

Promoting the Occupational Health of Indigenous Farmworkers

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Abstract In the United States, approximately 78% of agricultural farmworkers are immigrants. In Oregon, a growing number of these farmworkers are indigenous and speak an indigenous language as their primary language. This group of farmworkers suffers from linguistic, cultural and geographic isolation and faces a unique set of challenges yet little has been done to identify their health needs. Using data from focus groups, partners from this community-based participatory research project examined indigenous farmworkers' concerns regarding occupational injury and illness, experiences of discrimination and disrespect, and language and cultural barriers. The data revealed examples of disrespect and discrimination based on the languages and cultures of indigenous farmworkers, and a lack of basic occupational health and safety information and equipment. For example, participants mentioned that occupational safety information was inaccessible because it was rarely provided in indigenous languages, and participants felt there were no legal means to protect farmworkers from occupational hazards. Community-based strategies designed to address the occupational health status of

farmworkers must consider the unique circumstances of those farmworkers who do not speak Spanish or English.

Keywords Indigenous farmworkers · Pesticides · Community-based participatory research · Occupational health · Agricultural work · Discrimination

Introduction

According to the National Agricultural Workers Survey (NAWS), about 78% of agricultural farmworkers in the United States are immigrants [1]. This group of farmworkers lacks economic resources, and suffers from linguistic, cultural and geographic isolation. A growing number of indigenous people from Mexico and Guatemala have joined the U.S. agricultural workforce in recent years. Yet, a review of relevant public health literature suggests that little has been done to identify the specific needs and priorities of indigenous farmworkers. In this unique 4-year community-based project funded by the National Institute of Environmental Health Sciences and the National Institute for Occupational Safety and Health, we have gathered information using focus groups and other outreach efforts with indigenous farmworkers. During the analysis of the focus groups, we identified two primary areas of concerns: (1) disrespect and discrimination based on the unique languages and cultures of the indigenous farmworkers, and (2) a lack of basic occupational health and safety information and equipment. We will describe the focus group results, and will conclude with the project activities and efforts to address these concerns.

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Background: National and Oregon State Statistics

Farmworkers' mobility and varying immigration status make their exact numbers hard to ascertain, but estimates place the number of employed farmworkers nationally at about 2.5 million [2], of which 78% are in crop agriculture [1]. Many are undocumented, and are more likely to accept substandard working conditions, wages, and housing conditions. Farmworkers in the U.S. receive an average hourly wage of \$7.25; however, migrant farmworkers, those workers who travel away from their normal residences overnight to perform farm or crop work for wages, receive an average hourly wage of only \$6.96 [1]. Furthermore, *indigenous* farmworkers—farmworkers from pre-Columbian communities that are mostly self-governing and speak an indigenous language as their primary language—often work in the most labor-intensive crops in the U.S., but are paid the lowest wages [3].

Approximately 30% of all farmworkers in the U.S. have total family incomes below the poverty line, and the median family income is between \$7,500 and \$10,000. Approximately 77% of migrant farmworkers lack health insurance, making it difficult for farmworkers to obtain adequate and affordable health care [1]. About 20% of migrant farmworkers live in employer-provided housing, which is in short supply and frequently substandard [1]. Approximately 58% rent from someone other than their employer [1], while others live in fields, or in unsanitary and overcrowded conditions that can increase the spread of infectious diseases such as tuberculosis.

In Oregon, there are an estimated 174,000 migrant and seasonal farmworkers¹ and their family members [4], with indigenous farmworkers representing about 40% of the total migrant farmworker population [5–7]. Within Oregon, approximately 90% of all farm laborers are from Latin America, almost exclusively from Mexico. During harvest time, the population of Mixtecos, for example, is estimated at 20–30% of the total farmworker population in Oregon [3]. Mixtecos are indigenous Native American peoples from various states in southwest Mexico, including Oaxaca, Puebla and Guerrero. They are the second largest indigenous group in Oaxaca.

In 2006, Oregon State recorded 341 registered migrant farmworker camps [8]. The conditions at these camps vary greatly in terms of occupants' access to basic amenities such as hot water and showers, laundry facilities, and heat in the living areas. While Oregon law requires labor camps

to be registered by Oregon's Occupational Safety and Health Administration (OR-OSHA)², some unregistered camps do exist. In unregistered and registered camps alike, drainage, bathrooms, laundry facilities, and hot water may not be available in adequate supply, contributing to poor housing conditions. Moreover, since OR-OSHA must receive a complaint to recognize the existence of unregistered camps, the total number of such facilities may be underestimated.

Occupational Health and Discrimination: A Review of Literature

Agricultural work is one of the most dangerous jobs in the United States, with a mortality rate more than eight times the average of all other industries [9, 10]. In California alone, almost 500 acute pesticide poisoning cases are reported every year, though the actual number of poisonings is likely much greater as many cases go unreported [11].

Many of the crops grown in Oregon, such as vegetables and tree fruits, involve moderate to high field-worker exposure to pesticides. Pesticide exposure can lead to acute effects including skin rashes, eye irritation, headaches, vomiting, shortness of breath, convulsions, coma and death [12–14]. Farmworkers also suffer from elevated rates of non-Hodgkins lymphoma, leukemia and brain cancer which have been associated with pesticide exposure [15, 16].

