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Improving Data Quality in Pesticide Illness Surveillance

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Jim VanDerslice, Ph.D.

Office of Environmental Health Assessments

Lynden Baum, M.S.

Office of Environmental Health and Safety

Judy Bardin, Sc.D.

Office of Environmental Health Assessments

Joanne Prado, M.P.H.

Office of Environmental Health Assessments

Dorothy Tibbetts, M.S.

Office of Environmental Health Assessments

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Introduction

In September 2000 Washington State Department of Health (DOH) was awarded a grant from the National Institutes of Occupational Safety and Health (NIOSH) to enhance the pesticide surveillance system. The specific aim of this project was to increase the value of the information generated by the Pesticide Incident Monitoring Surveillance system (PIMS) for designing interventions by:

- Evaluating and improving the quality of data collected by PIMS.
- Improving the functionality and compatibility of the PIMS database management system.
- Enhancing the analysis of PIMS data and expanding the dissemination of program and policy relevant information derived from PIMS data.

These efforts were designed to address the surveillance needs identified by NIOSH and expert groups organized by NIOSH (NIOSH, 2000a; NIOSH 2000b) and develop methods and models to help the State of Washington and other states with occupational pesticide illness surveillance to develop the recommended comprehensive activities for state-based surveillance systems (CDC/NIOSH, 1995). This report summarizes the projects and major results of this effort.

Overview of Pesticide Illness Surveillance in Washington

Surveillance in Washington State

Washington State has required investigation of all reported suspected pesticide related illnesses since 1970. Prior to 1990, pesticide illness reporting by health care providers in Washington was on a voluntary basis and the program would receive from 35-180 reported incidents per year. In the late 1980's there was increased concern expressed by farmworker advocates that there was a lack of documentation of pesticide related illness in Washington. At this same time grower groups were pressing for accurate documentation of the extent of alleged worker related illnesses. There was also heightening concern by citizen groups and local communities over agricultural pesticide drift incidents.

In 1989, the legislature, in response to pesticide concerns, made suspected pesticide poisonings a reportable condition and established the Pesticide Incident Reporting and Tracking (PIRT) Review Panel. The purpose of the PIRT Review Panel is to serve as a scientific body to review pesticide related issues, make recommendations to the legislature or appropriate agencies, ensure centralizing data and issue an annual PIRT Review Panel Report to the Legislature. In addition to the Legislature, the PIRT Report is distributed to other state and federal agencies, health care providers, growers, farmworkers and other interested parties.

Role of pesticide surveillance in Washington

The ultimate goal of Washington's surveillance program is prevention. The process of using surveillance data for prevention is depicted in Figure 1. Although more than half of WA's program involves nonoccupational and non-agricultural cases, this report focuses on occupational agricultural cases.

Investigation of these occupational cases seeks to identify work practices that lead to overexposure of workers in the agricultural setting. Patterns become evident by investigating cases of suspected pesticide-related illnesses, systematically collecting and recording data from each case, analyzing these data and interpreting the results. Often analyses and observations from several states are used to draw more robust conclusions about practices that are associated with incidents of overexposure and illness. Once such practices have been identified, programs are developed to change these practices through outreach, education and regulation.

The surveillance system in Washington also serves to prevent pesticide illness by individually educating workers on potentially unsafe practices that are discovered in the course of the investigation. This direct intervention can be quite effective as it specifically addresses the issue that may have lead to an overexposure.

The surveillance system also has a role in evaluating the effectiveness of public health prevention activities. As programs or policies are put in place to address a specific risk, the surveillance system data can be used to assess whether there has been a decrease in the expected number of illnesses due to that practice.

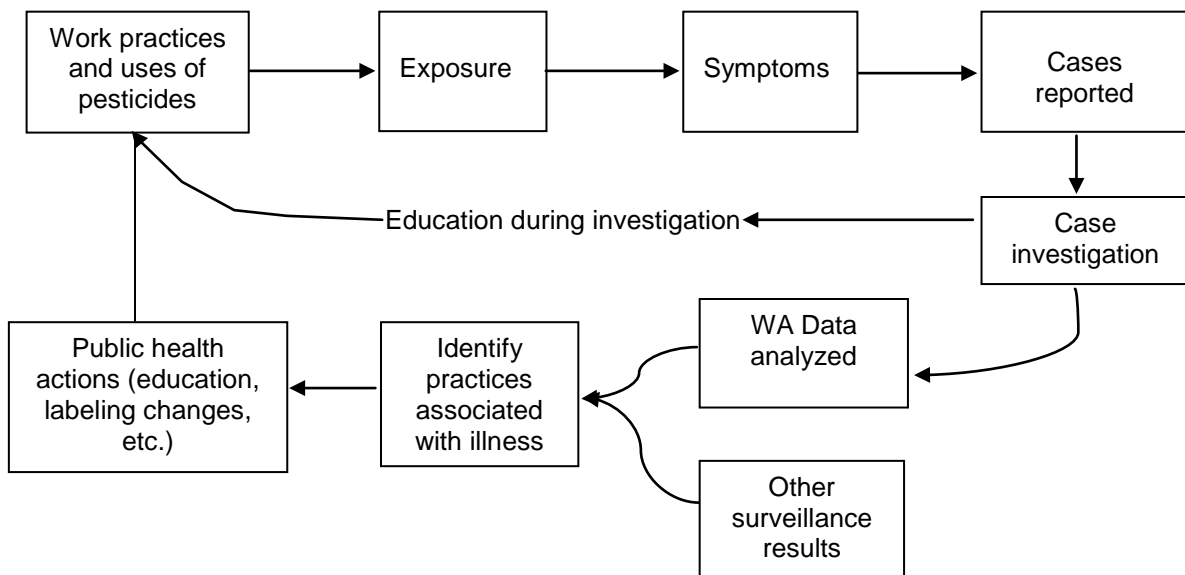


Figure 1: Role of Surveillance in Prevention

Description of reporting system

DOH has the responsibility to investigate reported cases of occupational and non-occupational pesticide illness and exposures. Data regarding suspected cases are gathered by a number of entities. DOH has signed Memoranda of Understanding with the Washington State Department of Agriculture (WSDA), the Washington Poison Center (WPC) and the Department of Labor and Industries (L&I) to receive reports of suspected exposures and illness which are pesticide related. WSDA refers all complaints of pesticide-

related illnesses to DOH. The Claims Administration Program of L&I provides information on all claims filed in which the words "pesticide", "spray" or "fumigate" are mentioned on a weekly basis. In addition, pesticide poisoning is a reportable condition requiring physicians or other health care practitioners to report all suspected cases. Such reporting may be made directly to DOH or to the WPC. Within 24 hours, the WPC refers all charts regarding patients seen by any health care provider (e.g., hospital, office-based physician, occupational nurse, out patient clinic) who reported being exposed to a pesticide or who had symptoms indicating pesticide poisoning (Figure 2).

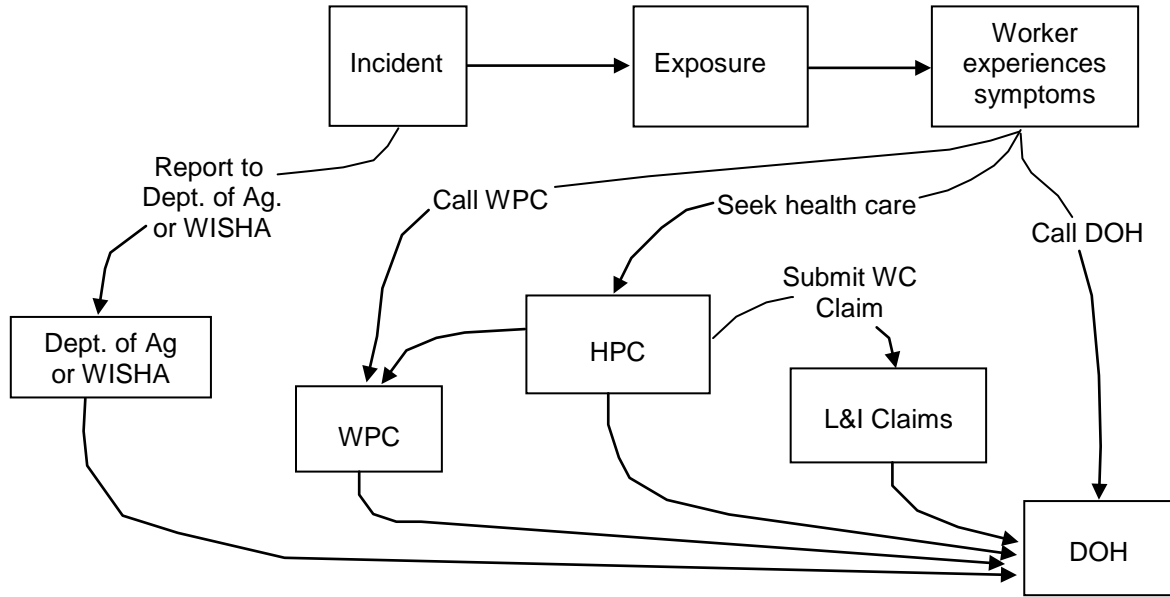


Figure 2: Reporting of Potential Pesticide Illness Cases to DOH

Once an incident is received by the DOH, it is initially reviewed and, if accepted as an incident, the case is then referred to an investigator. Most case investigations require, at a minimum, an interview with the injured party and witnesses, if needed; request for medical records and a request for spray records. Depending upon the circumstances of the case, biological and/or environmental samples are gathered. Following case closure, review and classification, data are entered into the Pesticide Incident Monitoring System. (PIMS) database.

