving their cumulative effects unaddressed. Furthermore, few longitudinal studies track farmworkers' health over time to capture the chronic effects of prolonged exposure to a multitude of environmental hazards. Addressing this gap is essential for understanding the long-term health outcomes of farmworkers.

Additionally, while research on COVID-19 has become increasingly abundant, the compounded impact of climate stressors and COVID-19 on farmworkers' livelihoods remains insufficiently researched. Researching COVID-19's impact on farmworkers is vital because they face heightened risks due to limited access to protective equipment, healthcare, and fair wages. These factors exacerbate their vulnerability to any illness, with overcrowded housing and poor working conditions increasing the likelihood of outbreaks in the agricultural sector. Additional research can quantify the health and economic toll on this population, strengthening the case for policy reforms, such as mandated sick pay, better workplace safety regulations, and expanded healthcare access, to ensure their well-being and sustain the agricultural workforce.

Lastly, while environmental factors have been extensively studied, the role of social determinants of health—such as access to healthcare, legal protections, and economic stability—is

often overlooked. Investigating these factors alongside environmental exposures could provide a more nuanced understanding of farmworkers' vulnerabilities.

Checklist

The environmental structural vulnerabilities checklist is an important tool designed to help farmworkers and their employers identify workplace and community resources needed to mitigate the harmful effects of climate change. This checklist was developed by Carlos Martinez, an expert in medical anthropology, public health, and Latino/Latin American studies, and draws heavily on the work of Seth Homes, Phillippe Bourgois, and colleagues at UC Berkeley. More specifically, it adapts concepts from their structural vulnerability framework, which emphasizes the interplay of social, economic, and environmental forces that create health disparities (Bourgois et al. 2017, 299-307). This framework highlights the checklist's focus on identifying and addressing the unique needs of California farmworkers.

While the checklist was originally formatted to be bilingual, with both English and Spanish on the same document, we decided to adapt the checklist into two distinct versions: one in English and one in Spanish to improve clarity and accessibility. While both versions were created to accommodate diverse populations, the Spanish version took precedence over the English version due to the significant number of Spanish-speaking farmworkers in the state. In California, a significant proportion of farmworkers are Latino, and Spanish is often their primary language. By providing the checklist in Spanish, we have removed a key language barrier that could otherwise prevent farmworkers from fully engaging with the tool to accurately assess their vulnerabilities. This adaptation is crucial for gathering reliable data, as it ensures that farmworkers can understand and respond to the checklist in their native language, likely leading to more accurate reflections of their lived experiences. Additionally, offering resources in

Spanish demonstrates cultural sensitivity and respect for language diversity of the farmworker community, promoting equity in research and public health efforts.

In addition to adapting the language, some questions in the original environmental structural vulnerabilities checklist were revised, added, or omitted to make the tool more relevant and effective for assessing farmworker vulnerabilities. For instance, the question *“Are you kept safe from disasters such as fires at your workplace?”* was reworded to *“Have you worked through fire or other natural disaster conditions, like excessive smoke or flooding?”* to reflect the specific and direct experiences farmworkers often face in California, where wildfires and extreme weather events are common. Similarly, the question *“What is your main form of health insurance?”* was simplified to *“Do you have health insurance?”* to make it more straightforward and accessible for respondents.

Furthermore, two new questions were added to address gaps found in the original checklist: *“Do you trust medical professionals?”* and *“Is there a hospital or urgent care accessible nearby?”* These questions highlight the importance of understanding barriers to healthcare access and trust in the healthcare system, which are crucial factors influencing farmworker health outcomes. On the other hand, certain questions were omitted due to redundancy. For instance, *“Is any paint peeling or flaking on the inside or outside of the house?”* and *“Have you ever been unable to pay for medical care or for medicine at the pharmacy?”* were removed from the checklist because their content overlapped with other questions present in the checklist. Altogether, these thoughtful revisions aimed to ensure that the finalized checklist was both concise and directly applicable to the unique challenges faced by farmworkers, ultimately making it a more effective tool for identifying structural vulnerabilities from the source.

In-Depth Analysis of Climate Change Risks

Extreme Heat

Due to climate change, there has been a rise in temperatures worldwide. With this, the frequency of extreme heat events (EHEs) has and will continue to increase. Not only has the frequency of heat events been affected, but they have also intensified and the average duration of individual events has increased (Patel et al. 2022). An extreme heat event is a period of higher-than-average temperatures that lasts longer than two days minimum. Sometimes referred to as heatwaves, these events can cause wildfires, power outages, increased hospitalizations, heat stroke, and death, in some cases. According to the World Health Organization, the main cause of weather-related deaths is heat stress. EHEs and other climate-induced events pose great risks for the agricultural community specifically. It is vital for the overall health of farmworkers to know and understand the environmental health risks they face in order to curb their ill health. However, more importantly, it is imperative that the farmworkers understand the risks they face, the protections they require, and the resources they have available to them.

Promotoras, or community health workers, are being trained on the environmental health and occupational health factors that the farmworkers in their community face through the use of various PowerPoint presentations. The presentation focused on heat-related risks created by Frederico Castillo, a Professor at UC Berkeley in the Department of Environmental Science, Policy and Management, highlights the signs and symptoms of heat exposure, preventative measures farmworkers can take, and various resources farmworkers can go to to learn more about heat safety and regulations. The signs and symptoms highlighted include intense sweating, paleness, muscle cramps, dizziness, fatigue, tiredness, headaches, stomach pains, vomiting, fainting, rapid heartbeat, and confusion. If any farmworker begins to feel any of these while

working in the heat, they are encouraged to take a rest in a cool area and hydrate. In order to prevent the onset of these symptoms, farmworkers should stay hydrated throughout the day, take breaks to cool down, wear lightweight and light-colored clothing, and most importantly, keep an eye out for each other. The presentation provides the Promotoras with various resources on heat safety and regulations in California, including the phone number for Cal/OSHA. Once trained on the risks, Promotoras begin building relationships with the farmers. The language barrier and the migrant status of many farmworkers often result in distrust of the public health system or higher-ups like their employers, so Promotoras are key to farmworker outreach.

Under the California Code of Regulations, Title 8 (T8CCR) sections 3995 and 3996, there is a list of steps employers must take that protect their employees from extreme heat, both indoors and outdoors. In outdoor workplaces, at any temperature, access to shade must be available upon request. Once temperatures reach 80 degrees Fahrenheit, shade structures must immediately be put up and available for use at any time. The employers must also provide clean, cool, and free drinking water located near the work and shade areas. Additionally, employers must encourage workers to take breaks from the heat and communicate with their employees once the temperatures exceed 90°F to urge them to cool down and rest for a moment. Lastly, under these regulations, employers must provide training for all employees on heat safety. In a previously conducted study of farmworker health in California by UC Merced, survey results showed that only 69% of the participating farmers received any heat training within the last year, and a subset of the farmers (15%) have received no heat training at all (Brown et al. 2022). Furthermore, the study also inquired about the farmworker's knowledge of their right to file a complaint. Only 56% of the farmworkers know they have the right to file a complaint related to their health to the county Department of Public Health. One in four farmers had no knowledge of

their right to file a Cal/OSHA complaint about their workplace safety. Along with that, 36% of the farmers said they wouldn't file a complaint because of fear of losing their job, retaliation from their employer, losing their work status, and even of being ridiculed (Brown et al. 2022). Using these already existing regulations and knowledge from the UC Merced study, the following questions were added to the modified structural vulnerability checklist asking farmers:

- *“Do you have access to shaded or cool places at your workplace?”*
- *“Do you have access to clean water at your workplace?”*
- *“Does your employer provide you with breaks when there is excessive heat at your workplace?”*
- *“Are you worried about being injured while working?”*

Since the California state regulations require these, the answers to these questions can help lead to the conclusion that the employer is not complying with the regulations and therefore putting their employees at risk, or if there are some other factors influencing the behavior of the farmworkers.

Various studies have shown that the language barrier, the migrant status of farmers, and the piece-rate payment system hold an influence on the health of farmworkers. Understanding rules and regulation can prove to be difficult because the majority of farmers in California speak Spanish as their first language, with many speaking different dialects such as Mixteco. On top of that, the migrant status of many farmworkers leaves them vulnerable to their employers. The uncertainty that they can be deported or face legal consequences allows the employer to continue to exploit farmworkers, resulting in a lack of filing complaints against the company. The piece-rate system also pushes farmers to work without stopping, as stopping results in less pay. These factors contribute to dehydration and the exacerbation of heat stress, which is why keeping

farmworkers hydrated throughout extreme heat events is key to curbing heat-related illness. This is another point that is highlighted in Professor Castillo's training PowerPoint. Dehydration triggered by heat stress and overworking is a leading factor in an epidemic of kidney disease among farmworkers, as well as, the trigger of heart disease in many cases.

As farmworkers work through extreme heat without stopping for water, shade, or simply to use the restroom, they are becoming increasingly dehydrated. As previously said, because of the piece-rate system, farmers do not want to take breaks. This results in farmers tending to not drink water prior to or while working because it means they will have to use the restroom more frequently which will cut into their pay. However, with the excessive sweating due to heat exposure and performing manual labor, combined with no water intake, the farmers become more dehydrated and much more susceptible to heat stroke. Heat stroke occurs when the core temperature of the body reaches 40°C, and without treatment can be fatal. Both heat stroke and dehydration are extremely harmful to the kidneys, and with chronic dehydration and heat stress, the kidneys become damaged. This leaves farmers at increased risk for kidney stones, crystalluria, acute kidney injury (AKI), and chronic kidney disease (CKD). Kidney stones and crystalluria are both induced by dehydration and highly concentrated urine. Increased intake of sugary drinks while experiencing heat stress tends to result in the formation of kidney stones, which is why included in Professor Castillo's presentation is a suggestion for farmworkers to only drink water while working rather than soda or alcoholic beverages (Khayat et al. 2022). Crystalluria is exacerbated by exercise in the heat. A study conducted among subsect sugarcane field workers in El Salvador found that 100% of post-shift urine samples on a day during a heatwave contained urate crystalluria (Roncal-Jimenez et al. 2016). Urate crystalluria occurs when urate crystals, a sediment, are present in urine. As the incidence of heatwaves continues to

increase, the farmers may become chronically at risk of crystalluria. Recurrent kidney stones, crystalluria, and other acute kidney injuries can progress to chronic kidney disease (CKD). Globally, there have been various epidemics of CKD in hot, rural regions, primarily among farmworker populations. These epidemics are of unknown etiology, however, it is hypothesized that they are all rooted in heat stress. The repeated exposure to extreme heat, coupled with the dehydration and hyperthermia experienced is theorized to have led to this epidemic of CKD (Sasai et al. 2022). Left untreated, kidney injuries and conditions are commonly fatal.

Many farmworkers do not have access to healthcare, whether it is because of their migrant status, it is unaffordable, or there are no resources nearby. The language barrier can also make navigating the healthcare system more challenging, especially for those who only speak their native dialect. Many migrant farmworkers also struggle to overcome the cultural barriers within the healthcare system. For example, one Zapotec woman stated “We go [to the doctor] when it hurts very much. We don’t just go to get checked” (Maxell et al. 2019). Other women from the same study group expressed discomfort and embarrassment during western medical examinations, and some felt mistreated by their healthcare providers. This leaves the agricultural community with an additional vulnerability to the effects of extreme heat. As previously said, without treatment kidney injuries are fatal, but so are heat stroke and other heat-related illnesses.

So, importantly, the following questions were added to the modified vulnerability checklist:

- *“Do you have health insurance?”*
- *“Have you had difficulties accessing healthcare for any reason?”*
- *“Is there a hospital or urgent care accessible nearby?”*
- *“Do you trust medical professionals?”*

Nearby accessibility to healthcare facilities, such as a hospital or urgent care, is important because excessive heat exposure can cause cognitive impairments leaving farmworkers at higher risk for injuries. A study on Washington agricultural workers in cherry fields communicated that farmworkers are at a higher risk of injury with increased heat exposure (Spector et al. 2016). Immediate or sooner visits to a healthcare provider and additional time-off days suggested the injuries were more traumatic. These traumatic injuries can include, but are not limited to, falls from ladders due to lack of grip from excessive sweating or cognitive impairment due to dehydration. With increased safety standards from employers, the occurrence of these injuries can begin to decline (Spector et al. 2016). Regular heat prevention training for farmworkers could also contribute to the decline of physical injuries in the fields. Easier access to healthcare facilities can improve the outcome for farmworkers who suffer from these traumatic injuries as well.

Apart from limited access to treatment at healthcare facilities, many farmworkers cannot properly recover from the heat in their time away from the fields. Many farmworkers live in substandard homes with no air condition or other means to cool down their living space. They also do not often have control over where they live because in many cases the grower provides their lodging or they cannot afford basic housing on their own. During extreme heat events, the nighttime temperatures do not lower as they normally would, leaving the farmworkers to sleep in the high temperatures. A study conducted in a cohort of farmworkers in North Carolina showed that sleeping in high temperatures impaired the individual's ability to reach rapid eye movement (R.E.M) sleep, which is important for the body to restore itself (Quandt et al. 2013). So, the farmworker is still exposed to the extreme heat and cannot properly rest in preparation for the next work day. This led to the addition of the following questions to the vulnerability checklist:

- *“Have you experienced excessive heat or cold in your home?”*
- *“Do you have affordable means of either heating or cooling your home?”*

Knowing if there is a lack of cooling in given farmworkers homes, resources on free-cooling spaces in the area can be given to the farmworkers. Supplies can also be given to farmworkers to cool their homes.

Extreme heat events also spark wildfires, especially in the dry state of California. The hot and dry heat combined with dried out vegetation is perfect fuel to start a blaze. The prolonged heat may also prolong the spreading of a wildfire, intensifying both the flame and smoke. Considering the previously discussed vulnerabilities of farmworkers being easily exploited by their employers, it is not uncommon to find them working in fields with big, pillowing clouds of wildfire smoke. In some extreme cases, farmworkers have worked in previously evacuated zones. For example, in Sonoma County, California farmworkers dangerously work in evacuated zones due to the Agricultural (Ag) Pass Program. The Ag Pass Program issues temporary permits that allow farmworkers to enter the evacuated fire zones to carry out their agricultural duties. This program particularly affects those who are undocumented and speak little to no English, as the farmworkers enter into these evacuated zones with no real preparedness and little oversight, putting their life at risk (Chunga Pizarro et al. 2024). To add on, the primary growing and harvest season, June to October, coincides with the peak wildfire season in California. This leaves the farmworkers frequently exposed to wildfire heat and smoke. With this in mind, the following questions were added to the vulnerability checklist:

- *“Have you worked through fire or other natural disaster conditions, like excessive smoke or flooding?”*

- *“If a disaster prevents you from working, is your job protected? Do you still receive payment in this scenario?”*

Similarly to the California extreme heat regulation, there are regulations put in place to protect agricultural workers, and other outdoor workers in the event of a wildfire. Under the California Code of Regulations section 5141, employers must measure air quality before each shift and notify each employee of the current Air Quality Index (AQI). The AQI measures the PM2.5 (particulate matter smaller than 2.5 μ m in diameter) concentrations in the air. Any measurement 150 and below is considered to be healthy or tolerable. Once the concentrations reach 151 to 500, the air quality is considered to be unhealthy. When this threshold is reached, the employer must inform their employees and enact preventative measures such as supplying them with face masks to filter the air they breathe. The employer should also implement administrative controls that alter the work schedule and allow for additional breaks. Once an 500 AQI is reached or surpassed, employers must provide every employee with respirators to help reduce as much harm as possible. While these regulations are helpful, they are not very feasible. It is difficult to determine if employers are fulfilling these regulations because they cannot all be watched over. Farmworkers will also not file reports against their employers because of fear of retaliation. Also, farmworkers will not file complaints against their employers if they do not know these regulations are in place. By educating Promotoras about all of the regulations that are already in place protecting farmworkers, small steps can be taken. As the frequency of these events increases, it is important that relationships are built between farmworkers and Promotoras to encourage the farmworkers to speak up for their health.

Lastly, in efforts to bridge communication, the icons for each question on the interactive map website for farmworkers launched by Professor Matt Sparke were revised. The map app acts

as a resource for farmworkers to respond to simple survey questions about their workplace and share stories of their working experience. In relation to heat, the survey on the map asks if there is access to clean drinking water, shaded areas, time to take breaks, and emergency services available at their workplace. The survey ends by asking if their work has ever been stopped because of extreme heat or smoke. The corresponding icons are as follows:



Figure 2. Drawings done by Roselyn Vasquez-Ramirez, <https://farmworkerhealth-app.ucsc.edu/>

Air Quality

Farmworkers face many serious health risks because of the tough and dangerous working conditions. They often work long hours outdoors, exposed to extreme heat and poor air quality. The air they breathe is filled with harmful substances, including smoke, dust, chemicals, and pesticides. More specifically, these pollutants contain tiny particles, called particulate matter (PM_{2.5} and PM₁₀), that are so small that they can easily enter the lungs and even the bloodstream. Breathing in these particles over time can lead to a variety of serious health issues such as respiratory problems like asthma, chronic health issues, and lung disease, along with heart disease, lung cancer, and neurological problems (Cheney et al. 2022). The risk of developing these health problems is higher for farmworkers because they are exposed to these pollutants every day during long working hours in the fields. This is a problem because they don't have the proper protective equipment to help decrease the health issues that come by being exposed to the contaminants in the air..

In addition to breathing in harmful air, farmworkers also face the danger of extreme heat. Many of them work in hot temperatures, especially in the summer, where they are exposed to intense sunlight for hours. This can lead to heat stress, dehydration, and even heatstroke, which can be life-threatening. The combination of poor air quality and extreme heat can make farmwork even more dangerous, putting workers at greater risk of serious health problems. Their bodies become more stressed, and it becomes harder for them to stay hydrated or cool down.

Another major danger that farmworkers face is exposure to chemicals like pesticides and herbicides. These toxic chemicals are used to protect crops from insects and diseases, but they can be very harmful to humans since they are being sprayed and released into the air as well. Many of these chemicals can damage the lungs, nerves, and other organs. They have also been linked to long-term health issues like cancer (Boonupara et al. 2023). Unfortunately, many farmworkers are not given the proper safety gear to protect themselves from these chemicals. They also often lack training on how to handle these dangerous substances safely, which puts them at even higher risk. These environmental hazards make farmwork not only difficult but also very risky for Latino workers. To help protect them, stronger rules are needed for air quality, better safety measures in the fields, and easier access to healthcare. Making these changes is essential to ensuring the health and well-being of farmworkers, who are a vital part of the agricultural industry.

Due to climate change, there is an increase in heat and wildfires which lead to smoke surrounding the farmworkers' work site. As stated in one of the powerpoints, these fires release smoke particles that the workers are continuously inhaling, affecting their lungs and causing problems like coughing, difficulty breathing, and other illnesses (Celene Serrato Flamenco). Illnesses can include asthma, chronic obstructive pulmonary disease which can lead to death, and

valley fever that “is caused by inhaling fungal spores in soil” (Celene Serrato Flamenco). Not only do farmworkers need to consider their chronic health, but female farmworkers need to think about the effects it can have on pregnancies and their reproductive system as well. If it is ignored there are many agricultural families who are the ones being affected and the children are left dealing with the consequences to their health too. A study in 2021 found that “wildfire smoke increased the risk of preterm birth in California” (Seda 2023). As female farmworkers have to continue going to work in the fields it gravely causes more harm to them because it brings complications to their potential pregnancies. During the continuation of wildfires, there is an increase in smoke pollution that brings a differentiation between night and day. For example, due to the farmworkers’ housing, pollutants greatly affect them more at night as heat brings wildfires and smoke in the San Joaquin Valley (Seda 2023). Farmworkers often have to work in smoke for long periods of time, making it hard for them to avoid it since they work outdoors. Whether they work during the day or the night, they don't realize how dangerous the smoke can be, and they struggle to stay healthy or avoid situations where the particulate matter is in the air.

While smoke does affect the air quality for farmworkers, the air is also contaminated with dust along with chemicals that winds carry. The reason for why farmworkers are exposed to much more than the environmental factors is because they work outdoors with machinery and chemicals. They work in conditions where dust storms surround them which leaves them unprotected to the “toxic metals, pesticides, and other toxins” (Cheney et al. 2022). For instance, The Salton Sea in Southern California, plays a role as well because it is constantly sending winds of dust and the smells of sulfur and fish which contributes to “poor eye health and poor vision, itchy skin, nosebleeds, sinusitis, colds, allergies, and headaches” (Cheney et al. 2022). Not only do dust storms cause asthma, bronchitis and other breathing difficulties among farmworkers, it

also affects the children that live around the fields. Winds carry “ammonia and sulfur dioxide gases” from the Salton Sea (Cheney et al. 2022). When the farmworkers are doing their job in the fields, the surrounding communities encounter the same air conditions that the farmers are exposed to, like the chemicals used for the crops or from the machinery. In the San Joaquin Valley, there are high ozone levels created by the carbon monoxide, methane, and nitrogen oxide released by the motor vehicles, power plants, and industrial processes (Seda 2023). While there are communities that surround the areas that farmworkers work in, the people are being exposed to contaminants traveling through the air that are being released by the workers, caused by the industrial equipment. As the farmworkers are doing their job, they may not know that the equipment they use and chemicals being spread can actually harm them, and this is not being told to them, which later brings more health issues that can be prevented by getting the proper training or proper preventative gear.

Farmworkers are not being told what they are in danger of. The risks include smoke, dust storms, chemicals, and pesticides that are found in the air encircling the grounds and fields that the farmworkers are trying to work in. Pesticides are detectable in air, soil, and water where it does not just spread among the farmworkers who use it at their workplace but can also be brought to their homes. Handling chemicals puts workers at a high risk and the workers often “receive inadequate training on safe pesticide handling and lack adherence to appropriate hygiene practices at work” (Castillo et al. 2021). National data found that only 57% of farmworkers had the proper training (Cheney et al. 2022). Not only are farmworkers required to apply these chemicals for the importance of the plants, but they are also not being trained on how to prevent the widespread exposure to pesticides. About 30-50% of pesticides are dispersed in the air during application. They eventually reach many more people and cause health issues to

those who are exposed to it (Boonupara et al. 2023). Half of the pesticides are dispersed in other places besides the crops they are meant for. They are found in three forms “solid, liquid, and gaseous” that pesticides are being transported through the air (Boonupara et al. 2023). The air that is being affected by these pesticides is easily being spread for long distances that expose more homes than the farmworkers, and it isn’t just breathed in but it can also be absorbed through the skin. It is critical for proper pesticide, so that it can help minimize the health issues on the workers as they work to protect the crops by keeping insects from infesting them. Since it not only affects the health of farm workers but also the communities, it being exposed directly or indirectly it leads to health issues like wheezing, coughing, blurred vision, skin irritation, shortness of breath, chest pain, headaches, dizziness, nausea and vomiting, nose bleeding, and scratchy noises or throats (Boonupara et al. 2023). Even when health issues like irritation and coughing affect the body it also leads to chronic illnesses such as types of cancer and cognitive and behavioral disorders (Castillo et al. 2021). Contaminants such as dust, smoke, chemicals, and pesticides have an environmental risk that is easily exposed to farmworkers but not limited to many communities who are living near the rural areas. The particulate matter makes it harder to try to prevent any contact of such toxins because it is easier to be indirectly affected by them. There are so many problems with the air quality being severely polluted and there are no huge resources to help reduce the health effects.

It was by research and surveys that these problems were figured out and calculated for farmworkers. By the task force, and Professor Carlos Martinez, a checklist was formatted, translated, and revised. Through this checklist, many farmworkers were able to answer questions that helped show the horrible conditions they live and work through in the rural city of Watsonville. However, it was clear that many workers couldn’t answer some of the questions.

Some didn't know the answers to the questions, while others had trouble understanding what the questions meant because they may have not learned or recognized what they could be dealing with in their home or workplace. This shows that many farmworkers face problems like not having enough information or struggling with language barriers, they could not recognize the problems that they could face in their line of work. For some, the questions about living situations, safety, and working conditions were hard to understand because of these barriers. Others simply didn't have the right information, possibly because they had never been taught about these issues before. This points out the need for better resources and clearer ways to communicate so that farmworkers can better understand their rights and the dangers they face. Without this understanding, it's harder for them to protect themselves from risks like poor air quality, heat, and exposure to harmful chemicals. More support and education are needed to help farmworkers stay safe and healthy on the job. Other factors to consider are that most farmworkers have undocumented status and limited education where they are being seen as just a "Mexican worker" and compensated with low wages through farm labor (Cheney et al. 2022). As farmers face the environmental factors through their status as an immigrant and as a latino/a, they also have to deal with social issues, there are more to take into consideration when figuring out how it can actually get worse with the work that they do.

To take the risks into consideration, it is important to understand that there needs to be preventative measures in place to help with limiting the health risks that can happen when the air quality for farmworkers isn't healthy. Some examples that have been mentioned were personal protective equipment, masks and respirators such as N95 or P100 masks to help protect the lungs, eye protection like safety glasses to help against dust and chemicals, and protective clothing like long sleeves, gloves, and hats to protect the skin (Celene Serrato Flamenco). There

are possible ways that can be included to help with caring for the farmworkers, like access to basic water, sanitation, and hygiene services that prevent the spread of disease and biological hazards, specifically bacteria, viruses, and intestinal parasites (Castillo et al. 2021). Another thing to help with reducing such ailments is to incorporate training for farmworkers to follow so that there isn't any need for them to be so easily contaminated and teach the importance of toxins and environmental risks that they may face when working through the fields. Like stated, “additional legislation that includes education, training, and more stringent enforcement of ergonomics guidelines” it what can help with makings sure that there are fewer “agriculture related physical injuries” that is mostly found within the latino migrant farmworkers who also struggle with getting the appropriate resources to help them (Castillo et al. 2021). If the workers are not being protected enough as they work outdoors it will increase the contamination when they bring back those toxins to their homes and also cause problems for the children and other relatives, which is why there should also be preventative care for at home as well. For example, removing shoes that are contaminated by chemicals at entrances, washing work clothes separately from any other household members’ clothes, avoiding smoking to protect your lungs, and obtaining an air purifier for homes when there are risks of smoke entering (Celene Serrato Flamenco). It is a necessity for employers to care for their employees who are the ones working to make sure that everything is in order so that the crops that they plant can be picked and shipped, because it is merchandise. As farmworkers work under the negative environmental factors such as poor air quality, it is important that they can get the help they need and have the proper training as they work outdoors. The winds can carry so many toxins and particulate matter that affects them and it shouldn't be neglected if it negatively impacts their health. Smoke, dust storms, chemicals and pesticides all can be transported through the air and when they aren't fully

protected it can infect the workers along with many others because these small particles can be carried through long distances. The air quality is bad especially for farmworkers because they are the ones who are constantly being exposed to these situations.

The environmental factors that directly and indirectly impact the farmworkers is the poor air quality, because it can carry toxins such as dust, smoke, chemicals and pesticides, and particulate matter (PM). Through these toxins the workers would face health issues that affect the skin, eyes, lungs, and brain. For example, smoke can be inhaled and affect the lungs that leads to asthma, dust can cause poor vision and skin irritation along with chemicals that can also cause skin irritation, and pesticides leading to dizziness and vomiting. These are just some examples of the health issues that can be found accountable by the severe contaminations in the air. As farmworkers always work outdoors, it is harder to prevent these malaties and be able to get the care for it at their workplace. That is why certain standards and training should be implemented at their work to help decrease the amounts of sick farmworkers, like wearing better protective clothing, not exposing too much skin, and keeping the eyes protected as well as wearing masks to limit the toxins inhaled. If we continue to have farmworkers work under bad environmental

conditions, they should be allowed to protect themselves from the poor air quality.



Figure 3: created by Tim Mossholder, [Strawberry Picking](#)

Pesticides & Water Quality

In modern agricultural fields, farmworkers are responsible for ensuring the global food system functions smoothly. However, their labor comes at the expense of their own bodies. Pesticides are often hailed as an essential tool for maximising crop yields and protecting against pests. These wonder drug chemicals that save the pocket books of farm owners and help provide plentiful quantities of food, carry hidden dangers that disproportionately impact the farmworker who handle them directly. Pesticide exposure goes beyond a workplace hazard. The continus

subjection to poorly regulated chemicals is a pervasive threat to farmworker health, livelihood, and dignity.

Despite the critical role they play in the agricultural system, farmworkers often labor under hazardous conditions, with limited access to protections or resources to mitigate the impacts of toxic chemicals. Exposure to pesticides has both immediate and long term consequences that can range from increased chronic to acute health conditions, further economic struggles, and heightened exposure to systemic inequities. All of which are exacerbated by inadequate government regulation, enforcement of protective policies surrounding pesticides, and an overall lack of caring for the struggles farmworkers deal with on a daily basis.

The impacts pesticides have on farmworkers range broadly from a myriad of different physical health risks, social inequities, economic hardships. By examining the systemic forces that perpetuate these risks, it highlights the urgent need for reforms and cultural shifts to prioritize the health and well-being of these essential, yet often overlooked, workers.

The primary purpose of pesticides is to protect crop yields from pests, weeds, and diseases that might otherwise impact the produce. The National Institute for Health found that “without the use of pesticides, there would be a 78% loss of fruit production, a 54% loss of vegetable production, and a 32% loss of cereal production” ([Tudi 2021](#)). Pesticides are classified by their intended target, namely; insecticides, fungicides, herbicides, rodenticides, molluscicides, and nematocides. They can then be further classified by organic pesticides, determined by their organic chemical structure, or inorganic pesticides like lime or sulfur. Pesticides function by disrupting a targeted pest's nervous system, by inhibiting growth processes, or preventing reproductive capacities, all of which lead to the eventual death of the pest.

However, an over indulgence in pesticides has led to an economic dependency on them. Fernando Carvalho writes in [*Pesticides, Environment, and Food Safety*](#), “At the current growth rates, it is estimated that world population will be of about 9.4–10 billion by 2050”. Without pesticides there is no feasible way that the agricultural complex could produce enough food to sustain a massive population like this. This presents the problem of pesticide resistance, “pesticide resistance represents a genetic mechanism whereby pests (including weeds) develop evolutionary abilities to adapt to pesticides, and then the same variety and dosage of pesticides do not work on the adapted pests” (Hu 2020). This process creates a cycle in which farmers now need to use higher quantities of pesticides as well as higher doses of pesticides to produce the same results. So not only are pesticides necessary to optimize the carrying capacity of the planet, but the more pesticides are used the more is needed to maintain this state. However this is a solution that comes at a huge environmental and human health cost.

Farmworkers are at the heart of the agricultural system, also meaning they are most vulnerable to the chronic effects of working first hand with these chemicals. They are responsible for a variety of different tasks ranging from spraying the pesticides themselves to constantly harvesting crops from recently treated fields. By working in such a toxic environment farm workers are exposed to a host of chronic illnesses. For instance, “chronic pesticide exposure has been associated with devastating health issues, including cancer, depression, diabetes, neurodegenerative diseases, and reproductive issues” (Farmworkers at Risk). While policy regulations and training that mandate personal protective equipment or safety protocol to protect against these chronic illnesses do exist; the follow through is loosely regulated. In a study performed at University of California Merced, they found that “as a whole, only 57 percent of workers who had applied pesticides in the past twelve months had received training on the safe

use of pesticides in a way they felt they understood” (Farmworker Health in California). A lack of understanding or denial of adequate on the job training is destroying the health of farmworkers by exposing them to unnecessary risk.

Despite the immensely vital role farmworkers play in sustaining global agriculture, they are not always afforded the luxury of a safe working condition. Due to farmworkers' close working proximity to pesticides, it places them at significant risk for both acute and chronic health issues. The health impacts of pesticide exposure can be profound, particularly for vulnerable groups within this population.

Short-term, or acute, exposure to pesticides can result in a range of immediate health effects. In these acute exposure incidents, pesticides come in contact with the farm worker via the skin, lungs, mouth, or eyes. Symptoms of pesticide poisoning are then grouped based on either systemic or topical ailments. In a pesticide safety fact sheet published by Penn State, they note that “systemic effects are quite different from topical effects. They often occur away from the original point of contact as a result of the pesticide being absorbed into and distributed throughout the body. Systemic effects often include nausea, vomiting, fatigue, headache, and intestinal disorders. In advanced poisoning cases, the individual may experience changes in heart rate, difficulty breathing, convulsions, and coma, which could lead to death” (Potential Health Effects of Pesticides). Conversely, topical effects of acute pesticide exposure can result in dermatological issues like blisters or rashes on the skin. According to the Centers for Disease Control and Prevention (CDC), acute pesticide poisoning affects thousands of farmworkers annually in the United States. One notable case occurred in California, where farmworkers reported acute symptoms after being exposed to chlorpyrifos, a pesticide known for its neurotoxic effects. Soon after beginning work in the field located in Kings county, “the workers

noted a strong odor and experienced headaches, nausea, and shortness of breath.... Of the 16 workers who left work at this time, nine subsequently sought medical care independently. Eight sought care on the day of the incident and were hospitalized overnight; one did so three days later and received outpatient treatment. Eight days after the incident, 80% of the interviewed workers denied having complete resolution of their symptoms” (Farm worker illness...).

Investigations revealed improper application techniques and insufficient protective measures, which ultimately highlights the prevalence of systemic gaps in safeguarding worker health. incidents like these also highlight the urgent need for stricter regulatory oversight and enforcement of safety standards.

The long-term health impacts of pesticide exposure are particularly concerning, as many farmworkers are exposed to these chemicals repeatedly over their careers. Studies have linked chronic pesticide exposure to a range of serious health conditions, including cancer, neurological disorders, and reproductive health issues. For instance, research published in the *International Journal of Cancer*, identified strong associations between pesticide exposure and elevated risks of non-Hodgkin lymphoma and leukemia. Neurological disorders are another significant concern. Prolonged exposure to organophosphates, a common class of pesticides, has been associated with cognitive decline, memory impairment, and an increased risk of developing Parkinson’s disease. Certain groups within the farmworker population face heightened risks from pesticide exposure. Pregnant women, for example, are particularly vulnerable, as pesticides can cross the placental barrier, potentially causing developmental issues in unborn children. Additionally, studies “Extensive research worldwide has identified potential associations between in utero exposure and a number of adverse birth outcomes, such as miscarriage, low birth weight, and small head circumference. Exposure during gestation has also been associated with developmental and

neurobehavioral problems in infants and young children, as well as with potentially increased risk for childhood cancers” (Rao 9).

Children living in agricultural communities are at continued risk, as their developing systems make them more susceptible to the toxic effects of pesticides. A 2005 study published in *Environmental Health Perspectives* highlighted that children in farming households had significantly higher levels of pesticide metabolites in their urine compared to non-farming communities (Lambert et al.). These findings emphasize the dangers of cumulative exposure, which can lead to developmental delays, behavioral disorders, and other long-term health challenges. Aging farm workers also face compounded risks due to the cumulative effects of exposure over decades. The build-up of pesticide residues in the body over time can exacerbate age-related health conditions, such as respiratory diseases and cancer; further diminishing their quality of life.

The widespread use of pesticides in agriculture extends beyond health implications, creating profound social and economic challenges for farmworkers. These impacts disproportionately affect vulnerable populations, including migrant workers and communities of color, further perpetuating systemic inequities in the agricultural sector. Farmworkers exposed to pesticides often face significant financial challenges due to pesticide-related illnesses. Medical expenses can quickly accumulate, especially for those without health insurance or access to affordable care. Conditions such as chronic respiratory issues, neurological disorders, and cancer necessitate ongoing treatment, placing an overwhelming financial strain on individuals and their families.

The inability to work due to illness further exacerbates this burden. Many farmworkers are paid hourly or based on productivity, meaning that any reduction in their ability to work

directly translates to lost income. According to Beyond pesticides, an activist organisation, pesticide-related illnesses cost U.S. farmworkers and their families millions annually in lost wages and medical expenses, claiming “the real costs related to pesticide use and exposure include those of health care, lost productivity and income, and environmental damage.” (Beyond Pesticides). For households already struggling with poverty, these costs can be devastating, pushing them further into financial insecurity.

The social impacts of pesticide exposure are starkly evident in marginalized communities, particularly among migrant workers and people of color. Migrant farmworkers, who make up a substantial portion of the agricultural workforce, often lack access to healthcare services. Language barriers and fear of retaliation from employers deter many from reporting symptoms or seeking medical attention. Additionally, the precarious legal and employment status of many migrant workers leaves them particularly vulnerable. Employers may fail to provide adequate protective gear or training, knowing that workers are unlikely to file complaints. This systemic neglect creates a cycle of exploitation and vulnerability, leaving farm workers exposed to hazardous conditions without the means to advocate for their rights.

The psychological toll of working under hazardous conditions cannot be overlooked. Farmworkers often experience significant stress and anxiety stemming from the dual pressures of financial insecurity and occupational hazards. The fear of long-term health consequences for themselves and their families adds to this emotional burden. A 2019 study published in the *International Journal of Environmental Research and Public Health* found that chronic exposure to pesticides was linked to increased rates of depression and anxiety among farmworkers. The uncertainty surrounding their health, combined with the lack of access to mental health resources, exacerbates these challenges. Furthermore, the stigma associated with

pesticide-related illnesses can isolate affected individuals, leaving them with few avenues for support. This isolation compounds the emotional strain, making it even harder for workers to seek help or improve their circumstances.

Water quality is intricately tied to the health of farmworkers, as contaminated water sources can amplify the risks posed by pesticide exposure and other agricultural practices. Farmworkers, who often labor in rural areas with limited infrastructure, face heightened vulnerability to water pollution caused by the very chemicals used to sustain industrial agriculture. The use of pesticides in agriculture contributes significantly to water pollution. When pesticides are applied to fields, they can leach into nearby water sources through runoff, contaminating rivers, lakes, and groundwater. Farmworkers often rely on these water sources for drinking, cooking, and bathing. Chronic exposure to pesticide-laden water can lead to severe health consequences, including gastrointestinal disorders, neurological impairments, and even cancer.

A study published in the *International Journal of Environmental Research and Public Health*, has shown that agricultural communities near areas of intensive pesticide use are more likely to report cases of water contamination (Siafrudin et al. 2021). For example, atrazine, a widely used herbicide, has been detected in drinking water supplies at levels that exceed safety limits set by the Environmental Protection Agency (EPA). Atrazine exposure has been linked to hormonal disruptions and reproductive health issues, which disproportionately affect farmworker families who depend on untreated or minimally treated water systems.

Beyond pesticides, fertilizers used in large-scale farming contribute to nitrate contamination in water supplies. Nitrates can seep into groundwater, creating health hazards for farmworkers and nearby residents. High nitrate levels in drinking water have been associated

with methemoglobinemia, or “blue baby syndrome,” which affects infants' ability to transport oxygen in their blood (Health Concerns... 2020). Adults exposed to nitrates over long periods may face increased risks of cancer and thyroid disorders.

Farmworkers, who often live in close proximity to agricultural fields, are at a higher risk of consuming water with elevated nitrate levels. Migrant workers, in particular, face barriers to accessing clean and safe drinking water, as many live in temporary housing with substandard water infrastructure. Water quality also impacts farmworker health indirectly through sanitation practices. Clean water is essential for handwashing, decontaminating equipment, and removing pesticide residues from clothing and skin. Limited access to clean water and sanitation facilities on farms increases the likelihood of pesticide residues remaining on workers' hands and bodies, leading to dermal absorption or accidental ingestion.

The lack of adequate water facilities disproportionately affects vulnerable populations, such as women and children, who may face unique hygiene needs. Ensuring clean water for farmworkers is not only a matter of public health but also a fundamental human right. By addressing water quality challenges, society can reduce health disparities and create safer working and living conditions for those who sustain our food systems.

Farmworkers, the backbone of global agriculture, are indispensable to feeding the world's growing population. However, the price of their labor often comes at a profound personal cost. The health risks, social inequities, and economic burdens associated with pesticide exposure reveal a troubling reality: the agricultural system prioritizes productivity over the safety and dignity of those who sustain it. Acute and chronic health issues, coupled with systemic vulnerabilities, illustrate the urgent need for comprehensive reforms.

Improved enforcement of protective regulations, access to adequate healthcare, and investment in safer agricultural practices are critical to safeguarding farmworkers' well-being. Addressing these issues is not merely a matter of fairness; it is a moral imperative that reflects the values of a society committed to equity and justice. By prioritizing the health and safety of farmworkers, we honor their indispensable contributions and take a meaningful step toward creating a more sustainable and humane agricultural system.

Flooding, Mold, & Housing Challenges

Agriculture in California is a multibillion dollar industry, producing around a third of the entire nation's vegetables and two-thirds of the nation's fruits and nuts (California Business, n.d.). The massive success of this industry is largely in part due to the reliance on immigrant farmworkers, who make up around 80% of the workforce (California Latino Legislative Caucus 2020). Many of the workers originate from Latin America, where a huge portion of workers are either undocumented or from indigenous backgrounds facing challenges like language barriers, legal status, and economic difficulties. Despite being such a large part of the state's industry, immigrant farm workers remain a largely underserved population, especially facing both environmental and potential health risks. Climate change plays a big part in increasing these risks leading to issues like flooding, which create significant damage among these populations. Affordable housing, usually occupied by low-income families like farmworkers, is left vulnerable to various disasters as it is poorly constructed with cheap materials and lacks structure, leaving them disproportionately affected by flooding disasters (CalMatters 2020). Housing in this area is the most affected, but the farthest away from resources for disaster relief. These issues were especially highlighted during the Pajaro river flood that occurred last year in 2023, which highly impacted farmworker communities in Pajaro valley.

Flooding, while not always directly caused by climate change, comes at a risk due to the frequent weather changes. It is made more severe and frequent. Warmer global temperatures with the combination of dry land cause the atmosphere to hold more water vapor, leading to heavier downpours, intense rainfall and an increased risk of water accumulation in rivers and along coastlines (U.S. Environmental Protection Agency n.d.). This stresses flood defenses like levees and floodwalls, causing breaches and overflows that severely impact the surrounding areas. Flooding has been a recurring issue in Pajaro valley, most notably because of the Pajaro River, which runs through Watsonville. Floodings had been prevalent since the 1800s leading to the installation of a levee finalized in 1949. This flood prevention measure only slightly dwindled the prevalence of the floods, only to continuously increase then after. The recurrent flooding causes the city millions of dollars in damages and has led to the loss of 2 lives. On March 11, 2023, the levee was breached leading to widespread flooding in the valley, inundating homes, destroying farmland, and causing over 3000 people to be evacuated (Pajaro Regional Flood Management Agency n.d.).

Flooding is a huge health and safety problem, especially for low-income and immigrant communities. When floodwaters come in, they often carry all kinds of harmful bacteria and chemicals from sewage and waste that can cause stomach issues, skin rashes, and respiratory issues (UCLA Health 2020). The aftermath of floods can also be detrimental to families as the stress of dealing with flooding can take a serious toll on mental health. Flooding leads to the loss of homes and jobs, ultimately impacting the physical and mental health of the population and worsening economic and environmental hardships. Many farmworkers, for example, rely on seasonal work that might not come through if there's flooding. Upon conducting a survey of 100 farmworkers, 73 responses were returned: 36 of them answered that if a disaster were to occur

and prevent them from working their job would *not* be protected, 22 said their job *would* be protected, and 27 declined to answer. During an interview with a male farmworker and father of two, he was asked if his job would be protected in the event of a disaster. He responded, “No, el año pasado perdí mi trabajo por las inundaciones y nos quedamos sin dinero” (“No, last year, I lost my job due to flooding, and we ran out of money”). Despite assuring anonymity, those that declined to answer could have been a result of fear to disclose negative feedback regarding their workplace. Nearly half of the respondents did not have job security regarding disasters like floods or fires signaling the negligence of employers to provide formal contracts or disaster-relief pay. Unfortunately, undocumented workers also do not qualify for unemployment or government assistance. Job loss and lack of social safety nets perpetuate poverty among workers and disproportionately affect a large portion of the Californian workforce.

Other barriers undocumented and indigenous farm workers face are the fear of potential deportation and issues with language barriers. When issuing warnings against the flood, a family of Oaxacan background who primarily spoke Mixtec, was able to evacuate only knowing limited Spanish (Center for Health Journalism 2023). During the aftermath, many were left wondering and trying to process what had happened, dozens of interpreters and volunteers aided in providing them with food and financial assistance. Despite being bilingual, interpreters faced issues translating or interpreting medical and legal information that did not have a direct translation (Mercury News 2023). When providing aid and government assistance, undocumented workers tended to hesitate out of fear and were unable to access the help they needed. The Federal Emergency Management Agency (FEMA) promised to disperse aid to families affected by the floods in Pajaro valley, but overlooked undocumented workers as they did not qualify (Good Times 2023). FEMA disaster relief typically requires proof of legal status,

which meant that undocumented farmworkers were excluded from receiving much-needed financial assistance for housing, repairs, and other recovery resources. Even though the flood had caused extensive damage to homes and fields, undocumented workers were often left without the support they needed to rebuild. This lack of access to government aid was particularly difficult because these workers were already economically vulnerable before the flood. Many rely on seasonal work and have little to no savings, so the loss of income from flooded fields left them in an even more stressful situation. Governor Newsom planned a 95 million dollar Rapid Relief Fund to aid undocumented workers, though the website to access this aid is behind an English language barrier (Lookout 2023). To present day, many have yet to receive aid and continue to live paycheck to paycheck, still recovering from the serious aftermath of these floods.

To tackle this detrimental and continuous issue, better precautions need to be taken especially with the Pajaro levee system. The Pajaro Regional Flood Management Agency has issued a 599 million dollar levee expansion project promising to provide a 100-year flood reduction risk (Pajaro Regional Flood Management Agency n.d.). Dealing with the flood risks in the area, however, is not just simply upgrading the levee system, as there needs to be a better system in place to tackle the ongoing social and economic issues that make immigrant farm workers especially vulnerable during floods. Programs for disaster preparedness and seminars about the dangers of floods are a necessary set to keep the population informed. Families, especially those that primarily speak mixtec, need a course of action and programs cover everything from flood risks to emergency plans and recovery help. Outreach needs to be culturally sensitive, and we have to consider the potential legal fears these communities face so that undocumented workers feel safe asking for help.

Mold Exposure

Mold is a consistent health hazard in many homes, primarily found in areas with high humidity, poor ventilation, or frequent water damage. For farmworker communities, mold exposure is an especially concerning issue since they often live in low-income housing, which is more likely to have structural issues, inadequate ventilation, or overcrowding, which are all conditions that manifest mold growth. Disasters like flooding also increase mold problems by increasing moisture levels in homes. Mold exposure impacts farmworker families who already face systemic barriers to healthcare and housing stability.

Mold proliferates in damp environments, causing flooding, leaky roofs, plumbing issues, or high humidity. Farmworker housing is often especially vulnerable since many live in older, poorly maintained homes which lack proper insulation, waterproofing, or ventilation, making them prone to building up moisture. Overcrowding can also be an issue since multiple families often share one home, which further encourages moisture build-up as they go about their daily tasks. (National Institute of Health 2020). Natural disasters, like the Pajaro River flood, only make things worse, as water damage creates ideal conditions for mold (Johns Hopkins University Press 2020). Many also rent their homes from landlords who neglect necessary maintenance, repairs are often delayed, and if repairs are made, only visible issues are targeted. This leaves non-visible mold spores to continue the growth, ultimately leading to a greater issue. Mold exposure causes significant health risks, especially for children, the elderly, and individuals with preexisting health conditions. Farmworker families, already dealing with limited access to healthcare, are exposed to more potential health risks presented by mold. Mold spores irritate the respiratory system, leading to issues like coughing and wheezing, with continuous prolonged exposure leading to more severe issues like asthma and bronchitis. (National Institutes of Health

2020). Black mold, *Stachybotrys chartarum*, is particularly dangerous since exposure can cause severe health problems, especially neurological and immunosuppression concerns. (Cleveland Clinic 2020). Living in a mold-infested home increases overall stress, affecting mental health problems like anxiety and depression since farm workers are continuously surrounded by health and financial risks (National Institutes of Health 2020).

Farmworkers face serious health issues from mold exposure, with one of the biggest challenges being that they often are unable to receive the healthcare they need. Many do not have health insurance making it much too expensive to see a doctor. Many undocumented farm workers also live in fear of being reported due to their legal status, making them hesitant to seek medical help, even when they're sick. This fear combined with lack of accessible healthcare, and potential language barriers only creates more stress for farm workers, ultimately worsening their health. Farm workers face many risks regarding issues in their own homes outside of their workplaces, yet are sometimes unable to identify such issues. Community-based organizations have created workshops teaching them of said risks, as well as provide them with resources to prevent and eliminate existing mold. Despite these efforts, this continues to be a systematic issue because of inadequate living conditions presented by landlords, who simply want to make a profit, and in access to affordable healthcare.

In addition to mold, poor housing conditions also contribute to health and safety risks faced by farmworker families. Economic constraints often force these families into overcrowded, poorly maintained apartments and older homes that fail to meet basic safety and sanitation standards. Many of these homes have poor plumbing, inadequate insulation, and structural deficiencies, which lead to environmental hazards such as mold growth and pest infestations. These structural issues ultimately lead to an impact on health issues like allergic reactions and

asthma. Affordable housing is scarce and low-income populations are often overlooked, leaving farmworker families highly vulnerable to a range of health and environmental risks. Other concerns among farm worker homelife include water quality, and overall limited information of how to address a majority of risks both in home and work life.



Figure 4: Powerpoint presentation surrounding flood risks in Monterey County (Lookout Santa Cruz 2024)

These risks are presented through seminars like the promotora training programs that train trusted members of the farmworker community to deliver vital health and safety information. They offer resources and communicate risks related to mold, flooding, pesticides, heat and water quality. Promotoras are especially important because they speak the languages and understand the cultural contexts of the communities they serve (Public Health n.d.). Many tools and resources are presented to farm workers in both Spanish and Mixtec, allowing for a fuller understanding of potential health and safety risks. The promotoras use simple, easy to understand materials that include visual aids, like PowerPoint presentations and brochures as

well as step-by-step instructions that simplify complicated information. Community health workers (CHWs) also address concerns in person, by providing checklists for self-assessment. Checklists created by CHWs address systematic concerns and personal vulnerabilities. They allow the farmworkers to assess their own risks in an anonymous and safe manner, asking questions regarding home and work life, legal status concerns, and environmental concerns. Checklists like these raise awareness and allow CHWs to see which concerns are most prevalent, and which risks to better explain in future workshops. Many farmworkers are unaware of the hazards they face in their daily lives, and are often unsure how to access resources in healthcare, work rights, and housing support. Language barriers, lack of formal education, and fear of discrimination create a knowledge gap where farmworkers may not fully understand the potential health risks posed by pesticides, mold, heat extremities, or flooding. Promotoras create environments that are welcoming and ensure [confianza](#) between all parties involved. These workshops allow farmworkers to understand that they are not alone and the community around them is actively trying to address their concerns and work towards addressing systemic issues for a safer and healthier life.

Mental Health

Even if the physical risks of farmworkers' labor and living conditions were not an issue, the effects on mental health are significant on their own. The poor working conditions and difficult living conditions that we have detailed in this report work synergistically to undermine the mental health of farmworkers. Farmworkers are especially at risk despite being the backbone of crop production in the US, as climate change will only exacerbate the existing stressors. As it is, there is limited research on the mental health of farmworkers in the United States.

Farmworker communities have been underrepresented in mental health research, and there is a lack of longitudinal studies. This can be attributed partially to hesitation to participate in any official activities, as many farmworkers are rightfully concerned about anonymity regarding their legal status and not getting into trouble with their employers.

Job insecurity in itself contributes to high stress and anxiety, as farmworkers often cannot complain about harsh working conditions for fear of not getting the next job, or of being let go. The actual physical work also takes a clear toll on mental health, especially when farmworkers can clearly see that their status as immigrants, either undocumented or documented, has them exposed to these conditions. In interviews, one farmworker in southern California asked, ‘When do you see a gabacho [White person] all pricked? Or scratching and scratching? They aren’t like us [immigrants], working ourselves to death out in the field. On our knees’ (Cheney et al. 2022). This conversation shows a small part of the psychological toll of stark inequities in labor conditions. Farmworkers notice this societal neglect and devaluation, which creates feelings of low self-worth, fosters resentment, and can worsen feelings of isolation and marginalization.

The same interview revealed that many farmworkers are aware of the potential dangers of low air quality and pesticides as an occupational hazard. Pesticides are also a contributor to poor mental health, especially in adolescents. Recent studies have found that organophosphate and carbamate exposure inhibit acetylcholinesterase (AChE) activity, which can contribute to depression. This was tested using a standard depression assessment tool, and the results indicate that more exposure to cholinesterase inhibitors is linked to depression, most notably in girls and teenagers younger than 14 (Suarez-Lopez et al. 2019). According to the authors, the agricultural communities in the study have reported a rise in adolescent depression and suicidal tendencies

for a long time. Now that these biomarkers can provide empirical data showing a link, there is a need for further study.

Extreme heat poses a physical danger to farmworkers, and this has increased with climate change. However, the effect of heat on farmworker mental health is particularly understudied according to a recent scoping review (El Khayat et al. 2022). The effects of extreme heat events and their relationship with mental health more generally shows a clear connection between heat waves and worse general wellbeing, including physical and mental health (Cianconi, Betrò, and Janiri 2020). Heat stress caused by heat waves has been associated with anxiety and mood disorders, among other consequences (Padhy et al. 2015).

Flooding as a result of extreme weather such as high levels of rainfall is also a cause of poor mental health, with a direct correlation between the intensity of the disaster and the severity of the effects on mental health being noted (Cianconi, Betrò, and Janiri 2020). Floods can bring psychosocial distress in addition to the mourning and distress as a result of belongings and possibly lives being lost. Depression, anxiety, and PTSD are possible after a flood with these risk factors present, especially with the lack of social support which many farmworkers face (Bei et al. 2013).

Another determinant of health which we have focused on is air quality in the workplace, and farmworkers face more and more exposure to smoke as a result of working in the fields despite nearby wildfires (Marlier et al. 2022). The physical effects of smoke exposure have been studied at length, and show cardiovascular, respiratory, and neuro-cognitive effects. However, there is a lack of research on how exposure to wildfire smoke affects mental health and wellbeing (Eisenman and Galway 2022).

Outside of work, farmworkers still face risk factors for worse mental health outcomes. Low wages often lead to farmworkers having no choice but to accept poor living conditions, as affordable housing is scarce. According to CPS surveys in the Journal of Urban Health, many farmworkers share their residence with non-family members, with an average of 1.8 families per shared living quarters among noncitizen farmworkers. One in seven farmworkers who are US citizens lives in a mobile home, trailer, or other alternative to a house or apartment. One in five noncitizen farmworkers in the same situation. As a result, crowding in addition to elevated noise levels have been associated with feelings of helplessness, while reduced access to private space has led to feelings of having no control (Evans 2003). Most farmworker mental health research has neglected housing and built environment as determinants of health, which points to a need for further work in this subject as well (Quandt et al. 2015).

One cause of higher depression rates in farm workers is inability to work due to occupational injury, which resulted in a sevenfold increase in the likelihood that male farm workers were depressed (NCFH 2017). Economic hardship and poverty are the driving factors for poor mental health in farmworkers, but there are a plethora of contributing underlying factors which create a combined effect of high stress and depression. These are made worse by social marginalization and separation from family (Hiott et al. 2008).

In addition, there are culture-bound illnesses that must be considered. Mexican folk illnesses are important to consider to understand how mental health is perceived in this population. According to the National Center for Farmworker Health, *susto* is one relevant condition which includes symptoms such as gastrointestinal issues, depression, and disturbed sleep as a result of a trauma. Another set of symptoms is *Nervios*, which includes worry, irritability, depression, agitation, and nervousness. One study on agricultural workers along the

border of Mexico and the United States reported that 41% of participants reported *Nervios* and 37% reported depression (Weigel et al. 2007). The importance of considering other understandings of mental health conditions is clear. Rather than only considering the western biomedical model of mental health, providers should have a better cross-cultural understanding of what mental health can encompass. There is likely a correlation between the lack of understanding of folk illnesses and the underutilization of mental health resources by Latino farmworkers (Donlan and Lee 2010).

The language barrier that many farmworkers face is also important to consider, as about 70% of farmworkers in the US were foreign born, with 78% of farmworkers identifying as Hispanic. Only 32% of farmworkers said they could speak English ‘well’, and 62% of farmworkers named Spanish as their preferred language (Gold et al. 2022). Among the farmworkers who speak Spanish, only 85% reported being able to read in Spanish ‘well’. There are still other farmworkers who do not speak Spanish or English, so even if helpful resources are available in Spanish, they may not be able to access it. With these varying levels of language proficiency and literacy, there is a clear need for resources to be developed using images and symbols which can be understood universally.

Access to healthcare, including mental health care, might be limited even without a language barrier. Poverty, frequent mobility, and cultural and language barriers all limit access, and even if a small percentage of farmworkers do attempt to access health services, they might find that they have no transportation, or that the cost of services is too high. There might be no services which are time efficient enough to access before they go back to work, or they might have no health coverage at all (NCFH 2022). A Health Center Program funded by the federal government has provided some care for farmworkers for over 55 years, but they lack the

resources to properly manage every existing case, and primary care is limited. Physical health is of course the first consideration by health care providers, but mental health is no small percentage of diagnoses that these health centers record. Their data shows that some of the most common diagnoses they had were post-traumatic stress disorder (PTSD), depression and other mood disorders, and other mental disorders excluding alcohol and other drug dependence (HRSA 2023).

Another stressor is the recent reelection of Donald Trump as the president of the United States. His racist rhetoric and threats of mass deportation make the vulnerable population of migrant farmworkers even more at risk in America. If hearing his dangerous false claims and watching millions of Americans support them was not enough to impact mental health, this adds yet another element of uncertainty and vulnerability to the lives of farmworkers who are undocumented. We have already seen anxiety about getting in legal trouble due to immigration status increase when farmworkers in Watsonville, California have answered our structural violence checklist. While we have not started formally gathering data with the checklist, one worker said that they “always have that fear, and right now with the new president, it's even worse.” Our aim for the checklist is to record farmworkers’ various living and working conditions without compromising their anonymity, and it includes many of the contributing factors to worse mental health. One example is a question asking if fear of immigration agents stops workers from accessing medical help or social services. So far, we have received answers such as “Well yes, we are all afraid [of immigration agents], that's why we don't go to the clinics much.” This anxiety over being deported is a constant for undocumented farmworkers.

A new powerpoint presentation on mental health and strategies for wellbeing has also been developed as a way to communicate risk. The presentation, developed by Dr. Nancy Chen,

a medical anthropology professor of UC Santa Cruz, aims to address some factors which affect mental health and what mental health challenges farmworkers might face, and details community resources that are available. These include legal resources, food banks, health centers, and helplines specifically for mental health. The presentation also includes a number of tools to relieve stress and anxiety and to build mental resilience, through mediation and short visualization exercises. These are not comprehensive solutions, but they can help to de-escalate in moments of mental health crisis. Thus far, the presentation has gone over well with Promotores.

There is a critical need to examine how climate change will affect not only crop production, but the health, safety, and livelihood of farmworkers. The risks to both physical and mental health that already face farmworkers will intensify as climate change escalates. The promise of opportunity in the United States brought many of our farmworkers across borders, but we have not supported them despite our dependence on their labor for food. Mental health is at high risk as a result of the cumulative hardships farmworkers face, and in addition to community outreach there must be more research done on mental health in this vulnerable population in order to create change.



Chapter 2: Communication

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Kandpal

Abstract

California is home to one-third of the nation's farmworkers, approximately 75% of whom are undocumented, with many concentrated in the Central Valley (Center for Farmworker Families 2024). Among the most affected by climate change, this region is among the most affected by environmental challenges such as wildfires, rising temperatures, and droughts. Farmworkers are particularly vulnerable to these impacts, experiencing heat stress, heat-related illnesses, and other health complications. Their well-being is further compromised by low wages, exploitative working conditions, inadequate legal protections, and limited access to healthcare and essential services, contributing to heightened poverty and food insecurity. The COVID-19 pandemic has compounded these challenges, deepening economic and health disparities. Migrant farmworkers often face language, educational, and accessibility barriers, leaving them unaware of the severe health risks associated with climate change, pesticide exposure, and hazardous working conditions.

In response to these vulnerabilities, our GCH 190 Task Force Class, through the Remedies Communications Team, has developed a community-centered initiative of making resource brochures. These brochures focus on six critical areas including food, housing, healthcare, education, legal services, and general resources such as maternal/child care and transportation which are customized for farmworkers in six Central Valley regions: Huron,

Watsonville, Gilroy, Salinas, Soledad, and Greenfield. By providing accessible, localized information, this initiative seeks to empower farmworkers to navigate the complex challenges posed by climate change and systemic inequities, promoting resilience and health equity.

Introduction: Addressing Challenges and Resources for Farmworkers

California's farmworkers are the foundation of the state's massive agricultural economy, yet the conditions that they endure are severely unfair. From long work hours in extreme heat to poor financial compensation, their day-to-day lives are shaped by systemic inequities that would be unimaginable for most of us. These struggles go beyond just the individual as they're tied to the social determinants of health. These are the conditions people live, work, and grow in, and they determine so much about a person's quality of life. Climate change has further worsened these inequities, bringing in even more challenges with extreme weather conditions and rising temperatures. These events create hazardous working conditions in the fields farmworkers work in. Heatwaves make outdoor labor extremely dangerous, while increasingly frequent wildfires destroy homes, taking away people's livelihoods. So, it is important to address climate change when on the topic of farmworkers' lives because it is a very real thing that impacts them greatly.

The goal of this Task Force is to improve the quality of life for farmworkers and their families, first starting in California. Within this broad mission, our Remedies Communications group has one main focus: identifying the resources farmworkers need and making sure those resources are easy to access and understand in cities like Huron, Watsonville, Gilroy, Salinas, Soledad, and Greenfield. More specifically, we will be addressing challenges farmworkers face with housing, mother/child care, food, healthcare, legal resources, and education. In addition to this, we will be providing remedies for these disparities per city that we researched. Additionally,

we aim to emphasize how climate change exacerbates each of these individual issues, which only proves more that change needs to happen now.

Poor housing conditions is a big concern for California's farmworkers, impacting their health, safety, and overall quality of life. Many live in overcrowded, substandard housing that lacks ventilation, plumbing, and privacy. To make matters worse, these homes are often located near agricultural fields treated with harmful chemicals, further worsening their health. Seasonal work worsens these challenges, leaving farmworkers with unstable housing that disrupts access to other resources like education and healthcare. In California, housing costs are through the roof, forcing families to spend most of their income on rent, leaving little left for essentials like food, healthcare, or schooling. Programs that offer affordable housing, rental assistance, or housing advocacy can make a huge difference, but demand often far outweighs availability.

Child and maternal care is a vital resource that is often out of reach for California's farmworkers. Many undocumented mothers lack access to healthcare due to the requirement of citizenship for insurance, leaving both women and children without essential prenatal, postnatal, and preventative care. This lack of healthcare access poses major health risks for children like developmental delays. Community resource centers created for farmworker families offer essentials like shelter, food, and childcare resources, but they're not well-known, leaving many in the dark.

Food insecurity is an indisputable issue for farmworkers. Oftentimes, they struggle to access nutritious meals despite their role in growing said food. Low wages, seasonal work, and poverty force many to prioritize other basic needs like rent or medical bills over a healthy meal. As a result, many turn to processed foods, especially in rural areas, adopting the term food deserts. Climate change also brings unpredictable weather along with economic instability,

which deepens these vulnerabilities. While there are a plethora of mobile food pantries, there simply just isn't enough accessibility for all that need it.

Access to quality and affordable healthcare is a significant challenge for California's farmworkers. This is especially apparent for those who have undocumented status. Many lack eligibility for government-sponsored programs, leaving them without essential medical care for chronic illnesses, work-related injuries, or preventative services. The hazardous nature of farmwork, like the exposure to pesticides, extreme heat conditions, and repetitive physical labor, places workers at high risk for severe health complications. Even so, because of things like low wages, rural isolation, fear of deportation, and language barriers, these people who desperately need access to medical care can't do so. There are clinics and outreach programs in place for farmworker families to use, but limited funding and systemic distrust prevents them from reaching everyone who needs them.

The accessibility of legal resources is important for California's farmworkers, who, as stated before, have a high percentage of undocumented status. Due to their status, many farmworkers experience wage theft, unsafe working conditions, and discrimination, but often refrain from seeking legal help due to fear of deportation threatened by their employers. Limited awareness of their rights and access to organizations like OSHA makes matters worse and furthers their vulnerabilities. Legal services that focus on farmworkers' rights, especially those in which address immigration, are crucial for farmworkers to help themselves out of unsafe environments. However, just like a lot of other resources, there just isn't enough discourse about it, nor enough programs that help everyone who does need help.

Lastly, we will look at education, which is something that is often neglected as a tool to empower people, especially farmworkers and their families. Systemic barriers like low wages,

language obstacles, and cultural disconnects prevent access to quality education, leading to high dropout rates among farmworker children. Economic instability, which is discussed with housing and food insecurity, also limits families from affording school supplies, transportation, and extracurricular activities. There are many programs in place that aim to bridge this gap by providing essential resources like financial literacy and mentoring programs. And, similar to what was previously mentioned, these resources are just not widely known.

While all of these resources are out there, one of the biggest problems is that many farmworkers don't even know that they exist. Others might be aware, but without the tools to access them, there's not a lot they can do. That's where our group, the Remedies Communications group has stepped in. To solve this problem, we've compiled lists of resources that are tailored to farmworker families in different counties in California to be added to the Campo-Sano app. The Campo-Sano app has been developed by this Task Force as a whole to eliminate some of the challenges that farmworkers face in their everyday lives. It displays an interactive map of California, showing resources like nearby health clinics, food banks, or ESL classes. Even better, it comes in both Spanish and English to prevent language barrier concerns.

One of the many things that stood out to us as we worked on this project is how unevenly resources are distributed across different cities. Some places, like Salinas and Watsonville, have a wide variety of programs, while smaller cities like Greenfield and Huron don't have as many opportunities. This disparity highlights the need for targeted efforts to bring these essential resources to underserved farmworker communities. Making sure support services are distributed more evenly would mean that every farmworker community — no matter how big or small — could have access to things like food, healthcare, education, housing, and legal help.

