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LESSONS LEARNED FROM A COMMUNITY COALITION WITH DIVERSE STAKEHOLDERS: THE PARTNERSHIP FOR CITRUS WORKER HEALTH

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The Partnership for Citrus Worker Health is a coalition formed by researchers at the University of South Florida Prevention Research Center and the Farm Worker Association of Florida. With the help of a community advisory board composed of agricultural laborers, public health professionals and agricultural employers, the project conducted research and designed an intervention that focused on eye safety among citrus harvesters. This case study demonstrates the successful use of a variety of participatory techniques and approaches, including social marketing, focus group research, community health workers, and quantitative measures of behavior change. The case also demonstrates how diverse stakeholders, including the researchers, the community advisory board and the target audience, collaborated to define problems and adopt solutions that make the agricultural workplace safer and improve conditions in the community. However, the way in which agricultural production utilizes migrant labor ultimately sets limits to the success of such collaborative approaches. [crops, agricultural, agricultural workers, occupational health]

The Florida Prevention Research Center (FPRC) is funded by the Centers for Disease Control and Prevention (CDC) with a primary goal of testing an approach to behavior change at the community level. This approach combines the toolbox of social marketing in partnership with community members who help university faculty prioritize local health issues, assist in data collection and analysis, and participate in the design, implementation, and evaluation of programs to improve health and safety. Known as Community-Based Prevention Marketing (CBPM), this approach is conceptualized in a nine-step planning process (Bryant et al. 2009). In 2001, the FPRC partnered with the Farmworker Association of Florida (FWAF) in their Immokalee office in southwest Florida to test the efficacy of the nine-step planning framework of CBPM in a unique community setting of migrant farmworkers. The nine steps are:

Mobilize the Community
Develop Community Profile
Select the Target Behaviors, Audiences, and Interventions
Build Community Capacity
Formative Research
Strategy Development for Designing/Tailoring the Intervention

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Program Development
Program Implementation
Tracking and Evaluation

The project came to be known as the Partnership for Citrus Worker Health (PCWH) and it successfully influenced adoption of eye safety protection among citrus harvesters (Monaghan et al. 2008). The project combined several approaches to be successful, including community-based participatory research, social marketing, and community health workers, also known as *promotores de salud.* The academic researchers were guided throughout the process by a community advisory board, the workers themselves and their employers. The process for identifying eye injuries as a priority, researching the causes and solutions, and finally designing and evaluating an intervention, took several years and a circuitous route; there were many spin-off projects, dead end investigations, and lessons learned. For example, the project staff has tried, unsuccessfully, to recruit many citrus companies to participate, yet the eye safety program has not become institutionalized even within a small part of the Florida citrus industry. Nevertheless, the PCWH demonstrated that community collaboration projects that include university researchers, service providers, immigrant communities and agricultural employers, can influence the adoption of occupational safety measures (Monaghan et al. 2008).

The diverse coalition that involves workers and employers in agriculture faces unique challenges, including language and cultural barriers and conflicting agendas. Many of these challenges are evident immediately and they can hinder the start-up and organization of diverse community coalitions. The structural limits to improving the quality of life and conditions of agricultural work reveal themselves more slowly. A major source of risk and injury in U.S. agriculture can be traced back to the effects of worker immigration status, the piece-rate pay structure for harvesting fruits and vegetables and the crew leader system (Rothenberg 1998; Zabin 1997). These characteristics lead to employment that is "precarious" in the sense that it is unstable, unregulated, and subject to informal structures outside of workers' control (Benach et al. 2010). These factors make it difficult to design appropriate interventions for farmworkers and even more difficult to measure their effectiveness. Although the PCWH made a contribution to the body of knowledge in the fields of farmworker safety and health, social marketing and community health workers, the most significant achievement was that it demonstrated the workplace could be made safer through the efforts of a community coalition.

BACKGROUND AND SETTING

The PCWH was originally organized by faculty from the College of Public Health at the University of South Florida and the Farmworker Association of Florida (FWAF), the state's oldest and largest member-based advocacy organization devoted to farm labor issues. The PCWH was not the first university–community partnership to use social marketing to address farmworker safety nor was it the first to experiment with community health workers in an occupational setting (Flocks et al. 2001; Forst et al. 2004). Before the PCWH, the same university researchers had previously partnered with the FWAF

to develop an intervention in central Florida that utilized all the steps of community based social marketing to reduce farmworker exposure to pesticides. Over several years, the academic researchers and farmworker advocates had built a trusting relationship as partners working together on federally funded health research (Flocks et al. 2007).

