

streamline

The Migrant Health News Source

Working with Hispanic Indigenous Migrant Men from Mexico and Guatemala to Promote Immunization

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The Immunization Initiative at MCN promotes improving childhood, adolescent, and adult immunization coverage levels among migrant and other mobile underserved populations. During the course of the initiative, anecdotal and documented evidence of an increase in the Hispanic indigenous population in United States and outside California surfaced from various sources. A separate initiative emerged, to design and develop a piece of educational material specifically for this population.

According to Johnathan Fox and Gaspar Rivera-Salgado, editors of *Indigenous Mexican Migrants in the United States*, "the indigenous proportion of the Mexican migrant population has grown significantly, most notably in both urban and rural California, and increasingly in Texas, Florida, New York, and Oregon."¹ In the course of the immunization initiative, MCN encountered such populations and subsequently contacted migrant and community health centers and clinicians in many parts of the US in order to obtain data confirming the presence of Hispanic indigenous migrant populations. More than 160 individuals were contacted and approximately 54 migrant and community health centers in 21 states confirmed that they were serving Hispanic indigenous populations. However, there is no broad regional or national data on the numbers of indigenous migrants seen at health centers, and no reliable estimate. Clinics serving migrants do not have a unified means of tracking indigenous clients.

Speaking of one group, Mixtec families living in California, Bade reports that "expensive biomedical treatments, lack of health insurance, language barriers, transportation problems, and cultural differences concerning illness causation and treatment combine to marginalize Mixtec families from the main-

stream biomedical health care culture."² This may be seen as an individual exemplar of a broader phenomenon among indigenous migrants. Predictably, clinicians contacted by MCN reported a lack of educational materials, as well as a lack of resources to hire interpreters to communicate properly with the patients. Reports indicated a basic lack of awareness among some clinic staff that any language other than Spanish was spoken by their clients.

Little research has been done among indigenous populations in the US to identify health beliefs, elements that would help promote health education, or barriers to receiving that education. Because men are overrepresented among migrant groups MCN chose to focus on men only, and to develop a single resource targeting immunization education for adult migrant indigenous men working in the US.

The goal of this study was to implement an effective immunization education project and to capture successful elements of the educational material. Furthermore, because so little research has been done with this group, we provide documentation of the process of conducting community-based in-depth focus groups with indigenous migrant men, so that further researchers working with this group might benefit from what we have learned.

Methods and Participants

To assess experiences with and knowledge, attitudes and beliefs about immunizations specifically among young Hispanic indigenous men and to lay the groundwork for materials development, Voces Indigenas, an agency in Ciudad Juarez, with whom MCN had worked with on various other projects, conducted three focus groups and three interviews with key informants. Their goal was to explore and

capture some of the beliefs, knowledge, attitudes and behaviors of males from different indigenous groups between the ages of 15 and 36, in order to develop educational materials related to immunizations for males of indigenous origin who work in the US.

MCN then developed the vaccine content for the piece and Voces Indigenas proposed and designed the poster-calendar.

Considerations that dictated choice and design included the fact that Voces Indigenas had developed and used a poster-calendar to teach the Raramuri community in Juarez about vaccine issues; a calendar serves more than one purpose, unlike a brochure, which is likely to be thrown away after the information is received. The use of multiple bright colors added to the visual appeal and the use of a circular motif reflecting the Aztec calendar and the tomato reflecting the harvest and its cyclical nature, added visual points of reference for a visual audience.

Before distributing and evaluating the poster calendar to clinics, Voces Indigenas and MCN developed a focus group guide to be used by clinics, and their staff to help evaluate the material. MCN then initiated a lengthy process of recruiting clinics and clinicians with access to Hispanic indigenous communities who were willing to conduct focus groups and surveys to evaluate the materials. Some of the difficulty in this process arose from limited awareness among clinics that indigenous groups were part of their service population.

Subsequently, a member of the research team spent extensive time training recruits from clinic staff in the process of conducting a focus group, through the development of a packet of materials including the focus group guide, through phone conversations, and

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through in-person, on-site trainings.

Once this training was completed, three clinics, in Florida, Oregon, and California conducted a total of five focus groups. Each focus group was conducted with a Spanish speaker from the clinic staff and a speaker of one of the represented indigenous languages. Focus groups were audio-taped, and the tapes were transcribed in both Spanish and English. Transcripts were read and discussed by members of the research team, and emergent themes were developed.

Participants

Participants in the focus groups conducted by Voces Indigenous in Ciudad Juarez were 15 men ages 15 to 36 years old (in addition, one man was interviewed with his mother, who also gave input). Eleven of the men were Mixteco, and four were Huichol. All but one had worked in the US, and all had family members currently in the US.