This introduction gives an overview of the resources our group has been researching over the past few months. In the sections that follow, we'll look into the key resources farmworkers rely on, the challenges that make them hard to access, and the solutions being put in place to help. Understanding these issues is a step toward making these resources more accessible and improving the overall lives of farmworkers.

Defining the Social Determinants of Health

In the medical field, many researchers and medical staff focus on how biological factors may contribute to the effects of individuals' well-being. These factors include genetics, sex, age, body structure, and body functions. Although biological factors contribute to our well-being, it is crucial to take into account the social and external factors. These factors, also known as the social determinants of health, have allowed researchers and public health experts to widen the focus on the different factors that may benefit our health, including developing interventions and programs that focus on addressing these determinants. Social determinants of health are non-medical factors that influence health outcomes (U.S Centers for Disease Control and Prevention). These non-medical factors may include legal status, environmental changes (e.g., climate change), socioeconomic status, education, marginalized communities, etc. Understanding the social determinants of health is important when examining the intersecting factor affecting farmworkers' well-being.

The majority of the U.S farmworkers from 2015-2018 are 83% Hispanics and 49% do not have authorization to work (Castillo et al., 2021). With this data, along with data regarding health insurance, housing, and food insecurity, we have conducted intensive research on gathering resources that address the social determinants that have been affecting farmworkers in

California. Although there have been laws passed in California that protect farmworkers in California, there are still many issues that farmworkers face such as food insecurity, lack of healthcare services, housing, financial resources, and climate change. All of these are considered to be social determinants of health that have negative effects on the farmworkers' well-being throughout the years.

Environmental changes are one of the social determinants that have heavily impacted farmworkers. There are many risks while working in the field of agriculture, such as exposure to excessive heat, exposure to pesticides, air pollution, basic sanitation, access to drinking water, and physical hazards that can all cause chronic and acute health conditions, such as respiratory disease and physical injuries (Castillo et al., 2021). Pesticides are made from different forms of chemicals that are used to control and kill insects, rodents, and other pests. Pesticides are managed by farmworkers to help with the production of produce in the agriculture field. Although the usage of pesticides has benefits for the production of produce, it has a history of causing respiratory disease and other health diseases for farmworkers due to the harsh chemicals they are exposed to. Along with the usage of pesticides, the farmworkers who spray pesticides receive little to no training on safe pesticide handling and appropriate hygiene practices as safe measures for using these chemicals (Castillo et al., 2021). Heavy and long-term exposure to pesticides can cause health conditions like cancer, deficits in motor skills, hypotension, paralysis, heart block, and many other chronic health conditions (Hansen & Donohoem 2003). Therefore, it is evident that environmental changes play a role in affecting farmworkers' health. Putting further importance on providing resources, such as training and safety measures, can help farmworkers reduce their exposure to harsh chemicals on them and their families.

Being at a high risk of developing chronic health conditions can cause more challenges for farmworkers. One of the challenges is that healthcare services are inaccessible to farmworkers. Approximately 53% of farmworkers hired in the U.S., from 2015-2018, do not have health insurance (Castillo et al., 2021). Without health insurance, it can be difficult for farmworkers to seek help when they begin to experience symptoms and signs of health conditions and/or disease. In the case that they do seek health care services, they will be forced to pay out of pocket for treatment which can be expensive to cover. Furthermore, farmworkers are less likely to report or seek care because of the fear of losing their jobs, unable to provide for their families, and lack of health insurance.

In most cases, healthcare services can be inaccessible to farmworkers because of distance, not enough health services in rural areas, and lack of culturally and linguistically competent providers (Ramos, 2018). Healthcare providers must understand and learn the different cultures and their values, beliefs, and practices as these can play a factor on how they perceive diseases and seek treatments. Healthcare providers that do not take into account their patient's cultural practices, values, and beliefs can cause a lack of trust between patients and providers. Patients are also less likely to make a follow-up appointment with the healthcare provider. In terms of linguistic competence, it's important to have some ability to communicate and understand the language that the majority of the patients speak. This can help with avoiding miscommunication and ensure that patients are receiving important information for their health. All of these are gaps in healthcare that need to be addressed to provide adequate healthcare treatment for farmworkers.

Another social determinant of health to consider is the food insecurity that farmworkers experience. Although food insecurity has been an issue throughout the United States,

farmworkers are more likely to experience food insecurity because of their low wages and lack of food assistance. It was reported that the “California Central Valley found that 45% of migrant workers households composed primarily of farmworkers had poor food insecurity, whereas a study of farmworker families in Salinas Valley observed that 29% and 10% of the households had low and very low food security” (Castillo et al. 2021). This demonstrates the lack of assistance in providing fresh and nutritious produce to farmworkers. This can cause long-term consequences with malnutrition in children and farmworkers, obesity, weak immune systems, and mental health disorders.

Additionally, many farmworkers have reported living in horrible housing conditions that can affect their and their families' well-being. Some reports of these conditions include living in overcrowded housing, reports of insect infestation, mold and water damage, and poor flooring, and electrical systems (Castillo et al. 2021). All of these conditions can cause negative health outcomes, such as skin irritation, and injuries due to the poor construction of these houses. Therefore, they are more likely to seek healthcare which can cause financial hardships as we have previously mentioned, because many farmworkers do not have health insurance to cover the costs.

Another factor that affects farmworkers' well-being is the fear of deportation. Although it is difficult to know the exact number of undocumented farmworkers, it is estimated that half of farmworkers are undocumented (Castillo et al. 2021). Due to their legal status, many farmworkers are at risk of experiencing maltreatment in their workplace. Many farmworkers live in fear that if they speak against their employer(s), they may either be fired or even targeted for deportation. This constant fear and worry has health consequences like developing mental health disorders, higher levels of inflammation, and a higher percentage of experiencing hypertension

(Castillo et al. 2021). This study was conducted after the 2016 US presidential election, in which former President Donald Trump was elected as president. During this campaign, he spoke about his immigration policy like strict deportation policies. Therefore, the results demonstrated how the politics and social events have impacted the well-being of farmworkers. With the current 2024 US presidential election, farmworkers may be experiencing fear and concern about the implementation of stricter immigration policies that negatively impact their future.

These are all intersecting factors that have negatively impacted farmworkers. Some farmworkers experience these factors in their everyday lives, whereas other factors progressively worsen over time. In other words, some of these factors may not seem to have interfered in their everyday lives, however, they could impact their health by developing chronic or acute health conditions and/or diseases, such as heart disease, respiratory diseases, injuries, etc. Therefore, these are social determinants of health that we took into account when researching resources to provide in different counties in the State of California. The cities that we focused on are Gilroy, Huron, Greenfield, Salinas, Soledad, and Watsonville. We developed resource brochures for each county that include mother/child care, food resources, healthcare, education, housing, legal services, and food resources.



Source: Centers for Disease Control and Prevention

Essential Resources

Essential Resource: Housing

Farmworkers are essential to California’s agricultural economy, yet they still endure systemic housing challenges that impact their health. Inadequate living conditions, exacerbated by climate change, have profound impacts on farmworkers’ health, safety, and productivity. Efforts to address these challenges have led to the creation of innovative resources, such as the “Campo-Sano Risk & Resource Map” app/website, but systemic barriers continue to limit their effectiveness. This section explores the numerous resources found to help farmworkers and their families through unsafe living conditions. Often, farmworkers live in overcrowded and unsafe living situations, deteriorating their physical and mental health.

Illustrated in the brochures (see conclusion), many housing resources have been provided to farmworkers that are culturally competent and free of deportation worries. For example, Soledad’s brochure provides a housing resource called “Dorothy’s Place” which provides independent living housing for those in need, that will lead to their path of permanent, safe residence. In Greenfield, “Tyler Park Townhomes” provides apartments to low-income families. This is a significant improvement than many farmworkers’ current living situations. In Gilroy, one of the resources provided for housing is the “Emergency Utility Assistance”, helping low-income families/struggling families to pay their utility bills. Salinas has “Loma el Paraiso” housing to provide homes to families that are low-income, with one of the requirements being that one member of the family must be a farmworker. This prevents overcrowding, and a more stable household for children. Watsonville provides the “Rental Assistance Program” which supports families who have been recently evicted from their homes, with requirements such as

specific incomes, eviction notice, etc. This is a great resource for a family who has recently been evicted, whether from standing up to unjust employers about broken housing promises or unstable economic situations. In Huron, there is a nearby resource called “Fresno Mission” that helps families and people struggling with homelessness and difficult living conditions. Since Huron is such a small city, many of their resources are located in Huron, which can be out of the way for farmworkers, and with a strict working schedule, it is hard to find time to travel to these assistance centers. This is why it is crucial that systemic change is made in policies that help farmworker families, for how much they help us.

According to the National Agricultural Workers Survey, 33% of farmworkers live in overcrowded housing, while many others contend with structural deficiencies, poor sanitation, and limited access to clean water (NAWS, 2019). Seasonal and migratory work further exacerbates the housing crisis, as workers must move frequently to follow the harvest, leaving them with limited and often substandard housing options. This unstable lifestyle disrupts their ability to access consistent schooling, healthcare, and social services. This also limits their abilities to seek resources to help them, oftentimes due to unjust employers. The 2024 report titled "Napa County Farmworker Housing Needs and Impacts Assessment" underscores the shortage of affordable housing for farmworkers, forcing many to live in informal arrangements such as overcrowded homes (County of Napa, 2024). These makeshift arrangements often lack basic infrastructure like heating, cooling, and plumbing, exposing residents to extreme weather and unhygienic conditions. For instance, in some areas of California’s Central Valley, families live in single-room units shared by multiple generations, with insufficient privacy and inadequate

ventilation. This impacts the farmworkers' physical health but also adds stress to their families, especially children who struggle with unstable living environments.

The connection between housing and health is well-documented. Inadequate housing conditions contribute to respiratory issues, skin diseases, and chronic health problems. A study by Farmworker Justice highlights the severe health implications of overcrowding, poor ventilation, and pest infestations in farmworker housing. These conditions are exacerbated by exposure to agricultural chemicals, which can linger on clothing and surfaces, further increasing health risks within homes. For farmworkers who already endure long hours in hazardous environments, returning to unsafe housing compounds the toll on their well-being. Limited access to clean water and sanitation facilities amplifies the risk of infectious diseases, such as gastrointestinal illnesses, while unstable housing situations exacerbate stress and mental health issues. The psychological impact of housing insecurity is profound, as many farmworkers live with the constant fear of eviction or displacement. This anxiety is heightened for undocumented workers, who face both threats of deportation and housing instability. Chronic stress can lead to long-term health problems, including hypertension and cardiovascular disease.

Climate change has intensified the housing crisis for farmworkers, introducing new challenges to an already stressful situation. Rising temperatures, frequent wildfires, and extreme weather events disproportionately impact agricultural workers, many of whom live in regions most affected by these weather events. During California's record-breaking heatwaves, farmworkers in poorly insulated housing or units without air conditioning are at significant risk of heat-related illnesses. Heat exhaustion and dehydration are common, as housing often lacks the infrastructure necessary to provide relief from extreme temperatures. Wildfires present

another critical threat to housing stability, many farmworker communities are located in rural or semi-rural areas near agricultural fields that are highly susceptible to fire outbreaks. When wildfires strike, these workers are often the last to receive evacuation warnings or assistance. In some cases, families lose everything because their homes are destroyed by fires, leaving them with no financial means to rebuild or relocate. Without renter's insurance, which is often unavailable or inaccessible to low-income populations, farmworker families are left to absorb these losses entirely on their own. The Union of Concerned Scientists emphasizes that farmworkers already face environmental hazards in their work, such as pesticide exposure, and inadequate housing compounds these risks (UCS, 2019). The combination of climate change and poor housing conditions creates a perfect storm of vulnerability, particularly for undocumented workers who may hesitate to seek emergency assistance due to fear of immigration enforcement. These overlapping crises highlight the urgent need for housing solutions that are both affordable and climate-resilient. Efforts to address the housing crisis have included federal programs, nonprofit initiatives, and innovative tools like the "Campo-Sano Risk Map." Developed by the University of California, Santa Cruz, this app provides a dynamic mapping system that highlights climate risks, such as extreme heat and poor air quality, alongside health and social service resources in California's farmworker communities. The app integrates environmental data with local resource directories, empowering farmworkers and community health workers to make informed decisions. For example, during a heatwave, the app might identify nearby cooling centers or medical facilities.

Regions such as Watsonville, Salinas, Soledad, Greenfield, Gilroy, and Huron are among the areas covered by this valuable tool. These regions, which are home to large populations of

farmworkers, face unique challenges related to climate change and housing affordability. By providing real-time information and actionable recommendations, the Campo-Sano Risk & Resource Map App/Website bridges critical gaps in resource accessibility, particularly for non-English-speaking workers.

Many of the resources provided in the brochures are temporary solutions to systemic problems, providing help to improved living situations. These initiatives are essential but must be scaled up to address the magnitude of the housing crisis. Despite the availability of resources, farmworkers face numerous barriers to accessing housing support. Language barriers, lack of awareness, and fear of deportation prevent many from seeking assistance. Mistrust of institutions further exacerbates this problem.

Economic constraints remain a significant challenge for many farmworkers. With the average farmworker family earning below the poverty line, even subsidized housing can be unaffordable. The unstable nature of agricultural work further complicates eligibility for traditional housing assistance, which often requires proof of long-term residency. The 2022 report "Protecting Farmworkers from Health Impacts of Climate Change" found that about two-thirds of farmworkers feared deportation, while half lacked health insurance and struggled to afford basic household expenses. This economic instability forces many families to choose between paying for basic necessities and securing safe housing. Inequitable policies also hinders the effectiveness of housing initiatives. For instance, while many housing resources have created new housing units, delays in permitting and construction often slow the delivery of these projects. These systemic issues underscore the need for a cohesive policy framework that addresses housing as a fundamental component of farmworker welfare.

The housing crisis for farmworkers in California is a pressing issue with far-reaching implications for health, safety, and economic stability. While tools like the "Campo-Sano Risk Map" and state-led initiatives have made huge differences in addressing these challenges, systemic barriers continue to undermine their effectiveness. Bridging these gaps requires collaborative efforts among policymakers, nonprofit organizations, and community leaders. By prioritizing equitable access to affordable, climate-resilient housing and leveraging technology to disseminate resources, California can improve the lives of its farmworker population. These efforts are not only a moral necessity but also essential to sustaining the state's agricultural industry in the face of growing environmental and economic challenges.

Essential Resource: Mother and Child Care

The state of California is home to the largest population of all the states in the US. It also has the third largest area. The US is made up of many farms all across the states, with California only containing <4% of the nation's total, nonetheless, crops grown here provide 13% of the nation's total agricultural value. These extensive amounts of sales are earned from products like 1/3 of the country's vegetables, 3/4 of the country's fruit/nuts, and 20% of the country's milk. California has the fifth largest supply of food globally. Due to California's presence of leading tech institutions, high education rates, top sports teams, and a large cultural pool, it is easy for California's farming to get overlooked as a large part of its economy. This results in the farming community getting overlooked and missing out on equal amounts of funding and opportunities.

The very root of California's farming industry and its success is built upon the farm laborers who work in the fields. Although agricultural technology has advanced and farming has

evolved over the years, the risk of being a farm worker has yet to be rightfully minimized. Some common health risks experienced as a farm laborer are heat-related illnesses including dehydration, kidney issues, bladder issues, skin damage, exhaustion, back/neck issues, etc. These issues have been studied and can be prevented with proper labor conditions and regulations. A study done in 2021 found that even with compliance with Cal/OSHA (Occupational Safety and Health Administration) regulations, health-related-illness prevention and hydration worker training were insufficient. This means that scientifically set and studied regulations are not even sufficient for keeping the workers safe. These agricultural workers in California need to be better protected against work-related risks to the same level as other occupations. Some might wonder why, as such an advanced and technologically reliant society with top billionaires and tech moguls present in the state, has such a large community been allowed to be left vulnerable to serious health risks regulated by out-of-date studies.

A possible reason that the farming community is not getting proper help and advocacy is that many Latin American immigrants make up California's farmers. Some of these immigrants are undocumented, finding refuge and opportunity by working in California's farm fields. A study conducted in 2024 by the School of Social Work at CSUSB found through qualitative methods and interviews that the most important topics brought up by immigrant farm workers in California involved health, fear, housing, and pay. As previously mentioned, fear of deportation is a huge factor in health advocacy and access in undocumented immigrants. Many would much rather stay complacent and quiet in efforts to stay under the radar than advocate for better conditions. This shared silence can prove beneficial and keep workers safe from getting deported but has ultimately led to an absence of advocacy for the social welfare of these farm workers. With these issues brought to light, those with means able to can help advocate for these

communities by bringing them accessible resources in order to create a safer, healthier, longer, and more fulfilling life.

A large part of California's farming area is in the Central Valley, containing many of the cities that our task force studied closely. These cities also house many farm workers and Latin American communities. It has been proven that farmers in California are not properly protected on the field, so it is easy to assume that these communities are also underserved. One resource that is of utmost importance, especially for underserved communities, is adequate assistance for Mother and Child Care.

The effects of inadequate health care on children, their development, and their overall well-being is a hugely important area of study for the growth and improvement of society and the future. One specific study was done by the International Journal of Psychology and Behavioral Sciences in 2023 studying and mitigating risks of Slow Children Development Due to the War in Gaza. In this study, it was found that establishing safe places, providing information on education and nutritional health development, and community engagement was all tied in as key ways to improve child development.(International Journal of Psychology and Behavioral Sciences, 2023)

In the US, health care is reliant on health care insurance. For health care insurance, proof of citizenship is needed, meaning that undocumented immigrants experience a huge disparity in proper access to health care. One study from the Maternal and Child Health Journal had the objective of exploring the extent that working, uninsured immigrant families' children experience more barriers in comparison to insured children. One part of the study found that even among all insured children, immigrant children experienced a greater lack of health care including gaps in care visits, less likely to visit the emergency room, and postponing scheduled

appointments. Whether this is due to cultural practices or their family being intimidated by their citizenship status, it does not distract from the fact that, by birthright, these American children are experiencing a lack of health care.

About 40% of undocumented immigrants and 1/3 of all immigrants live in California with numbers and populations ever-growing. The way that healthcare access is handled does not account for the true population of people who need the care. This disparity in access spreads to the more vulnerable, women and children. With access to insurance proving to be a leading factor in easily accessible mother and child care that is where a solution must be found. The ideal resolution would be to extend healthcare access to all across the state, however, until that possibility, there are community resource centers specifically curated for the underserved farming community and their mothers and children. Resource centers for mothers and children provide necessities like shelter, safety, food, toys, and essentials. Undocumented immigrants do not have easily accessible ways to look up or find help that explains hours and descriptions in Spanish. Researching and listing out specific resource centers and their hours, addresses, and links in Spanish is a new way to solve the problem of limited access to resources for Latino farming communities in California.

Essential Resource: Food Security

Food security is a basic human right. It means having, at all times, both physical and economical access to sufficient and nutritious food that meets an individual's food preferences and dietary needs in order to live an active and healthy lifestyle (US AID 2004). The four main pillars of food security are availability, access, utilization, and stability. Availability refers to the

presence of food within a community, access involves having the necessary resources to obtain food, utilization pertains to the ability to properly use food that is both sufficient and nutritious, and stability ensures consistent availability, access, and utilization of food over time (Austin Fahy 2022).

Food insecurity occurs when one or more of these pillars are lacking; it is often rooted in poverty, having long-term consequences on physical health, cognitive development, and overall well-being. These consequences include increased rates of chronic diseases such as diabetes, hypertension, and heart disease, as well as developmental delays in children due to inadequate nutrition. Additionally, food insecurity can lead to mental health challenges, such as stress, anxiety, and depression, which further impact an individual's ability to work, learn, and thrive. It prevents families, communities, and countries from reaching their full potential. Therefore, addressing food insecurity requires not only meeting immediate needs but also analyzing the issue from a conjunctural perspective, considering how historical and present factors contribute to its persistence and inequality (US AID 2004).

Despite the mass production of food that farmworkers provide for the nation, food insecurity is one of the biggest challenges that farmworkers face themselves. According to the U.S. Department of Agriculture (USDA), food security means “access by all people at all times to enough food for an active, healthy life” (US AID 2004). Earning low wages and experiencing high poverty rates are among the main reasons agricultural workers face such dire food insecurity. However, now more than ever, climate change and the recent escalation of the COVID-19 pandemic have added a new level of uncertainty to this current issue.

Food insecurity rates are high across the nation, evident in recent data, where a whopping 35% of migrant workers in Salinas Valley, California, 45% of migrant workers in Mendota, California, 63% of migrant workers in Georgia, and almost 100% Indigenous agricultural workers in the Central Coast of California experience food-related challenges (US AID 2004). To understand the reason behind the high levels of food insecurity observed among farmworkers, it's important to analyze the interaction of all the conjunctural forces that result in this issue.

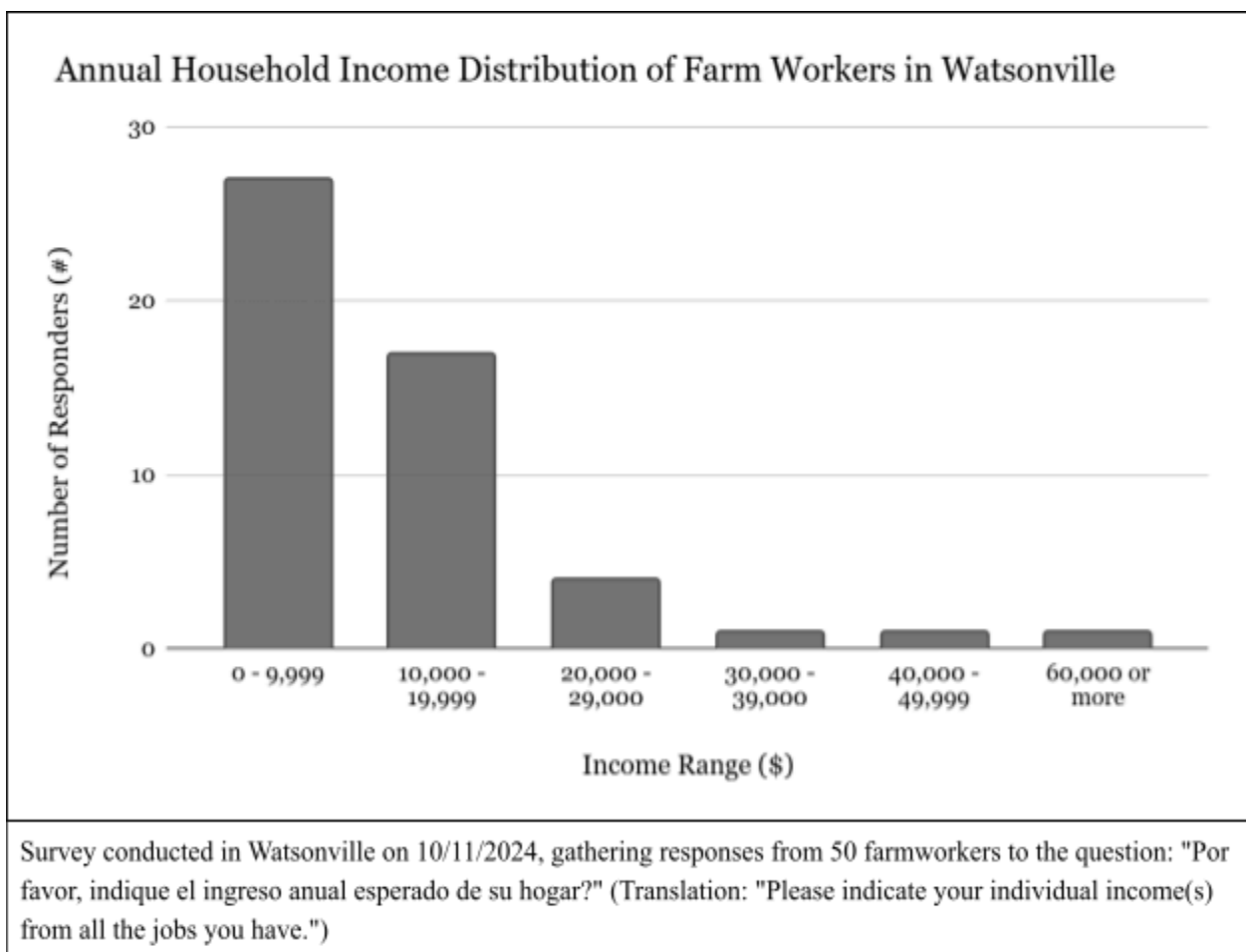
One of the primary reasons for food insecurity among farmworkers is the prevalence of extremely low wages. According to the 2019-2020 National Agricultural Workers Survey, the average wage for workers was \$13.59 per hour. Additionally, the average personal annual income ranged from \$20,000 to \$24,999, while the average family annual income was \$25,000 to \$29,000. Agricultural work is often seasonal, leaving workers without income during the off-season. Approximately 20% of all agricultural workers have family incomes below the poverty line (US AID 2004). This means that being below the poverty lines has serious implications for farmworkers and their families. It often results in limited access to basic necessities, including adequate food, housing, healthcare, and education. For farmworkers, this economic hardship can exacerbate food insecurity, as they may have to prioritize other essential expenses, such as rent or medical bills, over nutritious meals. It also creates a cycle of poverty where families struggle to break free due to lack of resources or opportunities, perpetuating poor health outcomes and limited upward mobility.

Similarly, findings from a recent survey conducted by the task force team in our GCH 190 research class provide local context to these national trends. On October 11, 2024, the team distributed surveys (in Spanish) to farmworkers in Watsonville during a monthly food

distribution event, compensating participants with \$25 gift cards as a small token of support.

Figure 1 shows that among the 50 survey responses collected, 27 responses indicated an annual personal income of \$10,000 or less and 17 responses indicated an annual personal income between \$10,000 - \$19,999, far below the current average income of farm workers according to the National Agricultural Workers Survey.

Fig. 1



This level of financial insecurity highlights the significant barriers farm workers face in meeting their basic needs. Beyond struggling to access sufficient and nutritious food, they must

also account for other essential expenses, such as housing, utilities, healthcare, and family responsibilities. These overlapping financial burdens intensify food insecurity within this already vulnerable population, leaving little to no room for stability or resilience against unforeseen challenges.

The unpredictability of climate change poses a significant threat to the livelihoods of farm workers. Since agricultural work is highly dependent on weather conditions, severe weather changes and natural disasters jeopardize their ability to work. This leads to a reduction in both their working hours and their income, further exacerbating their financial insecurity. For example, the “2015 California drought resulted in a loss of 10,000 seasonal farm jobs” (Farmworker Justice 2023, p. 1). In states like California, natural disasters like wildfires have increased fivefold since the 1970s, severely impacting the Central Valley, one of the state’s primary agricultural regions. This area now experiences some of the worst air quality in the country. Despite the risks that wildfire smoke poses to human health, many farmworkers stay in the fields in fear of losing their jobs if they leave (US AID 2004). In fact, 50% reported not being covered by unemployment insurance if they lost their jobs, 8% claimed not to receive workers’ compensation if injured at work, 61% reported their employer would not provide health insurance, and 11% didn’t even know if insurance was provided (Farmworker Justice 2023, p. 1). The need for a stable income is so vital that farmworkers often risk their lives to secure the money necessary for basic necessities, including food to feed their families.

The challenges posed by climate change and income instability have become further compounded by broader issues in recent years: the COVID-19 pandemic. The pandemic “hindered the supply chain from farmers to retailers, resulting in worldwide insecurity”

(Farmworker Justice 2023, p. 1). If the supply chain change from farmers to retailers impacted global food security, the impact on farm worker food security is unimaginable. In a cross-sectional study of 1,115 adult farmworkers, it was reported that 37% experienced food insecurity during the pandemic. Food insecurity was more common among those born outside the U.S. or those who lived with children under 18 years of age, but it was less common among those who lived with a higher income, had more education, or had lived longer in the U.S (Ana M. Mora et al. 2022). COVID-19 played a large-scale role in increasing food insecurity among farmworkers, a challenge that persists today. The pandemic's long-lasting effects have yet to be fully recovered from, let alone reversed.

Many other factors common in rural areas contribute to farmworker food insecurity. Many farm workers can only afford substandard housing, often living in units that lack basic equipment such as refrigerators and/or cooking appliances in proper working conditions. As a result, perishable foods or meals requiring basic cooking are often not an option. Another factor is limited transportation. Farm workers often lack reliable transportation needed to travel long distances to purchase food, further limiting their access to sufficient, culturally appropriate foods. As a result, many farmworkers resort to unhealthy diets by consuming whatever is readily available, negatively impacting their long-term health (Jill F Kilanowski 2010). Those experiencing these conditions are said to live in food deserts. Food deserts are defined as small, low-income communities with limited access to sufficient, nutritious food, a growing public health concern (Heval M Kelli et al. 2019).

Culturally sensitive food pantries play a vital role in ensuring that food security goes beyond just access to sufficient food by addressing the need for culturally appropriate options.

For farmworker communities, having access to traditional foods that they are familiar with and know how to prepare is essential for maintaining their health, identity, and sense of well-being. Organizations like the California Farming and Food Network work to influence state policies that promote access to healthy, culturally appropriate foods for farm workers by supporting programs and legislation that fund local food systems, prioritize community-led solutions, and address systemic barriers like transportation and affordability (California Food and Farming Network 2024). The organization essentially aims to reduce reliance on pre-packaged, highly processed foods that are often lower in nutrients and higher in fat and sugar, thereby supporting healthier, more culturally appropriate diets. By offering familiar and nutritious food options, culturally sensitive food pantries help empower farmworker families to prepare meals that honor their traditions while meeting their nutritional needs.

The Food and Nutrition Services is an agency under the USDA that runs most of the federal programs impacting the food security of agricultural workers. The agency's mission is to increase food security and reduce hunger by increasing access to food, a healthy diet, and nutrition education. Under the Food and Nutrition Services is the Supplemental Nutrition Assistance Program (SNAP), a program that “provides benefits for low-income households to buy groceries” (Jordan W. Jones 2024). The federal government pays for SNAP benefits but splits administrative costs among the states. It is reported that only 1.8% of noncitizen agricultural workers use SNAP. It is important to consider, however, that to be part of SNAP, the gross monthly household income, net income, and assets must fall below certain thresholds. SNAP eligibility is limited to U.S. citizens and lawfully present noncitizens. Many other programs, such as the Nutrition Program for Women, Infants, and Children (WIC), the National

School Lunch Program (NSLP), the Summer Food Service Program (SFSP), and the Gus Schumacher Nutrition Incentive Program (GusNIP), are federally funded programs aiming to expand access to affordable food for underserved populations (Farmworker Justice 2023, p. 2).

On a large scale, the 118th United States Congress has introduced several legislative measures to address food insecurity. For example, the Helping Schools Feed Kids Act of 2023 aims to provide additional reimbursements for the cost of certain meals in various child nutrition programs. The Healthy Meals Help Kids Learn Act increased federal reimbursement rates for school lunch and breakfast programs (Farmworker Justice 2023, p. 2). Most importantly, the Farm Bill, reauthorized every five years and reintroduced in 2023, governs USDA farm and food programs, including SNAP. It outlines the United States' agricultural and food policies and supports food assistance programs that help low-income families access healthy food (Farmworker Justice 2023, p. 2).

A number of approaches can be taken to improve access to food for farmworkers. One effective approach is to establish mobile food pantries, which bring the food directly to locations within farmworker communities that are easily accessible to them. This approach is beneficial to workers who lack transportation or live in remote areas. For example, the Farmworkers Mobile Produce Pantry, run by The Food Bank in Monterey County, delivers fresh produce and other perishable items to farmworkers in the fields directly when they're ending their shift in the day. By eliminating transportation barriers, these mobile pantries ensure that agricultural workers have access to nutritious foods that might otherwise be out of reach due to cost or location (Farmworker Justice 2023, p. 4).

An additional valuable approach is organizing community food drives. These events are crucial as they provide direct food assistance to farmworkers experiencing food insecurity. Community members often participate by collecting food and raising awareness about the challenges farmworkers face. By gathering essential food items to supply local food pantries, these drives not only offer immediate relief but also foster a supportive environment for farmworker communities. Many food drives also aim to include culturally appropriate foods for farmworkers. Increased community engagement enhances advocacy, expands resources, and creates a network of support that strengthens food security efforts (Farmworker Justice 2023, p. 4).

Another method of improving food access is through food prescription programs. These programs enable healthcare providers to prescribe healthy foods, which patients can redeem at local farmers' markets or grocery stores using benefits such as WIC or SNAP. Some clinics collaborate with farmers' markets or food outlets to provide vouchers funded by government or private grants, ensuring patients can afford these nutritious options. By aligning food prescriptions with patients' specific nutritional needs and health conditions, this approach not only addresses food insecurity but also enhances overall health outcomes, particularly for individuals with chronic illnesses or dietary restrictions. It helps bridge the gap in food access and contributes to the well-being of farmworker families (Farmworker Justice 2023, p. 2).

On a local scale, the Remedies Communications Task Force team included a food section in resource brochures to provide information on free food drives, events, food banks, and other services aimed at increasing farmworkers' access to food tailored to each region. The targeted regions include the cities of Huron, Gilroy, Salinas, Soledad, Greenfield, and Watsonville, where

many farmworkers face significant food insecurity. Given that the majority of farmworkers in these cities are Spanish-speaking, the brochures are currently written in Spanish. In the future, the goal is to enhance inclusivity and accessibility by translating the materials into additional languages that reflect the diverse ethnic backgrounds within the farmworker community.

Huron, a small city in Fresno County with a population of 6,367 and a poverty rate of 32%, faces significant socioeconomic challenges, particularly within its farmworker community (World Population Review 2024). While resources within Huron are limited, its proximity to Fresno allows residents to share resources across the two areas. Similarly, Gilroy, a city of around 60,000 in nearby Santa Clara County and known for its garlic production, is home to many low-income farmworker families who struggle with food insecurity due to limited access to affordable, healthy food.

In Monterey County, cities like Salinas, Soledad, and Greenfield highlight the persistent struggles faced by farmworker communities. Salinas, often referred to as the "Salad Bowl of the World" by promoters, is home to over 160,000 residents and serves as a cornerstone of California's agricultural industry (Samantha Roach 2023). Despite its significance in food production, many farmworkers live below the poverty line and face severe food insecurity. Neighboring Salinas is Soledad, a city with a population of just over 24,000, and Greenfield, with a population of about 22,000, also experiences high food insecurity rates. Rural isolation, economic hardships, and limited access to healthy food options heighten the challenges in these smaller cities.

Watsonville, located in Santa Cruz County, is another vital agricultural hub with a population of about 50,000. Many residents, employed in farming, struggle with low wages and rising living costs, leading to some of the highest rates of food insecurity in the region.

To support these farmworker communities, the Remedies Communications team provides essential resources, including information on food banks, free food drives, and food distribution events. These services, detailed with locations and timings (if applicable), aim to alleviate food insecurity and improve access to nutritious meals across Fresno, Santa Clara, Monterey, and Santa Cruz Counties.

Overall, the food resources aim to provide essential relief to the dense populations of farmworkers in these communities who face persistent food insecurity. The effort acknowledges the multiple challenges that farmworker families face including limited transportation, long working hours, and low wages, making access to healthy food difficult. Hence, the resources act as a small guide to farm workers in order to connect them with organized food drives, food banks, and meal programs, initiatives that strive to bridge the gap between farmworkers' contributions to the nation's food supply and their access to nutritious meals.

In regions like Watsonville, Salinas, and Greenfield, where farmworkers form the backbone of agricultural labor, these food relief efforts not only address immediate hunger but also aim to build long-term food security. Resources that incorporate mobile food pantries, seasonal meal distributions, and partnerships with local farms help provide consistent access to fresh, healthy produce for farmworker households. Furthermore, by raising awareness and

advocating for policy changes, these efforts empower farmworker communities to advocate for systemic improvements that reduce food insecurity at its root.

Ultimately, these collective initiatives emphasize the need for both immediate and sustainable solutions to food insecurity among farmworkers. Whether through expanding federal programs like SNAP and WIC, increasing access to affordable local food sources, or improving outreach in rural and underserved areas, these efforts are a testament to the resilience of farmworker communities and the importance of ensuring that those who help feed the nation are nourished themselves.

Essential Resource: Healthcare

Healthcare is a fundamental human right, essential for maintaining one's dignity and well-being. Unfortunately, however, for farmworkers, and particularly those who are undocumented, it is nearly impossible to access healthcare since they have little to no eligibility for government-sponsored programs like Medi-Cal (Diaz et al., 2024). The insurance was recently expanded in 2023 so “documented farmworkers who earn incomes less than 138 percent of federal poverty are eligible... [and] undocumented immigrants are eligible [only] for medical emergencies and pregnancy-related services, but most are ineligible for comprehensive coverage” (Cha, 2022). These individuals make up the backbone of our food supply; they put in long and grueling hours, oftentimes from dawn to dusk, no matter the conditions. The health risks that farmworkers face on the job are among the most severe of any occupation. Daily exposure to pesticides can cause acute poisoning, long-term neurological damage, and increase the risk of illnesses like cancer, asthma, and Parkinson’s disease (Walton et al., 2017). Working in extreme heat, coupled with inadequate breaks and no water or shade, often leads to

dehydration, heat stroke, and even kidney damage. The physical demands of the job — such as heavy lifting, repetitive motions, and bending over — frequently result in musculoskeletal injuries, including chronic pain and mobility issues. These dangers are further exacerbated by substandard working conditions, little to no workplace protections, and limited access to medical services. Despite this exhausting and thankless labor, without healthcare access, farmworkers are often forced to endure untreated injuries and illnesses and they face unfair and immense challenges when it comes to just getting some medical help. In California, the Fair Labor Standards Act mandates that farmworkers must be paid at least the state minimum wage, guaranteeing they receive fair compensation for their labor. However, farmworkers often struggle to enforce their rights due to inadequate government oversight, fears of retaliation from their employers, and the lack of legal representation, making the carrying out of this law unrealistic and futile. A study conducted in 2021 by UC Davis found that “the average directly hired California crop worker earned \$20,000 in 2021” (Martin, 2024). This income is not only impractical to live on for basic living expenses elsewhere, but it’s especially insufficient in high-cost areas like California. Affording healthcare is just not possible for farmworkers, and for many, the barriers are not only about money and a lack of insurance, but also fear of deportation if they do seek help, the isolation from resources due to living in rural areas, and a lack of programs that include and support farmworker communities.

Providing affordable/free resources for farmworkers and their families can have a profound positive impact on their overall well-being, both physically and mentally. As mentioned above, the studies have shown that many farmworkers earn wages that fall far below the poverty line, making healthcare completely unattainable. By offering low-cost or free medical resources, farmworkers will receive the essential care they deserve without adding to

their financial strain. Subsidized or free clinics can help families access vaccinations, checkups, and treatments that they would otherwise forego due to the high cost, and this ensures better overall health and the prevention of minor illnesses from escalating into severe conditions. Healthcare resources focused on primary care, treatment for work-related injuries, and chronic disease management will seriously improve farmworkers' overall health. First of all, primary care services are the critical initial phase in finding and addressing health concerns before they become serious. Treatment for common work-related injuries, like musculoskeletal issues caused by heavy lifting, bending over, and repetitive motions, allows workers to properly heal and work without pain. Additionally, the management of chronic illnesses like diabetes and hypertension, which are both prevalent in the farmworker population, can prevent life-threatening complications. Vaccination programs help prevent the spread of infectious diseases, which is particularly important in substandard housing conditions where overcrowding is common and results in the spread of diseases like the flu or tuberculosis (Diaz et al., 2024). Outreach programs educate farmworkers on topics like pesticide safety and heat stress prevention. Farmworkers can understand the risks of pesticide exposure and if protective equipment is actually offered by employers, they can learn how to use the equipment to prevent acute and long-term health problems. Teaching farmworkers to recognize the early signs of heat stress and emphasizing the importance of staying hydrated is crucial for their safety, particularly during the intense summer heat. Many workers refuse to drink water to avoid taking bathroom breaks which will cut into their labor, but this results in serious heat-related illnesses. These programs give workers the chance to make informed decisions about their health. Regular access to healthcare and education about how they can take care of themselves is a fundamental right that provides

workers with a sense of dignity and empowerment and overall contributes to their well-being and self-worth.

The high demand for healthcare services among farmworkers exceeds the resources available. The available clinics that do offer their services to migrant and seasonal workers can only do so much with limited funding. It is massively difficult for them to meet the needs of such a large population. The scarcity of this resource results in long wait times, overworked staff, and ultimately not enough support for those in need. Secondly, it is difficult for those living in rural regions to access clinics or hospitals without transportation. The financial burden of arranging transportation through services like Uber, Lyft, or taxis makes seeking care much more difficult. Also, even when healthcare programs assure protection and confidentiality, undocumented farmworkers may be hesitant to trust those promises due to their fear of deportation. Language barriers also play a role as a significant obstacle. If the farmworkers cannot speak English and there are no Spanish translators provided, how are they supposed to accurately communicate their symptoms or answer questions asked by the physician? The miscommunication — or really, the complete lack of communication — just makes matters worse, and the farmworker may likely end up feeling embarrassed or frustrated, so they will avoid seeking any health services altogether. This plays true especially for indigenous farmworkers who do not speak English or Spanish. Many indigenous communities speak unique languages that are not widely translated or supported in outreach efforts. A study shows that “According to the 2000 United States Census... it is estimated that there are 1 million Indigenous Mexicans from the state of Oaxaca in the US, mostly Mixtec, Zapotec, and Triqui people” (Holmes, 2006). Since the last comprehensive census of Indigenous farmworkers 24 years ago, their population has undoubtedly grown. However, the availability of resources in indigenous languages has not kept

pace, leaving many unable to access critical information. Another important aspect of the limitation to access is simply the lack of awareness that resources are out there. Many farmworkers are unaware that they may qualify for certain healthcare services or programs, especially if they live in rural areas where outreach campaigns will not reach them. Additionally, employers may not even prioritize or feel obligated to share critical information about available healthcare resources with their workers. If farmworkers don't have the means to learn about services being offered, they will never be able to get help.

The Remedies Communication group was tasked with making online and paper brochures offering resources to farmworkers in different cities throughout California. Among the resources, healthcare — especially affordable or free services for farmworker communities — was one of our main priorities to track down. For example, in Salinas, Clinica de Salud del Valle de Salinas (CSVS) offers medical, dental, and optometry services in five of their clinics throughout the city. This program puts emphasis on caring for farmworkers and their families and accepts patients without insurance. They also help eligible patients with applying for health insurance. This is a great example of what farmworkers need nationwide: health services that support them no matter their immigration or insurance status. Another resource we found is the Community Health Trust of Pajaro Valley: The Diabetes Health Center (DHC) in Watsonville. This center provides diabetes education to those living with diabetes or prediabetes and other health conditions. There are classes and individual sessions with Certified Diabetes Care and Education Specialists, medical nutrition therapy services, workplace wellness/community presentations that are offered in English and Spanish, and telehealth appointments, which is useful to those living in rural areas. There are affordable self-pay rates offered to those who don't

have insurance. Diabetes is prevalent in farmworker communities so educational programs like this are necessary to target such a chronic health issue.

Essential Resource: Legal Resources

As mentioned previously, there is no exact number of undocumented farmworkers in the United States. However, due to the fact that they receive little support when it comes to wages, healthcare, and discrimination, they still have the right to seek legal representation in any case that is needed.

There has been a long history of undocumented/documented farmworkers in the United States. During World War II, there weren't many farmworkers which created many challenges for the United States. Therefore, Mexico and the United States implemented the Bracero program in 1943. This program allowed Mexicans to come to the United States for a certain amount of time, to work in the field. After World War II, the United States deported legal resident farmworkers back to Mexico. This is similar to the H-2A which allows U.S. employers and agents to hire individuals from foreign countries to fill temporary agriculture jobs in the U.S. (U.S. Citizenship and Immigration Services).

This is similar to the H-2A program that was designed to provide authorization to arrive in the United States and to receive work authorization for agriculture jobs (Koreishi & Donohoe, 2010). It is important to note that farmworkers who had H-2A but extended their stay after their authorized date are considered to be undocumented. In other words, they will not receive benefits or protection, if any was applied under the H-2A. Many federal, state, and local laws have been implemented to protect employees and their rights from any unfair treatment. Unfair treatment can include discrimination, harassment, unfair pay, wage theft, etc. Additionally, some workers

may be undocumented which can cause fear of deportation, assistance with their legal status, and fear of making any reports against their employers. For that reason, we believe that it is important to find and provide legal resources to farmworkers.

Nevertheless, it is important that farmworkers, regardless of their immigration status, can seek legal support for any maltreatment in their work and protect their rights from employer(s). First, there is a difference in wages being earned by farmworkers based on their legal status. Farmworkers who are U.S. citizens earn the highest compared to farmworkers with green cards and undocumented farmworkers. Between the two groups of farmworkers with green cards and undocumented farmworkers, those with green cards earn more (Bowers & Chand, 2018). The unfair wages have been an issue that many undocumented workers have been protesting and striking against their employer(s). Additionally, it has been stated that “undocumented workers are particularly susceptible to exploitation and abuse by employers who may use their immigration status as leverage” (Kaleikini, 2024). Undocumented workers reporting abuse or unfair wages can put themselves at risk of losing their jobs and even being reported to Immigration and Customs Enforcement (ICE). In these cases, where undocumented farmworkers are put at risk for deportation or have encounters with ICE, they have the right to legal representation. It may be challenging for individuals to find legal support in rural areas, which emphasizes the importance of our work to provide these legal resources that can help undocumented workers.

To reiterate, many undocumented farmworkers do not have health insurance and are at risk for many health consequences, such as respiratory diseases, injuries, mental health disorders, etc. Working in agriculture can be dangerous work as there are many machines used in the field that need proper training to operate. Without proper training, farmworkers are more

likely to be injured at work and will be forced to work after an accident disregarding their health condition(s). It has been reported that approximately 33% to 69% of agricultural injuries are not reported (Snipes et al., 2017). When workers are injured in their workplace, they have the right to report and take legal action regarding their incident. Although they have this right, many undocumented farmworkers do not report any injuries because they fear losing their jobs or being reported to ICE, making undocumented farmworkers a vulnerable community for maltreatment in their workplace from their employer(s).

Along with this, many undocumented farmworkers believe that they aren't able to seek healthcare services because of the lack of health insurance and fear of losing their job.

Approximately, 42% to 50% of farmworkers do not seek medical treatment. In most cases, the employers add pressure to continue working without caring about their health conditions.

Employers have also threatened and added fear to farmworkers for seeking healthcare services, "Throughout her [Angelita, a farmworker] week-and-a-half stay in the hospital he continued to call her and urged her to come back to work as soon as she was released. He also threatened to hire someone else if she did not return" (Snipes et al., 2017). These are one of many situations that farmworkers find themselves in when facing their employers which makes it difficult for them to be able to seek care for their injuries.

Additionally, farmworkers are also able to report harmful work conditions to the Occupational Safety and Health Administration (OSHA). The purpose of OSHA is to ensure a safe and healthy working environment. However, while conducting surveys in the Watsonville area, one of the common issues amongst farmworkers is the little to no knowledge of OSHA and how to file a claim. This is a major issue as farm workers have the right to file a claim against their work regarding safety violations.

All of these situations can be taken to court for legal action because they are violations of workers' rights. That being the case, we felt that it was important to seek legal resources not only to help undocumented farmworkers with their immigration status but to also help with legal procedures that will help them feel safe in their workplace and be treated fairly by their employer(s).

Therefore, we focus on ensuring we can find legal services in different regions close to farmworkers. Some counties had more than others, and other counties did not have legal services that focused on immigration.

- Huron had approximately four legal services focused on servicing the farmworkers and the community of Huron.
- Greenfield has two legal services, the mission of which is to provide their services to farmworkers.
- Salinas had approximately three legal services that focused on immigration and general services, such as discrimination at work, tenants' rights, etc.
- Soledad had approximately two legal services.
- Watsonville has approximately two legal services focused on serving low-income communities with worker's rights and access to employment, as well as advocating and providing community education and information.

Essential Resource: Education

Education is one of the most powerful tools for personal and societal advancement. It allows for critical thinking skills to be built, opens doors to social and economic opportunities, and serves as the foundation for creating more equitable and resilient communities. For

farmworkers in California, in counties like Monterey, Santa Cruz, Santa Clara, and Fresno counties, education is even more relevant. It isn't just a right, but it serves as a way to break cycles of poverty and combat systemic racism/marginalization. Even so, a good education often feels somewhat unreachable for many farmworker families, even though they're the ones that sustain the state's multi-billion-dollar agricultural economy. This is because of a mixture of issues, including, but not limited to: the prioritization of work over school, economic instability, language barriers, technological barriers, cultural disconnects, systemic racism, and undocumented status. All of these reasons, and more, make it difficult for farmworker families to pursue an education in the United States.

Additionally, education isn't just about traditional academics. Health education, like recognizing symptoms of heatstroke, pesticide exposure, or other occupational hazards, is critical for this population of people. Farmworkers face disproportionately high risks of workplace injuries, heat-related illnesses, and chronic conditions due to the physical demands of their work on top of limited access to healthcare. Knowing how to prevent these issues or catch them early can make a big difference, not just physically, but mentally as well. The stress of unsafe working conditions only adds to the toll on their mental health. Not only are these issues a problem physically, but psychologically as well these environments are typically very stress-inducing, which is detrimental to mental health.

For farmworker families, education is the key to getting out of exploitative conditions. However, high dropout rates are prevalent amongst farmworker children. According to the California Department of Education, 15.7% of students enrolled in Migrant Educational Programs dropped out of high school, which is more than double the rate of non-Hispanic

students, at 7.6% (Daniela Delgado and Rachel Becker Herbst, 2018). This disparity highlights the systemic inequities these students face and the need for change.

A big systemic challenge that farmworker families face in accessing education is how low their annual income is compared to the standard cost of living. First, farmworkers face some of the lowest wages in the United States, making it troublesome to achieve financial stability, let alone think about a proper education. According to the U.S. Bureau of Labor Statistics (BLS), the median annual wage for farmworkers in 2023 was \$34,790 (U.S. Bureau of Labor Statistics, 2024). While this just barely goes over the federal poverty line, it cannot be ignored that the cost of living in California is much higher than that. In Santa Clara County, for example, the annual living wage for a family of four is estimated at \$168,058, which is more than 4x the median wage farm workers are given (Massachusetts Institute of Technology, 2024). In Santa Cruz County, it is \$104,676, which is about 3x the amount farmworkers are given (Massachusetts Institute of Technology, 2024). In Monterey County, it is \$96,776, slightly under 3x the amount farmworkers are paid (Massachusetts Institute of Technology, 2024). In Fresno County, it is \$76,776, though twenty thousand dollars less than it is in Monterey County, it's still more than 2x the amount that farmworkers are typically paid (Massachusetts Institute of Technology, 2024). These statistics show that farmworker families in California are earning less than $\frac{1}{3}$ of what is required to sustain a basic standard of living in these regions. Additionally, the U.S. Department of Agriculture reports that despite an increase in farm labor costs, wages and earnings for farmworkers have remained consistently low, contributing further to economic challenges for these families (U.S. Department of Agriculture, Economic Research Service). This financial strain makes it difficult for families to afford school supplies, extracurricular fees, and transportation costs, which can add up to several thousand dollars annually. For families living

on agricultural wages of \$34,790 or less, these expenses aren't realistic when compared to the high costs of rent, healthcare, and food.

Even though farmworker families face significant systemic barriers in accessing education, there are programs throughout California that aim to address these challenges. The resources below are specifically designed to close the gap by offering academic support, health education, and skill-building opportunities to farmworkers and their children.

The Semillitas Program in Santa Cruz County (Watsonville) provides free savings accounts for babies born in the region. This program creates a foundation for funding future educational needs, allowing farmworker families to save for expenses like college tuition, books, and other academic necessities. It's common for parents to put aside money for their children's college fund, etc., but this isn't a very realistic idea for farmworkers, who barely make enough money to pay for rent and food. So, this Program helps these farmworker families to establish finances early on for their children's education, eliminating one of the biggest barriers to higher education: affordability. Not only that, but Semillitas also works with families to offer financial literacy workshops, making sure that parents know how to navigate their finances. This is especially impactful for families who are unfamiliar with the instruments they can use or families who are distrustful of government institutions because of immigration concerns.

The ALCANCE Program in Watsonville focuses on youth mentoring and job readiness training, which is incredibly important for farmworker children/teenagers. Since the dropout rates of farmworker children are so high, this Program aims to provide information on developing job skills while going to school. Other services this Program offers are resume writing, mock interviews, retention assistance, basic needs and wellness assessment, community engagement, life skills, and linkages to leadership opportunities. All of these services help

children of farmworkers get a headstart in the workforce and provide them with the necessary skills and information to thrive in their adult lives.

Located in Monterey County, Bakersfield, the Greenfield Family Resource Center plays a major role in connecting farmworker families with educational and community support services. Some of these resources include providing available resources to food baskets, utility assistance, and health insurance, working with families in need with financial management or parenting training, nutritional support, preparing young children for school success, tobacco use prevention education, and many more. Similarly to the resources mentioned above, the Greenfield Family Resource Center offers a myriad of services that prepare farmworker families for the future.

The Agricultural and Land-Based Training Association (ALBA), located in Salinas, combines education with entrepreneurship to empower farmworkers to run their own agricultural businesses. Established in 2001, ALBA has provided intensive, on-farm skills training to over 600 farmers, where 200 launched a farm on their land, and about 100 went on to farm independently. By emphasizing hands-on training, ALBA ensures that farmworkers can apply what they learn immediately. They give access to land, equipment, and professional networks, giving farmworkers an opportunity to get out of their current exploitative jobs.

The Foundation for Agricultural Sustainability (FAS) in Huron offers farmworker families educational programs, training in sustainable agricultural practices, and access to community resources. Their workshops cover essential topics like soil health, water management, and crop diversification to support both environmental and economic stability. FAS also connects families with resources for housing, healthcare, and education, ensuring that their needs extend beyond the fields. With bilingual support and culturally relevant materials, the foundation makes sure that accessibility for Huron's predominantly hispanic farmworker

population. By empowering farm workers with knowledge and tools, FAS helps improve their quality of life and fosters long-term sustainability.

The Casa de Cultura Center in Soledad also offers a wide range of educational programs, including literacy classes, English as a Second Language courses, health education workshops, education about nutrition, cooking, sewing, free clinics offering general care, and living assistance. These services are vital for farmworker families who generally can't access these resources because of a language barrier or something else. It has also created a like-minded community of farmworkers in similar positions, so it is very accepting and judgment-free.

These programs and organizations represent just a fraction of the resources available to farmworker communities across California. In cities like Huron, Watsonville, Salinas, Greenfield, Soledad, and Gilroy, many similar services offer support in necessary areas. Each resource plays its own unique role in addressing the systemic inequities that farmworkers face, ensuring they and their families have access to the tools and opportunities they need to thrive. However, a major challenge remains: not every city has enough resources to meet the needs of this underserved population. The lack of access leaves many farmworkers without the support they need, putting an emphasis on the need for more services like these across all farmworker communities..

Together, these initiatives create a stronger foundation for equity, resilience, and long-term support.

To ensure that farmworker families can access valuable resources like these, this entire task force has developed the Farmworker Health App- Campo-Sano- that helps make it easier to access resources, stay informed about air quality, water quality, land toxicity, housing costs, immigrant data, and EPA data all for every county in California. The app is designed with accessibility in mind. It is bilingual (English and Spanish), ensuring that language barriers do not

prevent users from navigating its features. Through this app, it's the goal that farmworker families no longer have to spend hours searching for resources or vital information about their counties or surrounding counties. Now, all of the information they could need concerning their jobs and financial situations is available on one webpage.

The challenges faced by farmworker families in California are undeniably significant, but not impossible to overcome. Programs like Semillitas, ALBA, and the Greenfield Family Resource Center demonstrate that targeted support can transform lives by offering educational services. These resources, combined with the Campo-Sano app, represent a powerful step forward in addressing the systemic inequities that discriminate towards farmworker families. The Campo-Sano app isn't just a list of resources but serves as a way for farmworkers and their families the knowledge and access to improve their quality of life.

Through this collaborative effort, the Communications Remedies group aims to highlight how accessible these resources are and how they can make lasting impacts. By sharing these tools, we hope to lay the groundwork for progress in addressing the systemic inequities farmworker families in California face every day.

Bridging the Gap: How Our App Addresses Barriers to Resource Access for Farmworkers

Farmworkers face several barriers to accessing critical resources like healthcare, legal aid, education, housing, and more. These barriers are not just logistical, but also systemic and rooted in societal and racial inequities. One of the most significant barriers is the lack of information about where these resources are located and how to access them. This gap in farmworkers' knowledge comes from numerous factors, including language barriers, limited

access to technology, geographic isolation, and a lack of outreach to this community, leaving many farmworkers without the support they need to maintain their well-being.

Farmworkers often work long hours in rural or remote areas, making it difficult to find the time or transportation to reach resource centers which are typically concentrated in urban areas (Bloss et al., 2021). Many are unaware of the available services, and even when they know help is out there, they often don't know how and where to start looking. Living in isolated, rural areas creates several hurdles, like the need for transportation, time, and money to get to the location. Public transportation options are scarce or nonexistent for those who live remotely because bus or subway routes usually are not offered to areas beyond the town or city. This leaves farmworkers with few options for getting around, like personal vehicles — which many workers cannot afford — or carpooling with others. Rideshare services like Uber or Lyft may be available but are often too expensive for farmworkers, especially when the ride could cost them anywhere up to 2-4 times their hourly wage. For people in rural regions who cannot afford a car or a rideshare service, traveling to access resources is really difficult. And to make matters worse, farmworkers have extremely long working hours, usually from sunrise to sunset. If a clinic is only open from 9 am to 5 pm, the farmworker will not want to sacrifice those valuable hours of work. So even if they have access to transportation, many workers don't want to miss work or they are too exhausted after work to make the journey, so they just end up pushing their needs to the back burner.

Language and literacy barriers significantly compound the difficulties that farmworkers face when trying to access resources. Many of the essential services, from healthcare to legal assistance, are not presented in a way that is easily accessible or understandable for those who don't speak English. The vast majority of farmworkers in the United States come from

Spanish-speaking backgrounds, but many also speak indigenous languages, making communication even more challenging. This creates a major hurdle for many farmworkers who are either not fluent in English or lack literacy skills altogether. Even when resources are translated into Spanish, they can still be difficult to understand, especially if the person responsible for the translation doesn't actually speak Spanish and uses online translation tools which often makes the language too technical, formal, and/or full of mistakes. For farmworkers who speak indigenous languages, access to materials or services in their native tongue is often nonexistent. This issue is especially critical in healthcare settings, where understanding medical instructions, diagnoses, and treatment plans can directly impact the health and well-being of the worker. Without proper comprehension, the risk of miscommunication is high, leading to poor health outcomes, a lack of trust in the system, and a reluctance to seek care in the future. Similarly, when it comes to legal and housing issues, a lack of accessible information means that many farmworkers may not fully understand their rights or how to navigate the systems meant to assist them. As a result, they may miss out on crucial support, even when they are eligible for it.

In today's world, technology plays an important role in connecting people to information. However, many farmworkers live in rural areas where access to technology, like smartphones, computers, and reliable internet, is limited. In these communities, coverage is often scarce, making it difficult to search for resources or even check for nearby services online. For farmworkers who own smartphones, the high cost of cell phone data plans is another barrier. Additionally, even when technology is available, digital literacy can be a significant obstacle. Many farmworkers are not familiar with how to navigate websites or use apps that require specific knowledge or skills. Without the necessary training, they can feel disconnected from valuable online information that could help improve their lives. This digital divide forces many

farmworkers to rely on outdated or unreliable methods of communication, such as word of mouth or paper flyers, to learn about available services and resources. As a result, while technology has the potential to be a powerful tool for bridging gaps, for many farmworkers, it remains an inaccessible resource.

Another significant challenge facing farmworkers is the lack of outreach programs created specifically for their needs. Too often, outreach efforts are aimed at urban or suburban populations, leaving rural communities where farmworkers typically live underserved. This lack of targeted outreach means farmworkers are left unaware of important services that could improve their health, well-being, or financial stability. Furthermore, many service providers do not take into account the cultural differences and language barriers that can make it difficult for farmworkers to trust and engage with available resources. This lack of cultural sensitivity can prevent farmworkers from reaching out for help, which just continues to isolate them. For undocumented farmworkers, fear of deportation or legal consequences adds another layer of hesitation and reluctance in asking for help. Even though there are protections in place to shield them from deportation when seeking certain services, the fear of exposure keeps many from seeking essential care or legal assistance.

Our [Campo-Sano Risk and Resource app](#) is specifically designed to address these challenges by bridging the information gap and making it easier for farmworkers to locate and access resources. It is available in English and Spanish to ensure that it is usable for those who cannot speak or understand English. Additionally, it is designed to be accessible to users with limited tech experience. The app uses an interactive map to display a wide range of services available to farmworkers, including healthcare clinics, food banks, legal aid offices, educational resources, and mother/child care. It is a user-friendly platform that places essential information

about resources at farmworkers' fingertips. Essentially, users can search for specific services or explore what is available in their county. Each location is marked with icons representing categories such as healthcare, food, legal assistance, etc. When the user clicks on the icon, they will be greeted with a brief description of what the resource provides in Spanish, contact details, and hours of operation. The majority of the resources found, if not all, have staff members who are fluent in Spanish, ensuring effective communication and support for Spanish-speaking farmworkers. This makes it easier for farmworkers to understand what is offered and decide where to go. Farmworkers no longer have to rely on word of mouth or physical flyers and brochures, which are often outdated or inaccessible. With the app, they can quickly locate services, reducing the time and effort required to get help. Of course, it must be acknowledged that not all farmworkers have access to smartphones or internet connectivity, making outreach programs and offline solutions still an essential requirement. Additionally, another issue with the app is that it currently does not offer translation support for indigenous languages. However, for those with access, the app provides an invaluable tool for those who want to access and learn about offered services. By addressing the barriers to finding resources, this app helps ensure that farmworkers can get the support they need, and ultimately improve their quality of life.

select language/lengua:
 English

select a county
 Monterey

Mostrar todo California

select a category
 Air

select an indicator
 PM2.5 concentration (percentile)

Mostrar indicador en:
 Percentil por zona censal
 Valores exactos

Datos de colaboración colectiva (experimentales)
 Mostrar datos de origen colaborativo

Recursos (experimentales)
 Mostrar recursos & icons de recursos

Elige opciones -- coming soon:
 General
 Servicios legales

Map Datos Datos obtenidos de forma colectiva (experimental)

Leaflet | © OpenStreetMap, ODbL

Calidad del aire
 57 AQI

Temperatura de hoy y mañana

Principales peligros en esta región
 This census tract has some hazards such as:
 High Agricultural pesticide use: which has a percentile of 0.995 and a value of 13262.084
 Low Number of Immigrant Organizations which has a percentile of 0.196 and a value of 4

select language/lengua:
 English

select a county
 Santa Cruz

Mostrar todo California

select a category
 Air

select an indicator
 PM2.5 concentration (percentile)

Mostrar indicador en:
 Percentil por zona censal
 Valores exactos

Datos de colaboración colectiva (experimentales)
 Mostrar datos de origen colaborativo

Recursos (experimentales)
 Mostrar recursos & icons de recursos

Elige opciones -- coming soon:

Map Datos Datos obtenidos de forma colectiva (experimental)

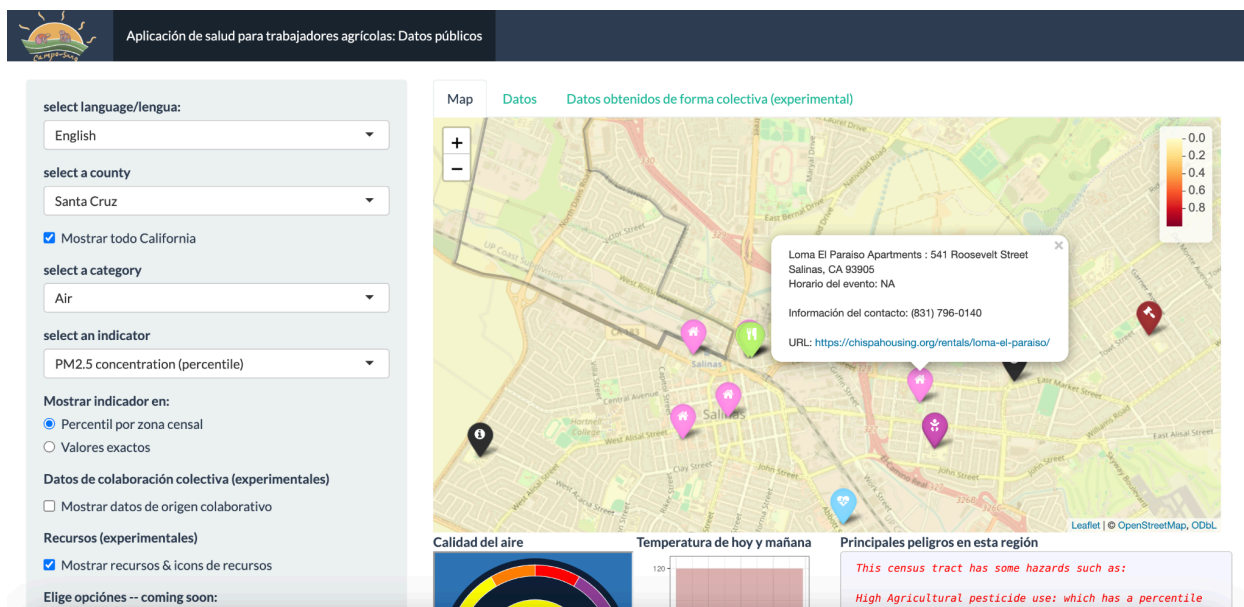
Community Health Trust of Pajaro Valley - 85 Nielson Street, Suite 201 Watsonville, CA 95076
 Horario del evento: Mon - Fri: 8:30 am - 5:00 pm
 Información del contacto: (831) 726-4267
 URL: <https://pvhealthtrust.org/diabetes-health-center/>

Leaflet | © OpenStreetMap, ODbL

Calidad del aire

Temperatura de hoy y mañana

Principales peligros en esta región
 This census tract has some hazards such as:
 High Agricultural pesticide use: which has a percentile of 0.995 and a value of 13262.084



Images showing the Campo-Sano app resources in Greenfield, Watsonville, and Salinas:

<https://farmworkerhealth-app.ucsc.edu/>

Empowering Farmworker Communities Through Accessible Resources

With collaboration as the communication section of the remedy cohort, six Californian cities, all with active farming communities, were researched and mapped for places providing resources or assistance to underserved communities. These maps and a list of addresses were made into six individual brochures to be distributed physically at food distribution centers, as well as presented as online files with QR scannable codes. Legal services, food, finance, education, housing, healthcare, transportation, and mother/child care were all organizational headings for the types of resources we were providing. The cities researched were Huron, Soledad, Salinas, Gilroy, Watsonville, and Greenfield. In cities near the Central Valley, with large numbers of Latino communities, resources that are accessible must be communicated to these communities through Spanish. Also, some families might not be present at food distribution

centers where pamphlets would be handed out and vice versa, some families don't have access to the internet. It was deeply important to create resource pamphlets in Spanish in an effort to cater to and address the needs of immigrant farm workers.