The first collaboration between the partners had focused on the risks of pesticide exposure associated with production of greenhouse and nursery crops in north central Florida (Flocks et al. 2001). Immokalee, in southwest Florida, was chosen as a second site primarily to focus on the health and safety problems of citrus workers. The FWAF had two organizers in their office in Immokalee and a cadre of local volunteers, but once the project began to work directly with citrus harvesters, the researchers had to go where the harvesters lived and worked. Although several of the independent harvesting crews resided in Immokalee, a majority of harvesters were scattered in migrant labor camps and small towns such as LaBelle and Clewiston, located within a 50-mile radius of the project headquarters. Focusing on an occupational group (citrus workers) made this a regional project headquartered in Immokalee.

Immokalee ("My Home" in the Seminole language) is a rural agricultural community of 19,786 permanent residents living at the edge of highly urbanized Collier County, Florida. Immokalee is surrounded by cattle ranches, citrus groves and vegetable farms and has a large rental housing market of camps and trailer parks for agricultural laborers. During the harvest seasons for citrus and vegetables, this unincorporated town receives an estimated 20,000 migrant workers, many of them from Mexico and Central America. Even though Immokalee only counts for eight percent of the total population of Collier County, 36 percent of the substandard housing in the county is found there. Naples, the county seat of Collier County has a per capita income of $61,141, while Immokalee, 45 miles away, has a per capita income of $8,576. Among the residents of Immokalee, almost 40 percent fall below the poverty line (U.S. Census Bureau 2000).

Immokalee is known as the winter vegetable capital of the United States and is a major producer of tomatoes, cucumbers, green peppers, and watermelons. There are also more than 31,000 acres of citrus surrounding Immokalee in Collier and nearby Hendry County. Agricultural labor has shaped Immokalee into an ethnically diverse community compared with the rest of Collier County; according to the most recent census data available, 71 percent is Hispanic (primarily Mexican but also from Central America), 18 percent is Black (incl. Haitian and African American), and 6.3 percent is White non-Hispanic. A full 78 percent of permanent residents do not use English as their primary language, and over 37 percent were not U.S. citizens. Service providers informed us that there are numerous indigenous people from Mexico and Central America who only speak Spanish as a second language. Only 24 percent of the adult population has a high school diploma, compared with 80 percent for the United States as a whole (U.S. Census Bureau 2000).

The poverty, lack of infrastructure and seasonal influx of workers cause a host of problems in Immokalee and the PCWH advisory board had to choose just one to focus their efforts. Even though it represents such a small proportion of the county population, Immokalee accounts for 40 percent of HIV/AIDS cases, and has an infant mortality rate

that is almost twice that of the rest of the county (Collier County Health Department 2011). Primary and preventive health care services are limited to the Immokalee Branch of the Collier County Health Department and a single migrant health clinic. Many people in the area only use emergency health services; however, the nearest emergency room is 30 miles away in Lehigh Acres.

The worst effects of poverty in Immokalee are experienced by children: more than 90 percent of schoolchildren are considered economically needy and qualify for free or reduced lunch programs. A report by the Immokalee Foundation found that 35 percent of children lacked health insurance and more than 50 percent do not receive preventative medical care (Pemberton and Dow 2006). Approximately 30 percent of elementary and middle school students are overweight. The report found that the school system in Immokalee is inadequate for the needs of the community. At least 50 percent of the children needing early learning opportunities do not receive them and the waiting list for these programs is one to two years. Fewer than 20 percent of eligible children participate in after-school support programs. By the third grade, a majority of students cannot read at grade level (Pemberton and Dow 2006).

Many of the social and environmental problems in Immokalee originate from its role in the agricultural industry of Florida and the diverse immigrant groups that pass through or eventually settle there. It is an unincorporated town with a low tax base. Year-round residents have to contend with poor services, inadequate housing, and a low performing school system. Many of the jobs available in the agricultural sector, not just harvesting, are low skilled and low paying. The social and ethnic groups in Immokalee have differences in language, occupations, and health priorities. Our research with the permanent Haitian population of Immokalee, for example, found they were mostly employed in the local packing houses and or they commuted to work in the service industries in nearby Naples and Ft. Myers; their priority health issues are chronic disease such as hypertension and diabetes. The temporary residents that pass through Immokalee following the harvest of seasonal crops are primarily young Hispanic males that have fewer health problems but are exposed to risks at work and in the community. Because of the conditions of migrant life and the fact that they are living apart from their families and home communities, they are at risk for drug addiction, alcoholism, sexually transmitted diseases, and HIV. They face discrimination in rental housing and harassment from the police; many are under the constant threat of being arrested and deported because they lack legal documentation.