One focus group was conducted in Vista, California to pre-test the questions about knowledge, attitudes and beliefs about immunizations. The group included six Mixteco participants, of whom two were women. They ranged in age from 19 to 27 and all were from rural towns of Oaxaca, Mexico, and spoke Mixtec Alto or Spanish. They had been in the US from seven to ten months.

Five focus groups were subsequently conducted with indigenous men from Mexico and Guatemala living in the US. A total of twenty-five men participated in these five focus groups, at three different clinic sites (California, Oregon and Florida). Of the 25 participants in all groups, most were 25 years old or less. A majority of the participants spoke Zapotec. The next most common language was Mixtec followed by Mam and Triqui. About half of the participants reported that they could understand Spanish. One third said that they understood a little Spanish. Most of the men worked in construction. The rest picked tomatoes or worked in nurseries. A majority, had been living in the US for less than six months. Participants were all from either Mexico or Guatemala.

MCN also conducted a survey to determine the effectiveness of the poster-calendar. Respondents to the survey, administered to two groups California, were men waiting for their spouses to be served at the clinic. An interpreter who spoke both Spanish and Mixtec interviewed the men in private rooms. A total of 41 men responded to the survey. Twenty-nine percent of the men (12) were 15-20 years old, and 29% (12) were 21-26. Six men were 27-33 years old (15%) and 11 were 34-39 (27%). Sixty-three percent (26) of the men spoke Mixtec Bajo, and 34% (14) said that in addition to Mixtec Bajo, they also

spoke some Spanish. One person spoke only Mixtec Alto.

Results

Knowledge, attitudes and beliefs

This research addressed knowledge, attitudes and beliefs of indigenous Mexican men about immunization. The men in the group talked about their overall feelings about the importance and efficacy of immunization, who they believed immunizations were for, their understanding of what immunizations are and what they do, and general feelings about healthcare and preventive health services delivery in the US and in Mexico and Guatemala. Their responses are grouped into themes below.

Theme 1: Vaccines are primarily for children and possibly women.

While most participants agreed that vaccines could be accessed by adults, participants tended to think that vaccines were primarily for children (a common belief in the US as well). They correctly identified common side effects of vaccination in children (pain at the injection site, sometimes fever), and said that adults can also have these reactions. Some respondents indicated that they had not been immunized when they were infants, but as older children.

Many had had experience with tetanus vaccine as an adult (often after an injury).

Respondents in the Seaside, California, group indicated that they were vaccinated against tetanus as adults, and were asked about that vaccination whenever they were injured, but that they received other vaccinations only as children. The only other adult vaccine about which there was general awareness was the flu shot.

The focus group that included two women and four men talked explicitly about gender issues related to immunization experience and attitudes. All six participants were from small villages in Oaxaca. Men indicated that vaccinations were for women and children. However, they also indicated that all healthcare and exposure to clinics was more geared toward women and children, not men, who got sick less often and could withstand illness without assistance. The women agreed that men got sick more rarely, and speculated that vaccines were more effective for men. One 24-year-old said that only the boys in his family had been immunized in Mexico because only the boys had gone to school.

Theme 2: Knowledge of how vaccines work was limited, and participants occasionally confused vaccination with injectable medications and very occasionally, with illegal drugs.

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Kaiser Foundation Study Shows Community Health Centers Seeing More Patients After Massachusetts Health Reform

Community health centers in Massachusetts saw a significant increase – rather than the decline expected by some – in their patient load from 2005 to 2007 as that state began implementing its health reform law. This trend illustrates the continuing need for a robust primary care safety net as a key component of a reformed health care system, according to a new report from the Kaiser Family Foundation's Commission on Medicaid and the Uninsured.

The 34 federally-qualified health centers in Massachusetts, which provide comprehensive primary care for low-income and uninsured patients, served 482,503 patients in 2007, up more than 51,000 from two years before, the report found. At the same time, the number of center patients who lacked health insurance declined, a reflection of the state's successful effort to improve coverage by expanding public programs and making private insurance more affordable.

Despite the reduction in the overall number of uninsured, health centers continued to see substantial numbers of people with no health coverage at all, serving an increasing share of the state's shrinking uninsured population.

The findings offer important lessons for policymakers in Washington contemplating health reform on a national scale. The Massachusetts experience shows that community health centers play a critical role in caring for newly-insured patients while continuing to serve as the primary care safety net for those who remain uninsured.

The report, commissioned by the Foundation's Kaiser Commission on Medicaid and the Uninsured, was conducted by researchers at The George Washington University School of Public Health and Health Services, with additional support provided by the Geiger Gibson/RCHN Community Health Foundation Research Collaborative.