Bringing new resource opportunities to light was the main goal of researching the cities, and with this research, we are able to highlight any disparities in inaccessible resources in each city and areas for improvement. Every city differs in area and relative population, however, some had much harder to find resources. For example, the city of Soledad is known to be a smaller city, however, many of the closest help/resource centers were in the next nearby city of Salinas. This can prove to be a source of disparity for immigrants in Soledad especially those who cannot travel. The end goal of the city research is to prove the need to ever expand and improve access to resources for all. On the other hand, larger communities that have the benefit of trial and error, experience, and wider opportunities can be evidence for what works and what doesn't work in resource centers.

One example of a good idea was through research in Gilroy, CA, where one recurring address turned out to be a large-scale center that provided a large range of different types of resources. This would be the ideal way to provide as many resources as possible to smaller cities that don't have space for individual areas. The Salvation Army Community Center is a well-known resource center, nonetheless, it is important to keep in mind the limitations to accessing these centers. Some centers can require proof of citizenship, birth certificates, and/or social security numbers. It is important to communicate as much information as possible with those who receive these pamphlets so they can be as prepared as possible in their mission to acquire the help needed.

Some might say, didn't you just look up "resources in Gilroy, CA," which might be true, however, the way that information is provided in the United States rarely takes into account the large number of immigrants whose native language is not English. Latinos make up 40% of California's population, the largest in the state. 43.9% of California's population speak a language other than English at home. This is all evidence of why translations to targeted communities are important.

Access to education and resources needs to be communicated starting in all sections of life. One example of a major discrepancy is the health care community. Latinos make up less than 7% of physicians in California despite making up most of the population. Latino patients are not getting treated by doctors that even speak a language they understand. Health care access, once provided, can, hopefully, lead to a very close and trusting relationship between doctor and patient. This relationship would definitely be stronger when communicating in the same language with the same cultural references, practices, body language, and familiarity. It is very important to give equal diversity to languages spoken in such a largely Latino community.

The source of information, which creates a sense of trust, is a very important cultural value to Latinos. The development of a relationship will cause individuals to be more inclined to visit a resource center or take medical advice. One would immediately feel more trusting of someone who speaks my same language amongst many who do not.

Method of communication is a huge degree of research studies and relation of information back to studied communities. This research is being actively used by directly giving back the found information to the community being researched. Helpful communication between language barriers needs to be an educational training aspect for medical, government, and high-position jobs. Some tips that we used on the brochures were to understand our audience, use

clear language, use cultural context, use tech thoughtfully, get feedback from Spanish speakers, as well as using graphics to convey quick, globally understandable information. Bright colors are also a way to create eye-catching information that appeals to Latinos and their most popularly used colors. Effective bi-language communication needs to be practiced and is an opportunity to bring confidence to your multilingual interactions.

The next step after proper communication, would be focusing on real change due to advocacy. This is the longer step as it takes years and decades for an organization to cause legislation to actually be passed or changed. However, advocacy has proven to be the spark that starts fires, especially in today's social media-heavy present society. The extent to which advocacy can work varies, however, at the very least, advocacy will bring attention, and attention equals opportunities to spread awareness, information, and stories to people who would have never otherwise had the opportunity to listen. With storytelling comes compassion and willingness to give. The more and more advocacy, the more and more attention, the more and more storytelling, and the more and more compassion and care from others.

Brochure distribution, as well as other task force contributions, will be a lasting and founding start to a long road of providing the care to California agricultural workers that should have been accessible all along. If anything it will be a source of advocacy, evidence, and education on sources of improvement, as well as successful resource center ideas that will ultimately lead to more ambitious and widespread help to this community. This community provides such a diverse food supply with little to no health-related studies done on it. What they needed was advocacy without the fear of reparations, like deportation and work punishment. With no room to voice their transgressions, their health has suffered for too long with no voice, until now.

A Call to Action: Ensuring Equity and Justice for California's Farmworkers

Farmworkers are the backbone of California's agricultural success and essential for our food industry. Despite their hard work and contributions, they continue to face systemic disparities that impact their health every day. These barriers include lack of healthcare, inadequate housing, food insecurity, lack of childcare, and lack of education, especially for their legal rights. Addressing these challenges is crucial for the health of our farmworkers and to ensure California's agricultural economy stays successful. Matt Sparke and his students have been researching accessible resources and innovative remedies to better the quality of farmworker's lives. Climate change and extreme weather events (droughts, fires, etc.) have negatively affected the lives of farmworkers as they are most vulnerable to these disparities. Additional barriers that farmworkers must face include language barriers, low wages, inadequate legal protection, poor working conditions, lack of access to health care, and others; these compound to their heightened poverty and food insecurity. These challenges lead to problems like pesticide poisoning, heat-related illnesses, and other health problems. Due to the language and educational barriers, farmworkers often do not know their legal rights and are unaware of the health risks associated with their work.

The Global and Community Health Task Force led by Matt Sparke, specifically the Remedies Communication Team has worked diligently to develop a community-centered initiative of making resource brochures that are accessible to the farmworkers and distribute them to their farms. These brochures have been made to focus on various resources such as housing, food, healthcare, legal services, and general services such as mother/child care. Most of

these resources are free and culturally sensitive in the sense that the fear of deportation is understood among undocumented farmworkers, so our group has worked tirelessly to find resources that are community-based and accessible. Providing these resources with addresses and working hours is key when providing accessible and localized information which empowers farmworkers to feel safe while navigating the complex challenges placed on them due to systemic inequities and a changing climate. The cities that the team has made brochures (physical and online accessible) for include Soledad, Salinas, Greenfield, Watsonville, Gilroy, and Huron. When making these brochures, all resources needed to be safe and legitimate to provide real care to the farmworkers. Extensive research revealed the best resources that have a strong understanding of the challenges these farmworkers face every day. An in-depth explanation of why each resource was included in the brochures will be presented. Furthermore, our group worked closely with Ewan Whittaker-Walker, the website developer, to create the Campo-Sano Risk & Resource Map App/Website. This website provides resources and risks of importance to the farmworkers of specific cities as well.

Healthcare remains one of the most significant challenges for farmworkers in California for a variety of reasons. These reasons include pesticide exposure, extreme weather events, and hazardous working conditions. Unfortunately, these challenges lead to chronic illnesses, work-related injuries, heat stress, and mental health struggles. All of these often go untreated simply because there are not enough resources or they do not have enough money/time to get the help they desperately need. Accessing healthcare is the main challenge as they are often not given breaks to go to the clinic, or their lack of healthcare prevents them from visiting the doctor compounded with the fear of deportation. They also cannot speak up or protest, often because

their employers are ruthless and will replace them within minutes. Their economic insecurity and fear of deportation contribute to their lack of affordable healthcare accessibility. This makes affordable healthcare out of reach due to financial barriers, legal insecurities, and systemic discrimination. The research conducted to find free healthcare clinics, mobile health units, and outreach programs offers the farmworkers a potential pathway to address and hopefully overcome these disparities. With more accessible healthcare clinics, much-needed vaccines can be administered, injuries can be treated without leading to chronic injuries, and preventative care can be given the attention it needs, especially in this field of work. Outreach and educational programs help educate farmworkers on topics like pesticide safety, heat stress prevention, and the importance of seeking healthcare early. The resources provided to them are culturally sensitive, including staff that speak Spanish/Mixtec/Zapotec to care for patients that do not speak/have limited English. The resources provided are crucial as they address the systemic challenges that prevent farmworkers from accessing healthcare such as language barriers, lack of health education, and fear of deportation.

There is quite some irony in the fact that farmworkers, who play a vital role in feeding the nation, are among the most food-insecure populations in the country. This is unjust and their disparities are compounded with low wages and seasonal employment which creates poor financial situations where many farmworkers cannot afford food to fuel themselves and feed their families. Climate change exacerbates this issue, as severe weather events disrupt agricultural work and reduce incomes, further destabilizing their food security. Efforts to address food insecurity must include both immediate relief and systemic changes. Providing the farmworkers with food resources such as food banks gives them a sense of security for a basic

need in life. It is essential that these food banks are located near agricultural communities and have culturally relevant meal distributions. Understanding that this is a temporary fix to a systemic issue, the long-term solutions require addressing their wage disparities, consistent employment, and giving them the basic rights to unemployment insurance and paid sick leave. Another component, that research is encouraged in, is disaster preparedness and recovery plans specifically designed for agricultural workers to mitigate the impact of climate-related disruptions. This is a field of ongoing research and change; the research conducted with this Task Force is a small step in the right direction, impactful change happens on a bigger scale of policy change.

Housing is a huge sector where systemic neglect has left farmworkers vulnerable and lowering their quality of life. Many farmworkers live in overcrowded, unsafe, and temporary housing arrangements; these living conditions can exacerbate physical and mental health issues for them and their families. These inadequate housing conditions such as poor ventilation, lack of clean water, and insufficient insulation increase health problems and the likelihood of heat-related illnesses, especially during California's record-breaking heat waves. The climate change crisis is a spreading wildfire in California, disrupting their families and adding a layer of vulnerability. Extreme weather events such as wildfires and floods displace entire communities, leaving families without shelter or financial means to rebuild. Accessible and innovative tools such as the “Campo-Sano Map App/website, provide farmworkers with significant resources to mitigate the effects and challenges of housing. On the website/app, people can input their city/county and choose the type of resource they would like to search for, then an online map with all the resources helpful to them pop up so they can see the distance and travel time to these

resources. Making the website as accessible as possible is crucial, especially when English is not their first language, and technology can be confusing. The Map also shows real-time data on climate risks to direct farmworkers to specific resources near them such as cooling centers and emergency shelters. Although these resources should be basic rights in life, crises, and weather events can make them feel like a privilege. We hope to have the App/Website help them make informed decisions and educate themselves on their legal rights. Importantly, our website/app cannot solve systemic housing issues, justice comes from policy change. Differences like affordable and safe housing, employee rights, and stricter safety precautions are necessary to ensure farmworkers have access to healthy living conditions.

Lack of education, specifically awareness of the resources that can help them, is one of the greatest challenges farmworkers face. The long working hours, language barriers, and geographic isolation of the farms compound and make it difficult for farmworkers to learn and access essential services. This can be for a range of resources like healthcare, food assistance, housing, legal aid, mother/child care, and more. The story exacerbates when farmworkers are undocumented and fear seeking any kind of assistance because they have a fear of deportation, which in turn, further isolates them from support networks. The map/app is designed to close this information gap; with an interactive map displaying resources for healthcare, food assistance, housing, legal aid, and more. This app serves as a centralized hub for farmworkers who are seeking help. The bilingual (mostly Spanish and icons) feature allows for an accessible design to give farmworkers resources in the easiest way possible. The brief descriptions and working hours of each location allow for navigating to the resources intuitively, even if they have limited literacy or technology experience. It is also mobile phone friendly to ensure it is the most

accessible option. The brief descriptions/working hours are essential to enable users to connect directly with the service providers. The websites' high potential is complemented with a tool for those who do not have access to reliable internet/smartphones. Brochures are distributed at selected farms that cater to those specific cities (Soledad, Salinas, Watsonville, Huron, Greenfield, and Gilroy). By handing out brochures, our efforts also prioritize building trust within farmworker communities, in which we emphasize confidentiality and cultural competence to alleviate the fears that would stop them from seeking assistance.

Although our efforts are making a significant contribution and difference, advocacy plays a huge role in systemic change. That is why the stories of farmworkers and their real, lived experiences must be amplified to reach policymakers, nonprofit organizations, and the broader public, and hopefully, some change will occur. These efforts for advocacy should prioritize securing funding for these resource centers, increasing wage protections, and expanding healthcare and housing programs. Creating healthy and trusting collaborations between policymakers, community leaders, and farmworkers will foster long-lasting change. It is not uncommon that immigrant families face significant barriers to accessing pediatric care, this worsens when the family is a farmworker family. By highlighting their disparities and advocating for change, people in power can ensure that vulnerable populations receive the care they deserve and need.

Fundamentally, the systemic inequities that farmworkers face are deeply rooted in the societal structures that are implemented in today's society. These structures prioritize economic profit over human dignity, seen evidently by the many rights they have taken from them. An

intersectional approach is needed that considers health, housing, food security, child care, legal aid, and most importantly, resource access. Examples of what policymakers can do to mitigate disparities faced by farmworkers include eradicating specific barriers such as wage exploitation, discriminatory policies, and inadequate funding for social programs. With change being made, the conversation should center the farmworkers' voices in the discussion. Their voices and input are critically important because too often, decisions about resource allocation and policy design are made without input from the affected communities. Engaging farmworkers as colleagues for remedies ensures that the new solutions implemented are grounded in the reasoning of lived experiences and address the realities of their daily lives. Involving the farmworkers in important decisions builds a sense of trust within the farmworker communities, which encourages and empowers them to advocate for their needs and rights.

Although the challenges faced by farmworkers are vast, they are not unsolvable. The collaborative research conducted by Matt Sparke's Task Force (Remedies: Communications Group) demonstrates the commitment to finding accessible solutions and the importance of advocacy in addressing systemic inequities. From the "Campo-Sano Risk & Resource Map App/Website" to the regional specific brochures distributed to farms, the innovative efforts illustrate the meaningful steps taken toward improving the lives of farmworkers and their families. Moving forward, it is essential to scale-up these efforts and approach the issue from the deep-rooted, systemic cause of inequality/inequity. These systemic changes must advocate for policy change that expands healthcare access, increased wages, and improved living conditions. These are basic rights of life, everyone deserves to receive safe food, housing, and a stable income. There should also be improved and accessible childcare, their education, and adult

education/job training. By improving the educational opportunities in the community, there are higher rates of people in these communities achieving economic stability. While many of these resources are short-term, long-term systemic changes will build a more equitable and sustainable future for the farmworkers in California. Farmworkers are essential to our agriculture and their contributions are too significant to be oblivious to, this means that their well-being is much too important to compromise. As a society that relies on their work, it is our responsibility to ensure that the people that feed us are not left hungry, those that labor our fields are not left without safe homes, and that those who endure hazardous work conditions are not left without care. Prioritizing equity and justice for the farmworkers of California creates a future where they are valued not only for their labor but also for their humanity.

Recursos en Soledad

La Comida



Food Bank for Monterey County (Banco de alimentos para el condado de Monterey.)

La ubicación: 235 Main Street, Soledad, CA

2o Martes de Cada Mes (9:30-10:30 am)

Dorothy's Place (El Lugar de Dorothy)

La Ubicación: 30 Soledad Street, Salinas, CA (todos los días: desayuno (8:30-9:30 am) y almuerzo (1-2 pm)).

ALL-IN Monterey County

La ubicación: Marina High School, 298 Patton Pkwy, Marina, CA 93933

Comida para llevar: todos los miércoles desde las 4:30 hasta que se agoten las existencias. Mercado libre: todos los martes y viernes (6:30-8 pm).

Viviendas



Centro de la Costa Central para la Vida Independiente

La ubicación: 318 Cayuga Street, Suite 208, Salinas, CA 93901
(831) 757-2968

El lugar de Dorothy

La ubicación: 17 East Lake Street, Salinas, CA
(831) 444-1056

Centro de Recursos de Vivienda del Condado de Monterey

La ubicación: 30 Soledad Street, Salinas CA
(831) 424-9186

CHISPA

La ubicación: 295 Main Street, Suite 100, Salinas, CA 93901
831.757.6251

La Salud



Clinica de Salud del Valle de Salinas (CSVS)

La ubicación: 799 Front Street Soledad, CA 93960
831-678-0881
M-F 8-5, Sat:8-12pm

Programa de Mujeres, Bebés y Niños (WIC)

La ubicación: 355 Gabilan Drive, Soledad, CA 93960
888-413-2599

Centro vecinal de Humana en línea

La ubicación: En Línea
HumanaNeighborhoodCenter@humana.com



Created by Erica D'Souza. Resource brochure created for farmworkers living in Soledad. 2024.

La Educación



Soledad Unified School District

La ubicación: 441A Main Street

Soledad, Ca 93960

831-678-3950

(Centro de recursos familiares y escuela de adultos)

CAPSLO

La ubicación: 160 Main Street

Soledad CA 93960

(831) 678-1584

(Cuidado infantil gratuito)



Servicios Legales

California Rural Legal Assistance

La ubicación: 8 Williams Road, Salinas, CA 93905

(servicios legales civiles gratuitos)

(831) 757-5221



LawHelp.CA.GOV

En línea

(Información sobre cuestiones jurídicas)

GENERAL



2-1-1 Monterey County

(Un servicio gratuito y confidencial que ayuda a las personas a encontrar los recursos que necesitan cerca de ellos.)

Llame al número gratuito: 2-1-1

Recursos Comunitarios de la Ciudad de Soledad

Sitio web oficial de la ciudad de Soledad para proporcionar recursos comunitarios



Created by Erica D'Souza. Resource brochure created for farmworkers living in Soledad. 2024.

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| <p>RECURSOS PARA TRABAJADORES AGRÍCOLAS EN GREENFIELD</p> <p>SALUD</p> <p>Clinica de Salud del Valle de Salinas (CSVS) 808 Oak Ave, Greenfield, CA 93927 (831) 674-5344</p> <p><u>Horario Médico:</u> Lunes – Viernes: 8am - 5pm <u>Horario Dental:</u> Lunes – Jueves: 8am - 5pm</p> <p>Greenfield, Salinas, & La Ceyba Dental 608 E. Boronda Rd., Suite B Salinas, CA 93906 (831) 443-3524</p> <p>Lunes – Sábado: 8am - 7pm</p> <p>Albert and Oliveira Clinic 467 El Camino Real Greenfield, CA 93927 (831) 674-0112</p> <p>Lunes – Sábado: 8am - 6:30pm</p>  | <p>VIVIENDAS</p> <p>Tyler Park Townhomes <i>(Lista de Espera Cerrada)</i> 1120 Heidi Drive, Greenfield, CA 93927 (831) 674-8857</p> <p>Villa Santa Clara <i>(Lista de Espera Cerrada)</i> 225 3rd Street, Greenfield, CA 93927 (831) 674-3319</p> <p>Vineyard Green Homes <i>(Lista de Espera Cerrada)</i> 1130 13th Street, Greenfield CA 93927 (831) 674-2736</p> <p>Walnut Place Townhomes <i>(Lista de Espera Cerrada)</i> 500 12th Street, Greenfield, CA 93927 (831) 674-5322</p> <p>Greenfield Commons I <i>(Construcción terminada aproximadamente en 2025)</i> 41206 Walnut Avenue, Greenfield, CA 93927 (626) 240-1520</p> <p>Solicitud de Vivienda En línea</p> | <p>COMIDA</p> <p>Greenfield Memorial Hall Colecta de Alimentos 615 El Camino Real, Greenfield, CA 93927 831-758-1523</p> <p>Cada Cuarto Martes desde 10am - 11am</p>  <p>Celebration Nation 1351 Oak Ave, Greenfield, CA 93927 (833) 447-0226 <i>(Solo se reciben mensajes de texto)</i></p> <p>Cada Primer Sábado desde 10am - 12pm</p> <p>Greenfield Community United Methodist Church Despensa de Alimentos 237 9th St, Greenfield, CA 93927 (831) 674-5708</p> <p>Martes desde 4pm - 5:30pm</p> <p>Asistencia de Cupones para Alimentos En línea</p>  |
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Created by Chance Lengyel. Resource brochure created for farmworkers living in Greenfield.

2024.

EDUCACIÓN

Greenfield Family Resource Center

5400 Monitor Street, Bakersfield, CA 93307
(661) 837-6000

Lunes - Viernes:
7:30am - 4:30pm

Servicios de Educación Migrante

E-mail Erin Ramirez at
erinramirez@greenfield.k12.ca.us
for more information

Greenfield Branch - Bibliotecas Gratuitas del Condado de Monterey

315 El Camino Real
Greenfield, CA 93927
(831) 755-5878
(800) 322-6884 (número gratuito)

Martes 11am - 7pm
Miércoles 11am - 7pm
Jueves 10am - 6pm
Viernes 10am - 5pm
Sábado 10am - 5pm

(Servicios en la acera disponibles durante el horario de atención)

SERVICIOS LEGALES

Servicios de Inmigración

27 South El Camino Real,
Greenfield, CA 93927
(831) 722-2675

Lunes - Viernes: 8am - 5pm

United Farm Workers Foundation

917 H Street, Bakersfield, CA
933004
(661) 324-2500

Lunes - Viernes: 9am - 5pm
(Cerrado de 12:30pm - 1:30pm
para el almuerzo)



GENERAL

Hope in Home

(Apoyo Financiero)

27 South El Camino Real, Greenfield, CA
93927
(831) 393-3110

Lunes - Viernes: 8am - 5pm

Asistencia Financiera para Niños con Enfermedades que Amenazan la Vida

En línea
(305) 756-0068

Lunes - Viernes: 5am - 2pm

Calvans Program

(866) 655-5444
calvans@co.kings.ca.us

Programa de Subvenciones de Alivio para Trabajadores Agrícolas y Alimentarios

En línea

Para ver todos estos recursos en línea:



<https://farmworkerhealth-app.ucsc.edu/>



Created by Chance Lengyel. Resource brochure created for farmworkers living in Greenfield.

2024.

Recursos en Gilroy, CA



TRANSPORTE

Access Healthline by Access Reproductive Justice

**Aceso a la línea de salud por
Aceso a la justicia reproductiva**
800-376-4646

El Enlace

Domingo: Cerrado
Lunes: 10:00 AM - 4:00 PM PDT
Martes: 10:00 AM - 4:00 PM PDT
Miércoles: 10:00 AM - 4:00 PM PDT
Jueves: 10:00 AM - 4:00 PM PDT
Viernes: Cerrado
Sabado: Cerrado

SALUD



Food Pantry by Children and the Country Life(CCL)

**Despensa de alimentos por los
niños y la vida en el campo**
help@childrenandthecountrylife.org

El Enlace

Jueves: 10-12 AM
2579 Bridle Path Drive, Gilroy, CA 95020

California Lifeline Program

**Programa La Cuerda Salvavidas
California**
800-430-0443

El Enlace

Domingo: 10:00 AM - 6:00 PM PDT
Lunes: 10:00 AM - 7:00 PM PDT
Martes: 10:00 AM - 7:00 PM PDT
Miércoles: 10:00 AM - 7:00 PM PDT
Jueves: 10:00 AM - 7:00 PM PDT
Viernes: 10:00 AM - 7:00 PM PDT
Sabado: 10:00 AM - 7:00 PM PDT

COMIDA



Food and Nutrition by St. Joseph Family Center

**Centro de Alimentos y
Nutrición por el Centro
Familiar St. Joseph**
408-842-6662

El Enlace

Martes & Jueves: 8-2:30
7950 Church Street, Gilroy, CA 95020

ASISTENCIA GENERAL

El Enlace
to findhelp.org



Created by Alana Hansen. Resource brochure created for farmworkers living in Gilroy. 2024.

VIVIENDAS

The Salvation Army Community Center

**El Centro Comunitario de
Ejército de Salvación
408-848-5373**

El Enlace

Horas de trabajo: 8:00 AM - 4:30 PM,
Lunes - Viernes

El almacén de distribución de alimentos:
2:00 PM - 3:00 PM, Miércoles
9:00 AM - 11:30 AM, Viernes

Distribución de alimentos frescos: 10:30
AM - 12:30 PM, Jueves
1:30 PM - 2:30 PM, Jueves

Horas de comida caliente: 12:00 PM -
12:30 PM, Lunes - Viernes

Lavandería y ducha: 8:30 AM - 11:30
AM, Lunes

8:30 AM - 11:30 AM, Miércoles
200 5th Street, Gilroy, CA 95020

Nueva Vida Community

Comunidad de Nueva Vida
jorge@nuevavidacommunity.org
669-500-2427

El Enlace

Gilroy, CA



Emergency Utility Assistance

**Asistencia para servicios de
emergencia
408-842-6662**

El Enlace

Domingo: Cerrado

Lunes: 10:00 AM - 4:00 PM PDT
Martes 10:00 AM - 4:00 PM PDT
Miércoles: 10:00 AM - 4:00 PM PDT
Jueves: 10:00 AM - 4:00 PM PDT
Viernes: 9:00 AM - 4:00 PM PDT

Sábado: Cerrado

200 5th Street, Gilroy, CA 95020

Emergency Rental Assistance

**Asistencia de alquiler de
emergencia
408-842-6662**

El Enlace

Domingo: Cerrado

Lunes: 10:00 AM - 4:00 PM PDT
Martes 10:00 AM - 4:00 PM PDT
Miércoles: 10:00 AM - 4:00 PM PDT
Jueves: 10:00 AM - 4:00 PM PDT
Viernes: 9:00 AM - 4:00 PM PDT

Sábado: Cerrado

7950 Church Street Suite A Gilroy, CA 95020

CUIDADOS DE MADRES Y NIÑOS

Access Healthline by Access Reproductive Justice

**Acceso a la línea de salud por
Acceso a la justicia reproductiva
800-376-4646**

El Enlace

Domingo: Cerrado

Lunes: 10:00 AM - 4:00 PM PDT
Martes 10:00 AM - 4:00 PM PDT
Miércoles: 10:00 AM - 4:00 PM PDT
Jueves: 10:00 AM - 4:00 PM PDT

Viernes: Cerrado

Sábado: Cerrado

Community Solutions: La Isla Pacifica Shelter for Victims
of Domestic Violence and Their Children

**La Isla Pacifica albergue para víctimas
de violencia doméstica y sus hijos
408-779-2113**

877-363-7238(emergencia)

El Enlace

Lunes - Jueves 8:30 AM - 4:30 PM PDT

7351 Rosanna St. Gilroy, CA 95020



Created by Alana Hansen. Resource brochure created for farmworkers living in Gilroy. 2024.

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| <p style="text-align: center;">Recursos para Trabajadores Agrícolas en Salinas</p>  <p style="text-align: center;">COMIDA</p> <p>La Cocina de Dorothy:</p> <ul style="list-style-type: none"> • 30 Soledad St. Salinas, CA 93902 • (831) 757-3838 • Todos los días: Desayuno: 8:30 am - 9:30 am y almuerzo: 1:00 pm - 2:00 pm • Sirven desayuno y almuerzo. <p>Misión de Victoria:</p> <ul style="list-style-type: none"> • 43 Soledad St, Salinas, CA 93901 • (831) 424-5688 • Todos los días: 9:30am-1pm y luego 2-5pm • Distribución de bolsas de comida. <p>Banco de Alimentos en el Condado de Monterey</p> <ul style="list-style-type: none"> • Para más ubicaciones, consulta el mapa en su sitio web para ver los lugares de distribución de alimentos. • O visita su página de Facebook para ver el horario: https://www.facebook.com/TheFoodBankforMontereyCounty/ • (831) 758-1523 | <p style="text-align: center;">SALUD</p>   <p>Clinica de Salud del Valle de Salinas de Plaza:</p> <ul style="list-style-type: none"> • 55 Plaza Circle, Suite C, Salinas CA 93901 • Lunes a viernes: 8am-5pm • (831) 500-6960 • Ofrecen servicio dental y médico! <p>Clinica de Salud del Valle de Salinas de Alvin:</p> <ul style="list-style-type: none"> • 620 E. Alvin Dr. Suite G, Salinas, CA 93906 • Lunes a sábado: 8am-5pm • (831) 444-9722 • Ofrecen servicio dental! <p>Clinica de Salud del Valle de Salinas de Main:</p> <ul style="list-style-type: none"> • 2180 N. Main St., Salinas, CA 93906 • Lunes a viernes: 8am-5pm • (831) 443-2190 • Ofrecen servicio dental y médico! <p>Clinica de Salud del Valle de Salinas de Sanborn:</p> <ul style="list-style-type: none"> • 219 North Sanborn Rd. Salinas, CA 93905 • Lunes a viernes: 7:30am-5pm • (831) 757-1365 • Ofrecen servicio médico! <p>Clinica de Salud del Valle de Salinas de Circle:</p> <ul style="list-style-type: none"> • 950 Circle Dr., Salinas, CA 93905 • Lunes a viernes: 8am-5pm • Número para servicios medicos: (831) 757-6237 • Número para servicios de optometría: (831) 757-1264 • Ofrecen servicio médico y optometrías! <p>Salud de Diabetes y Endocrinología:</p> <ul style="list-style-type: none"> • 355 Abbott Street Salinas, CA 93901 • Mon-Fri: 7:45am-5pm • (831) 422-3636 • Clínica de control de la diabetes, centro de tratamiento e investigación. Proveen exámenes de detección de diabetes y bombas de insulina. | <p style="text-align: center;">VIVIENDAS</p>  <p>Apartamentos de Loma El Paraiso:</p> <ul style="list-style-type: none"> • 541 Roosevelt Street Salinas, CA 93905 • (831) 796-0140 • Para calificar para los apartamentos de alquiler bajo, al menos un miembro del hogar debe trabajar como trabajador agrícola. <p>Jardines De Boronda:</p> <ul style="list-style-type: none"> • 15087 Canario Street Salinas, CA 93907 • (831) 724-9640 • Apartamentos asequibles para personas de bajos ingresos. <p>El Lugar de Dorothy:</p> <ul style="list-style-type: none"> • 30 Soledad Street Salinas, CA 93902 • Lunes-Viernes: 9am-3pm • (831) 757-3838 • Ofrece necesidades básicas, como comidas, duchas, higiene, ropa nueva o usada en buen estado, lavandería, un lugar para recibir correo y una clínica de salud abierta los miércoles. <p style="text-align: center;">Código QR a un mapa de recursos</p>   |
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EDUCACIÓN



Asociación de Agricultura y Formación Basada en Tierra:

- 1700 Old Stage Rd, Salinas, CA 93908
- (831) 758-1469
- Lunes-Viernes: 9am-5pm
- Cada año, se eligen y capacitan a 75 trabajadores agrícolas para iniciar sus propias granjas.

Buena Vista - Centro de apoyo a la biblioteca del condado de Monterey:

- 18250 Tara Dr. Salinas, CA 93908
- (831) 796-6060
- Martes-Jueves: 10am-6pm; Viernes-Sábado: 10am-5pm
- Ofrecen acceso gratuito a computadoras y wifi, recursos impresos y en línea, y útiles escolares limitados.

Montage Health: Educación Sobre Diabetes y Nutrición

- 1910 North Davis Road Salinas, CA 93907
- (831) 649-7220
- Lunes-Viernes: 8am-5pm
- Proveen educación sobre diabetes, control de peso. Ofrece monitoreo de glucosa en sangre y administración de medicamentos.

SERVICIOS LEGALES

Oficinas Legales Sigal:

- 1187 N Main St, Ste 105 Salinas, CA 93906
- (831) 757-3001
- Lunes-Viernes: 9am-6pm
- Una firma de abogados con licencia que atiende a inmigrantes indocumentados que desean ajustar su estatus o residentes quienes quieren hacerse ciudadanos.

Caridades Católicas Diócesis de Monterey:

- 1705 Second Ave, Salinas, CA 93905
- (831) 422-0602
- Lunes-Viernes: 9am-5pm
- Ofrecen asistencia para aquellos que buscan el estatus de residencia permanente legal y aquellos que desean convertirse en ciudadanos.

Asistencia Legal Rural de California:

- 3 Williams Road, Salinas, CA 93905
- (831) 757-5221
- Lunes-Viernes: 9am-5pm
- Proporciona asistencia jurídica general pro bono y prácticas especializadas como los derechos de los inquilinos, ayuda en casos de discriminación laboral, y los derechos de asistencia social para programas de beneficios públicos.



GENERAL



Asistencia Para la Solicitud de Seguro Médico Medi-cal:

- 1000 S Main St, Salinas, CA 93901
- (831) 755-4448
- Ofrecen asistencia con las aplicaciones de Medi-Cal.

Distrito Escolar Primario de la Ciudad de Salinas - Centro de Recursos Familiares:

- Cada centro ofrece ayuda con necesidades esenciales como comida, mochilas, útiles escolares, y más.
- La Escuela Primaria de Sherwood:
 - 110 S. Wood St., Salinas, CA 93905
 - (831) 540-8420
 - Lunes-Martes: 10am-6:30pm;
 - Miércoles-Viernes: 8am-4:30pm
- La Escuela Primaria de Kammann:
 - 521 Rochex Ave, Salinas, CA 93906
 - (831) 784-2289; (831) 784-2292
 - Lunes-Martes: 10am-6:30pm;
 - Miércoles-Viernes: 8am-4:30pm
- La Escuela Primaria de Loma Vista:
 - 757 Sausal Dr., Salinas, CA 93906
 - (831) 753-5670
 - Lunes-Viernes 9am-4pm
- La Escuela Primaria del Parque Universitario:
 - 833 West Acacia St. Salinas, CA 93901
 - (831) 753-5655
 - Lunes-Viernes: 8:30am-2:30pm



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Recursos para Trabajadores Agrícolas en Watsonville

Salud

Community Health Trust of Pajaro Valley (831) 726 - 4257

El Centro de Salud para la Diabetes brinda educación y apoyo a personas con diabetes, prediabetes y otras condiciones de salud.

- 85 Nielson Street, Suite 201 Watsonville CA 95076
- De lunes a viernes de 8:30 am - 5:00 pm

General

La Manzana Community Resources (831) 724 - 2997

Proporciona a la comunidad de Pajaro Valley acceso a recursos como defensa comunitaria, asesoramiento navegación sobre viviendas, preparación para emergencias, educación para padres, asistencia para la inscripción en beneficios públicos, almuerzos de verano y defensa contra el desalojo.

- 521 Main Street, Suite Y, Watsonville CA 95076
- De lunes a viernes de 9:00 am - 12:00 pm y 1:00 pm - 4:30 pm

Ventures (831) 200 - 1719

Proporciona programas que garantizan que las personas comprendan cómo utilizar su poder económico y político, desde generar sus ahorros hasta abogar por salarios dignos.

Comida

Salud Para la Gente (831)728 - 0222

Proporciona distribución semanal de alimentos en diferentes lugares en Watsonville

- 204 East Beach Street Watsonville, CA 95076
 - Cada viernes de 9 am - 12 pm
- 45 Nielson Street, Watsonville, CA 95076
 - Cada tercer martes de 9 am - 11 am

Second Harvest: Food Bank Santa Cruz County (831) 662 - 0991

En Second Harvest Food Bank, su misión es inspirar y apoyar al condado de Santa Cruz para proporcionar alimento a todos los miembros de la comunidad

Buena Vista Children Center

- 113 Tierra Alta Drive, Watsonville, CA 95019
- Cada primer miércoles de 6 pm - 7 pm

Cabrillo College Watsonville

- 310 Union Street, Watsonville, CA 95019
- Cada primer y tercer miércoles de 3 pm - 4 pm

Calabasas Elementary

- 202 Calabasas Road, Watsonville, CA 95019
- Cada primer y tercer martes de 4 pm - 5 pm

Casa Del Alfarero

- 113 East Front Street, Watsonville, CA 95019
- Cada primer y tercer miércoles de 3 pm - 4 pm

Pajaro Valley Loaves and Fishes

(831) 722- 4144

Sirve almuerzos calientes y nutritivo todos los lunes y viernes.

- 150 2nd Street, Watsonville, CA 95076
- El almuerzo es todos los días de la semana de 12 pm - 1 pm
- Despensa es todos los días de la semana de 9 am - 11:30 am y de 1 pm - 3 pm

Viviendas

Community Action Board of Santa Cruz County, Inc.

Youth Homeless Response(831) 227 -8733

Los servicios de YHRT incluyen asistencia para la búsqueda de vivienda, plan individualizado y administración de casos, y conexión a recursos y servicios.

- 406 Main Street, Suite 207, Watsonville CA 95076

Rental Assistance Program (RAP)

(831) 457 - 1741

El programa de asistencia para el alquiler atiende a residentes de bajos ingresos, familias con niños de 0 -17 años, discapacitados (temporal o permanentemente) y/o personas de 60 años o más.

- 406 Main Street, Suite 207, Watsonville CA 95076

Transitional Age Youth Housing Navigation

(831) 227 - 1326

Provee servicios a adultos jóvenes de 18 a 25 años que se encuentran en hogares de crianza y ayudar a completar los vales FUP (Programa de Unificación Familiar). EL objetivo es ayudar a los clientes a superar las barreras para conseguir y mantener una vivienda,

- 406 Main Street, Suite 207, Watsonville CA 95076



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2024.

Educación

Semillitas (831) 200 - 1719

Semillitas invierte en el futuro educativo de los niños del condado de Santa Cruz creando una cuenta de ahorro universitaria automática y realizando un depósito inicial al momento de nacimiento de hasta \$50 para todos los recién nacidos de Santa Cruz.

ALCANCE (831) 322 - 9041

La misión de ALCANCE es brindar oportunidades económicas y servicios de tutoría a jóvenes y adultos de escasos recursos, prometedores o de reingreso. Algunos de los servicios incluyen:

- Evaluación de necesidades básicas y bienestar
- Talleres de preparación laboral y apoyo personalizado
- Habilidades para la vida

De lunes a viernes de 3:00 pm - 7:00 pm



Servicios Legales

WLC: Watsonville Law Center (831) 722 - 2845

El Watsonville Law Center brinda servicios legales gratuitos a personas de bajos ingresos en la costa central de California. Nos centramos en problemas legales con impactos y soluciones a largo plazo, como los derechos de los trabajadores, los derechos de los consumidores y el acceso al empleo.

- 315 Main Street, Suite 207, Watsonville, CA 95076

Santa Cruz County Immigration Project (831) 724 - 5667

La misión de TSCCIP es promover el bienestar de la comunidad de inmigrantes en el condado de Santa Cruz y el Valle de Pajaro. Proporcionan servicios legales competentes y profesionales, defensa y educación e información comunitaria.

- 406 Main Street, Suite 218, Watsonville CA 95076
- De lunes a viernes de 9:00 am - 5:00 pm



¡Enlace al Sitio Web del Mapa de Recursos!



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2024.

Recursos para Trabajadores Agrícolas en Huron

EDUCACIÓN

Desarrollo Humano de California

- En Línea
- (707) 523-1155

Proteus, Inc

- 2841 N. Tulare Street, Suite 102, Fresno, CA 93703
- (559) 473-4486

Escuela de Adultos de Fresno

- 2500 Stanislaus Street, Fresno, CA 93721
- (559) 457-6000

Fundación de Educación y Liderazgo

- 1308 E Olive Avenue, Fresno, CA 93728
- (559) 291-5428

Instituto de Educación y Desarrollo de Liderazgo para Trabajadores Agrícolas

- En Línea
- (661) 822-4381
- El Correo Electrónico: mail@fieldinstitute.org

VIVIENDAS

Centro de Transición Santuario

- 1046 T Street, Fresno, CA 93721
- (559) 931-1444
- Diario 7:00 PM - 10:00 PM

Misión de Fresno

- 2025 E Dakota Ave, 4th Floor, Fresno, CA 93726
- (559) 268-0839

La Casa de Noemí

- 421 F Street, Fresno, CA 93706
- (559) 498-6988
- Lunes - Viernes, 8:00 AM - 5:00 PM

Condado de Fresno - Servicios Sociales - Programas de Asistencia

- 3500 Never Forget Lane, Clovis, CA 93612
- (559) 600-5956
- Lunes - Viernes, 7:30 AM - 3:30 PM

Vales de Vivienda de Emergencia

- 1331 Fulton Street, Fresno, CA 93721
- (559) 443-8400

Fresnohousing - Instagram

- En Línea
- (559) 443-8400
- El Correo Electrónico: info@fresnohousing.org

COMIDA

Red de Servicios de Preservación Familiar de Westside

- 16856 Fourth Street, Huron, CA 93234
- (559) 945-1022
- Miércoles, 8:00 AM - 2:00 PM

Despensa Bulldog

- 2311 E. Shaw, Fresno, CA 93710
- (559) 224-9052

El Almacén de Distribución de Alimentos

- 4710 North Polk Avenue, Fresno, CA 93722
- (559) 578-8991
- Miércoles, 8:00 AM - 5:00 PM

Distribución de Alimentos en Fresno

- 4498 North Cornelia Avenue, Fresno, CA 93722
- (559) 978-5469
- Viernes, 1:00 PM - 2:00 PM

Cristiano Reformado de Fresno

- 1639 West Shields Avenue, Fresno, CA 93791
- Viernes, 8:00 AM - 10:30 AM

La Iglesia Luterana de Nuestro Salvador

- 2101 North Fruit Avenue, Fresno, CA 93705
- (559) 237-7597
- El Viernes pasado de cada mes, 2:00 PM - 4:00 PM

La Gran Despensa Roja en la Primera Iglesia Congregacional

- 2131 N Van Ness Ave, Fresno, CA 93704
- (559) 227-8489
- Lunes y Miércoles, 9:30 AM - 3:00 PM
- Viernes, 9:30 AM - 12:30 PM



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SALUD



Centros de Salud Unidos del Valle de San Joaquín - Centro de Salud Huron

- 17008 13th Street, Huron, CA 93234
- (800) 492-4227

Huron Family Health Center

- 16928 11th St., Huron, CA 93234
- (559) 945-2541
- Lunes, 11:00 AM - 8:00 PM
- Martes - Viernes, 8:30 AM - 5:30 PM

Centro para Personas Mayores de Huron

- 16900 5th Street, Huron, CA 93234
- (559) 945-1022

Departamento de Salud Pública del Condado de Fresno

- 1221 Fulton Street, Fresno, CA 93721
- (559) 600-3200

Departamento de Salud Mental del Condado de Fresno

- 4441 E. Kings Canyon Road, Fresno, CA 93702
- (559) 600-9180

Condado de Fresno - Servicios Sociales - Programas de Asistencia

- 3500 Never Forget Lane, Clovis, CA 93612
- (559) 600-5956
- Lunes - Viernes, 7:30 AM - 3:30 PM

Condado de Fresno - Servicios Sociales - Bienestar Infantil

- 380 W. Ashlan Avenue, Clovis, CA 93612
- (559) 600-5956

SERVICIOS LEGALES

Asistencia legal rural de California

- 3747 E. Shields Avenue, Fresno, CA 93726
- (559) 441-8721

Fundación de Trabajadores Agrícolas Unidos

- 732 North Van Ness Avenue, Fresno, CA 93728
- (559) 496-0700
- Lunes - Viernes, 9:00 AM - 5:00 PM (Cerrado 12:30 PM - 1:30 PM)

Centro La Familia Advocacy Services

- 302 Fresno Street, Fresno, CA 93706
- (559) 237-2961
- Sabado, 9:00 AM - 1:00 PM

Centro de Autoayuda del Condado de Fresno

- 1130 O Street, First Floor, Fresno, CA 93721
- (559) 457-2143
- Lunes - Viernes, 8:00 AM - 4:00 PM por correo electrónico/teléfono o cita previa en persona
- Martes - Miércoles, 9:00 AM - 12:00 PM entrar



GENERAL



Fundación de Trabajadores Agrícolas de California - Centro de Recursos Familiares Huron

- Recursos y educación familiar
- 16673 W Palmer Avenue, Huron, CA 93234
- (661) 778-0015

Comisión de Oportunidades Económicas de Fresno

- Servicios de asistencia comunitaria
- 1920 Mariposa Street, Suite 300, Fresno, CA 93721
- (559) 263-1000

Red de Servicios de Preservación Familiar de Westside

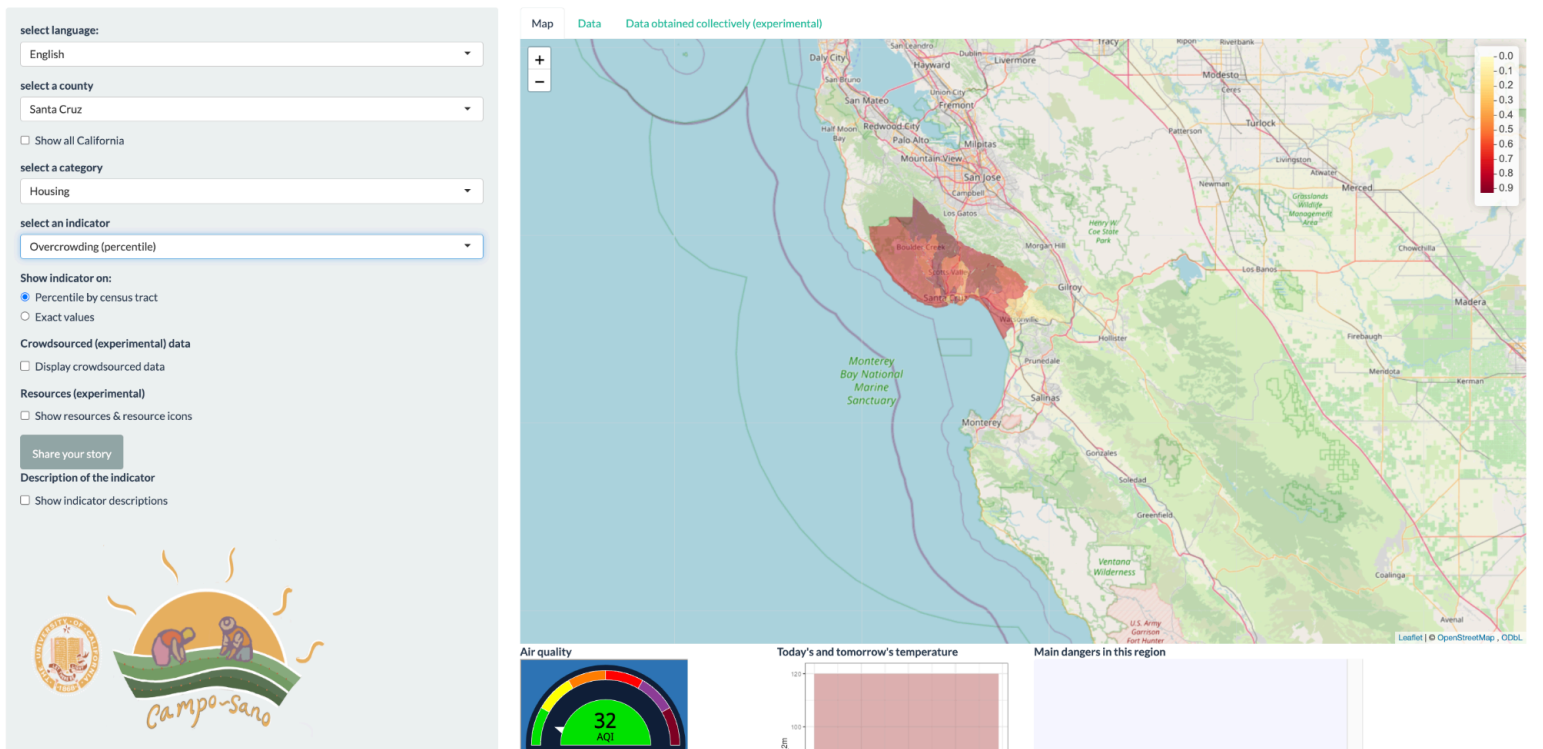
- Apoyo familiar
- 16856 Fourth Street, Huron, CA 93234
- (559) 945-1022
- Lunes - Viernes, 8:00 AM - 5:00 PM (Cerrado 12:00 - 1:00 PM)

Green Raiteros

- El transporte
- 17010 Apple Ave, Huron, CA 93234
- 1-844-851.7433

Código QR a un mapa de recursos





Campo-Sano Resource & Risk Map App/Website.

<https://farmworkerhealth-app.ucsc.edu/>



Chapter 3: Stories

Daneidy Mazariegos, MaryJane Gomez, Kiana Miller, Jana Schmitdt, & Julia “Joy” Mellin

Introduction to Stories

Farmworkers are a vulnerable community who have been repeatedly exploited by large farming corporations for years. Due to the large population of farmworkers being undocumented immigrants (most of whom can't even speak english), it is difficult for them to speak out against the many abuses and health obstacles they might face for fear of being deported or losing the jobs they depend on for survival. This is especially the case as climate change worsens the environmental conditions they must deal with in the fields. There are some organizations in place to help farmworker communities manage these hurdles by providing them resources for food, housing and health, however farmworker voices often go lost. So in this section of the task forge project we aimed to reemerge empower farmworker stories as a form of empowerment and analyze common trends for future application in community work and research going forward.

Promotoras and Their Influence on Farmworkers

Barriers Faced by Farmworkers

In the agriculture sector of the United States, farmworkers face significant barriers when trying to understand their rights. This is often caused by systemic inequalities, corporate greed, and social factors such as their documentation status and their fear of losing their job. The lack of knowledge within the farmworkers' community can lead many vulnerable workers toward being exploited in unsafe working conditions and experiencing health risks. Farmworkers, especially undocumented ones, live in constant fear of losing their jobs or being exposed to Immigration

and Customs Enforcement otherwise known as ICE due to their documentation status. This can discourage many from speaking up against unsafe working conditions, wage theft, or other rights violations.

The agricultural industry, since being driven by greed and maximizing their profits, has led to the increase of issues in farm worker's health due to exposure to toxic pesticides, poor housing conditions, and exposure to extreme heat. Many farmworkers may not be fully aware of the risks that come from their jobs, especially since many corporations do not provide adequate training or access to health information that may help them take preventative measures against these slow violence risks.

In many cases, farmworkers have limited access to health care. Especially given the lack of health insurance and the language barriers caused by the majority of workers who predominantly speak Spanish and Indigenous languages such as Mixteco. The lack of medical interference and misinformation that many farmworkers encounter are major contributors to major health risks and chronic health conditions. This is why it is important to have many promotoras available. With the help of promotoras, more can be done to take preventative measures that protect farmworkers.

How do Promotoras Help Their Communities

Promotoras within the farm working industry are community-based health advocates and educators who are often Latina or Indigenous women. These promotoras help bridge the gap between agricultural communities and information regarding health, social and environmental services. Their work plays a crucial role in ensuring that as many farmworkers as possible are educated about these topics and their potential impact on their communities' health.

Many promotoras help advocate for health promotion and the prevention of illnesses by educating as many workers as possible. “Promotoras working with migrant or seasonal farmworkers often... educat[e] about environmental health hazards. They address topics such as lead poisoning prevention, water quality, hazardous waste, and pesticide safety.” (RHIHUB) By educating the public about these topics, agricultural workers can learn more about the potential health risks associated with long-term exposure to particular working conditions. Promotoras are also able to provide training on how to safely handle chemicals and practice hygiene skills to reduce exposure to substances with detrimental long-term effects.

Through education and advocating for farm worker’s health, promotoras contribute to the overall health improvements of their communities. With the information they provide, it is evident that there has been a reduction of injuries, diseases, and more awareness toward mental health. Having promotoras available also contributes to the strengthening and empowering of communities. Organizing events and meetings amongst farmworkers has helped build a stronger sense of community and solidarity. It also encourages farm working communities to advocate for their rights and better working conditions.

Fear Amongst Farmworkers When it Comes to Resources

For many undocumented workers, even when new resources become available, there is often fear when accessing these resources. This fear mainly stems from the risk of their immigration status being exposed, which could lead to unemployment, potential deportation, and family separation. An example of this involves when Medi-cal became available to many undocumented workers. “Promotoras play essential role in connecting farmworkers with health care in rural NorCal” by Peter Schurmann, discusses how many farmworkers were too afraid to

apply to Medi-cal due to the previous Public Charge Rule under Donald Trump’s administration, which threatened to deport any immigrant who accessed public benefits (Schurmann, 2024). This heavily discouraged many from applying for healthcare benefits that were now available to them. This is why it is important to have promotoras available, especially in rural communities where there aren’t any major resources available that actively seek proactive solutions for farmworkers. Promotoras are an essential resource that often learn about certain topics and then go out into their communities to educate those who do not have access to this information. With adequate information, promotoras were able to encourage farmworkers to apply to Medi-cal. This is significant because many farmworkers often experience health issues that can not be addressed immediately due to a lack of health insurance and the high cost of out-of-pocket payments. This is especially important since “coverage rates were higher for documented workers (43.0% in 2011-2012 and 77.7% in 2017-2018) than for undocumented workers (26% in 2011-2012 and 46.8% in 2017-2018)” (Sandhu). This goes to show that before Medi-cal was introduced to farmworkers, less than 50% of undocumented farmworkers had any health insurance. Without insurance, the majority of undocumented farmworkers were unable to take preventative care to help avoid major health concerns because the resources were not available. With the encouragement and uplifting from promotoras, many of these undocumented workers could now be made aware of these resources that they may qualify for. Promotoras can also provide reassurance, emphasizing that seeking human rights like health care does not put them at risk.

How Do Promotoras Get Trained and What Do They Learn

We were able to partner up with the Center for Community Advocacy, an organization based in Watsonville, California to take a deeper dive into what the promotoras within their

organization were learning about. As we learned more about their processes, we discovered that this group of promotoras would meet weekly on Wednesdays to learn about various topics. These include pesticide and heat exposure, poor air and water quality, the effects of climate change on food, mental health, household mold and how to educate farmers workers about their workplace rights.

Heat exposure

In this section, many promotoras learned how California's Central Valley and Imperial Valley are at higher risk in comparison to other places regarding heat waves. This is also where the majority of agricultural work takes place, exposing many farmworkers to extreme heat conditions. Many dangers from extreme heat exposure can be silent and so slow that it may appear invisible to many. It is a gradual risk factor that can ultimately lead to death if not prevented. Excessive heat has many potential effects on the body such as reducing the heart from distributing blood throughout the body, increasing heart palpitations as well as creating a loss of liquid throughout the body. Other symptoms you may be aware of as well include being pale, cramps, feeling tired, having headaches or feeling dizziness, and nausea. Unfortunately, this is also something that could altogether be prevented amongst farmworkers if adequate conditions were provided and precautions were taken to keep agricultural workers safe. During this presentation, promotoras were also taught preventative measures that they could take to prevent heat fatigue. Some of the solutions offered included drinking plenty of water as much, even when not thirsty, resting in the shade, wearing hats and light-colored clothes, and checking in with other farmworkers to make sure everything is okay. This gives many workers the knowledge of what they should be doing to prevent extreme measures as well as reminding many of the

importance of taking breaks to drink water or be under the shade. If they are experiencing heat exhaustion, the first priority should be to cool down the body.

Poor air quality

During the informational session surrounding poor air quality, promotoras learned about the different contaminants that are in our air. Some of the pollutants include chemicals, pesticides, dust, and smoke. The contamination can impact the health of farmworkers' lungs. Dust and smoke can cause inflammation and irritation within the lungs that may have long-term effects leading to chronic illnesses such as high blood pressure, asthma, lung cancer, and irritations within the skin and eyes. Not only has climate change amplified these health concerns, it has also caused an increase of forest fires which have affected many people in California. Oftentimes, farmworkers are forced to work under smoky conditions caused by these fires without the proper protection (Simon). Within this training, promotoras learned that the best way to prevent harm to your lungs includes wearing protective gear such as N95 masks, wearing the proper eyewear, using eye drops as well as wearing long clothing to prevent the skin from coming into contact with harmful chemicals. Overall, the promotoras gained multiple pieces of advice on how to help people reduce their contact with harmful chemicals that are present in the air. Although these tips may seem small, in the long run, they can help many prevent illnesses.

How food and water are effected

Climate change has led to an increase of contamination of water, often caused by heavy rains and the flooding that follows. Through this contaminated water it is easier to catch diseases like Giardia and Cryptosporidiosis. This is also why you should always be aware of the water you are drinking and the diseases such as E. Coli, listeria, and salmonella, that may be spread

through produce. With the rising number of floods, it is also important to be aware of mold and how to properly get rid of it without putting your health at risk. Some precautions that promotoras were encouraged to teach farmworkers included washing their hands frequently, checking for signs of cross-contamination, cooking produce at the correct temperature, and keeping necessary items refrigerated.

Mental health

Mental health was also an important subject discussed during promotora training. Mental health has become a growing concern among many farmworkers, especially since many workers are working in harsh conditions and experiencing high levels of fear. These fears can range from devastating events caused by climate change (ex. forest fires), to fear of losing their jobs or being deported. Many farmworkers experience high levels of stress that can lead to major mental health conditions such as experiencing anxiety, depression, PTSD, or domestic violence. For many workers, there can be a stigma surrounding talking about mental health even though these are negative effects that come along with this. Promotoras are such an essential tool in this regard because they can help address why mental health should be validated. This helps destigmatize mental health among the many Latino farmworkers.

Farmworker's rights

Promotoras also play an essential role in teaching farmworkers about their rights and advocating for them if they are being exploited. They ensure that workers are aware of their rights, such as the ability to take breaks as needed, drink water, and use the bathroom. They also explain that although they may be undocumented, there are still laws that apply to them. There

are multiple laws for when there are heat waves, sanitary laws, laws that protect the quality of air as well as laws against pesticides. This is all legal information that many farmworkers may be unaware of. Promotoras can help educate farmworkers more about their rights so that they don't fall victim to major corporations.

After learning about all of these topics, many of these promotoras are now trained enough to relay this information to other promotoras who are recently getting involved in the program. This causes a chain reaction where there are enough promotoras to train future promotoras as well as the farmworkers within their communities. With this information, it becomes easier for farmworkers to identify when they are being taken advantage of in the workplace. It also helps many learn about preventative measures they can take in order to sustain their health. Many promotoras are also farmworkers within these communities. This helps them understand the struggle that many farmworkers face and why it is essential that they receive this information.

Abril's Beginning as a Promotora:

In an interview with a promotora we were able to learn more about the experience of a promotora. For this interview and to keep the privacy of our promotora we will refer to her as Abril. Abril began her journey as a promotora after the COVID-19 pandemic. During this time there was a lot of uncertainty around the COVID-19 vaccines and what they consisted of. Especially because of the misinformation that spread during this time that caused many to be afraid. During this time she was recommended by her supervisor to become a promotora within an organization called Lideres Campesinas which has multiple chapters throughout California. Previous to this Abril had worked in the fields for twenty years. She was motivated to join due to the struggles she encountered within her community. Especially, since many members of the

farm-working community do not ask for help because they are too afraid to do so. Additionally, there is a disconnect between the information the farmworkers need to take care of themselves and what they actually receive. Now she is a promotora with the Center for Community Advocacy (CCA), where she participates in multiple training sessions each week to complete her promotora program and better serve her community.

Promotora with CCA

As a promotora with CCA, she has learned how to help farmworkers who have diabetes about how they can access healthier food alternatives as well as addressing climate change, pesticide use, and their effects on the body. They receive the information through huddles and presentations held by professionals once a week, educating them on precautionary measures they could take. With this information, this group of promotoras will help educate and train other promotoras as well as farmworkers.

As a promotora, Abril describes that the most gratifying part is being able to truly help her community and in return receive a thank you and blessings from her community. She believes that her job is truly impactful since oftentimes many people who are being taken advantage of do not know how to report it. This is why it is important that the majority of promotoras within the program are farmworkers since they have first-hand experience in the fields as well as being well-known within their community. These people are what help build a bridge from the information to the farmworkers.

First-hand experiences affected workers in her community

As a farm worker herself, Abril has seen how climate change has already impacted her community and how her job as a promotora is essential to her community. She has noticed how

agricultural companies do little to help the laborers who work under them. Earlier this year during the major heat waves in California, little was done to prevent farmworkers from working under these conditions especially since many companies have a set schedule of when things need to be completed. Stopping one or multiple farmworkers can prevent companies from having deadlines met. During one of these heat waves, a farm worker began to feel fatigued by a heat stroke. Thanks to her experience as a promotora, Abril was able to identify the symptoms that the worker was experiencing so that she could seek the necessary help and precautions. She was also able to contact an ambulance and ensure that the woman received the appropriate help, especially given that she was an older woman with diabetes. This is why it's important to know when and how to take action and educate as many farmworkers as possible.

Unfortunately, many of the outreach events they hold for community members are often not mandatory making it more difficult to reach as many people as possible. She and other promotoras usually ask companies to let them create an outreach event that informs farmworkers about how to take preventative measures to stay healthy as well as getting to know more about their rights. Abril also mentioned that she and many other promotoras face difficulties getting approval from companies to come and give presentations. Often, these companies are reluctant to allow promotoras to speak about the conditions that workers are facing, as they want to avoid taking responsibility for those issues. Additionally, there is a linguistic barrier as well as a cultural barrier within Latino Spanish-speaking farmworkers and agricultural companies. This is intensified more within Indigenous farm working communities that only speak native languages. Usually, they get translations through a double translation of a promotora explaining the information to a Spanish and Mixteco translator who then can translate to the farm worker's native language.

Abril ended the interview with the following English translation: “They don't care, many times it's because of necessity. Many times people do not talk about what happens to them even though they continue to be mistreated or abused. They don't speak out of fear because their rent is very expensive and what they want is to work to be able to survive in this country. Because in this country it is very expensive, especially in this state. And people get frustrated, they prefer what they are told and what is done to them. They prefer to work to continue paying their debts to be able to support their families and their children.” This is why many farmworkers are afraid to reach out for help. They are just simply trying to survive in this country.

Farmworker Health Disparities in California: A Comparative Analysis of the Central Valley and Central Coast

Introduction

The Central Valley and the Central Coast are two key agricultural hubs that play a crucial role in California's agricultural economy. This study explores the health disparities among farmworkers in California's Central Valley and Central Coast, emphasizing the role of environmental, socioeconomic, and healthcare factors. Limited access to healthcare and exposure to environmental hazards are prevalent among farmworkers, yet the regional variations in these challenges remain underexplored. Through the analysis of farmworker narratives and regional data, the findings are based on a survey conducted in Spanish and supplemented with phone interviews, ensuring that the perspectives of these essential workers are accurately captured. This study highlights the lived experiences of laborers in the Central Valley and Central Coast. Understanding the health disparities among farmworkers in these regions is critical for

developing targeted interventions and policies. The health of farmworkers is not only a public health concern but also a matter of social justice. In California, farmworkers disproportionately suffer from preventable health conditions, a consequence of systemic inequities rooted in their working and living conditions. While the Central Valley exposes workers to extreme heat and air pollution, the Central Coast presents its own challenges, including economic barriers and limited access to healthcare.

Farmworker Health Background

California's agricultural labor system has deep roots in migrant labor, beginning with the Bracero Program (1942–1964), which brought millions of Mexican laborers to the United States to address wartime labor shortages. This program institutionalized the reliance on migrant workers, many of whom stayed in California after its termination. Following the Bracero era, farm labor shifted to undocumented workers and domestic migrants, often living in precarious conditions and receiving low wages. Today, the majority of California's farmworkers are immigrants, predominantly from Mexico, with a significant portion lacking legal documentation. The legacy of the Bracero Program and subsequent policies has created a workforce that is vulnerable to exploitation. Farmworkers frequently lack legal protections, face language barriers, and have limited access to healthcare. These historical inequities set the stage for modern health disparities, with the Central Valley and Central Coast presenting distinct challenges shaped by their unique agricultural economies and environments. Over 90% of farmworkers are Mexican-born, comprising two main groups: settled unauthorized workers and H-2A guest

workers. Settled unauthorized workers, many of whom arrived before the 2008–2009 recession, are now in their 40s and 50s and often reside with their families in the U.S. H-2A guest workers, typically in their 20s and 30s, are employed under temporary work visas and stay in the U.S. for about six months annually, providing a reliable labor source for producers of perishable commodities. While H-2A workers offer labor stability and higher productivity, they come at a higher cost for employers due to recruitment, transportation, and housing expenses. The Central Valley and Central Coast differ in terms of the crops grown and the labor demands associated with them. In the Central Valley, almonds, pistachios, walnuts, tomatoes, melons, alfalfa, table grapes, and wine grapes are predominantly grown, reflecting its agricultural diversity and large-scale production. Thus, employing a large, stable workforce. In contrast, the Central Coast is renowned for producing most of the strawberries grown in California, as well as a variety of cool-season leafy vegetables such as lettuce, spinach, and kale. The Central Coast's strawberry fields and vineyards often rely on seasonal labor, leading to higher rates of migration and housing instability. These differences influence the health outcomes and access to resources for farmworkers in each region. The Central Valley and Central Coast present distinct environmental challenges that directly impact farmworker health. The Central Valley experiences extreme heat, with summer temperatures regularly exceeding 100°F. This heat, coupled with long hours of physically demanding labor, puts workers at risk of heat-related illnesses such as dehydration, heat exhaustion, and heat stroke. Additionally, the region suffers from poor air quality due to agricultural dust, vehicle emissions, and wildfires, exacerbating respiratory conditions like asthma and chronic obstructive pulmonary disease (COPD). While benefiting from a more temperate climate, the Central Coast presents its own environmental hazards. Coastal areas are prone to pesticide drift from nearby fields, exposing workers and their families to toxic

chemicals. These exposures have been linked to acute symptoms like nausea and dizziness, as well as long-term risks such as cancer and developmental issues in children. Both regions are increasingly affected by climate change, which intensifies heat waves, alters pesticide use patterns, and exacerbates existing vulnerabilities. In the Central Valley, the mechanization of agriculture introduces risks such as injuries from heavy machinery and musculoskeletal disorders from repetitive tasks like picking and sorting. Reports from the California Department of Industrial Relations have documented incidents where employees suffered head trauma from falls off orchard ladders, emphasizing the dangers associated with mechanized farming. Pesticide exposure is another significant concern, with workers often coming into direct contact with chemicals despite regulations mandating protective equipment. The University of California Merced's Farmworker Health Study highlights the challenges farmworkers face in dealing with pesticides, which can lead to a range of acute and chronic health issues. In the Central Coast, the manual nature of work in strawberry fields and vineyards increases the likelihood of musculoskeletal injuries. The region's reliance on seasonal labor also contributes to precarious working conditions, as seasonal workers may not receive the same training or protections as permanent employees. The Future of Work in California report notes that despite historic labor movements, farmworkers, particularly immigrant workers, continue to face challenges in attaining good pay and healthy working conditions. Furthermore, the lack of union representation in many agricultural jobs exacerbates these risks, leaving workers without recourse when their health is compromised. These occupational hazards underscore the need for improved safety measures and labor protections to safeguard the health and well-being of farmworkers in both regions. Socioeconomic factors play a critical role in shaping farmworker health outcomes. The median annual income for farmworker households in California is approximately \$24,000, far

below the state's median income. Low wages force many workers to live in substandard housing, often overcrowded and lacking basic amenities like clean water and sanitation. Housing conditions are particularly dire in the Central Coast, where the high cost of living exacerbates overcrowding and homelessness among farmworkers. Access to healthcare is another significant barrier. Farmworkers in both regions often lack health insurance, with fewer than 20% covered by employer-provided plans. Undocumented workers face additional obstacles, as they are ineligible for federally funded programs like Medicaid and Medicare. In the Central Valley, community clinics and migrant health programs provide some relief, but these services are often underfunded and overstretched. The Central Coast has fewer migrant health clinics, further limiting access to care.