The overall goal of this effort was to conduct a comprehensive assessment of PIMS and, based on this assessment, generate recommendations for improving the collection and use of surveillance data to better protect farmers and agricultural workers in the state.

Sources and quality of case report data

Introduction

The purpose of this effort was to document where case reports were coming from, the degree of overlap of these reports, and the quality of the data coming from each source. The case report data is used for two purposes: (1) to determine whether to open an investigation of that case; and (2) to provide sufficient information to conduct the investigation. The investigator needs to collect information about the exposure and the health effects in order to classify the cases according to the National Public Health Surveillance System Relationship Classifications (PIRT, 2003). Usually this entails interviewing the worker, gathering information from the applicator or grower about pesticide applications that may have lead to the worker being overexposed, and collecting information about clinical effects from the Health Care Provider (HCP).

Timeliness is one of the most important aspects of case report data quality. The longer the interval between the incident and reporting to DOH, the less likely samples of foliage or clothing can be collected to confirm exposure and the more likely that the interviewed worker will lack precision in their memory of the exact location of the incident, the day of symptom onset, or the products involved. For workers employed seasonally, late reporting may prevent DOH from locating the worker. Without information from the worker, it is almost impossible to assess the reasons why the worker was exposed: whether the worker read and followed the pesticide label, whether workplace safety practices were followed, and where the worker was at the time of the incident. On large farms, the exact location and date of the suspected incident is often required to identify the pesticides involved.

The completeness of the case reports is also very important. If a case report does not include valid information on the worker's name, and some means for contacting the worker (e.g., address, phone number), it delays DOH's contact with the worker. Similarly, without accurate information about both the worker and the HCP, it can be impossible to obtain clinic records. While the worker can usually identify their employer when contacted by DOH, having such information as part of the initial case report can assist the investigator when the worker is difficult to contact.

Approach

Since complete information about each of the sources of case reports was not reliably available from the PIMS database, we conducted a manual review of all cases where the exposure occurred while the person was on the job and the job setting was agricultural. There were 167 cases which met these criteria for the year 2000.

We compiled a list of data elements that we considered to be the most important for being able to conduct an investigation (Table 2), and determined which of those data elements had been provided by each case report. Timeliness of the reports was measured as the number of days between the day of exposure and the day the case report was received by DOH. In cases where there was no date of exposure, the date of first onset of symptoms was used.

Each case had already been assigned a Relationship Classification by the DOH Pesticide Surveillance staff. The Relationship Classification characterizes the strength of the relationship between the health effects and the exposure to pesticides. The categories are: definite, probable, possible, unrelated, unlikely, suspicious, asymptomatic, and insufficient information. These classifications were further collapsed into two groups: those for which the relationship with pesticides had been determined (i.e., definite, probable, possible, unrelated, unlikely and asymptomatic), and those where the relationship with pesticides had not been determined (i.e., insufficient information and suspicious). We examined the timeliness and completeness of data provided by each source of case reports, and assessed the relationship between data timeliness and whether the relationship of the case to pesticide exposure had been determined or not.

Summary of major findings

Overall there were 192 case reports for the 167 cases. L&I workers' compensation claims were the most important source of case reports, providing information for almost three-fourths of *all* pesticide illness cases among agricultural workers (Figure 1). There was some overlap, with about 14% of the cases (n=23) being reported by two sources, and one case being reported by three sources.

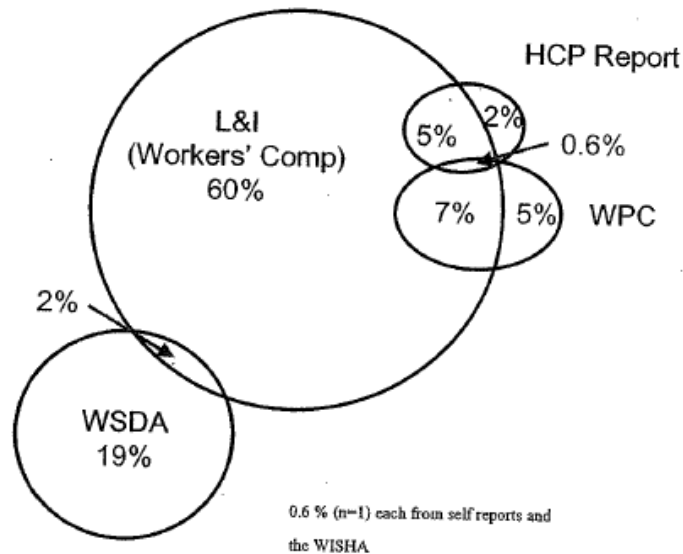


Figure 3. Sources of Reports to PIMS for the Year 2000

The timeliness of the report varied significantly by the source of the report (Table 1). While most of the cases reported by HCPs, WSDA and WPC were reported within five days, only about 2% of those from workers' compensation claims were reported this quickly. The majority of reports from the workers' compensation claims data took over 25 days to be reported to DOH. These delays likely result from a variety of factors including the time it takes the HCP to fill out and submit the Report of Accident (ROA) form, the processing of the ROA form, conducting the text search algorithm to identify potential cases, and transmitting those results to DOH.

Table 1: Timeliness of Case Reports, by Source of Reporting

| Time from Exposure to Report to DOH (days) | L&I (n=120) | WSDA (n=34) | WPC (n=20) | HCP (n=11) |
|--|-------------|-------------|------------|------------|
| <5 | 1.7% | 97.1% | 80.0% | 72.7% |
| 6-15 | 10.0% | 12.9% | 15.0% | 18.2% |
| 16-25 | 35.8% | 0.0% | 0.0% | 9.1% |
| >25 | 52.5% | 0.0% | 5.0% | 0.0% |

The completeness of the different types of information also varied by the source of reporting. Data submitted through the WPC always had the worker's name and very frequently included information about the HCP. This reflects the fact that over 90% of the cases reported by WPC were the result of HCP calls to WPC for information and/or to report the case. As would be expected, reports from WSDA were primarily about incidents and often did not include personal information about any potentially affected workers. However, this information was usually collected at the work site by DOH investigators.

Table 2: Completeness of Selected Data Elements in Case Reports, by Source of Reporting

| Data Element | L&I (n=120) | WSDA (n=34) | WPC (n=20) | HCP (n=11) |
|----------------|-------------|-------------|------------|------------|
| Worker Name | 100% | 29% | 100% | 91% |
| Worker Address | 100% | 26% | 5% | 45% |
| Worker Phone | 92% | 3% | 10% | 64% |
| Worker Age | 99% | 3% | 86% | 91% |
| Provider Name | 38% | 0% | 90% | 82% |
| Clinic Name | 86% | 0% | 95% | 91% |
| MD Address | 87% | 0% | 67% | 82% |
| MD Phone | 6% | 0% | 90% | 91% |
| Work Address | 80% | 32% | 10% | 55% |
| Work Contact | 45% | 32% | 14% | 27% |
| Work Phone | 80% | 32% | 10% | 36% |

Overall, the relationship between pesticide exposure and illness was determined for 56% of the cases (n=110); the remaining 34% (n=57) were classified as either "suspicious" or "insufficient information." Accordingly, 68% of the 192 case reports were about cases where the relationship between pesticide exposure and illness was determined, while 32% of the case reports were about cases where this relationship was not determined.

The timeliness of the case report was associated with the determination of the case. For case reports received within five days, 13% were, classified as "suspicious" or "insufficient information." The proportion of cases that could not be determined increased sharply as the timeliness decreased.

Table 3: Percent of Cases for which a Relationship to Pesticides was Determined by Time to Reporting Interval

| <u>Time Interval (Days)</u> | <u>% of Cases Determined</u> | <u># of Cases Determined</u> |
|-----------------------------|------------------------------|------------------------------|
| <5 | 86.5% | 51 |
| 6-15' | 56.3% | 9 |
| 16-25 | 62.2% | 23 |
| >25 | 47.1% | 24 |
| <i>Overall</i> | <i>65.6%</i> | <i>107</i> |

Completeness of data was not strongly associated with whether a case was successfully determined to be related to pesticide exposure.

Recommendations and actions

- Continue tracking all sources of case reports and periodically examine reporting patterns and timeliness.

Fields have been added to the new PIMS database to record all sources of case reports. Further, DOH is instituting a new module of PIMS which will electronically receive case reports from selected sources and electronically track and manage investigation decisions and assignments.

- Make efforts to improve the timeliness of case reporting, particularly for case reports stemming from Workers' Compensations Claim data.

DOH has been working with PC and L&I to institute electronic reporting of case reports. These reports will be delivered daily via secure http. The software application will allow DOH staff to sort and filter case reports, view details provided by the source agency, and document decisions regarding whether the report will be investigated. Both WPC and L&I have been instrumental in working with DOH to develop this system. L&I has been examining ways to identify potential cases using alternative text search strings and HCP-supplied ICD codes. This system should be operational by September 2004.

Under-reporting of potential pesticide illnesses

Introduction

The purpose of a pesticide illness surveillance system is to characterize the overall burden of acute disease resulting from pesticide exposure, identify work practices that are associated with overexposures, identify high risk groups for targeted intervention and evaluate the effectiveness of intervention efforts. The value of the surveillance data for addressing these needs is reduced if cases of pesticide-related illness are not reported to the surveillance system. First, the true burden of disease is under-estimated. In addition, missing cases makes it more difficult to identify those work practices that are associated with a higher risk of pesticide overexposure, as well as to identify those groups at highest risk.