The study was published in March, 2009 along with a new fact sheet on community health centers and an updated issue brief that examines the role of such centers in providing comprehensive primary care to more than 16 million patients nationwide.

The reports can be viewed online at <http://www.kff.org/uninsured/kcmu032409pkg.cfm>.

Respondents generally thought of vaccines as liquids that were distributed via the blood after the injection, but did not indicate knowledge of how vaccines work. There was some confusion about the differences between preventable infectious diseases, and common ailments, like headaches. Most were not familiar with oral vaccines.

There was some significant confusion in all of the groups between vaccinations and injectable medications, like antibiotics. In Latin American countries, the use of injections to treat a cold or pain is very common. Participants included their perceptions about getting shots from a doctor once you were sick or thought you might be getting sick, and vitamin shots that were also thought to help keep people healthy. These were seen as times adults might get injections, and some participants also iterated a negative understanding of illegal injected drugs.

Theme 3: Overall, men believe in the efficacy and importance of immunization, but strong elements of suspicion for US and other healthcare systems remain.

The indigenous men in all groups believed overwhelmingly that vaccines were good and kept people healthy. Most also believed that they, individually, needed vaccines.

Participants expressed ideas about the importance of prevention, and concerns about caring more for their health. Many asked questions following the groups about where they could go to receive vaccines, and how much they might cost.

There were sporadic reports of suspicion, primarily about the source of the vaccines rather than the vaccines themselves. One respondent reported some long-term suspicion of government immunization campaigns in Mexico among indigenous people. An English translation follows:

There is a belief from the past that the indigenous people thought the government did not want them and could exterminate them through the vaccines. By putting bacteria or diseases so that they would die. In this way, the adults (the elders) pass that belief to the young ones and they did not trust the government and would not get their vaccines. That is why it is important to tell them what it consists of, and what they are, and that the individuals identify themselves well.

Another three participants commented that in their villages of origin, the traditional healer (*curandero*) had recommended that one should avoid getting immunizations in the US because the vaccines could be harmful to one's body. They attributed this to a belief that doctors in the US use immunizations on Hispanic immigrants to test treatments for illnesses.

Though these comments are interesting for revelations about the continued presence of ideas about experiments with minority populations, the suspicion seemed to focus on the source of vaccines rather than the vaccines themselves. Responses about the source of information revealed more about this barrier to immunization:

- "Do we believe it? Do we believe they are telling us the truth, or trying to hurt us?"
- "Before we did not believe, but now things are changing."
- "Depends on the person and the circumstances."
- "If they come asking for information about our names, where we are from and where we live, that does not inspire confidence, since you know we are there illegally and they can report us to immigration. Nevertheless, if they first tell us what the reason for their visit is, and do not ask us for information about ourselves, I think we can trust them more."

Participants and facilitators stressed the importance of immunization information coming from a trusted source, and suggested written information with short clear text and explanatory graphics, as well as video and audio information.

Theme 4: Language and literacy are barriers for delivery of health information.

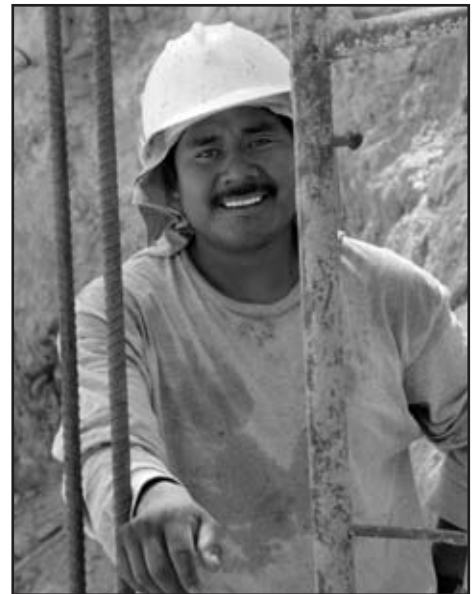
Literacy was a significant barrier for all of the groups. Very few people could read in any language (Spanish). They indicated that language was a barrier for them in clinics in Mexico as well. They suggested use of illustrations to convey key public messages.

Other groups echoed this message. Two groups in Immakolee, Florida relied on translators to help conduct groups in Spanish, Mixteco and Mam. The Mixteco group seemed to know less about vaccines (such as what diseases might be prevented by them), and have less experience with immunization themselves, even as children. Facilitators later speculated that some of this lack of knowledge might have had to do with the facility of the translator. The groups suggested heavy use of pictures to convey messages.

Theme 5: Men tend to use fewer healthcare services and know less about healthcare in the US than women.