Comparative Analysis of Farmworker Experiences: Central Coast vs. Central Valley

Farmworkers in Watsonville and the Central Valley face numerous environmental stressors, but the specific nature and impact of these challenges vary between the two regions. Workers in Watsonville reported significant issues caused by the region's variable climate. Rainy conditions often result in muddy soil, complicating tasks as workers' shoes get stuck, delaying productivity and increasing physical strain. Heat waves during the summer are another prominent concern, often causing dehydration and heat-related illnesses such as fainting. Additionally, the prevalence of wildfires in the area poses severe health risks, particularly acute respiratory problems, headaches, and difficulty breathing due to smoke exposure. The seasonal nature of wildfires exacerbates these risks, as air quality deteriorates drastically during fire seasons, leading to heightened health concerns for workers. In contrast, extreme heat is a

year-round stressor for farmworkers in the Central Valley. With temperatures regularly exceeding 100°F, dehydration, heat exhaustion, and fatigue are common. Workers frequently reported insufficient access to water and breaks during peak heat periods, further compounding these health risks. Poor air quality—caused by a combination of agricultural dust, pesticide exposure, and wildfire smoke—poses additional challenges. Many workers experience persistent respiratory issues and allergies that are often left untreated due to limited healthcare access. Unlike in Watsonville, inadequate housing conditions in the Central Valley exacerbate these environmental stressors, as poorly insulated homes fail to provide relief from extreme heat, preventing proper recovery. Both regions face similar health challenges, though the severity and type of issues vary. Farmworkers in Watsonville frequently identified heat-related illnesses, such as heat stroke and dehydration, as major concerns. These conditions are worsened by limited access to clean drinking water during work hours. Respiratory issues caused by wildfire smoke are also common, with workers noting symptoms such as shortness of breath and headaches. While these acute health issues align with the environmental challenges of the region, limited access to healthcare exacerbates the situation, leaving many workers without adequate medical support. In the Central Valley, chronic respiratory problems are more prominent due to prolonged exposure to pesticides and agricultural dust alongside the region’s poor air quality. Workers detailed symptoms of allergies and other persistent respiratory conditions that indicate potential long-term health consequences. Another notable issue is untreated injuries sustained on the job, such as falls from equipment, which often go unaddressed due to minimal employer support. Mental health challenges, including stress and anxiety caused by extreme heat and unsafe working conditions, are also significant concerns but are rarely addressed by existing resources. Employer practices play a crucial role in shaping the health and well-being of farmworkers, and

notable differences exist between the two regions. Some farmworkers in Watsonville mentioned that employers occasionally provide resources such as shaded rest areas, water, and cooling centers during extreme heat. However, these measures are inconsistently implemented and often insufficient to fully mitigate the risks posed by the environmental conditions. Workers also reported being required to take unpaid breaks, limiting their ability to rest adequately during long shifts. While some local organizations provide educational materials and basic resources, direct employer engagement in improving worker health appears limited. Workers in the Central Valley reported insufficient access to water and rest breaks, even during extreme heat. Instances of employer neglect were common; for example, workers who sustained injuries were often ignored or offered inadequate support, such as being sent to a massage therapist without follow-up care as one farmworker accounts. This lack of accountability reflects systemic gaps in enforcing labor protections and ensuring workers' basic needs are met. Housing conditions significantly impact the health and recovery of farmworkers, and the challenges differ between the two regions. Housing was less frequently discussed by Watsonville workers but remains critical during extreme weather events. Workers emphasized the importance of well-ventilated and insulated housing to mitigate the effects of extreme heat and cold. However, access to high-quality housing is inconsistent, and poor housing conditions can exacerbate health risks during adverse weather. Basic utilities such as water and electricity were highlighted as essential for maintaining well-being, particularly during wildfire seasons and heat waves. This prolonged exposure to high temperatures not only exacerbates physical strain but also contributes to mental health challenges, as workers are unable to recover adequately after long days in the fields. Despite regional differences, farmworkers in Watsonville and the Central Valley share several significant challenges. Both groups face dehydration, heat exhaustion, and other heat-related conditions.

Poor air quality from wildfire smoke, pesticides, and dust affects workers across both areas. Workers in both regions struggle to obtain adequate medical care due to financial, logistical, and systemic barriers. Employers in both regions fail to consistently provide necessary resources, such as water, rest breaks, and proper medical care. However, key contrasts exist between the two regions. Watsonville workers are more affected by acute issues such as wildfire smoke and rainy conditions, while Central Valley workers face chronic respiratory problems linked to pesticide exposure and the region's poor air quality.

Future Interventions

Addressing these disparities requires targeted interventions. Policymakers and advocates should strengthen enforcement of California's Heat Illness Prevention Standards through regular inspections and stricter penalties for non-compliance. Requirements for shaded rest areas and water availability should be expanded. Investments in affordable, climate-resilient housing tailored to the needs of farmworkers are essential. In the Central Valley, priorities should include insulation and cooling infrastructure to combat persistent heat challenges. In Watsonville, wildfire-resistant housing and reliable access to utilities should be emphasized. Expanding funding for community clinics and mobile health services to cater to farmworker communities is also necessary. Barriers such as undocumented status, language differences, and transportation challenges must be addressed. Developing culturally appropriate mental health resources, including counseling services and support groups, can help alleviate the stress and anxiety experienced by farmworkers in both regions. Lastly, establishing mechanisms to hold employers accountable for providing adequate health and safety resources is crucial. Compliance with

pesticide safety training, rest break requirements, and access to medical care for workplace injuries should be rigorously enforced. Farmworkers in Watsonville and the Central Valley face overlapping challenges but also distinct regional differences that shape their experiences. By combining personal narratives with broader data trends, it is clear that tailored interventions are needed to address the unique needs of each region. Policymakers must prioritize heat protection, housing improvements, healthcare access, and employer accountability to improve the health and well-being of California's essential agricultural workforce.

Conclusion

The health disparities faced by farmworkers in California's Central Valley and Central Coast highlight the urgent need for systemic reforms and targeted interventions. Farmworkers in these regions endure significant environmental, socioeconomic, and occupational challenges, from extreme heat and pesticide exposure to inadequate housing and limited access to healthcare. These disparities are not only public health issues but also matters of social justice, as they reflect systemic inequities rooted in the historical and structural exploitation of agricultural labor. The comparative analysis reveals that while both regions share common challenges—such as heat-related illnesses, respiratory issues, and insufficient employer support—there are also distinct differences shaped by the agricultural economies and environmental conditions of each area. The Central Valley's extreme heat and chronic exposure to air pollution create persistent health risks, exacerbated by poor housing and minimal employer accountability. In contrast, the Central Coast's seasonal labor, pesticide drift, and wildfire smoke lead to acute but equally severe health concerns. To address these issues, policymakers must adopt region-specific

strategies while ensuring a comprehensive approach to improving farmworker health. Strengthened enforcement of heat illness prevention standards, investment in climate-resilient housing, expanded access to healthcare, and the development of culturally appropriate mental health resources are essential steps. Moreover, holding employers accountable for providing safe working conditions and adequate resources is critical to reducing health risks and empowering farmworkers. The health and well-being of farmworkers are integral to the sustainability of California's agricultural industry and the broader food system. By addressing the disparities outlined in this study, stakeholders can create a more equitable and just framework for supporting the individuals who form the backbone of California's agricultural economy. Achieving these changes will not only improve the lives of farmworkers but also strengthen the state's commitment to fairness, public health, and social justice.

Newspaper Stories

When working with any community, it is important to build a relationship and trust. This trust leads to honesty about concerns and experiences. To help highlight other journalists and researchers who have worked with the farmworker community, we have gathered pre-existing articles. Not all interviews take place in the same part of California—highlighting the similarities and differences on issues that farmworkers face based on location and crops harvested.

- [Interview with a farmworker in California's Central Valley](#)
- [Latina Farmworkers Speak Out about the Hazards of Life in California's Fields](#)
- [An Account of Agriculture: Episode 4](#)
- [California Farmworkers Stand on Uneven Ground](#)

- [Interview: 'Ghost Workers' More Common Than Thought In Migrant Farm Work](#)
- [Undocumented and abandoned: Telling the story of Punjabi farmworkers in California](#)
- [California's Farmworkers Are on the Front Lines of Climate Change](#)
- [Central Valley, where a quarter of the U.S.'s food is grown, faces extreme heat](#)
- [“Everyone Is Tired of Always Staying Silent”: Inside a Worker Rebellion in the Central Valley](#)
- [In Their Own Words: Oral Histories of California Farmworkers](#)
- [‘It smells bad’: the US farmworkers grappling with unsafe water at home](#)
- [The Influence of Organizational Aspects of the U.S. Agricultural Industry and Socioeconomic and Political Conditions on Farmworkers’ COVID-19 Workplace Safety](#)
- *They Leave Their Kidneys in the Fields* by Sarah B. Horton

Interview with Sally Tirado

The priority for our stories group is to uplift farmworkers' voices and share their stories. Though, we were curious to know—what happens behind the scenes? Who is a part of this movement and what role do they play? What piqued their interest in working with farm workers?

Sally Tirado is the Co-Director of Community Medicine at Natividad Teaching Hospital in Monterey County. She works closely on the Farmworker Health and Climate Change research project alongside her husband, Dr. Miguel Tirado. They work directly with training the promotores at the Center of Community Advocacy. Sally has an educational background of masters degrees in Social Work, Education, and Nutrition. She has worked closely with farmworkers for a long time, working with notable figures such as Cesar Chavez and Dolores

Huerta. I had the pleasure of interviewing Sally and getting to know her path to where she is now.

Over the summer, I learned of a “radical introduction”. This is like a general introduction except it dives more into your background, and how your background has shaped your life to what it is today. I’d love to receive a radical introduction about yourself—growing up, how you ended up where you are now and whatever you think is relevant to that story.

“That’s a fun question. I think what was important to me about my growing up is that it wasn’t necessarily easy growing up, not that anybody has such an easy growing up. I had a lot of losses and I had a lot of influences, a lot of really positive influences and a lot of support in my life as well. Within my family, I had to deal with major mental illness, some addiction issues, a bankruptcy, and a lot of poverty. Particularly in my adolescence, were very rough years. And I think that it’s important to say, my mother had tuberculosis when I was little, and I had a lot of support from family when she was in the sanitarium.

And that’s one of those things that actually I’m so very grateful for is that family. I had some very wealthy family that supported me or to help take care of me during that process. I had grandparents that moved in and helped take care of me. So I had at some level, it felt like I had enormous privilege. At the other end, it felt like I didn’t at all. I had both, and I think that the fact that I had both has been hugely valuable for me in my life because I have, I think, a capacity to look at people’s lives. What’s really important to me is looking at what really is going on in people’s lives and what really has an impact—and looking at different cultures and looking at how all of that interfaces and makes us who we are. I see it as a gift that I was given in my life—to see so many different life stories both within my family and around me.

I think another big influence is that I grew up in San Diego, and was in and out of Tijuana all the time. I had people close to me that were Mexican and that were part of my life that were all intertwined. I'm grateful for where I grew up. I'm grateful for that cross culture. In those days, it was an open border, you know, you went in and out all the time and it was very different than it is now.

The other piece is my father, who started the first professional theater in the round. It was a theater where it was the first time where they did musicals, you know Stachmo came, Louis Armstrong came and it was a really creative period in my family's life. I got to watch dancers and singers and spent a lot of time with them, going and just watching them. Then I wanted to dance, and I wanted to sing. I was scared, but that's what I really wanted to do. So I'd go home and I'd listen to all the music and I'd sing and I'd dance, but I never pushed myself to do that until much later in my life. And then I did, and I loved it. Years later, I was living in Barcelona, and I studied music, I studied dance and psychotherapy together, and I danced 30 hours a week. You never know where your life will take you. I wouldn't have ever believed that when I was 20 years old, that was what I would be doing at some point in my life."

When you lived in Barcelona, was that an opportunity you sought out yourself or was that something that was curated through a study abroad program?

"It wasn't either, and I've thought about this with life. Sometimes what I thought would be so great and so wonderful wasn't necessarily. It was when I took unexpected turns or something presented itself and I just took advantage of it at the moment. Those experiences in my life have shifted directions for me and given me strengths and a sense of creativity that was unexpected."

What ultimately brought you to Monterey County?

“I came here in the nineties, I had been living in Sonoma County and I was working with Latino youth at that point in time. Sort of an interesting story, for me anyway, it wasn't what I expected. Miguel had the opportunity to come and be the first faculty member for California State University, Monterey Bay, and help create it. Though we were living in Sonoma and I was very involved in that work, I thought it was an opportunity and I loved this area down here.

I'd worked here earlier in my life, in Salinas Valley. We quickly made a move. Before that happened—I'm going to take you roundabout way that I got there, which is how life happens, usually.

I was working with Hispanic youth, and there were four particular young men that I was very, very attached to. They were kids that weren't doing well, they came from complicated, difficult families. They were super bright, and I thought they're either going to become corporate presidents, or they're going to become the head of the gang. They're going to do something, they're not going to just be unremarkable people.

I really mentored them, and one of them went on to become the head of the Board of Supervisors for Sonoma County. One went on to become a really fine lawyer. The other one, spent his life in prison. I've lost touch with him, but whatever he did in prison, it was probably also extremely meaningful, I just know who he is.

The fourth was injured right before I moved to Monterey County in a drug related accident, and came from a family that was very involved in gang stuff. He went into the hospital and I was there and I stayed with that family. He was brain injured and he was on life support. I was the intermediary in a sense between the physicians at that point and the family. I stayed there

by his side and after about two weeks, it became clear that he probably was not going to come out of that coma. They [his family] went through lots of angst about finally letting go of the life support, they asked me if I would stay there with him when, you know. His uncle was sort of the Godfather in Sonoma County, of everything that was going on there. He and I sat together as I watched this young man who was very, very important to me pass. I was very, very close to all of that family and all of that community. So for me to leave there was really hard for me at that point to come here to Monterey County.

I wanted to continue to do my work there, but you weigh things in life and I came down here. I decided that I really wanted to do medical work. That experience is sort of what pushed that and that is what eventually got me to becoming a faculty of medicine at UCSF. It was a later decision. Then because so much of my life and the work I'd done had been community based, going into community medicine and behavioral health made sense to me.

What brought you into this project with Dr. Sparke?

“I lived in Mexico when I was younger. And had been really involved sort of with the student movement. All the student leaders had really impacted me too with experiences in life and how I reshaped the way I thought about the world. So there was a piece of me that just felt this huge sort of cultural affinity to continue to work with the Latino community, which I did.

I went into working internally within the hospital initially, and I started to do a lot of hospice kind of work. Like, if there was somebody who was dying, I would be the one that helped them through that. Most of the patients were Latino patients. There was a lot of ‘how do we handle this? And what does this mean culturally?’. Because there weren’t many voices, I was

one of those voices that would say ‘this is what’s important’ you know, these things need to be honored.

Later on, I was leading the COVID initiative in Monterey County with an ag [agriculture] organization. I did a lot of the initial work going out with COVID education in the fields. And I had been doing education in the fields for years. Then one of my colleagues with the residency was also a friend of Dr. Sparke, so we met that way. He knew the work I was doing and the work Miguel had also been doing for years, and that got us onto the project. It was a long circle to get there.”

How did you begin your involvement in education in the fields? How has that experience shaped you?

“I had come back from Mexico and had the opportunity to be a Washington fellow and work with Congress for a brief period. But that sort of reshaped my sense of policy. At first I thought ‘why does this make a difference?’ but then I began to see why it made a difference.

I can’t remember who the contact was, but at that point Miguel had been working with Congressman Ed Roybal from East LA, he was one of the first Latino congressmen. He was from East LA, and Cesar [Chavez] was looking for a Spanish speaking female who could work both with the farm workers and also work with the mayordomos, foremen, and supervisors.

I remember the first time I met Cesar, he told me he was coming into the airport at LAX. I went to LAX and we sat in a coffee shop and talked. He told me what he wanted to do and it interested me. It just felt like that was where I was supposed to go, and what I was supposed to do and didn’t know what it was going to look like. I worked with an ex Jesuit priest (who was

originally considered for the role) and I was really young, he had experiences doing sort of organization development work, and he taught me a lot. I remember going into this meeting, I never forgot it.

I went into a meeting with Cesar and the head of Sun Harvest Growers, which were the biggest growers in the valley at the time, connected to Chiquita Banana in that era. I remember sitting there and saying: 'well, the problem is, the problem is this, and the problem is that'. The ex Jesuit priest was there with me, and when we got out of that meeting he just looked at me and he said 'don't you ever, ever, ever, again say 'the problem is''. He said 'you never approach anything that way. You say, 'what I've learned is that *this* is going on, and this may be where the conflict is' but you always approach it in a different way'. I see it as a gift he gave me. So I look at things that way when I go in, I try to get out of the mentality of a 'problem'. There's a challenge here, maybe one side is viewing it this way, and the other side is viewing it that way. How do we find a place of connection, that place where we can agree without criticizing each other? That is what I learned. Also in that very same meeting, I expected we were going to go into a really conflictual meeting.

I was ready to see two sides that were going to be in enormous conflict with each other. That's not what I saw. The head of Sun Harvest looks at Cesar and says 'How are your children? I loved going to the baptism' and I was like, 'what?' Then Cesar told him 'I loved the bar mitzvah. How's your son Joe?' He's telling him that he's really close to him. He had invited Cesar to the bar mitzvah and they did these kinds of things together. Who would ever believe that now? That there was that kind of way of connecting to each other to try to find solutions."

What is your role within the project?

“My role is really to connect the community and to help develop a lot of the training modules. I’ve worked for years with physicians who have been involved. As the Director of Community Medicine I would pull physicians, they’d come from other parts of the country and they would not understand those patients that they were serving. I really wanted them to understand them. I organize them to go out into the fields to go out and work with the Center for Community Advocacy and actually learn, teach others. I’ve been using that model again with the climate change work that we’re doing to learn from each other.”

What is next for the current group of promotores?

“The training with the Center of Community Advocacy (CCA) has ended. They are the main core promotores that we have first trained. Now, instead of me training them or bringing other people who are experts on different climate topics in to train them—they will be the ones that will go out and train other promotores in the community and train the community itself. Maybe go to schools or churches or community groups. So they’ll be doing that sort of networking out.”

How did you find this first group of promotores?

“I started the promotores program at CCA with Gloria de la Rosa, she and I started it many, many years ago. It was a collaboration between the residency [Natividad] and CCA. When Matt [Dr. Sparke] was telling me about this project, I immediately thought of CCA as one of the potential community folks to do that training. When I told them what we wanted to do—they have

a network into the community—they already have a sort of core smaller group of promotores, they pulled them in. We also wanted to bring in promotores from Castroville, from Pajaro, from Greenfield, and South. There are sort of three main promotores each representing a different geographical section. Then they went out into the community and pulled them in. Before that, they also helped me organize focus groups. So we really went out and listened to them.”

Before we end, is there anything you’d like to share regarding the project?

“I have been working with small coffee growers in Puebla and Veracruz for the last couple of years with an indigena congresswoman. I’ve spent a lot of time travelling and talking to the small farmers and how difficult it is for them with climate change issues, and the other sort of political issues they face. I think that we really need to think about how to hold farm workers in both countries. I don’t think we can do one without the other. I think we have to really understand how to hold both and, and how to support both in, in both countries. I really feel that that's ultimately the solution because of the immigration pressures, all directions, and the current climate we're in. I still hold onto that piece, even though I, I believe there are going to be some rough times. But first, I believe it can get to that place where we hold each other, all of us better than we have been doing.”

For future student researchers, it is important to reflect on stories like Tirado’s. Life is unexpected, and you never know where it can take you. Through Tirado’s story I hope readers have noted that it is important to take advantage of opportunities that come up, or even create an opportunity on your own. Rather than focus on the negatives of problems, focus on what can be

done for improvement. Work closely with your community, learn to uplift their voices and concerns.

Safety in the Workplace: Experiences with Complaining to OSHA

Introduction

Workplace safety is a fundamental right for all workers that ensures their well being and their ability to do their jobs without fear. However, this right is often overlooked by employers as well as insufficiently enforced. This is especially a problem for farmworkers whose rural farm workplaces have long been treated as an exception to traditional protections afforded by US law to factory workers and other urban workplaces. Workers are faced with dangerous working conditions over many different industries and deal with retaliation when it comes to reporting these hazards to corporations such as the Occupational Safety and Health Administration (OSHA). While yes, this is an issue that stretches over many industries, this paper will focus on farmworkers and their specific experience. Below will explore some of the challenges that workers face while trying to ensure a safe workplace, the limitations of OSHA, systemic issues that perpetuate unsafe conditions, and what is being done and should be expanded on in order to address the situation at hand.

Loopholes Around OSHA

Employers often fail to prioritize worker safety which typically results in conditions that are unacceptable to work in. While employers may have a variety of reasons for not meeting standards, none are able to justify their workers losing their lives or loved ones on the job.

Companies will poke holes in the regulations that are placed on them in order to make it extremely hard for workers to use resources such as OSHA in order to achieve a safer workplace. Safety violations are being covered up which is resulting in workers dying and the employers hardly being penalized for it. Companies will find out when OSHA is coming ahead of time and “clean up the evidence, so by the time the OSHA rep comes, it all looks good. But it’s a lie” (*Workers tell OSHA* 2022). Employers are taking the easy way out and instead of finding long term solutions for the issues present in their spaces, they are fixing it temporarily so that they are approved and able to continue production. They take shortcuts in order to skip anything that may delay production. Workers will be thrown into a job with little to no training and no safety information making them much more prone to injury.

An Interview with Ixtel

California is home to a significant population of America’s farmworkers - approximately 500,000 to 800,000 individuals, or about one-third to one-half of the national total. Many of these workers face unsafe working conditions. The following stories are from an interview with Ixtel, a worker on the farms for the last 16 years. As a worker in the fields, they are subject to extreme heat, inadequate water supply, and a lack of shade. The shaded areas for breaks are typically a long walk away through the fields and are not worth going to during a break since the breaks are shorts and the areas often do not have room for all the workers. During the day’s work, the water that was offered to her was hot from the weather and told that if they don’t want it, then don’t take it. Some workers even feel an incentive to not drink water since the bathrooms may be very far away and unsanitary. When Ixtel complained to the rancher about the situation,

she was told that if she complained again that she would be fired. This boss and any others will make it seem as if their workers have no rights so that they will fear complaining. The other alternative to bringing the issue to the attention of the rancher would be to file a complaint with CAL/OSHA. Since there are certain requirements in order to be protected by OSHA, some companies don't fall under them and therefore OSHA can not be a help to them. As stated in this interview, "I'm going to tell you - Madera to Bakersfield is about as hot as you can imagine. But CAL/OSHA doesn't lift a finger unless you send them formal complaints, and if you send them complaints, they'll go, 'Well, is it really that hot?'" (Interview with a Farmworker 2024). This puts workers in a corner since they are unable to go to their employers for a change and the main company that is supposed to help them out of this corner is simply pushing them further into it. These power imbalances perpetuate these unsafe practices and make it feel impossible for the workers to overcome.

Who is OSHA?

The Occupational Safety and Health Administration (OSHA) is a public agency that serves to assure safe and healthful working conditions by setting and enforcing standards, providing training, education, and assistance. Through OSHA, workers can file two different kinds of complaints - safety and health complaints or whistleblower complaints. A 'safety and health' complaint is in regards to something that a worker believes is a serious hazard or if an employer is not following OSHA standards. These are confidential complaints that can be submitted online, by fax/email/letter, telephone call, or in person visit to a local OSHA office. Even though the complaint is anonymous, signed complaints are more likely to result in an onsite inspection. A 'whistleblower' complaint should be filed if a worker feels that their employer has

retaliated against them for exercising their rights as an employee. These complaints can be submitted the same way as a safety and health complaint. OSHA makes it known that “workers have the right to report injuries, safety issues, and actions taken against them for speaking up including being fired, demoted, or disciplined” (File a Complaint). While all of this is true, these complaints don’t always result in everything that they are made out to be. During the COVID-19 pandemic, OSHA failed to fulfill its duty of keeping workers safe. They are still trying to recover from the workers lost during that time period. Workers who became ill or died during the pandemic were disproportionately people of color. As of 2019, OSHA only had 862 inspectors to oversee millions of workplaces nationwide, making a 45-year low in staff. This shortfall limits its ability to address complaints and conduct thorough inspections, leaving workers in poor conditions. From 2017 to 2023, the number of field inspections dropped nearly 30% (Lopez) making it so that employers are not being held accountable for keeping a safe work environment for their workers.

Limitations of OSHA

Due to chronic understaffing, OSHA struggles to fulfill its critical responsibilities, leaving worker’s rights overlooked and workplaces unsafe. With just 862 inspectors overseeing millions of workplaces nationwide, OSHA has become increasingly unfit in meeting the demands of their claims. One of their stated purposes is the education of workers on their rights, but they clearly fall short. A 2022 study by UC Merced found that more than a quarter of workers said they were unaware of their right to file safety complaints, and two thirds said that they would not report violations due to fear of retaliation or job loss (Kuang). This widespread lack of knowledge and fear is leaving countless workers vulnerable to dangerous practices.

OSHA also provides outreach efforts which include educational materials for employers and workers and communications to vulnerable communities. However, between 2017 to 2023, these outreach efforts dropped by 83% from 18,05 to 308 (Lopez 2024). This failure to protect workers is clear in shocking cases like that of six women who were working in extreme heat. On the second day of unbearable conditions, the women were granted permission to leave early since they were feeling nauseous and ill. When they returned to work the next day, they were given their final paychecks and told there was no more work for them. Such retaliatory actions are unethical and clearly violate workers rights, yet they continue to go unaddressed due to the weak enforcement of standards set and the fear workers have of their employers. OSHA remains the place where workers are supposed to be able to turn to in a time of need when they are unable to go to their employer. However, when a worker sent them pictures of an unsanitary bathroom, their employer also sent in pictures from a different, cleaner bathroom that customers used and OSHA wrote off the issue as fixed. They did not address the issue at all and instead took the employers word that it was fixed instead of looking into their issue on their own. The clear imbalance of power between employers and employees persists and endangers workers. These issues require action or else the exploitation of workers will likely continue unchecked.

Bilingual Workers of OSHA

People with limited English proficiency face significant barriers when it comes to reporting workplace safety violations to OSHA. Many OSHA resources are available in limited translations which may deter non-English speakers from seeking help. Officials claim that a high priority is having direct communications with workers who have limited English proficiency.

However, there are disproportionately less OSHA workers who are bilingual and able to represent major groups of people.

Cal/OSHA Bilingual-Certified Inspectors

| | Bilingual inspectors | LEP workers |
|-----------------|----------------------|-------------|
| Spanish | 19 | 2,347,834 |
| Cantonese | 1 | 308,969* |
| Vietnamese | 1 | 167,473 |
| Filipino | 0 | 132,819 |
| Other languages | 0 | 448,596 |

Source: Cal/OSHA personnel records of employees paid a monthly bilingual premium; LEP estimates of workers, ages 16-64, from USC Equity Research Institute's analysis of 2019 Census data. • Inspectors are safety engineers and industrial hygienists in district and regional offices, as well as other inspection units.

*This figure includes LEP workers who speak Cantonese, Mandarin and other Chinese languages.

Chart by Matthew Green/KQED

According to this chart, there is one Spanish speaking inspector for every 124,000 workers. (Romero 2024). This makes it much harder for people who are not proficient in English to seek help. While there are complaint forms that are able to be filled out online, workers may be afraid of submitting them due to a fear of retaliation and would prefer to anonymously call and speak with someone, but this may not be possible due to the lack of bilingual staff. This leaves non-English speakers without adequate support while navigating the reporting process. This language gap disproportionately affects immigrant and minority workers who are often employed in high risk occupations. Without accessible resources, workers are left unable to advocate for safer working conditions or hold their employers accountable. This highlights the urgent need for increased multilingual resources, more bilingual inspectors, and overall stronger protection of vulnerable workers.

Systemic Issues

Systemic issues in the agricultural industry perpetuate the unsafe working conditions for the people working in the fields. Employers often hire workers for only a single season. This ensures that if a worker is injured, compensation is limited to the remainder of that season instead of year-round accountability. Even though year-round work is needed, companies will not let workers sign a longer contract, only shorter consecutive contracts with the same company. Companies find loopholes such as this while still not protecting their workers and trying to avoid these injuries. A UC Merced study found that 20% of farmworkers reported that their employers never monitored temperatures during hot days, and 15% stated they were never provided shade. These conditions are not only dangerous, but entirely preventable. Despite these alarming statistics, many workers continue to endure harsh and unsafe environments since they are unaware of their rights or even too intimidated to exercise them.

H-2A Worker Experiences

H-2A workers are a prime example of a group of people where many are unaware of their rights and are treated as if they don't have any. A group of 6 workers from Oaxaca spoke up against what they thought were unfair and unsafe working conditions they had been working in for the past three years. They would work in extreme heat without protection, hours of pay were taken off for unjustified reasons, and they suffered verbal abuse from their supervisor. These workers worked with a separate company to report these conditions as to which their employer apologized for and assured his workers that he would hire them again. When the next year came along, they were not rehired and it was thought to be because they told management about the unsafe working conditions. While this can't be proven for certain, there are systemic issues that

are almost certainly in place. In order to become an H-2A worker, people use formal and informal recruiters to find jobs as well as navigate the visa application process. When it comes to attention that a worker has spoken up about illegal labor practices, these recruiters will make sure the worker is blacklisted across the industry and labor agencies. With this exclusion method existing, people who complain are no longer able to find work. This presence makes it so that workers are extremely discouraged from complaining since they are afraid of losing their jobs and the benefits that come with it, such as a visa. As being an H-2A worker, you are very dependent on your employer. An H-2A worker has to rely on their employer to provide them with housing, meals, and transportation to and from the worksite. Since many workers do not have a US driver's license or own vehicle, they depend on their boss for transportation to grocery stores, medical care, and other essential activities. Given the statistics of how employers treat their workers, it is not likely that they are taking these extra steps for their employees' comfort. A 2020 report by the migrant rights group Centro de los Derechos del Migrante showed out of 100 former H2A workers in the organization, 100% experienced at least one serious legal violation and 94% experienced three or more serious legal violations. Workers are too scared to report these violations while they are still employed at the company, so they search for help after they no longer work there. People will complain of things like shaved hours, missed meals or bathroom breaks and it is often too late for help. If there are not significant changes in the enforcement of standards, the cycle of exploitation and neglect is bound to persist.

What is being done

Efforts are underway to address the systemic issues that discourage workers from reporting unsafe conditions, particularly those related to heat illness. Senate Bill 1299 aims to

strengthen protections by making it easier for workers to file compensation claims when employers fail to prove they are meeting required safety standards. The bill would ensure that claims would cover essential needs including medical care, lost wages, and death benefits for family members in extreme cases. By shifting the responsibility of providing proof to the employers and expanding worker protections, it leaves the employers in a place where they have to take more accountability for their workplaces and maintain them. The bill also acknowledges the challenges that come alongside climate change. “The earth is changing, and the way we protect our workers must change as well” (Cabrera-Lomeli 2024). She signals the critical push toward creating safer and more equitable conditions for vulnerable workers.

Trust Building and Communication Barriers: The Importance of Community Connection

Narratives Spotlight Collective:

“Stories from the Field” by Farmworker Justice:

Javier.

“I told my family to report it to the Labor Department. To them it’s inevitable, though. They think we should just put up with it and be grateful that we have a job. It’s also fear of losing their job if they make a complaint. That’s pretty much how it is. Other people would make fun of my dad because he would fight for his rights. They’d mock me and say, ‘That is why your dad never gets jobs.’”

Marisol.

“When I called the county, they told me they had to use pesticides because the trees needed it to grow. The county is more preoccupied with growing crops than with the negative effects on people.”

Pedro.

“The union is very important for poor people. We didn’t know where to go to ask for help and I barely spoke Spanish.”

Ramona.

“But farmers work what we live off of. It’s important that others recognize this type of work. It has dignity, because it’s a difficult but honest job. Not every person can do this type of work. I don’t think it’s right to look down on this work. Anyone with a conscience understands that’s wrong and realizes that this type of work should be recognized. I’m not saying we should have a banner put up in our honor, but Cesar Chavez worked hard for the rights of workers and I would hope that others respect how difficult it is”

“Domestic violence is the primary problem but the woman is always afraid to speak up and say that her husband hits her, is an alcoholic, and doesn’t give her money for food. She doesn’t want to say anything out of fear that she’ll have her children taken away. It’s taboo to speak about it. We’ve been trying to educate women and encourage them to exercise their rights and familiarize themselves with agencies that can help. They can help themselves with a visa available to immigrant women who suffer abuse at the hands of a legal resident or citizen. But they’re not going to admit their husband beats them on the first visit. It takes a long time to convince them to take these steps. The visa is important because it first grants you a work permit. It’s a long process, but you can begin if you have proof of your situation, be it a police report, restraining order or witnesses. If I don’t know for sure, but I think that if it weren’t for this visa it would be more difficult to convince them to come forward. This visa helps them think that they can survive on their own. Without it, they would probably think, ‘Are you going to support me?’ Women need the ability to work here legally and not have to ask anybody for a handout.”

Teresa

“Another experience I had is that owners would pay us with a check that doesn’t have funds. I still have those checks. I’d go to cash my check and they’d tell me that the account had been closed for a number of days already. That happened to me three times.”

“My doctor told me that. He told me I didn’t take care of my body while working in the fields.”

Local News - Narrative Highlights:

Ruiz.

“We’re here and doing all this work, but we are not given the path to be here legally and raise our families without the fear of it one day being ripped apart ... It would definitely be appreciated if our government also saw us as essential” (*Latina Farmworkers Speak Out 2021*).

Juana Chavoya.

(Video story of a Tulake, CA farmworker)

<https://youtu.be/abT28CIkHD8>

Photo-Voice Stories of Pájaro:

Elisa H.

(A resident of Pájaro and is originally from Oaxaca, Mexico. Elisa speaks Zapotec, Spanish and is learning English at Cabrillo College. Elisa works in a packaging company making boxes and during the season she also works harvesting strawberries.)

“Anxiety that I will miss work if it floods again. I'm worried because my son needs diapers and milk. The mud and cold remind me of the rain from the 2023 flood.”

“The strawberry is not growing well. I have to throw away food and there is less money to bring home.”

Ricardo P.



Photo by Ricardo P: *Strawberry* - “In this photo I feel like emphasizing a feeling of being left behind compared to people in Watsonville, especially during the floods.”

Bird with tree - “The tree stands tall and ‘el pájaro vuela de nuevo.’ A sign of how we still persevere. Pajaro Rises.”

Window - “This photo was the first one I took. It describes how every rainfall, storm or weather event, I live in fear of being left behind again or hurt. A beautiful view corrupted by my own thoughts.”

Tent with river - “Despite both of our communities being so distant, we are connected by the river, even then we find a way to keep fighting.”

Angelina G.



Photo by Angelina G. - “This day was very rainy and the strawberries went bad. It was a big loss of fruits that were damaged by the water. This is the same thing that happened to Pajaro residents. A lot of their personal things were damaged and had to be thrown out. There are new fruits growing which represent a new beginning in Pajaro.”

“On hot sunny days there can be so much dust, which gets all over the cars and even inside the homes. Dust all over the cars make the streets in Pajaro feel abandoned, like if no one cares about Pajaro”

“In this picture, the field workers are waiting in the sun to get the fruit checked. This line reminds me of how many long lines Pajaro residents had to wait to get the help they needed after the flood.”

Jose L.



Photo by Jose L: *Inequitable* - “The tireless immigrant families who add food to our plates. The corporations take what they need and leave us behind.”

Trust Building Highlights from Sally Tirado's Interview:

There is a large importance on creating personal connections when trying to build trust, so I asked farmworker health community organizer Sally Tirado in an interview about what her thoughts and experiences are in this matter to gather further insights on key methods of trust building to analyze in this paper.

In response to my question:

What specific things did you do to communicate and trust build with these communities? For instance, you mentioned previously how having these organizations be more community centered are important, but how did you go about helping build that trust and put yourself in that community (especially as you moved) to help emphasize their voices and needs being heard and actually met in a way where something is actually done about it?

She answered that she was “committed to the community” and has a history of working within it, such as during her time as one of few Spanish speaking therapists in the Salinas/Monterey county area. This made her a central member of the local community who the farmworkers and their family members interacted with regularly and successfully relied on. This allowed her to gain an essential form of trust that allowed her to not only work with the community better, but communicate with them more easily in addressing the issues they faced.

She emphasizes this ideal especially further in her response:

“Well I think I understood it maybe in a different way than some. Some of it was the growing up in San Diego and that but what I really got it was living in Mexico. I lived in poverty in Mexico and my friends were working and they were the ones that were organizing. I was there, I was shot at by the Federales in a manifestation. So I saw it differently. Saw it differently. And that, and that was just the grace of God that I had that experience in early in my life ... And that's what I said at the beginning, you know, you, where you think you're going and where you end up are gifts that you don't think are gifts. And then you begin, as you get older, to see those threads as to why, but then not completely why, it's just what happened. Life happens.”

So armed with her own deep personal experiences she could better relate to these farmworker community members and better see the concerns of trust they might encounter while working with our farmworker health initiative project and research.

“It's just generally in academia is that we tend to go in and extract information. For research for projects for whatever it is. And I think the community feels that frequently, like ‘why, do you just want to get more information, but when it really comes down to you, are you really doing something that will make a difference in my life’ ...

So in regards to this project, I think whatever can happen in terms of that relationship building through people that already are connected, like through the community organizations, people that have relationships with the people in the

community, through church, through whatever it is, that kind of relationship needs to be built, I think, for it to work.”

Her conclusions on this matter are so largely important to consider especially as we work with these farmworker communities further.

Literature Review:

Many of the key points Sally made in this interview, also ties into some of the common themes existing literature mentions on this topic, so with her input we are able to grasp a greater understanding on applying these prevalent themes of trust building techniques and barriers to our specific project goals.

To begin with, farmworker well-being and resilience is supported by cultural values of ‘familismo’ and spirituality by creating a sense of community belonging (Blanco 2017). Acculturation is a barrier to this, but systematic mechanisms needed for survival impose this as a requirement, such as when indigenous languages often go ignored when accessing public resources or bureaucratic needs. This shows the importance of community-based organizations that embrace farmworkers’ native languages, especially because of its ability to increase feelings of personal connection, and thus trust when we work with these communities (Funke 2019; Main 2022).

Another important factor is demonstrating attitudes of “relationality and reciprocity” when growing personal connections (and thus trust) with farmworker communities (Blanco

2017, 95). This is especially true when systemic abuse from ‘outsiders’ acts as a fear-based divider when building trust, which emphasizes the importance of community connection building on a personal-level with existing local organizations in order to demonstrate reliability and actual care for their life concerns. An ethnographic excerpt from Horton’s book *They Leave Their Kidneys in The Fields*, especially demonstrates an example this fact and how we can possibly overcome it:

“As a visible outsider in this farmworking community, I initially struggled to explain my objective to parents and establish trust. Migrant parents initially did not know what to make of me. I probably seemed like a peculiar variant of the many gabachos (white North Americans) who often intruded in their homes: social workers, school officials, health outreach workers. However, over time, the fact that I was a gabacha and that I was often indignant about their work conditions seemed to provide them with a sense of validation. Interviewees knew that I cared about their health and work safety; they knew that I was on their side. Soon, many wanted me to know as much about their lives as possible. They invited neighbors and friends to come and tell me their stories; they volunteered my services in contacting workers’ compensation insurance carriers, doctors, and attorneys. In this highly segregated community, my English skills, legal status, and knowledge of the workings of state bureaucracies (however limited) were rare assets. I embraced my role as a researcher-cum-social worker, helping my research participants locate health care services, driving family members to appointments, translating letters from state and federal bureaucracies, and helping

them navigate the eligibility rules for California and Social Security disability programs. Offering this assistance not only helped me establish trust with families but also gave me valuable insights into how state and federal policies themselves shape migrants' health, workplace vulnerabilities, and health care seeking behaviors" (Horton 2017, 9).

Horton was able to successfully build trust and ease this farmworker community' fear of 'outsiders' because they specifically worked towards showing they are a reliable figure who both actually cares for and understands their struggles.

However, these efforts of trust building may become increasingly more difficult in the future. This is especially the case as farmworkers' face greater vulnerability and fear with the upcoming Trump presidency after the 2024 election, which aims to strip away even more of their rights both as farm workers and as undocumented immigrants who will now have a higher risk of deportation ("Attacked and Discriminated" 2024). This will create a greater hesitancy of undocumented immigrant farmworkers' willingness to speak out to both academia advocacy platforms and worker health safety complaint organizations due to this fear of deportation. Thus posing the question: 'what can we do to overcome this major obstacle?'

In order to help counteract this, trust building and empowerment within these communities is crucial. Both highlighting farmworker voices and stories, as well as supporting Promotora work as a form of empowerment to break stigmatic divides and improve 'common identity'-based resilience. By emphasizing the idea that 'we all face these issues, let's work

together' it can join people together as a resilient, culturally-centered community to better cope and overcome these real obstacles of fear.

However, this is not as easy as it seems. In addition to the 'outsider' vs 'insider' normative barriers, there are also inter-cultural barriers to trust due to the structure of competitiveness within the farm work itself, both on an ethnic and gendered basis. For instance, as mentioned in Dr. Seth M. Holmes' book *Fresh Fruit, Broken Bodies*, there is a competitiveness of worker pride along ethnic lines to withstand their harsh conditions, even at the consequence of their own health. So, instead of working together to fight for better labor health conditions amongst climate change, they will alter their cultural perceptions of each other to make the cultures different from their own seem as 'lazier' or 'less hardworking'. This can especially be seen in this ethnographic story of competitiveness between Oaxacan and Mestizo farmworkers:

“Oaxacans like to work bent over, whereas mestizo Mexicans get too many pains if they work in the field. Oaxacans are perfect for picking berries because they are lower to the ground,’ said one worker. Another worker told Holmes that ‘Pesticides affect only white Americans because your bodies are delicate and weak... We [Oaxacans] are strong and we hold out.’”

This especially demonstrates how, in the powerful words of Holmes, “this perception of bodily difference along ethnic lines helps render invisible the violence done to those bodies” (Holmes 2013).

Gender-norms also act in a similar way to this through the concept of ‘Machismo’. Masculinity and pride also act as socio-cultural barriers to receiving help or reporting brutal health conditions in the fields (which is only getting worsened by climate change). So not only do the structures of farm work in the fields enhance competitiveness, such as through the gendered division on labor roles, the social edging on by supervisors, and the structures of piece-by-pay, but cultural attitudes of ‘proving’ masculinity do as well. This role of ‘machismo’ is especially highlighted in the ethnography of *They Leave Their Kidneys in The Fields*:

“The agricultural industry capitalizes on migrant men’s pride in their work capacity. Supervisors use gendered barbs to encourage men’s productivity, taunting men who become ill, like Miguelito, by saying they are merely ‘lazy’ (flojo) or ‘weak.’ If middle-aged men are lagging in their work, supervisors may urge them on by saying that they can ‘no longer cut it’ (ya no la hace), or worse, that ‘they have already hung up their gloves’ (ya colgó los guantes). Meanwhile, they discipline women by implying that they cannot compete with men or by infantilizing them” (Horton 2017, 27)

Together this culture of ethnic and gender-based divisions, thus creates an overall barrier to cross-cultural unification to support needs as a whole community and further worsen health outcomes as a form of cultural exploitation.

All of this must be taken into consideration when we aim to work within these communities, so by empowering the roles of current community members who understand the deep personal context behind these cultural norms. As highlighted in the Peter Schurmann and

Manuel Ortiz’s reporting project mentioned in *Building Trust with ‘Gate Openers’ Proves Key for Reporting on Undocumented Farmworkers’ Access to Health Care in California*:

“Those connections were key ... covering undocumented communities in rural parts of the state like Smith River requires a physical presence. You have to be there. You have to spend time with the communities you are looking to cover. You have to speak with them, get to know them and, ultimately, earn their trust. Trusted intermediaries, including local health providers and community-based organizations, can also play an important role in this ... [as] a gate opener to the wider community ... While data and experts can provide valuable background information, there are few outside intermediaries (fixers) who can serve as gate openers to the workers themselves ... “Farmers don’t want outsiders talking to farmworkers in the field, making it difficult to find sources to speak to. Hence, locating communal spaces where farmworkers gather off-hours — churches, eateries, the local laundromat — was critical to making the connections we needed for this project”

(Building Trust with ‘Gate Openers’ 2024)

A key way to do this empowerment is by supporting the hard work and training promotoras do as ‘gate-openers’ in their communities while sharing crucial health information, as well as uplifting their voices to be more heard by spreading awareness of their stories (of obstacles and ideas of improvement). For instance, in the study *Barriers and Facilitators for Promotora’s Success in Delivering Pesticide Safety Education to Latino Farmworker Families: La Familia Sana* promotoras felt empowered through their experiences of helping teach families within their own communities, especially when they were “able to gain participant’s trust,” and felt an improved

sense of self-esteem going forward (*Barriers and Facilitators*, 72, 82). So by highlighting the ability of the farmworkers themselves (in the form of promotora work), building trust and communicating with these communities can also improve.

Conclusion

Farmworkers across California's Central Valley and Central Coast face a variety of challenges that are typically overlooked. Many health and safety concerns affecting these workers were highlighted as well as things that are being done in order to ease some of these challenges. Promoters are a catalyst for change in these communities. Farmworkers face many dangerous conditions, environmental hazards, and limited access to healthcare. Promotores are trained on essential topics such as illness prevention, heat exposure, mental health, and air quality in order to educate other farmworkers on how to best protect themselves in their homes and workplaces. Their role is so valuable in bridging the gaps in knowledge and resources to empower workers to navigate systemic barriers, including hazardous working conditions, violations of rights, and challenges that are tied to documentation status. Promotores are the backbone of safety within these vulnerable populations. California farmworkers play a vital role in sustaining California's economy and must be protected. The importance of their work is exemplified through stories from Sally Tirado. Her life story shows how important each person's role is in making a change. By looking at the lived experiences of farmworkers and hearing stories such as Sally's, it is evident that there is a need for targeted interventions. Addressing systemic inequalities, enhancing workplace safety regulations, and expanding programs such as training more promotores are essential steps toward a future where the health and rights of California farmworkers are protected.



Chapter 4: Reskilling

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Farmwork is a notoriously difficult job that has been connected to a variety of health risks. Additionally, its low pay and inconsistency leaves the majority of California farmworkers, most of whom are immigrants, living in poverty. Although the harsh nature of farmwork, low pay, and unsustainable living conditions may one day be mitigated by policies, activism, and social change, the immediate dangers faced by farmworkers in their everyday lives are vitally urgent to attend to at present. They are exposed to irreversible risks such as carcinogens, serious injury, and death, which cannot afford years of waiting for solutions. Educational development to help them move into other professions may be one way to alleviate some of these risks and help farmworkers attain a higher quality of living. This section aims to look at the effects of agricultural technology on job availability and health, various barriers to access for educational opportunities, and K-12 education for farmworker families.

Agricultural Technology

The general topic of agriculture technology (AgTech) encompasses many different aspects of reskilling, making it a helpful example to dissect as an introduction to the issue with reskilling. Although AgTech can help to create higher-skilled agricultural jobs, it also puts lower-skilled jobs at risk of being replaced. Additionally, we will discuss how it can both help and harm farmworkers' health; this makes AgTech a very complex topic with many different facets to explore in relation to farmworker health.

AgTech has transformed traditional farming practices through innovations that strengthen productivity, sustainability, and efficiency. Its purpose is to tackle critical issues such as climate change, food security, resource management, and labor shortages. This section will focus on four main dimensions of current AgTech: precision agriculture, automated machinery, genetic engineering, and sustainable farming practices. AgTech, with its potential to completely revolutionize how we grow our food and how it is processed and distributed, reassures us about the future of farming. It enhances productivity and sustainability across the agricultural industry (Bashiru et al., 2024).

Utilizing technology to address specific agricultural needs sits at the core of this transformation. Precision agriculture combines GPS mapping, sensors, and Internet of Things (IoT) devices to monitor and manage crop conditions while reducing adverse health effects on farmworkers. It collects data on different variables such as soil moisture, nutrient levels, and weather patterns, empowering farmers to make data-driven decisions (Bashiru et al., 2024).

Automation and robotics are the second essential dimension of AgTech. It features autonomous tractors, robotic harvesters, and drones (Mathushika et al., 2022). Genetic engineering and biotechnology extend the possibilities of agriculture by enabling genetic modification and enhanced resistance to pests, diseases, and environmental stressors (Adamsone-Fiskovica and Grivins, 2024).

Monterey, San Benito, and Santa Cruz counties contain many programs geared toward supporting the inclusion of AgTech because of the necessity of enhancing California's farming—concentrated on the Central Coast. Especially with the effects of climate change, farmworkers are struggling with water scarcity, rising temperatures, soil degradation, and high market demands (Feddema and Freire, 2001). Addressing the skill gap calls for educational

programs to be created to respond to the agricultural sector's needs. These three counties have many institutions tailored to providing adult education and hands-on training opportunities.

This section will explore the role of AgTech in modern farming and the skills necessary for its use in the agricultural industry. By examining these elements, we aim to highlight the role of AgTech in sustainable agricultural practices that ensure the long-term success and resilience of farms on the Central Coast.

The Role of Agricultural Technology in Modern Farming

As climate change continues to cause extreme challenges for California farmworkers, AgTech emerges as the innovative response method. Especially when considering that climate change is not the only challenge—population growth and resource scarcity—AgTech’s combination of advanced technologies and agricultural practices is just as advantageous as it is essential. The past two decades have seen tremendous technological leaps, which have reshaped the agricultural industry. These innovations have become almost indispensable for achieving food security while minimizing environmental impact (Maja and Ayano, 2021). This section will provide a holistic overview of each element of AgTech and deliver its benefits, instilling a sense of hope and optimism in the audience.

Precision Agriculture

Precision agriculture combines Global Positioning Systems (GPS), remote sensing, Wireless Sensor Networks (WSN), and the Internet of Things (IoT) to minimize inputs such as water, fertilizer, and pesticides. These innovative tools not only boost productivity, but also reduce the negative impacts of farming on the environment, representing a cornerstone of

sustainable agriculture (Stafford, 2022). It is based on the fact that within-field variables, such as soil properties and crop conditions, can vary across a farm due to differences in environmental factors. Precision farming allows farmers to gather large amounts of data, analyze it, and apply inputs as needed by utilizing technologies such as satellite imaging, sensors, and drones. GPS systems from the late 20th century were among the first tools for precision agriculture, allowing location tracking within fields (Stafford, 2022). Modern precision agriculture now includes IoT-based systems, connecting sensors, drones, and satellites to provide real-time information about crop health, soil conditions, and weather patterns. For example, spectral imaging technologies, such as the Normalized Difference Vegetation Index, utilize near-infrared and red light to examine crop health, allowing farmers to understand nutrient deficiencies or stress early (Shafi et al., 2019).

This innovative method of targeted assessment offers a plethora of benefits to farmworkers. Firstly, there is enhanced productivity and cost efficiency. By limiting the amount of resources used to only the bare necessities, waste is reduced, and yields are enhanced simultaneously. Variable-rate application systems allow fertilizer to be applied only in areas with deficiencies. By not over-fertilizing, farmers can improve nutrient uptake without unnecessary nutrient implantation. It reduces the use of chemicals that further damage soil content and poses an extreme health risk to farmworkers exposed to them for long periods (Stafford, 2022). Another benefit is environmental sustainability. A significant driver for precision agriculture is its ability to mitigate environmental impacts. Runoff and pollution are significantly lowered when precision agriculture is used to apply water, fertilizers, and pesticides only where needed. In addition, remote sensing enables farmers to monitor for water stress and manage their irrigation efficiently. This is incredibly effective for farms in water-scarce regions (Shafi et al.,

2019). With WSN measuring things such as soil moisture, temperature, and humidity, farmers can respond immediately to changing conditions. This adaptability is extremely valuable and enhances the decision-making process. Consumer confidence is a major aspect of the agricultural industry. With GPS and data logging systems, detailed records of field treatment can be kept, increasing transparency, ensuring compliance with food safety standards, and enhancing trust in the market (Stafford, 2022).

Precision agriculture is a new vision for farming that blends technological innovation and sustainability principles to meet the demands of modern agriculture. It contributes explicitly to this climate adaptation imperative by increasing productivity, resource-use efficiency, and resilience of food systems, leading to reduced environmental degradation. With the advancement of technology, precision agriculture will remain a front-line player in highlighting its central role in feeding an ever-increasing global population while protecting resources for our planet. The future of precision agriculture holds even more promise, with advancements in AI and machine learning likely to further enhance its capabilities and sustainability impact.

Precision agriculture has a notable impact on farmworker health. It reduces their exposure to hazardous conditions, such as direct contact with pesticides and long periods of manual labor. Pesticide exposure is known to cause acute and chronic health issues among farmworkers, and hard manual labor can cause musculoskeletal disorders (Damalas and Koutroubas, 2016). These changes, however, pose a risk to job security with a higher need for skilled labor. To counteract this, educational and training programs geared towards transitioning farmworkers into AgTech are crucial to creating the dual benefit of better working conditions and enhanced agricultural productivity.

Automation and Robotics

Robotics and automation have revolutionized agriculture by addressing labor shortages, optimizing resources, and enhancing sustainability. These technologies have integrated robotics, sensors, and artificial intelligence to make significant strides in various agricultural practices. This section will examine the current applications, benefits, and challenges of robotics and automation in agriculture.

Robotics have been used to perform labor-intensive, repetitive tasks requiring immense precision. Harvesting and picking robots are a great example of advanced sensors and artificial intelligence and their ability to identify and collect ripe fruits and vegetables—a task that would have required immense time and dedication to complete otherwise. Technologies like Agrobot’s strawberry harvester represent this cutting-edge technology (Lemay & Boggs, 2024). Weeding robots, such as FarmWise’s Titan, utilize machine learning and computer vision to target weeds without damaging the surrounding crops, reducing the reliance on herbicides and greatly diminishing the environmental impact (Oliveira et al., 2021). Automated irrigation systems adapt to moisture levels to reduce water usage and promote sustainability. Additionally, automated crop monitoring systems use drones equipped with multispectral cameras to detect plant health issues and optimize interventions. These systems are only a few applications of automation and robotics in agriculture. They have significantly improved efficiency while simultaneously assisting with eliminating errors in assessing crop quality (Krishnan et al., 2021).

The benefits of integration are immense. These technologies require skilled workers, providing more avenues for people to reduce labor shortages. By performing strenuous tasks, robots overall improve working conditions and enhance farm productivity (Martin, 2021). It is important to note, however, that similarly to precision agriculture, it is necessary to properly

transition farmworkers into AgTech through training programs to counteract the loss of jobs. Automation also reduces operational costs by reducing resource allocation to only the essentials, promoting sustainability by minimizing environmental impacts through targeted interventions (Bazargani et al., 2024). Furthermore, automation and robotics applied to precision agriculture increase yields, contributing to food security by ensuring that supply can meet the demands of a growing population without overusing natural resources (Lemay & Boggs, 2024).

Despite these benefits, the integration of automation and robotics still needs to be improved. The first is a high initial cost, which might deter many farmers from investing in these technologies, especially the smaller farms in developing regions. Additionally, the complexity of operating and maintaining robotic systems creates a knowledge barrier that requires specialized training (Martin, 2021). Infrastructure issues, such as WiFi connection and power availability in rural areas, further hinder the application of these systems. Policy also plays a critical role. For example, using drones for agricultural monitoring has varying degrees of regulations, which can delay its implementation (Bazargani et al., 2024). Addressing these barriers is crucial to implementing sustainable practices in our farms.

Automation and robotics represent a shift in agriculture to address food shortages, inefficiencies, and environmental issues. While their implementation faces numerous economic, technical, and regulatory barriers, their ability to support farmers is undeniable. Fostering innovation and addressing these challenges can pave the way for a more sustainable and productive agricultural sector. Automation and robotics provide a similar benefit to farmworker health as precision agriculture.

Biotechnology and Genetic Engineering

Genetically modified organisms (GMOs) have changed crop production by enabling higher yields and reducing dependency on chemicals like pesticides and herbicides. Globally, GMO technology has resulted in a 22% increase in crop yields, particularly in regions with pests and diseases. Additionally, GM crops have reduced pesticide use by 37%. This has provided economic benefits to farmworkers while reducing environmental harm (Klümper, 2014). For example, *Bacillus thuringiensis* (Bt) cotton and Bt corn are engineered to produce natural insecticides, reducing the need for extra chemical pesticides to protect yields. The environmental benefits push beyond just pesticide reduction. GM crop cultivation significantly lowers greenhouse gas emissions. This reduction is because GM crop cultivation requires more conservative tilling practices, which are more feasible with herbicide-tolerant crops. It also decreases fuel consumption from fewer field operations (Brookes & Barfoot, 2016). This impact underscores the importance of GM crops in sustainable agriculture.

Advancements in genetic engineering tools, such as CRISPR-Cas9, have expanded the potential of biotechnology in agriculture. Unlike traditional GM techniques, CRISPR allows for precise editing of genes without introducing new DNA, making it more acceptable to regulators and the public. CRISPR has had significant success in developing crops with drought tolerance, disease resistance, and enhanced nutritional values (Paul & Qi, 2016). These advancements are crucial in addressing malnutrition and climate change-induced crop stress.

Despite its promise, social norms and regulations hinder the widespread adoption of biotechnology. Public perception of GM food is influenced by trust in regulatory institutions, ethical considerations, and perceived risks and benefits. Acceptance of GM foods is higher when consumers can see actual benefits, such as improved nutrition or reduced pesticide exposure (Cui

& Shoemaker, 2018). Regulatory landscapes further complicate the integration of biotechnology and genetic engineering. For example, the United States and the European Union have adopted different approaches to regulating GM crops. The U.S. focuses on the end product, while the E.U. emphasizes the production process, requiring stricter regulations (Skogstad & Moore, 2008). These differences impact international trade and innovation, as well as the adoption of biotechnology.

The future of biotechnology and genetic engineering rests in continued innovation and addressing the societal and environmental challenges. Building public trust is crucial. This can be done through transparent communication and by demonstrating the actual benefits of GM crops. Creating regulatory frameworks that are the same throughout the international community will also ensure that innovation is not occurring in any one country but worldwide. They have proven to be transformative tools that can address global food security, environmental sustainability, and climate change. As technologies like CRISPR continue to evolve, they will continue to address challenges that arise by providing a different avenue. By addressing these barriers, biotechnology can significantly contribute to a more resilient and sustainable agricultural system.

Biotechnology and genetic engineering provide benefits similar to farmworker health in the previous two AgTech fields; however, those benefits are pronounced differently. Firstly, reduced pesticide exposure is derived from the creation of Bt crops. These crops have developed pest resistance, which reduces the need for chemical insecticides (Datta, 2013). The protection from excess manual labor stems from herbicide-tolerant GM crops, which allow for effective weed control. This reduces reliance on manual labor and mechanical weeding, protecting farmworkers from overworking (Das et al., 2023).

Mechanization's Effects on Job Security

The term 'mechanization' refers to this process of using machinery or other technology, such as the use of animals, to perform tasks traditionally done by hand. This thereby replaces the need for manual labor, especially for labor consisting of tasks considered to be 'unskilled.' The major draw of mechanization is that many farm tasks can simply be done faster by machine than by hand, which can benefit farmers financially since they can accomplish work more productively and without the need for as many employees (Peng et al. 2022). On the other hand, however, mechanization has been criticized for contributing to a decrease in the number of available low-skill agricultural jobs (Pingali 2007).

As machines take over tasks such as harvesting, which is a primary role for seasonal farmworkers, then these workers may find it even more difficult to obtain employment. A classic example of this is given by Philip Martin (2003, 19-20) describes the decline in farmworker employment during the 1960s due to mechanization. He discusses how the invention of the mechanical tomato harvester by engineers at UC Davis resulted in the amount of farmworkers hired to harvest tomatoes by hand decreasing by 90%.

In a different article, Martin (2002) notes that agricultural mechanization in the 1960s had been expected to lead to an industry in which people enter as unskilled laborers, but then eventually move their way up to higher-skilled positions within agriculture. In other sectors, this type of industry relied on the existence of unionization and negotiation with employers. However, economic and political shifts in the following decades, including the rise in undocumented immigrant workers as well as the separation of farmworkers and farm management due to intermediaries, weakened the capacity for collective bargaining. This

contributed to the current situation in which immigrant farmworkers in the U.S. have poor upward job mobility and are often unable to find employment once they age out of farmwork (Rotz et al. 2019).

More recently, in the 21st century, new AgTech has substantially focused on robotics, digital agriculture, and precision agriculture. These types of technologies tend to require a much higher degree of skill to operate than previous machinery. Like earlier advancements, these technologies also aim to increase efficiency and reduce costs, but with a particular focus on optimization through the use of computers (Klerkx and Rose 2020). While prior innovations such as tractors and combine harvesters required much less formal education to operate, newer technologies tend to call for a much higher degree of educational attainment. This puts farmworkers at risk of being pushed out of agricultural employment opportunities if they do not meet the educational requirements for operation of this advanced technology.

One example of this is with drone operation. The U.S. Department of Federal Aviation Administration lists the eligibility requirements for a commercial drone license as being at least 16 years of age, being able to read, speak, and write English, being in adequate physical and mental condition to fly a drone, and to pass an exam on aeronautical knowledge. (“Become a Certified Remote Pilot” 2024). The process to actually obtain the remote pilot certification requires a series of applications and appointments to confirm eligibility, many of which must be done online. It also requires an official background check, creating a significant roadblock to applicants who are undocumented immigrants. Additionally, the requirement for English proficiency serves as a further barrier to entry for farmworkers, a demographic that is largely Spanish speaking. It is clear from these requirements that farmworkers, especially those who are immigrants, are not the target population for remote drone operation jobs. Although the

requirements are entirely reasonable considering the amount of knowledge needed to safely and effectively operate a commercial drone, the problem lies in the fact that drone use can replace jobs previously performed by farmworkers. However, farmworkers are often unable to obtain the training necessary to work with such machines, ultimately pushing farmworkers out of jobs all while blocking their access to the new roles that are created.

AgTech is advancing at a remarkable pace. Some crops, such as strawberries, were previously considered to be challenging candidates for automated harvesting. Not only are the fruits small and fragile, but they also require a level of expertise in determining their ripeness before harvesting (Christiaensen et al. 2020). Despite strawberries' prior reputation for being difficult to harvest by machine, the University of Essex recently reported their invention of a machine capable of picking strawberries with significant efficiency, picking one fruit per 2.5 seconds ("Strawberry-picking robot to speed up harvest and tackle labour crisis" 2024).

Although it may still be some years before this machine is fully accessible and implementable to the public, this example of the strawberry harvesting machine showcases the speed at which agricultural research and development is moving. Even if many farms are not currently set up to be able to make proper use of robotics, automatic machinery is still predicted to eventually replace manual labor, making it more a matter of 'when,' and not 'if' mechanization will take over jobs historically done by hand (Prause 2017).

Extensive research has been done to predict the future growth of automation across a variety of industries. Unlike mechanization, which uses human operators for machinery, automation uses computers to control machinery and requires limited human involvement. Nevertheless, the concepts still share the similarity of replacing manual labor through the use of new technology; both pose a threat to the job security of low-skilled laborers. In 2013, Frey and

Osborne estimated that 47% of the total employment in the U.S. was at high risk of becoming automated before 2030, with agricultural workers being part of that high risk group. Researchers at the Organisation for Economic Co-operation and Development elaborated on this statistic by studying which jobs in particular were the most endangered by automation (Nedelkoska and Quintini 2018) It was found that the agriculture and hunting industry had the highest likelihood of all industries to be automated, with a mean probability of automation of 57%. They noted that a common characteristic of jobs that were most likely to be automated was a low level of required education for that position. Demand for skilled labor over unskilled labor has increased substantially during the past century and this trend is expected to continue (Katz and Margo 2013). Since farmwork does not require any specific skills, this puts it at extremely high risk of being replaced by modern AgTech. Conversely, the characteristics of jobs reported by Nedelkoska and Quintini to be least likely to suffer from automation included high educational requirements, problem-solving, creativity, and social interaction. These traits should be taken into account when considering the potential industries that are the most stable to transition into. Farmworkers, however, face significant barriers when it comes to obtaining these types of jobs, making employment in those industries far less likely to be realized than for lower-skilled professions.

There does not appear to be a common consensus on the effects of mechanization on labor demand in the future. Christiaensen et al. (2020) claim that the extent of the outcomes of mechanization is not possible to predict due to the economic effects of substitution and scale. They argue that mechanization may not reduce the number of employment opportunities when substitution effects are outweighed by scale effects. In other words, mechanization allows farmers to expand their farms and grow more crops, which may in turn create more jobs for

farmworkers. However, if paying wages is less cost-effective than paying for machinery, then farmers may instead be inclined to substitute machines for manual labor. Both outcomes have been observed in different regions of the world, indicating that the effects of mechanization vary depending on factors specific to the circumstances of individual areas (Christiaensen et al. 2020). Since mechanization affects different communities in unique ways, this suggests the importance of local involvement in aiding farmworkers. Those most familiar with a certain community will naturally know its struggles more intimately than outsiders, and will therefore have an advantage in devising more personalized solutions.