It is estimated that worker protection law violations by employers contributed to 41% of pesticide poisonings in California, including “failure to provide useable safety equipment, absence of washing/decontamination facilities, and lack of fieldworkers' access to pesticide training or information” [11]. Similarly, in other studies farmworkers have reported a lack of access to hand washing facilities [17, 18], toilet facilities [19] or protective equipment [20, 21]. Arcury and colleagues [19] found that less than half of the farmworkers surveyed reported being informed when pesticides were applied, and only 11% of workers knew the names of those pesticides. Yet many studies suggest that farmworkers are suffering from the effects of exposure. For example, in interviews with Washington State farmworkers, 25% reported a rash or itchy skin and 39% reported burning eyes in the past 3 months [22]. Further increasing the risk of injury and illness, workers reported that training and safe practices are often viewed negatively by employers [20].

¹ Note that “migrant” generally refers to farmworkers who leave their permanent residence to work for months in agriculture; “seasonal” refers to farmworkers who work temporarily, or seasonally, but return to their permanent residence each day after work. Both types of farmworkers tend to work in the same type of agricultural jobs, and frequently share language and culture.

² The Oregon Occupational Safety and Health Administration (OR-OSHA) administers the Oregon Safe Employment Act of 1973, which was enacted after the federal Occupational Safety and Health Act (OSHA). OSHA's “State Plan Agreement” requires Oregon to set job safety and health standards that are “at least as effective as” comparable federal standards.

In addition to pesticides-related exposures and illnesses, the public health literature on migrant farmworkers has examined the issue of workplace discrimination. Being subjected to discrimination can contribute to poor health outcomes [23, 24]. In a 1999 survey of 1,001 Mexican migrant farmworkers in California, discrimination was highly correlated with depression. Approximately 22% of workers who reported they were subject to “medium discrimination levels” and 40% of workers who reported “high discrimination levels” also reported experiencing depressive symptoms [25]. In other studies, migrant workers have described being treated inhumanely by employers because of language and cultural differences, feeling harassed by foremen, and performing unsafe tasks without complaining for fear of losing their jobs [20, 21].

Though the occupational health and safety of Latino farmworkers is becoming increasingly well-studied, there is a dearth of occupational health research and information specifically related to *indigenous* farmworkers. Their distinct cultures and multiplicity of languages make it challenging to develop culturally and linguistically-relevant occupational safety and health outreach and educational approaches. For example, there are over 60 indigenous languages spoken in Mexico alone. Few agencies and organizations serving indigenous farmworkers have acquired the language skills or cultural competence necessary to assist these communities. Challenges include: the absence of a widely used written transliteration of the spoken indigenous languages; the number of languages and variety of dialects spoken; the seasonal nature of agricultural work; the lack of persons in health care and occupational health and safety professions who speak the indigenous languages; and the distinct health beliefs of these groups of workers. For this study, we use focus group data to examine the indigenous farmworkers’ concerns regarding occupational injury and illness, experiences of discrimination and disrespect, and language and cultural barriers.

Overview of *Promoting the Occupational Health of Indigenous Farmworkers*

To address the needs of Oregon’s indigenous agricultural communities, a team of project partners works collaboratively and includes indigenous-language speaking community educators, farmworker advocates, labor union representatives, environmental scientists and health care providers. This 4-year project is funded by the National Institute of Environmental Health Sciences and the National Institute for Occupational Safety and Health. Partner organizations include the Oregon Law Center, Salud Medical Center, Pinos y Campesinos Unidos del Noroeste (PCUN), Portland State University School of Community Health, and Farmworker Justice. Dr. Linda McCauley of University of Pennsylvania School of Nursing serves as project consultant.

The project, *Promoting the Occupational Health of Indigenous Farmworkers*, aims to develop community-based strategies to address the health concerns of indigenous populations that migrate to the United States to work in agriculture. The project’s mission is to improve the capacity of migrant farmworkers who do not speak Spanish or English to understand the hazards associated with agricultural work and increase their access to economic, health, and social services. The specific project aims are included in Table 1.

Methods

In an effort to learn more about the occupational and health-related challenges of Oregon’s indigenous farmworker community, project partners conducted a series of six focus groups with farmworkers representing a variety of agricultural sectors early in the project. For the first time in Oregon, indigenous farmworkers were invited to express

Table 1 Specific aims of *promoting the occupational health of indigenous farmworkers*

- Aim #1. Investigate the needs of farmworkers speaking indigenous languages, and of health providers and other stakeholders, to identify priorities for workplace education, intervention, and policy change.
- Aim #2. Promote the development of local leadership among indigenous farmworkers to assure their participation in the determination of priorities and the implementation of solutions.
- Aim #3. Explore the existing channels of communication currently employed by indigenous farmworkers to obtain information, and examine the strengths and weaknesses of these channels.
- Aim #4. Develop and disseminate a replicable educational/outreach program and materials to address the health and safety needs of indigenous farmworkers.
- Aim #5: Increase the knowledge of organizations, clinics and agencies that work with indigenous farmworkers for their occupational health and safety needs.
- Aim #6: Develop a successful partnership including representatives from the farmworker communities, and the research project partners.

their concerns and priorities with regard to occupational health and safety issues. Adhering to the principles of Community-based Participatory Research [26], we used a participatory process to develop focus group questions and protocol. After several iterations, we finalized the list of focus group questions. Questions included in the focus group are presented in Table 2. The project took extra care to assure that the questions were culturally and linguistically appropriate by working closely with project partners, especially those partners who have backgrounds as farmworkers and who speak both Spanish and one of the indigenous languages of Mexico. Prior to conducting the focus groups, the facilitators identified the concepts and terms that would be difficult to interpret into Mixteco. They created and agreed upon alternative explanations of the terms that would increase the participants' understanding. Terms and concepts that required additional interpretation and context were *focus group*, *pesticides*, *services* (as in "health or social services"), *legal protec-*

tion, *legal rights*, and *associated* (as in "the dangers associated with agricultural work").