Such under-reporting is of particular concern if there is a systematic exclusion or under-representation of one type of worker. While a general underreporting will reduce the statistical power to detect an association, a systematic exclusion of a type of worker or condition will lead to a selection bias, which can seriously affect the analysis of the data and which can not be remedied by simply analyzing more years of data.

There are two primary factors affecting whether a case is captured by the surveillance system. The primary means of case reporting is through HCPs. If a worker does not seek health care when he/she is experiencing symptoms they attribute to pesticide exposure, then the case will only be picked up if the incident is reported to WSDA or L&I (i.e. WISHA) or if the individual or a friend directly calls DOH or WPC (Figure 3). Based on our analysis of case reports to the Pesticide Program for 2000, approximately 78% involved the HCP. Virtually all the rest involved investigations of large incidents by WSDA. One case was reported directly by a worker or friend. As such, the health care seeking behaviors of workers when they feel they have symptoms due to pesticide exposure is a major determinant of case identification. Illnesses among workers who do not seek health care are much less apt to be investigated.

For workers who do go to a hospital or clinic when they feel ill, there are several ways that that potential case is reported to DOH. The hospital or clinic staff is required to report the case to DOH or WPC. If the case is not reported, it may still be identified if the doctor submits an ROA form to L&I to request reimbursement for the visit. All initial visits for illnesses or injuries attributed to the work place by the worker are covered by the state comprehensive workers' compensation system. These reports, however, will be sent to DOH for screening only if the HCP specifically mentioned "pesticide, insecticide, herbicide, fungicide, rodenticide, miticide, algacide, fumigation or fumigate, or spray) in the text describing the accident.

The goal of this part of the project was to explore the degree of under-reporting of pesticide-related illness by (a) gaining a better understanding of the healthcare seeking behaviors of farmworkers, and (b) estimating the proportion of identified occupational pesticide-related illness seen by health care providers that were captured by the Pesticide Program.

Healthcare seeking behaviors of farmworkers

Many factors can affect the completeness of data collected by a surveillance system (NIOSH, 2000b). Even in a system like that in Washington where workers' compensation is compulsory, cases are reported directly from workers' compensation claims, and agreements are in place to receive data from other sources (e.g., WPC, medical providers) observing a case is still largely dependent on a worker using the health care system. Workers, particularly those who are new immigrants or undocumented workers, may be less likely to seek medical care when they do suffer symptoms (NIOSH, 2000b). This was observed during an intensive application of a SENSOR surveillance program in an agricultural county in California (Maizlish, Rudolph and Dervin, 1995). Case patients were asked whether they knew of coworkers who had been exposed during the same exposure incident but who had not sought medical care. Approximately 40% of the cases indicated that they knew of coworkers who had been exposed but who had not sought medical care.

While such behaviors will have some impact on the overall estimates of the number of cases, it can have a very large impact on the perceived burden of disease among those special populations who are less apt to seek medical care or file for workers' compensation. In fact, these populations may be at highest risk as they may be less apt to have received training or

may not be able to understand oral or written pesticide safety instructions in English. Accordingly, the Workgroup studying the problems of hired farmworkers set as one of the top priorities the development of regional and local studies to obtain data from ill or injured workers who have not sought medical care (NIOSH, 2000b). NIOSH has made a similar recommendation for the collection of data "to identify individuals with pesticide illnesses who have not sought out health care and therefore have not been reported in surveillance systems" (GAO, 2000, p. 13).

Under-reporting

The most commonly cited concern regarding pesticide illness surveillance is the underreporting of cases. A GAO investigation in 1993 found that officials from all eight states which had specific pesticide reporting requirements believed underreporting to be a problem, and that no state was able to provide quantifiable estimates of the degree of underreporting (GAO, 1993). A recent follow-up report by the GAO concluded that the problem of underreporting "remains largely unaddressed" (GAO, 2000).

There are few studies of the degree of underreporting in the published literature. The Texas Department of Health assessed the degree of underreporting associated with their SENSOR program (GAO, 1993; Schnitzer and Shannon, 1999). Two years of hospital records and emergency department logs from 16 hospitals and 7 migrant clinics covering a nine-county area were reviewed and compared to the cases identified by their SENSOR surveillance system. Only two cases had been reported to the surveillance system for this area and time period. The chart review identified 10 cases, one of which was also picked up by the surveillance system.

While this indicates a very low level of sensitivity, the small total number of cases identified also indicates, the difficulty in capturing occupational pesticide exposures and/or poisonings when the system relies on worker contact with the health care delivery system.

As part of the National Occupational Research Agenda (NORA) effort, NIOSH convened a workgroup of experts to identify priorities for research, occupational health surveillance and research regarding hired farmworkers. This group identified and prioritized topics in the areas of surveillance, research and methods. Pesticides were ranked as the second most important area for surveillance, and the principle objective in this area was to "gather more data on the actual number and type of incidents involving farmworkers and to ascertain the level of underreporting" (NIOSH, 2000b).

Approach

Farmworker health care seeking behaviors

While it would be useful to estimate the proportion of workers who, when ill with symptoms they ascribe to pesticide exposure, actually visit a HCP, such a study was deemed not feasible for various reasons. First, this would involve either a prospective surveillance in the field, or a retrospective survey of farmworkers. It would be very difficult to carry out either kind of survey due to the difficulties in deriving a sampling frame for selecting a random sample, and then contacting the selected workers. Further, some of the most important questions would address attitudes and motivation: Why did you/would you go to a clinic? What would keep you from doing so? Such in-depth questions are more difficult to administer as part of a structured questionnaire.

Given these factors, we decided to explore the issue of healthcare seeking behaviors using focus groups. While we would not be able to select a random group of farmworkers for these focus groups, we would be able to gather a rich set of information about farmworkers views, actions and motivations.

Six focus groups were conducted during the summer and fall of 2001. The participants of the first four sessions were mostly "settled out"; that is, formerly inter-state migrant farmworkers who were now living year-round in the region. About half of the participants said that they traveled within the state for work. To ensure representation of migrant farmworkers who worked over a large area of the country, participants for the final two focus groups were recruited through the Enterprise for Progress in the Community and Migrant Head Start, programs located in rural Yakima County that provide services to inter-state migrant farmworkers.

At each site, two focus groups were conducted on the same day, one for female farmworkers and one for male farmworkers. Each focus group had about 10 participants for a total of 31 women and 33 men. All focus groups were conducted in Spanish. Joanne Bonnar Prado, a Public Health Educator with DOH, and Miguel Juarez, a community outreach specialist with the Fred Hutchison Cancer Research "Para Ninos Saludables" project in Yakima, co-facilitated sessions at the Employment Securities Department and the Migrant Education Program. Joanne Prado and Tito Rodriguez of the DOH Pesticide Program facilitated a session at Saint Joseph's Catholic Church.

Once participants were seated, the facilitators gave a brief, formal introduction covering the participation ground rules and the informed consent procedure. The facilitators explained the purpose of the focus group, how it would be conducted and, because this was a group, that it would not be possible to guarantee confidentiality. The facilitators reiterated that participation was voluntary, and that the participants should answer only those questions they felt comfortable answering. They asked each participant to avoid using actual names of workers or growers and agree to not discuss what was said outside of the group.

Facilitators received permission from the groups to audio record the sessions, with the understanding that the recorder would be turned off if requested and that facilitators would remain after each session should participants want to talk with the recorder off. The majority of each session was audio recorded, though discussion also occurred after the tape was off. Typically, each session had one or two people who spoke only while the tape was off. To avoid the creation of a written record that linked specific individuals to the recordings or transcripts, signed consent forms were not used. Instead, facilitators obtained verbal informed consent before the session began. An information sheet was used to guide the participants through the consent process. This study was reviewed and approved by the Washington State Institutional Review Board (DOH Project Application A-061600-H).

The content of the transcripts was systematically reviewed, and comments were categorized into one or more of the topic areas of the focus group guide. Comments which did not pertain to these structured topic areas (e.g., field sanitation, use of personal protective equipment) were categorized into new areas. The categorized comments were then reviewed by two researchers to further categorize them into subtopics and to identify major themes. No information about individuals was collected, and no effort was made to associate a comment with the participant who made it. For more information on the methods and results, please see *Learning from Listening: Results of Yakima Farmworker Focus Groups About Pesticides and Health Care* (Appendix 1).

Reporting of pesticide cases

This effort focused on Yakima County, which has had the largest agricultural production and the largest number of pesticide illness cases among agricultural workers of any county in the state. Records of all inpatient and outpatient encounters which had at least one of a defined set of ICD-9 CM codes were requested from the eight largest hospitals and clinics in the county for the period 1999 to 2001. The list of ICD-9 codes was compiled from the ICD-9 codes associated with workers' compensation claims where the case was determined by DOH to be a definite, probable or possible (DPP) pesticide-related illness. The conditions represented in the list included toxic effects from specific pesticides, dermal conditions, ocular conditions and injuries, selected allergies, asthma, and selected systemic conditions.

These data were compiled into a single consistent data set and reduced so each observation represented what was thought to be the first of any series of visits for a specific complaint. The first visits which had a pesticide-related ICD-9 code were then manually compared to PIMS data to identify those patient visits which were not captured by PIMS. Pesticide-related ICD-9 codes were defined as those which explicitly referred to a toxic effect of pesticides (i.e. 989.0 - 989.4) or referred to pesticide exposure as an external cause of injury (i.e. E863.0 - E863.9).

We requested and were given the patient records for those cases which did have a pesticide-related ICD-9 code, but which had not been captured by PIMS. These records were abstracted to determine if the complaint was due to an exposure while on the job and, if so, whether the work was in agriculture. These data were used to estimate the proportion of cases given a pesticide-related diagnosis code but which were not captured by PIMS.