ESTABLISHING THE PCWH COMMUNITY ADVISORY BOARD

Recruitment for the advisory board by the academic team and the FWAF began in 2001. The team from the University of South Florida met with and made presentations to citrus growers associations, public health and service providers and faith based institutions. The Farmworker Association recruited among their constituent base in the migrant labor camps. They also organized initial focus groups to begin exploring possible issues to focus on for the social marketing intervention. Despite lobbying from the university faculty, the powerful citrus growers association declined to participate; their board did

not feel the project represented the interests of their organization as a group. However, several individual labor supervisors did participate in the early meetings of the advisory board and offered their input into the risks and issues of citrus work. Their insights into what would be feasible given the structures of citrus production and harvesting were invaluable. One labor supervisor in particular helped the PCWH to establish a pilot project in the groves of one of the largest growers in the state and he provided open access to their labor camp and workers. In the end, this participation by a few individual companies was crucial to the success of the final program.

Participation by the citrus companies came at a cost, however. Those that represented the citrus industry were adamant about not attempting to conduct research into pesticide related issues. The position of the citrus growers was that the pesticides used in citrus production had minimal risk compared to those in vegetables and it was clearly an issue that got disproportionate and negative attention. Because citrus companies had recurring issues with harvesters suffering eye injuries and had been unsuccessful at implementing safety glasses programs, their representatives on the board steered the topic toward the issue of eye safety. The university faculty and members of FWAF had discussions about the trade-off of participation by the citrus industry and the focus for the first social marketing campaign. The final decision on which topic to choose for an intervention, however, would rest with the advisory board; neither the Farmworker Association staff nor the university researchers would have a vote. Although the FWAF had a long history of working on pesticide issues, they accepted the fact that the citrus industry could only participate in the collaboration if it was a safety or community issue (such as worker housing) that benefitted them. The trade-off was that the FWAF could establish a working relationship with growers and work on an issue that would still have a positive outcome for laborers. Among the other reasons for keeping the citrus industry involved was that there were many safety issues besides pesticides that were still relevant to workers and the development of a successful intervention could lead to further cooperation on these issues in the future. In the end, it was the advisory board members that chose the topic that would be addressed.

The board held its first meeting in October 2001 at Our Lady of Guadalupe Catholic Church. Those who attended that first meeting represented the Immokalee office of the Collier County Health Department, the homeless shelter, the primary care clinic, and the local agricultural experiment station. There were ten current or former agricultural workers in attendance and a local Catholic priest. For the first meeting, there were no representatives of citrus companies or any local Haitians, but this would change by the second meeting. After a meal of Mexican food, the principal investigator from the university and the executive director of the Farmworker Association explained how the project would be structured. They told the attendees that they had received five years of funding from the Centers for Disease Control and Prevention to create a Prevention Research Center at USF and establish pilot projects that would utilize the nine steps of Community Based Prevention Marketing (Bryant et al. 2009). The attendees were asked to form an advisory board that would prioritize issues, help conduct research and assist in the design of an intervention.

The participants had a lively discussion about issues in Immokalee, but one topic that came up immediately was what incentive could be provided to workers to attend the board meetings. For the service providers in the audience, the time spent on the PCWH community advisory board was seen as part of their work, while agricultural laborers had to volunteer their time after a long day in the fields. Even the day of the week and the time for the next meeting got lots of discussion; workers don't get back from the fields until well after dark and wanted to go home first and get ready before coming to a public meeting. Many of the professionals in the audience didn't live in Immokalee and they wanted to meet earlier to make the commute home before it got too late. The different languages spoken by the group (English, Spanish, and Haitian Creole) were another problem during the meetings and with only volunteers helping with the translation, it made for slow progress.

By the third meeting, the location was changed to the offices of the Farmworker Association and that's where most of them occurred for the duration of the project. The industry representatives did not seem to have a problem with going to the headquarters of a group they had opposed on many issues, and workers were comfortable in the storefront office. The meetings always began with a meal and there was usually a lot of social interaction among the participants, many of whom had never talked with one another before. It was this social interaction that led to networking and spin-off projects between members of the advisory board. (See Figure 1.) For example, the health department would have a need to reach workers to encourage them to get tested for STDs and the organizers from the FWAF would accompany them into the camps and help arrange meetings. By the third meeting, the group had begun analysis using the "Problem Tree" method (Slocum et al. 1995). Problems were analyzed for their root causes and possible solutions were discussed. The problems had been narrowed down to six priorities: housing, HIV/AIDS, hypertension/diabetes (chronic diseases common among the local ethnic groups), pesticides, injuries caused by the equipment used in citrus harvesting (ladders and picking bags), and eye safety among citrus harvesters.