The university partners conducted a half-day training on focus group facilitation with attendees from all partner organizations. The training included sections on confidentiality, the importance of rigor and consistency in conducting focus groups, the role of the focus group facilitator, and a discussion of ethics, participants' rights, and informed consent. All facilitators and co-facilitators practiced asking the focus group questions from the focus group interview guide, and trainers emphasized the importance of maintaining neutrality and reading the questions as worded. Human Subjects Approval was obtained from the Institutional Review Board at Portland State University to recruit participants and conduct the focus groups.

Six focus groups were conducted with indigenous farmworkers, with three groups conducted in Spanish, one conducted in Spanish with Triqui interpretation by a project volunteer, one conducted in Spanish with Mixteco

Table 2 Focus group interview questions

Occupational health questions

1. What do you view as the greatest hazards to your health and well being at work?
2. What types of training or information have you received from your employer on occupational hazards and how to avoid injury or sickness?
 - a. Was the training or information useful?
3. Does your employer provide ways to protect yourself from work hazards in the fields? How?
4. What types of facilities are available at your worksite?
5. If someone was injured or became ill while working, could they report the incident?
 - a. If yes, to whom?
6. What legal protections exist to protect farmworkers from job hazards?
 - a. Do you think they protect farmworkers?
 - b. Why or why not?
7. Regarding the hazards associated with agricultural work, what are your highest health concerns?

Information and services questions

1. Aside from your place of employment, where else have you or others you work with received information about health and hazards related to agricultural work?
 - a. What did you think about the information received?
 - b. Is the information provided in your language?
 - c. Who provided the information?
2. Have you ever spoken with an outreach worker or health educator?
 - a. Where did you speak with him/her?
 - b. How well do outreach workers and health educators understand people in the community?
3. What medical services are available to you?
 - a. Do you access those services?
 - b. What barriers do you face when trying to access health services in your community?
 - c. Do the existing health services address the health issues most important to you?
4. If you do not access typical medical services in the United States, what alternatives do you use, if any?
5. Thinking about work hazards and health, what kinds of information, activities, or services would be most helpful to you or others in your community?
 - a. How should that information be disseminated in the community?

interpretation by project staff, and one conducted in Mixteco by project staff. The focus group facilitators were experienced farmworkers who were bilingual in Spanish and either Mixteco Bajo or Mixteco Alto, dialects of Mixteco. Focus groups interpreters were also bilingual in Spanish and either Mixteco Bajo, Mixteco Alto or Triqui. Although over 60 indigenous languages are spoken in Mexico, the two indigenous languages used in the study (Triqui and Mixteco) are the most common indigenous languages spoken by farmworkers in Oregon. Farmworkers who spoke other indigenous languages were not excluded from recruitment efforts.

The interpretation was simultaneous, using headsets, and allowed the farmworker participants to switch between languages as they felt comfortable. Present at each of the focus groups was a facilitator and a co-facilitator. The facilitator was in charge of asking questions and keeping the participants on track using a semi-structured focus group guide. The focus group guide ensured that the same questions and wording were used consistently in each focus group while allowing for some free-flowing discussion and dialogue. Participant questions that took the group off-topic were addressed at the end of the formal focus group session to maintain the flow of the focus group and to make certain that all questions in the guide were discussed during the 75-min sessions. For example, during the focus group with nursery workers one participant asked for a description of the types of alternative medicine services that were available. The facilitator asked the participant to wait until the end of the focus group discussion to approach the facilitator or co-facilitator with this question.

The co-facilitator observed the dynamics of the participant interaction, assisted the facilitator, and recorded notes and observations. After the focus group the co-facilitator reviewed his or her notes to ensure accuracy and completeness. All six sessions were audio-taped with the verbal consent of each participant. Consent statements were read aloud to individuals in Spanish, Mixteco or Triqui. A brief background questionnaire was administered to obtain demographic data such as age, years of formal education completed, and years lived in Oregon.

Project partners, including the indigenous community educators, recruited farmworkers to participate in the focus groups through presentations at churches, classes, and tenant meetings, and made follow up phone calls and home visits. Home visits and networking with indigenous representatives were effective ways to recruit farmworkers to participate in the focus group discussions. In one focus group where home visits and follow-up visits were completed prior to the meeting, all ten invited farmworkers participated. The focus groups were held at a local health clinic that serves farmworkers, a union hall, and centrally-located community centers. Although the focus groups

frequently lasted more than 1 h, participants often stayed longer to ask the facilitators about health care, farmworker rights, and other issues. When children were present, they were in an adjoining room and toys and materials were available, enabling parents to fully participate in the focus group discussion. A stipend of \$25 to a local grocery store was offered as compensation for participation. In addition, a meal was served before each focus group to serve as an icebreaker.

Four of the six focus group discussions were transcribed and translated by a professional transcription service at Portland State University. The transcribers were fluent in Spanish and English. The indigenous languages were first translated into Spanish with assistance from focus group facilitators who were fluent in Spanish and an indigenous language, then transcribed and translated into English for coding and analysis. The focus group facilitators and co-facilitators reviewed the transcripts for accuracy and, when necessary, provided additional interpretation of those sections of the focus group interviews that were spoken in an indigenous language. Using a focused coding method [27], code categories were created based on the interview items and the broader aims of the research study. The original text segments for each individual code category were grouped across focus groups using ATLAS/ti qualitative software. This technique allowed the researcher to analyze from the same code categories the text segments and any relevant observational notes recorded by the co-facilitator. This process of analyzing and combining code categories helped to reveal relationships between categories and move the analysis beyond a description of single code categories [28].