Labor Fragmentation

Another considerable concern is the potential for labor fragmentation within a labor force on a farm (Prause 2017). This predicted stark division of agricultural workers based on skill level is summarized clearly by Rotz et al. (2019):

More pointedly, it appears that the technophilic promise of [agricultural technology] will likely displace existing agricultural labour hierarchies with a radically bifurcated labour market, where on the one side, highly-skilled, highly-trained workers use digital agricultural technologies to increase productivity and find evermore efficiencies, while on the other side, lower-skilled workers in the fields, greenhouses, processing plants and warehouses are subject to increased employer scrutiny and surveillance, further rationalization of their workplaces, and ever-escalating expectations of productivity.

Prause discusses how, with new technology requiring more highly skilled laborers, this may separate workers due to their now vastly different tasks and wages, which in turn diminishes the ability of a workforce to organize. This is important to consider since farmworkers already

struggle to advocate for their rights to their employers (Martin 2003), so additional barriers to unionization will only further prevent farmworkers from achieving safe and fair working conditions through collective bargaining. The agricultural sector already heavily exploits low-skilled farmworkers, but the deepening segregation of farm employees due to AgTech will only serve to worsen the issue.

Benefits vs. Risks of Agricultural Technology

Adding on to the earlier discussion about the benefits of AgTech, one common argument in favor of new technology is that it can decrease certain health risks associated with farmwork, overall creating a safer environment for workers (Rotz et al. 2019). For example, the use of drones for spraying pesticides, compared to other methods such as spraying by hand, is thought to allow smaller amounts of pesticides to be used due to improved precision of where they end up being sprayed (Yallappa et al. 2017). It has been argued that this can reduce farmworkers' exposure to pesticides, however one study found that the exposure to pesticides is not isolated to the spraying phase of pesticide application. Although exposure is highest during spraying, farmers and farmworkers are also exposed while loading the concentrated pesticide product into the sprayers and while cleaning the spraying equipment (Christos and Koutroubas 2016), as well as exposure while working in fields that have been exposed to pesticide treatment (Burns et al. 2007).

This case demonstrates the difficulty in accurately assessing the impact of new technology on farmworkers. Many sources state that drones usage for pesticide spraying will help reduce farmworkers' exposure, but this may only be true for one part of the pesticide spraying process. Whether using drones or handheld sprayers, a worker will still need to load the

pesticides into the equipment and clean it after use, and farmworkers harvesting crops in treated fields are still exposed if proper personal protective gear is not properly utilized. Although drones are a step towards reducing pesticide exposure in farmworkers and for the environment, the extent of benefits on health must be carefully examined and considered in contrast with the risks that modern AgTech poses in terms of job scarcity.

AgTech does also have the potential to support farmworker health as well. Aiello et al. (2021) detail a small wearable device for farmworkers which tracks vibration data. Vibrations can originate from hand tools and machinery used by workers, such as hand-held harvesters or shakers, and can cause a variety of musculoskeletal disorders. This study found that this sensing device for vibrations was able to accurately measure the vibration risk and exposure in Italian farmworkers. They propose that this technology could be used in the future to better monitor the health of farmworkers and assure that they are not overexposed to vibrations. Another way in which digital technology can be used to enhance farmworker health is seen in the online map on the *Campo-Sano* app that is being developed. This map allows local farmworkers to view nearby environmental hazards such as temperature and air quality, which can in turn allow them to make more informed decisions about addressing those health concerns. When implementing new AgTech with the aim of helping farmworkers, it is important to consider potential barriers that may prevent those technologies from being used at their full potential. These types of personal technologies may still require people, such as *promotoras*, to spread word of the technology and help to teach the community how to make use of it. In addition, education about the risks themselves is still vital since this can allow farmworkers to understand the impact of health risks and be able to make more informed decisions using the provided risk data.

Ultimately, the decision for farmers to use technology or not will likely be made on a financial basis rather than for the socioeconomic and health benefits of farmworkers (Ruzzante et al. 2021). By enhancing productivity, mechanization can in turn lower production costs and increase profits, making it incredibly appealing to farmers wanting to increase their revenue (Pengali 2007). The risk posed to farmworkers' job security by modern AgTech underscores the necessity for reskilling opportunities. Many farmworkers report being unable to miss even one day of work because even that small amount of income is incredibly vital to paying for rent, bills, and basic necessities (Thierry and Snipes 2015). If missing one single day of income is such a high risk for farmworkers, then the health and wellbeing risks that would stem from longer periods of unemployment due to job scarcity would be even more detrimental. In order for technological transitions to be socially sustainable and conducive to farmworker's health, we must recognize the ways in which marginalized communities are affected and find ways to support them without leaving them behind.

Adult Educational Resources

The future of agriculture in California will strongly focus on AgTech and the skills required to fill the jobs that become available appropriately. With its focus on precision farming, automation, and genetic engineering, specialized skills are required that are only sometimes readily available within the existing workforce. To address this gap, educational programs in Monterey, San Benito, and Santa Cruz counties provide adults with the opportunity to gain the knowledge and expertise needed to excel in modern agricultural practices. These programs bridge traditional farming methods with cutting-edge technologies, ensuring farmworkers are well-equipped to meet the demands of an ever-evolving industry.

The first program is the University of California Cooperative Extension Programs (UCCE). Santa Cruz County offers this program to equip farmers, agricultural workers, and industry professionals with the skills to adopt cutting-edge technologies. UCCE programs focus on combining scientific research into practical applications to emphasize both efficiency and sustainability. The Climate-Smart Agriculture Program is the flagship initiative of UCCE, training participants on implementing practices that reduce greenhouse gas emissions, improve soil carbon storage, and optimize water usage. Additionally, UCCE offers workshops on soil mapping, drone usage for crop monitoring, and variable rate irrigation. These are all critical components of precision agriculture. UCCE helps farmers improve yields, reduce environmental impacts, and lower operational costs by showing farmers how to adopt data-driven and resource-efficient practices (University of California).

The following program is the Monterey County Workforce Development Board (MCWDB). This provides targeted training programs to prepare workers for AgTech. MCWDB offers courses in mechatronics, automated irrigation systems, and robotic engineering tailored to the agricultural sector. This program also creates opportunities for hands-on experience with advanced machinery and technology. Participants gain the practical skills needed to become fully immersed in the automation and robotics aspect of AgTech. The MCWDB's partnerships with local agricultural employers ensure that the training aligns with industry demands (MCWDB).

The third program is the Economic Development Corporation (EDC) of San Benito County. This program plays a vital role in fostering innovation and entrepreneurship in agriculture. The EDC can connect local farmers and AgTech entrepreneurs to resources, mentorships, and advanced technologies through partnerships with organizations like the Western Growers Center for Innovation and Technology. Their workshops focus on key areas

such as precision farming, data analytics, and sustainable crop management. While the EDC is designed to help participants integrate modern technologies into their operations, it also supports startups developing AgTech solutions by providing access to funding opportunities and industry networks (EDC, 2021).

These three programs are just a few examples of educational opportunities to meet the demands of this evolving industry. Many of the skills learned apply to AgTech and many fields outside the agricultural sector. By gaining the skills and knowledge these programs offer, individuals can set themselves up to earn higher-paying, more sustainable employment in agriculture or begin a new career path outside of the industry. This mobility provides safety nets for farmworkers who have experienced labor shortages due to climate change. For all three of these programs, enrollment requirements vary depending on the specific program a person would like to attend. To get the correct information, it is recommended to contact these organizations, but all of them are available to farmworkers and have resources available in other languages to assist with accessibility. By completing all three of these programs, farmworkers would experience an increase in wages due to the skilled nature of their newly earned roles.

Future of Agricultural Technology

AgTech is a new wave of innovation transforming agriculture and gaining importance due to its role in facing some of the significant challenges the agricultural world faces today. Precision agriculture, automation, biotechnology, and genetic engineering are just a few ways AgTech is improving productivity and sustainability while helping farmers and farmworkers develop the skills needed to navigate the industry's evolving demands. Such innovations are

significant in the Central Coast region of California, where climate change, scarcity of resources, and market pressures strain the agricultural workforce and the land.

AgTech assures us of this bold perspective, combining technology and engineering with agricultural science. It has employed precision agriculture, a data-driven approach that reduces resource use while optimizing yield. Automation and robotics reduce labor gaps and enhance working conditions, and biotechnology provides more resilient, nutritious, and sustainable crops. Combined, these technologies allow for reducing the ecological footprint of farms so they can better withstand the climate and economic threats they will face in the coming years.

Educational programs exist that help empower the workforce to use these technologies profitably. Monterey, San Benito, and Santa Cruz counties institutions offer skill gap training in AgTech for farmworkers and other industry professionals. Through programs like UCCE, MCWDB, and EDC, technical skills are cultivated alongside innovation, entrepreneurship, and practices that promote sustainable living, helping the agriculture sector stay competitive and viable to all.

A future for our agricultural industry and the livelihood it supports can be achieved through AgTech, education, and workforce development. These technologies are growing and promise to address the dual challenge of feeding the growing world while saving the planet for future generations. That transformation has already begun—when it comes to innovation and forward-thinking programming, the Central Coast is leading the way, creating a blueprint for agricultural innovation worldwide.

Socioeconomic Status as a Barrier to Education

Socioeconomic status (SES) in the past has been used as a key indicator of an individual's social class within society. It takes into consideration a variety of different factors such as education level, employment status, income, and access to basic needs such as food and housing. Vulnerable populations, such as farmworkers, often experience significant socioeconomic barriers including “low income, lack of educational attainment, stress, poor job security, unstable family relationships, exposure to discrimination, and poor housing” (Marsh et al. 2022). All of these barriers create moments of adversity with chronic stress affecting not only the individual but their families as well. The sources of stress are surrounded by the concept of socioeconomic status, revolving around trauma, chronic pain, hunger, fear for personal safety, worry about finances, interpersonal conflict as well as excessive caregiver burdens (Marsh et al. 2022). If provided with the adequate resources and benefits, much of the stress correlated to these challenges could be minimized and improve their overall quality of life. However, failure to acknowledge and address these issues lead to long term both physical and mental health problems. It is not only the farmworkers' health being considered here, but also their families and the environment they are in as well.

Overview on Housing

Marsh et al. (2022) stated that one’s housing and neighborhood can “negatively or positively impact farmworker children’s educational outcomes which, in turn, strongly affect their health as adults and the health of their children.” Looking beyond, housing determines the quality of access to education, freedom from stress, and different sources of reliable health information and prevention services which is crucial in children's lives. It is also important to

address the term “household chaos”, excessive chronic noise pollution related to specific stress related health outcomes and how these negative health effects can actually be passed down to children of stressed mothers (Marsh et al. 2022). This highlights the long term impact that socioeconomic barriers restrict among farmworkers and their families.

The housing available to farmworkers ranges, however the options are not always the best. Farmworker housing types can consist of trailers, apartments but with severe overcrowding (four families in a two bedroom apartment), single family dwellings, motels, and “back houses” or garages. There tends to be overcrowding, family conflict, and increase in stress levels relating to sharing housing with unrelated members, extended family households, and the presence of unaccompanied males (up to eight people in some households) (Marsh et al. 2022). Housing is a greater issue that needs to be addressed and the detrimental effect it can have on an individual's health.

Local Affordable Housing Initiatives

At the county basis, there have been several different initiatives that aim to fill the gap between local farmworkers and accessibility to safe and affordable housing. In Santa Cruz County, there is the US Department of Agriculture-Rural Housing Service (USDA-RHA) Program (California Department of Housing and Community Development 2024). It is organized and run by the Housing Authority of the County of Santa Cruz and their main goal is to provide affordable housing to households where at least one household member earns a substantial portion of their incomes as farm laborers, and with the condition they are either a U.S. citizen or legal resident. USDA-RHA is designed to allow farmworkers to stay for as long as they remain eligible, providing stability for farmworkers and their families. It is also programmed in a way to

benefit and help out farmworkers, with a “flat rent” their cost of living will not change due to the family's income and it will also provide financial stability knowing they have a consistent rent payment every month (California Department of Housing and Community Development 2024). In Monterey County, as of October 2024, a new project was developed through the Community Housing Improvement Systems and Planning Association (CHISPA). From a farmworker housing grant, the Alfred Diaz-Infante Apartments were constructed and have since provided around 66 homes for low income residents, with 43 being reserved for agricultural workers and their families. The neighborhood and quality of life was also considered to benefit the residents as it is an all-electric building with onsite services including a community room, patio and children play areas; making it accessible and achievable for families. It is also conveniently located near jobs, schools, public transit and vital services ensuring the neighborhood and environment children of farmworkers are in is ideal for their advancement and development (California Department of Housing and Community Development 2024). Since the 1970s San Benito County has enacted the Migrant Housing Center Program, which is administered from the County of San Benito Health and Human Services Agency (County of San Benito Health and Human Services Agency 2020). The Migrant Housing Center offers farmworkers subsidized housing from the months of May through November, which is peak harvest season. While not long term, the program is able to help the farmworkers in their most important months with safe affordable seasonal housing, as well as a variety of support services for both farmworkers and their families. They provide supplemental support resources such as Migrant Education, Health Education, Bookmobile, Church Groups, Community FoodBank of San Benito as well as Girl Scouts activities and the presence of the First 5 San Benito (County of San Benito Health and Human Services Agency 2020). These resources aim to address the various socioeconomic

barriers in farmworker families' lives, ensuring their health, education, food, and social well-being needs are met. As of June 2024 in Fresno County, new affordable housing developments opened to low income residents, with the main focus on providing housing opportunities to agricultural workers and their families. They aim to provide 60 homes to agricultural workers, specifically those individuals and families earning 30-60% of the area median income (California Department of Housing and Community Development 2024). Similar to Monterey County, the complex is for both commercial and civic use including a community building and laundry facilities, outdoor amenities such as a barbeque area, children play area, half-basketball court and even a community garden. It is also climate conscious with sustainable energy solutions such as solar paneling. These efforts demonstrate the commitment and need to improve the livelihood and quality of life for farmworkers (California Department of Housing and Community Development 2024).

These county-level initiatives have represented the vital needs toward addressing housing and socioeconomic barriers that are faced by farmworkers and their families. By providing various affordable, secure and stable housing as well as integrating essential services including education, healthcare and community engaging opportunities, they improve their living conditions as well as their overall and long term well-being. Recognizing the intersection that lies between housing and other barriers such as access to transportation, job opportunities, and support systems, they aim to minimize these common and often overlooked disparities.

Counties' Financial Impact

Santa Cruz County specializes in agricultural crops including: primarily berries, leafy greens, wine grapes and assorted vegetables (Rance 2024). As of 2022, the total crop values were

\$666,955,000 dollars and 60% of this total economic activity is attributed to berries (Santa Cruz County 2023). This is a significant statistic given that California grows 90% of the nation's strawberries, with almost half of them being grown in the Watsonville to Salinas area (Rance 2024). In Monterey County, they specialize in growing strawberries, leaf lettuce and celery to name a few. Since 2019, there has been a 26% increase in strawberry value contributing to the local economy. Focusing on the direct agricultural contribution, Monterey County contributes over \$3.9 billion per year, in addition they contribute to the local economy over \$11.7 billion dollars. This is associated with the impact Monterey County has on the nation as well, as they supply 61% of the nation's leaf lettuce, 57% of the celery, and 56% head lettuce (Monterey County Farm Bureau 2022). San Benito County crop specialty ranges from spinach, lettuce, wine grape and salad mix. As of 2023, their agricultural production came to just over \$360 million (San Benito County 2024). Fresno County specializes in crops such as grapes, almonds, and tomatoes. As of 2023, Fresno County reported a total gross value of \$8.5 billion which was a 6.1% increase in comparison to the year prior (Fresno County 2024).

Such success and positive impact for the local community and nation would not have been possible without farmworkers. Upon analyzing these three counties, they cater to and specialize an immense variety of crops which later are seen at local grocery stores across the nation. How is it possible that farmworkers, who are the backbone and success of California, are denied basic rights and endure constant barriers in their day to day lives? Each county demonstrates significant economical boosts and benefits, and while these crops are cultivated and employ locals, at what cost is it? As previously stated, housing is a key stressor for many farmworkers and finding safe and affordable housing is a challenge. Many farmworker populations are low income, and as reported in the NAWS survey, as of 2021-2022, it was

reported that around 71% of farmworkers who completed the survey earn an annual income anywhere between \$500 and \$39,999 (NAWS 2023).

Climate Change and Socioeconomic Status

Climate change is defined as the long-term change in the average weather patterns across Earth's local, regional, and global temperatures (NASA 2024). It involves activities driven by human interaction such as the burning of fossil fuels and it results in an increase of heat trapping greenhouse gas levels in Earth's atmosphere (NASA 2024). As a result, Earth's average surface temperature has risen. Agriculture and climate change hold an intersection of effects, seen in the way that the rising global temperatures has had a detrimental effect on our nation's agriculture industry. This is especially significant given that the U.S. is a major crop supplier not only domestically, but globally as well. Studies have shown that the U.S. farms supply nearly 25% of all grains, including wheat, corn, and rice, that are on the global market (Khayat et al. 2022). This remarkable statistic emphasizes how much climate change is going to affect agriculture on the global scale and in the long term, but also the impact it will have on farmworkers' lives (Khayat et al. 2022).

Farmworkers' lives are going to be exacerbated with the detrimental effects of climate change, not only on their individual health but economically as well. It has been stated that "climate change is expected to impact agricultural production, leading to higher levels of poverty and food insecurity among agricultural workers" with farmworkers working reduced hours due to increasing heat stress (Khayat et al. 2022). It has even been predicted that by the year 2030, the agriculture sector will account for 60% of global working hours lost due to heat stress. Such loss of productivity is going to increase the amount of food insecurity and further lead to more

losses among this vulnerable population. This also brings awareness to the farmworkers of whom are undocumented, and will thus be unable to receive unemployment funds. This addresses a greater systemic issue which is often overlooked, undocumented farmworkers especially are going to face more severe effects as a result of climate change. A study found that agricultural workers experience four times higher levels of extreme poverty in comparison to their non-agricultural workers counterparts, in addition to the majority of farmworkers already experiencing poor socioeconomic conditions (Khayat et al. 2022). Farmworkers working legally in the U.S. when harvest seasons are over are able to receive unemployment benefits which sustain them and their families throughout the months they are not working. However, for undocumented farmworkers, they are unable to receive such unemployment benefits. Systemic barriers impede their ability to receive benefits and resources, such disparities are seen over and over. As of late September 2024, California's governor vetoed a bill that would have allowed undocumented immigrants to receive unemployment benefits (Kuang 2024). This is disappointing given that a majority of farmworkers, who are undocumented, reside and contribute to California's agriculture success. With such changing climate conditions, farmworkers are also expected to lose work days due to storms, periods of extreme heat as well as due to wildfires which is why such a bill would benefit many farmworkers here in California (Kuang 2024). Climate change is opening up the inequities that lie within our system and calls for greater action to be taken place.

Climate Resilient Practices

Climate resilient practices have been enacted in recent years, given the rising temperatures and the impact it holds on agriculture everywhere. Climate resilient is a concept of

climate risk management, entailing the ability of an agricultural system to anticipate, prepare, adapt and recover from any changes in climate and its extreme weather conditions (FAO 2021). It addresses issues brought up due to climate change including: cultivating climate-resilient crop varieties (growing crops that are more resistant to temperature and precipitation extremes), conservation agriculture (keeping crop leftovers, keeping land covered and rotating crops), agroforestry (growing trees alongside crops/livestock), water management (precision irrigation, drip irrigation, collecting rainwater), integrated pest, nutrient, and livestock management (EOS 2024). Such practices are essential to agricultural farms not only for the environment but the crop quality and outcome that it can produce as well.

Efforts towards integrating climate resilient practices here in California have already begun. In July 2024, California passed the California's Climate Resilience Bond which addresses a variety of climate solutions such as nature based farming practices as well as investments to improve historically underserved communities' access to healthy food and safe drinking water (Center for Food Safety 2024). It aims to create programs to help achieve those goals including: State Water Efficiency and Enhancement Program, Healthy Soils Program, Farmland Conservation, Farm equipment-sharing program, Local Food Infrastructure and Farmworker Safety and Well-being (FSW). For farmworkers, the FSW program would allocate funds for "energy-efficient retrofits for housing and safe, affordable drinking water infrastructure for farmworkers and their communities" (Center for Food Safety 2024). Being able to acknowledge the barriers in their health and ensuring those basic needs are met is important. By giving farmworkers the resources needed such as safe housing and clean water, it removes stressors and influences their ability in overcoming these barriers overall leading to a better work environment.

With such programs, it addresses our vulnerable communities and introduces as well as makes accessible federal solutions across California.

Introduction to Language Barriers

California is the primary host state for migrant farmworkers serving American agriculture. "Between $\frac{1}{3}$ and $\frac{1}{2}$ of all farmworkers in America reside in California, roughly 500,000 to 800,000 farmworkers" (Center for Farmworker Families 2024). Farmworkers are vital to the country's agricultural industry despite making up less than one percent of U.S. wages and salary workers (USDA 2024). However, many farmworkers, particularly those in California, face significant educational barriers. Farmworkers in the U.S. typically have an average education level of up to the ninth grade (National Center for Farmworker Health INC 2024). This limited education reflects systemic challenges and restricted opportunities in the Central Coast and the valley region of California, such as Fresno, San Benito, Santa Cruz, and Monterey Counties, where economic mobility and career advancement are often limited.

Countries and Their Lack of Education

To understand how language barriers affect farmworkers, it is essential to consider the countries where farmworkers originate from, including the education system within their origin country. According to the National Agricultural Workers Survey (NAWS), approximately 63% of Californian farmworkers are from Mexico, and 5% are from Central America (2019). Examining these countries individually highlights the challenges many face in obtaining a proper education in their native language. Farmworkers have an average educational attainment equivalent to the ninth-grade level (NAWS 2019). This is significant because farmworkers need more access to

education because they focus more on other priorities, making it more challenging to reach an average education within the United States, which creates these language barriers in the first place.

Education in Mexico

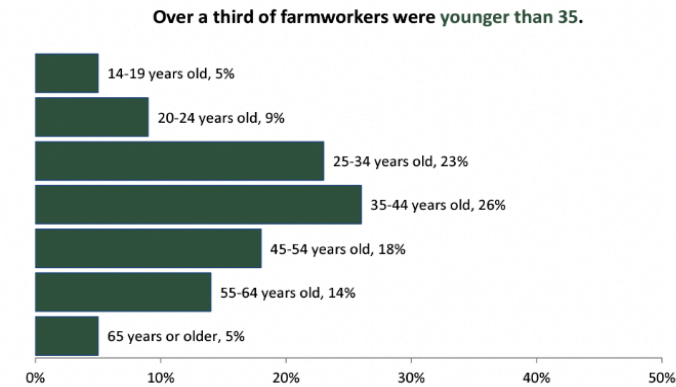
The article "*Education in Mexico*" briefly describes the Mexican educational system during the past centuries. It explains how the colonial period impacted Mexico's educational system, which the Catholic Church highly influenced. In addition, education was highly restricted for "aristocracy, clergy, and other ruling elites, while most indigenous people learned by way of oral tradition" (State University 2024). This is important because it already creates this stigma of not having access to education, especially for those less fortunate than others.

As time progressed, the article explains that compulsory education for children between 7 and 15 was introduced, and education gradually became more secularized (Monroy and Trines 2019). Significant changes occurred during the Mexican Revolution and World War II, including land redistribution and the onset of industrialization (World Education 2019). After these events, "Mexican authorities focused on eradicating illiteracy and advancing rural education and the inclusion of indigenous peoples. However, forming a national identity through education has been a challenge. Choosing Spanish as the language of instruction, for instance, resulted in high illiteracy and desertion rates among Indigenous peoples—a circumstance that caused the introduction of bilingual programs in recent decades" (Mexican Journal of Education 2016).

This information is tied to Mexico's relatively low-ranked education system. The Programme for International Student Assessment (PISA), a worldwide study by the Organisation

for Economic Co-operation and Development (OECD), evaluates students' performance in reading, math, science, and other subjects (Monroy and Trines 2019). Mexico ranked 46th out of

Figure 2.1: Age Distribution of Farmworkers, 2019–2020



In 2019–2020, unauthorized workers were younger than authorized workers (an average of 39 and 42 years of age respectively) and newcomers to U.S. farm work (i.e., those arriving in the United States within the year prior to interview) were younger than experienced workers (an

50 countries studied in 2018.

Mexico's math and science scores declined in 2022, while reading

scores remained stagnant since

2018 (Mexican Journal of

Education 2016). Mexico's low

ranking reflects the country's

failure to prioritize education,

which has affected many, including farmworkers. It is also noteworthy that those of higher socioeconomic status in Mexico had more access to education than those in rural areas, making farmworkers more vulnerable to language barriers (OECD 2022). The NAWS 2019 study indicates that over one-third of farmworkers were under 35, with most attaining an average education level similar to Mexico's rural regions. This is because "Lack of access to quality education is a root cause of poverty and economic hardship which in turn drive people to choose migration as a means of seeking job opportunities and improving their lives" (Kino Border Initiative 2024).

Overall, the educational system from past to present determines farmworkers language barriers. It connects to the region they originated from and how much it genuinely impacts their studies. In Mexico, "Education is perceived to be a static stage in [their] lives rather than the dynamic process in which the individual grows and [their] collective –society- can advance" (

Gutierrez Mendez 2024). Despite this being in Mexico, other countries, such as Central America, face similar challenges.

Central America's Education System

Central America's education system has been historically influenced by the Spanish colonization, which highly used the catholic church's religion. This history has led to uneven educational attainment across the region, creating a social hierarchy regarding who has access to education (Global Issue 2024). As Karla Rodas, a Salvadoran journalism graduate from the public University of El Salvador, stated, "The teachers have the knowledge, but the university falls short in technology; there is a lot of precariousness in that area." (Ayala 2024). This issue was echoed by Juan Pablo Escobar, the dean of the faculty at Rafael Landívar University in Guatemala, who stated, "I would not question the professionals and professors, but rather the structure, the logic behind it, the administration. The investment in public universities is not what would be expected; it does not achieve the desired impact" (Ayala 2024). Each statement can highlight the lack of educational prioritization of higher education institutions in these Central American countries. This creates a barrier in communication between many who need access to these resources, mostly made up of farmworkers.

However, many parts of Central America, despite Honduras, Guatemala, and El Salvador, have drastically increased their educational accomplishments in recent years. According to the International Trade of Administration (ITA), Central America has the best education systems for pursuing higher education (ITA 2024). Despite its growth in achievement in higher education, K-12 education and higher education systems have impacted many students, who face

“...inadequate infrastructure, limited resources, and socioeconomic inequalities” (Global Issues 2024). Understanding the connection between education and the limited quality of resources truly ties into the communication issues and how it creates a barrier for California’s farmworkers. One in twenty farmworkers is from Central America (Global Issues 2024), which shows how education in Central America impacts the level of education for farmworkers in the United States. In Central America, the United Nations Educational, Scientific and Cultural Organization (UNESCO) stated that “only 75% of students in the region complete primary education, and the dropout rates increase significantly in secondary and higher education” (UNESCO 2024). This correlates much with the NAWS study (2019), which shows the correlation between farmworkers dropping out and the highest level of education in the benign ninth grade. With that, “62% percent of students [in school] reach proficiency in reading and mathematics by the end of primary school” (Antonio Bosh and Consulting 2024). It demonstrates how farmworkers who are from better regions are more proficient in their language compared to farmworkers who live in oversized areas growing up and are less likely to be proficient in their native language, which genuinely affects one quality of language because, again if they are barely doing well in their school system, how can they succeed in the U.S. system of schooling?

Undoubtedly, the educational system in Latin America truly impacts California farmworkers today, such as the impacts of language barriers for farmworkers. Language barriers occur not only in the U.S. system but also through farmworkers native language. Examining the historical depth of this issue also reveals how Spanish colonization truly has impacted the education system in Mexico and Central America. Despite the end of colonization, little traces have been followed by farmworkers' educational system struggles in their country. With low test

scores, socioeconomic structures impacting access to education, and an overall lack of support for many, this will continue to be an issue, especially for marginalized farmworkers who have very low academic performance and completion.

The Lack of Language and Literacy

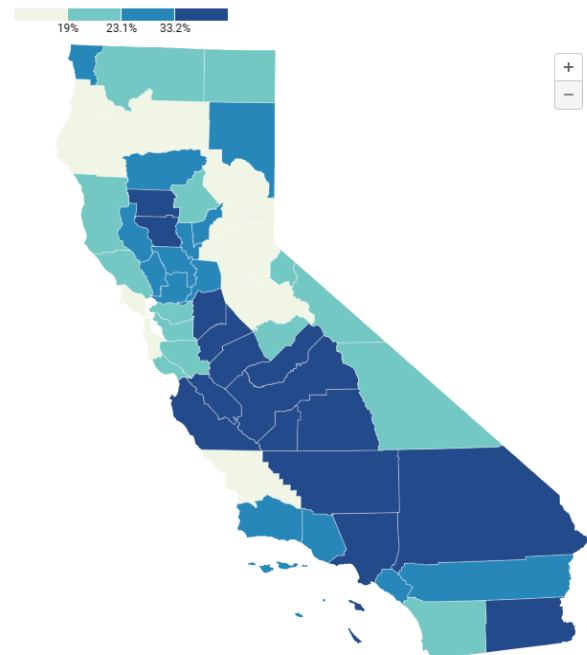
Language is “the principal method of human communication, consisting of words used in a structured and conventional way and conveyed by speech, writing, or gesture” (Oxford, 2024). Understanding the aspects of language is essential in determining how language barriers prevent many adult farmworkers from accessing educational opportunities. According to the NAWS (2019) study, in California, over 80% of crop workers (USDA: ERS 2024) identify as Hispanic or Latino. Of those, approximately 77% speak Spanish as their primary language, and on average, many have less than a high school education and only slightly over five and a half years of schooling.

There needs to be a comprehension of literacy within this information. According to the National Literacy Trust, literacy is the “ability to read, write, speak and listen in a way that lets us communicate effectively and make sense of the world” (National Literacy Trust 2024).

Literacy is vital because it impacts farmworkers ability to comprehend information in the English language. Approximately 35% of farmworkers comprehensively understand speaking or reading English (US Department of Labor 2019). This

California residents with low English literacy

The map shows the rate of adults at the lowest literacy level in English. These adults may have very basic vocabulary and be able to read short texts – or they may be functionally illiterate.



low English proficiency (LEP) can create tension in understanding topics in an educational and workforce setting. According to this statistic, “LEP is an independent driver of health disparities and exacerbates other social determinants of health” (Derrington and Espinoza 2021). This creates a barrier for many farmworkers; it is important to acknowledge that this issue is not limited to farmworkers; it also impacts the whole state. On average, California is ranked second with the lowest literacy rate for adults, and within regions, San Benito, Fresno, and Monterey are ranked the highest with adults with low literacy (PIAAC 2024). This showcases a migration pattern, particularly as Emma Gallegos, a reporter for EdSource, discussed on the podcast *how California can teach more adults to read in English*. Gallegos (2024) explained that this low literacy percentage comes from agricultural workers who, most but not all, immigrated to California, especially the central coast and valley.

Acknowledging this information demonstrates the barriers for farmworkers in various educational contexts. Gallegos interviewed a woman named Marcelina, who indicated that in her journey toward literacy, she explained why she kept off learning English due to one disparity of time: relying on her children. Most of all, what stopped her was that she was ashamed to speak (Gallegos 2024). Knowing how much literacy impacts a person's insight creates vast challenges restricting farmworkers ability to access educational advancements. This creates a dual barrier: farmworkers struggle with English literacy and lack proficiency in their given language. This issue has expanded beyond many individuals, affecting them in the community they are living in and contributing to expanded disparities in economic mobility and access to resources.

Effects on Confidence and Motivation

The challenges associated with language barriers are often overlooked and impact farmworkers' educational journeys. Many farmworkers LEP creates stigmas about communicating in English more effectively, alienating them and creating frustration, isolation, and inferiority. According to a paper it highlights that "Individuals with LEP [(Limited English Proficiency)] can become wary that they are being victimized or stigmatized as a result of their difficulties with language and communication or worry about interpersonal discomfort and embarrassment that could lead to social isolation, undermine self-worth, and eventually cause negative psychological consequences" (Mui et al. 2007). This ties into how LEP genuinely impacts farmworkers by noticing how California is ranked second with the lowest literacy rate (PIAAC 2024). It shows how much of a mental block they are in within their self-worth, which causes a negative perception of trying to advance their educational understanding. In Monterey County, studies have shown that farmworkers frequently internalize these negative perceptions, which impact their lack of confidence in their academic abilities. Self-doubt results in higher dropout rates, as many perceive their struggle as unfixable (Muñoz et al.2022). Lastly, another factor that ties into the effect of adult farm workers not wanting to outline their education journey is relying on other family members, especially their children. Virginia Vasquez, a 16-year-old student, was her family's primary translation source. "My parents had the jobs they wanted," Virginia says in the film. "They studied, went to a university, and got their degrees. But here, you start over. ... They do not get English classes like mine. They are at work, doing everything they can for my brother and me (NBC News 2023).

While Language barriers are still a consistent issue, various factors, such as the country of origin of farmworkers, low literacy rates, and limited access to education, create issues for farmworkers to advocate for and advance their academic and professional careers. Factors like these create restrictions on access to resources, creating feelings of isolation and undermining farmworkers confidence, which leads to reduced motivation and increased dropout rates. In addition, the Latin American educational system continues to perpetuate cycles of limited opportunities for advanced education. Even though there are limitations in language barriers for farmworkers, within California, there are many English as a Second Language programs, adult education courses, and career advancement programs that help ease the way for farmworkers to gain access to the education they desire and need to be successful in the future.

Undocumented Status as a Barrier to Education

Monterey County also has one of the highest concentrations of undocumented farmworkers in California, with estimates suggesting that up to 75% of the workforce lacks legal status. The implications of this are profound, affecting not only access to financial aid and higher education but also the overall well-being and security of these families (Aguirre and Flores 2019). Fear of deportation permeates many aspects of life for undocumented farmworkers, discouraging them from seeking medical care, reporting unsafe working conditions, or enrolling in educational programs. The Monterey County Farmworker Resource Center, has been instrumental in providing resources to undocumented individuals, such as information on tenant rights, health care access, and language translation services. Collaborations with local organizations like Mujeres en Acción have furthered outreach. However, the scale of the need far

outstrips the resources available, requiring ongoing advocacy to ensure these programs can expand and reach more families (National Center for Farmworker Health 2021).

Financial constraints represent a significant obstacle to education and career advancement for farmworkers. Programs like the College Assistance Migrant Program (CAMP) and the Farmworker Career Development Program offer crucial scholarships, but they are not accessible to everyone who needs them. CAMP supports children of migrant workers during their first year of college, offering scholarships, tutoring, and other resources. Unfortunately, many eligible families remain unaware of CAMP or face challenges with the application process, which requires extensive documentation that some farmworkers find difficult to gather (Wiggins and Gabbard 2020). Similarly, the Farmworker Career Development Program provides funding for vocational training but remains highly competitive, with only a limited number of scholarships available (Ramirez and Martinez 2022). For many farmworkers, these programs fail to cover the full cost of education, especially when factoring in additional expenses like transportation, childcare, and housing (Center for Farmworker Families 2018).

The fluctuating nature of farmworker income, driven by the agricultural cycle, complicates eligibility for financial aid. Farmworkers earn a median income of just \$24,500 per year, according to the California Institute for Rural Studies, which barely covers basic living expenses in a region with a high cost of living like Monterey County (California Institute for Rural Studies 2020). During peak harvesting seasons, income may increase temporarily, disqualifying families from certain types of aid. However, these seasonal spikes do not reflect

their overall financial stability, leaving families struggling to afford higher education or vocational training (Wiggins and Gabbard 2020).

For undocumented farmworkers, the barriers are even more formidable. Disqualified from federal financial aid, they must rely on limited state-level assistance like the California Dream Act, which often proves insufficient. A study by the Public Policy Institute of California reveals that even among eligible undocumented youth, only a fraction apply for aid due to fears of deportation or a lack of awareness about the resources available (Public Policy Institute of California 2020). Programs like the Monterey County Farmworker Resource Center attempt to bridge these gaps by offering comprehensive assistance in multiple languages. However, the need remains immense, and many undocumented families continue to face significant obstacles to education and financial support (National Center for Farmworker Health 2021).

Housing and Transportation

Housing and transportation are also critical challenges, particularly in Monterey County. The high cost of living exacerbates the precarious financial situation of farmworker families. The average farmworker in Monterey earns around \$12 per hour, well below the living wage needed to cover basic expenses in a county where the median home price exceeds \$800,000 (California Institute for Rural Studies 2020). Many farmworker families are forced to live in overcrowded, substandard housing, often sharing cramped spaces with multiple families to make ends meet. Seasonal housing provided by the California Migrant Centers is a temporary solution, but when

these facilities close in the off-season, families are often left scrambling for affordable alternatives (Center for Farmworker Families 2018).

Monterey County's transportation infrastructure further complicates life for farmworkers. The region is geographically expansive, with agricultural fields spread across vast areas that are poorly served by public transit. Many workers rely on private vehicles, which are expensive to maintain, or pay high fees to ride with raiteros. A survey by the Center for Farmworker Families found that workers spend up to 20% of their income on transportation costs alone. This lack of reliable, affordable transportation not only affects their ability to work but also limits access to education and training programs, which are often located in urban centers like Salinas or Monterey (Center for Farmworker Families 2018).

Geographic isolation adds to the difficulties faced by farmworkers. Many families live on or near the farms where they work, often in remote areas with limited access to services. The transient nature of agricultural work means that families frequently move, which disrupts children's education and makes long-term planning nearly impossible. According to the U.S. Department of Education, children of migrant workers experience severe educational disruptions, leading to higher dropout rates. In fact, only about 50% of children in migrant families graduate from high school, significantly limiting their future career prospects (U.S. Department of Education 2019). The College Assistance Migrant Program (CAMP) at California State University, Monterey Bay (CSUMB) offers some support, providing financial assistance, tutoring, and mentorship. However, the program can only serve a limited number of students, leaving many others without the help they need (Ramirez and Martinez 2022).

The lack of internet access and technological resources further restricts opportunities for Monterey County farmworkers. A 2020 Pew Research Center survey revealed that only 43% of rural households have high-speed internet, compared to 75% of urban households (Perrin, 2020). Even when internet service is available, it is often prohibitively expensive. The COVID-19 pandemic underscored these disparities. Monterey County was among the hardest-hit regions in California, with farmworkers experiencing disproportionately high infection rates. A University of California, Berkeley study found that farmworkers in the Salinas Valley were three times more likely to contract COVID-19 than other residents (Mora et al., 2021). Contributing factors included crowded living conditions, lack of paid sick leave, and inadequate access to health care. During the pandemic, children in farmworker families often fell behind academically due to a lack of internet access for remote schooling. A 2020 report from the National Center for Farmworker Health documented significant learning losses, with few options for catching up.

Digital Literacy

Digital literacy is another hurdle. Many farmworkers, particularly older adults, have limited experience using computers and navigating online platforms. This lack of proficiency hinders their ability to apply for jobs, enroll in educational programs, or access vital resources. Some community-based organizations offer digital literacy training, but these programs are often oversubscribed or held at times that conflict with farmworkers' demanding schedules (Rivera and Lopez 2020). The technological divide not only limits educational opportunities but also restricts entry into higher-skilled, tech-oriented roles in the agricultural sector.

Economic hardship is intertwined with health and basic needs. Low wages and job insecurity contribute to widespread food and housing instability, directly impacting farmworkers' ability to focus on education or career advancement. Nearly 60% of farmworker households experience food insecurity in 2020, according to the California Institute for Rural Studies, a troubling figure given their role in producing the nation's food supply. Temporary housing programs like the California Migrant Centers help during peak agricultural seasons but do not provide year-round stability. The chronic stress of living in unstable conditions, compounded by inadequate healthcare, exacerbates existing health disparities. Exposure to pesticides, extreme weather, and physically strenuous labor results in high rates of respiratory and musculoskeletal disorders among farmworkers, further reducing their quality of life and capacity for educational or career development (Smith and Johnson 2019).

Remedies to Systemic Barriers

The California Agricultural Labor Relations Act of 1975 remains a critical piece of legislation aimed at protecting farmworkers' rights. It grants the right to unionize, collectively bargain, and advocate for better wages and conditions. Yet, enforcement in Monterey County has been inconsistent. The Agricultural Labor Relations Board (ALRB) has documented cases where employers have engaged in unlawful practices, such as retaliatory firings or threats, to discourage unionization (Agricultural Labor Relations Board 2020). Strengthening the ALRB's enforcement capabilities and supporting grassroots advocacy groups are essential steps to ensure farmworkers can exercise their rights without fear of retribution.

To address these systemic barriers, a comprehensive, multifaceted approach is needed. Expanding scholarships and financial aid for farmworker families, simplifying application processes, and increasing outreach through community organizations are vital first steps (Lopez and Rivera 2021) Enhanced protections and support systems for undocumented students are also crucial to alleviate fears of deportation and provide clear pathways to higher education. Investment in transportation infrastructure, such as subsidized transit and more accessible public options, would make education and training more feasible (Smith 2021).

Bridging the digital divide should be a top priority. Government initiatives and partnerships with private companies could provide affordable broadband access in rural areas, ensuring that farmworker families are not left behind in an increasingly digital world. Expanding digital literacy programs tailored to the needs and schedules of farmworkers can empower these communities with the skills necessary for modern education and employment opportunities (Jones 2020).

Addressing food and housing insecurity requires long-term investment in stable, affordable housing and targeted assistance programs. Creating year-round housing solutions would provide a foundation of stability, allowing families to focus on education and career growth rather than scrambling to find shelter during the off-season. Food assistance initiatives should be designed to meet the specific needs of farmworker communities, with a focus on accessibility and nutritional quality (California Institute for Rural Studies 2020).

Healthcare access is another critical area that must be addressed. Given the high rates of chronic illness and injury among farmworkers, comprehensive healthcare services tailored to this population are essential. Mobile health clinics, bilingual medical staff, and health education programs can make a significant difference (Garcia et al., 2021). Efforts to provide farmworkers with better protections against environmental hazards, such as pesticide exposure and extreme heat, are also crucial. Legislation must be enforced rigorously, and new regulations should be introduced to address the growing impact of climate change on the agricultural workforce (Green and Patel 2020).

Investing in community health initiatives and climate resilience programs is vital to protect the well-being of farmworkers who are on the front lines of both economic and environmental crises. These programs should not only address immediate health and safety concerns but also consider long-term strategies for adapting to climate change. For instance, providing shaded areas and hydration stations in the fields, along with regular health screenings, could help mitigate the risks associated with rising temperatures (Miller et al., 2021).

Monterey County's farmworkers are at a pivotal moment. With the right investments in education, health, labor protections, and climate adaptation, there is hope for a future where they can transition into higher-paying, stable careers that offer safer and more sustainable working conditions. These changes would benefit not only farmworker families but also the broader community by ensuring the continued vitality of one of California's most important agricultural regions (Garcia et al., 2021).

The work ahead is undoubtedly challenging, but the opportunity to transform lives and strengthen the community is too important to ignore. By addressing these systemic barriers with comprehensive, well-funded strategies, Monterey County can serve as a model for supporting the health, education, and economic mobility of farmworkers, setting a precedent for other agricultural regions across the nation. It's time to recognize and invest in the people who make Monterey County's agricultural success possible, creating a more equitable and prosperous future for all (Smith and Johnson 2019)

K-12 Education

As we see this shift of careers, especially in California, from agricultural and manual labor to more industrial and technical careers, we see a widening gap from multigenerational households indigenous to California and an increase of families getting priced out of their family homes, especially families of color. A common practice for families able to choose where to move to includes looking at school district lines and seeing where they rank using websites like school-ratings.com, where schools are ranked according to various metrics including California Assessment of Student Performance and Progress (CAASPP), SAT test results, drop out rates, and other metrics. As students have access to public education in California, the quality of education here is ranked 36th out of 50 in the country by state (World Population Review 2024). This low standing is due in part to the emphasis placed on standardized testing, performed entirely in English, and these tests ineffectively reflect a school's performance nor their student base's ability to grow and change in a changing climate.

English Language Arts (ELA) and literacy in History, Social Studies, Science, and Technical subjects are lumped together as all are treated equally as important to students' growth

as future college students and workers. As students work through language comprehension, including reading, writing, speaking and listening, they are building skills to develop their individual thoughts, lines of reasoning, and expressing ideas in a formal setting (2010). The English language is our only official language as a country, despite 81.56% of students in California identifying Spanish as their language spoken at home. There has been a shift in 2012 to emphasize the importance of multilingual students by creating a Seal of Biliteracy for students who show a proficiency in English and one or more other languages (California Department of Education 2020). State mandates and programs provide opportunities for students to be tracked and graduate out of English Language Development programs, where students can become reclassified. This table shows the intersections and outcomes of how literacy in English creates



more favorable outcomes for students in standardized testing scores. Now, this common core standard is taking control of education from a top-down approach, as ultimately, it comes down to the individual teachers in their classrooms and

their available resources to provide to their students a comprehensive analysis of each subject at

hand. This trickle-down approach to education has vastly divided the quality of education given to farmworker students and families living in lower socioeconomic statuses, which in turn will affect their long-term health outcomes (Marsh et. al 2015). Since county lines and borders are defined by politicians and local measures, this often leaves farmworker families, especially those who are undocumented, powerless in determining where their students will be receiving their public education.

Sourcing and Allocation of Funding

As these counties are allocated funds in the form of these grants, voters in these areas control whether or not these measures and proposals make their way into action. This privilege of voting is reserved, by design, only for those who are citizens, not currently or previously incarcerated, and are above the age of 18. In order for folks to vote, they must be able to take time off work, have child care, and have transportation in order to vote in person, or have a stable address to be registered to vote at in order for them to receive a vote by mail option. Lagunage accessibility in this department has thankfully been expanded greatly, though it requires some self advocacy alongside community advocacy and awareness in order to perform this act of civic duty.

In order for people to achieve financial stability in a sustainable career, there is a barrier to entry for access and opportunities granted to farmworkers, both as individuals and as families. Although many scholarships and grants exist on various levels from local to federal, these programs are structured in a top-down funding approach; the remnants of Reaganomics see to their eventual establishment on the grounds and in the fields. State-wide grants include funding projects like 100k in 10, a plan to train 100,000 teachers in STEM resources and specialties in

just 10 years, from 2011 to 2021 (Carrasco and Gualdalupe 2024). This project focuses their funding towards schools serving majority Black, Latine, and Native American students, by equipping them with joyful, positive, relatable, and prepared teachers who reflect their racial identity. Similar programs like this exist at UCSC, with the CalTEACH program which provides grants and scholarships and support to students seeking to become science and math teachers. Local districts can then offer scholarships for the future teachers in exchange for a contract of five years of service (CalTEACH Program UCSC). These neoliberal top-down approaches to big systemic issues set up giant albeit hopeful goals, though not fixing the issue as it currently is, but for future generations down the road who will be taught by these new teachers in their careers.

For students, federal bills like the No Child Left Behind of 2001 and its successor, Every Student Succeeds Act (ESSA) have provided structure and accountability plans for the states to have more control and choice over which goals they deem most important. According to Education Weekly, districts monitor the plans made every three years by the five lowest performing schools which are based on key indicators of success including but not limited to English-language proficiency, student engagement, and postsecondary readiness, among others (Klein 2024). The ESSA also places English-language learners at a higher priority than other students for their ELA test scores so that schools have to focus more of their efforts on the students in the most need. In California schools, the bottom 5% of schools were identified as needing comprehensive support and improvement. From this sample of schools, researchers found that focusing the measures less on the status of the school but more on the rate of change put schools on a more level playing field in respect to the demographic makeup of students (Atchinson et. al 2023). This study also found “that the suspension rate indicator played a larger role than the other performance indicators in determining which schools were identified for

comprehensive support and intervention (CSI)” showing that the student engagement and interest in the subject marked the most important.

Though the ESSA sounds good in theory, the National Center for Education Evaluation showed that the expansion of the grant qualifications have shifted the focus away from schools with historically underserved students (NCEE 2024). This shift has further separated the public education analysis to include charter and specialty schools. These measures have shifted from measures that accounted for poverty, and towards student achievement. Arguably, these increases of industry do also bring development programs to areas, though limited in resources and particularly in geospatial placements, which allow students and future generations of the families who are able to stay a chance to participate in and learn new and innovative ways.

Supplemental Programs and Afterschool Activities

One way for students to prepare themselves in high school is by the introduction of Career and technical education (CTE) classes. By introducing youth to clear and confident career pathways, these partnership programs open their eyes to hands-on learning opportunities and real-world applications of the education they received. These programs are funded initially from the Smith-Hughes Act of 1917 and the Carl D Perkins Vocational and Technical Education act of 1998, but require investment into grants and programs that will stand while partnering with local businesses and colleges to allow for integration (California Department of Education).

CTE programs include projects happening concurrently in the school day, as well as after school. Programs like these provide 11th and 12th graders access to alternative, hands-on experiences while paired in local apprenticeships. Some examples include: firefighting, culinary sciences, education, child development, robotics, transportation, arts, construction, and

healthcare programs. These programs are cosponsored by the district, sometimes held in their classroom spaces, or working in specialized facilities and taking field trips to local businesses and colleges. For example, Salinas High School offers two CTE programs for juniors and seniors, including the Sustainable Architecture program (SHS Green Building Academy) and their fitness and sports training program (SHS FAST Academy). Alisal High school offers more industries as options, including manufacturing and transportation for students to gain work experience in mechanical engineering and automotive technology (Alisal High School).

In agricultural education, we see students gaining access to information about the farming industry, but primarily in the case of animal production. This more costly practice not only harms the biodiversity, but requires schools to undergo massive renovations to incorporate farms onto campuses. Most of this agricultural education implementation occurs with Future Farmers of America (FFA) and 4-H programs, which are national organizations that have invested in state and county programs. For Central California though, there is only 4-H in Santa Cruz and San Benito counties, with more information at their county offices, and FFA splitting Central California into two different regions, South Coast with Santa Cruz, San Benito and Monterey, but Fresno County is in the San Joaquin region. The *University of California 4-H Youth Development Program 2019-2020 Annual Report* shows that participation in these programs allow students hands-on experiences in STEM, Healthy Living, Civic Engagement, and Agriculture through their various programs (2024). Over the last three years, 4H has been expanding their base and specifically involving the Latino community through their program called ‘Juntos’ or together in spanish. Through this outreach, counties including Monterey are able to create culturally relevant curriculum for latino students, and offer community support and empowerment in a positive school setting. The real catch here being that 4H is partially a parent participation program,

which does often conflict with farmworking seasons, or is just another program to add into the parents' very busy schedules. Regardless of the direct parents being able to participate, students find themselves more engaged, less likely to drop out, and confident by joining programs such as these.

Recommendations: What Needs to be Done to Help Farmworkers?

Career and Technical Education (CTE) programs are widespread across primary and secondary schools within the Central Coast area we have examined, offering students a broad range of vocational training opportunities. However, when it comes to adult learners and young adults who cannot return to high school or pursue traditional educational pathways, we have observed that the availability of such resources becomes significantly more limited. This distinction illustrates a critical gap in the United States educational system, and how we treat adults who want to continue learning or pursue higher skilled employment.

Children have been asked what they want to be when they grow up since they muttered their first words. When one sees their parents working in a specific field, they are likely to pursue that work as well because of the security it presents. This suggests a support system around them that has experience within the work and understands the struggles they will face (Koçak et al. 2022). Sticking with the “known” rather than exploring one’s interests seems to be a trend among financially insecure families (Koçak et al. 2022). Another factor that contributes to this known route is the affordability of whatever career they are seeking. For example; it is cheaper to become a farmworker and instantly make a wage compared to furthering one’s vocational skills and education, which requires tuition and other costs. The issue is even more pronounced when looking at farmworker populations in the central coast of California, as job

stability is inconsistent throughout the year and subject to change as climate change engulfs this world (U.S. Department of Labor 2021). What's interesting about the data we found documented by the US Department of Labor was that between 2019-2020 the average number of weeks farmworkers worked on a farm was 43 (U.S. Department of Labor 2021). This suggests a relatively normal and expected average when compared to other professions in the US. El Khayat et al. (2022) describe how the implications of rising temperatures suggests "Furthermore it is predicted that farmworkers will only be able to work for a fraction of the hours they currently work due to rising heat stress". As discussed in a previous section, the drastic increase of temperatures during harvesting seasons is concerning for a variety of reasons. A significant issue arises from farmworkers pushing through the heat in order to maintain the amount of paid working hours. There is a common trend among farmworkers of prioritizing income over well-being and health because in order to be healthy outside of work, you need money from working to maintain a certain lifestyle (El Khayat et al. 2022).

If farmworkers do decide to pursue a different field of work and undergo re-skilling or training for higher-skill jobs, there will be a notable gap left in the labor force of agricultural sectors. This gap is frequently filled by more vulnerable groups who may be subject to even greater exploitation. Furthermore, retraining programs for farm workers often aim to transition them out of agriculture entirely, redirecting them toward industries like construction and landscaping (Martin 2021). While such programs may benefit some individuals, they do not address the broader issue surrounding the health of those staying in agriculture. For these individuals, leaving agriculture may not be a viable or desirable option, as they have grown up and are accustomed to working and living in agriculture. There are, however, many valid reasons as to why people want to leave the field or propel their kids towards a different career path,

particularly when they face the prospect of deteriorating health from continued physical labor in the field.

There needs to be a more nuanced and holistic approach to this field of workforce development. Community members and employers need to recognize the inherent value of agriculture and continue to support farmworkers in advancing their skills within this field while providing avenues for those interested in advancing elsewhere. As climate change takes hold of agriculture sectors and the rates of agricultural technology (AgTech) use increase, there should be a focus on creating higher-skilled, more socially sustainable roles within agriculture that attract a wider range of people interested in pursuing agricultural jobs. As mentioned previously, there are significant issues surrounding AgTech, specifically robotics taking the jobs previously designed for human labor. The issue is conflated with employers and farm production managers who prioritize costs over their employees' well being. There are opportunities to change how we work with advancing technology, ways in which emphasize collaboration and prioritize farmworkers' well being. By tending to opportunities for career growth within agriculture, it is possible for farmworkers to continue a profession in farming with dignity knowing how valued and important they are to our food systems both in California and the rest of the country.

In our exploration of educational resources available in the Central Coast, we observed a significant barrier to access—namely, the lack of comprehensive Spanish translation on county websites and associated documents. While it has become increasingly common for these websites to offer a Spanish-language option, this is often the extent of the linguistic accommodation. Other languages that are commonly spoken by farmworkers and their families, such as Mixteco, Punjabi, or other indigenous languages, are rarely represented. While we acknowledge the complexity involved in determining which languages to prioritize for

translation, there are plenty of resources available for county organizations to conduct research on the specific language needs of their communities (see: “PIAAC Skills Map”). With this information, they could make more informed decisions about which languages to include in their educational and outreach programs.

As previously mentioned, many essential documents, including forms that are meant to serve a broad and diverse population within our studied counties, are provided only in English, (see (“SEEK Services | County of Monterey, CA” 2024)). This neglect excludes individuals who are not proficient in English, limiting their ability to access or even know about important services and opportunities. While it may not be feasible to offer translations in every language spoken by residents, it would be a significant improvement to ensure that key documents are accompanied by clear instructions on how to access translation support services. Specifically, providing contact information for multilingual staff or language support services would go a long way toward bridging this gap. These provisions would ensure that all individuals, regardless of their primary language, have the opportunity to understand the content, complete necessary forms, and fully engage with available educational programs. The failure to provide these accommodations directly reflects the responsible parties as perpetrators of systemic inequities that prevent the access of life-improving resources to those unable to speak certain languages. Given the diversity of the region’s population, it is crucial that county organizations take the right steps to make their services more accessible, ensuring that all community members, regardless of their language background, are equipped with the information and support they need to thrive.

Another barrier previously mentioned includes adults who are seeking to further their education or career opportunities, and are less likely to do so because of financial and/or time

limitations. This is also relevant among high school students or those unable to attend school in order to provide a source of income for their family. While there may be a desire to take courses provided by CTE programs and college or vocational workshops, there is a more immediate concern of providing stability for one's family. A majority of farmworkers work full time in a physically taxing trade and are forced to work additional hours or additional jobs if circumstance permits, in order to meet the needs of their family system ("Agricultural Workers:Occupational Outlook Handbook::U.S. Bureau of Labor Statistics" 2024). Consequently, the time that might be spent pursuing educational opportunities may be devoted to caring for one's family. There isn't much incentive for individuals to engage in courses that do not result in immediate income. While financial aid programs can help offset the cost of tuition, they often fail to compensate for the lost wages when working fewer hours, leaving a significant financial gap (Collom 2022). This situation confronts these individuals with a complex dilemma, one that is not easily answered by existing policies or infrastructure surrounding agriculture and education within the United States (Staff et al. 2010). This conundrum leaves many families and individuals more likely to delay or abandon the pursuit of higher education or career exploration altogether, once again enforcing the marketed scheme of stability among the "known", even if it isn't beneficial.

Research indicates that this conundrum is particularly pronounced for working students, who often perceive the need to prioritize income over education. As Ziskin et al. (2014) highlights, financial aid alone is insufficient to address the broader financial strain of reduced working hours, underscoring the tension between work and study. Furthermore, the situation is exacerbated by the inequities in access to education, especially among adult learners. These challenges are compounded by a lack of comprehensive policy solutions that account for the lived realities of working adults.

It should also be considered where and how these individuals are receiving informational resources. Is it from someone they trust? Someone who understands the full extent of their experience, and is able to communicate the value of furthering their education? That is why promotores and other community health workers are critical to the implementing practices that we have mentioned in this essay. Getting the resources out to farmworkers is only a small part of how this information will be digested, while those who can be trusted and relied upon by farmworkers will support further interest and comprehension. It is only with these personal relationships that these resources can prove useful (Lebrón et al. 2024). These authors discuss the integral part promotores and community health workers (CHWs) have on the health and well being of Latino communities, which is a large majority of central coast farmworkers. They state, “The health and well-being of Latino communities is intimately linked with creating conditions for economic thriving and belonging.” This starts with kids, by providing an encouraging environment that empowers them to use skills other students may not have experience with and lean into community building. Having a support system can mean life or death, so Lebrón suggests promoting “community-based ecosystems” that thrive off of mutually beneficial education and cultural exchange, further engaging people of all ages to be more involved with their own health and the health of others around them.

However, the current reality does not reflect this harmonious ecosystem, especially in schools that were designed to produce good workers. There is a lack of trust among teachers and migrant students/ children of migrants who are underestimated and assumed to not possess the same “drive”. Lorena Gutierrez discusses how teachers are likely to view Latino migrant and seasonal farmworkers in a “deficient lens” (Gutierrez, 2022). These ‘deficiencies’ are usually identified in the form of language barriers, lower economic status, and frequently moving around

schools due to the changing nature of farmwork. When students are viewed and treated this way by their own educators, they are set up for failure, or at the least, pinned against odds that are already out of their favor. Guitierrez suggests a shift from remediation and trying to “fix” a kid’s inabilities, toward strength-based approaches that encourage students’ potential and unique skills that are equally as valuable to society and school. Integrating one's personal life with their educational life is becoming more and more valuable among resilient students and their career outcomes.

Moreover, when educational programs do allow for a greater sense of cultural and academic integration, they can provide a more meaningful and engaging experience. As O'Connor (2022) suggests, when students see their cultural identities as an integral part of their academic pursuits, they are more likely to feel motivated to contribute back to their communities in ways that they may not have previously imagined. This deeper sense of connection not only enhances the educational experience but also fosters a broader sense of purpose, as students recognize the potential impact they can have on their communities. The integration of both cultural and academic interests can act as an essential factor in overcoming the barriers that typically prevent working adults from pursuing education earlier in their lives.

Conclusion

Central Californians, especially farmworkers, are the backbone of this country, and are unfairly bearing the weight of this capitalist colonialist landscape of gridded fields and routine gentrification. Many of the struggles faced by farmworkers in California are intersected and compounded by their lack of literacy in digital and communication skills, minimal resources in

both time and money to be able to afford extracurricular activities for their students, as well as physical effects of the agricultural labor market trending toward mechanization. As resources are gathered and presented to individuals and families of farmworkers, they are often left overwhelmed with a bunch of options and little to no guidance from administrators or community leaders. As more awareness and outreach, as well as community engagement and early childhood intervention through education, more farmworkers will have access to and comfortability around utilizing and participating in programs designed to equip them with marketable skills. This change is marked by integrating culturally relevant curriculum, hiring representative and diverse teachers and professors, and public policymakers further encouraging and implementing effective skill based programs to the areas that need it most. When we equip our workforce with effective tools to drive themselves toward a better future, we in turn create a healthier landscape.

Glossary





Farmworker Health

Glossary

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Agricultural Technology:

General Definition

Agricultural technology refers to the application of technological innovations to enhance farming practices and improve agricultural productivity, efficiency, and sustainability.

Agricultural technology is also shortened and commonly phrased as “agtech,” which is how it will be referred to in the rest of this glossary entry.

Brief History

Agtech is found in all steps of farming—from soil preparation to harvesting. Agtech is no new practice, being utilized since the 16th century. Early examples of agtech include an oxen and plow, the cotton gin, and self-governing windmills. Agtech is not limited to the use of machinery to help improve farming, measures such as barbed wire are an important marker to the diversification of agtech. The invention of barbed wire made a significant turn in farming, ending the era of unrestricted, open-range grazing (ThoughCo, 2021).

By the 1890s, agriculture experienced a shift, becoming more mechanized and commercialized. Agtech dependent on horsepower had found the potential for more mechanized modalities. Through the 1890s-1920s came improvements in the tractor, starting with gas tractors.

Through 1940-1970 came a “second agricultural revolution”. The potential in mechanized modalities became reality. More farms shifted from using horses to using tractors. By 1954, the number of tractors on farms exceeded the number of horses and mules for the first time (ThoughtCo, 2021). Toward the end of this revolution, in the 1970s, one farmer could supply nearly 76 people with food. Compared to the 1940s, where one farmer could supply 11 people with food. Throughout this early period of agtech, the number of labor hours saw decreases due to the use of machinery.

Agtech’s modern innovations include broad terms such as smart irrigation, biotechnology, vertical farming, and precision agriculture.

Modern Practices & Implementation

Modern agtech uses have changed significantly since the 1800s. While mechanization and automation are still relevant—with new developments like the autonomous tractor—there has been a shift in what agtech looks like and could look like.

Smart irrigation refers to watering systems that are scheduled to meet specific landscape needs. Smart irrigation is not only used for farming, it is a system that someone can

install in their own front lawn. Where typical irrigation controllers are based on preset programs, smart irrigation systems are constantly measuring factors such as weather, soil condition, evaporation, and water use. With that data, smart irrigation systems then run on a schedule based on those factors. Smart irrigation systems are said to save both money and water.

Vertical farming is the practice of growing on vertical surfaces, rather than the traditional in the ground horizontal growing. These vertical systems allow for more crop production by reaching greater heights. Being built into buildings, greenhouses, or even shipping containers. Vertical farming depends on controlled systems, which includes artificial temperature, light, water, and humidity control. As said by EdenGreen technology in “What Is Vertical Farming? Everything You Should Know About This Innovation” is “if a delicate balance is not maintained, it’s possible to lose an entire crop the way a traditional farm might in the event of a drought or flood” (2024). Vertical farming comes with many stated benefits like use of less water by hydroponic systems, ability for year-long production, and no use of pesticides. Companies like EdenGreen claim that vertical farming can also solve the problem of food deserts, this is because “vertical farms can be constructed with a small footprint and can even be integrated into existing buildings and rooftops” (2024). When thinking about what communities are experiencing food deserts—rural, agriculture based communities come up. Even though these communities are agriculture based, there is still a lack of supermarkets in the area that carry fresh produce. Which begs the question—how exactly will vertical farming be integrated into these communities? Food deserts exist due to a multitude of factors

including cost, distance, transportation and access. While vertical farming may help in one aspect of accessibility, how will it be implemented to address the other aspects?

Image 1. Example of vertical farming system presented by EdenGreen technology. In this



system by EdenGreen, natural sunlight is utilized as often as possible. For other vertical farming systems, this may not be the case. Artificial light is

needed when access to sunlight is not available. “Vertical Farming.” EdenGreen technology, 9 Jan 2024,

<https://www.edengreen.com/blog-collection/what-is-vertical-farming>

While most modern agtech come with solutions of sustainability, how often are these practices actually being implemented? As written by ---, there is a current adoption problem with agtech and farmers. Common between most is the high cost of agtech, making it difficult to afford and implement within small and medium farms. With the increased use of cloud-based systems, farmers also hesitate to implement modern agtech solutions with the concern of who has access to their data.

Agtech & Climate Change

As climate change becomes an increasing concern and barrier for farming, what role does agtech play? Current agriculture practices contribute to 10% of greenhouse gas emissions. While that 10% is not entirely made up of emissions by agtech, it still contributes a great amount. Practices such as tilling, which uses a plow to turn over soil, emits carbon dioxide. Where carbon dioxide makes up 7.2% of the 10%. Nitrous oxide emissions in agriculture make up about 49% of emitted greenhouse gas emissions, which comes from the use of fertilizers.

Utilizing current agtech models can help slow the efforts of climate change. To help with emissions brought about by soil, is to add more modifications. This process, as found by researchers at Cornell, recommends a process called “enhanced weathering, ’...silicate rock dust can be added to crop soils every five years to accelerate the formation of carbonates. This process devours carbon dioxide, which can sequester several billion metric tons of carbon per year” (Friedlander, Cornell Chronicle, 2023).

Conclusion

Agricultural technology has made a significant impact on agriculture and farming throughout the last century, good and bad. While current models of agtech work to reverse the damage done by previous models, the process of implementation is a slow

one. Concern regarding costs for small and medium farmers play the biggest role in this slow implementation.