Over a period of seven months, the board met five times to research, discuss, and finally vote on an issue for the intervention. Each meeting would have a few new members, but there was a consistent core group of health department employees, labor supervisors and citrus workers. There was also a core group of workers that were members of the Farmworker Association. By the fifth meeting, there were 16 regular members: eight were Hispanic agricultural workers, two were health care providers, one was a researcher at the agricultural experiment station, one was a representative of the citrus industry, one was a Catholic priest, and three were young Haitian college students from Immokalee. The participants had not yet chosen a name or a logo for the project, but they had discussed many of the issues faced by agricultural workers living Immokalee and were ready for a vote. The method used was a hybrid of voting and use of a consensus technique called "Fist-to-Five" (Free Child Project n.d.). This allowed the members to have a forum for discussion and also a way to measure numerically how they wanted to proceed. Each of the 16 advisory board members was given a chance to vote on each issue in the following way:

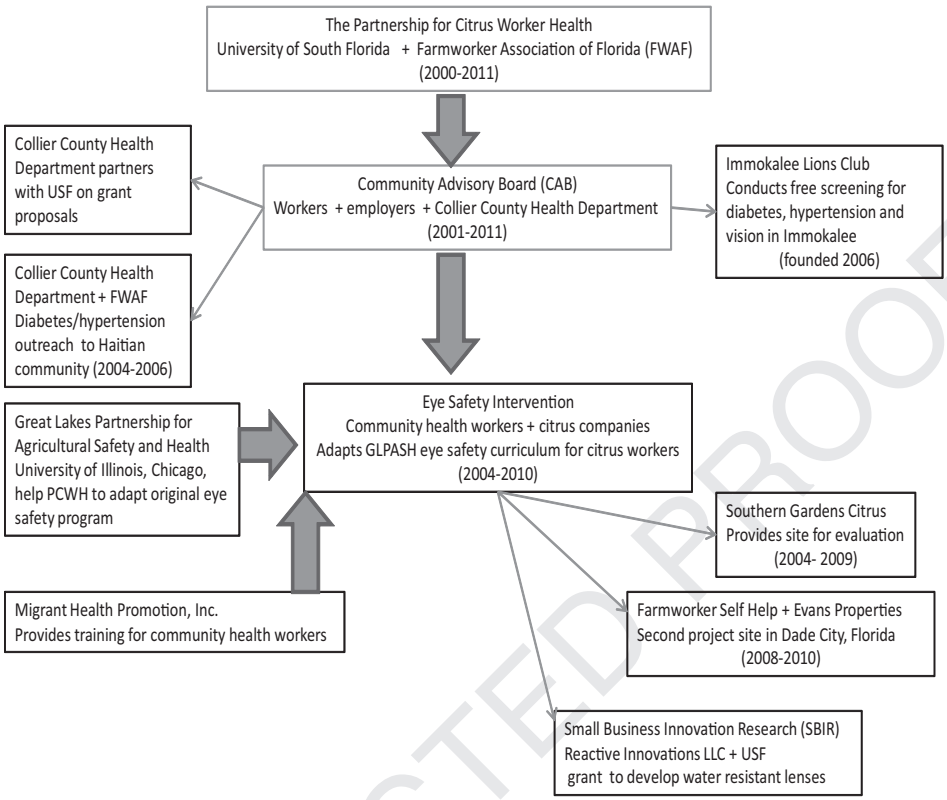

FIGURE 1. Partnerships and outcomes as a result of a community coalition.

Five fingers meant full support of the issue and that the member would be a leader for it.
Four fingers meant they considered it a good idea and would work on it with the others.
Three fingers meant not total agreement but would let it pass without further discussion.
Two fingers meant the member was comfortable with the choice but had some minor issues.
One finger meant the member wanted more discussion of that topic.
A closed fist meant they would actively oppose that choice.

After the first round of voting, the following topics received the most votes of "five fingers" and most overall votes: pesticides, picking equipment and eye safety. It was noted that while pesticides did receive votes of complete opposition by the industry representatives, the choice was not automatically eliminated. Instead, more discussion ensued and then a second vote was taken on just these three topics. After the second vote was counted up, eye safety was the largest vote getter, but more importantly, it received twice as many votes of "five" than the other two topics. The members were satisfied that they had achieved consensus and could all support the main topic even though some of their other priority areas had not been chosen.

This was a good compromise for some of the stakeholder groups but others would be left out from this choice. The FWAF could conduct research on a safety topic that directly affected their members who worked in citrus. The citrus companies could get

help with a problem that had real costs for them and that did not have the controversy associated with pesticides. However, the Haitians on the board had hoped that an issue that was a priority in their community (HIV/AIDS) would be chosen and they had voted as block for that choice. There were few Haitians in Immokalee that still picked citrus and so job safety in that industry was a low priority for them. The health department, which focused on housing inspections and chronic disease, would have benefitted more from one of those choices, but they strongly supported eye safety when it came up for the second vote. Later on in the project, members of the board would work together in an attempt to address the issues of chronic disease in the community and specific outreach with Haitians was implemented. (See Figure 1.) At the end of the fifth meeting the group had reached a consensus and it was now time for the university researchers to begin conducting the formative research that would lead to a social marketing campaign.