Men in the focus groups indicated that government immunization campaigns in communities were common in Mexico. Men said they were less likely to utilize public health services in the US. Focus group facilitators for one group reported the following:

In the US, the main barriers [to health care utilization] are fear of deportation, language limitations, lack of money and need to



"deal with it," etc. Health services are only used in cases of emergency or serious situations, and when the "bosses" or someone in whom they fully trust takes them.

Several indicated that they visited traditional healers both in Mexico and the US, and they told stories of Mixteco people returning to Oaxaca if they did get sick, often with financial assistance from others in the Mixteco community in the US. All six of the respondents in the group from Woodburn, Oregon, said that traditional healers were the most common source of health information and care in the US.

Many of the men in the groups had no knowledge of where or how to access health-care in the US, and most indicated that they rarely did so in their villages of origin. Few male participants spoke about experiences taking children to clinics for vaccinations in the US.

Effectiveness of materials

Five focus groups and surveys for determining the effectiveness of the poster-calendar were conducted during January and February 2007 at four sites. The purpose of the focus groups was two-fold: to assess knowledge, attitudes, and beliefs, (see previous section) and to gather information about the usefulness of the poster-calendar.

The opinions of the focus group participants reflected some of the difficulty of reaching a group for whom language is a barrier, as was noted in the knowledge and beliefs section above. While a majority said they liked the poster-calendar, a much smaller number said that they understood "the story." About half said they would have liked fewer words. Perhaps correlating with those who could not read Spanish, about a quarter of the partici-

pants said the information was good and useful, while another quarter said they couldn't evaluate the information. About the same percentages said the information could help as those who said they did not know if the materials would help.

While less text was clearly perceived as beneficial (because the majority of the men indicated that they couldn't read) responses also indicated some confusion related to the graphics. Many men clearly related to the graphics in positive ways (they liked the colors, and identified with the workers portrayed) but unintended associations did arise from the pictures. For example, because the poster featured men picking tomatoes, the participants made associations between the dangers of pesticides and vaccines, or to nutrition information. (One response seemed to indicate that "the poster is telling us about nutrition or food" because adult workers have the strength to carry boxes.) Clearly, there is a fine balance between textual information and interesting graphics that is difficult to achieve. The strongest negative comment about the graphics was that the participants did not like "the sick men." Participants also recommended that the poster be smaller (they would not be likely to have a place for it in their living spaces), and that it not be used solely in clinics (because they do not go there), but posted in other locations like stores and bus stops. Overall, although misinterpretations were possible, the poster appeared to be effective in getting the participants to think about the possibility of adult vaccines.

Survey results mirrored the information from the focus groups. For example, while all of the participants responded "yes" to the question about whether or not they liked the poster, only 46% said they understood the information. Several made comments similar to this one: "I did not like the information, because I do not know how to read." Participants also expressed worry about being able to pay for vaccines. Again, however, the poster clearly introduced the participants to the idea that adult vaccinations are available and recommended. It helped them to know what vaccines they need and why they should get vaccinated.

Conclusions: Implications for practice and research

Several issues emerged as we progressed through this project that may shed light for future work with Hispanic indigenous migrant men. In terms of immunization, what emerged as a primary theme was that attitudes toward vaccination are mostly positive, and resistance to vaccinations is not the primary barrier to immunization for

this population. There are, however, other barriers. Foremost among these is the difficulty of access in both directions: for health care workers to make significant contacts with indigenous migrant men, and for migrant men to get access to health care facilities. Contact, or access is limited in several ways:

- Lack of awareness among providers that this population exists. Though it may be clear that a client does not speak English, it is not always perfectly clear what the client's native language is. Clients may not let on that they don't speak Spanish for a variety of reasons, including a history of discrimination even in their own country.²
- Lack of an "official presence." Because of persistent problems of census undercounts, especially in migrant communities, the 2000 census data for this population must be taken as suggestive rather than definitive.
- Lacking legal status, clients may seek to be inaccessible and are hesitant to put themselves in situations where their lack of documentation may be obvious. Outreach efforts can be difficult due to the need to remain "invisible."
- As mentioned before, men are generally less likely to access health care systems. Several factors contribute to this reluctance. Lack of money is one, as is the issue of trust. They may not go to the clinic unless someone, like their boss, takes them. Long working hours may be incompatible with clinic hours. Reasons for resistance may also include a desire to be perceived as tough, as not needing help from doctors or clinics.

Our experience offers some suggestions for overcoming some of these barriers.

- Outreach efforts are crucial, since many indigenous men will not access healthcare services independently.
- The bearer of information should be a trust-

ed source, of the same origin as the group, who speaks the language.

- It is important to assure that the interpreter and the clinic staff have good communication between them, so that information is delivered accurately.
- Never begin your conversation by asking for personal information. If asked at all, it should be at the end of the visit, and limited to information essential for research.
- Informal networks of communication exist in migrant groups, and information about where to go, what is safe, and who can help is shared through this network. These networks may be a powerful tool for connection.
- Once connections are established, people are appreciative of the information they receive.