Barriers to Accessing Healthcare:

Barriers to health include a lack of health insurance, inability to pay, language barriers, long waiting times, rushed encounters with providers all stem from the overall systemic issues surrounding economic constraints, legal and policy barriers, cultural and language barriers, occupational health risks and healthcare access, as well as mental health challenges and limited services.

It was found that farm workers in California make an hourly minimum wage rate of 15.50 dollars on average, which was enacted as of January 1, 2023 under state law (*Farmworker Justice*). Given these wages, farm workers have to make the most out of their salary including childcare, rent, food, basic necessities and any other primary expenses. They have to allocate and maximize the most they can, and when you add in the expensive cost of healthcare services and treatment it prevents and discourages individuals from wanting to receive and seek care, it becomes daunting. A study from Villarejo et al. (2018), found that the average annual income for farmworkers is significantly below the national poverty line, which directly impacts their ability to afford health insurance or pay out-of-pocket healthcare expenses. It is also important to consider the privilege of having health insurance and what that sustains. Many farm working employers don't provide employer insurance, making it difficult for them to receive care. The premiums for insurance are another financial burden, and public healthcare services

may not always provide the best quality of care and treatment as they seek to help as many people as possible, impeding personal interactions and connection from the patient and medical provider. As a result, it also leads to fewer healthcare visits and individuals not receiving timely care.

For many farmworkers, there are many legal factors that interfere with their ability to receive care. It was found that an estimate of nearly half of farm workers in the United States are undocumented, and they often avoid seeking healthcare due to fears of deportation or legal repercussions (Parra-Cardona et al., 2019). Additionally, undocumented workers are ineligible for many government-sponsored health insurance programs, such as Medicaid, which limits their access to affordable healthcare. The Patient Protection and Affordable Care Act (ACA) was intended to expand healthcare coverage but largely excluded undocumented farm workers, creating a gap in coverage for this vulnerable group (Nguyen & Rehkopf, 2016). The exclusionary policies, combined with limited state-level initiatives to support healthcare for undocumented individuals, leave many farm workers reliant on underfunded community health centers that may not offer comprehensive care (Horton, 2016).

The farmworkers are working in rural areas and agriculture regions where healthcare facilities are hard to come by and at farther distances away. Due to this work, many of the agriculture fields tend to be on the outskirts of towns and prevents them from getting regular healthcare services for issues such as respiratory conditions, musculoskeletal disorders, and pesticide exposure related health concerns. Respiratory conditions could include asthma, chronic obstructive pulmonary disease, and wheezing (*Respiratory Hazards on the Farm*). Musculoskeletal disorders such as osteoarthritis,

lower back pain, and neck and upper limb complaints (*Musculoskeletal Disorders in Farmers and Farm Workers*). Pesticide exposure related health concerns would be rashes, vomiting, even death as well as increased risk of cancer and infertility (*Earthjustice, 2022*). Seasonal migration among farm workers further complicates access to healthcare as many workers move from one location to another following crop cycles, which disrupts continuity of care and prevents long-term healthcare relationships. Being able to develop a relationship with your healthcare providers is crucial, having that trust and connection allows one to advocate for themselves and trust that your medical provider has the best medical intentions for one and is seeking the best outcome for you.

Cultural and language differences between farm workers and healthcare providers contribute to communication difficulties that can affect the quality of care. Studies show that healthcare providers often lack training in culturally sensitive communication, which can lead to misunderstandings, misdiagnoses, and dissatisfaction with care (Flores et al., 2021). Having that cultural component is essential in order for patients to trust their providers, and having that gap between the patient-provider is what stops individuals from wanting to receive care.

Language barriers also pose significant challenges, as a large portion of the farm worker population speaks limited English and may be more comfortable communicating in Spanish or indigenous languages. Lack of professional medical interpreters in rural healthcare settings can hinder effective communication, discourage workers from seeking care, and lead to poorer healthcare outcomes. When interpreters are unavailable, family members, including children, may act as translators, which can introduce errors and discomfort, especially for sensitive health topics. It highlights the systemic issue that

many farm workers experience across the US in efforts to receive treatment. Farm work is physically demanding and comes with various health risks, including exposure to pesticides, extreme weather, and repetitive physical tasks. Agricultural work environments also present unique hazards, such as pesticide exposure, which can lead to acute and chronic health conditions. Unfortunately, due to limited access to healthcare and inadequate workplace protections, farm workers often lack preventive measures and treatment options for occupational health issues (Quandt et al., 2018). Farm workers might be unaware of their rights and simply follow orders from their mayordomo, skipping breaks and being unable to go to the restroom when needed. Mental health issues, including stress, depression, and anxiety, are prevalent among farm workers due to the demanding nature of their work, economic insecurities, and, for many, the psychological toll of migration and separation from family. Yet, access to mental health services is significantly limited, particularly in rural areas where farm workers are concentrated. A study by Hiott et al. (2019) indicates that farm workers experience high levels of mental health distress but are often unable to seek support due to stigma and a lack of culturally appropriate mental health services.

Cal/OSHA:

Cal/OSHA (California's Occupational Safety and Health Association) is a state-run health and safety organization that expands upon the existing federal protections of workers in their workplaces. Cal/OSHA is responsible for creating regulations, practices, and training to be implemented in the workplaces, including in the field. Some regulations specific to agricultural workers include shade breaks, water stations, and

accessible restrooms. These regulations can then set precedent for other workplaces across the country, but also to hopefully enshrine these rights into workers rights at a federal level. Cal/OSHA goes above and beyond its predecessor by writing in preventative measures for [heat illnesses](#) by identifying them as a safety hazard for outdoor workers. Critics of Cal/OSHA say these measures do not go far enough to protect workers' health in the short term, especially as legislation and bureaucracy is behind the pace of rising temperatures due to climate change and [global warming](#). A cross cultural analysis of central california farms showed that even as Cal/OSHA's protective measures were implemented, that the population of workers participating with internal thermometers and accelerometers showed that their internal core temperatures still became elevated, despite access to shade breaks and clean cool water (Langer et al. 2021). This shows that even as protections are put in place as preventative measures, this is still not enough to help fix the systemic issues at hand that farmworkers face in their workplaces.

Carcinogenic Pesticides:

Pesticides that are capable of causing cancer.

What are Carcinogenic Pesticides?

Pesticides are synthetic or [organic](#) chemicals used in agricultural areas to control, prevent, or eliminate pests and insects that damage crops. Pesticides consist of active ingredients, which produce the desired effect, and inert ingredients, which support the active component. They are classified as organochlorine,

organophosphate, carbamate, and pyrethrin/pyrethroid pesticides (Gupta). The toxicology of pesticides is managed by the Environmental Protection Agency (EPA).

Carcinogenicity refers to the ability of a substance to cause cancer. Cancer involves mutations or changes in DNA structure, which can lead to an accumulation of abnormal cells that form tumors. The time between exposure to carcinogens and the development of cancer is called the latency period, which varies depending on the type of carcinogen and the duration of exposure. For example, cancer caused by exposure to potentially carcinogenic pesticides can take decades to develop. The classification of carcinogens is determined by the International Agency for Research on Cancer (IARC), which divides them into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic), Group 2B (possibly carcinogenic), and Group 3 (not classifiable as carcinogenic to humans) (Gupta).

Combining these two concepts results in the concept of “carcinogenic pesticides.” Pesticides banned in the United States from Group 2A include Lindane, Pentachlorophenol (PCP), Aldrin and Dieldrin, and Dichlorodiphenyltrichloroethane (DDT). Pesticides such as Glyphosate, 2,4-Dichlorophenoxyacetic Acid (2,4-D), Atrazine, Malathion, Chlorpyrifos, and Paraquat are also classified in Group 2A but continue to be used today due to regulatory issues and ongoing scientific debates.

Concern

Farmworkers play an important role in maintaining crops and agriculture as a whole, however their health and safety is oftentimes overlooked. One main issue is the exposure to carcinogenic pesticides that can manifest as cancer over the course of their lives. Farmworkers are often in the vicinity of these chemicals or even apply the

pesticides themselves. Farmworkers absorb the chemicals in their skin and the residue remains on their clothes. Without access to facilities to wash and change clothes at worksites, workers have no choice but to bring contaminated clothing home. This ongoing exposure creates a cycle of harm that affects not only the individual but also their household and community. To limit pesticide exposure, proper equipment, such as respirators or chemical resistant gloves are required, however are not always provided by employers.

Language

Migrant farmworkers are particularly vulnerable to the dangers of pesticides due to language barriers. Many of them speak Spanish or Indigenous languages, but safety instructions and pesticide labels are often only available in English. Without proper translations or training, workers are left unaware of the risks and how to protect themselves. According to AGDaily, a leading independent agriculture and lifestyle journalistic platform, approximately 62 percent of the nation's farmworkers use Spanish as their dominant language. If there is anything in Spanish it tends to be an occasional single warning word that translates to, "If you do not understand the label, find someone to explain it to you in detail" (Fine). This is obviously a loophole for pesticide companies to divert responsibility for any communication effort. Employers should guarantee a safe working environment no matter the industry and this is no different matter. There needs to be an effort from employers and leading companies to better communicate the dangers and handling of these harmful substances for the well being of all workers.

Consequences

Healthcare access remains a significant issue. Most farm workers lack health insurance, making it nearly impossible to afford medical treatment for pesticide-related illnesses. Early detection of conditions like cancer is critical, but without access to screenings or preventative care, many workers are left untreated until it's too late. Articles from *The American Journal of Industrial Medicine* and *The Washington Post* highlight how these systemic barriers perpetuate cycles of poor health and poverty among farmworkers. According to *The American Journal of Industrial Medicine*, farmworkers exposed to pesticides face higher rates of chronic diseases, including respiratory conditions and certain types of cancer, yet limited healthcare options prevent them from seeking early treatment (The Journal of Industrial Ecology). Other journals such as *The Washington Post* mention that without comprehensive insurance mild symptoms often go unchecked. This leads to long-term health consequences that disproportionately impact agricultural laborers (Singh). This is highly impacted by agricultural workers having a language barrier. This combination of limited healthcare access and language barriers traps many farmworkers in a cycle of vulnerability, risking not only their physical health but also their livelihoods.

Vulnerability

A large portion of farmworkers are undocumented, making them hesitant to report unsafe working conditions due to fear of deportation. Employers take advantage of this vulnerability, often failing to provide safety measures or training. Farmworkers are also excluded from many labor protections that apply to other industries. According to Farmworker Justice, this exclusion leaves them without

access to the same legal safeguards, protective equipment, or the ability to advocate for safer working environments. In 2018, a case revolving around working conditions sparked controversy. Glyphosate, an active ingredient in the herbicide known as Roundup, was linked to cancer. Specifically non-Hodgkin's lymphomas. Lawsuits ensued against the company responsible for the product. After years of repeated exposure to Roundup, a groundskeeper named, Dewayne Johnson, developed cancer. The court ruled in Johnson's favor, and awarded affected parties a settlement (“Into the Weeds”). Undocumented farmworkers, however, were not represented in court because of fear to seek justice due to their legal status. Other pesticides like paraquat and atrazine have also been linked to cancer and even Parkinson’s. Affecting a largely latino and black population, yet there are little to no regulations against them (Patel and Romero). Pregnant mothers working in the fields face even more health concerns, especially birth defects. The pesticide DCPA (trade name Dachal) had been linked to not only cancer but also interfered with fetal thyroid hormone levels. This could ultimately lead to health risks for the child later in life. The EPA, as of 2024, had finally suspended the use of this chemical, as regular exposure levels surpassed the amount deemed safe by 20 times (“Pregnancy and Pesticides”). With there being a direct link to cancer, and lawsuits against carcinogenic pesticides, farmworkers continue to be exposed to these chemicals.

Chronic Disease:

Chronic diseases are long-term, persistent health conditions that affect people all over the world, requiring continuous management and care (World Health Organization, 2023). Among farmworkers, who experience unique occupational and environmental challenges, chronic diseases present unique health risks and burdens. The physical demands of farm work, combined with barriers to healthcare access, economic constraints, and often poor living conditions create a high-risk environment for the development and exacerbation of chronic diseases in this population.

‘Chronic disease’ is an umbrella term for a range of conditions, including cardiovascular diseases, diabetes, respiratory conditions, and musculoskeletal disorders, that tend to progress slowly and last a lifetime without complete cure (Murray et al., 2020). These conditions require ongoing care and can impact individuals’ abilities to perform daily tasks and, in the case of farmworkers, can limit their capacity to work. Chronic diseases are characterized by several factors: they are typically incurable, progressive, and often require sustained intervention for symptom management and quality of life improvement (Centers for Disease Control and Prevention [CDC], 2023).

Farmworkers face unique challenges in managing chronic diseases. First, the physically demanding nature of farm work increases the risk for chronic musculoskeletal disorders, such as chronic back pain, arthritis, and joint issues. These conditions are made worse by repetitive motions, heavy lifting, and extended work hours (Quandt et al., 2016). Farmworkers also experience elevated risk for respiratory illnesses, as they are frequently exposed to pesticides,

dust, and other airborne particles that can damage lung function over time, leading to conditions like chronic obstructive pulmonary disease (COPD) (Ronda-Perez et al., 2019).

Chronic disease risk factors are particularly prevalent among farmworkers due to a combination of environmental and lifestyle factors. One example is their exposure to hazardous pesticides, which, over time, increase their risk for respiratory issues and have been linked to certain cancers (Bastien et al., 2016). Moreover, farmworkers typically have limited access to healthcare, meaning that conditions like hypertension and diabetes often go undiagnosed and untreated for longer periods compared to the general population (López-Cevallos et al., 2018).

Additional factors contributing to chronic disease among farmworkers include poor living conditions, inadequate access to nutritious food, high levels of occupational stress, and mental health challenges. These stressors are compounded by economic insecurity, linguistic barriers, and often immigration status, which collectively hinder consistent access to preventive healthcare and health education (Gaitan-Cremaschi et al., 2020).

In addition to the risks of pesticide exposure and hard physical labor, farmworkers are frequently required to work in extreme heat, which contributes to [heat-related illnesses](#) and cardiovascular stress (Schaeffer et al., 2020). Chronic heat exposure can worsen existing cardiovascular conditions like hypertension due to increased strain on the heart and circulation. Socioeconomic factors also play a significant role, as many farmworkers face economic hardships and lack health insurance, which hinders their ability to afford treatment and preventive services (Arcury & Quandt, 2020). As a result, chronic diseases may progress unchecked, leading to complications that could have been mitigated with earlier intervention. Limited access to nutritious food and safe drinking water can also lead to poor diet and dehydration, both of which

contribute to the development of metabolic disorders like diabetes and hypertension (Zuniga et al., 2017).

Chronic diseases can also impose a substantial economic burden on farmworkers, as they rely on their physical capacity to earn a livelihood, therefore chronic health conditions that reduce physical function can lead to lost wages and financial strain. For instance, musculoskeletal disorders that affect mobility and strength may cause missing many days of work or even losing a job, contributing to a cycle of poverty and health deterioration (Minkler et al., 2020). The economic impact of chronic disease is further intensified by farmworkers' limited healthcare access. Many farmworkers are uninsured or underinsured, making it difficult to afford regular medical checkups or the medications necessary to manage chronic conditions (Gaitan-Cremaschi et al., 2020). This lack of insurance creates a barrier to accessing preventive care, which is essential for managing diseases like hypertension and diabetes in their early stages (CDC, 2023). Chronic diseases not only affect individual farmworkers but also their families and communities, as the primary wage earners in many migrant families, farmworkers' health directly impacts the wellbeing of their dependents (Quandt et al., 2016).

Given the high prevalence of chronic disease risk factors among farmworkers, prevention and early intervention are essential. Effective prevention strategies should target both occupational and lifestyle factors contributing to chronic disease. Community health programs that provide preventive services, screenings, and health education have proven effective in reaching farmworkers who may otherwise lack access to care (López-Cevallos et al., 2018). Programs that educate farmworkers on the importance of nutrition, physical activity, and stress management can empower them to adopt healthier lifestyle practices, reducing their risk of chronic disease

(Minkler et al., 2020). Research has shown that local community organizations who conduct health screenings and disseminate information are very effective in reaching isolated populations (Gaitan-Cremaschi et al., 2020).

Chronic diseases, defined here as long term, incurable conditions requiring ongoing management, present unique challenges for farmworkers. This population faces elevated risks due to occupational hazards, limited healthcare access, and socioeconomic stressors. Addressing chronic disease in farmworker communities requires a comprehensive approach that includes preventive care, workplace safety improvements, and culturally tailored health education. Such measures can reduce the burden of chronic disease on individual farmworkers and their communities, promoting healthier, more sustainable agricultural workforces.

Climate change:

Climate change refers to the long-term shifts in the average weather patterns that characterize Earth's local, regional, and global climates. It is essential not to conflate climate change with the concept of [global warming](#), as climate change encompasses a multitude of long-term changes beyond temperature rise alone. While these shifts in weather patterns can occur naturally over time, observed changes over the last century have been accelerated by human activities, particularly the burning of fossil fuels. Human influence on climate change became especially significant starting in the late 18th century with the Industrial Revolution, in which there was an increase in greenhouse gas emissions – especially carbon dioxide – through activities like burning coal, oil, and natural gas to produce energy. These emissions create a “greenhouse effect” that acts like a thermal blanket and traps heat in the atmosphere,

subsequently raising Earth's surface temperature over time. This warming effect intensifies weather patterns, contributing to more frequent heat waves, droughts, heavy rainfalls, and storms (National Aeronautics and Space Administration, 2024).

The impacts of climate change are especially profound for those in the agricultural sector, specifically farmworkers and their families. These workers face unique vulnerabilities to climate change due to the nature of their occupation, which involves long hours of outdoor labor under increasingly challenging conditions. Climate change exacerbates these conditions, creating a cascade of health risks and socioeconomic hardships for farmworkers – many of whom face limited access to resources that could help mitigate these effects. In order to understand climate change in the context of agriculture, one must examine how each major consequence of climate change – extreme heat, drought, air quality, and flooding – affects farm workers' productivity, health outcomes, and overall quality of life.

One of the most immediate effects of climate change is the rise in global temperatures, which leads to more frequent and intense heat waves. Farmworkers in regions like California are particularly vulnerable due to the nature of their occupation, which often requires working long hours outdoors with limited access to shade, water, and rest breaks. Prolonged exposure to high temperatures can result in dehydration, heat exhaustion, and heat stroke, which can be life-threatening without proper management. Chronic heat exposure can also impair cognitive function, increasing the risk of occupational accidents and injuries (Kaleikini, 2024).

However, farmworkers are often paid by the hour or by the quantity of produce harvested, meaning that taking breaks to cool down or hydrate can result in lost income. The economic pressures to keep working, despite the extreme heat, can heighten the risk of [heat-related illnesses](#). Many farmworkers also live in substandard housing that lacks air conditioning or adequate ventilation, which can prevent them from recovering after working in high temperatures. This ongoing exposure to extreme heat not only harms physical health, but also contributes to chronic stress and mental health issues as farmworkers aim to balance the need for financial stability with climate-change associated health risks.

As temperatures rise alongside prolonged drought conditions, the frequency and intensity of wildfires increase dramatically, especially in regions like California where many farmworkers are employed. Wildfires release large amounts of smoke and particulate matter into the air, which can travel great distances, impact air quality far from the source of the fire, and increase risk of respiratory illnesses like asthma and bronchitis. Farmworkers are especially vulnerable to wildfire smoke because they work outdoors and often lack access to protective equipment, such as N95 masks. Poor air quality has also been linked to cardiovascular problems and increased stress levels, further exacerbating health inequities. Many farmworkers in California face additional barriers to healthcare access, including cost, language barriers, and immigration concerns, which means symptoms of smoke exposure often go untreated. Over time, this can lead to chronic health issues and reduced quality of life (Becerra, 2023).

Climate change also drives eco-syndemics, or the interaction of environmental and social factors that worsen health outcomes. In agricultural communities, farmworkers face overlapping stressors like pesticide exposure, extreme heat, poor air quality, and limited access to clean water. For instance, the combination of heat stress and pesticide exposure can exacerbate respiratory conditions or trigger neurological symptoms. In California's Central Valley, where high pesticide use intersects with rising temperatures, farmworkers often experience compounding health risks. These eco-syndemics reflect how climate change amplifies existing vulnerabilities, particularly for low-income and undocumented workers (Farmworker Justice, 2022).

Warmer temperatures and longer growing seasons caused by climate change also promote the growth and spread of pest populations, increasing reliance on pesticides to protect crops. Farmworkers are often required to handle or work in fields that have been recently treated with pesticides, exposing them to harmful chemicals that can have serious health consequences. More specifically, exposure to pesticides has been linked to a range of health issues, including but not limited to: skin and eye irritation, respiratory problems, and in severe cases, neurological disorders and cancer. The lack of protective gear and insufficient safety regulations further heighten these risks, leaving workers vulnerable to long-term health impacts.

Droughts, another consequence of climate change, are especially significant in California, where agriculture is a major economic driver. Prolonged drought conditions reduce water availability for crops, threatening agricultural production and livelihood of farmworkers. Farmers facing water shortages often cut back on labor and reduce wages, leaving farmworkers with fewer job opportunities and unstable incomes. Water scarcity also directly affects farmworkers, who may have limited access to clean drinking water to stay hydrated during long work hours. Beyond the workplace, lack of clean water impacts basic household needs, such as bathing and cooking, which can lead to poor hygiene and increased vulnerability to illness (Farmworker Justice, 2022).

Increased rainfall, flooding, and extreme weather events like hurricanes are additional consequences of climate change with serious implications for farmworkers. Flooding can damage crops and disrupt agricultural production, leading to financial instability and even job losses for farmworkers. In rural communities prone to floods, extreme weather events can damage housing and create unsafe living conditions, forcing farmworkers and their families to seek temporary shelter or relocate entirely. The costs of repairing homes or replacing damaged belongings can further impose financial burdens, pushing farmworkers further into cycles of poverty and economic hardship (Farmworker Justice, 2022).

Farmworkers are often hesitant to advocate for safer working conditions due to fears of job loss, retaliation, or deportation. This vulnerability is intensified for undocumented workers, who lack adequate legal protections and are less likely to report unsafe conditions. These challenges are particularly concerning given the essential role farmworkers play in maintaining food production and supporting the agricultural industry. As climate change continues to intensify, it is crucial to prioritize the health and safety of farmworkers within adaptation and resilience efforts. By implementing stronger protections, addressing eco-syndemics, and expanding access to resources, we can help safeguard their livelihoods and build a more sustainable agricultural community.

Climate Migration:

Climate migration is an increasing trend globally that affects many vulnerable communities, such as farmworkers, by forcing them to move due to environmental changes, and knock-on social and economic stresses driven by [climate change](#). At base, climate change consists of all the changes in the earth's temperatures and weather patterns driven by human influences (such as burning fossil fuels) that trap heat in the atmosphere through the so-called 'greenhouse effect'. The changes from natural causes or human activities, such as burning fossil fuels, extreme weather events, rising sea levels, and deteriorating natural resources, disrupt livelihoods, especially in vulnerable regions. The consequences of climate change truly impact the livelihoods of many farmworkers, who have their whole lives shaped around the agricultural business. Knowing this, many farmworkers are forced to migrate to a safer environment due to climate change or even being forced to stay in. This puts them at more risk of health effects and economic instability, which ties in with existing issues tied to socio-economic conditions and

occupational hazards. Understanding climate migration is crucial to understanding the factors of this world and is necessary for developing effective responses to this global challenge.

Sudden and slow environmental changes impact the drivers of Climate Migration. Within California, we can see how both environmental changes affect one's health, especially farmworkers' health, regarding job placements and living conditions. Some factors include wildfires, extreme heat, and water

scarcity, which affect them, such as air quality, heat exhaustion, and pesticide exposure. Knowing these factors can cause many farmworkers to leave their space or struggle with permanent exposure temporarily. Many studies

have been conducted to showcase that rising temperatures, increased

frequency of droughts, and extreme weather events have reduced crop yields and threatened the viability of traditional farming practices (Mueller et al., 2021). This creates a ripple effect that

significantly diminishes employment opportunities for farmworkers. When extreme weather

events or changing growing seasons reduce agricultural output, many farmworkers are compelled to migrate—often temporarily—in search of alternative job opportunities.

While this migration can be viewed as a necessary adaptation strategy, it usually places them in even more vulnerable situations, particularly in regions where legal protections for migrants are inadequate or nonexistent. The figure analyzes how the complex paths by which climate change influences population movement (McMichael et al., 2012). Noticing this figure

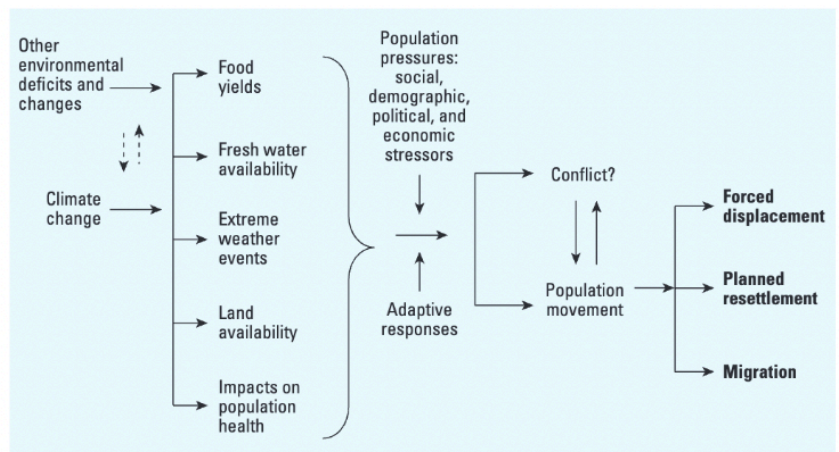


Figure 1. Relationship of climate change to potential population movements. The question mark after "Conflict" refers to the much debated topic regarding whether the effects of climate change, such as changes in food yields or population movement, will increase violent conflict.

helps unwind the relationships of climate change to population moves, which can be confusing to identify. For starters, there are three categories of understanding the moves many take: Forced displacement, Planned resettlement, and migration. Forced displacement usually takes place short distances from one area to another. It is more likely to occur as environmental changes and extreme climate events undermine peoples' ability to live in their places of residence. (McMichael et al., 2012).

Meanwhile, planned resettlement is more large-scale because communities are resettling within a country. Lastly, migration is more of an act of climate change impacts within a country and is more likely to contribute to urbanization. Understanding this considerably solidifies that many farmworkers within the U.S. while following this figure, are climate-driven to migrate based on changes, stressors, and more. For instance, in the United States, there is a pinpoint climate-driven migration of farmworkers in regions like California and Florida, where they are impacted by droughts and hurricanes, which disrupt agricultural productivity. Even though there is a backlash to climate migration being affected by climate change, research has shown that farmworkers are increasingly moving to different regions just due to seasonal work, jumping around from season to season (Fussell, 2018). Overall, it is very understandable, and the reality of moving occupations, however, does not alleviate their vulnerability but often exposes them to new risks, including job insecurity, health issues, and poor working conditions due to a lack of familiarity with new environments and communities (Horton, 2021).

Climate change is a significant driver of migration, affecting vulnerable populations globally, with farmworkers and fieldworkers among the most impacted. (McGloin., 2018). These workers, who rely on agriculture for their livelihoods, face increasingly precarious conditions

due to rising temperatures, unpredictable weather patterns, and resource scarcity. Farmworkers often reside in regions with limited social safety nets, making them particularly vulnerable to the health risks and economic instability associated with climate change. As environmental changes disrupt agriculture, migration has been a choice that many follow because of the new seasonal changes and job opportunities. However, migrating brings a higher risk of challenges, compounding existing issues tied to socio-economic conditions and occupational hazards.

Diving further into the Health implications of Climate Migration for Farmworkers is significant. Many farmworkers face numerous occupational hazards, which include exposure to pesticides, extreme temperatures, and long hours of physically demanding labor (Arcury & Quandt, 2020). Migrating in response to these hazards often affects farmworkers physically and mentally by exacerbating these risks. For instance, extreme heat has been illustrated to increase [heat-related illnesses](#) among farm workers, and migrant workers may experience these health impacts more acutely due to a lack of access to healthcare and language barriers in new regions (Schenker, 2017), which is devastating overall. However, it is a reality for many farmworkers because they need more resources.

To add, as many migrate, there is a higher risk of contracting infectious diseases due to substandard living conditions and the lack of/reduced time to access restrooms. Mental health impacts often compound these health challenges, as frequent migration and job instability contribute to high levels of stress, anxiety, and depression among farmworkers (Castañeda et al., 2018). Overall migration exacerbates many because, without stable access to health, including mental health support, many are faced with the same issues that can worsen over time and the overall well-being of farmworkers populations. (Quandt et al., 2016). Knowing these factors very

much dismisses that these effects are due to impetus for economic and institutional failure, fragile statehood, population relocation, and conflict (Shultz et al., 2018). This is a significant contributor to why many lack the necessary resources to aid them in a better livelihood.

Another significant barrier affecting climate migration is socio-economic and structural, including poverty, legal protection, and language and cultural differences, exacerbating farmworkers' vulnerability to climate-related health risks. For instance, those farmworkers that are undocumented immigrants face again reduced access to healthcare, poor working conditions, and wage exploitation (Horton, 2021; Holmes, 2013). Language barriers are another effective way to limit access to health care, especially for indigenous-language speakers (Arcury & Quandt, 2020). Knowing these structural barriers is very beneficial to understanding the structural solutions. It helps enhance and strengthen farmworkers' protections and legal status pathways and helps invest in climate-resilient agriculture, improving stabilization within employment and reducing Migration (Castañeda & Holmes, 2020; Mueller et al., 2021). Creating more mobile health clinics and bilingual educational programs will help improve healthcare access while also being able to expand within Medicaid expansion. Alternative options for uninsured workers would bridge healthcare gaps, ensuring better outcomes for this population.

In conclusion, climate migration is a complex issue that underscores the interconnectedness of environmental, social, and political factors in an era of climate change. It affects many vulnerable communities, such as farmworkers who rely on agriculture. Farmworkers are compelled to relocate as climate change rises yearly, bringing more environmental effects, resource scarcity, and deteriorating work conditions. This move imposes more effects on unstable working conditions, healthcare risks, and socio-economic hardships. Addressing climate change as climate migration effectively requires more protections for their

livelihoods, labor rights, and services. Creating more measures would allow farmworkers to adapt to changing conditions safely and securely by building relevance in agricultural communities as they face environmental challenges.

Community Health:

The definition of community health is ever-evolving because community health is an ever-evolving field. Since the term community health was first coined, it has obtained various definitions. Community health was previously defined by Green and Ottoson in 1999 “as referring to ‘the health status of a community and to the organized responsibilities of public health, school health, transportation safety, and other tax-supported functions, with voluntary and private actions, to promote and protect the health of local populations identified as communities’” (Goodman 2014). As the field of community health has evolved and grown, this definition has proved to be limited. Each individual community, the health at play, the scope of interventions, and the methods involved are unique and larger than this definition. With this in mind, Goodman later defined community health as “a multi-sector and multi-disciplinary collaborative enterprise that uses public health science, evidence-based strategies, and other approaches to engage and work with communities, in a culturally appropriate manner, to optimize the health and quality of life of all persons who live, work, or are otherwise active in a defined community or communities.” Using this and knowledge of biological, social, economic, environmental, and political factors that impact a given community’s health, community health workers strive to optimize the health of their community. They aim to tackle four major obstacles: health disparities, chronic disease burden, global health threats, and health literacy.

Community health workers do this by prioritizing disease prevention, health promotion, and health equity.

Disease prevention aims to reduce the incidence of communicable (a disease spread by contact, e.g. spread from person to person) and non-communicable (a chronic disease, not spread by contact) diseases within the community. This includes preventative actions such as vaccination programs, sanitation improvements, safety regulations, and preventative screenings. Both disease prevention and health promotion must involve the synergistic workings of all levels of the community health system. The fusion of community engagement, data collection, and policy development along with healthcare access and delivery through collaboration is essential for their success.

Health promotion involves analyzing the health risks a given community is exposed to, and then using what they have learned to improve the health outcome. This can include creating public health campaigns, educational programs, or community-based initiatives to tackle the population's health literacy skills. For instance, in the farmworker community, it is vital that community health workers utilize health promotion because of the insufficient training on the safety of handling pesticides, and other hazards on the farm. A study conducted in small tomato farms in western Cameroon showed that full personal protective equipment (PPE) was not used by the majority of farmworkers when handling and disposing of pesticides. The farmworkers mainly used only gloves and a nose mask, while full PPE also includes safety boots, safety glasses, and raincoats. Additionally, 99% of the farmworkers who participated in the study reported that they did not rinse their bodies after spraying pesticides and that only 35.6% of them received proper PPE and OHS (occupational health and safety) training. The farmworkers were

also asked how they dispose of the pesticide containers, and the overwhelming majority of the responses were that containers were disposed of in the environment or they were burned (Tambe et al. 2019) These are two relatively easy ways for pesticides to accumulate in soil and water sources. With proper PPE and pesticide safety training, the farmworkers would have learned the reasoning for the full PPE to be worn and why they should not burn or dump the containers into the environment. It is important to note that “generally, farmers believe that pesticide poisoning symptoms are ordinary so they get used to them”, which is not the reality (Tambe et al. 2019). Knowing this, community health workers can use health promotion strategies, to work with the farmers and educate them on the importance of proper PPE and other safety measures when handling pesticides, aiming to reduce the incidence of pesticide poisoning.



Example of PPE for pesticide spraying.

<https://croplifela.org/en/whats-new/personal-protective-equipment-ppe-for-the-application-of-agrochemicals>

Health equity addresses health disparities in the community. Each member of the community should have equal access and opportunity to have the necessary resources to live a healthy life, regardless of their race, gender, age, socioeconomic or legal status. According to the World Health Organization, to pursue health equity means to give attention to the communities with the greatest risk of experiencing poor health, based on social factors. These social factors can be referred to as the social determinants of health, which are the conditions in which people are born, grow, learn, live, work, and age. The social determinants of health can be grouped into five domains: education access and quality, health care access and quality, neighborhood and built environment, social and community context, and economic stability. Within the domain of neighborhood and built environment, we can look at environmental health factors.

Environmental health factors consider air quality, water quality, extreme weather, changing climate, sanitation, exposure to chemicals or radiation, accessibility to nature, and the sustainability of the built environment an individual resides in. These are especially important when analyzing the health inequities that the farmworker community faces.

Farmworkers are one of the most essential communities, however, they are at the greatest risk of experiencing poor health. Community health workers help to identify and mend the health disparities experienced by the farmworking community, especially among migrant and seasonal farmworkers. Not only do farmworkers experience occupational hazards, like the pesticide exposure mentioned previously, but farmworkers are isolated to rural communities. These rural

communities often experience food insecurity, unfit homes, and no real proximity to healthcare centers (Harwell et al. 2022). Additionally, there is a language barrier in these communities. In California for example, many of the migrant farmworkers speak Spanish or dialects of Spanish such as Mixteco. For these reasons and others, the farmworker community must rely on community health workers to improve their health and eradicate these disparities.

Confianza:

A cultural construct meaning "trust," which is essential for effective communication and relationships between farmworkers and health educators.

What is Confianza?

Confianza is a term in Spanish that directly translates to “trust” in English, but encompasses a wide spectrum of words like reliance, confidence, faith, familiarity, and most importantly the belief that there is a mutual respect and understanding between a relationship. In Latino communities, common phrases like “confia en mi”, “ten confianza” and “con confianza” signify a common ground between interpersonal relationships. Where each phrase expresses a particular meaning of Confianza, ie. “Believe in me”, “Have faith”, and “With confidence”. There are many ways to develop and express this relationship which plays a crucial role in understanding the latino experience.

Linguistic Background

The term Confianza is made up of the latin word Confidentia, where “con” means with or together, and “fides” meaning faith. The word itself incorporates a wider range of meanings versus its english counterpart. It invokes a feeling of positivity, belonging, and togetherness.

There are many types of Confianza, where the article *Fortalece tu capacidad y la de los demás: ¡Infunde confianza siempre!*,

takes a psychological approach about the importance of each division: Confianza in others, auto confianza, conductive confianza, spiritual confianza, simple confianza, and fed Confianza (UNAM Global). Confianza is incredibly important for development as a society and as a human, and it teaches how to approach situations in a way that will generate solutions and maintain positive attitudes between all parties.

Cultural Background

Confianza is what encompasses shared humanity and is the foundation for developing meaningful interpersonal relationships. This concept is especially significant in Latino communities, where collective trust is essential for managing both home and work life. For example, within families, confianza builds strong support systems, helping them face challenges together. In professional settings, such as workplaces or community organizations, confianza encourages collaboration, mutual respect, and collective growth. Confianza is also especially important when working with latino communities, where someone who understands or has lived through similar experiences would outweigh any credentials, which garners more trust among individuals versus institutions (Foster).

Real World

Confianza has been at the forefront of the farmworker rights movement, bringing people with shared backgrounds together to advocate for change in California. The United Farm Workers (UFW) has used the idea that confianza y esperanza are necessary to unite farmworkers in their

fight for better wages, safer working conditions, and basic human dignity. *Confianza* is built on the power of solidarity and unity, demonstrated through movements like the Delano Grape Strike of the 1960s, where despite coming from different cultural backgrounds, latino farm workers joined the filipino grape workers strike (United Farm Workers). This unity not only promoted the idea of solidarity but exacerbated the movement across North America. Another important example being the Salinas Lettuce strike during the 1970s, where the UFW led a boycott of non-union lettuce. This strike amassed thousands of supporters with the ultimate goal of having safer working conditions and solidifying their right to organize. *Confianza* amongst farmworkers and others was crucial in order to properly organize and maintain unity.

Barriers

Confianza goes beyond the simple meaning of trust since it is also about feeling understood, respected, and supported. For many farmworkers, however, feeling this connection is difficult when met without proper communication. Language barriers are a significant hurdle. Many Indigenous farmworkers speak languages like Mixtec, Zapotec, or Nahuatl, which aren't widely understood by employers or service providers. Without interpreters or resources in their languages, basic communication becomes a struggle. This lack of understanding leads to frustration and isolation, creating a divide that weakens *confianza*. Fear creates another hurdle that needs to be addressed. Undocumented workers often live under constant pressure, knowing that deportation, job loss, or retaliation could be potential consequences if they decide to speak up. This fear creates a protective silence, cutting off the chance for trust to develop between workers and those who might help them. This is where providing a safe and understanding environment and assuring there is *Confianza* is crucial when managing subjects like legal status.

Building Confianza

Despite the challenges, *confianza* is not out of reach. Building it takes consistent effort, empathy, and practical strategies. Speaking Spanish is a great way to engage with some latino communities, as well as addressing language barriers. Offering resources in Indigenous languages and hiring community health workers who share cultural backgrounds with farmworkers builds stronger connections. Speaking the same language shows respect and creates trust. Another way to build relationships is by keeping communities informed, which encourages transparency and builds trust. Conferences that teach labor rights, healthcare access, or financial skills provide the necessary tools to speak up and address difficult situations. Learning builds confidence, which helps strengthen trust and mutual respect. Creating spaces like *Platicas en Confianza*, where people can share their experiences also helps (*Farmworker health, safety and rights are focus of conference*). These workshops create spaces that promote open dialogue, build relationships and promote understanding. These spaces give farmworkers the opportunity to connect and find common ground.

Overall

Confianza forms the foundation for stronger relationships and communities. It encourages collaboration and problem-solving, which makes it easier to address shared challenges like unfair working conditions or gaps in healthcare. *Confianza* also strengthens everyday relationships. Workers who trust their doctors are more likely to seek care, leading to better health outcomes.

They are also more likely to open up about their issues when presented with a safe environment to do so.

Cultural Competence:

Cultural competence is a framework of congruent behaviors, attitudes, and policies that equips individuals and institutions with the skills and knowledge to interact effectively across diverse cultural contexts. As the Centers for Disease Control and Prevention referred, "'Culture' refers to integrated patterns of human behavior that include the language, thoughts, communications, actions, customs, beliefs, values, and institutions of racial, ethnic, religious, or social groups. 'Competence' implies having the capacity to function effectively as an individual and an organization within the context of consumers' and their communities' cultural beliefs, behaviors, and needs. (Adapted from Cross, 1989). As regions continue to evolve in diversity, cultural competence has been a significant component of the delivery of health and human services, where cultural differences can be impacted by access, quality, and outcomes. (Saha et al., 2008; Horvat et al., 2014). Especially communities of farmworkers, where much of their culture/beliefs can be diminished in employment, healthcare, educational settings, and more. Acknowledging cultural competence in these types of environments is essential to know how to be responsible for and respect many farmworkers' diverse backgrounds, especially those who are migrants or immigrants who do not primarily speak English, utilizing Spanish or Indigenous languages as their comfort language, and have to face health challenges tied to their work environments and socioeconomic conditions.

This keyword is conceptualized as a framework with several other definitions that play significant components in this word—keywords such as cultural awareness, knowledge, skills, and encounters. These words build cultural competence and form the foundation for culturally competent interactions in professional and community settings (Renzaho et al., 2013). Knowing the surrounding components regarding these words dives deeper into how they impact the role of farmworkers' lives within healthcare, employment, and educational settings. First, we must understand critical components, such as cultural background and health beliefs. Farmworkers within the U.S often come from Mexico, Guatemala, El Salvador, and other parts of Latin America, where cultural norms and health beliefs may differ significantly from those in the U.S. Many farmworkers hold traditional beliefs about health and illness, influenced by family, religion, and Indigenous practices (Ornelas et al., 2020). There needs to be a normalization for providers to understand these beliefs and incorporate them into patient care by acknowledging, respecting, and even integrating them into the treatment process when appropriate.

Diving deeper into how cultural competence must be part of farmworkers' healthcare, let us examine how disparities in access to quality care reflect broader social inequalities. Many farmworkers within their employments face many barriers, such as significant occupational hazards such as pesticide exposure, extreme temperatures, and limited access to shade and clean water, which directly impact their health (Arcury & Quandt, 2020). Knowing this information, many mayordomo (crew supervisors) and healthcare providers should uphold a cultural competency communication system with farmworks by enabling a trust system, more accurate treatment, and follow-through on care plans. Studies have shown that patients are more likely to

feel respected and understood by culturally aware providers, leading to better patient outcomes and higher satisfaction (Alizadeh & Chavan, 2016; Horvat et al., 2014). Studies have shown that cultural competence training can reduce healthcare disparities by addressing cultural barriers, improving communication, and fostering trust (Betancourt et al., 2005; Saha et al., 2008). For example, some farmworkers may prioritize traditional healing practices, which culturally competent providers can incorporate into care plans to foster understanding and cooperation—knowing the patient's needs and upholding the beliefs that show a strong sense of belonging and being understood.

Many opportunities within an educational setting are downside and limited due to language barriers, restricted program access, and cultural differences. Cultural competence in education is vital for addressing these challenges and creating programs that support farmworkers' learning needs. Educators must be culturally aware of many farmworkers because some may lack formal education, impacting their comfort in an educational setting. Educators who recognize and respect this make the environment more welcoming (Renzaho et al., 2013). It will allow understanding of farmworkers' backgrounds, goals, and obstacles, like work schedules and transportation, making programs more accessible and practical. By helping educators present material more reliably, such as translations, bilingual staff can be crucial in helping understand topics and feedback one gets. This approach allows educators to develop inclusive, culturally attuned programs that better serve the unique needs of farmworkers.

In an employment setting, this keyword is vital in creating a more inclusive workplace that respects everyone regardless of their beliefs, background, cultural norms, and more.

Farmworkers, in particular, face barriers such as language differences, legal protection, and very unfamiliarity with laws within the U.S and knowing their rights within a working environment, making it vital for employers to recognize and accommodate their unique needs (Méndez et al., 2020). Incorporating cultural competence into employment practices, such as bilingual training for mayordomos and more understanding for promotores to understand workplace protocols. This will allow the supervisor to communicate, actively listen, respect farmworkers' trust, and encourage compliance with workplace expectations. Daily interactions with farmworkers offer valuable enabling employers to change and understand the practices they have developed and create a safer, more inclusive workplace.

Lastly, institutions increasingly incorporate cultural competence into professional training programs to address the need to evolve diverse populations. Research indicates that such training benefits students and practitioners by enhancing empathy, cultural awareness, and communication skills, ultimately improving their ability to effectively serve diverse communities (Constantinou et al., 2022). Integrating cultural humility and structural competence into training programs can create more building blocks in evaluating this keyword to strengthen its understanding and aid it can contribute. It can further enhance employers' ability to address complicated social and cultural factors influencing workers' care. Integrating this training will promote reflective practices by encouraging self-assessment and engagement with cultural issues impacting many today. Implicating professionals to understand and respond to cultural and structural factors, cultural competence training contributes to a more inclusive and equitable service environment across sectors.

In summary, cultural competency is applied effectively in various contexts related to farmworker life, including the workplace, healthcare, and educational institutions. It enhances results by “expanding the focus beyond individual cultural attributes to include the social and structural factors, such as socioeconomic status and access to resources, that shape health and wellbeing” (Metzl & Hansen, 2014). This keyword respects and does not discriminate between the cultural origins of farmworkers, strengthening the bond between them and the system they encounter regularly. These initiatives are strengthened when cultural humility and structural competence are incorporated, enabling professionals to handle systemic obstacles and cultural quirks that affect farmworkers' access to opportunities and resources. In the end, fostering conditions that promote farmworkers' safety, well-being, and academic advancement still requires cultural competence.

Dehydration/Deshidratación:

Dehydration is a severe condition that impacts the health of farmworkers, where prolonged exposure to high temperatures and intense physical labor are common. Dehydration is defined by the body's loss of more fluids than it takes in, which sets off a chain reaction of physiological disruptions that can have both immediate and long-term consequences. For farmworkers, the risks are increased by limited access to water and shade, putting them in constant danger of dehydration.

TABLE 2 | Heat-related health outcomes of included studies.

| Heat-related outcomes | N | % |
|----------------------------|----|----|
| Heat-related illnesses | 57 | 62 |
| Kidney diseases | 28 | 30 |
| Cardiorespiratory symptoms | 1 | 1 |
| Respiratory diseases | 2 | 2 |
| Injuries | 1 | 1 |
| Skin disorders | 1 | 1 |
| Reproductive health | 1 | 1 |
| Diabetes and hypertension | 1 | 1 |

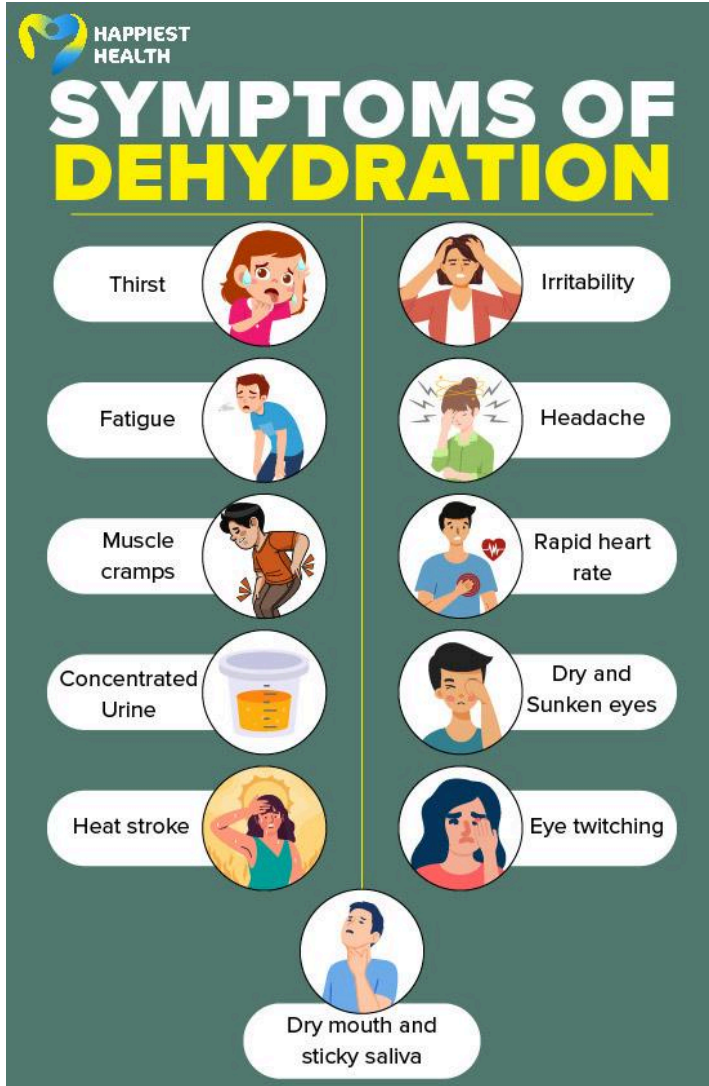
Table above is clipped from the Article below. See [Heat Related Illness](#) for more information.

El Khayat, M., et al. "Impacts of Climate Change and Heat Stress on Farmworkers' Health: A Scoping Review." *Frontiers in Public Health*, vol. 10, 2022, pp. 1-12.

At a physiological level, dehydration affects nearly every organ in the body, beginning with the kidneys. The kidneys are vital for maintaining the body's fluid balance by filtering waste from the blood. When dehydration sets in, they start conserving water by keeping all the waste (urea, potassium, sodium, etc.) they produce. This waste then increases the risk of developing kidney stones, as the minerals in the urine—made in the kidneys—begin to crystallize. Dehydration over a long period of time can further damage the kidneys, potentially leading to [chronic kidney disease](#). Occupational heat exposure along with dehydration have also been recorded to be linked to an epidemic of chronic kidney diseases known as “chronic disease of unknown etiology (CKDu)” (Khayat, et al. 2). The cardiovascular system, as well as the brain are also impacted negatively by dehydration. Dehydration tends to make blood thicken as fluid levels drop, making the heart work harder to pump. As well, without a proper balance of water and electrolytes, the

brain won't be able to function properly, causing cognitive impairments such as confusion, memory issues, and impaired judgment.

Other causes of dehydration include, and are not limited to, alcohol consumption, not drinking enough water, diarrhea, and vomiting. Alcohol, especially, acts as a diuretic, increasing urine production, leading to rapid fluid loss. This combined with hot weather and the demanding physical activity farm workers tend to experience, the intake of alcohol can greatly exacerbate dehydration risk. Which, in the end, can permanently damage the organs and, when severe enough, lead to death.



Graphic from link:

<https://mygoodlife.org/blog/news-events/staying-cool-as-a-cucumber-a-sunny-caution-from-goodlife/>.

Dehydration can happen very subtly, with early signs that are easily overlooked, but are extremely important to recognize. Common initial symptoms include thirst, dry mouth, fatigue, and dark-colored urine. As dehydration progresses, more concerning symptoms may develop,

such as dizziness, headaches, muscle cramps, and confusion. In severe cases, symptoms like rapid heartbeat, extreme weakness, or even fainting can occur, indicating a need for immediate intervention. At the onset of any of these dehydration symptoms, it's essential to take a break, find shade, and begin rehydrating by drinking small amounts of water gradually. Drinks like Pedialyte and Gatorade are also good to drink because of their high electrolyte percentage. Keep in mind, there is a big emphasis on taking in fluid gradually, as the body absorbs fluid more effectively in smaller amounts, preventing the digestive system from being overwhelmed. When dehydrated, drinking large amounts of water too quickly can cause nausea or vomiting, which, as stated above, causes dehydration, worsening the whole situation. *Risk Factors Associated with Indicators of Dehydration Among Migrant Farmworkers* found that 96.8% of farmworkers reported had end-of-shift USG samples above 1.020, indicating potential dehydration (Alasilim, et al. 1). So, for the majority of farmworkers or those in hot environments, regular hydration breaks are crucial for preventing dehydration from worsening. If symptoms persist for more than a day, a trip to the hospital is critical for preventing serious complications from occurring (i.e. kidney failure). Similarly, an improper diet lacking in water-dense foods— like fruits and vegetables, can make it more difficult to stay hydrated. Farmworkers are at particularly high risk, as they often work extended hours in intense sun due to low wages that force them to push beyond their physical limits. This prolonged exposure increases the chances of all the complications related to dehydration stated above as well as [heatstroke](#), which is another life-threatening condition associated with dehydration. Unfortunately, many farmworkers are discouraged from taking essential breaks to drink water or find shade, as they may face reduced pay for time spent away from work. Even restroom breaks are often avoided, as going to the bathroom could result in punishment, further worsening their dehydration risk as well as risk for

kidney infection (See Kidney Infection). These pressures create an environment where farmworkers' basic health needs are neglected, heightening their vulnerability to severe health issues that, with proper conditions, could be largely preventable.

When suffering from a severe case of dehydration, one should seek out immediate medical care. Going to the Emergency Room (ER), though it has long lines, is typically the best place to go for those who don't have health insurance and/or can't afford medical care. In the United States, ERs are required to treat patients regardless of their ability to pay as well as immigration status. So, anyone that goes to the ER must be given a medical examination, as required by law. This makes it easier for undocumented immigrants to seek the medical care that they desperately need. Not only are ERs helpful, but places like Salud Para La gente, in Watsonville, are equipped to aid in the health of farmworkers, including those who are uninsured and undocumented. This specific clinic is located at 204 East Beach Street and is open from 8AM to 7PM Monday through Thursday.

Diminished Biodiversity:

Decline in the variety of life on earth caused by human activities, [climate change](#) and pesticides use, resulting in more pesticide use.

In a purely scientific sense, diminished biodiversity refers to the decline in the variety of life at multiple scales, including the genetic, species, and ecosystem levels. The issue with this kind of decline is its impact on an ecosystem's ability to be resilient to outside variables.

Diminished biodiversity is closely related to human activity, further exacerbated by climate change, but can also occur through natural processes. The loss of biodiversity undermines

ecosystem services critical for human well-being, reducing food security, water purification, and disease control (Cardinale et al., 2012). Human activities contributing to diminished biodiversity include habitat degradation, deforestation, agricultural activity, and urbanization. Climate change's influence on diminished biodiversity is mainly attributed to temperature shifts, extreme weather, and altered species distribution (Newbold et al., 2016; Parmesan & Yohe, 2003). For farmworkers, biodiversity loss causes a cascade of adverse events. Firstly, it creates economic instability with less available job opportunities and less available produce to sell for profit.

Without biodiversity, one farm cannot produce enough of one crop to meet the same level of economic gain as seen with various crops. It also creates an increased risk for chemical exposure since pesticides and other harmful chemicals will increase, allowing a farm to attempt to continue operations similarly to previously. An overlooked aspect is erosion as well. Without crop diversification, erosion is more likely to occur since the nutrients in the soil are more likely to be diminished. This can lead to more intense flooding during the rainy season, adverse lung health due to inhaling too many chemicals in the soil, and a loss of farmable land space (Altieri, 1999; Kjellstrom et al., 2016). The cultural and socioeconomic relation to biodiversity is also crucial in understanding the importance of its loss. The loss of indigenous biodiversity knowledge has laid the foundation for unhealthy practices. All Indigenous protection techniques do not require pesticides or other harmful chemicals and practices to preserve biodiversity. Instead, they utilize methods that preserve nature to ensure that their practices do not create more adverse effects to simply quell one issue. Furthermore, biodiversity loss disproportionately affects marginalized communities, exacerbating inequalities and threatening traditional ways of life (Adams et al., 2004).

Mitigating biodiversity loss is extremely possible, but requires a multipronged approach to ensure more issues aren't created. First, there is community led and indigenous conservation approaches. It works to recognize indigenous land practices to ensure that the best solution is created to curb diminished biodiversity. It also ensures that both parties share the benefits instead of one-sided solutions we have seen throughout. This helps to protect local, cultural values, provides agency to disenfranchised populations, and ensures a safe method of protecting our shared land and planet (Berkes, 2004). Protected areas, such as national parks and wildlife reserves, also serve as a valiant effort in protecting biodiversity. It ensures that biodiversity, in at least one area, can be protected; however, this approach needs to be in conjunction with addressing climate change. Addressing climate change is a major method to curb biodiversity loss in a way that both protects farmworkers and our environment as a whole. Investments in renewable energy, reforestation, and adaptive strategies can help mitigate climate change's effect on biodiversity (IPCC, 2018).

Returning back to how diminished biodiversity affects farmworkers, a crucial aspect is monoculture farming. This is where a single crop dominates land use for either farms. This makes the crops much more vulnerable to pests and disease, which increase the likelihood of chemical use. Overreliance on chemicals creates hazardous working environments for farmworkers, specifically leading to chronic health issues, respiratory problems, skin irritation, and neurological disorders (Kamel & Hoppin, 2004). Diminished biodiversity also affects pollination and soil fertility. Crops that depend on natural pollination are adversely affected by a decline in pollinators. This reduces crop yields and forces farmworkers to manual pollinate, a labor-intensive practice (Potts et al., 2010). Soil fertility is a key aspect of biodiversity in crops; however, monoculture practices and chemical use all contribute to soil degradation. This reduces

productivity as it requires more labor to restore soil fertility and control erosion (Lal, 2004).

Bringing climate change back into discussion, a loss of biodiversity can threaten farmworker safety. As previously mentioned, it can create extreme weather events such as heatwaves, floods, and droughts that not only threaten the physical health of farmworkers, but also their economic health. If their crop yields are destroyed or severely lessened by climate change, it creates a situation where farmworkers cannot, realistically, solve the problem themselves.

Diminished biodiversity is a multifaceted problem that requires a comprehensive understanding of all different aspects. This definition highly focuses on the affects it has on farmworkers specifically; however, biodiversity is such a blanket term that it requires a basic understanding of genetics, among other sciences. Addressing the impact of diminished biodiversity of farmworkers requires promoting environmentally friendly agricultural practices, policies that protect farmworkers from hazardous exposure, and innovative solutions that utilize a holistic approach.

Disability:

Disability is not a simple concept, rather it is complex and multidimensional which include impairments in body function or structure, activity limitations and participation restrictions which are significantly influenced by external factors namely environmental barrier (World Health Organization). Current understandings go beyond reductionist models that circumscribe disability to the physicality of the individual, and instead reflect perspectives explaining how social, cultural, legal, and economic factors shape the experience of disabled individuals. This more expansive view aims not only to capture the experiences of disabled people, but also to find approaches that work towards uprooting structural barriers that lead to their oppression.

The established medical model of disability characterizes disability as a health condition that diverges from the normative state and requires medical intervention or treatment (Marks). This model focuses on locating the “problem” within an individual, and often serves to alienate disabled people from agency. It has taken hold, for instance, by emphasizing rehabilitation and other corrective practices as the solution when barriers to well-being are prevalent. This sort of normalization theory promotes stigmatization itself, as critics believe it places people with disabilities in a passive role (Barnes 23) to adapt to "normal" society instead of a place where "normality must be resisted if human experiences are diverse and different" (23).

In contrast, the social model reframes disability as a result of societal structures and systemic oppression, stating that people are handicapped not because their conditions physically impair them but rather because of their exclusionary environments and attitudes towards differences (Oliver). You shaped up the model, which has been productive and helpful to advocacy, policy-making and accessibility campaigns. Studies, however, say that it may unintentionally minimize the hold of disability on everyday life. Shakespeare and Watson point out that we make the mistake of forgetting that for many people pain, fatigue, etc., are very much inextricably linked to their condition (15).

The biopsychosocial model of disability can be construed as an effort to bridge the gaps between models by incorporating biological, psychological, and social dimensions. It stresses the interaction of personal health determinants with external influences, emphasizing that disability is not merely a property ascribed to individuals but a multidimensional concept shaped by disability determinants (Bickenbach et al.). By focusing on the complex interaction of biological,

psychological and social factors in an individual, this approach is particularly useful for developing targeted interventions that can meet both medical and structural needs.

The explanation of disability, then, can be further nuanced through an intersectional framework that considers how interlocking identities (ex: race and gender; sexuality and class) create distinctive forms of oppression and privilege (Cho et al. 785). For instance, disabled individuals of color may encounter layered barriers that are rooted in racism, ableism and economic exclusion. Looking through an intersectional lens reminds us that there is no one narrative which can adequately describe the full breadth of disabled experience.

How disability is perceived varies from one culture to another and reflects differences in its values, beliefs, and norms. To some societies, disability is stigma and social exclusion; to others, it is part of the realm of human diversity (Ingstad and Whyte 8). Societal values regarding disability can over-ride access to much necessary healthcare, social services and community inclusion. This salient of cultural aspects highlights the necessity regarding contextual awareness for understanding and dealing with disability.

Disability: A Unique Dimension for Farmworkers From the Study Arcury and Quandt describe farmworkers as being at high risk for sustaining disabling injuries and development of chronic health conditions due to the strenuous demands of agricultural labor, exposure to dangerous terrains presented by pesticides or machinery employed on farms, and the precarious economic situations many farmworkers face (456). Farmworkers experience various health conditions, including musculoskeletal injuries, pesticide poisoning and respiratory illnesses, but the problem is even worse because of barriers to healthcare access and adjustments at workplaces

that do not exist (Hansen and Donohoe 17). The immigration status of many exacerbates their vulnerability (increased risk of abuse), and language access creates hurdles to psychogeriatric services.

On farm workers are burdened with disability through structural inequities in the form of a lack of affordable housing, health services, and safety standards in the agricultural sector. Comprehensive reforms that prioritize health and safety regulations, ensuring medical access to everyone, and prioritizing policy change for farmworker protection are required to mitigate these challenges.

Disability can be re-framed as a social justice issue with the human rights-based approach, which recognizes that all human beings are born free and equal in dignity and rights (UDHR Article 1). Policies such as the Americans with Disabilities Act (ADA) and international frameworks like the United Nations Convention on the Rights of Persons with Disabilities (CRPD) aim to remove obstacles and promote additional participation ("Convention on the Rights of Persons with Disabilities"). Although these legal instruments are an important step forward, the difference they will make in countries will depend on how well they are implemented and the willingness of policymakers to reform discriminatory practices that have become embedded over many decades.

Disability is an interaction of biological, psychological, social and cultural factors: a multi-dimensional concept that is no inherent property of the human condition. Those individual impairments may be problematic, but the negative social and structural barriers that accentuate exclusion are no less important. These dynamics express themselves uniquely among

marginalized communities, such as farmworkers, and is an indication of a larger theme of inequity and injustice. Adopting holistic and inclusive definitions will enable society to better meet the needs of, and uphold the rights of disabled persons.

Environmental Exposures:

Farmworkers endure many environmental exposures in their occupations that affect their health and can have lasting impacts but short or long term. The agricultural industry relies heavily on manual labor, and these workers are often exposed to a variety of harmful agents, including pesticides, dust, heat, and other occupational hazards. Many farmworkers, particularly in low- and middle-income countries or among migrant populations in high-income countries, experience these exposures under suboptimal working conditions and limited access to healthcare.

Pesticides are among the most significant environmental hazards for farmworkers. These chemicals are widely used to control pests and increase agricultural productivity but are associated with a range of health effects. Acute exposure to pesticides can lead to symptoms such as skin irritation, dizziness, nausea, and respiratory issues. Chronic exposure is linked to more severe outcomes, including neurological disorders, endocrine disruption, reproductive health problems, and certain cancers (Alavanja et al., 2013). Farmworkers are exposed to pesticides through direct handling during application, contact with residues on crops, and drift from nearby fields. Studies show that protective measures, such as wearing gloves and masks, are not consistently utilized due to lack of training or the unavailability of protective equipment (Quandt et al., 2010). Many farmworkers can recall being forced to go back into the fields after they've

been sprayed with pesticide, noticing insects and worms jump from the fruits at coming into contact with the pesticide. It raises concern to the effects it clearly has on insects, and what it is doing to human health as well.

[Heat stress](#) is another critical concern for farmworkers, especially relating to global warming. Farmworkers often perform strenuous labor outdoors during peak heat hours, increasing their vulnerability to heat-related illnesses. Prolonged exposure to high temperatures can lead to dehydration, heat exhaustion, and heatstroke, which, if untreated, can be fatal (Schaeffer et al., 2021). It has even been found that the average US agricultural worker is being exposed to 21 working days in the summer growing season that is unsafe for human health. In addition, farm workers are 20x more likely to die from heat related illnesses compared to other non-federal government workers highlight the detrimental impact heat plays in farm worker health (*Environmental Defense Fund, 2023*). Migrant farmworkers, who often live and work in regions with extreme temperatures, are disproportionately affected. A study by Runkle et al. (2017) found that the combination of heat exposure and poor housing conditions exacerbates health risks for these workers. Climate change is expected to intensify these challenges by increasing the frequency and severity of heatwaves, further endangering this population. Farm workers might be denied access to shade, water, and restroom breaks which prevents them from getting the resources they need in that moment, and it can become a fatal action(*Federation of American Scientists, 2024*). Farmworkers are frequently exposed to respiratory hazards, including organic and inorganic dust, animal dander, and endotoxins. These exposures can lead to chronic respiratory conditions such as asthma, chronic obstructive pulmonary disease (COPD), and hypersensitivity pneumonitis (Kirkhorn & Garry, 2000). Workers in specific agricultural sectors, such as grain handling or livestock farming, may face even greater risks due

to the high concentration of airborne particles in their work environment. Despite these dangers, respiratory protective equipment is rarely used in practice, often due to discomfort, lack of awareness, or limited access to suitable gear (Arcury et al., 2012).

In addition to pesticides, farmworkers are exposed to other chemicals used in agriculture, such as fertilizers, solvents, and fuels. Chronic exposure to nitrogen-based fertilizers, for example, has been linked to respiratory and skin disorders, while solvents can cause neurological and liver damage (McCauley et al., 2006). Many of these exposures occur in settings where safety protocols are inadequately communicated or enforced. Water and soil contamination in agricultural areas can also affect farmworkers. Irrigation water contaminated with agricultural runoff may expose workers to pathogens and chemicals, while direct contact with contaminated soil can lead to dermal absorption of harmful substances (Thompson et al., 2015). Prolonged exposure to arsenic, for instance, which can be present in some soils, is associated with skin lesions, cancers, and cardiovascular diseases.

Socioeconomic and structural factors exacerbate the health risks associated with environmental exposures among farmworkers. Many are low-income earners, immigrants, or migrant laborers who lack access to adequate healthcare, housing, and legal protections. Language barriers and limited health literacy further impede workers' ability to understand and follow safety guidelines. These systemic issues create a cycle of vulnerability, where workers are continually exposed to risks without adequate means of protection or remediation. Pesticide exposure alone has been linked to increased risks of Parkinson's disease, reduced neurodevelopment in children of exposed workers, and certain cancers, such as non-Hodgkin lymphoma (Ross et al., 2015). Respiratory exposures contribute to a significant burden of

chronic lung diseases, while heat stress is a leading cause of occupational mortality in the agricultural sector.