FORMATIVE RESEARCH INTO EYE INJURIES AMONG CITRUS WORKERS

After the board had chosen to focus on eye injuries, formative research began to gain an understanding of the factors that contribute to eye injuries; factors that influence safety eyewear use; and workers' willingness to seek treatment for injuries. Data collection included a literature review, brief interviews with a convenience sample of 58 citrus harvesters waiting in line for immigration services, ten interviews with key informants in the citrus industry, eight focus groups conducted in workers' homes with 50 citrus harvesters participating, and field observations made while working side-by-side with harvesters in orange groves. Interview questions were developed and pilot-tested by an anthropologist and bilingual interviewers from the community were hired and trained. Intercept interviews and focus groups were conducted in Spanish with the interviewer taking notes. Focus groups were tape recorded, transcribed, and translated by graduate assistants. Results were analyzed to identify perceived costs and benefits of safety glass use and other factors that must be addressed to market their use among workers. Citrus employers also were interviewed to understand their experience with eye injuries and their efforts to promote protective eyewear use by their employees.

In citrus harvesting, eye injuries result from penetrating and blunt trauma caused by branches; chemical burns from pesticides; infection, allergy, and irritation caused by foreign bodies from dust, debris, and particulates; and cataracts and pterygium caused by exposure to the UV light of the sun. Harvesting of citrus fruit is particularly hazardous because workers pick from a ladder placed within the tree canopy. Although data on occupational injuries among citrus workers has not been published, all of the citrus company managers we interviewed in Florida reported eye injuries as the most common ones experienced by their employees. Studies of serious occupational eye injuries have demonstrated that safety glasses would have prevented the majority of injuries; however, worker acceptance is a key element in any program that depends on safety eyewear (Quandt et al. 2008).

Citrus harvesting is done by crews of 15 to 40 pickers working for a crew leader (known by the name of the truck he drives in the fields, he is called a *chivero* or goat driver).

The crew leader transports the crews to distant and isolated orange groves at sunrise and they begin harvesting immediately to take advantage of the cooler temperatures of the morning. If the trees are wet from rain the night before, some workers may wait for the groves to dry off, but most get right to work and their clothes quickly become soaking wet. Each worker picks at his own pace, moving his ladder around each tree until it is completely clean of fruit and then moving to the next tree. The harvester places the fruit in a canvas bag slung over one shoulder. When the bag is full (weighing 60–90 lbs) the worker empties the citrus into a large tub *(baño)* that usually holds 900 pounds.

Workers are largely unsupervised during the day except for when the crew leader periodically drives by to transfer the oranges from the tub to a tractor trailer. Using a hydraulic lift, the driver picks up the full tubs, empties them into his truck, and credits the worker for payment by either using a paper receipt or by touch screen computer that provides data to the front office. The crew leader is paid a percentage of the total weight of the oranges picked by his crew that day. Workers' productivity varies greatly depending on the condition of the groves, the amount of easily picked fruit, and individual capabilities. Even to make the minimum hourly wage guaranteed by law, harvesters must net several tons of fruit per day. Workers picking under ideal conditions often filled six to 12 of the 900-pound baños in a long day.

The initial focus groups, surveys, and observations pointed to three general factors that influenced injuries and behavior: the environmental conditions, the structure of work, and the social environment (such things as immigration status and language barriers) of harvesters. There was some overlapping of these different categories in the way they affected eye injuries, treatment, and prevention. The physical environment of the groves increased risks and created high barriers to prevention. The groves are large and distant from residences and workers are not closely supervised during the day. Weather and seasonal changes bring new risks such as dust, rain, insects, and intense UV rays. The quality of the trees and the maintenance of the groves vary widely from one grove to the next. The humid environment plays a large role in the feasibility of using safety eyewear. Focus group participants feared that distorted vision owing to fogging safety glasses presented a potential danger when working on the tall ladders.

The structure of work also influenced the risk of injury. The fact that workers are paid by the piece, rather than by the hour, is a disincentive for working slowly and for taking time to address more minor injuries. The tools, techniques and biomechanics of citrus picking, including the heavy bag and the ladder, make balance difficult. The organization of work by crews contributes to an atmosphere of working as fast as possible and not stopping for safety measures or properly treating an injury. Most workers believed that if they were to be paid an hourly wage instead of a piece-rate, eye injuries would decrease. Crew leaders were seen to have a key role in determining how injured workers were treated. Interviews with company managers and observation in the fields presented cases where crew leaders were the ones responsible for not reporting injuries to the company and delaying treatment. Agricultural workers are less likely to have adequate training because of the seasonal nature of their work and language barriers.