We also met with the administrators and clinical supervisors from these institutions to discuss our preliminary results and to better understand their perceptions and practices surrounding reporting of potential pesticide-related illnesses.

Summary of major findings

Farmworker use of health care

With few exceptions, farmworkers who participated in these focus groups had a good understanding of symptoms of pesticide-related illness and routes of pesticide exposure. Many of the participants felt that they had experienced symptoms resulting from what they thought was exposure to pesticides while on the job. Few respondents said they had sought medical care because of these symptoms. Nearly all agreed that they would not seek medical care in the event of mild to moderate symptoms of pesticide poisoning.

The key barriers to seeking health care, when they thought they had been exposed to pesticides, were economic. The participants made it clear that they desperately needed the money they earned, and could not afford the loss of wages from taking time off to seek medical care. In addition, participants placed a very high value on having and maintaining their current job and feared that seeking medical care might put their job in jeopardy.

Fewer than half of the participants were aware that they were eligible for workers' compensation coverage. Most of those who were aware realized that their employer would be notified of any such claim. Most participants indicated that they were concerned that if they were to seek payment under workers' compensation and their employer was notified, they might be demoted to a more tedious, lower-paying position, be fired, or not be rehired the following season.

Another major barrier to the use of medical care was a general sense of dissatisfaction and mistrust of local health care providers for situations involving pesticide-related illness. However, they were very satisfied with the local health care providers and the services they provided. There appeared to be two facets to the sense of dissatisfaction with care for pesticide-related illness. First, many of these participants seemed to believe that health care providers in Yakima were more sympathetic to the position and needs of the growers and would not do anything to make growers uncomfortable. Many also felt that their health care provider had not seriously considered the possibility that their symptoms were the result of pesticide exposure.

The attitude of the supervisor or employer was also put forth as a reason participants would or would not seek medical care. Participants told stories of supervisors who insisted a worker go to a hospital or clinic, and other supervisors who discouraged workers from seeking health care.

The full results of the focus groups are presented in the attached report: *Learning from Listening: Results of Yakima Farmworker Focus Groups About Pesticides and Health Care* (Appendix 1).

Capture of pesticide-related illnesses seen by HCPs

The second aspect of this project was to estimate the proportion of pesticide cases which had seen a HCP that were captured by the Pesticide Program's surveillance system. Overall a total of 101,737 unique patient encounters were identified from the hospital data provided spanning 1999 to 2001. Each of these encounters included at least one of the pesticide-related ICD-9 codes or one of the codes that had been linked to DPP pesticide cases through the workers' compensation data.

Of these, 79,151 were considered to be a first visit, with the remaining 22,586 appearing to be follow-up visits. Overall 169 of the encounters had been coded with a pesticide-related ICD-9 code, that is, a code which explicitly referred to a toxic effect of pesticides (i.e. 989.0 - 989.4) or referred to pesticide exposure as an external cause of injury (i.e., E863.0 - E863.9). Of these, 116 appeared to be records of initial visits to the HCP, and the remaining 53 appeared to be subsequent appointments. We were able to find matching records in Pesticide Program's PIMS data for 42 of the 116 records.

We then requested medical records of the cases that were not found in PIMS. These records were manually abstracted to determine if the case was occupational, associated with agriculture, deliberate, and asymptomatic. We also noted whether there was a note indicating that the case had been reported to DOH or through another mechanism.

Five cases were follow-up visits from previous exposures or duplicate visits, leaving 111 records. Of the fifty-five cases involving agricultural workers, 30 had been captured by PIMS (54.5%). In three cases, there was a note in the medical record indicating that the case had been reported to either PIMS or WPC. With this adjustment, the Pesticide Program captured 60% of the eligible cases among agricultural workers.

In addition, for 11 other cases that were not found, there was an indication in the medical record that the case had been submitted to L&I as a workers' compensation claim. While submitting a workers' compensation claim does not constitute reporting of a notifiable condition, many of the cases captured by the Pesticide Program are through a review of these claims. This finding indicates that our current method for identifying cases using a text

search of the cause of injury reported on the ROA form may not be adequate to identify all potential pesticide-related illness cases. If these 12 cases had been identified and investigated by DOH, then 80% of the patient encounters for agricultural workers with a pesticide-related ICD-9 code would have been captured by PIMS, and 20% would have been missed. These represent cases that were not reported by the HCP to DOH, and for which an L&I Report of Accident form was not submitted.

Views from health care providers

Preliminary results from this analysis were shared in a series of meetings with representatives from health care facilities where pesticide-related cases had not been captured by PIMS. The purpose of these meetings was to discuss the findings and to learn more about HCP's understanding of pesticide-related illness reporting requirements, and barriers or difficulties they experienced with reporting. There was some lack of clarity on the exact reporting requirements and how to report. In particular, there was an understanding on the part of several staff that only confirmed cases of pesticide-related illness should be reported, and that suspected cases should not be reported. There was a clear understanding that submitting an ROA form and a workers' compensation claim did not constitute reporting.

A number of obstacles to reporting were mentioned. Newer physicians were considered less likely to be aware of reporting requirements. Cultural differences and language barriers between patients and HCPs frequently were felt to be obstacles to obtaining an adequate medical history. Lack of time at work to report, especially in emergency room settings, was cited as a problem.

The need for education of HCPs about reporting requirements and the types of illness associated with pesticide-related illness was a recurrent theme expressed by almost all participants. The majority of participants felt that DOH needed to increase awareness of the nature of pesticide-related illness and that education should also be carried out at both clinics and emergency departments (i.e. emergency rooms). Many meeting participants thought it would be a good idea to develop a small poster or display card to both remind and give information on reporting a pesticide-related illness. One participant suggested that the statement about pesticides poisonings on the DOH reportable conditions web page should be modified to include suspected cases of pesticide-related illness. A strong recommendation was made to target private physicians for educational efforts and that an effective way of reaching private physicians might be to have case investigators make an introductory visit to inform physicians about reporting requirements and the PIMS surveillance system.

Recommendations and future actions

Based on the results of this effort,

- Continue efforts to improve reporting of pesticide-related illness by health care providers. Focus efforts to clarify the types of cases which should be reported.
- Develop alternative means of reporting potential pesticide illness cases to reduce the time and effort required by clinical staff.

DOH is developing a system to electronically capture visits to selected hospitals and clinics that are diagnosed as a pesticide-related illness. This should increase the proportion of such illnesses that are investigated, and reduce some of the effort required on the part of the physician.

- Work with health care providers to better understand and address factors that may limit their credibility with farmworkers. Gather information from health care providers about the difficulties associated with diagnosing and treating patients with potential pesticide-related illnesses.
- Educate farmworkers regarding existing mechanisms for self-reporting of possible pesticide-related illnesses, unsafe workplaces, and incidents of perceived job discrimination resulting from the use of health care for job-related illness or injury.
- Raise awareness among growers, health care providers, involved agencies and other stakeholders about the barriers farmworkers face in accessing health care for pesticide-related illness.
- Improve the distribution of existing educational materials targeting farmworkers. Promote educational efforts among farmworkers regarding:
 - Their use of the workers' compensation system and the safeguards that protect their rights when they use the system.
 - The risks of pesticide exposure to workers who are not pesticide applicators and the requirements for PPE use under the Worker Protection Standard.
 - The difficulties and limitations in diagnosing mild to moderate pesticide-related illness.
- Examine the process of employer notification in the workers' compensation system to determine if changes need to be made to reduce any real or perceived threats to farmworkers' job security.
- Encourage timely and aggressive investigation of all complaints of job reprisals resulting from a worker's use of the health care system for a job-related illness or injury.

Processing and analyzing data

Introduction

From 1991 through 1999 the Pesticide Program used an Rbase 4.5+[®] (DOS) database located on a Novell[®] server at the DOH. The database is comprised of several codes tables and four basic flat file tables: Incident data, Claimant data, Pesticide data and Symptoms data. There were a total of 4,500 pesticide incidents and 6,800 claimant records in the database for cases investigated between 1991 and 1999. In 1999, the Pesticide Program identified a need to upgrade this system for three specific reasons. First, the existing Rbase system was not Y2K compliant and DOH had adopted database software specifications which limited the type of software which could be used for new database development. Second, the existing system required an in-depth knowledge of the variable coding and Rbase query language making it difficult for staff to access specific information. Third, many of the variables were not coded consistently with the current CDC/NIOSH data definitions and formats. The DOH Pesticide Program decided to begin a major overhaul of their database and formulated the following goals for the new database system:

- Simplify, standardize and centralize system administration by developing a single database, located on the Olympia DOH server, that supports all users, including staff located at Seattle, Yakima and other remote field sites. This database will use a software system that is supported by DOH Office of Resource and Information Management.
- Improve reporting functionality and quality of the data by developing menu-driven querying and analysis to enable the staff to easily produce results for PIRT and management reporting.
- Expand and revise the database structure so that the data are consistent with CDC/NIOSH standard variable definitions, coding, names and formats, and can be easily exported to NIOSH, EPA and the other SENSOR states in a standardized format.

Summary of major accomplishments

The new database has been operational since 2000. For the new database, DOH developed an SQL server database with a MS-Access® front-end interface. The Access interface allows for the use of drop-down pick lists to maintain consistency. The structure of the database was expanded to ensure consistency with the NIOSH variables and coding schemes. Washington data was successfully exported to NIOSH using SPIDER variable formats and definitions beginning in 2001. Several packaged queries have been developed to assist in the production of the PIRT yearly report.