Hispanic Indigenous men in the US and immunization

This research contributes to the understanding that lack of acceptance or fear of vaccines are not primary or significant barriers to adult immunization for this group, similar to migrants as a whole, and indeed the majority of the adult population in the US. As reported above, an overwhelming majority of participants reported that vaccines were good and useful. We hypothesize that the real barriers are practical ones—poverty, transportation, language, and health literacy—not negative beliefs, and that future efforts need to focus on removing these barriers, not on convincing people that vaccines are necessary and safe to use. ■

References

1. J Fox & G Rivera-Salgado, editors, *Indigenous Mexican Migrants in the United States*, p. 2. La Jolla: Center for U.S.-Mexican Studies, UCSD, Center for Comparative Immigration Studies, UCSD.
2. Fox & Rivera-Salgado, B Bade, "Alive and Well: Generating Alternative to Biomedical Health Care by Mixtec Migrant Families in California," p 206.

Immunization Initiative at Migrant Clinicians Network

The Immunization Initiative at the Migrant Clinicians Network (MCN) is devoted to promoting and improving childhood, adolescent, and adult immunization coverage levels among migrant and other mobile underserved populations. Funding for this project is obtained from a cooperative agreement with the National Immunization Program, Centers for Disease Control and Prevention.

MCN and the Immunization Initiative provide training and technical assistance to Migrant Community Health Centers, Migrant Health Start Centers, Migrant Education Programs, employers, and state and local health departments to manage complex cultural issues of mobile underserved populations and in strategies to reach them and help minimize the barriers to full immunizations.

The Immunization Initiative also develops popular-educational materials and resources which are culturally and linguistically appropriate. The materials assist clinicians in educating and encouraging migrants to get vaccinated and to vaccinate their children. For more information about services and resources available contact Kate Bero at 512-327-2017 or kbero@migrantclinician.org.

Acute Pesticide Poisoning Associated with Pyraclostrobin Fungicide – Iowa, 2007

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Pyraclostrobin is an agricultural pesticide product used to kill fungi (e.g., blights, mildews, molds, and rusts). Hazards to humans from pyraclostrobin exposure include eye injury and skin irritation.¹ In July 2007, the Iowa Department of Public Health (IDPH) received reports of five events involving pyraclostrobin that sickened 33 persons, including 27 migrant workers who were exposed in a single incident during aerial application (i.e., crop dusting). This report describes those five events and provides recommendations for preventing additional illnesses associated with exposure to pyraclostrobin.

Event A. On July 23, 2007, IDPH received media reports that migrant workers in a field had been inadvertently exposed to pyraclostrobin fungicide by a crop-duster plane on July 22. An IDPH investigation identified 27 cases of acute illness among the potentially exposed workers; all illnesses were associated with off-target drift of the pyraclostrobin to an adjacent field, owned by a different grower, where workers were detasseling field corn. IDPH learned that the pilot had seen the nearby workers yet proceeded to apply the fungicide. Some workers reported feeling wet droplets on their skin and seeing mist coming from the aircraft.

All 27 persons with acute illness were Hispanic and residents of Texas. Twenty were male, and seven were female; median age was 46 years (range: 15–74 years). All received skin decontamination on-site by a hazardous materials team before being transported to an emergency department for observation until their symptoms resolved. All cases were categorized as being of low severity.* The most common symptom was upper respiratory tract pain or irritation (26 patients), followed by chest pain (20 patients). Three patients had nausea, and one patient each had pruritis, skin redness, eye pain, weakness, headache, dizziness, and chest pain.

The Iowa Department of Agriculture and Land Stewardship (IDALS) began an investigation on July 23 that included collection of soil and vegetation samples from the cornfield where the detassellers had been working and samples of worker safety glasses and hats. All samples tested positive for pyraclostrobin, even though the samples were collected the day after pyraclostrobin appli-

cation and after substantial evening rainfall. Before this incident, the field had not been treated with pesticide (i.e., herbicides containing atrazine and topramezone) for 40 days. On August 1, IDALS suspended the commercial pesticide applicator license of the crop-dusting company that applied the fungicide; an administrative law judge later revoked the license.

Event B. On July 20, a crop-duster pilot aged 55 years visited an emergency department with first-degree chemical burns after skin and inhalational exposure to pyraclostrobin fungicide that occurred when his plane crashed during takeoff, spilling the liquid fungicide. Emergency department personnel consulted the Iowa Poison Center (IPC), and IDPH was notified of the case. The pilot was admitted to the hospital for observation for 2 days, and the case was categorized as being of moderate severity. Although inhalational exposure occurred, the pilot reported no respiratory symptoms.