The social environment in general also determined whether workers sought health care because of such factors as transportation to clinics and fear of being undocumented. Other contributing factors to the poor health outcomes of migrant workers included low educational and health literacy levels, and language and cultural barriers. Because their income is generally below the poverty line, they are less likely to be able to afford to buy or replace safety glasses. Finally, the social environment included cultural barriers and unfamiliarity with the use of safety glasses, the perception that they are not at risk and the amount of discomfort that they are willing to suffer.

Focus group research indicated that while many workers had experienced an eye injury, most often they did not consider it serious enough to seek treatment. Foreign objects (e.g., dust, dirt, mold, mildew and residues from the leaves) lodged in the eye were the most common complaint, with nearly all interviewees suffering from this at one time or another. Many participants had suffered from abrasions to the eyes from branches and leaves as well. They often did not seek medical treatment and used self-treatments and took time off from work. Rarely did anyone in the focus groups or surveys ever respond that they had tried to wear safety glasses while picking but they acknowledged that some employers had encouraged this. The use of glasses was most often associated with a prescription to do so following an eye injury and a visit to the clinic.

Employer surveys in the area confirmed that eye injuries were often the most common injury reported by citrus companies. Several of the largest employers in the region had purchased various styles of commercial safety glasses to distribute to their employees. No employer contacted had been able to convince even a small number of employees to use safety eyewear while picking and with no system in place to require their use, the workers often misplaced the glasses within a few days. Because of the structure of piece rate work in the industry, companies were unlikely to switch to an hourly rate of pay so that workers would pick more carefully. Many of the risks for eye injuries are inherent in orchard work and the environmental conditions anyway. Although safety glasses are the easiest way to reduce eye injuries in the orange groves, they still had many barriers to acceptance.

The main reason that workers gave for not wanting to wear the glasses was that they would be expected to fog up in the humid environment, become dirty from the dust and leaf residue, and would require cleaning. In general, workers expected that safety eyewear would slow down the pace of work. Thus, the biggest fear of changing the way that harvesters were used to picking was that ultimately it would lower their wages; picking less during the day, even if it meant better safety, was simply not an option. Formative research results suggested that an effective intervention success to promote eye wear would require: (1) testing available safety glasses that have features needed to minimize fogging; (2) education to counter negative preconceptions about wearing safety glasses, particularly the fear of lost wages; and (3) the ability to deliver benefits the worker desired most (i.e., relief from daily irritation and the fear of injury).

The formative research stage (2002–03) provided rich data on those factors that increased the risk of eye injuries and served as barriers to protective eyewear use and treatment of injuries. At the end of the formative research stage, the research team

concluded that the vast majority of respondents had never actually tried wearing safety eyewear in the field. Preconceptions were so overwhelmingly negative that a unique approach would have to be used to get workers to experiment with the safety glasses.

THE PCWH EYE SAFETY INTERVENTION

During the early stages of formative research, project staff learned of an eye injury prevention project developed by the Great Lakes Partnership for Agricultural Safety and Health and designed for the conditions of Hispanic farm workers in the Midwest (Forst et al. 2004). This program relied on community health workers to distribute eyewear, teach workers about eye health and safety, model eyewear use, provide first aid in the field, and record their activities. With approval of the community board and consultation from the GLPASH principal investigator, the community health worker program was adapted for use with citrus pickers in Florida. Migrant Health Promotion, a migrant service organization in the Midwest that had helped develop the original eye safety curriculum, came to Florida and provided training materials, organizational advice, and training of candidates and supervisors. Adaptations were necessary for the citrus setting as candidates for training were all actively employed as citrus harvesters and often worked six days a week. Their schedule offered less time available for outreach and observing the use of safety eyewear by their crews. Candidates in the Florida study had lower levels of education than in Michigan, making record keeping and training more difficult. Findings from the formative research were incorporated into a simplified training curriculum directed at the risks and prevention measures best suited for Florida citrus harvesters (Luque et al. 2007).

Early in the harvest season of 2004, the FWAF hired a field coordinator to recruit and train citrus workers to become community health workers (CHWs) for eye safety. The workers were compensated for 10 to 12 hours of work per week to carry out the following activities: attend training sessions through the season; wear safety glasses at all times during harvesting; distribute safety glasses to all members of their harvesting crew; encourage eyewear use; conduct and document four health education sessions with crew members; train every crew member–participant at least once during the season on the topics of eye safety and the benefits of eyewear; meet with the project coordinator once per week; administer eye washings or other first aid to crew members when needed; and record every incident or encounter. The training consisted of 20 hours of instruction in popular education methods, project methodology, responsibilities and recordkeeping, and injury recognition and treatment. In weekly meetings with the field coordinator they reviewed their records and activities (training and first aid) with other crew members. Program staff made unannounced visits to the fields and observed whether the participants were actually wearing safety glasses.