Themes were created based on statements made by more than one focus group participant, and mentioned in more than one focus group transcript. When focus groups are not videotaped it may be difficult to distinguish among speakers, and to identify whether recurring comments were provided by an individual speaker or by many of the focus group participants. To address this methodological limitation, the focus group co-facilitators recorded observation notes and provided the researchers with information about whether certain participant comments were shared by the majority of participants or expressed by one or two farmworkers. The observation notes provided the researchers with information regarding group dynamics and the specific context or history within which comments were made. For example, the observation notes indicated when the facilitators made a special effort to solicit responses from women and farmworkers who preferred to speak in their indigenous languages. The notes also highlighted instances when the presence of others may have intimidated participants or lessened their full participation. Reviewed in tandem, the observation notes guided the researchers in the analysis of transcripts. This was critical in helping the

researchers name the themes and interpret the participants' responses. The other two focus groups, both conducted with women only, were not transcribed but detailed typed notes were recorded during the focus group discussion by the focus group co-facilitator. The results presented here are based on the analyzed transcripts of the four tape-recorded focus groups, unless otherwise noted.

Shortly after completing the analysis of focus group transcripts, the project partners conducted a forum, or feedback session, to share the focus group data with the community. Community educators invited focus group participants to the forum and arranged transportation for them when it was needed. Farmworkers who had not participated in the focus groups attended this session. To make participation easier, child care and dinner were provided at the event. Conducted in Spanish, with simultaneous Mixteco interpretation, community educators presented the key themes from the focus groups and invited feedback. During this session, community educators also shared information about the project partners and the goals of the project. After an interactive presentation regarding pesticide safety, forum participants divided into small groups and discussed the following: the challenges of indigenous farmworkers in seeking medical care; the most urgent occupational safety and health concerns of indigenous farmworkers; occupational health and safety concerns specifically for indigenous women; the barriers to reporting health and safety concerns; and suggestions from community members about how the project can reach more indigenous workers in Oregon. Results from the small group discussions were shared with the entire group.

Focus Group Results

A total of 52 farmworkers representing a variety of agricultural work, including nursery and cannery workers and pickers, participated in the six focus groups between February and May 2005, with an average of 8 farmworkers per focus group (see Table 3).

The average focus group participant was nearly 34 years old, slightly older than the national average (29 years) of migrant farmworkers [1]. Participants had worked in agriculture in the U.S. on average for 8 years, had lived in Oregon for 8.5 years, had completed 4.67 years of school, and were most likely to report "good" health. Table 4 presents summary demographic information on the focus group participants, presented as averages and frequencies of responses.

The following section describes the focus group results and is organized by the primary overarching themes, which include: (1) farmworkers' experiences of discrimination and disrespect, and (2) occupational health hazards and lack of safety information or equipment.

Experiences of Discrimination and Disrespect

One of the primary recurring themes of the focus groups was that of the farmworkers' feeling disrespected, discriminated against, and disregarded. Discrimination toward the farmworkers by employers and supervisors was mentioned during every focus group. The following quote illustrates the nature of discrimination experienced by the focus group respondents:

You swallow dust and when you speak to [the employer] about it they laugh sometimes, because they are not interested in the law...they're not interested in people's health. What they are interested in is that people work and that they are productive. That's what's important; they're not interested in whether you're tired, if you need water, if you're in the heat or the cold.

While Spanish-speaking farmworkers face many occupational difficulties, it became clear through the focus groups that indigenous-speaking workers face even greater obstacles, due to linguistic and cultural differences. General information, such as that provided by health educators or included in radio broadcasts, was mentioned as being inaccessible, because it is rarely provided in indigenous

Table 3 Description of focus groups ($n = 52$)

Focus group	Date	Types of participants	Language of focus group	Number of participants	Location (City)	Transcribed
1	2/16/05	Nursery workers	Spanish	5	PCUN (Woodburn)	Yes
2	3/17/05	Cannery workers	Spanish	10	Salud Medical Center (Woodburn)	Yes
3	4/4/05	Women only	Spanish	9	Salud Medical Center (Woodburn)	Yes
4	4/27/05	Women only	Trique/Mixteco/Spanish	7	Salud Medical Center (Woodburn)	No
5	5/12/05	Women only	Mixteco/Spanish	9	Oregon Human Development Corporation (Gresham)	No
6	5/21/05	Pickers	Spanish/Mixteco	12	Centro Cultural (Cornelius)	Yes

Table 4 Demographic data for focus group participants ($n = 52$)

Variable	Response
Median age	33.83 (range 17–59)
Gender	
Male	17
Female	35
Primary language	
Spanish	17
Mixteco	25
Tarasco	6
Triqui	4
Type of work ^a	
Cannery	16
Nursery	14
Pickers	15
General agricultural	7
Unknown ^b	4
Average years of agriculture work in US	8.04 (range 1–29)
Average years living in Oregon	8.49 (range 1–29)
Average years of school completed anywhere	4.56 (range 0–14)
Residency status	
Migrant	11
Seasonal	30
Unknown ^b	11
Average number of family members living in the home	5.33 (range 1–12)
Self-reported health status	
Excellent	5
Good	31
Fair	7
Poor	5
Unknown ^b	4

^a “type of work” responses total more than 52 because participants checked more than one response category

^b “unknown” category indicates no response

languages. Similarly, indigenous workers encounter a danger on the job when they do not understand safety information or training. They are not able to ask questions or even explain that they do not understand what is being presented.