Events C, D, and E. During July 2007, IPC notified IDPH of three additional events involving five cases of acute pesticide poisoning associated with pyraclostrobin exposure that resulted from off-target drift of pyraclostrobin from nearby aerial applications. All five illnesses were of low severity; all persons who were exposed consulted IPC but did not otherwise seek medical care. On July 5, a man aged 54 years experienced headache and eye pain after pyraclostrobin exposure while riding a motorcycle near a field. On July 12, a woman aged 40 years reported eye pain and headache, and a man aged 49 years reported eye pain, headache, and dizziness after pyraclostrobin drifted into the yard of their home. On July 14, a man and woman both aged 20 years reported eye pain and conjunctivitis after pyraclostrobin drifted into the yard of their home. In all five of these cases, symptoms subsided after the exposed persons moved indoors or away from the pyraclostrobin-treated fields.

Reported by: RM Gergely, MAg, BW Hokel, Iowa Dept of Public Health. GM Calvert, MD, Div of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health; SE Luckhaupt, MD, EIS Officer, CDC.

Editorial Note:

The cases described in this report are the first published accounts of human illness caused by exposure to pyraclostrobin or any of the other strobilurin chemical compounds used

as agricultural fungicides. Pyraclostrobin has a toxicity category of II;[†] the product label warns that pyraclostrobin exposure can cause substantial, although temporary, eye injury and skin irritation but can be fatal if swallowed.¹ Contact with eyes, skin, or clothing should be avoided. After a cornfield has been treated with pyraclostrobin, workers should be prohibited from entering that field for 7 days to perform detasseling unless they are wearing appropriate personal protective equipment (i.e. coveralls and chemical-resistant gloves).¹ Although upper respiratory symptoms are not mentioned on the product label warnings, 26 of the 27 workers exposed in event A experienced these symptoms, perhaps as a result of irritation of the upper respiratory mucosa by a mechanism similar to that causing skin and eye irritation.

The strobilurin fungicides, including pyraclostrobin, are relatively new to the US agricultural market. Pyraclostrobin was approved for sale in the United States in 2002 for use on a limited number of crops but was not approved for use on corn until December 2004. During 2007, the first year of widespread use on field corn, pyraclostrobin was applied to an estimated 1.5 million acres of corn in Iowa (C. Eckermann, IDALS, personal communication, 2007). Increased use of pyraclostrobin on corn likely is attributable to several factors, including increased planting of corn in the same field in successive seasons, which is associated with increased fungal disease risk to the corn plant; high demand for corn to produce corn-based ethanol; and aggressive fungicide marketing by agricultural-chemical dealers.^{2,3} In addition, strobilurin fungicides, especially pyraclostrobin, might increase corn yield in the absence of disease by directly stimulating plant growth, although field trials to document this have produced inconsistent results.⁴ No cases of illness related to exposure to trifloxystrobin and azoxystrobin, the other two strobilurin fungicides licensed in Iowa, were reported to IDPH during 2006 or 2007.

The 27 workers sickened in event A were detasseling corn (i.e., removing tassels from corn plants to prevent auto-pollination and enable hybridization). Although the field where these workers were detasseling had been treated previously with atrazine and topramezone, both of which can produce mucosal irritation, 40 days had elapsed since that treatment. Workers may return to a field

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Respiratory ailments nothing to sneeze at

RESPIRATORY problems go with the territory in agriculture. The workplace is filled with irritants ranging from organic and inorganic dusts to chemicals, fumes and animal bacteria. Mites and molds account for many breathing problems as opposed to the usual suspect — smoking. Those in agriculture have some of the lowest rates of tobacco use compared to any other occupation.

Rhinitis — nasal irritation, sneezing, runny nose — is the least serious and most common complaint caused by agricultural irritants. Grain farmers, livestock breeders, dairy farmers, and processors of flax and hemp are bothered the most.

The same dusts, especially grain and cotton, also trigger an asthma-like syndrome. It feels like asthma but does not recur or become chronic. It improves by the end of the work week. Swine and poultry workers are troubled with this syndrome from the ammonia and multiple microorganisms in the air.

The dust most implicated in classic asthma is soya bean. Also, grain storage mites, cow dander and cow urinary proteins have been implicated. Chemicals such as solvents, welding fumes and ammonia, rather than being a cause, actually only aggravate underlying asthma. More recently, the Agricultural Health Study (www.aghealth.org) found a link between organophosphate pesticides and wheezing.

Chronic obstructive pulmonary disease is another dust-related ailment. The more exposure the tougher it is on the small air sacs (alveoli), which lose their elasticity. Fumes and endotoxins — toxic poisons produced by bacteria from animal manure — also cause air sac inflammation and bronchitis. These lung problems are common in those working in animal confinement areas.