Because safety glasses appropriate for citrus harvesting had never been tested before, the project relied on the CHWs to test and evaluate different styles of commercially available safety glasses. The CHWs field-tested approximately 20 different styles of glasses before deciding on the criteria that made for effective protective eyewear for citrus workers.

It was decided the glasses needed to be lightweight and with frameless lenses to minimize distortion. The most appropriate lens color was a medium, indoor–outdoor tint that reduced sunlight but did not hinder work in the darkened citrus tree canopy. The design chosen had a soft rubber nosepiece that elevated the lens of the glasses off the cheekbones of the face, a gap in the top of the glasses between the lens and the frame that allowed for the venting of heat from the face and adjustable arms that allowed for a better fit. Finally, a "sports style" band was attached to the glasses to keep them securely on the worker's head.

The Field Coordinator verified that: (1) the CHWs demonstrated that they were capable of training on eye safety during the role-play sessions and by observing them in action, (2) the CHWs were modeling the use of safety glasses in the field at every unannounced site visit, (3) they distributed glasses and other crew members who were observed wearing them, and (4) the CHWs delivered training and first aid in the field, which were documented during weekly meetings and follow up interviews. Ninety percent of participating harvesters could recall specific information shared with them by the CHWs; many of them reported receiving first aid or knew of a coworker who had received first aid from them.

PCWH PROGRAM ACCOMPLISHMENTS

In the first two years of the CHW eye safety program (2004–05), more than 400 workers had participated and 150 of them had been surveyed on their opinions about the comfort of the glasses, the economic cost of getting accustomed to wearing them and their experiences with injuries. Several hypotheses from the formative stage were verified by the intervention and follow-up survey and others were discounted and new things were learned.

Prior to the intervention, no workers were ever observed wearing safety glasses in the fields and employers and supervisors corroborated this finding. No participant in any of the focus groups stated that they regularly wore safety glasses. Following the CHW intervention, nonrandomized visits to the field verified an average of 34 percent of workers wearing glasses. These visits (a total of 11) were constrained and were planned with the companies to allow access to the groves. In the follow up survey of 150 participants in the program, 94 percent reported that on the first day they received them they tried to wear the glasses. Among those, 44 percent said that they continued to use the glasses "most of the time." However, most workers admitted to not using the glasses until later in the morning when the citrus trees dried off. Thus, there was a two to three hour period at the beginning of work when excessive moisture (water droplets obscuring the lenses) made use of the glasses especially difficult.

The educational curriculum of the CHWs emphasized that immediate treatment of eye injuries and first aid provided in the fields and camps reduced the likelihood that foreign object injuries would become more serious infections. After distributing the safety glasses and promoting their use through a short educational program, the most common encounter CHWs had with their fellow workers was providing first aid, mainly

in the form of flushing out foreign objects from the eye using sterile water. Over two seasons, the CHWs performed this task 227 times. This simple procedure performed by the CHW came to be one of the most important features of the program. There was clearly a need for this basic first aid in the groves and it provided an opportunity for the CHWs to educate workers about eye safety and encourage the use of safety glasses.

Focus groups of the promotores were conducted at the end of the season. The promotores wore safety eyewear more often than any other workers and they provided important feedback about the effectiveness of the glasses. Generally, they corroborated the perceived costs and benefits stated by the workers in their survey. The most significant cost to wearing the glasses were droplets on the lenses in the morning and fogging in the hot afternoons. In a reversal from what the formative research had lead us to believe, both the CHWs and the participants from their crews focused on the protection from daily eye irritants and the reduction in redness and burning as an important benefit they discovered after using the safety eyewear. This suggests a primary program emphasis on the short-term and daily comfort benefits of using the glasses, rather than a promise of fewer serious injuries from branches and minimizing long-term damage from UV exposure.

The survey of participants provided the best evidence that those who experimented with the glasses and became accustomed to wearing them concluded that there was no real economic effect on their ability to pick citrus. The survey contained several questions about the number of baños (the measure of a day's work for citrus pickers) they could be expected to pick with or without wearing safety glasses. Those who did not use the glasses (a convenience sample of 35 workers not involved in the program) had a much more negative view of their impact on income earning ability. They expected nearly a ten percent drop in daily productivity owing to the fogging and dirt. In contrast, those workers who reported wearing them or were verified to have worn them, agreed the glasses had no effect on the amount of citrus picked; many even expected to pick more because of the protection offered by safety glasses. Probing questions on the survey yielded responses that the glasses allowed them to "pick with more confidence." For the first time, a large number of workers experimented with safety glasses and most concluded they did not affect the speed of harvesting. This was in contrast to the negative preconceptions held by those who had yet to try wearing safety glasses. By convincing workers to try using safety glasses, the CHWs helped to remove the perceived economic cost of wearing them and helped them to pass through and "adjustment phase" to become comfortable with a new technology.