When [the employer] provides the information and the people don’t speak Spanish, how are they going to explain to those people that speak a different language...they need [an interpreter]. They [the employers] provide the information in Spanish and they think they all [workers] speak Spanish, and they don’t care if you speak another language.

It was also mentioned that indigenous speakers cannot report injuries or otherwise communicate with supervi-

sors. Participants from every focus group agreed that they felt there were no legal means which could be invoked to protect farmworkers from occupational hazards. In fact, no participant suggested that adequate legal safeguards existed. The common sentiment expressed by the group was summarized by one woman’s response, “For us field workers, there is no protection.” As another worker stated:

When I work and get hurt, I can’t report it because I don’t know who to tell, where to go. When I am sick, I also don’t know where to report it. We don’t speak with [the supervisor] because we don’t know how to speak [in Spanish or English].

Mayordomos, those directly supervising the farmworkers, were mentioned in the focus groups as being the most responsible for repressive and harsh work conditions. Mayordomos are often former farmworkers that have been selected by management to serve as foremen and as a liaison between the workers and the employers. It was explained by one focus group participant that mayordomos earn extra pay based on the amount of work that is completed by his or her crew, which can lead to exploitation and abuse of the workers. Participants alluded to feeling betrayed by the mayordomos (“our own people”), but said they cannot protest, as mayordomos have the power to dismiss them. It was also said that farm and factory owners are sometimes unaware of the abusive conditions in the workplace, as they are usually not present to witness it. Workers reported feeling pressure to work harder than is safe or healthy. As one worker explained:

[The mayordomos] are the ones that demand that you hurry, and if you don’t hurry they will put their finger on you, and they’ll say, ‘Look, you have not been as productive as you should and look at everyone else.’ That is when people are afraid they will lose their jobs due to not obeying.

Additionally, the typed notes from two of the women-only focus groups included repeated mention of being victims of sexual harassment by co-workers and supervisors. These experiences were only discussed in the focus groups with women.

A general lack of occupational autonomy, or decision-making power, appeared to contribute to elevated levels of distress among the workers. For instance, one man working in the cannery was reprimanded for stopping the conveyer belt in an effort to extract a rat from the berries, noting, “I had to let it go”. He later shared that he felt guilty that such actions may jeopardize the general public’s health. One nursery worker went so far as to compare his work atmosphere to slavery:

It's like in the past during the times of slavery, they were pressured with whips and sticks, but today it's not like that...now it's more verbal. 'Hey, hurry up, hey look here, look,' and that's how they force you to work.

Participants talked of the importance of reporting injuries and illness, and that the employers are obligated to send injured workers to get medical care, yet most agreed that reporting rarely happens. Participants acknowledged that they are supposed to report to the mayordomos, but fear of losing their job keeps them from doing so (unless the mayordomo is a good friend or family member). As one woman explained, workers are sometimes fired when they are injured, instead of cared for, which results in hiding or ignoring injuries.

Simply the fact that [an injury] gets reported gives the boss notice, the boss immediately does this: they give you the [last] check and no more work. Why? 'Because I don't need you like that, the way you are injured.' And the boss, as it goes, just washes his hands [of the worker].

Occupational Health Hazards and Lack of Safety Information and Equipment

The second primary recurring theme that surfaced in the analysis of the focus groups was the exposure to numerous occupational hazards and a general lack of safety measures provided to indigenous farmworkers. Participants mentioned suffering from a host of ailments that are potentially related to occupational hazards, including headaches, stomach aches, swollen and achy joints, runny noses and fevers. Two particular types of occupational health exposures were most commonly cited during the focus group transcripts—(1) exposure to pesticides and other hazards, and (2) a lack of adequate training and protection.

Pesticides and Other Occupational Hazards

Fear of the effects of pesticides on the body was expressed in every focus group. Farmworkers discussed health concerns that were specific and general, acute and long-term. A nursery worker talked about a fear of absorbing pesticides through the skin during normal work activities:

One has no idea what could be there [in the fields] because since they fumigate the trees and there could be some chemical, if you cut yourself you can get some pesticide in you or something... So, there you could get sick.

Throughout the focus group discussions, it became evident that most farmworkers acknowledged that pesticides

are harmful. For example, farmworkers talked about becoming sick after they were asked to taste unwashed, pesticide-treated grapes for sweetness before picking. Other workers voiced concerns regarding the effects of chronic pesticide exposure over time, such as developing cancer. However, the need to earn money forces them to work in dangerous conditions, and this imperative frequently supersedes health concerns. As one man explained, 'If (my health) is going to go well, if it's going to go bad, what matters is the money, right?' Another explained:

With time when one works that much with pesticides or fertilizer, it affects us... [but] it's hard to object because of the need that one has to work and be able to earn a little money. I'm not sure what type of sickness may come in the future...it's just the need is what makes us work and earn money.

In addition to pesticides, hazards associated with mechanical equipment and physical hazards, such as lifting heavy objects or equipment, falling from tractors, and slipping on wet floors, were mentioned in three of the focus groups. Nursery workers in particular spoke of heavy lifting as an occupational hazard.

Also repeatedly mentioned during the focus groups was a general lack of sanitation and potable water. Farms are required to provide drinking water, toilets, and hand-washing facilities, but these amenities are often absent. When water is provided, participants mentioned that it is sometimes not potable, yet the workers drink it because they lack other options.

Lack of Adequate Workplace Training and Equipment

In every focus group, workers spoke extensively about inadequate occupational training and equipment. Most participants had received some type of training in their jobs, but they explained that these trainings lacked important information. Participants felt that the absence of training regarding machinery and safety procedures contributed to increased dangers in the workplace.