Use of pesticide illness surveillance data

Introduction

The pesticide illness surveillance system serves two prevention functions. First, as cases are investigated, the investigator has the opportunity to directly educate the affected workers or other associated personnel about practices that may have increased their exposure to pesticides. Second, the body of data collected through surveillance is analyzed and combined with other data to assess trends, identify high risk groups and work practices, and develop and evaluate intervention strategies. While it is important to collect high quality data, and have the means for accessing and analyzing this data, there needs to be institutionalized mechanisms for identifying policy-relevant questions from stakeholders, analyzing data to address those questions, and disseminating those results to the stakeholder community. One of the objectives of this project was to enhance the value of the data collected by improving the analysis of PIMS data and expand the dissemination of relevant information derived from PIMS data.

Improving the usefulness of data begins with input from stakeholders, those who develop interventions, those who evaluate these interventions and those who, as employers or workers, are directly affected by these interventions. DOH and the PIRT Review Panel have the responsibility to assess the effects of pesticide exposure in the workplace, identify trends, issues, needs, and make recommendations for improved pesticide use practices. The Pesticide Program, the PIRT Review Panel and its stakeholders use PIMS data to assess trends in acute

pesticide illnesses and develop, implement and evaluate interventions. Stakeholders are also impacted by interventions developed and implemented based on PIMS data.

Approach

Individual semi-structured interviews with stakeholders, representing all groups with an interest in pesticide surveillance data, were used to:

- Assist in evaluation of the quality of data collected by the Pesticide Program and PIRT Review Panel.
- Enhance the utility of PIMS data and expand dissemination of program information derived from PIMS data.

The Pesticide Program staff identified organizations and individuals who might use PIMS data (or the PIRT Review Panel annual report) from the PIRT Review Panel interested party list, lists of participants at local and regional pesticide issue conferences, and program contacts. A total of 31 interviews were conducted in September and October of 2003. The interview list included HCPs, individuals associated with farm worker advocacy groups, environmental groups, agricultural groups, non-agricultural applicator groups, governmental interests (e.g., WSDA, U.S. Environmental Protection Agency, NIOSH), local health jurisdictions (LHJs), university researchers and individuals involved with pesticide safety outreach and prevention. Nineteen of the 31 individuals were interviewed in person, the remainder by telephone. Interviews, both personal and by telephone, lasted from 45 minutes to one hour.

Additionally, information was incorporated from 13 separate interviews conducted by Pesticide Program staff during a Western region agricultural safety and pesticide health conference in San Francisco. Those 13 interviews were done in person using a simplified instrument. The interviews focused on three components, the DOH pesticide program, PIRT Review Panel and the PIRT annual report. Questions focused on:

- Awareness of Pesticide Program components.
- Attitudes regarding the quality and benefits of each of the three components.
- Suggestions for improvement of the Pesticide Program, PIRT Review Panel and the data generated in their respective reports.
- Potential research/work area if funding were available.
- Pesticide data sources used by stakeholders in addition to PIRT Annual Report.

Although the survey was essentially qualitative, some quantifiable results were obtained. Where percentages are provided, they are based on those giving a response: individuals answering, "don't know" have been excluded. Percentages need to be treated with some caution because this was not a probability sample; however, they may have some usefulness in supporting qualitative findings.

Information collected from the interviews was presented to the DOH Pesticide Program and the PIRT Review Panel for their consideration and feasibility of implementation.

Summary of major findings

Virtually all of the respondents were familiar with the DOH Pesticide Surveillance program and with PIRT. While the investigative functions of the program were the most well known, most respondents were also aware of the outreach and education efforts. Overall most individuals interviewed thought the Pesticide Program and PIRT were doing a good job. However, when asked if they could grade the program only nine individuals felt they had enough knowledge of all aspects of the Pesticide Program to give a grade. Eight gave a grade of B or B+ and one a grade of D, due to the time lag between worker exposure and incident reporting to DOH.

Most respondents felt that the DOH Pesticide Surveillance program did a good job, particularly in investigating potential cases of pesticide-related illness. When asked what things the program should also be doing, or doing differently, there was a wide range of responses. The most common response was to reduce the time to produce the annual summary of investigation results. Several respondents also felt that DOH should increase its efforts at outreach and education for farmworkers, health care providers, and local health authorities. A number of specific suggestions for new or enhanced analyses were also offered. The full results of these stakeholder interviews can be found in Appendix 2.

Recommendations and actions

The specific recommendations provided by the stakeholders interviewed are presented in the full report (see Annex 1). The more commonly mentioned recommendations are listed below. For those recommendations where the Pesticide program has developed a plan of action in response to the recommendations, the planned actions are also listed.

- Improve timeliness of annual reports.

The Pesticide program has developed a plan for accelerating the processing of data and will publish both 2002 and 2003 case investigation data in the next PIRT report due out in the fall of 2004. The goal for subsequent years is to publish data no later than the fall of the following year.

- Publish a timelier 1-2 page summary of annual data/interim reports.

We will begin producing summaries prior to the annual report when preliminary data is available.

- Do more to market Pesticide Program.
- Increase awareness to LHJ's of Pesticide Program expertise.
- Re-institute county summaries for LHJ's.

The Pesticide Program will reinstitute the practice of periodically sending case summaries to LHJs. This will have the added benefit of increasing awareness of the pesticide program among LHJs. We will prepare summaries using combined data for the last 2-3 years as the first report. This will continue on an annual basis.

- Increase efforts to improve illness reporting.

We are developing systems to electronically deliver case reports of potential pesticide-related illnesses to us from WPC, L&I and selected hospitals and clinics.

- Speak out, be more proactive on pesticide reform issues.

We are evaluating the appropriateness and feasibility of developing program activities that address issues associated with long-term pesticide exposures and chronic health effects.

- Evaluate time spent on cases that have minor health effects and whether this time could be better used on other activities.

We have begun a process to evaluate the future scope of and priorities for PIMS. We are seeking input from the PIRT panel and other stakeholders.

- Identify ways Pesticide Program investigators can become a HCP resource.

We will evaluate the pesticide program's role in prevention and outreach, assess the current scope of our prevention and outreach, and plan for targeted prevention and outreach in the future. Increased emphasis will be placed on evaluating prevention and outreach activities. The scope of new activities will depend on availability of resources.

- Improve explanation of how the Pesticide Program defines (classifies) DPP cases.

Classifications are defined in the PIRT Report Appendix. We now also include classification criteria and an example of a case classification in the body of the report.

- Identify in reports how individuals were poisoned so WSDA can use in training.

We will evaluate the quality of data collected to date pertaining to cause and prevention of pesticide illness. We Will evaluate the feasibility of including this data in future PIRT reports.

- Minimize the number of unknowns as this is of concern.

We will evaluate the nature of unknowns in the PIMS database and establish strategies to reduce the number of unknowns.

- Make more attempts to find a denominator so as to show rates for number of illnesses.

We will work with L&I and NIOSH to identify appropriate denominators for the purpose of showing rates of pesticide illness among agricultural workers.

- Separate cases by different type of applicator licenses and work activities (e.g. commodity groups; landscape applicator v. PCO; non-licensed v, licensed).

We are evaluating the quality of data collected to date on certain variables, including applicator licenses and work activities.

- Do more to define the number of unreported cases.

We are working with DOH Office of Environmental Health Assessments to better understand issues associated with under-reporting and non-reporting.

Other recommendations from these stakeholders are included in the summary of the key stakeholder interviews (Appendix 2).

Other issues of importance

Other issues of importance have come to light in the process of carrying out this project. In particular, during the focus groups we asked the participants what issues were most important to them. In response the participants in these focus groups identified two issues: problems with field sanitation and the availability of adequate personal protective equipment (PPE). Many of the participants in these focus groups felt that all farmworkers should be provided gloves for all farm work. Many also reported problems with having access to water in the field for washing. There was also a great deal of concern about access to and the condition of sanitation facilities in the field. These farmworkers felt that, while most of the growers followed the regulations and provided the required facilities, there were a few growers who consistently did not follow regulations. Throughout the focus groups, the participants expressed frustration that the state did not inspect these 'bad actors' and force them to follow the regulations.

To address these concerns we recommend the following:

- ◆ Explore ways to better assure that farmworkers have access to clean drinking water, adequate water for washing, and sanitary latrines while working in the field.
- ◆ Employers should be encouraged to provide, at a minimum, clean gloves in good repair for any farmworker wishing to wear them while on the job.

For full details regarding these issues, see *Learning from Listening: Results of Yakima Farmworker Focus Groups About Pesticides and Health Care* (Appendix 1).

Hospital and clinic staff and administrators expressed concerns about payments for work-related illness from the workers' compensation system. Some staff reported that they often see patients who had been referred from other private physicians. Since this visit was not the initial visit, the visit would not be automatically covered under the workers' compensation system. There were also concerns that even initial visits were not being reimbursed, and the costs of these visits were significant. DOH was encouraged to get involved with a task force that was working with problems associated with the L&I worker compensation system.