Beyond the targeted program of eye safety for citrus harvesters, the PCWH served as a catalyst for several spin-off efforts. One of the lessons learned from the PCWH was that just by bringing diverse groups together, collaboration outside of the boundaries of the project could take place. (See Figure 1.) The FWAF used its contacts in the labor camps to assist the health department with outreach for some of their specific programs on family planning and STDs. The academic partners from the University of South Florida collaborated on grant writing with the health department and the FWAF for projects outside the scope of worker eye safety. The Immokalee Lions Club was initiated through

contacts and networks made in the PCWH; when it was founded in 2006, membership in the new club was almost entirely Hispanic. They now conduct community health screenings several times a year and nearly a 1,000 people annually are screened for vision problems, hypertension, and diabetes. The FWAF and the health department collaborated briefly on a diabetes and hypertension outreach program with the Haitian community but funding was not secured to sustain it. Each of these collaborative efforts among the partners originated in the social interaction that took place on the community advisory board.

DISCUSSION: LESSONS LEARNED

A ten-year program with a diverse coalition of partners yields many lessons learned. Primarily, we learned that combining the nine-step planning framework of community-based prevention marketing with the approach of community health workers had a variety of benefits. The CBPM approach was evaluated in a workplace setting and was shown to change safety behavior (Monaghan et al. 2008). Social marketing, with its focus on targeted audiences and behavior change, was useful for modifying an existing CHW program and adapting it to the citrus worker setting (Bryant et al. 2009). We were able to design a curriculum based on the findings of formative research that met the need for eye safety among citrus workers (Luque et al. 2007). The research revealed that daily eye irritation from dirt and debris was as much a motivating factor for safety glasses use as was the threat of traumatic injury from sharp branches. We discovered that when the CHW provided first aid (most often eye wash in the field), it had a significant impact on a worker's decision to use safety glasses. The CHWs modeled good safety behavior by wearing the glasses and most of them were also successful harvesters, showing that safety did not have to compromise productivity. Finally, the CHWs also served as field researchers; they tested eye safety wear to determine the best styles for citrus work and they tested different lenses to measure fog-resistant coatings.

We also learned that through collaboration, each of the individual communities or stakeholder groups bring essential resources to the table; by doing so, they increase their chances of helping one another while still advancing their own agendas. Struggling community organizations may receive a share of grant funding that helps keep offices open and staff paid, their staff may receive new skills training, and their volunteers become engaged in new activities. Academic partners fulfill their grant obligations, fund faculty salaries, produce research results, and, hopefully, renew their funding. Service providers such as public health departments can benefit from these coalitions by establishing links to hard-to-reach communities (such as undocumented workers), thus meeting their targets for delivery of services and also increasing their chances for grant funding. Agricultural employers can solve issues particular to their labor force, improve their public image and engage with the different groups that otherwise might be in conflict with them. Employers can also use their position in these coalitions to direct attention away from more contentious issues.

To be mutually beneficial, each group of participants must play the role of guide as they help the other groups to cross the barriers to entrance into their community. This

can be done through the use of participatory methods, the setting of shared agendas, and supporting one another well beyond the original scope of work. The representatives of different ethnic or occupational communities (such as citrus harvesters or labor contractors) provide the "insider" perspective. They can provide access to researchers, offer their interpretations of data that is collected, and help implement strategies for change that the other partners could not do on their own. For example, agricultural workers can provide detailed description of the conditions of harvesting and the risks to their health; they can recount their experiences being injured and seeking treatment and they can point out the features of work that constitute barriers to change. Agricultural employers functioned as literal gatekeepers by allowing researchers to enter into their fields and labor camps to talk with workers and gather data.

The PCWH taught us about the rewards of community collaborations and also what is sacrificed. To achieve consensus on an issue, the participants in a community coalition must usually agree to compromise on other issues that are important to them. The differences in power in a diverse community could be seen in the voting process of the PCWH advisory board and through the collaboration of the citrus companies. If the board had chosen to focus on pesticides, the citrus companies would not have allowed research to take place in their groves the way they did with eye safety. That power differential can also be seen in certain structural features of agricultural labor that makes workers vulnerable; they lack legal documentation and are constrained by the demands of piece-rate harvesting and the crew-leader system. Community coalitions can attempt to change these features or adapt to them instead.

Despite the limitations, the farmworker community as a whole can benefit from these coalitions. Original research is conducted that documents the risk of agricultural work and the conditions of immigrant labor. If successful, new programs may be developed that meet the particular needs of immigrant workers. The most important lessons learned from the project may have been the expansion of the knowledge base about agricultural work, the associated health risks, and the evidence that safety conditions can change when diverse coalitions work together.

NOTE

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