Additionally, the psychological toll of working in hazardous conditions cannot be overlooked. For many farm workers, they don't realize they are experiencing mental health challenges; however, such symptoms can be displayed through physical effects like tense necks, muscle pain and difficulty sleeping. More significantly, it was found that the majority of farm workers who seek healthcare service and treatment often prioritize their own children's medical needs before their own, preferring for their kids to receive any resources and benefits possible. In addition, 38% of Hispanic adults have reported having poor mental health due to their occupation (Bejarano, 2023).

Ergonomics:

Ergonomics is the study of the way people work with the tools in their environment, especially in the workplace, in order to better design methods of reducing strain on the body. These studies can inform the regulations put in place by health and safety organizations, such as Cal/OSHA, in order to ensure that workers' long-term health is accounted for. Studies such as the MDPI's meta study on ergonomics in agriculture, show the need for "the identification of the risk factors pertaining to MSDs; the determination of the root causes; as well as the development, implementation, and evaluation of ergonomic interventions" in the agricultural field as a workplace (Benos, Tsaopoulos, and Bochtis 2020). Ergonomics includes the limitation of repetitive movements, awkward postures, and changing the design of tools to better adapt to the individual tasks.

Ethnography:

A social science research method with its origins in Victorian anthropology back when anthropologists presumed to study the cultural and regional 'ethnos' of an ethnically defined people. It has subsequently lost its ties to colonial anthropology and become a word to describe any close study of people involving conversations, extended interviews and length periods of fieldwork in a particular community. NB James Clifford

Extreme Heat Events:

An extreme heat event (EHE) can be defined as unusually high temperatures for an extended period of time. Unusually high temperatures are temperatures that exceed the typical seasonal averages. This will vary depending on location and season, however, according to the Federal Emergency Management Agency (FEMA), extreme heat in most of the United States is consistent temperature readings above 90 degrees Fahrenheit with humidity. If this were to persist for two to three days or longer, it will classify as an extreme heat event. In addition to heightened temperatures during the day, EHEs often lack the cooling of temperatures at night. This can cause negative effects on human health because there is no cool-down period, continuing the body's [heat stress](#). While not all locations experience it, the introduction of humidity can also amplify the effects of extreme heat, putting further stress on the body.

Extreme heat events can occur as a result of many factors. High-pressure systems, heat domes, and other atmospheric circulation patterns can trap the hot air near the surface. This prevents cooling and stagnates the temperatures, causing prolonged heat. Metropolitan and urban areas are more susceptible to this and other extreme heat-causing events because the high amount of

concrete and built environment retain more heat. This is known as the urban heat island effect. Weather conditions can also influence the occurrence of EHEs. The El Nino climate pattern brings warmer temperatures, which can lead to unseasonably high temperatures in many areas. Droughts also contributed to intensified EHEs because of the lack of moisture in the soil. This causes less evaporation to cool the air, which essentially creates a positive feedback loop extending the extreme heat. With all these being said, [climate change](#) is the biggest driver of more frequent EHEs. Greenhouse gas emissions are the main force behind them. According to the IPCC, “the frequency and intensity of hot extremes will continue to increase and those of cold extremes will continue to decrease, at global and continental scales and in nearly all inhabited regions with increasing [global warming](#) levels” (Seneviratne et al., 2021).

As extreme heat events are becoming more frequent they are now, in the United States, the most prominent cause of weather-related human mortality (Luber et al., 2008). Heat-related illnesses, such as heat stroke and heat exhaustion, are major outcomes of EHEs. Without treatment, these heat-related illnesses can be fatal. In order to avoid heat-related illnesses, it is advised to stay indoors with a cooling system and to avoid any strenuous activity outside. However, this is often not an option for agricultural communities. Many farmworkers continue to work through EHEs and have reported that they have “limited opportunities to hydrate” or they avoid drinking water because of the piece-rate payment system many farms use (Iglesias-Rios et al., 2022).

Dehydration and heat stroke are proven to be very damaging to kidneys. In recent years, there have been several epidemics of chronic kidney disease (CKD) developing in primarily agricultural communities (Sasai, 2021). This is most likely due to the exposure to extreme heat, coupled with dehydration and housing that lacks cooling systems, that most farmworkers face.

Additionally, extreme heat events lead to increased occurrences of wildfires. The hot and dry conditions conducive to EHEs are perfect for the ignition of wildfires. Not only do wildfires wipe out entire communities and small regions, they leave behind a high amount of smoke impairing the air quality of an even larger land mass. Wildfires prove to be especially harmful to the health of the agricultural community. In Sonoma County, California farmworkers are permitted to enter and work in evacuated zones due to the Ag Pass Program. Many of the farmworkers in the county are undocumented and speak little to no English. The farmworkers enter into these evacuated zones with no real preparedness, putting their life at risk. Wildfire smoke contains PM_{2.5} (particulate matter that is smaller than 2.5 μm), which is highly associated with acute and chronic respiratory effects (Pizarro et al., 2024). Additionally, because the primary growing season (June to October) coincides with the wildfire season, agricultural workers outside of Sonoma County are harmed due to traveling wildfire smoke. Exposure to wildfire smoke can cause irritation to the eyes, nose, and throat, and the tightening of the lungs. It can also aggravate pre-existing conditions, such as asthma. Chronic exposure can result in decreased lung function and increase the chance of hypertension (Schollaert et al., 2024). Because of this increasing frequency of wildfires due to EHEs, farmworkers will be increasingly exposed to wildfire smoke, exacerbating its effects.

On top of all that, extreme heat events can amplify food insecurity. With rising temperatures, crops can become stressed resulting in a decreased yield. This can lead to food shortages and in turn higher prices, leaving many communities to struggle to get food. Along with higher prices for food, the cost of energy can increase. With higher temperatures, comes increased use of electricity for air conditioning and cooling systems. This in larger cities often leads to power

outages. Extreme heat is also damaging to both our natural and built environment. Asphalt and steel can warp when exposed to consistently high temperatures, damaging roads and railways. In our natural environment, ecosystems are harmed by rising ocean temperatures and prolonged drought in ecosystems not conducive to those conditions. Disbalance in ecosystems can have drastic effects on food chains, which is threatening yet again to human health.

With the increasing frequency of these extreme heat events and their increasing effects on human health, it is vital that public health interventions and climate mitigation strategies are implemented. Public health interventions can be the introduction of cooling centers available for members of the community to access at any time, or food banks that give out water and foods beneficial to curbing dehydration. Climate mitigation is more preventative, involving implementing renewable energy sources, conserving water, and initiatives to lower greenhouse gas emissions. Lastly, cities can introduce more green spaces and shaded spaces in hopes to counteract the urban heat island effect and provide an area for the public to go to cool off.

Food Insecurity:

Unreliable access to a sufficient amount of food (let alone healthy), which affects their long-term health.

Food security is the access to safe, nutritious, and readily available food at all times in order to maintain an active and healthy lifestyle. There are four components that determine a community's food security: availability, access, utilization, and stability.

Food Availability determines if there is enough food produced or imported to meet a community's needs. There are primary factors that affect food availability, such as farming

practices, trade, and climate conditions. Changes in climate, for example, have made food availability increasingly unpredictable, with extreme weather events disrupting food production (McCarthy et al., 2018). Additionally, trade policies and global markets influence the flow of food, which can either strengthen or weaken local food systems (Margulis, 2016).

Food Access determines if people have enough money or resources to obtain or buy food. While there may be available food in one's community, it may be too expensive to purchase, restricting access for populations with lower incomes. Economic inequality, such as hyperinflation or lack of employment opportunities, exacerbates this challenge, preventing many from affording nutritious food (Martin-Shields & Stojetz, 2018). Global trade systems can also worsen food access when they prioritize cheap, imported food over local agricultural production, further undermining food security for vulnerable populations (Margulis, 2016).

Food Utilization is about the ways in which food is prepared, and the knowledge people have about making food that is healthy and nutritious, and consuming food in a healthy way. This includes things like nutrition education, access to clean water, and proper hygiene. The ability to effectively utilize food also relies on community education and access to cooking technologies that can improve food safety and nutritional value (McCarthy et al., 2018).

Food Stability addresses the longevity of food security, including how much food is consistently available and how often people can rely on it. This includes considering short-term conflicts like natural disasters or long-term economic adversity. Food insecurity can be dependent on social unrest and political instability. In areas where food production relies heavily on climate conditions, tensions between communities and even nations can lead to competition, creating scarcity among available resources (Martin-Shields & Stojetz, 2018). Margulis (2016) highlights

that political decisions and international trade agreements also affect the stability of food supplies, particularly in conflict zones or areas with weak governance.

In order to break the cycle of food insecurity, we must address the root causes of these insecurities, including inequality and inadequate political governance (Boliko, 2019).

Why is Food Security Important?

Food sustains life, health, well-being, and development. Malnutrition and hunger are outcomes of food insecurity that can impact the health of generations. Food insecurity can be dependent on social unrest and political instability. In areas where food production relies heavily on climate conditions, tensions between communities and even nations can lead to competition, creating scarcity among available resources (Martin-Shields & Stojetz, 2018). Boliko (2019) emphasizes that global food systems must adapt to meet the nutritional needs of a growing population, particularly in vulnerable regions facing political instability and conflict. In order to break the cycle of food insecurity, we must address the root causes of these insecurities, including inequality and inadequate political governance (Margulis, 2016).

The Challenges to Achieving Food Security

Several big challenges make food security hard to achieve:

[Climate Change](#): The increasingly unpredictable weather patterns, such as droughts, floods, and natural disasters, heavily affect food production, especially in areas that rely on farming. These events can destroy crops and disrupt food supplies, making it difficult for communities to maintain stable access to food (McCarthy et al., 2018). The FAO (Boliko, 2019) reports that extreme climate conditions are already undermining global food systems, with consequences for both food availability and stability.

Economic Inequality: Due to hyperinflation, more and more people are lacking the money to afford healthy food or do not have access to reliable markets. Trade policies sometimes make this worse by prioritizing cheap imports over local production, which can harm local farmers and disrupt food access (Margulis, 2016). The lack of sufficient income to purchase food, compounded by global trade imbalances, creates barriers to achieving food security, especially for low-income populations (Martin-Shields & Stojetz, 2018).

Conflict: Wars and violence destroy food systems, making it hard for people to grow, buy, or get food. Conflict can also make food access more unpredictable and harder to rely on, especially when a community or nation is not currently self-sufficient due to the destruction of farmlands and routes of import (Martin-Shields & Stojetz, 2018). Margulis (2016) notes that multilateral trade negotiations, when influenced by conflict, can further destabilize local food systems and exacerbate food insecurity.

How Can Technology Help?

Advances in farming, like drought-resistant crops or better irrigation systems, can help ensure more food is available. Innovations in food storage and transportation can reduce food waste and make food distribution more efficient (McCarthy et al., 2018). By training farmworkers in agricultural technology, there is a better chance for people to continue in agriculture without harming their bodies and to achieve a better financial outlook that can support a healthy lifestyle. Furthermore, technologies that enhance food security must address both local farming methods and global trade systems to improve access to healthy food for all (Boliko, 2019).

The Connection Between Food Security and Conflict

Food insecurity and conflict are often linked. Hunger and a lack of resources can spark conflicts, while wars destroy food supplies, making it harder for people to access food. This creates a cycle

where both food insecurity and conflict worsen each other (Martin-Shields & Stojetz, 2018). McCarthy et al. (2018) argue that technological advancements must be integrated into conflict-prone regions to ensure that food systems are more resilient to disruption.

Moving Forward

To solve food security problems, countries, organizations, and communities need to work together. We must focus on making food available, accessible, and stable for everyone, while also addressing inequalities and protecting each other and the planet from irreversible effects of climate change. This requires both better technology and more inclusive policies that ensure fair access to food for all people, especially the most vulnerable (Boliko, 2019; McCarthy et al., 2018).

Global Health:

The physical and mental well-being of people around the world and how those concerns bring all of us together to learn and grow as humans

As recognized by the World Health Organization (WHO), healthcare is a fundamental human right. Global health is the concept of improving health and achieving health equity for people worldwide. It focuses on the physical and mental well-being of individuals, regardless of their socioeconomic status, race, or gender. It encompasses the social determinants of health, including social, cultural, economic, political, and environmental factors that contribute to health inequities. Global health aims to address a wide range of global health issues, including infectious diseases, non-communicable diseases, maternal and child health, mental health, environmental health, and the impacts of [climate change](#). The primary goal is to maximize academic research and science to promote health equity, reduce health disparities, and improve

health outcomes. Achieving these goals requires collaboration across sectors beyond traditional medical and healthcare systems, even though research and interventions are often implemented at the local level.



The social determinants of health include economic stability, access to and quality of education, healthcare access and quality, neighborhood and built environment, and social and community context. People with higher incomes and social status tend to have better health outcomes, and the greater the gap between the richest and poorest, the more pronounced the health disparities. Low education levels are often linked to poorer health, increased stress, and lower self-confidence. In terms of the physical environment, access to safe water and clean air, healthy workplaces, safe housing, and well-planned communities and roads significantly contribute to better health outcomes. Stable employment and good working conditions are associated with improved health outcomes compared to limited or unstable work environments. Additionally, genetic factors and strong social support networks, such as relationships with

family, friends, and communities, are critical for better health outcomes. Access to and effective use of preventive healthcare services are also essential to maintaining overall health. These interconnected social determinants provide a holistic perspective on health while emphasizing the complexity of achieving equitable health outcomes worldwide. Recognizing these factors has significantly influenced the evolution of global health as a field, with efforts to address health inequities gaining momentum and driving impactful change globally.

The term global health first appeared in scientific literature in the 1940s and was later adopted by WHO as a guiding theoretical framework. From the 1990s onward, as the term gained traction among scholars, research and publications on global health grew rapidly. This expansion was supported by the Global Health Initiative, a plan signed by the U.S. President Barack Obama, which fostered collaborations between countries to tackle complex medical and public health challenges through federal funding, development aid, capacity building, education, scientific research, policymaking, and implementation. The initiative became a key component of national strategies addressing economic globalization, security, and international policies.

The history of global health is deeply tied to the impacts of colonialism and ongoing power imbalances. Colonial systems often disrupted indigenous healthcare practices, imposed Western medical models, and exploited resources from colonized regions, leaving behind weakened health systems and insufficient infrastructure. These legacies still shape global health today, as high-income nations and large international organizations frequently dominate decision-making. This imbalance can lead to programs that reflect the priorities of donor-driven agendas rather than addressing the actual needs of local communities. For example, aid and funding are frequently tied to conditions that align more closely with the strategic interests of

wealthier nations rather than addressing systemic health inequities in resource-poor settings. Addressing these structural issues is critical to fostering a more equitable and sustainable approach to global health, one that centers the voices and needs of affected populations.

By 2019, WHO identified a total of 10 threats to global health including air pollution and climate change, noncommunicable diseases, threat of a global influenza pandemic, fragile and vulnerable settings such as regions impacted by drought and conflict, antimicrobial resistance, Ebola and high-threat pathogens, weak primary care, vaccine hesitancy, dengue, and the human deficiency virus (HIV). Each of these threats listed is real and supported by substantial data and evidence of its occurrence. Air pollution and climate change stand as urgent, recurring environmental and health challenges. Air pollution is linked to millions of deaths annually due to its role in respiratory and cardiovascular diseases, while climate change intensifies the situation by increasing extreme weather events, disrupting ecosystems, and contributing to the spread of diseases like malaria and dengue. Farmworkers that are disproportionately impacted by these environmental changes face high risks of [heat-related illnesses](#) and respiratory conditions due to prolonged exposure to extreme temperatures and pesticides. As essential contributors to the global food system, their vulnerabilities highlight the negative impact of climate change and the urgent need for equitable, sustainable interventions.

The threat of a global influenza pandemic serves as a critical reminder of the need for preparedness in public health systems, an urgency made abundantly evident by the COVID-19 pandemic. COVID-19 demonstrated how quickly a novel pathogen can spread across the globe, causing immense loss of life, overwhelming healthcare systems, and disrupting economies. It emphasized the importance of robust surveillance systems, early response mechanisms, and

international collaboration to mitigate such crises. The pandemic also emphasized the interconnectedness of other health threats, such as vaccine hesitancy, which emerged as a significant barrier to achieving widespread immunity, and antimicrobial resistance, which complicated the treatment of secondary infections.

Fragile and vulnerable settings, such as areas impacted by conflict, drought, and displacement, add on to the global health threats by limiting access to basic healthcare and resources. Over a billion people live in such conditions, facing barriers to vaccination, nutrition, and essential medical services. Meanwhile, noncommunicable diseases like diabetes and heart disease that are driven by risk factors such as unhealthy diets and sedentary lifestyles, remain the leading cause of death globally. Furthermore, the resurgence of diseases like dengue highlights the impact of rapid urbanization and climate change on vector-borne illnesses.

Tackling global health challenges involves three key tasks. The first is understanding the spatial and temporal patterns of medical and health issues globally to better assess their impact. The second is investigating the determinants and influential factors associated with health issues of global significance. The third is developing evidence-based solutions, including strategies, frameworks, governance structures, policies, regulations, and laws to address these issues. Global health also fulfills three core functions: generating knowledge and theories about global health issues, disseminating this knowledge through education, training, and knowledge-sharing initiatives, and applying knowledge, theories, and intervention strategies in practice to solve global health problems effectively.

A collective effort is required to tackle any global health challenges including a coordinated global response, investment in better healthcare systems, and community-driven solutions to address root causes effectively. By maximizing shared knowledge amongst each other, fostering innovations, and implementing coordinating actions, the global community can address pressing threats and improve health outcomes worldwide.

Global warming:

Global warming refers to the gradual increase in Earth's average surface temperature, primarily caused by human activities such as burning fossil fuels. These activities release greenhouse gasses, like carbon dioxide, into the atmosphere, trapping heat that would otherwise escape into space. This process, known as the greenhouse effect, creates a “thermal blanket” around the Earth, causing temperatures to rise over time. While global warming is one component of the broader phenomenon of [climate change](#), it is a central driver of related impacts, such as shifts in weather patterns, rising sea levels, and more extreme weather events. Since the Industrial Revolution, the burning of coal, oil, and natural gas has intensified, leading to a sharp increase in greenhouse gas emissions. These emissions have now reached levels that are causing observable changes in our climate, affecting ecosystems, communities, and industries around the world (Kristof, 2024).



“Carbon dioxide traps heat, like a puffy coat,” (National Aeronautics and Space Administration, 2022)

The impacts of global warming are especially profound for those in the agricultural sector, specifically farmworkers and their families. California, a hub for U.S. agriculture, is one of the most affected regions. More specifically, the Central Valley experiences some of the higher summer temperatures in the country, with daily highs often exceeding 110°F (43°C) (Ortiz, 2022). Rising temperatures and extreme heat events are particularly dangerous for farmworkers due to the nature of their occupation, as they are often expected to work long shifts outdoors with limited access to shade, water, or rest breaks. This can expose farmworkers to the risk of [heat stress, dehydration, and heat stroke](#), which can have life-threatening consequences if not addressed. Additionally, taking breaks or seeking shelter during extreme heat is not always a feasible option for farmworkers, as they are typically paid by the hour or by the quantity of produce harvested. This creates an economic pressure to keep working, even when the risks to their health are significant. Moreover, many farmworkers live in substandard housing that lacks proper ventilation or air conditioning, making it difficult for them to recover after a long day in the heat. Without a proper cooling system, they face prolonged exposure to high temperatures

both indoors and outdoors, exacerbating heat stress and contributing to chronic health issues (Kaleikini, 2024).

Rising temperatures also lead to more intense and frequent wildfires, particularly in areas like California, where large numbers of farmworkers are employed. The smoke from wildfires can travel hundreds of miles from the active fire, and farmworkers who are working outdoors are directly exposed to this polluted air. Long-term exposure to wildfire smoke can lead to or worsen pre-existing respiratory conditions such as asthma and bronchitis. Poor air quality has also been linked to cardiovascular issues and mental health problems, such as increased stress and anxiety, which can compound the already difficult living and working conditions. Furthermore, farmworkers often lack access to the protective equipment needed to shield themselves from harmful air pollutants, such as masks, which further heightens their vulnerability. The lack of healthcare resources in many rural farming areas means that symptoms of smoke exposure may go untreated, potentially leading to more severe health problems down the line. When access to healthcare is available, many farmworkers still face additional barriers to access, including financial constraints, language barriers, and fear of seeking care due to immigration status (Becerra, 2023).

Global warming promotes the growth and spread of pest populations due to higher temperatures and longer growing seasons, which forces farmers to rely more heavily on pesticides to protect their crops. Farmworkers are frequently required to work in fields that have recently been treated with these chemicals, putting them at risk of exposure to substances with serious health implications. Pesticide exposure has been associated with numerous health problems, including skin and eye irritation, respiratory issues, and in severe cases, neurological disorders and even cancer. As a result, prolonged exposure to pesticides can lead to lasting health

effects, and the limited availability of protective gear and insufficient safety regulations further increase the risk for farmworkers.

In addition to the direct health risks posed by rising temperatures, global warming also affects farmworkers in other ways. One of the most immediate effects is the increasing frequency of droughts and water scarcity. In many agricultural areas, water is a critical resource for crop production, and its scarcity can lead to crop failure, reduced yields, and economic instability. For farmworkers, this can mean reduced work opportunities, as farmers may be unable to afford to pay workers or may have to cut back on labor during difficult harvests. The reduction in work hours or even the loss of employment can push farmworkers further into poverty. Many farmworker communities also lack access to clean drinking, bathing, and cooking water, and in turn, become more susceptible to poor hygiene, [heat-related illnesses](#), and other health complications (Farmworker Justice, 2022).

Farmworkers are oftentimes reluctant to speak up about unsafe working conditions, often due to fears of job loss, retaliation, or deportation. The fear is heightened for undocumented workers or those lacking sufficient legal protections, making them less likely to report unsafe working conditions. These challenges are all the more concerning given the central role that farmworkers play in ensuring food production and sustaining the agricultural industry. As the effects of global warming become more pronounced, it is essential to prioritize the health and safety of farmworkers through effective adoption and resilience strategies. By developing stronger protections and providing better resources for these workers, we can not only safeguard their livelihoods, but also promote a more sustainable and equitable agricultural system.

Health:

Relating to a person's physical and mental well-being, generally in a state without illness -
address WHO definition

Health is a broad concept that goes beyond just the absence of disease. The World Health Organization (WHO) defines health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity" (WHO, 2024). This definition recognizes that health involves not only being free from illness but also feeling good mentally and having strong social connections. As definitions change, health has become more subjective to the individual and their experiences influenced by a variety of social and biological factors. Health is no longer able to be determined in a general sense, since everyone has different needs and desires. While some biological needs are more objective, there needs to be a more holistic approach to addressing health issues. Health is a dynamic state that can change over time, influenced by a range of factors, including how we live, our environment, and the support we receive from society.

1. Physical Health

Physical health refers to the well-being of the body. It includes staying free from disease, maintaining good nutrition, exercising regularly, and getting enough rest. Physical health is what most people traditionally think of when they talk about being "healthy." But it also involves preventive care and healthy lifestyle choices that keep the body functioning at its best.

2. Mental Health

Mental health is just as important as physical health. It involves emotional well-being and the ability to handle stress, build relationships, and make decisions. People with good mental health can manage challenges and feel good about themselves. Mental health is connected to physical

health, as stress or emotional issues can lead to physical problems, and staying active and healthy can improve mood and mental function (Javidi et al., 2022).

3. Social Well-being

Social health refers to the quality of our relationships and how we interact with others. It involves having a supportive network of family, friends, and community, as well as having access to resources like education, employment, and healthcare. A supportive social environment can help individuals lead healthier, happier lives. Social factors, like income or education, play a big role in determining health outcomes (Kickbusch et al., 2013).

4. Health as a Dynamic State

Health is not a fixed condition; it can change over time. It is influenced by personal choices, environmental factors, and life events. For example, a person might be healthy in their youth but face health challenges as they age, or they might encounter environmental risks that impact their well-being. Health is also affected by larger issues, such as pollution, unsafe working conditions, or social injustice (Saxton, 2021).

5. Health Literacy

Health literacy is the ability to understand and use health information to make decisions about one's well-being. People who are health literate know how to navigate the healthcare system, follow medical advice, and take steps to improve their health. This empowers people to make better choices and improves overall health. Improving health literacy is essential for preventing diseases and promoting well-being (Kickbusch et al., 2013).

6. Public Health and Health Promotion

Public health plays a key role in improving health by creating conditions that promote well-being. This includes policies to prevent diseases, improve living conditions, and address

social and environmental factors that affect health. Public health initiatives, such as vaccination programs or clean water access, help populations stay healthy and reduce health disparities (WHO, 2024).

Conclusion

Health is a complex and evolving state that includes physical, mental, and social well-being. It is influenced by personal choices, environmental factors, and the support we receive from society. Good health means not just avoiding disease but also feeling good physically, mentally, and socially. To achieve good health, we must consider all these aspects, address the root causes of health problems, and create environments that support healthy living for everyone.

Health Disparities:

The difference in health care treatments/outcomes that disadvantaged groups experience compared to other groups

Introduction

Despite the demanding nature of their jobs, farmworkers are often left unprotected, facing significant health risks with little to no support for medical care. These essential workers are completely taken advantage of, and they face health challenges that extend beyond the field. Farmworkers often live in remote, rural areas where cramped and overcrowded housing only adds to the daily struggles of survival. Clean water and fresh, healthy food are hard to come by in these communities, forcing families to rely on processed foods and water that may not even be

safe to drink. The lack of these basic necessities isn't just inconvenient — it's dangerous, making it nearly impossible for farmworkers to stay healthy.

Mental & Physical Conditions Within Farmworker Populations

Farmworkers are particularly vulnerable to a range of physical and mental health conditions due to their work-related stressors & exposures. Despite regulations aimed at protecting workers, the enforcement of safety standards is inconsistent and often inadequate, leaving workers without the protection they need and rightly deserve. The back-breaking nature of their work, combined with inadequate access to healthcare, significantly contributes to the health disparities they face.

Pesticide exposure is a major health hazard for farmworkers. The chemicals sprayed on fields are applied frequently and in high concentrations, exposing workers to toxic substances every day. As a result, workers regularly suffer from rashes, eye irritation, and even chemical burns, along with respiratory symptoms like coughing, wheezing, and shortness of breath. Long-term exposure to these toxins, however, is where the real tragedy lies. Chronic respiratory conditions like asthma and chronic obstructive pulmonary disease (COPD) become almost inevitable after years of working under these conditions. There is a consistent link between prolonged pesticide exposure and lasting lung damage, with many farmworkers reporting health effects, including several cancers, delayed neuropathy, Parkinson's disease (Walton et al., 2017).

Additionally, diabetes, hypertension, and musculoskeletal pain are common chronic health conditions they face. Influenced by limited access to healthy food options & the prevalence of food deserts in rural areas where they work, farmworkers are forced to rely on inexpensive,

processed foods. This diet leads to high rates of diabetes. Furthermore, hypertension is another serious issue in farmworker communities. There is ceaseless physical labor in high-stress working conditions, to the point where many farmworkers avoid drinking water during their shifts to minimize break time and maintain productivity, often at the expense of their health. Oftentimes, employers will set a quota that the farmworkers must meet in terms of the amount they need to pick. If the workers can't reach that limit, their wages are cut, or in some cases, they are fired. In an article covering Triqui laborers in Washington, a farmworker explains the chronic pains they experience from the physical demands of bending over & picking strawberries, "... You pick with both hands, bent over, kneeling like this [demonstrating with both knees fully bent and his head bowed forward]. Your back hurts; you get knee pains and pain here [touching his hip]. Well, when it rains, you get pretty mad and—and—you have to keep picking. They don't give lunch breaks. You have to work every day like that ... You suffer a lot in work'" (Holmes, 2006). The repetitive movements involved in tasks like bending over and picking the fruit lead to a lot of musculoskeletal strain. Over time, these physically demanding tasks take a significant toll on the farmworkers' bodies, contributing to chronic pain and injury.

While physical health issues are pervasive among farmworkers, their mental health challenges are often overlooked due to the stress that defines their daily lives. Many are under constant financial pressure, working in low-wage jobs with little to no job security. This economic instability, coupled with the ongoing fear of deportation, leaves many farmworkers in a perpetual state of anxiety. The long hours of physically demanding work doesn't only take a toll on their body, it also affects their mind. The emotional strain can lead to serious mental health issues such as anxiety, depression, and anger (Hagen et al., 2017). Many farmworkers experience these

feelings but refuse to speak up about it, due to the stigma surrounding mental health within many farmworker communities and the scarce services offered (particularly in rural areas). This lack of access to care and the cultural reluctance to address psychological well-being only worsens the situation. Without intervention, untreated mental health issues can spiral into substance abuse, further complicating farmworkers' health problems.

Barriers to Healthcare Access

The barriers to preventive care, including lack of health insurance, undocumented status, and poverty, result in high rates of untreated conditions. Accessible, high-quality healthcare remains out of reach for the majority of farmworkers in the United States, particularly due to the prohibitive costs associated with medical services. Many farmworkers are undocumented as well, limiting their eligibility for government-supported insurances. Safety net hospitals attempt to fill the gap by serving patients without private insurances or those covered by programs like Medicaid. These facilities are essential for vulnerable populations who would otherwise lack access to healthcare. Located predominantly in economically disadvantaged areas, they aim to increase healthcare access for those most in need. Unfortunately, however, these hospitals face significant financial challenges: they receive lower reimbursements for treating patients on government plans and no compensation for uninsured patients, which limits their resources and impacts the quality of care they can provide. This funding gap hinders their ability to maintain high standards, perpetuating a cycle of inadequate care in underserved communities.

Furthermore, undocumented farmworkers often feel like they have no choice but to avoid seeking healthcare services due to their fear of exposure & its consequences, like deportation

(Kisa et al., 2024). This deep-seated distrust of healthcare institutions leaves them to make a painful choice: go without the necessary medical attention they desperately need, even when struggling with injuries from work or suffering through chronic health conditions. Many will endure their pain all because the risks of reaching out for help are too dangerous.

Environmental & Cultural Factors

Health disparities are further exacerbated by environmental factors. Many farmworkers are forced to resort to substandard housing, often situated near hazardous sources of pollution, including landfills, industrial zones, and agricultural sites. These areas often expose residents to harmful environmental hazards, such as contaminated air, water, and soil, as well as high levels of pesticides, all of which take a devastating toll on their health. Living near agricultural fields, for instance, means that farmworker housing is often subject to pesticide drift, where toxic chemicals sprayed on nearby crops can spread through the air, posing long-term respiratory, neurological risks, and chronic health issues. The air they breathe, the water they drink, and the soil they touch are often laced with dangers that most of us would never have to face. These poor living conditions only make it harder for them to stay healthy, and the lack of access to proper nutrition makes matters worse. Many farmworker communities live in “food deserts”, where fresh & healthy food is out of reach. Instead, cheap, processed food becomes the only accessible option, contributing to chronic health issues like diabetes and hypertension (Kiehne et al., 2013). This cycle of illness becomes harder to escape, especially when every facet of their environment is working against them.

Living so far from urban centers means even more challenges. Reliable internet access is a luxury most can't afford, cutting them off from resources many take for granted, like looking up health information, booking doctor's appointments, or accessing telehealth services. With healthcare facilities often miles away, and no way to bridge that distance, many farmworkers are left to manage serious health issues on their own. Language barriers create yet another hurdle. Many farmworkers speak Spanish or indigenous languages, but healthcare systems are built around English, leaving workers to navigate a confusing, often hostile system without the support they need. Without interpreters or bilingual staff, getting care feels impossible. And then there's the lack of transportation. In rural areas, there's no reliable public transit, and owning a car is out of reach for most families, making even a short trip to the clinic a daunting task. These are not just inconveniences — they're barriers that keep farmworkers from getting the care they desperately need. Each obstacle piles onto the next, creating a system that leaves them isolated, vulnerable, and overlooked. It's a cycle of neglect that takes a toll not just on their bodies but on their spirits, too.

Solutions

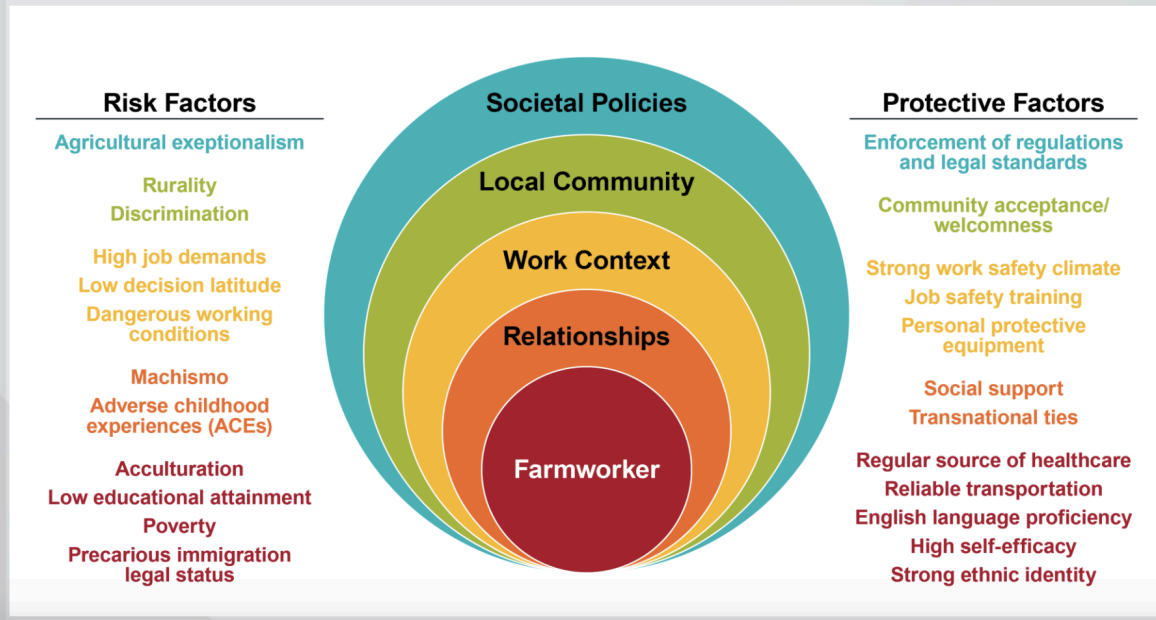
Employer-provided health insurance could drastically improve the well-being of millions of farmworkers. With guaranteed access to coverage, workers would be able to receive preventive care, better manage long-term health conditions, and address injuries common to agricultural work, such as musculoskeletal disorders & pesticide-related illnesses. These conditions often go untreated or poorly managed due to the lack of insurance and fear of seeking medical help. Another solution is found in community health workers, or CHWs. They are often the lifeline for farmworker communities, stepping in where traditional healthcare systems fall short. Many

CHWs come from farmworker backgrounds themselves, giving them a deep understanding of the challenges these workers face. They provide culturally relevant education on critical topics like pesticide exposure, [heat illnesses](#), and workplace injuries, tailoring their help to the realities of farmwork. They also assist with the practicalities of accessing care, arranging transportation to clinics, interpreting during appointments, and helping farmworkers navigate a healthcare system that often feels confusing and unwelcoming. Their presence ensures that farmworkers are not completely cut off from vital services (Harwell et al., 2022).

Conclusion

For farmworkers, the hope of a stable, healthy life remains distant. Addressing these disparities is crucial not only for the farmworkers themselves, but also for the broader communities that rely on their labor. Meaningful change will require systemic action to create safer working conditions, improve access to healthcare, and ensure fair wages & housing — ultimately recognizing and respecting the contributions these workers make to our communities.

Social ecological model of migrant farmworker health



Graphic from:

https://www.ncfh.org/uploads/3/8/6/8/38685499/supporting_mental_and_social_well-being_among_farmworkers_04-25-23_fv_pdf.pdf

Health Literacy:

The ability of individuals to receive and understand health related information so that they can make decisions about their own health. High health literacy also empowers people to seek care when needed and take control of their health.

Heat Related Illness:

‘Heat-related illness’ is an umbrella term for a variety of disorders caused by excessively high body heat. This may include heat cramps, heat syncope, heat exhaustion, or heat stroke, which all vary in level of severity (Lugo-Amador et al., 2005). In normal conditions, human body temperature is strictly regulated by a system of heat creation and heat dissipation.

Hyperthermia, or high body temperature, occurs when the body is either producing too much heat or is unable to dissipate enough heat to return to ideal body temperature. Although the body can typically withstand short periods of slightly increased body temperature, such as with a fever or during intense exercise, severe heat illness can occur when temperatures are excessively high, the body is unable to cool itself off, or the high body temperature is prolonged (Lugo-Amador et al., 2005).

As was previously mentioned, there are many different illnesses that can be caused by heat. Minor conditions include heat edema, heat syncope, and heat cramps (Lugo-Amador et al., 2005). Although the symptoms vary slightly, these are not life threatening and can usually be treated with rehydration and rest. However, if the heat-related illness is left untreated, it may progress to heat exhaustion, which is characterized by water depletion followed by salt depletion caused by fluid loss without adequate replacement of lost fluids and electrolytes (Lugo-Amador et al., 2005). Symptoms of heat exhaustion may include fatigue, headache, nausea and vomiting, muscle cramps, and dizziness, and weakness, and this condition is often treated by replenishing lost fluids. Heat exhaustion can progress to the most severe form of heat-related illness, heat stroke (Lugo-Amador et al., 2005). This commonly occurs when environmental temperatures and humidity are high and tends to develop over the span of a few days. Patients typically experience similar symptoms to heat exhaustion, but with the potential addition of body temperatures higher

than 104°F, altered mental status, hyperventilation, hypotension, and tachycardia. A variation of classic heat stroke is exertional heat stroke, which tends to occur due to engagement in strenuous physical activity during times of high heat. Heat stroke can develop into additional complications such as acute renal failure, rhabdomyolysis, and abnormal blood clotting abilities (Lugo-Amador et al., 2005). Heat stroke is a severe and life threatening condition that requires immediate medical attention.

Knowing about the various levels of heat-related illness aids in understanding the ways in which it affects farmworkers. Farmworkers are disproportionately affected by heat illnesses compared to other workers in the United States, with 30% of fatal heat-related illness cases in California between 2005 and 2021 being from farmworkers (Langer et al., 2023). A positive correlation was found between level of work exertion heat stress, indicating that higher activity and effort levels with little rest are a significant contributor to incidence of heat-related illness (Langer et al., 2023). Additionally, in California, farms tend to be situated in areas such as the Central Valley, which experience high temperatures up to approximately 120°F. In addition, humid environments can reduce heat dissipation, thus reducing the body's ability to reduce its temperature (Mora et al., 2017). High ambient temperatures and heat waves are being exacerbated by [global warming](#), and are only expected to continue rising in future years (Edgerly et al., 2024). This will only add to the severity of the issue if [climate change](#) is not addressed and measures are not taken to reduce the risk of heat-related illness in farmworkers. Another contributing factor is poor work conditions and overworking due to work culture. Farmworkers often feel unable to stand up for their rights, and may not even know their labor rights in the first place (Edgerly et al., 2024). Farmworkers may feel unsafe taking rest or water breaks due to a

work culture that encourages constant labor (Fleischer et al., 2013). Others may also feel the need to continue working in order to earn more wages.

Recommendations for preventing heat-related illness by The Occupational Safety and Health Administration (OSHA) include gradually acclimating worker to heat levels, drinking one cup of water every 20 minutes, wearing appropriate protective clothing, ensuring a cool, shaded place for frequent rest breaks, and monitoring of symptoms (OSHA, 2024). It has been found that proper access to heat-related illness prevention as well as protective policies are vital in preventing illness and death (Edgerly et al., 2024). A common preventative intervention is education about heat-related symptoms. Heat education for farmworkers has been shown to decrease the incidences of heat-related illnesses and overall improve the health of farmworkers (Santos et al., 2022). In one study that surveyed farmworkers about their knowledge on heat-related illness first aid, over half of survey participants answered questions related to heat illnesses incorrectly (Smith et al., 2020). One notable example from this survey was that all 13 participants who stated that a dizzy coworker should be told to push through their symptoms were men. Despite the low sample size, this may hint at the role that *machismo* plays in farmworkers disregarding heat-related symptoms. Findings on the importance of health education for farmworkers highlight the need for community involvement and intervention, as roles such as *promotores* are often effective for this type of task.











Heat-Related Illness Graphical Illustration:



[This](#) is a link to a pdf of a poster created at the University of Washington detailing symptoms and treatments for heat-related symptoms and is targeted at agricultural workers.

Source: https://deohs.washington.edu/pnash/heat_illness

Symptoms and treatments for heat illness

Symptoms of heat illness can be mild or severe. Know symptoms and treatments to prevent serious heat illness and death.

| TYPES AND SYMPTOMS | | TREATMENTS | |
|--|---|--|---|
| Rash <i>Red, itchy skin bumps</i> |  | <ul style="list-style-type: none">Keep skin clean and dryUse calamine lotion |  |
| Cramps <i>Painful muscle spasms in the arms, legs, and belly</i> |  | <ul style="list-style-type: none">Water, rest, shadeHave a snackTell supervisor |  |
| Dizziness or Fainting |  | <ul style="list-style-type: none">Water, rest, shadeElevate legsTell supervisor |  |
| Exhaustion <i>• Feeling sick to stomach, vomiting • Cool, clammy, sweaty, pale skin • Weak, tired, light-headed, headache</i> |  | <ul style="list-style-type: none">Water, rest, shadeElevate legsLay on side if vomitingCool, wet clothsTell supervisor |  |
| EMERGENCY! CALL 911! Heat Stroke <i>• Feeling sick to stomach, vomiting • Hot, dry, red skin (some sweat possible) • Confusion, irritability, seizure, no response</i> |  | <ul style="list-style-type: none">Move to shadeElevate legsLay on side if vomitingCool, wet clothsTell supervisor |  |

 PACIFIC NORTHWEST AGRICULTURAL SAFETY & HEALTH CENTER
 SCHOOL OF PUBLIC HEALTH
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Síntomas y tratamientos de enfermedades por calor

Los síntomas de las enfermedades por calor pueden ser leves o graves. Conozca los síntomas y tratamientos para prevenir enfermedades graves causadas por el calor y la muerte.

TIPOS Y SÍNTOMAS

TRATAMIENTOS

Sarpullido

Granitos rojos con comezón de la piel



- Mantener la piel limpia y seca
- Usar loción de calamina



Calambres

Espasmos musculares dolorosos en brazos, piernas y vientre



- Agua, descanso y sombra
- Comer un aperitivo
- Informar al supervisor



Mareos o desmayos



- Agua, descanso y sombra
- Elevar las piernas
- Informar al supervisor



Agotamiento

- Sentirse mal del estómago, vomitar
- Piel fría, hamedad, sudorosa, pálida
- Debilidad, cansancio, mareos, dolor de cabeza



- Agua, descanso y sombra
- Elevar las piernas
- Acostarse de lado si vomita
- Paños frescos y húmedos
- Informar al supervisor



¡EMERGENCIA! ¡LLAME AL 911! Golpe de calor

- Sentirse mal del estómago, vomitar
- Piel caliente, seca, roja (con algo de sudor posible)
- Confusión, irritabilidad, convulsiones, sin respuesta



- Mover a la sombra
- Elevar las piernas
- Acostarse de lado si vomita
- Paños frescos y húmedos
- Informar al supervisor



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Humanizing:

Remembering that we are all people and we are all deserving of love, compassion, and understanding. The ability to associate with people of differing backgrounds and not put one above another, but act with a sense of togetherness. Humanitarians bring this commitment of care to various communities, including to some non-human animals as well as to historically marginalized people.

Kidney Infection/Infección Renal:

Kidney Infection, or pyelonephritis, is a serious bacterial infection that originates in the urinary tract and spreads to the kidneys, resulting in inflammation and potentially severe kidney damage. Farmworkers are particularly vulnerable to kidney infections due to prolonged exposure to high

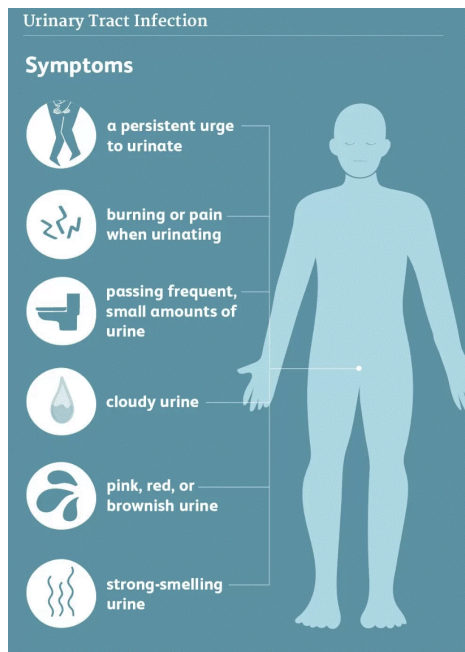
heat, [dehydration](#), and inadequate access to sanitary facilities. These factors create an environment that significantly raises the risk of infection and, if left untreated, can lead to chronic kidney disease (CKD), a condition that has reached epidemic levels among agricultural workers worldwide. According to recent studies, CKD among farmworkers is being increasingly recognized as a “silent massacre” fueled by the harsh conditions and physical toll of agricultural labor (Martinez, Carlos).

The physiological effects of a kidney infection are extensive and can lead to serious, long-term health consequences. Kidney infections occur when bacteria, commonly *Escherichia coli* (*E. coli*), move through the urinary tract and infect the kidneys. In response, the body triggers inflammation, disrupting the kidneys’ critical functions: filtering waste, balancing electrolytes, and regulating blood pressure. This inflammation compromises the kidneys' ability to perform these vital processes efficiently, which is especially dangerous for farmworkers who may be unable to take immediate steps toward rehydration or medical treatment. Kidney infections are often worsened by dehydration, a common condition in agriculture due to intense, physically demanding labor in high temperatures.

Dehydration reduces urine production, creating conditions where bacteria can travel more easily through the urinary tract to the kidneys. Many farmworkers, who are often paid based on productivity, avoid drinking water to minimize restroom breaks, fearing that breaks could decrease their earnings. This cycle of insufficient hydration and lack of sanitation facilities heightens the risk of kidney infections and can lead to kidney damage even after a single shift. Studies have shown that workers in extreme heat environments face “acute kidney function

declines within a single work shift,” making it clear that kidney function is sensitive to the stresses of agricultural labor (Sorenson et al., 241).

Left untreated, kidney infections can lead to chronic kidney disease, a progressive condition marked by the gradual decline of kidney function. Chronic kidney disease often requires intensive medical management, including dialysis or kidney transplants in advanced stages, as kidney function deteriorates. CKD is highly prevalent among farmworkers, who face repeated cycles of dehydration and exposure to extreme heat. This condition, known as Chronic Kidney Disease of Unknown Origin (CKDu), has reached epidemic levels in agricultural regions like Central America, where extreme temperatures, strenuous labor, and lack of sufficient hydration are routine. This pattern is especially evident in rural agricultural communities, where CKDu has become “a crisis driven by environmental conditions and inadequate labor protections” (Martinez, Carlos).



Graphic above is from this link:

<https://www.orkidmedilife.com/urinary-tract-infection/>

Symptoms of kidney infection, including chills, fever, back pain, and urinary discomfort, should be addressed as early as possible to prevent the infection from worsening. Early treatment usually involves antibiotics to clear the infection and rehydration to help flush out bacteria from the urinary tract. Without prompt medical intervention, kidney infections can lead to severe complications such as kidney abscesses and sepsis, both of which can have life-threatening consequences if left untreated. Access to healthcare, however, remains a significant barrier for many farmworkers, particularly undocumented individuals. Concerns about immigration status, high medical costs, and lack of insurance prevent many farmworkers from seeking treatment even when symptoms indicate a serious infection (Martinez, Carlos).

For those experiencing worsening symptoms, a visit to the emergency room (ER) becomes critical. In the United States, ERs are required by law to treat all patients, regardless of their ability to pay or immigration status, so they are often the best resource for those in urgent need. While the ER offers necessary care, it is often a last resort due to long wait times and potential out-of-pocket costs. Despite these challenges, ER visits are sometimes the only viable option when kidney infections reach a critical state.

For farmworkers in the Watsonville area, clinics like Salud Para La Gente provide a crucial alternative, offering affordable healthcare to those without insurance and to undocumented individuals who may be hesitant to seek traditional medical facilities. Salud Para La Gente, located at 204 East Beach Street in Watsonville, is open from 8 a.m. to 7 p.m. Monday through

Thursday, and it specializes in offering care for underrepresented and vulnerable populations, including farmworkers. Such community-based resources are essential for addressing preventable conditions like kidney infections and chronic kidney disease, allowing farmworkers access to healthcare that might otherwise be unattainable.

Mayordomo:

General Definition

A mayordomo in the context of agriculture is a crew supervisor. Those in this role supervise farmworkers and make sure labor laws and regulations are being followed. This role is interchangeable with “majordomo”, the English equivalent.

Etymology

The words mayordomo and majordomo come from the Medieval Latin “major domus” which means “chief of the house” (Merriam-Webster, n.d.). This best relates to its earliest uses, for those who were the head steward of a royal household. As time has gone on, the meaning of the word and responsibilities associated have grown into different roles.

Roles and Responsibilities

The main role of a mayordomo is that of a crew supervisor. Job duties may vary between different farms. For example, in a job listing posted by Purpose Point Harvesting in Mears, Michigan, the crew supervisor has the following responsibilities (summarized from the listing):

- Read and understand signs, labels, and understand written and oral work orders
- Serving as crew supervisor for farmworkers

Required to train new workers

Assist the orchard/farm manager/management in ensuring that the work performed and production procedures are accomplished in accordance with the established procedures and guidelines

Fruit and vegetable crops checking

Ensure optimal level for stacking

Must be able to communicate with the orchard/farm manager/management concerning scheduling tasks, performance, training, program design, and workflow

May be required to help with timekeeping and recordkeeping

And much more...

When fieldworkers want to make complaints or voice concerns regarding how they are feeling, the mayordomo is the first line of contact they should be speaking to. Many don't, however, due to the hierarchy that exists between the fieldworker and mayordomo. On the fields, the mayordomos have the say. While job responsibilities write that the mayordomo should ensure labor laws are mandated, such as giving breaks when a fieldworker asks. Many however, do not.

Narratives regarding mayordomos

In almost all interviews conducted with fieldworkers, comes the mention of their mayordomo. Many fieldworkers express their fear in speaking up to the mayordomo. Generally throughout the farm working community is the cultural concept of machismo (see machismo). A social concept that regards masculinity, and how masculinity is portrayed. With this in play, many workers do not wish to voice their concerns, as they fear being looked down upon. And in far too many cases, a threat of being fired.

In the book *They Leave their Kidneys in the Fields*, Sarah Bronwen Horton recounts her ethnographic work in the fields of the Central Valley in California. Horton has many conversations with fieldworker's experiences regarding their mayordomos. In a particular conversation with fieldworkers, a group tells her that even though many people get sick, they won't say anything. When she asks why not, the worker responds: "Because they're afraid the mayordomo won't believe them, that he'll just say, 'That one's lazy.'" There are mutters of agreement from around the table. Encouraged, the man continues. "That's the problem about preventing la insolación [heat illness]. It's better to wait until you are going to fall over. If you fall over, they'll believe you. If not, they'll just say, 'That lazy ass [flojón] just doesn't want to work'" (22). Establishing the significance of machismo in the fields. Though the law states that if a worker feels that they need a break, due to [heat exhaustion](#), or generally feeling ill, they should be able to. Another worker tells Horton: "But it all depends on the mayordomo. There are some that will let you take a break, and you'll still have your job. In other cases, though, ni modo [no way]. You'll have to look for work elsewhere" (22).

In a different interview written by Worker's Voice, comes a narrative from Ixtel, a worker in the Central Valley. Ixtel recounts a time that she had concerns about the bathroom. She was going to tell the majordomo, but he was busy and instead she spoke to a contractor. She told the contractor "Hey, can't you have the bathroom washed!" And most of us are women, I told him, it is very dirty. And why don't they bring us fresh water; yesterday it was very hot and the shades don't open. Meanwhile, the majordomos get vans with air conditioning! How is it possible? I can't go to my car to waste my gas, because that's what I use to get around" (1). Following her

complaint, she tells the interviewee that the majordomo “really laid it in on her” (1) with a threat of being fired if it were to happen again.

What's Next?

Due to many narratives regarding fieldworkers falling ill due to heat related illness, more preventative measures are being taken in California. In the article “Farmworkers face illness and death in the fields” by Ruxandra Guidi, comes an interview with Marbella Cruz, a former fieldworker. Cruz now works with a Cal/OSHA contractor to hold safety meetings and trainings with mayordomos and fieldworkers. Cruz discusses ways to prevent heat illness, and helps garner trust between the workers and their mayordomos. Cruz says that “it's about trust” (1).

Mayordomos play an important role in maintaining the upkeep of a farm or ranch, but play an even bigger role in fieldworker’s health. With continued mandated training, more trust and accountability can be brought between mayordomos and fieldworkers.

Mechanization:

The world as a whole has gone under profound and quick transformation mechanically, as we have instilled mechanization into nearly every aspect of our lives bringing increased productivity and efficiency. Our agriculture has benefited with a large increase in output, however it has led to negative impacts on the environment, climate, and specifically agricultural workers. Two things can be true, there are key potential benefits of mechanization as well as unintended consequences.

Mechanization on a broad scale refers to the use of machinery in conjunction with agricultural practices, reducing human labor and maximizing productivity. Early examples are plows, tractors, irrigation systems, and harvesters. This machine addition to farming also led to cultivating larger areas of land and faster processing of crops, allowing major steps taken in food security and access. A main positive point for health impacts from mechanization was the reduction of labor intensity in handling and transporting crops. (Basso, 2021). Unfortunately, there are many negative effects emerging from widespread mechanized farming on both workers and the environment.

Some common examples of [climate change](#) implications that are seen in California are droughts, extreme weather patterns, impacting agriculture, heatwaves, storms, and shifting geographic crops distribution. These constant impacts affect production and risks that are faced by farmworkers. This community needs help, knowledge, and advocacy for navigating all the impacts due to mechanization.

The most common and well known health consequence of climate change is heat exposure. This can lead to severe dehydration, [heat stroke](#), skin cancer, bladder issues from holding the bladder, and all these symptoms keep increasing in numbers as the frequency and intensity of the heat waves are ever increasing. (NCCOR, 2021). Poorly ventilated working areas accompanied with exposure to pesticides and other chemicals is another example of bad working conditions.

Even with the use of pesticides, diseases and other pests. Mosquitos are very common in rising weather and damp areas, and as more and more chemicals are used, animals and bacteria can continue to evolve leading to more toxic chemicals needing to be used to ensure clean crops, while exposing the workers to the harmful chemicals for hours at a time every day.

One lesser known health issue common in agricultural workers is ergonomic related illness. This includes issues within the musculoskeletal system like arthritis, joint pain, weak joints, weak bones, tendonitis, and carpal tunnel syndrome. These musculoskeletal disorders (MSDs) can be caused by repetitive motion, vibration, and poor posture. (Mierzejewski, 2020). Although long-lasting health effects on agricultural farmers are being researched still today, the organizations and company workers are well aware of them, and the farmers need to have better access and knowledge of risks that they face as it is their right as they are the ones exposed. One last negative impact of mechanized farming is accidents involving farming equipment and machinery with operators at the front of these injuries, needing proper training to prevent accidents from happening at all.

Each of those health risks can intersect and have a direct relationship on each other, for example, as the world continues to ignore the need to stop climate change, the heat will continue to rise, drying out water supply and heat exhausting the workers which can lead to mistakes, fatigue, dizziness, etc. There was a study in 2019 covered by Schulte that observed an increase in mistakes due to heat stress. With areas prone to heat stress and drought, there is a higher need for mechanized equipment and closer parameters for mistakes to occur.

Another negative effect of mechanization of farming is the displacement of field workers. The latino migrants are already a marginalized group, so being displaced from work with no immediate second option is a huge social issue that also needs to be addressed. (Van Der Meer, 2022).

Some examples of tangible solutions will need to involve multiple aspects across society and government levels. There is an obvious need for improving worker protection regulations.

Specifically, enforcement of current regulations needs to be improved especially in smaller agricultural communities.

With the ever increasing use of technology in our lives, it would be helpful to invest in innovative technological solutions that promote productivity and safety. An example of new technology innovated for agricultural farming is a closed-loop sprayer that reduces chemical risks. Increasing automation and tech in agriculture can be an opportunity to create a safer and ergonomic system including workers.

Honing in on a comprehensive approach to combating mechanization's negative impacts on farming related health issues as well as climate will allow us to produce a better executed and harmonious agricultural community, especially in California. California's crop harvest is very diverse, expansive, and popular. The need to provide is essential, with a large and dense urban population, which can lead to the agricultural and rural areas to be underrepresented further. Real change can start with story sharing and advocacy, risks need to be observed, studied, then addressed. The largest issue to work on is climate justice. This can be started at smaller scales by reducing individual emissions and education on sustainable agricultural practices.

One easy way to spark individual change in large numbers is simple with education techniques. Informing the public on issues that are relevant to their lives is actually usual welcomed in communities and very necessary in allowing individuals to take power of their circumstances. If we can spread awareness of climate justice, sustainability practices, agricultural farming risks, mechanization risks, and more, small individual changes will lead to higher institutional changes and actual policies being put into place.

Neoliberalism / Neoliberalization:

A catch-all category for diverse forms of market rule, the term “neoliberalism” is widely used to name efforts to make market competition the basis of economic coordination, social distribution, and personal motivation. It recalls and reworks the 18th and 19th century liberal market ideals of economists such as Adam Smith and David Ricardo. And yet it is new – hence the ‘neo’ – insofar as it comes after and actively repudiates the 20th century redistributive ideals of welfare-state liberalism and state-led economic planning. Over time the ‘neo’ has also come to index the many ways in which neoliberalism keeps evolving into new hybrids of market rule. Their names now are as radically revisionist as they are varied: ‘roll-back neoliberalism,’ ‘role-out neoliberalism,’ and ‘roll-over neoliberalism,’ are useful conjunctural revisions of the term introduced by critical geographers (Peck and Theodore, 2019); and others include ‘authoritarian neoliberalism,’ ‘progressive neoliberalism,’ ‘neocolonial neoliberalism,’ ‘nationalist neoliberalism,’ ‘zombie neoliberalism,’ ‘nihilistic neoliberalism’ and ‘neoliberalism with Chinese characteristics’. While they share family resemblances as real-world examples of actually existing neoliberalism – such as a tendency to undermine democracy – they are all also departures from the ‘one-size fits all’ market-fundamentalism of famous neoliberal thinkers such as Friedrich von Hayek and Milton Friedman. What they all indicate is that neoliberalism keeps coming back socially and politically as well as in scholarly debate, and for the same reasons we in turn need to keep revisiting the questions of how and with what consequences, including for farmworkers.

A recent the more marginal and mutant form of so-called ‘rollover neoliberalism’ that we have seen with Donald Trump is a mix of policies that favor tax cuts and deregulation (neoliberalism) with others that seem at odds with traditional free market neoliberalism,

including Trump's opposition to free trade internationally, his hostility to open borders and migrants, and more generally his campaigning against associated forms of progressive neoliberalism, managerial cosmopolitanism and DEI programs - all of which are now routinely dismissed as just WOKE. This mix of policies promises to be especially damaging to farmworkers, and understanding their own experience of neoliberalism helps us understand why.

Neoliberal norms have long overshadowed the lives of farmworkers in the US. They experience many of the aspects of the more general labor market precarity that has increased under neoliberalism. They are treated as disposable workers, whose contracts, and worker benefits are extremely limited and highly contingent. They have few union protections or health and safety protections on the job, and they have even more limited access to health rights, educational rights or pension rights associated with their work (Martin, 2003). They are the epitome in all these ways of a flexible neoliberal workforce. But yet they are not classically 'neoliberalized' as a workforce because they *never* enjoyed these sorts of protections in the first place. Nor did they benefit from the classic forms of workplace collective bargaining for rights that characterized union jobs at the height of 20th century liberal welfare-state 'Fordism'. Even the great successes of Cesar Chavez and what became the UFW were exceptional insofar as they came to be based more on boycotts and the rallying of consumer activism rather than on strikes - which only increased the value of fruit and vegetables produced by growers in non-strike locations (Martin, 2003). And today, the widespread poverty, marginalization and social exclusion of farmworkers continues to define their experience of an extreme 'precariat' existence without a proper living wage - especially in California where the cost of living is so high (CAUSE/Mixteco Alliance, 2024).

For all the above reasons, most farmworkers in America were working under neoliberal conditions both before and during the rise of liberalism and liberal Keynesian approaches to workplace management mediated by government. In a sense, they might therefore be said to comprise a kind of ‘pre-neoliberal precariat’ that was ‘flexibilized’ and post-Fordist even before Fordism. Their exceptional vulnerability also illustrates the ways in which extra-economic forms of violence and dispossession have always been a part of the division and organization of labor in America, even in the golden years of unionism (Martin, 2003). And part of what secures this highly exploitative approach to farm labor, is that most of the workers have been and continue to be imported in the form of vulnerable migrants escaping dire poverty, war, gangs and/or environmental catastrophe in other parts of the world.

Studying such marginal and complex cases of actually existing neoliberalism raises questions of when it really began and more pressingly when it might stop actually existing? When will the dispossession and roll-over domination that make possible super-exploitation in something like the US farmworker labor market be so egregiously out of line with free market capitalism as to no longer seem to share any family relations with the original iterations of roll-back and roll-out neoliberalism?

The roll-over regime of Trumpism already appeared to some as an especially reactionary and contradictory reworking of pro-market rule, a kind of monstrous Frankenstein formation that Wendy Brown among others saw as a nihilistic nadir of neoliberalism in ruins (Brown, 2019). But then came COVID. Coinciding with rightist roll-over developments in many countries, the pandemic signaled to some commentators the final death knell of neoliberalism altogether; a moment to post obituaries to globalized market rule and questions about what ‘post-neoliberalism’ post-pandemic might look like. From the imposition of global city

lock-downs, quarantines and border closures, to the fragmentation of international coordination into naked nationalist self-interest, to the hasty roll-out of Keynesian support for deficit spending on welfare and food security in rich countries, to the geopolitics of vaccine supply in poor countries, to the subsequent supply-chain challenges and deglobalization dynamics seen in its economic aftermath, COVID created havoc for neoliberalism as normal as well as inspiring post-neoliberal aspirations to ‘build back better’. Yet as research has continued, the pictures of post-neoliberalism painted in early obituaries have come to seem premature. Instead, at every stage COVID exposed, exploited and exacerbated vulnerabilities caused by neoliberalism (Sparke & Williams, 2022). As a thoroughly neoliberal disease, the virus sped through vectors created by the neoliberalization of societies, health systems and global health security. And just as just as SARS-COV2 evolved itself into newly challenging variants by mutating in the bodies of unvaccinated and vulnerable populations – often unvaccinated because of WTO-enforced neoliberal intellectual property rights limiting access to the best vaccines – so too did neoliberalism mutate in the pandemic into newly damaging forms, including, not least of all, widespread attacks on public health in the name of economic liberty (Holst, 2023; Sparke & Williams, 2023). The result is that governments have tended to build back with more neoliberalism, not alternatives.

With Trump’s return to the White House after the elections of 2024, we now face the prospect of “MAGA 2.0” (Slobodian and Brown, 2024). Perhaps this truly will be the end of neoliberalism in America. Certainly, the coming threat of deportations of millions of undocumented migrant farmworkers threatens to undermine the traditional flexible and precarious labor-market of US agriculture. If COVID showed that Trump’s team saw herd immunity in terms of the survival of the fittest and the sorting of a national herd, now they

promise to start herding out all those they deem in xenophobic ways to be non-herd. And yet we must also ask if this is really so post-neoliberal? For one thing, many neoliberal intellectuals have long made racist exceptions from the free market freedom that they have always prized for themselves. But more practically, at the level of the labor market itself, it is not clear what is actually going to happen. Most probably the Trump administration will not be able to deport millions of people, even if it does inflict massive suffering on many. There will also be widespread resistance (Seidman, 2024). Instead of millions of deportations it seems more likely the administration will terrorize undocumented workers from claiming any rights or pushing for any recognition, and in this respect the threat of deportation will serve to discipline labor anew to be compliant with market forces and business needs. Likewise, the possibility of importing H-2A workers (workers imported legally by employers on visas) to replace deported farmworkers, also threatens to impose market discipline that will force down wages in new ways, especially if the Republican Congress re-sets the wage floor for H-2A workers - the so-called Adverse Effect Wage Rate - much lower, or strips the H-2A program of any minimum wage at all. For the same reason, we need to keep revisiting how neoliberalism keeps being built back again on the ground even by far right forms of government, studying how it is contested too, and remembering, like the original neoliberal thinkers in the peak period of redistributive state planning, that alternatives nevertheless remain possible whatever the relentlessly revisiting TINA-touts tend to say.

Organic Food:

The definition of the word ‘organic’ varies slightly between disciplines and countries, and is often misunderstood. In the United States, organic food is regulated by the United States

Department of Agriculture (USDA). The USDA defines organic crops as those grown without the use of synthetic substances, a select list of non synthetic substances such as arsenic or potassium chloride, nonorganically produced agricultural products, excluded methods, ionizing radiation, or sewage sludge (National Organic Program, 2023). There are select exceptions for some of these categories, however those are the general criteria for a product to be labeled as ‘organic’ in the United States. It is clear that, contrary to the most common definition, ‘organic’ food excludes much more than just synthetic pesticides. Nonetheless, synthetic pesticides on food are still a significant public concern worth investigating due to their risks for consumers, farmworkers, and the environment (Kim et al., 2017). See the glossary definition for pesticides to read more about their health effects.

It is estimated that, as of 2022, 2% of total worldwide farmland is used for organic farming (IFOAM, 2024). In non-organic farms, pesticides are used to promote agricultural crop health by controlling pest infestation in fields. Pest infestation can be detrimental to a field of crops and can therefore lead to noteworthy financial losses for farms if a large portion of a crop is lost. This risk highlights a major draw of pesticide use and thus the high usage rates. However, there are many methods of organic farming available to farmers, some of which have been in use for centuries.