Discussion and conclusions

The goal of this effort was to increase the value and effectiveness of Washington State's pesticide surveillance system by examining and improving the quality of data. This effort has been instrumental in making changes in the way that Washington collects, manages and analyzes its pesticide illness data. The main findings include:

- ◆ The vast majority of pesticide illness cases among agricultural workers are identified through the analysis of worker compensation claims.
- ◆ The timeliness of case reports is significantly associated with the ability to determine whether the case was related to pesticide exposure.
- ◆ Case reports identified through workers' compensation claims take significantly longer to be reported to DOH than case reports coming from other sources.
- ◆ There appears to be significant under-reporting of mild to moderate pesticide illness. A large proportion of farmworkers participating in our focus groups reportedly have not, and would not, seek medical care for mild to moderate symptoms that they attribute to pesticide exposure.
- ◆ The primary barrier to the use of medical care appears to be economic; farmworkers can not afford to lose wages to visit a doctor and feel that their job might, be put at jeopardy if they decided to visit a doctor for a job-related illness.
- ◆ Many farmworkers who participated in our focus groups were unaware of workers' compensation benefits.
- ◆ While these farmworkers were very satisfied with the health care they received from local providers, they were not satisfied with their experiences regarding symptoms they ascribe to pesticide exposure.
- ◆ There is confusion regarding the reporting requirements for pesticide-related illness and the definition of a pesticide-related illness among some staff at local hospitals and clinics.
- ◆ Reporting pesticide-related illness is felt to be difficult in the clinic and emergency department settings due to the time it takes and confusion regarding how and why to report.
- ◆ Clinicians and coders generally do not assign an ICD diagnosis code specific to pesticide poisoning if there is some level of uncertainty that the observed signs and symptoms were specifically a result of pesticide exposure: Many of the signs and symptoms are non-specific and can be due to other underlying causes.
- ◆ About 20 to 30 percent of pesticide-related illnesses among agricultural workers who file an L&I claim were assigned an ICD-9 diagnosis code that is specific to pesticide poisoning.
- ◆ Of those cases involving a HCP and assigned a pesticide-related ICD code, about 60% were captured by PIMS. Another 20% submitted a workers' compensation claim but were not in the PIMS data.

- ◆ Most stakeholders reported general satisfaction with the pesticide surveillance system and the organizations which direct and run the effort (i.e. DOH and PIRT).
- ◆ The primary concern of stakeholders and users of PIMS data is the timeliness of the annual reports.
- ◆ While many stakeholders reported using the data generated for general purposes, few specific purposes were mentioned. There were few requests for specific, new analyses.
- ◆ While exposure to pesticides continues to be an important issue to farmworkers, farmworkers in our focus groups were also concerned about a lack of hand washing facilities in the field, the condition of sanitation facilities in the field, the lack of PPE for farmworkers who are not directly mixing, loading or applying pesticides, and the small proportion of employers who they considered to be 'bad actors' and who they thought did not follow health and safety regulations.

As a result of these findings, the Washington State Department of Health has taken steps to address some of these issues, and is bringing these findings to the Pesticide Incident Reporting and Tracking (PIRT) Review Panel to begin a process of soliciting input from stakeholders and developing responses. Some of the immediate actions include the following:

1. DOH and L&I are working together to explore ways to better identify workers' compensation claims from cases of potential pesticide exposure, to improve the security of reporting, and to reduce the time from receipt of the Report of Accident form to the report to DOH. This includes the development of a system for electronic identification, review and secure transmission of potential case data from L&I to DOH.
2. DOH and WPC are working together to develop a similar system of case identification and secure, daily data transmission.
3. DOH is developing a system for receiving electronic reporting from WPC, L&I and, later this year, from selected hospitals and clinics. This system will allow for all case reports to be tracked and will document the disposition of each report. This system, as well as the components for electronic reporting, from WPC, L&I and hospitals and clinics, is funded by Washington's Environmental Public Health Tracking grant. The activities were included in the grant application based on the findings from this effort.
4. DOH has developed a management plan to reduce the amount of time it takes to produce its annual report summarizing pesticide-related illnesses.
5. Discussions have begun within DOH regarding new ways to conduct surveillance in order to generate data that are more relevant to developing prevention efforts.

The activities conducted as part of this three-year effort represent a significant expenditure of personnel time. While these efforts have yielded very valuable information, many states with pesticide surveillance programs do not have the resources to carry out these studies and analyses. Some of the activities that other states may consider doing without additional resources are:

- ◆ Reviewing the source(s) of case reports, the time it takes to report the case to the relevant entity, and the proportion of cases from each reporting source for which the relationship with pesticides can be determined. The results of such an evaluation may assist in motivating partners which provide case reports to look for ways to increase the capture of potential cases and reduce the time it takes to report cases.
- ◆ Conducting selected interviews with key stakeholders and data users to identify their data needs and their ideas on how to improve the value of the data collected.

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Appendices

Appendix 1

*Learning from Listening:
Results of Yakima Farmworker Focus
Groups About Pesticides and Health Care*

Learning From Listening: Results of Yakima Farmworker Focus Groups About Pesticides and Health Care

June 17, 2004
(revised on June 21, 2004)



For more information or
additional copies, contact:

Joanne Bonnar Prado, MPH (360) 236-3172

Jim Vanderslice, PhD (360) 236-3183

Office of Environmental Health Assessments
7171 Cleanwater Lane, Building 2
P.O. Box 47846
Olympia, Washington 98504-7846

Executive Summary

The usefulness of surveillance information depends on consistent reporting of suspected pesticide illnesses. In Washington, the Department of Health (DOH) usually learns about occupational pesticide-related illness cases because the worker visits a health care provider (HCP), and the vast majority of these cases are identified through a search of claims made to the state's workers' compensation system. Therefore, unless a worker seeks out health care for symptoms that they believe to be pesticide-related, there is little chance that the case will be investigated by DOH, making it more difficult to identify products or practices responsible for causing serious illness and injury. To better understand whether and when farmworkers utilize medical care for symptoms they believe are due to pesticide exposure, we conducted a series of six focus groups with approximately 60 farmworkers in Yakima County, Washington, during the summer and fall of 2001.

With few exceptions, farmworkers who participated in these focus groups had a good understanding of symptoms of pesticide-related illness and routes of pesticide exposure. Many of the participants felt that they had experienced symptoms resulting from exposure to pesticides while on the job. The symptoms most frequently mentioned were rash, dizziness, difficulty breathing, and coughing. Few respondents said they had sought medical care because of these symptoms. Nearly all agreed that they would not seek medical care in the event of mild to moderate symptoms of pesticide poisoning.

The key barriers to seeking health care were economic. The participants made it clear that they desperately needed the money they earned, and could not afford the loss of wages from taking time off to seek medical care. In addition, participants placed a very high value on having and maintaining their current job; they feared that seeking medical care might put their job in jeopardy.

Fewer than half of the participants were aware that they were eligible for Workers' compensation coverage. Most of those who were aware were skeptical that their costs of care would be covered, and expressed concern that their employer would be notified of any such claim. Most participants indicated that, if their employer was notified, they would be reluctant to seek payment under workers' compensation because of concerns that they might be demoted to a more tedious, lower-paying position, be fired, or not be rehired the following season.

Another major barrier to the use of medical care for symptoms occurring on the job was a general sense of dissatisfaction and mistrust of local health care providers, but only for cases of pesticide-related illness. There appeared to be two facets to this sentiment. First, many of these participants seemed to believe that health care providers in Yakima were more sympathetic to the position and needs of the growers and would not do anything to make growers uncomfortable. Many also felt that their health care provider had not seriously considered the possibility that their symptoms were the result of pesticide exposure. The attitude of the supervisor or employer was also put forth as a reason participants would or would not seek medical care. Participants told stories of supervisors who insisted a worker go to a hospital or clinic, and other supervisors who discouraged workers from seeking health care.

When asked what issues were most important to them, the participants in these focus groups identified two issues: problems with field sanitation and the availability of adequate personal protective equipment (PPE). Many of the participants in these focus groups felt that all farmworkers should be provided gloves for all farm work. Many also reported problems with having access to water in the field for washing. There was also a great deal of concern

about access to and the condition of sanitation facilities in the field. These farmworkers felt that, while most of the growers followed the regulations and provided the required facilities, there were a few growers who consistently did not follow regulations. Throughout the focus groups, the participants expressed frustration that the state did not inspect these 'bad actors' and force them to follow the regulations.

To address these issues, we recommend the following:

- Continue efforts to improve reporting of pesticide-related illness by health care providers. Educate farmworkers regarding existing mechanisms for self-reporting of possible pesticide-related illnesses, unsafe workplaces, and incidents of perceived job discrimination resulting from the use of health care for job-related illness or injury.
- Raise awareness among growers, health care providers, involved agencies and other stakeholders about the barriers farmworkers face in accessing health care for pesticide-related illness.
- Improve the distribution of existing educational materials targeting farmworkers. Promote educational efforts among farmworkers regarding:
 - Their use of the workers' compensation system and the safeguards that protect their rights when they use the system.
 - The risks of pesticide exposure to workers who are not pesticide applicators and the requirements for PPE use under the Worker Protection Standard.
 - The difficulties and limitations in diagnosing mild to moderate pesticide-related illness.
- Examine the process of employer notification in the workers' compensation system to determine if changes need to be made to reduce any real or perceived threats to farmworkers' job security.
- Encourage timely and aggressive investigation of all complaints of job reprisals resulting from a worker's use of the health care system for a job-related illness or injury.
- Work with health care providers to better understand and address factors that may limit their credibility with farmworkers. Gather information from health care providers about the difficulties associated with diagnosing and treating patients with potential pesticide-related illnesses.

In addition to problems associated with use of health care, these farmworkers forcefully expressed concerns with field sanitation, and a strong desire to have access to personal protective equipment for all farm work, not just for pesticide applicators. To address these concerns we recommend the following.

- Explore ways to better assure that farmworkers have access to clean drinking water, adequate water for washing, and sanitary latrines while working in the field.
- Employers should be encouraged, to provide, at a minimum, clean gloves in good repair for any farmworker wishing to wear them while on the job.