Engineering controls in the grain industry have reduced the well-known problem of Farmer's Lung (hypersensitivity pneumonitis).

A mold (*saccharopolyspora rectivirgula*) that grows in damp animal feed storage in winter is a common cause. Recently researchers have found that hay dusts and endotoxins make the lungs more reactive to this spore. Farmer's Lung may be a single illness, come and go recurrently, or be chronic. Acutely, it comes on in the afternoon or evening after work and starts with chills, a cough and a feeling of being out of breath. It resolves in a few days.

Organic Dust Toxic Syndrome is a lung condition in which the air sacs and airways



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become inflamed from organic dust. The symptoms arise after four to six hours of exposure to the dust and include fever, breathlessness and cough. People recover quickly usually after 36 hours without long-lasting damage to their lungs. It is a toxic reaction to endotoxins and molds in the dust.

Toxic gas inhalation can occur with exposure to accumulated oxides of nitrogen, carbon dioxide and other gases in ensiled plant material. Animal manure storage produces carbon dioxide, carbon monoxide, ammonia, methane and hydrogen sulfide, all injure the airway. Mild exposures will cause irritation, but with high concentrations the lungs fill up with fluid leading to death by asphyxiation.

Preventive strategies

Controlling dusts and fumes, improving storage areas, and adding ventilation to prevent the growth of molds and bacteria reduce these respiratory problems. Studies of workers in animal confinement areas with humidity sensors and automatic ventilation systems demonstrated that they had better lung function than those without these technologies. Closed tractors and combines with air filters significantly reduce inhaled dust. Dust suppressants added to animal feed, automatic feeding systems, extractor fans and dust removal vacuums, and respirators are all vital ways to protect your lungs.

Helen Murphy, outreach and education director at the University of Washington Pacific Northwest Agricultural Health and Safety Center, may be reached by phone at 206-616-5906 or by e-mail at hmurf@u.washington.edu.

Common respiratory hazards in agriculture

Organic dusts (grain, straw, hay)

Molds and spores

Bacteria

Mites and their excreta

Animal dander

Animal urine and feces

Animal feeds

Inorganic dusts

Minerals (e.g., silicates)

Quartz

Clay

Chemicals

Pesticides

Fertilizers

Paints

Preservatives

Disinfectants

Gases and fumes

Slurry (ammonia, methane, hydrogen sulfide, carbon dioxide)

Silage (nitrogen dioxide, carbon dioxide)

Welding fumes (oxides of nitrogen, ozone, metals)

Engine exhaust fumes (oxides of nitrogen, particulate matter)

Infectious agents

Bovine tuberculosis

Psittacosis (carried by turkeys and ducks)

Q fever (carried by cattle, sheep)

UC Berkeley Researchers Press for Strengthening of OSHA Lead Standards

Although the United States has dramatically reduced environmental lead levels since the 1970s, lead is still used in many workplaces and many workers have too much lead in their blood. A growing body of research shows compelling evidence of harm from long-term exposure to much lower levels of lead than OSHA allows in the workplace. Its 1978 regulations were considered protective at the time. Thirty years later, scientists are calling for change.

According to the latest issue of *Perspectives*, from UC Berkeley's Health Research for Action, low to moderate levels of lead exposure can lead to serious chronic health conditions. This means that Americans who work with lead and their families are at greater risk of developing serious health conditions than previously anticipated. (Family members can be poisoned by lead dust on workers' clothing, increasing the risk of developmental problems in young children.)

Over time, even lower levels of lead in the blood are associated with some of the major chronic conditions that contribute to skyrocketing US healthcare costs:

- Increased blood pressure in workers whose blood lead levels are far lower than the levels OSHA allows. Hypertension increases the risk of heart disease, stroke, and chronic kidney disease.
- Decreased kidney function, which may be even worse in people who are already at risk for kidney disease because of hypertension or diabetes.
- Decreased brain function and intellectual activity in adults whose lead levels are lower than OSHA-allowed limits.
- Reproductive problems, especially with low to moderate levels of lead exposure during pregnancy. These include an increased risk of spontaneous abortion and harmful effects on fetal growth and brain development.

Workers in manufacturing, mining, and construction are particularly vulnerable to dangerous levels of lead exposure. So are lead workers in small shops and businesses that have no lead safety program, and are not aware of the risks of working with lead.

The *Perspectives* article — "Indecent Exposure: Lead Puts Workers and Families at Risk" — calls for the revision of OSHA standards. It also recommends a range of actions to better protect workers. These include eliminating unnecessary uses of lead, substituting safer compounds, and expanding education and outreach for employers and workers.