Common methods of organic pest control tend to focus primarily on preventing pests before they become a problem in the first place (Costa et al., 2023). Some prevention methods include diversification of crops, crop rotation, and introducing pests’ natural predators. Another technique looks to the plants themselves. By genetically modifying or breeding plants to be more resistant against pests, farmers can rely on their crop to have a stronger defense for itself. Similarly, maintaining the overall health of a plant is an effective way to allow it to resist pests.

This can be done by addressing soil health and the nutrient composition of a plant. Much like with humans, a healthy and thriving plant tends to fare better on its own when fighting off threats. Agricultural technology can be used for optimization of crop protection methods. For example, drones equipped with sensors can be flown over fields, where imaging and sensing data can be used to monitor crop health as well as pest incidence. Although prevention is the most ideal practice, biopesticides, which are derived from naturally-occurring substances, may be used when an infestation has already occurred and treatment has been deemed necessary by risk assessment (Costa et al., 2023).

Herbicides, on the other hand, are substances used to control the growth of weeds in fields. Synthetic herbicides, also known as xenobiotics, are the most commonly used. Although ‘natural’ herbicides do exist, they tend to be less effective and more expensive, making them less appealing to farmers (Merfield, 2023). Integrated weed management looks to combine multiple methods of controlling weeds. General techniques of weed control could fall into the following categories: chemical, physical, biological, and ecological. By using a mixture of methods from these categories, with the exception of most chemical herbicides, organic integrated weed management can increase the chance of success for farmers fighting weeds (Merfield, 2023).

Use of organic pest and weed control may lower farmworkers’ exposure to harmful synthetic pesticides, but it is important to also investigate the degree to which organic farming reduces health risks. A 2014 study found that, when comparing biomarkers of pesticide exposure between farmers exposed to pesticides and organic farmers, that there is a higher presence of damaged DNA in the group of farmers who were exposed to pesticides (Costa et al., 2014). They also found significant decreases in the amount of B lymphocytes, which can lead to reduced immune function. Although this study does indicate a relationship between pesticide exposure

and impacted health, it is worth noting that the relatively small sample size and potential confounding variables may reduce the credibility of these results. Despite there being a lack of studies comparing the health of organic and non-organic farmers, there is a vast amount of evidence indicating the adverse health effects caused by pesticide exposure.

If pesticides are so harmful, then why don't more farmers go organic? One previously identified reason is the economic loss from pest infestation, indicating that better insurance and safety nets may be important for encouraging organic farming. One study found that farmers were more motivated to continue organic farming if they had the support of their community and government (Koesling et al., 2012). They also noted how many organic farmers converted to non-organic farms due to stricter organic farming regulations, social pressure, and economic reasons.

Despite how essential farmwork is for food production in the United States, farmworkers are subjected to incredibly harsh and unhealthy working conditions, often for little pay. Pesticides, with all their detriments to both human health and the environment, are one key factor adding to the risks that our indispensable farmworkers face day to day. Reducing the use of synthetic chemicals in farming can not only be a step towards improving working conditions for farmworkers, but also for the health of our planet. The barriers to organic farming must be addressed in order to increase its prevalence in the United States.

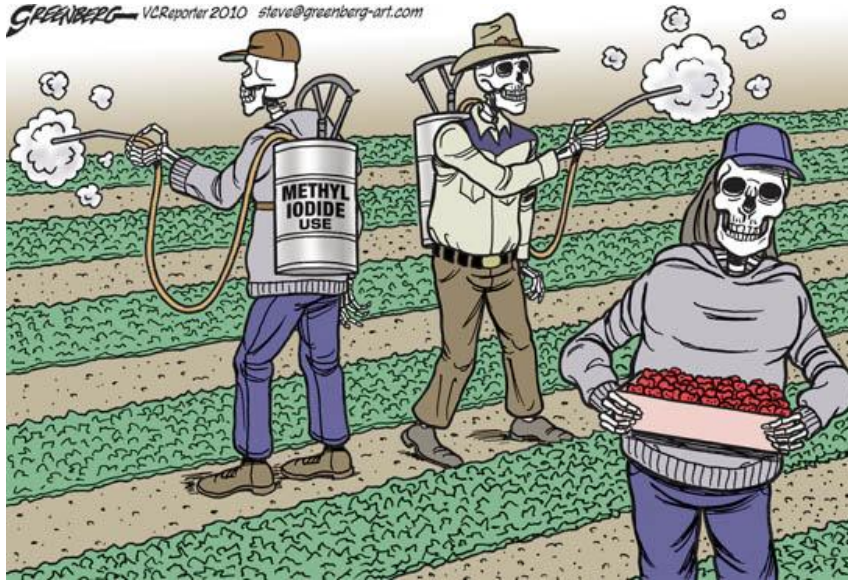
Pesticide Exposure:

When farmworkers use pesticides in agriculture, they are exposed to harmful chemicals that can lead to short-term and long-term illnesses.

A pesticide is any substance or combination of substances designed to prevent, destroy, repel, or mitigate pests, including insects, rodents, fungi, and unwanted plants (weeds). Pesticide products contain both "active" and "inert" ingredients. Active ingredients are chemicals that control pests, while inert ingredients are combined with active ingredients to enhance product performance and usability. Inert ingredients may include chemicals, compounds, and other substances, such as common food commodities (e.g., edible oils, spices, herbs) and natural materials (e.g., beeswax, cellulose). All inert ingredients must be approved by the Environmental Protection Agency (EPA) to be included in a pesticide.

Pesticides are widely used in agriculture across the United States. Their ability to kill or control pests has significantly increased yields for most fruit and vegetable crops. Over the past 40 years, pesticide use has led to substantial improvements in the quantity and variety of U.S. produce, thereby benefiting public health.

However, while pesticides increase crop yields and support better public health for some persons, they also come at the cost of harming the environment and people directly exposed to them. Although pesticides in small doses pose minimal risk to the general public, agricultural workers, specifically farmworkers, face daily exposure that places their health at greater risk. Pesticides pose significant health threats to farmworkers, causing both short-term adverse (acute) and long-term (chronic) adverse health effects that may appear months or years after exposure. Acute health effects include stinging eyes, rashes, blisters, blindness, nausea, dizziness, diarrhea, and even death. Chronic health effects include cancers, birth defects, reproductive harm, immunotoxicity, neurological and developmental toxicity, and disruption of the endocrine system.



Immediate impacts of pesticide exposure include irritation of the nose, throat, and skin, leading to burning, stinging, and itching, as well as rashes and blisters. Nausea, dizziness, and diarrhea are also common. In many cases, symptoms of pesticide poisoning mimic those of colds or the flu, leading to frequent misdiagnosis or under-reporting of pesticide-related illnesses.

Chronic effects from pesticide exposure may take weeks, months, or even years to identify, making it challenging to directly link specific health outcomes to pesticide exposure. Pesticides have been implicated in studies on leukemia, lymphoma, and various forms of cancer. Reproductive harm from pesticides includes birth defects, stillbirths, spontaneous abortion, sterility, and infertility. Pesticides are a type of endocrine-disrupting chemical (EDC), chemicals that interfere with essential bodily functions by mimicking or blocking hormones. EDCs, depending on many factors such as age, diet, and occupation, are known to disrupt reproductive and sexual development.

Different pesticides affect health outcomes in various ways. For example, organophosphates and carbamates act similarly to nerve gas, targeting the brain and nervous system by disrupting nerve signal transmission. Soil fumigants are pesticides applied to the soil, forming a gas that is toxic to nematodes, fungi, bacteria, insects, and plants. As gasses, they can move from soil to air, exposing people living or working nearby. Another type of pesticide, pyrethroids, are synthetic insecticides that resemble botanical compounds but are designed to be more persistent. They are toxic to the nervous system, and there is concern that during pregnancy, a fetus may be unable to efficiently break down these chemicals.

Pesticides are extremely detrimental to human health. Yet, farmworkers handle them daily, often with minimal protection. They may inhale or absorb harmful chemicals through their skin while mixing or applying pesticides or during tasks like planting, weeding, thinning, irrigating, pruning, harvesting, and processing crops. Many incidents go unreported, but data from California on farmworker poisonings reveal the extent of the problem. Studies show that farmworkers are more likely than the general population to develop leukemia, brain cancer, prostate cancer, skin cancer, and non-Hodgkin's lymphoma.

Farmworkers are among the most vulnerable to pesticide exposure due to the high levels of exposure they face. Infants and children are particularly susceptible to the toxic effects of pesticides because much of the damage caused by endocrine-disrupting chemicals (EDCs) occurs during gametogenesis and the early stages of fetal development. These effects, however, may not become apparent until adulthood. Infants are especially vulnerable to both pre- and postnatal exposure to endocrine-disrupting pesticides, which can result in a wide range of adverse health

effects, including potential long-term impacts on intellectual function and delayed effects on central nervous system functioning.

Conditions of poverty and proximity to treated fields further exacerbate the risks and consequences of pesticide exposure. Farmworkers and their families are also exposed by living near or within the vicinity of treated fields. Pesticides carried from fields into the home on workers' clothing and skin further put farmworker children at risk. Unfortunately, the regulatory system has failed to adequately protect farmworkers from these occupational hazards, let alone provide the basic protections enjoyed by workers in other industries. Although the Agricultural Worker Protection Standard (WPS) has aimed to reduce pesticide poisonings and injuries among workers and handlers in the past, it has faced criticism for weak enforcement and limited scope. Many farmworkers remain unaware of their rights under the WPS or lack access to training and resources needed to protect themselves and their families effectively. Moreover, gaps in regulations often leave farm workers vulnerable to exposure from highly toxic pesticides that are still permitted for use in agriculture. This systemic failure highlights the urgent need for stronger policies, comprehensive enforcement, and community-driven solutions to safeguard the health and well-being of farmworkers and their families.

Many farmworkers are undocumented, and undocumented workers, in general, are less likely to seek medical care for pesticide exposure and rarely report poisonings. The fear of lost wages or job loss from taking time off for medical care is a strong deterrent. Additionally, many farmworkers lack personal vehicles and must rely on employers or others for transportation to social service agencies or healthcare facilities. Under the current system, hundreds of workers suffer from pesticide-related illnesses each year. Thoughtful reform of U.S. immigration policies

would not only acknowledge the essential contributions of undocumented farmworkers but also pave the way for stronger protections, including access to healthcare and workplace safety measures. By addressing these systemic barriers, the U.S. can create a more equitable system that values the health, dignity, and rights of the farmworkers who sustain its agricultural economy.

Personalismo:

A relationship-oriented approach that emphasizes personal bonds and interactions, critical for building trust and effective communication in community engagement.

Personalismo is a cultural value among many Latinx and Hispanic communities. It emphasizes the importance of personal relationships and mutual respect in personal and professional interactions. In healthcare settings, personalismo is essential to build trust and show empathy. Latinx/Hispanic patients often respond in a more trusting/honest manner when they know that their healthcare provider sees the patient for who they are as a person and their situation rather than just another patient in the clinic.

It is first important to recognize the systemic and institutional barriers that make it challenging for farm workers to access healthcare, maintain safe working conditions, and secure legal protections. Unfortunately, these barriers are deeply rooted in socioeconomic inequalities, immigration policies, and unjust labor laws that disproportionately affect vulnerable and low-income families, especially those who are undocumented. Due to these barriers, there are many outcomes. The first one is the fear of deportation due to their undocumented status. This also leads many farmworkers not to trust institutions and authorities. An example of this would be farmworkers not reporting unsafe working conditions because of the fear of legal

repercussions. (Maldonado) Another barrier is a lack of health insurance because they are ineligible for employer-sponsored health plans; this is due to the seasonal nature of their work or having multiple employers (Moyce and Schenker). With the low wages that farm workers earn, it is very discouraging to miss a day of work for healthcare appointments. This is dangerous as it often leads them to delay or avoid healthcare until they face a critical health issue. (Arcury and Quandt). This can be seen with many farmworkers who brush off some medical ailment until it's too late. To make matters even more complex, the language barriers that many farm workers have to face (farmworker's primary language is Spanish/other Indigenous dialects) lead to lots of misinterpretation, miscommunication, and an overall lack of understanding regarding health concerns/treatment options.

In regards to farmworkers, who face health risks due to systemic and institutional barriers, *personalismo* is the culturally competent factor that provides them with care that they can trust. It is important to understand why there is a need for this cultural value in a healthcare setting. It bridges the cultural gaps between farm workers and healthcare providers whether that be due to language barriers, cultural barriers, socioeconomic status, or other personal values. Many farmworkers are Latinx, and family is so important, especially when making any kind of medical decision/change. The inclusion of family in health is a core value in many Latinx families, and this can be demonstrated in *personalismo*; a healthcare provider asking whether they want their family in the emergency room, including family members in any major medical decisions, and understanding the practice of home remedies as a cultural value is crucial. (González and Ortiz 37). An example of this is when providers ask personal questions about the patient's family, when this cultural value is met, there is improved communication between the provider and patient as well as a higher level of trust. While ideal, this often does not happen

because of the fast pace and different priorities that is prevalent in Western healthcare, leading to mistrust and a lack of connection between providers and patients.

While personalismo is essential to understand in farm worker health, the reason why their health is at risk is because of systemic and institutional barriers. Many farmworkers don't have health insurance and can't access health care (like working long hours without being able to take a break or take time off for medical appointments). A more common issue is that many undocumented farm workers fear deportation, making them reluctant to seek medical help/discuss health issues. This pressing fear, along with economic instability leaves many health needs for farmworkers unmet. Farm Workers avoid healthcare facilities due to high costs and fear of legal repercussions. This is damaging because it allows long-term illnesses to go undetected and leaves acute/chronic health issues untreated. (Moyce and Schenker).

[Climate change](#) poses risks to farm workers such as working in extreme temperatures, pesticide poisoning, pollution from wildfire smoke, and more. (Rosenstock). While these are environmental hazards, they lead to serious health consequences such as heat-exposure-related illnesses, respiratory conditions, and chronic exposure to harmful chemicals. How does personalismo play a role in environmental hazards? It's complicated because personalismo won't mitigate the systemic challenges posed by climate-related risks, but the culturally competent and effective way that farm workers are educated is what is key. The way information is presented to the farmworkers makes all the difference. For instance, instead of simply telling the farmworkers about the dangers of [heat stress](#), one could offer on-site solutions like hydration strategies and access to shaded breaks. Many of these farmworkers know the risks but can't access the remedies; solutions need to be culturally relevant, practical, and empathetic. Incorporating personalismo is necessary to build trust and deliver information in culturally sensitive ways.

Visual aids. Interactive demonstrations and non-text-based resources are often highly effective in educating farmworkers, especially with varying literacy levels/languages. Other barriers can be region-specific that should be taken into consideration as well such as internet access or even device availability. After all, health advice can only reach their target audience in ways that they can access it.

When personalismo is combined with systemic awareness and culturally competent healthcare, it breeds a much more powerful approach to supporting farm workers' health amid climate-related and occupational risks. Personalismo emphasizes trust, empathy, and personal connection which strengthens healthcare outcomes within the farmworker communities. With the deep-rooted cause being systemic and institutional injustices, a wider-scale change that could be made is policymakers addressing the issue head-on -tackling the limited healthcare access along with the fear of deportation- to make the effects of personalismo even more effective.

Personalismo in healthcare is equitable care.

Photovoice:

The concept of "*Photovoice*" combines participatory research methods and visual, emotion-evoking storytelling to offer marginalized communities a unique opportunity to document their lives for others and for themselves. This type of research technique is called a PAR which stands for Participatory Action Research, allowing participants from communities of vulnerable populations the ability to actively engage in the research process. Combining photography with firsthand narratives will lead to participants and their communities being empowered, recognized, and changed socially. This concept of using Photovoice has been used in relation with community health, environmental justice, and social policy. With using

Photovoice as a research method to provide a lens for farmworker's challenges and resilience, this will lead to an increase of push for environmental change that can be documented, shared, analyzed, and used to spark real climate justice and change.

Wang and Burris(1997) introduced this concept for the first time in efforts to empower marginalized communities by giving them a chance to communicate their perspectives to people living completely different lives. Their perspectives in photos can illustrate their daily realities, document issues, and inspire solutions. The biggest factor of implementing this research technique is that the participants, from the marginalized communities being studied, are allowed to take some power in their hands and help their communities first-handed as producing agents of knowledge instead of passive research subjects.

This research is typically done in three steps starting with photographic documentation, group discussion, and then advocacy and action. First, participants are given cameras or phones then asked to take photos reflecting key aspects of their lives and including themes related to health, environment, and communal well-being. The next step is a collaborative discussion about the pictures and process between the participants creating shared dialogues and meaning from the pictures taken. The last step is using these pictures to lead to environmental advocacy and social change with help from policymakers, community leaders, and the public who view these pictures.

In relation with farmworker health and [climate change](#), Photovoice technique can bring forth powerful insights of farmworker conditions, impacts of “unseen” climate change on their lives and well-being, and solutions needed to keep adapting to more and more unforeseen challenges.



This photo is an example of an emotion evoking, relatable picture, *Photovoice*, that is likely to get its viewers engaged and interested in the man's life. This picture (from Columbia Climate School) of the farmer in the water will most likely not be relatable to most people at least in the US and will allow them to recognize that there are countless other realities other than theirs, like farmers and agricultural workers, that need urgent social change.

The need to bring the use of *Photovoice* to the farmworker community is of utmost importance since they are one of the most vulnerable populations in the United States. Their health disparities they face are due to their hazardous working conditions, socioeconomic status, and limited access to healthcare. There are numerous threats to farmworkers' health including chemical, physical, and biological. Examples of emerging chemical threats are mainly pesticides and air pollution. Examples of physical hazards are machinery-related injuries, musculoskeletal injury, and heat exposure. Lastly, biological hazards like water, sanitation, and hygiene access, and exposure to endotoxins and mycotoxins are common in farmworker communities. In addition to all of these exposures, the ethnic makeup of farmworkers in California is majorly immigrants from Mexico and other Latin American countries which adds social aspect bringing

forth more health barriers such as language barriers, fear of deportation, and proper healthcare access and knowledge.

Photovoice has actually been used before in several studies to explore health impacts of farming labor. One particular study was done in California in 2021 by Kegley. The participants took photos of their working environment and conditions like pesticide use, poor housing, and impact of [heat stress](#). The participants also accompanied their photos with narratives that described how the environmental factors impacted their health. A space for farmworkers to reflect on their shared experiences together is also created while carrying out the *Photovoice* method while sharing them with a larger population. First person photos bring a completely different perspective to viewers that would not be able to be communicated the same way just through text.

There are many layers to the impact of climate change on farmworkers such as the ever-changing weather and climate patterns, agricultural practices, food production, and migration. Climate change is always accelerating and evolving causing farmworker's risks to increase and creating a constant need to adapt.

Another *Photovoice* technique example from California is a study by Dunn in 2020 focusing mainly on heat and drought impacts on the Central Valley. They observed photos of dried-up fields, working in extreme heat, and physical health impacts due to working in this environment. These pictures show the immediate dangers as a result of climate change and long-term health impacts imposed on these communities that are leading food producers. Another interesting aspect included in this particular study was pictures depicting groups of workers migrating to cooler conditions or walking out of the industry with no promise of change or help.

A key strength of *Photovoice* is its ability to advocate, becoming an effective tool for real policy change by humanizing complex issues and providing a platform for communities that have not had a voice previously. This has potential to lead to changes in labor laws, improving workplace safety standards and advocating for climate policies protecting vulnerable communities.

Piece-Rate Wage:

The piece rate wage system is a payment method where employees are compensated based on the number of units or "pieces" they produce or tasks they complete, rather than receiving a fixed hourly wage or salary. This method aligns compensation directly with output, incentivizing higher productivity and fostering efficiency. Piece rate wages are especially prevalent in industries like manufacturing, agriculture, and textiles, where tasks are repetitive and output is measurable. Below, we look into the concept in detail, exploring its advantages, disadvantages, evidence and applications.

Definition and Mechanism

The defining characteristic of piece rate wages is their direct linkage between output and earnings. For example, a garment worker may earn \$0.50 for each shirt produced. If they produce 100 shirts in a day, their total earnings for that day would be \$50. This system requires clear metrics for measuring output, predefined rates for compensation, and mechanisms for quality control.

Piece rate wages can be implemented in various forms:

1. Straight Piece Rate: A fixed rate per unit produced, regardless of the total output.

2. Differential Piece Rate: Rates vary based on the level of output, often incentivizing higher productivity by increasing pay for exceeding certain thresholds.
3. Group Piece Rate: Payments are distributed among a group of workers based on collective output, fostering teamwork.

Advantages

1. Incentivizing Productivity: The direct correlation between effort and pay motivates employees to maximize their output. Empirical studies have shown that workers under piece rate systems often outperform those paid hourly, particularly in repetitive, task-based jobs (Paarsch & Shearer, 2000).
2. Cost Efficiency for Employers: Employers benefit from predictable labor costs tied to production levels, reducing risks associated with overpayment during periods of low productivity.
3. Fair Compensation: High-performing workers earn proportionally more, aligning pay with individual contributions and potentially increasing job satisfaction.
4. Ease of Implementation: In industries where output is easily measurable, piece rate systems simplify payroll calculations and align employee goals with organizational objectives.

Disadvantages

1. Quality vs. Quantity: Workers may prioritize speed over quality, potentially leading to defective or subpar products. Employers often address this through quality control mechanisms, but these add to operational costs.

2. **Physical and Mental Strain:** Sustained pressure to maintain high productivity can result in worker burnout, injuries, or health issues, particularly in physically demanding roles (Leigh & Du, 2012).
3. **Inequities and Exploitation:** Workers with less experience or limited physical capacity may struggle to meet output thresholds, earning significantly less than their peers, raising concerns about fairness.
4. **Administrative Challenges:** Implementing and managing piece rate systems require robust systems to monitor output, maintain quality standards, and address disputes.
5. **Workers Rights:** Employees may be less likely to take a sick day or rest if needed since they need to hit a certain quota in order to earn enough to provide for themselves and/or their families

Case Studies and Evidence

A study in Bangladesh's garment industry highlighted the limitations of piece rate pay, including reduced focus on safety and high turnover rates due to physical strain (Rahman et al., 2017). These findings underscore the need for balancing productivity incentives with worker welfare. Governments and labor organizations often regulate piece rate wages to ensure fair treatment of workers. Policies typically mandate minimum wage protections, requiring that total earnings under piece rate systems meet or exceed minimum hourly wage standards. Additionally, international labor organizations advocate for transparency in rate-setting and adherence to safety standards to prevent exploitation.

Conclusion

The piece rate wage system remains a powerful tool for incentivizing productivity, offering benefits to both employers and employees in suitable contexts. However, its success depends on thoughtful implementation, quality control, and a commitment to worker well-being. Keeping these factors balanced is essential for maintaining safety in the workplace while keeping productivity at its highest potential.

Preventative Healthcare:

Preventative healthcare is about taking steps to avoid health problems before they happen. Instead of waiting for someone to get sick or hurt, the focus is on keeping people healthy by preventing illnesses and accidents in the first place. This includes getting vaccines, having regular check-ups, screening for conditions such as diabetes or high blood pressure, and teaching people how to live healthier lives through better eating, exercising, and avoiding harmful habits like smoking. The goal of preventative healthcare is to catch problems early, when they are easier and cheaper to treat, and to advance overall well-being, which leads to longer, healthier lives.

For Latino/a farmworkers in the United States, preventative healthcare is really important, but it's also much more difficult to access. Farmworkers play a critical role in producing food, but they often face serious health risks due to their work and living conditions. They are more likely to suffer from conditions like respiratory problems, joint pain, heart disease, and stress. They often work a lot of hours in dangerous conditions, handling pesticides and working in extreme heat, which increases the risk of injury or illness (Cheney et al. 2022). Many of them also live in rural areas where healthcare facilities are farther away, and they might not have health insurance

or enough money to pay for care. Because of this, farmworkers are less likely to get the healthcare they need, including important preventative care like health screenings and vaccinations.

Another problem is that many Latino/a farmworkers speak Spanish and may not be able to easily talk to doctors or nurses who speak only English. The language barrier can make it hard for farmworkers to explain their symptoms or understand what their doctor says about their health. Another situation is that some farmworkers are afraid to seek help because they are worried about immigration issues. This fear keeps many from going to clinics or hospitals, even when they are in need of medical care (Yamanis et al. 2021). These challenges make it even harder for farmworkers to take advantage of preventative care, which could help them avoid serious health problems in the future. Preventative healthcare is especially important for Latino/a farmworkers because many of the health issues they face can be prevented when found early. For example, farmworkers are more likely to develop high blood pressure, diabetes, and heart disease, but regular check-ups and screenings can catch these conditions early, when they are easier to treat. Health problems related to their work, such as injuries from lifting heavy loads or exposure to chemicals, can also be reduced if farmworkers have access to proper training, protective equipment, and medical care to prevent issues from getting worse (Castillo et al. 2021).

There are a lot of ways to give access to preventative healthcare for Latino/a farmworkers. One solution is mobile health clinics, which bring healthcare directly to the workers in the fields or their communities. The clinics can help give more services like blood pressure checks, screenings, and vaccines. By bringing healthcare to farmworkers where they live and work, mobile clinics help reduce the issues created by long distances to medical centers or the inability

to take time off from work. For example, mobile clinics can also be staffed by bilingual healthcare workers, which will help overcome language barriers. This makes it easier for farmworkers to understand their health needs and receive care without the problems of being misunderstood and be able to get the care they need.

Another way to help farm workers is through health education programs that teach them about the risks they face and how to stay healthy. For example, the presentations that are being taught by those involved in this project can teach the farmworkers on how to protect themselves from pesticide exposure or how to prevent health issues caused by environmental factors. This can show them the best ways to protect themselves while working, and explain how to stay safe. It is also important to let the farmworkers know about the quality of care they should have at work because it's also possible that they might not know what is fair for them as farmworkers and their needs in the workplace.

Another major issue for many farmworkers is that they don't have health insurance, which makes it hard for them to pay for care. Without insurance, even doctor visits and health screenings can be too expensive. Farmworkers who don't have insurance may avoid going to the doctor, which means they miss out on preventative services that could have detected health problems early. Expanding access to affordable health insurance and making it easier for farmworkers to qualify for programs like Medicaid would help them get the care they need. This could help prevent chronic illnesses and reduce the cost of treating conditions when they become more serious.

In addition to improving access to healthcare, it's important to address the living and working conditions that put farmworkers at risk in the first place. For example, farmworkers often live in

crowded or unsafe housing and may not have enough access to healthy food, which can make it harder for them to stay healthy. Which is also the reason why their population is more likely to be diagnosed with diabetes and obesity. Policies that improve wages, provide safer housing, and help farmworkers access healthy food would improve their overall health and reduce the need for healthcare.

In conclusion, preventative healthcare is important for the health of our Latino/a farmworkers, but many face serious challenges that prevent them from getting the care they need. Addressing the language barriers, fear of immigration status, lack of health insurance, and long distances to healthcare services is essential for improving their access to care. Programs like mobile health clinics and health education, can make a big difference in helping farm workers stay healthy. Also improving the overall living and working conditions of farmworkers through better wages, housing, and workplace safety will reduce health risks and help keep them healthy for the long term. By taking these steps, we can help ensure that Latino/a farmworkers have the opportunity to live healthier and longer lives.

Primary Health Care:

Essential health care that is accessible, affordable, and community-based, serving as the first point of contact for individuals.

Promotores:

A Hispanic/Latino community member with specialized training to provide basic health education to the community. Since the majority of these community health workers are women, they are often referred to with the Spanish feminine as *promotoras*. They commonly help deliver health information and resources to other communities members, often acting as a liaison

between communities, health workers, and other assistive organizations in the area. Historically they have often been treated as volunteers and have not received the respect and training they deserve. But this is slowly changing thanks to diverse efforts in global health and community health to professionalize and pay *promotoras*, including in California.

Social Determinants of Health:

The social determinants of health (SDOH) can be defined as the social, economic, and environmental factors that significantly influence health outcomes and health inequities. When considering farmworker health, these factors are especially important for California's farmworkers, who are among the most vulnerable groups because of limited resources, workplace hazards, and barriers in accessing healthcare. The social determinants of health are complex and fluid, and this definition describes SDOH in the specific context of farmworker health. By examining the unique challenges this group faces and how these determinants contribute directly to health disparities, we can try to improve health outcomes and quality of life.

Social determinants of health are “the conditions in which people are born, grow, live, work, and age” (World Health Organization [WHO], 2014). These determinants encompass a range of social and economic factors, including access to healthcare, education, economic stability, social networks, and the physical environment. The SDOH framework, developed by Dahlgren and Whitehead's Rainbow Model (1991), highlights the wider social, economic, and environmental factors driving health disparities.(Solar & Irwin, 2010). Instead of a focus on personal lifestyle choices, health risks can be attributed to peoples' environment. In farmworker communities,

these determinants are affected by occupational factors, such as seasonal work and exposure to environmental hazards, which amplify health risks and limit access to healthcare services.

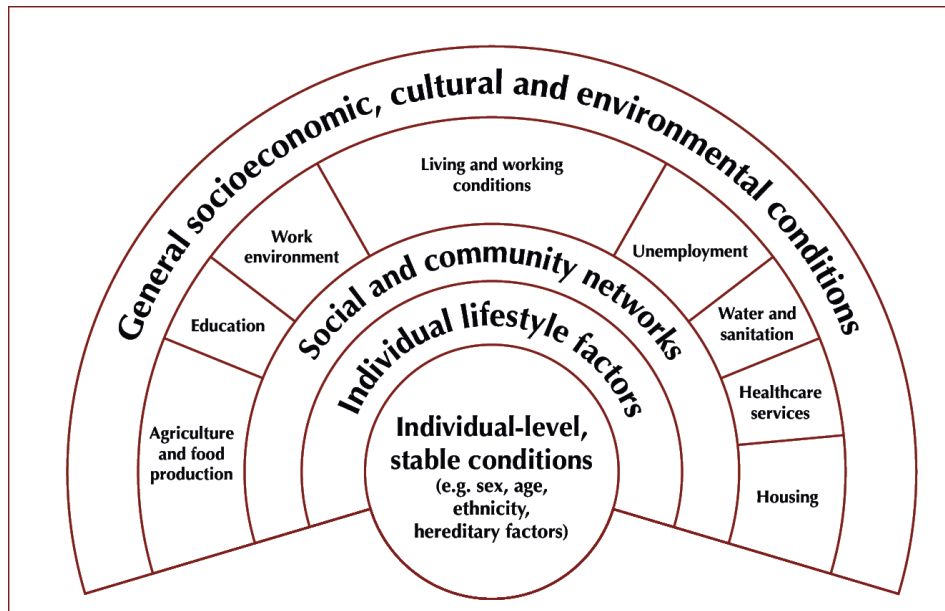


Figure 1. The Dahlgren-Whitehead rainbow model of health.

For farmworkers, SDOH often interact to shape unique health vulnerabilities. Many farmworkers face barriers such as low wages, inadequate housing, lack of health insurance, and social marginalization due to immigration status, which makes achieving good health incredibly challenging. Addressing SDOH is essential to reducing health disparities, as the factors that shape health for farmworkers are deeply embedded within the social and economic structures of our society (Braveman & Gottlieb, 2014).

Key pillars of SDOH include economic stability, physical environment, education, social context, and healthcare access and quality. Each of these plays a critical role in determining farmworkers' health outcomes. Economic stability is a foundational determinant of health, encompassing employment, income, and financial security (Healthy People 2020). For

farmworkers, economic stability is often precarious due to seasonal employment, low wages, and lack of benefits such as health insurance or paid leave (Arcury & Quandt, 2020). These economic constraints increase vulnerability to health risks as many farmworkers struggle to afford healthcare or basic necessities like nutritious food, leading to poorer health outcomes (Clark et al., 2021). Income instability also limits farmworkers' access to preventive care and can result in delayed medical treatment, which only exacerbates health issues over time.

The physical environment in which farmworkers live and work significantly impacts their health. They often have no choice but to live in rural, isolated areas with limited infrastructure and inadequate housing, leading to higher exposure to health risks. These risks include unsafe drinking water, pesticide exposure, and extreme weather conditions which have only worsened with [climate change](#). In addition, substandard living conditions often mean a lack of proper sanitation, crowded spaces, and limited access to healthcare facilities. These environmental factors increase the risk of respiratory issues, musculoskeletal injuries, and infectious diseases, all of which disproportionately affect farmworker populations (Hernández et al., 2017).

Many farmworkers also have limited educational opportunities due to socioeconomic barriers and not being English speakers. This makes it incredibly difficult for them to navigate healthcare systems, understand medical information, and make informed health decisions, contributing to poor health outcomes. Health literacy programs tailored to farmworker communities are aiming to address these barriers and improve health outcomes by providing accessible health information and resources (Clark et al., 2021). The project's app is one example of this project attempting just that.

Social and community contexts, including social support networks and experiences of discrimination impact farmworker health and quality of life on a daily basis (Moyce & Schenker, 2018). The cumulative effect of social isolation and discrimination exacerbates health risks, leading to a higher prevalence of mental health issues such as anxiety, depression, and stress-related conditions. Strengthening social support networks with programs like Promotores training are essential strategies for improving farmworker health outcomes.

Access to quality healthcare is a critical component of SDOH, influencing individuals' ability to manage health conditions and access preventive care. However, farmworkers face numerous barriers to healthcare access, including lack of insurance, high costs, language barriers, and limited availability of services in rural areas (Hernández et al., 2017). These barriers are compounded by a lack of culturally competent healthcare providers who understand the specific needs of farmworker populations. Without adequate healthcare access, farmworkers are more likely to experience untreated chronic conditions, delays in receiving care, and inadequate preventive health services (Moyce & Schenker, 2018).

Structural determinants refer to the policies, cultural norms, and governance structures that shape the broader social and economic context in which people live (Solar & Irwin, 2010). For farmworkers, these structural determinants are often unfavorable, as policies may limit labor protections, restrict access to social benefits, and perpetuate discrimination based on immigration status. These systemic factors create a cycle of economic precarity, occupational hazards, and limited healthcare access, which increases health vulnerabilities and perpetuates inequities (Arcury & Quandt, 2020). Structural discrimination and marginalization are “fundamental causes” of health disparities, as they systematically restrict access to resources such as

healthcare, safe housing, and legal protections (Link & Phelan, 1995). The SDOH framework emphasizes that health disparities arise from preventable social and economic inequalities that disproportionately affect vulnerable populations, including farmworkers (Braveman & Gottlieb, 2014). Health disparities are not random; they reflect the unequal distribution of SDOH across social groups. Farmworkers, often economically marginalized and exposed to multiple health risks, experience significant health disparities due to limited access to healthcare, unsafe working conditions, and social marginalization (Clark et al., 2021).

The social determinants of health provide a meaningful framework for understanding health disparities, particularly in vulnerable populations. Defined as the conditions in which individuals live, work, and age, SDOH include factors like economic stability, physical environment, education, social context, and healthcare access. For farmworkers, these determinants intersect with structural barriers that exacerbate health risks, resulting in significant health disparities. A comprehensive approach that considers these determinants can help reduce health disparities and foster a healthier future for farmworker populations.

Social-Ecological Vulnerability:

How groups, particularly underprivileged ones like farmworkers, experience and adjust to environmental changes due to the interdependence of social and ecological elements.

Structural Vulnerability:

"A social science concept that describes the likelihood of experiencing difficulties due to a lack of resources, such as money, education, health care, or information" (Bourgois, 2017)

Structural vulnerability describes the risks and disadvantages that certain groups of farm workers face due to systemic social, economic, and political systems. It is important to recognize that the term is “structural vulnerability” rather than “Vulnerability”. This is because individual vulnerability is at the expense of personal circumstances, and while that may be the case for many farm workers, there are deep-rooted systems (structures) that continue to challenge farm workers. Their health, financial security, and well-being is compromised because of the systemic barriers set in place that limit their access to healthcare and fair wages. It is crucial to understand that these farmworkers are vulnerable because the structural systems we have in place create inequalities and inequities in their everyday life (Quesada). To illustrate my point, the majority of farm workers face low wages and dangerous working conditions because of labor laws and immigration policies that put them at a disadvantage, not their personal failings. Unfortunately, these systems reinforce each other, creating a cycle of vulnerability and making it even harder for farm workers to advocate for themselves and better conditions.

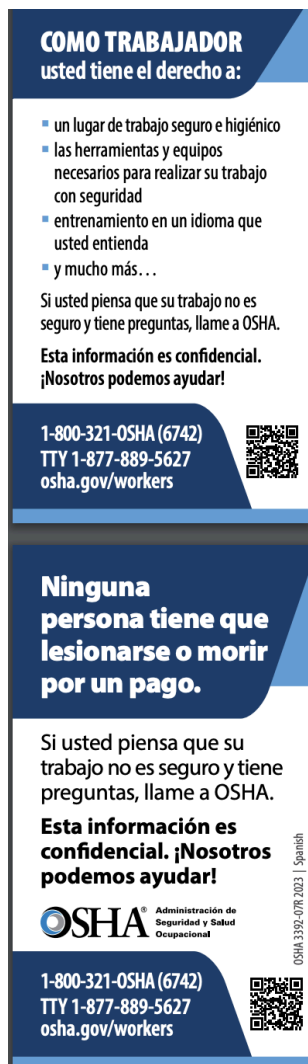
Many farm workers migrate to the United States in hopes of better economic opportunities. Unfortunately, they find themselves working jobs that are physically demanding, low-wage, and dangerous environments. Due to U.S. labor laws, agricultural workers are excluded from certain protections like unionizing and getting overtime pay. Since many are undocumented, the fear of deportation stops them from negotiating better treatment and advocating for better access to essential services. This lack of labor protection exposes farmworkers to various health risks such as chronic pain, respiratory issues, and pesticide poisoning. (Arcury and Quandt)

There are numerous barriers that farm workers face when it comes to healthcare, especially if they are undocumented. These barriers include a lack of health insurance due to

multiple employers or other reasons; this causes farmworkers to avoid seeking care due to the high cost of care without health insurance or fear of deportation. It is also important to note that many people in the Latinx/Hispanic communities do not trust healthcare institutions for various reasons, whether that be fear of deportation or lack of connection with providers/alignment with cultural values. This is an issue because when these farmworkers do seek healthcare, they encounter numerous barriers such as language barriers and cultural misunderstandings. This is because a majority of healthcare providers are not trained to provide culturally competent care that respects immigrant farmworkers or their values, such as personalismo. Intersectionality can be seen among Indigenous farmworkers because Spanish to English is already a language barrier, so an additional barrier is placed because of the few healthcare materials available in their native languages. (Holmes 224)

Recognizing intersectionalities is crucial and understanding how structural vulnerability affects different farmworkers is essential because they are not impacted in the same way. Many factors affect this such as gender, native language, race/ethnicity, etc. For example, a female farmworker is exposed to the same physical risks as their male counterparts but also faces a heightened risk of sexual harassment and assault in the workplace. Unfortunately, there is a power imbalance between female farm workers and their supervisors, this power dynamic discourages them from speaking up about it because of fear of retaliation, losing their jobs, and deportation. Another example of this intersectionality would be an Indigenous farmworker who is compounded by racial and linguistic barriers/discrimination. Due to their limited ability to speak/understand English and Spanish, there are additional barriers that prevent them from accessing health information, social services, and help within the farmworker community (because they mostly speak Spanish). This language isolation prevents Indigenous farmworkers

from understanding their legal rights, accessing healthcare, and creating support networks within the farmworker community that could alleviate some of their vulnerabilities. There are resources available to help farmworkers in almost every single language, a great website is OSHA (Occupational Safety and Health Administration). An example of this would be this printable image from their website, which tells them their rights in their selected language, and tells them the help they want will be confidential. Here is an example in Spanish:



COMO TRABAJADOR
usted tiene el derecho a:

- un lugar de trabajo seguro e higiénico
- las herramientas y equipos necesarios para realizar su trabajo con seguridad
- entrenamiento en un idioma que usted entienda
- y mucho más...

Si usted piensa que su trabajo no es seguro y tiene preguntas, llame a OSHA.

Esta información es confidencial. ¡Nosotros podemos ayudar!

1-800-321-OSHA (6742)
TTY 1-877-889-5627
osha.gov/workers

Ninguna persona tiene que lesionarse o morir por un pago.

Si usted piensa que su trabajo no es seguro y tiene preguntas, llame a OSHA.

Esta información es confidencial. ¡Nosotros podemos ayudar!

OSHA Administración de Seguridad y Salud Ocupacional

1-800-321-OSHA (6742)
TTY 1-877-889-5627
osha.gov/workers

OSHA 3392-OTR 2023 | Spanish

This image is from [OSHA Worker Rights and Protections | OSHA.gov | Occupational Safety and Health Administration](https://www.osha-slc.gov/worker-rights-and-protections) under “Publications”

This is a great resource because it advocates for them and their language while also encouraging them to seek help if they feel unsafe in their workplace. The different modes of accessibility are refreshing to see, the physical picture that can be printed, the phone number, the website, and the QR code make this much easier for them.

This brings up an important aspect of structural vulnerability for farmworkers, which is the lack of health literacy among them. Health literacy refers to someone's ability to understand and act on health information. This can be difficult when these farmworkers have limited education and face additional language barriers. This can make understanding healthcare options, preventative care, and workplace rights challenging for them. With this lack of education and accessible healthcare/health education, farmworkers will not recognize the importance of regular check-ups, protective gear, and hydration to prevent long-term illnesses. There are health literacy programs that focus on educating farmworkers in simple and relatable language that encourages them to take preventive measures, seek timely care, and understand their rights.

[Climate change](#) adds a whole new layer of risk, exacerbating their structural vulnerability. Since they are the most exposed to climate impacts due to the outdoor nature of their work, the rising temperatures, changing seasons, and extreme weather events increase their risk of health problems. For example, when the temperature rises, farmworkers face longer periods of [heat exposure](#), which leads to dehydration, heat exhaustion, and even heatstroke. These unfortunate events occur due to their limited worker protections and economic insecurity, discouraging them from taking shaded breaks/hydration breaks, which puts them at risk every day. Importantly, the use of pesticides is a prevalent issue among farmworkers, an issue that causes exposure to harmful chemicals. Most farmworkers are paid based on the quantity harvested, so when crops

are damaged due to droughts, floods, or extreme weather events, they must use pesticides to protect the crops and save their income. Their unpredictable income is based on weather events with the only option to save the crops being pesticides, which in the long term causes respiratory diseases (Moyce and Schenker).

Policy reform will reduce structural vulnerability, but it lacks the community-based and practical solutions that farmworkers can use. Unionizing/union organizing is community-led and encourages farmworkers to advocate for better wages and safer working conditions. When joining a union, farmworkers can negotiate with employers, instead of their dependence on a single employer. Unionizing will also support farmworkers with legal representation to defend their rights. This has been proven with farmworker-led unions like UFW (United Farm Workers) in which they won labor rights, access to shaded rest breaks, and protection rights. (Levine)

Overall, structural vulnerability is more than barriers, it is the intersectionality of systemic inequalities that are rooted in our social, economic, and political systems. This results in health risks, financial instability, and little to no legal protections, all while being excluded from basic health rights. Health education and community-based solutions are key to empowering and supporting farm workers in a world where they have almost no rights. By tackling structural vulnerability from multiple angles (support networks and practical resources), we can work towards a more equitable society where farm workers are respected, supported, and even able to thrive.

Substandard Housing:

Introduction

The living conditions that farmworkers must suffer through, whether in employer-provided housing or rental units from landlords, are often substandard, unsafe, and/or harmful to their

health and wellbeing. Even if farmworkers can manage to find housing outside of their employer-provided accommodations, it usually is very difficult to afford, forcing them to crowd into small & cramped spaces just to make ends meet. The lack of infrastructure and basic amenities like clean water or adequate sanitation, in the employer-provided housing setups, just makes it so much more difficult for farmworkers to protect their health and that of their families. Proximity to pollutants can lead to respiratory illnesses, cancers, skin conditions, and other health problems. This disproportionately and unfairly affects farmworker communities who already have limited access to healthcare.

Socioeconomic Barriers to Housing

Farmworkers in the U.S. face an immense amount of financial & social obstacles that make it difficult to find safe and affordable housing. Low wages, the transient nature of agricultural jobs, and undocumented status are some of the biggest hurdles. Together, these challenges create a neverending cycle of housing instability. For undocumented farmworkers, finding stable housing is a great battle. The fear of deportation looms over them heavily, often discouraging them from advocating for safer living conditions or reporting issues like overcrowding, faulty utilities, or pest infestations. This fear also makes them vulnerable to exploitation by landlords who charge exorbitant rents for inadequate and unsafe housing. With no power to address these injustices, many undocumented workers are trapped in substandard living situations. Adding to these difficulties, undocumented farmworkers are excluded from most government housing assistance programs, such as public housing or rental subsidies like Section 8. Without access to these programs, their housing options are very limited, and many are forced to rely on informal or temporary arrangements. Laborers are paid measly wages, and as of 2015, the average annual

wage was less than \$17,500 annually. This severely limits their ability to afford quality housing (Martin et al., 2017). As a result, they often reside in temporary or employer-provided housing, trailers, and shared rooms, many of which lack basic facilities like heating, ventilation, and adequate sanitation. Multiple farmworker families often share a single living space, packing as many people as possible into overcrowded conditions to cope with high rent costs. Many landlords require that prospective tenants earn three times the monthly rent, a demand that is just unrealistic for farmworkers. The agricultural industry relies on the labor of seasonal farmworkers, whose employment is inherently unstable. The lack of steady and year-round employment makes it very difficult for these workers to secure stable housing. Many landlords require proof of consistent income, and ask for monthly paystubs, so this is an insurmountable obstacle for migrant workers. Discrimination further compounds these struggles as workers will face biases from landlords. Farmworkers have no choice but to live in horrible housing conditions.

Physical Health Implications

Farmworkers often live in substandard housing conditions that seriously jeopardize their physical health. From poorly ventilated spaces to inadequate sanitation facilities, these living environments contribute significantly to respiratory issues, the spread of diseases, and sanitation-related skin infections. Many farmworker housing units lack poor ventilation and suffer from exposure to harmful pollutants. Mold and mildew, which is common in overcrowded and poorly maintained housing, release spores that can exacerbate respiratory conditions like asthma and chronic bronchitis (Quandt et al., 2015). Additionally, pesticide drift from nearby agricultural fields often contaminates the air & infiltrates living spaces, only furthering negative

effects on respiratory health. Prolonged exposure to such toxins can lead to chronic obstructive pulmonary disease (COPD). Overcrowding is common in farmworker housing, with multiple families or individuals crammed into small units to cut costs. This creates a breeding ground for infectious diseases such as the flu, COVID-19, and tuberculosis. (Vallejos et al., 2011). Shared bathrooms and kitchens amplify the risk of disease transmission, especially when basic hygiene supplies like soap or disinfectant are unavailable. Sanitation is also a significant issue in many farmworker housing units. Many lack functioning plumbing, forcing residents to use unsanitary communal toilets. These conditions often result in infestations of rodents and insects, which carry diseases. Clean drinking water is often unavailable, increasing the risk of waterborne illnesses like diarrhea and cholera. Children and older adults are particularly vulnerable to these health risks, facing higher rates of dehydration and related complications.

Mental Health Implications

Substandard housing poses significant mental health challenges for farmworkers, exacerbating stress, anxiety, and depression. Living conditions shaped by the constant fear of eviction or deportation, the overwhelming challenge of meeting high rent costs, and the strain of overcrowding strip away any sense of stability. These challenges feed into a cycle of mental and emotional strain, making substandard housing not just a housing issue. For undocumented farmworkers, the constant fear of deportation weighs heavily on their mental health. Many live in informal housing arrangements or employer-provided accommodations where they have little security or rights. The looming threat of being reported to immigration authorities or evicted without warning fosters ongoing anxiety. This chronic worry disrupts sleep, affects decision-making, and may lead to serious mental health issues such as anxiety disorders (Mora et

al., 2016). Even farmworkers with legal status may avoid speaking out about poor living conditions for fear of retaliation, whether it be job loss or eviction. Housing affordability is another significant source of distress. Farmworkers will often spend a large portion of their already limited income to cover their rent. Landlords will frequently require proof of steady income or enforce rent requirements that farmworkers cannot meet, such as earning three times the monthly rent. For many, the pressure to keep up with rent payments leads to financial insecurity, which compounds mental strain. The constant fear of falling behind or facing eviction can push workers to take on additional jobs, leaving them physically and emotionally exhausted while still feeling trapped in a cycle of financial instability. Overcrowding is common in farmworker housing, where multiple families of individuals often share cramped spaces to make ends meet. This lack of privacy can take a serious toll on mental health. Personal space is an essential that most of us take as a privilege; it is essential for rest & emotional recovery. However, in these conditions, it becomes almost impossible. Noise, constant interruptions, and the inability to set boundaries can lead to heightened irritability, stress, and even conflict among those sharing the space.

Barriers to Reporting Substandard Housing & Lack of Legal Protections

Farmworkers often face inadequate safeguards against substandard housing conditions due to weak legal protections and inconsistent enforcement. Federal legislation, such as the Migrant and Seasonal Agricultural Worker Protection Act (MSPA), outlines minimum housing requirements but often falls short in practice (Joyner et al., 2015). Many enforcement agencies are underfunded and understaffed, leaving countless violations overlooked or unresolved. This lack of oversight is especially pronounced for farmworkers living in informal housing arrangements

or those without legal documentation, as they frequently fall outside the reach of these protections. Local governments often favor agricultural industry stakeholders over worker well-being, leading to minimal regulation of employer-provided housing. Even when housing violations are reported, penalties are typically too insignificant to compel landlords or employers to address unsafe conditions. Without accessible legal remedies, farmworkers are left to endure poor living environments, perpetuating a cycle of neglect and insecurity.

FIGURE A

Annual full-time equivalent (FTE) and average wages for California farmworkers, 2015

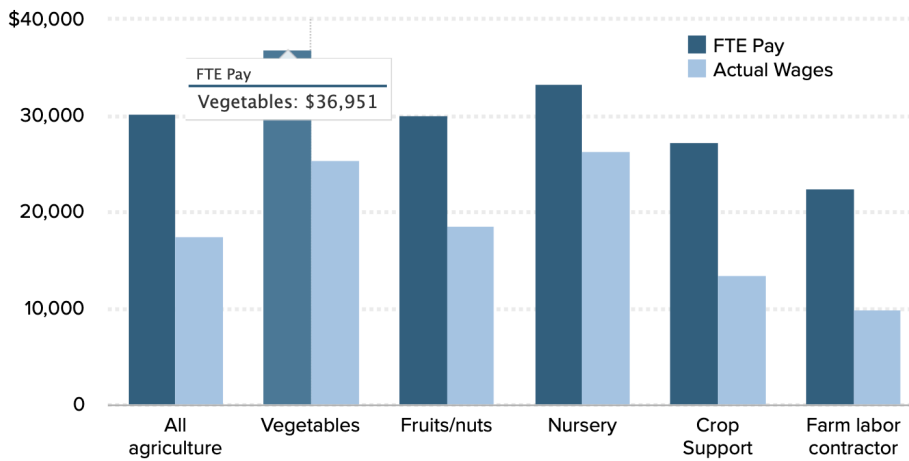


Chart Data

Note: All wages shown are in 2015 dollars.

Source: Quarterly Census of Employment and Wages (Bureau of Labor Statistics, U.S. Department of Labor), <https://www.bls.gov/cew>, and special tabulations provided to the authors by CA Employment Development Department (March 7, 2017).

Economic Policy Institute

Graphic from:

<https://www.epi.org/blog/farmworker-wages-in-california-large-gap-between-full-time-equivalent-and-actual-earnings/>

Symptoms/Síntoma:

Symptoms are physical or emotional experiences that are led by being exposed to pathogens, infections, or medical conditions. Symptoms can be experienced in a wide range of forms such as physical, psychological, acute, and chronic. Symptoms can be shown as the body's defense mechanism or the progress of a disease.

Syndemic:

A syndemic refers to when two or more health problems interact in a way that makes each one worse. This is different from having two health issues at the same time. In a syndemic, the conditions interact in such a way that the overall impact is more severe than if they were happening separately. For example, the combination of chronic health problems, such as diabetes and high blood pressure, with mental health issues, like anxiety or depression, can lead to worse outcomes for people. These health problems are often made worse by social and environmental factors, like poor living conditions, and lack of healthcare access. The concept of a syndemic helps us understand how multiple factors both medical and social interact to create a larger public health problem. One group that experiences syndemics in a particularly severe way is Latino/a farmworkers in the United States.

Latino farmworkers face a lot of health risks because of the kind of work they do, where they live, and their social and/or financial circumstances. They often work long hours in agriculture, exposed to dangerous chemicals like pesticides, which can cause problems like skin irritation, respiratory issues, and even long-term diseases (Portela de-Assis et al., 2021). In addition, farmworkers are often exposed to extreme heat, which can cause dehydration and [heatstroke](#).

These health risks are made worse by the fact that many Latino/a farmworkers already have chronic health conditions, such as diabetes or high blood pressure, which are more common for them (Castillo et al. 2021). For example, a person with diabetes may have a harder time managing their blood sugar levels if they are also working in the heat or exposed to pesticides, leading to serious health problems over time. These health issues don't just happen on their own; they interact with each other, repeating the affected health that can be hard to handle. Mental health issues, such as anxiety, depression, and stress, are also common among farmworkers (Castillo et al. 2021). The pressures of long hours, low pay, job insecurity, and fear of deportation all play to their mental health struggles. They are not separate from physical health problems; they make chronic conditions like diabetes and high blood pressure even worse. For instance, stress can increase blood pressure and make it harder for the body to control blood sugar levels. In this way, the combination of physical health problems and mental health issues creates a syndemic, where the impact of each health problem is worse because they are happening together.

Another key factor in the syndemic affecting Latino/a farmworkers is limited access to healthcare. Many farmworkers, especially those who are undocumented, don't have health insurance or may be afraid to seek medical help because of their immigration status (Matias et al. 2022). Even if they wanted to see a doctor, they often live in rural areas far away from healthcare facilities. This makes it difficult for them to get the care they need for chronic conditions or mental health issues. Many farmworkers also don't have much access to preventive care, such as regular check-ups or screenings for health problems like cancer or high blood pressure. Without regular care, health conditions can go without them noticing, leading to worse outcomes.

Because of these barriers to healthcare, farmworkers often have to deal with untreated or poorly managed health problems that could be much less severe if they had access to proper care.

In addition to physical and mental health issues, farm workers also face social and economic problems that worsen their health. Many live in overcrowded and not so good housing, where conditions such as mold or lack of proper ventilation can cause respiratory problems. They also often don't have access to clean water, sanitation, and healthy food (Castillo et al. 2021). These living conditions contribute to a lot of health problems, including respiratory issues. The low wages and job instability in farmwork make it harder for workers to afford healthy food, exercise, or healthcare. Economic struggles also lead to high levels of stress, which, as mentioned earlier, can make chronic health conditions worse. The combination of poor living conditions, lack of money, and mental health stress creates a cycle that makes health risks worse and contributes to a syndemic.

One clear example of a syndemic among farmworkers is the combination of chronic conditions like diabetes and hypertension with mental health issues. These health problems are common in the Latino/a farmworker population. The stress of living in poor neighborhoods, working long hours, and worrying about job security makes it harder for people to manage chronic conditions like high blood pressure or diabetes. When farmworkers are unable to get the healthcare they need, these conditions become more difficult to control and can lead to serious problems, like heart disease or kidney failure. At the same time, mental health problems like depression or anxiety can interfere with a person's ability to take care of their health, making the chronic diseases even worse. This combination of chronic disease, mental health issues, and social stress creates a repetition of poor health that is hard to break. The syndemic model is especially

important for understanding the health struggles faced by Latino/a farmworkers because it shows how different factors, health problems, social conditions, and environmental risks come together to create a larger health crisis. To help people in these communities, we need to focus not just on treating individual diseases, but on addressing the issues that make these health problems worse. This includes improving working conditions for farmworkers, providing better access to healthcare, and addressing the social and economic factors that contribute to poor health.

Farmworkers need access to medical care for chronic conditions like diabetes and high blood pressure, but they also need support for mental health issues like anxiety or depression. By treating both physical and mental health problems together, healthcare providers can help farmworkers manage their health more effectively. Another important step is to improve access to healthcare for farmworkers. This could include offering health insurance options, providing more clinics in rural areas, and ensuring that workers have access to preventive care, such as regular check-ups and screenings. In addition, people in charge can help by improving working conditions, such as limiting the use of pesticides and making sure that workers are provided with breaks and water during hot weather. Finally, programs that address the social determinants of health like improving housing, providing better access to food, and focusing on income inequality can help not cause a syndemic.

To conclude, Latino/a farmworkers face a set of challenges that make them vulnerable to syndemics, where multiple health problems interact to create worse outcomes. The combination of all these situations of diseases, environmental hazards, mental health, and social and economic make it harder to not have a syndemic. To manage this, healthcare and policies need to focus not only on treating individual diseases, but also on improving working and living conditions,

expanding access to healthcare, and addressing the total social issues that contribute to poor health. By doing so, we can help stop a series of syndemics and improve the overall health and well-being of Latino/a farmworkers.

Wage Theft:

Wage theft is a type of crime that employers commit when they intentionally fail to pay workers their entitled wages or compensate any form of benefits

WASH Services:

Water, Sanitation, and Hygiene (WASH) services are aimed at ensuring access to safe water, effective sanitation, and hygiene education everywhere. This is fundamental to public health, economic development, and environmental sustainability. These services are being integrated into practices and infrastructure in order to prevent diseases, promote health equity, and achieve the global health targets such as the United Nations Sustainable Development Goals (SDGs), particularly Goal 6: "Ensure availability and sustainable management of water and sanitation for all" (World Health Organization, 2022).

Components of WASH Services

WASH encompasses three interconnected elements:

1. **Water:** This refers to the availability and quality of water for drinking, cooking, and personal use. Safe drinking water is defined as water free from pathogens and harmful

chemicals, meeting quality standards for human consumption. Key water-related services include:

- Infrastructure for safe water supply, such as boreholes, protected springs, and piped systems.
- Treatment processes, such as chlorination and filtration, to ensure potability.
- Distribution systems that deliver water reliably to communities, schools, and healthcare facilities.

2. Sanitation: Adequate sanitation facilities help manage human waste hygienically to prevent contamination of the environment and water sources. Essential sanitation components include:

- Toilets and latrines designed for safety, privacy, and accessibility.
- Waste management systems that safely dispose of or treat fecal matter.
- Promoting open-defecation-free (ODF) environments through community-led sanitation initiatives.

3. Hygiene: Exposure to diseases is minimized when hygienic behaviors are prioritized. Some things that are crucial for proper hygiene are handwashing with soap, menstrual hygiene management (MHM), and the safe handling of food and water. Facilities and educational programs help ensure that individuals adopt these practices.

| | WATER | SANITATION | HYGIENE | WASTE MANAGEMENT | ENVIRONMENTAL CLEANING |
|---------------------------------|--|--|--|---|--|
| Higher levels of service | To be defined at a national level | To be defined at a national level | To be defined at a national level | To be defined at a national level | To be defined at a national level |
| Basic service | Water is available from an improved source on the premises. | Improved sanitation facilities are usable, with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for people with limited mobility. | Functional hand hygiene facilities (with water and soap and/or alcohol-based hand rub) are available at points of care, and within five metres of toilets. | Waste is safely segregated into at least three bins, and sharps and infectious waste are treated and disposed of safely. | Basic protocols for cleaning are available, and staff with cleaning responsibilities have all received training. |
| Limited service | An improved water source is within 500 metres of the premises, but not all requirements for basic service are met. | At least one improved sanitation facility is available, but not all requirements for basic service are met. | Functional hand hygiene facilities are available either at points of care or toilets but not both. | There is limited separation and/or treatment and disposal of sharps and infectious waste, but not all requirements for basic service are met. | There are cleaning protocols and/or at least some staff have received training on cleaning. |
| No service | Water is taken from unprotected dug wells or springs, or surface water sources; or an improved source that is more than 500 metres from the premises; or there is no water source. | Toilet facilities are unimproved (e.g. pit latrines without a slab or platform, hanging latrines, bucket latrines) or there are no toilets. | No functional hand hygiene facilities are available at either points of care or toilets. | There are no separate bins for sharps or infectious waste, and sharps and/or infectious waste are not treated/disposed of safely. | No cleaning protocols are available and no staff have received training on cleaning. |

Case Studies and Evidence

Rural India: India's Swachh Bharat Abhiyan (Clean India Mission) is a landmark sanitation campaign aimed at eliminating open defecation. By constructing millions of toilets and raising awareness, the program significantly improved sanitation coverage and public health outcomes.

Sub-Saharan Africa: A study in Zambia demonstrated that community-based water management systems, coupled with hygiene education, reduced waterborne illnesses by 40% in participating villages (PLOS ONE, 2021).

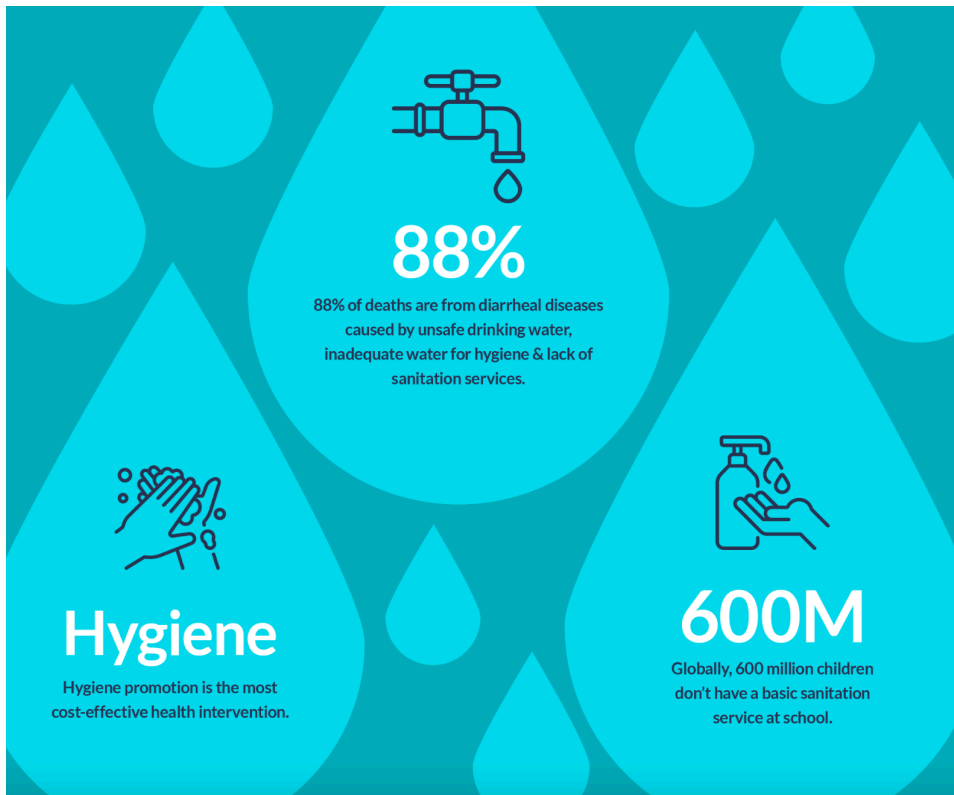
According to the World Health Organization (WHO), lack of access to clean water and sanitation is a leading cause of diarrheal diseases, which are responsible for approximately 1.6 million deaths annually, predominantly among children under five (UNICEF & WHO, 2023).

Additionally, improved WASH services have been shown to:

- Reduce the incidence of diseases like cholera, typhoid, and hepatitis A.

- Improve maternal and child health by reducing infections during childbirth and infancy.
- Enhance nutritional outcomes by preventing conditions such as waterborne illnesses that cause malnutrition and stunting.

During the COVID-19 pandemic, the role of WASH services in infection prevention became even more evident. Studies revealed that consistent access to handwashing facilities significantly reduced the spread of the virus in both healthcare and community settings (Berendes et al., 2022).



WASH in Diverse Contexts

At the household level, access to basic WASH facilities significantly improves quality of life. Women and girls, who often bear the responsibility of water collection, benefit from reduced physical and time burdens when water sources are close to home. Moreover, menstrual hygiene

management (MHM) facilities empower women and girls to manage menstruation safely and with dignity.

In educational institutions, WASH services enhance attendance and learning outcomes. Lack of adequate sanitation and hygiene facilities often leads to absenteeism, especially among girls during menstruation. Implementing gender-sensitive WASH infrastructure ensures that schools are inclusive and supportive environments for all students.

In healthcare settings, proper WASH services are critical for infection prevention and control (IPC). Studies indicate that healthcare facilities with inadequate WASH services are hotspots for healthcare-associated infections, posing risks to patients and staff (PLOS ONE, 2021). Investing in reliable water supplies, functional sanitation systems, and handwashing stations improves patient outcomes and staff well-being.

Barriers to Effective WASH Services

Even though there has been a lot of work to implement WASH services, there are still barriers that are particularly prevalent in low- and middle-income countries.

1. **Resource Limitations:** Insufficient funding for infrastructure, maintenance, and education programs affects sustainability.
2. **Cultural Barriers:** Stigmas and taboos, particularly around menstruation, can impede hygiene promotion efforts.
3. **Geographical Challenges:** Remote and arid regions face logistical difficulties in establishing water and sanitation systems.
4. **Policy Gaps:** Weak governance, lack of coordination, and limited enforcement of standards hinder progress.

5. [Climate Change](#): Droughts, floods, and extreme weather events threaten water supplies and sanitation infrastructure.

The Future of WASH

In order for positive outcomes to be achieved, WASH must be implemented in a way where all aspects are being addressed to the highest number of people possible. An example of this would be educating people in hygiene while constructing latrines

Innovative solutions, such as solar-powered water pumps, smart water meters, and low-cost filtration systems, improve efficiency and accessibility. Mobile apps for monitoring WASH facilities also enhance transparency and accountability.

Strong policies that prioritize equitable access to WASH services are essential. Advocacy efforts should focus on increasing investment, promoting gender equality, and ensuring that marginalized groups are not left behind.



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