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Appendix B: Focus Group Guide

Appendix C: Washington State Institutional Review Board Approval Letter

Introduction

Since 1990, the Washington State Department of Health (DOH) has investigated and documented reported cases of pesticide-related illness and injury. The purpose of this program is to reduce the risks of pesticide-related illness by identifying the products, use practices, and situations associated with large numbers of cases, and those associated with serious illness and injury. The usefulness of surveillance information depends on consistent reporting of suspected pesticide illnesses: if only a small percentage of pesticide illnesses are reported to or identified by the surveillance system, it is more difficult to identify products or practices responsible for causing illness and injury. Many anecdotal reports, backed up by a small number of studies, indicate that only a small fraction of all pesticide-related illnesses are reported (1,2,3,4,5,6).

In Washington, health care providers (HCP) are required to report suspected cases of pesticide-related illnesses and injuries to DOH or to the Washington Poison Control center. Most occupationally-related cases, however, are identified by searching for potential pesticide-related illnesses among workers' compensation claims submitted to the Washington State Department of Labor and Industries (L&I). While individual workers may report suspected exposures or illnesses directly to DOH or to the state poison control center, less than one percent of occupational cases are identified this way. As a result, virtually all occupational cases investigated by DOH are initially identified because the worker made a visit to a HCP. Unless a worker seeks out health care for symptoms that they believe to be pesticide-related, there is little chance that the case will be investigated by DOH.

The purpose of this research was to gain a better understanding of the health care seeking behaviors of farmworkers and the attitudes and beliefs underlying these behaviors. This work was supported by a grant from the National Institute of Occupational Safety and Health (NIOSH Grant #3 U01-OH07296).

Methods

Key contact interviews

From March through June 2001, project staff interviewed several people who were knowledgeable of the farmworker community in the Yakima Valley, either through a long history of working with farmworkers, and/or because they were from Hispanic, farmworker families. The purpose of these interviews was to discuss and refine the ideas and questions to be used during the planned focus groups, and to identify organizations that could assist in recruiting farmworkers.

The initial key contacts included people within DOH, the Washington State Board of Health, staff from the Yakima County Health Department, and staff at the Title 1 Migrant Education Health Program. These contacts identified appropriate community-based organizations to assist with the focus groups, as well as other researchers working in these communities. These organizations and researchers were asked to provide input on the design and conduct of the focus groups, and to assist in recruiting farmworkers. Specific areas discussed during these interviews included:

- The risks of participation.
- Protection of participants' anonymity.

- The content and correct phrasing of questions.
- Characteristics of facilitators and facilitation styles to maximize participation.
- Methods for distributing the results.
- Organizations that are trusted and considered credible.

Researchers were particularly concerned about the risks posed by participation in such focus groups. Key contacts noted that, while there would be no way to ensure confidentiality, setting ground rules for participation and researcher conduct could help to minimize the risk. Several key contacts stressed that results of this work should be useful to local health care providers, farmworkers, and the agencies that protect the health and safety of farmworkers. They stressed the importance of listening, the need for appropriate distribution of results to all stakeholders, and the need to act on the study results. One way project staff responded to their concerns was to add a question asking the farmworkers what they would like DOH to do to protect and improve their health.

Focus groups

Participants were recruited through three community-based organizations: the Yakima Employment Securities Department, Saint Joseph's Catholic Church, Enterprise for Progress in the Community (EPIC) and Migrant Head Start programs. Contacts at these organizations invited potential participants to the focus groups. The only requirement for participation was that individuals identify themselves as currently employed or seeking employment as a farm laborer in the Yakima Valley. Contacts were instructed not to record the names of those recruited. Further, they were encouraged to recruit a variety of workers, not just those workers who had experienced problems with pesticides or the health care system. The contacts were provided an abridged version of the informed consent information handout that described the session and assisted them in answering questions from potential participants (see Appendix A).

Six focus groups were conducted during the summer and fall of 2001. The participants of the first four sessions were mostly "settled out;" that is, formerly inter-state migrant farmworkers who were now living year-round in the region. About half of the participants said that they traveled within the state for work. To ensure the representation of inter-state migrant farmworkers who worked over a large area of the country, participants for the final two focus groups were recruited through EPIC/Migrant Head Start, a program located in rural Yakima County that provides services to migrant farmworkers.

At each site, two focus groups were conducted on the same day, one for female farmworkers and one for male farmworkers. Each focus group had about 10 participants for a total of 31 women and 33 men. Joanne Bonnar Prado, a Public Health Educator with DOH, and Miguel Juarez, a community outreach specialist with the Fred Hutchison Cancer Research Center "Para Ninos Saludables" project in Yakima, co-facilitated the sessions at the Employment Securities Department and EPIC/Migrant Head Start. Joanne Bonnar Prado and Tito Rodriguez of the DOH Pesticide Program facilitated the session at Saint Joseph's Catholic Church.

Efforts were made to set a comfortable, friendly environment where participants felt they could speak safely. Food and beverages were provided. Children were welcomed and accommodated in an area with pillows, blankets and toys in the same room. Children were allowed to take home a toy of their choosing.

Once participants were seated, the facilitators gave a brief, formal introduction covering the participation ground rules and the informed consent procedure. The facilitators explained the purpose of the focus group, how it would be conducted and, because this was a group, that it would not be possible to guarantee confidentiality. The facilitators reiterated that participation was voluntary, and that the participants should answer only those questions they felt comfortable answering. They asked each participant to avoid using actual names of workers or growers and agree to not discuss what was said outside of the group.

Facilitators received permission from the groups to audio record the sessions, with the understanding that the recorder would be turned off if requested and that facilitators would remain after each session should participants want to talk with the recorder off. The majority of each session was audio recorded, though discussion also occurred after the tape was off. Typically, each session had one or two people who spoke only while the tape was off. To avoid the creation of a written record that linked specific individuals to the recordings or transcripts, signed consent forms were not used. Instead, facilitators obtained verbal informed consent before the session began. An information sheet was used to guide the participants through the consent process (see Appendix B).

To begin the session, a series of 8" x 11" photographs were used to tell the story of a farmworker who began feeling ill on the job. Facilitators then asked a series of questions in the third person about what the person in the story might do next. This technique enabled participants to begin discussing this topic at a comfortable distance, without referring to their own experience. This preliminary dialogue also gauged the participants' understanding of routes of exposure, pesticide illness signs and symptoms, and options for health care.

Following the story, the facilitators presented a series of structured questions for discussion (Appendix C). They used a written focus group guide to assure consistency between the sessions. The questions were designed to explore participants' experiences and attitudes about pesticide-caused illness as well as their use of health care services, and the conditions that affect their decision to seek or not to seek health care. The facilitators allowed the discussion to evolve, maintaining a neutral tone. They took all comments at face value, following up by eliciting further comments from other participants without agreeing or disagreeing with any assertions made by the participant. Consistent with accepted principals of focus group facilitation, the facilitators did not try to correct any factual misunderstandings on the part of the participants during the discussion part of the session.

At the end of each session, the facilitators briefly reviewed the topics covered and gave participants the opportunity to correct and expand on the topics discussed. Finally, a table containing a variety of educational and resource materials was brought to their attention, and the materials were briefly presented. This final period was not recorded. Facilitators answered questions that arose during the discussion and corrected misinformation regarding pesticide illness and health care that surfaced during the discussion. Contacts and referrals were given to participants who had specific concerns outside the framework of these focus groups. As an incentive, participants were given a \$35 gift certificate from a local grocery store.

The audiotapes were transcribed and then translated by a private translation service. The translator had some difficulty understanding parts of the tape where more than one person was talking or where the conversation was rapid. Consequently, there were some gaps in the written translation. The facilitators reviewed the transcriptions while listening to the recording and made corrections.

The content of the transcripts was systematically reviewed, and comments were categorized into one or more of the topic areas of the focus group guide. Comments which did not pertain to these structured topic areas (e.g., field sanitation, use of personal protective equipment) were mapped into new areas. The categorized comments were then reviewed to further categorize them into sub-topics and to identify major themes. No information about individuals was collected, and no effort was made to associate a comment with the participant who made it. However, each comment was given a code identifying the focus group session so that we could assess whether there were any differences between males and females or between participants recruited from the three community partners.

Direct quotes are used in the results to provide examples of the common themes and issues discussed by the participants. The quotes used were chosen to best represent the overall discussion of the group. When there were divergent views on a topic, quotes representing the different views are presented.

This study was reviewed and approved by the Washington State Institutional Review Board (DOH Project Application A-061600-H, see Appendix D)

Results

Knowledge of pesticide exposure and illness

With few exceptions, farmworkers who participated in these focus groups had a good understanding of symptoms of pesticide-related illness and routes of pesticide exposure. During the introductory story and in their responses to subsequent questions, participants demonstrated a very good understanding of the symptoms commonly associated with acute pesticide exposure. In each group of males, there were one or two farmworkers who could readily describe the signs and symptoms of acute pesticide-related illness. These participants tended to have had training and work experience applying pesticides.

Participants did not appear to have specific knowledge about the potential chronic effects of pesticide exposure; however, there were general concerns about cancer, birth defects, and poor birth outcomes. There were several comments demonstrating concern that some symptoms may occur years after chronic exposure:

"There was a gentleman who worked at a ranch, who did things with his hands without gloves. Now his hands tremble; the consequences come later."

Generally, participants also had a good understanding of the possible routes of exposure. They were particularly concerned about being exposed to residues while working in previously treated areas or from drift from nearby applications:

"If they are spraying right next to me and that guy has a mask and everything, why shouldn't I? Air moves you know."