I work in a nursery [picking pinecones]... I drive machines that are 65 feet high and it's something very dangerous to be up there, and they give us some brief information but it's not enough for anyone...I got hurt.

While the previous participant mentioned receiving some training, other participants spoke of receiving no training at all.

They don't tell me what I have to do, or how I am going to turn the machine off in case of an emergency, they don't say anything.

Participants said that in order to do their jobs, they must “learn by doing” and observe their coworkers. When information is provided, it is often incomplete and is largely limited to what is “convenient” for the employers to share, such as facts that will not frighten the workers. Spanish speakers mentioned the difficulties of understanding training videos and pamphlets that are only provided in English. Similarly, indigenous language speakers noted that they derived no value from videos presented in Spanish. Even if the video is in the worker’s language, the videos are sometimes on the wrong subject altogether. A cannery worker explains:

It would be good if they would show us [videos] about the fruit. They show us videos about meat, milk and all of those products. I mean, why do they show us those videos if everyone is here just for fruit?

In addition, the lack of adequate protective equipment, such as masks, gloves, helmets and coveralls, was discussed in each of the focus groups. According to the farmworkers, protective equipment is only available at “some” worksites. One woman mentioned that she must pay for any gloves or other equipment needed for work. Another woman said she is provided with goggles, but that they fog up and she cannot wear them. Another participant spoke of equipment that was defective or inadequate.

[The employers] do not completely protect the field worker, because [if you] are going to roll up some rope, and your glove rips, well now you have to really take care because it’s been ripped...if they really protected you they would have offered good gloves, not those two dollar gloves that just last a day or so.

By contrast, a few participants offered examples of instances when they did receive satisfactory training and protection. However, this was the minority perspective and infrequently mentioned. The types of information provided included a description of protective clothing, sanitation training, rules against running inside the plant, and other tips on safety in the workplace.

Discussion

Two overarching themes were widely expressed by focus group participants, and these themes corroborated with and added to findings reported in past studies. The first theme was the farmworkers’ experiences of disrespect and discrimination. This finding is similar to Alderete et al. study with male and female Mexican migrant farmworkers in California [25]. In their study, over 50% of the survey participants reported medium to high levels of discrimination, and those respondents who experienced stress due

to discrimination were more at risk for depressive symptoms. In a survey of Northwest farmworkers, 38% reported experiencing discrimination or harassment at work [29], and Austin et al. [20] reported that farmworkers felt an intense pressure to perform quickly in unsafe work conditions for fear of losing their jobs. A qualitative study of orchard workers showed that they also felt disrespected and undervalued by their employers, and some respondents associated this lack of respect with their language skills and low educational levels [21].

Public health and other researchers have studied the negative health effects of discrimination, disrespect, and occupational stress among other populations [30]. One of the earlier studies by Bosma et al. [31] examined the association between job stress, job control, reward imbalance and the risk of coronary heart disease. In this study of 6,895 male and 3,413 female British workers, the researchers found that work-related hostility, lack of job control, and other job strains were associated with elevated risk of new coronary heart disease. A more recent ethnographic study of farmworkers in Washington state conducted by Holmes [32] describes an ethnic hierarchy, which places white and Asian American U.S. citizens at the top of the hierarchy, followed by Latino U.S. citizens, undocumented Latinos and finally indigenous Mexicans at the bottom of the hierarchy. The groups closer to the bottom of the hierarchy were given substandard housing, more stressful, dangerous, and physically demanding work with stricter deadlines, poorer treatment from supervisors and greater exposure to extreme weather and pesticides. The indigenous workers experienced a disproportionately higher number of health problems because of these conditions. The study presented here has the potential to add an important dimension to the study of job stress and health outcomes by examining “double discrimination” by both the majority population and Latino supervisors among an underrepresented and understudied community of indigenous farmworkers in Oregon.

The second theme uncovered in the focus groups was the general lack of basic occupational health and safety information and equipment. This finding was similar to results from a cross-sectional survey conducted with migrant farm workers in Florida and Illinois. In this study, respondents reported limited provision of personal protective equipment; only 39% were provided with gloves and only 60% reported having access to toilet facilities and water for hand-washing [18]. Similarly, Salazar et al. [21] noted that very few employers provided equipment such as gloves and goggles for the orchard workers in their study. An analysis of in-depth interviews with farmworkers indicated that most workers felt that basic safety and sanitation facilities were substandard and not always available to them [19].

One probable explanation for this lack of occupational safety information and knowledge is that much of the information provided is in the wrong language or focused on the wrong crop. For example, interviews with adolescent farmworkers in Oregon revealed that even when pesticide training was provided it was not always comprehensible to workers. Workers were afraid to ask questions about the information presented and to report unsafe conditions [33]. Even when pesticides training is provided, some studies suggest that farmworkers may not take steps to protect themselves because they are not provided with the conditions—such as access to water and laundry facilities—supportive of safe practice [34]. The focus group results presented here suggest that linguistically-appropriate occupational safety information is a good first step toward protecting the farmworkers, but this information must be accompanied by suitable protective equipment and supportive working conditions.