Health Research for Action (HRA) publishes the *Perspectives* series to address critical health policy issues and provide constructive recommendations. The March 2009 issue is available on the HRA Web site at: <http://healthresearchforaction.org/perspectives/occupational-lead-exposure.pdf>. HRA is a center in the University of California, Berkeley, School of Public Health. ■

■ Acute Pesticide Poisoning Associated with Pyraclostrobin Fungicide continued from page 5

12 hours after such treatments. Therefore, these herbicides were unlikely to be responsible for the illnesses reported July 22.

In the United States, cases of pesticide-related illness and injury are identified through state-based surveillance systems, several of which are supported by the National Institute for Occupational Safety and Health (NIOSH) through the Sentinel Event Notification System for Occupational Risk (SENSOR)-Pesticides program.[§] Data from SENSOR-Pesticides and the California Department of Pesticide Regulation were reviewed to identify cases associated with pyraclostrobin exposure through 2005. A total of 12 cases were identified; however, only one of these cases was associated with pyraclostrobin application to corn. The other cases were associated with applications to grapes (five cases), other fruits (four), almonds (one), and tomatoes (one). One case occurred in 2003 in Michigan, three cases occurred in 2004 in California, and eight cases occurred in 2005 in California (six cases), Florida (one), and Washington (one). All cases were work related; six occurred among pesticide handlers, five occurred during routine agricultural work (not involving pesticide application), and one occurred in a mosquito-control worker in a vineyard treated with pyraclostrobin. Patients reported combinations of skin, eye, respiratory, gastrointestinal, nervous system/sensory, and systemic symptoms. Two cases were of moderate sever-

ity, and 10 were of low severity. None of the patients were hospitalized.

The events described in this report reinforce the importance of compliance with existing pesticide regulations and pesticide label requirements. Pesticide applicators must avoid aerial applications of pesticides when workers are in nearby fields, application methods must minimize off-target drift of pesticides, and farmers should consider the potential adverse health effects on humans when weighing the risks and benefits of pesticide use. Greater use by crop-dusting pilots of educational programs offered by the National Agricultural Aviation Association (e.g., Professional Aerial Applicator Support System)[¶] also might help reduce the incidence of acute illnesses resulting from exposure to pesticide.

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* Severity was categorized by using the standard index of the National Institute for Occupational Safety and Health (available at <http://www.cdc.gov/niosh/topics/pesticides>). Moderate-severity illness or injury consists of non-life-threatening health effects that generally are systemic and require medical treatment. No residual disability is detected, and time lost from work or normal activities usually does not exceed 5 days. Low-severity illness or injury includes illnesses manifested by skin, eye, or upper respiratory irritation. These illnesses might also include fever, headache, fatigue, or dizziness. Typically, the illness or injury resolves without treatment, and time lost from work or normal activities is <3 days.

† The Environmental Protection Agency classifies pesticides into one of four toxicity categories based on established criteria (40 CFR § 156.62). Pesticides with the greatest toxicity are in category I, and those with the least toxicity are in category IV. Additional information is available at http://a257.g.akamaitech.net/7/257/2422/08aug20031600/edocket.access.gpo.gov/cfr_2003/julqtr/pdf/40cfr156.60.pdf.

§ Through SENSOR-Pesticides, NIOSH provides funding and technical support to state health departments to conduct surveillance of acute, occupational, pesticide-related illness and injury. Health departments in 10 states (Arizona, California, Florida, Louisiana, Michigan, New Mexico, New York, Oregon, Texas, and Washington) participated through 2005. Iowa joined the program in October 2006. Additional information is available at <http://www.cdc.gov/niosh/topics/pesticides>.

¶ Information available at <http://www.agaviation.org/paass.htm>. ■



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April 21st, 2009, 1pm EST
Candace Kugel, CRNP, CNM, MS and Hilda Ochoa Bogue, RN, MS, CHES
www.CDNetwork.org/webcast_registration.htm

Webcast: Clinician Recruitment Strategies for Migrant Health Centers

May 5th, 2009, 1pm EST
Candace Kugel, CRNP, CNM, MS
Trish Bustos, Workforce Coordinator, Northwest Regional PCA
www.CDNetwork.org/webcast_registration.htm

2009 National Farmworker Health Conference

May 12-14, 2009
San Antonio, TX
National Association of Community Health Centers
www.nachc.com/farmworker-health-conference2.cfm

NWRPCA Spring Primary Care Conference

May 16-20, 2009
Anchorage, AK
Northwest Regional Primary Care Conference
www.nwrpca.org/

The American College of Nurse-Midwives 54th Annual Meeting & Exposition

May 21-27, 2009
Seattle, WA
www.midwife.org/



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