Project Next Steps

Taken in sum, the analogous results of this study to past studies provide clear evidence of need for the types of activities implemented in this project. In response to farmworkers' expressed concerns, we are recruiting *promotores/as* or community health workers from the indigenous community to bring information about workplace safety and services to indigenous workers in labor camps, churches and other community gathering places. Additionally, the project is working on increasing awareness among medical providers, regulating agencies, and employers that indigenous languages are not simply a variation of Spanish, but are unique and diverse languages. Toward this end, project staff has developed cassettes, CDs, radio announcements, and other educational materials in indigenous languages. To help bridge the linguistic and cultural gap in health care and social services, two project partners hired bilingual community educators and interpreters. PCUN hired an indigenous community educator, a former farmworker who has been working with members of the union and who speaks Spanish and Mixteco, and Salud Medical Center hired a bilingual (Mixteco-Spanish) interpreter and community patient advocate and two trilingual receptionists who speak Mixteco, Spanish, and English. Finally, participants requested information about what to do when they are underpaid for completed labor, how to report an incident of being forced to work in a freshly-sprayed field, and how to respond if the employer does not allow a sick employee to go home. Project partners write and air radio shows and announcements in indigenous languages, and use interactive presentations to address these workers' rights issues

Limitations

There are several potential limitations to the data presented. First, the data are based on six focus group interviews with indigenous farmworkers. This qualitative method has been criticized for its potential subjectivity and lack of precision. To counter this limitation, the project was careful to follow rigorous data collection, analysis, and interpretation methodology, recorded detailed observation notes, and worked with all project partners to interpret the focus group transcripts and develop themes. Additionally, the themes presented here were consistent and recurring across all focus groups, suggesting that these are widely held viewpoints based on shared experiences. Whether the indigenous workers discussed their employment as fieldworkers, cannery workers, or nursery workers, their statements reflected the same basic themes.

A second limitation inherent to a case study is the lack of generalizability to other indigenous farmworkers who live outside of Oregon or work in different crops or industries. It is also possible, because data are drawn from a small group of individuals and because the farmworkers were responding to a particular set of interview questions, that certain types of information are omitted. For example, we did not ask explicitly about their experiences working in agricultural settings in other areas of the United States, or in their home states of Mexico or Guatemala. Additionally, the focus groups were conducted in the winter and early spring of 2005. Due to the timing of the focus groups, many participants were living in the area year round ("seasonal" farmworkers) and we were less able to recruit migrant farmworkers who move between states and are more transient. Finally, the focus groups were conducted in two of the most commonly spoken indigenous languages in Oregon (Mixteco and Triqui) and Spanish, and may have excluded other farmworkers who speak one of the other indigenous languages. Conducting additional studies of indigenous workers, employed in agriculture in other parts of the United States, would contribute to a better understanding of this population and assist in determining whether the experiences recounted by those working in Oregon are shared by workers in other regions.

Despite these limitations, qualitative interview data are particularly useful when researchers are conducting formative research to obtain a detailed contextual view of factors that are not easily measured with numbers alone [35, 36]. The focus group data presented here is the first of several types of data collected in this project. For example, the qualitative focus group results were used to inform the content and wording of the project's quantitative baseline survey, which was used to gather occupational and health data from 150 migrant and seasonal farmworkers in Oregon. During the administration of the baseline survey, we

intentionally oversampled migrant workers who may be more transient and more likely to live in labor camps in an effort to complement the information obtained using focus groups. Using data triangulation methods, the next steps in data analysis will be to compare results from the quantitative survey to the focus group results to look for agreement and dissimilarities. We will repeat the focus group and quantitative survey data collection strategies in the final year of the project to test for changes that may be attributable to the project intervention.

Conclusion

In focus group interviews with indigenous farmworkers in Oregon, two common themes emerged: workers were facing unsafe working conditions, based in part on the unavailability of safety information and equipment and language barriers; and workers experienced discrimination on the job, due primarily to their language and cultural differences. During the next 2 years, this project will promote leadership among indigenous farmworkers by directly involving the farmworkers as leaders and *promotores/as*, develop and disseminate education materials identified as effective by the communities, and advocate for healthier occupational environments and practices. It is evident that given the rapidly changing demographics of the agricultural workforce, there is a strong need for culturally and linguistically appropriate services and materials for indigenous farmworkers. Finally, project partners want to underscore the importance of collaborative research partnerships between academic researchers, advocates, health care providers and community members and the necessity of having a strong community voice in directing project activities so that a healthier work and community environment may be achieved.

Acknowledgments This research was supported by a grant from the National Institute for Occupational Safety and Health (Grant #R25-OH008334-01). Special thanks to Sue Plaster and Maria Cortes del Rojas with Salud Medical Center in Woodburn, Oregon for their feedback on earlier drafts of this manuscript.

References

1. U.S. Department of Labor: Findings from the National Agricultural Workers Survey (NAWS) 2001–2002: a demographic and employment profile of United States farm workers. Washington, DC: U.S. Department of Labor, Office of the Assistant Secretary for Policy, Office of Programmatic Policy; 2005.
2. U.S. Commission on Agricultural Workers: Report of the commission of agricultural workers. Washington, DC: US Government Printing Office; 1992.
3. Stephen L. Globalization, the state, and the creation of flexible indigenous workers: Mixtec farmworkers in Oregon. *Urban Anthropol Stud Cult Syst World Econ Dev* 2001;30:189–214.
4. Larson A. Migrant and seasonal farmworker enumeration profiles study: Oregon. Portland (OR): Department of Human Services Migrant Health Office; 2002.
5. McCauley L. Work characteristics, pesticide exposures among migrant agricultural families: a community-based research approach. *Environ Health Perspect* 2001;109(5):533–8.
6. McCauley L, Stickler D, Bryan C, Lasarev MR, Scherer JA. Pesticide knowledge and risk perception among adolescent Latino farmworkers. *J Agric Saf Health* 2002;8(4):397–409.
7. Stephen L. Mixtec farmworkers in Oregon: linking labor and ethnicity through farmworker unions and hometown associations. In: Fox J, Rivera-Salgado G, editors. *Indigenous Mexican Migrants in the United States*. Center for U.S.-Mexican Studies, Center for Comparative Immigration Studies. San Diego: University of California; 2004. p. 179–202.
8. Oregon State Department of Consumer and Business Services (DCBS) Report Catalog [database on the Internet]. Salem (OR): Oregon State DCBS. C2006—[cited 2006 Feb 14]. Available from: <http://www.4.cbs.state.or.us/ex/imd/reports/rpt/index.cfm>.
9. National Safety Council: Injury Facts (2005–2006 Edition). Itasca, IL: NSC Press; 2006.
10. Bureau of Labor Statistics. National census of fatal occupational injuries in 2001. Accessed June 19th, 1006 at <http://www.bls.gov/iif/oshwc/foi/cfr0008.pdf>.
11. Reeves M, Schafer KS. Greater risks, fewer rights: U.S. farmworkers and pesticides. *Int J Occup Environ Health* 2003;9:30–9.
12. Villarejo D, Baron S. The occupational health status of hired farm workers. *Occup Med* 1999;14(3):613–35.
13. Arcury TA, Quandt SA. Occupational and environmental health risks in farm labor. *Hum Organ* 1998;57:331–4.
14. Reigart R, Robert J. Recognition, management of pesticide poisonings. 5th ed. Washington DC.: U.S. Environmental Protection Agency; 1999.
15. Zahm SH, Blair A. Cancer among migrant and seasonal farmworkers: an epidemiologic review and research agenda. *Am J Ind Med* 1993;24:753–66.
16. Mills PK, Kwong S. Cancer incidence in the United Farm Workers of America (UFW):1987–1997. *Am J Ind Med* 2001;40:596–603.
17. Thompson B, Coronado GD, Grossman JE, Puschel K, Solomon CC, Islas I, Curl CL, Shirai JH, Kissel JC, Fenske RA. Pesticide take-home pathway among children of agricultural workers. *Stud Design Method Baseline Find* 2003;45:42–53.
18. Cameron L, Lalich N, Bauer S, Booker V, Bogue HO, Samuels S, Steege AL. Occupational health survey of farm workers by camp health aides. *J Agric Saf Health* 2006;12(2):139–53.
19. Arcury TA, Quandt SA, Cravey AJ, Elmore RC, Russell GB. Farmworker reports of pesticide safety and sanitation in the work environment. *Am J Ind Med* 2001;39:487–98.
20. Austin C, Arcury TA, Quandt SA, Preisser JS, Saavedra RM, Cabrera LF. Training farmworkers about pesticide safety: issues of control. *J Health Care Poor Underserved* 2001; 12(2):236–49.
21. Salazar MK, Keifer M, Negrete M, Estrada F, Synder K. Occupational risk among orchard workers. *Fam Community Health* 2005;28(3):239–252.
22. Strong LL, Thompson B, Coronado GD, Griffith WC, Vigoren EM, Islas I. Health symptoms and exposure to organophosphate pesticides in farmworkers. *Am J Ind Med* 2004;46:599–606.
23. Williams DR, Neighbors HW, Jackson JS. Racial/ethnic discrimination and health: findings from community studies. *Am J Public Health* 2003;93:200–8.
24. Krieger N. Discrimination and health. In: Berkman L, Kawachi I, editors. *Social epidemiology*. Oxford: Oxford University Press; 2000. p. 36–75.

25. Alderete E, Vega WA, Kolody B, Aguilar-Gaxiola S. Depressive symptomatology: prevalence and psychosocial risk factors among Mexican American migrant farmworkers in California. *J Community Psychol* 1999;27(4):457–71.
26. Israel B, Schulz A, Parker E, Becker A. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health* 1998;19:173–202.
27. Strauss A, Corbin J. *Basics of qualitative research: grounded theory procedures, techniques*. Newbury Park CA: Sage Publications; 1990.
28. Dye JF, Schatz IM, Rosenberg BA, Coleman ST: Constant comparison method: a kaleidoscope of data. *The Qualitative Report* [On-line serial] 2000; 4(1/2). (Accessed at <http://www.nova.edu/ssss/QR/QR4-1/dye.html>).
29. Northwest Federation of Community Organizations. *In our Own Words: Immigrants' Experiences in the Northwest*; 2006.
30. Murray LR. Sick and tired of being sick and tired: scientific evidence, methods, and research implications for racial and ethnic disparities in occupational health. *Am J Public Health* 2003;93(2):221–6.
31. Bosma H, Peter R, Siegrist J, Marmot M. Two alternative job stress models and the risk of coronary heart disease. *Am J Public Health* 1998;88(1):68–74.
32. Holmes SM. An ethnographic study of the social context of migrant health in the United States. *Plos Medicine* 2006;3(10):1776–93.
33. Salazar MK, Napolitano M, Scherer JA, McCauley L. Hispanic Adolescent farmworkers' perceptions associated with pesticide exposure. *West J Nurs Res* 2004;26(2):146–66.
34. Arcury TA, Quandt SA, Russell GB. Pesticide safety among farmworkers: Perceived risk and perceived control as factors reflecting environmental justice. *Environ Health Perspect* 2002;110(S2):233–40.
35. Yin R. *Case-study research: design and methods*. 2nd ed. Beverly Hills, CA: Sage Publications; 1994.
36. Denzin NK, Lincoln YS. *Strategies of qualitative inquiry*. Thousand Oaks, CA: Sage; 1998.