Illness experiences thought to be due to pesticide exposure

When asked directly whether they, or someone close to them, had ever become ill due to pesticides at work, more than three-fourths of participants indicated that they had. Many

went on to describe specific events and symptoms. The symptoms most frequently mentioned were rash, dizziness, difficulty breathing, and coughing. Headache, eye and throat irritation, disorientation, and nausea were mentioned less frequently. Many of the respondents used the term "allergies." When asked what they meant, these respondents listed a wide range of symptoms including itchy, inflamed skin, head congestion, sinus problems, sneezing, asthmatic conditions, and other respiratory problems.

Accounts of these incidents included several plausible exposure scenarios. Some participants recounted stories of people becoming ill after eating unwashed fruit directly from the tree while working. They related this to the need for access to clean water for washing and drinking:

"... when one grabs an apple all of that (pesticide) comes off on your fingers. There is a lot, and one should wash one's hands, but there is nowhere to wash. When you scratch yourself you get itchy all over your body."

"They spray too much of that dust on the apple, a white dust, right? All this area (of my body) is itchy, like lye. I think it was the dust because sometimes I am picking apples and I have to eat lunch. But I can't wash my hands because there is no water there. They (the growers) don't supply water, so there is no chance of washing your hands. It is not my fault because if I want to make money, and if I eat lunch there, then it (the pesticide) can affect me during lunch. That is what happened to me ..."

Other respondents told of being exposed to pesticides during aerial applications:

"For me, it was my eyes. Every time I was thinning, my eyes were red. It was due to a sprayer plane. They did not tell us about it coming over. Later, after it finished its work, around 2: 00 pm, my husband's cousin began throwing up and throwing up and he still hasn't gotten better."

Some participants had stories about re-entering a site after an application:

"It can be a question of timing, because workers need to wait so many hours before going in. Sometimes they go in before that. The chemicals are bad. That is what happened to me."

Healthcare seeking and self-care behaviors

While many of the respondents were certain they had experienced symptoms resulting from pesticide exposure, few said they had sought medical care because of these symptoms. Further, there was near-unanimous agreement that they would not seek medical care in the event of mild to moderate symptoms of pesticide poisoning. They were far more likely to "wait it out" with the hope that they would feel better in a short while. Several participants recounted that when they felt nauseous, dizzy, or had a headache, they would rinse their head, face, and hands with water, perhaps take an aspirin or analgesic, and rest for several minutes. Usually this would help them feel better, and they would return to work:

"Well, one time I was picking peaches, and suddenly I felt awful and started to vomit. But that was only for a moment. Then I broke out in a cold sweat, for maybe 15 minutes, and then I was OK, and I went back to work. What did

you do to feel better? *Well, I just vomited and I was OK and went on picking. Then did you go to see a doctor? No I did not.*"

"No, I did not go to a clinic because I did not think it was a serious problem and because I am only a part-time worker in the field."

Many farmworkers reported using simple remedies to reduce the effects of symptoms. For example, many participants reported using creams, such as aloe vera, when they had rashes or itchy skin. Several participants reported that these symptoms returned when they returned to work. There was no mention of using alternative health care, such as traditional healers or "curanderos," and little mention of the use of herbal remedies or teas.

"I think that many of us do self-prescribing, and we take some home remedies, and we do not go to see the doctor. That is what has happened to many of us."

While a minority of these farmworkers indicated that they would seek out medical care for mild to moderate symptoms that they attributed to pesticide exposure, there was virtually unanimous agreement that if symptoms were life threatening, they would immediately go to the nearest emergency room. There was also a strong sentiment that they would encourage their family members or co-workers to go to an emergency room in such circumstances.

"The clinics are good for some things and not for others. Hospitals are better if one is really sick."

"But if you are really sick you have to go straight to the hospital; or to the clinic and they will transport you to a hospital. It is not worth dying for a job."

Factors affecting workers' use of medical care

Economic barriers

A major part of the discussion explored the factors that encouraged or discouraged workers from seeking health care when they did feel ill while on the job. In all groups, the key barriers to seeking health care were economic. There were several aspects to this. First, the participants made it clear that they desperately needed the money they earned, and could not afford the loss of wages from taking time off to seek medical care. Some participants expressed concerns about the distance from the worksite to a clinic and the lack of transportation. When participants did seek medical care, they reported waiting until after work, the weekend, or after harvest, so as not to lose their daily wages or miss work.

Second, participants placed a very high value on having and maintaining their current job. They feared that seeking medical care might put their job in jeopardy. Some felt that if they took time off to seek medical care, the crew leader might replace them with another worker to ensure a full crew:

"It's just too expensive (to miss work). Everything costs money. Time off work makes you look bad. We don't want to lose our jobs. I don't want my boss to know I'm complaining about things. We need that money. I cannot get laid off even for a little bit, no way."

The costs of health care and prescriptions were also frequently mentioned as a barrier:

"There are times when one is not in good shape financially. One does not have enough money for living, and when one feels bad, one prefers to endure the pain or the annoyance (of feeling sick) and avoid going to where it would cost a lot of money. That is why one does not go (to the doctor) to look after oneself, because of the bills one will get."

Employers in Washington State are mandated to have workers' compensation insurance.. Any initial visit to a health care provider is fully covered if the worker believes that they have a work-related complaint. Subsequent visits are also covered if L&I determines that the illness or injury was work-related. To receive payment, the HCP submits a bill to L&I along with a Report of Accident form and a workers' compensation claim to start the adjudication process. It is through this process that L&I determines whether the illness or injury was work-related.

Fewer than half of the participants were aware that they were eligible for this benefit. Of those who were aware, most were also aware that the employer was notified of any work-related claim made by a worker. Most participants indicated that they would be reluctant to seek payment under workers' compensation, if their employer were notified of the visit, because of concerns that they might be demoted to a more tedious, lower-paying position, not be rehired the following season, or be fired:

"The thing is that they (the employers) limit you to only two chances to see the doctor, and that is why you don't go. If you go three times, then you have to look for another job because you'll no longer have a job here. But there are different owners, some would say 'you can't go even if you have a problem.'"

"I think that some persons (farmworkers) don't understand (the workers' compensation system) and are afraid of being fired and losing their job."

"If a worker goes to the hospital or the clinic, you have to report where you work. They (the clinic) fill in a form and send it to the grower. I think that workers don't go to the doctor just so they don't lose their job."

Participants were not asked to divulge their residency status; however, many participants felt that residency status did impact a worker's decision to seek or not to seek health care. There was consensus that an undocumented worker would be much less likely to seek medical care than would a legal resident worker or U.S. citizen for fear of being deported.

"Many times it is just the fear of the owner - yes, fear of the owner. This is because they (the workers) don't have papers. They get nervous, and they don't want to go to the doctor."

"The persons who are weak [are the ones who don't go to the doctor]. And in a word, these are those people who are illegally in this county. The supervisor knows that saying something about that gets you in trouble."

There was also a general consensus among participants that undocumented workers would be less likely to bring up any kind of job-related concern to their employer. In several instances, participants noted that undocumented workers tended to have the least desirable jobs.

"It is those without papers who are punished. And if they do something wrong, they get fired. They don't complain, and they get the worst jobs because of that."

Attitudes about health care

Many of the participants expressed a general sense of dissatisfaction and/or mistrust of local health care providers in the diagnosis and treatment of illnesses and symptoms that the farmworker believed to be due to pesticide exposure. These negative sentiments seemed to apply only to health care experiences for occupational pesticide illnesses. With the exception of some complaints about waiting-time at clinics, virtually all participants expressed a high degree of satisfaction for the job that local HCPs did serving their other health care needs.

"I go (to a local clinic) for my blood pressure. Diabetes is in my family. I hope the kids don't get it. I've learned a lot of stuff there."

"It is a real help when I take my kids in. They treat us great."

For situations involving suspected pesticide exposures while on the job, however, many of these participants were skeptical that the practitioners were really "on their side." They seemed to believe that health care providers in Yakima were more sympathetic to the position and needs of the growers and would not do anything to make growers uncomfortable. As one woman commented, "They are in it with the growers."

From the ensuing discussion, it was clear that the reporting process used to reimburse doctors for work-related visits contributed to this attitude. Farmworkers who were aware of the workers' compensation system, pointed out to others, that employers would be notified of any claim submitted on an employee's behalf. This reporting mechanism seemed to support the pervasive belief that the physicians, in essence, were working for the employer rather than for the patient, leading to the belief that doctors were reluctant to diagnose farmworkers' symptoms as being due to pesticide exposure:

"One has to pay (out-of-pocket), otherwise the doctor will not say that the cause is due to pesticides. How do you give proof to the owner that you got sick because of the spray?"

"This is true because I heard a doctor's own words, saying to a person, 'I have to work with the State, and I don't want any problems with the State.' That is what a doctor said in a farmworkers' clinic. That shows you that if you go to a clinic, you'll never find out what is wrong with you."

"That is right, because the doctors and clinics are in agreement with the owners and L&I."

The few respondents who reported having sought medical care for mild to moderate symptoms expressed dissatisfaction with the care they received. They felt that their health care provider had not seriously considered the possibility that their symptoms were the result of pesticide exposure. For example, some recounted being told that their rashes were due to a lack of bathing or poor hygiene, that their headaches were due to stress, or that their breathing difficulties were due to seasonal allergies. Other workers spoke of being prescribed creams that "didn't work" or of coughing that didn't get better.

"They don't compromise themselves or the farmer. They just don't give you details. They don't say specifically (what was wrong). They say you are allergic and don't explain where it (the symptom) came from or how."

"In the case like when the pimples show up on your hands, they (the doctors) say, 'Who knows what it might be?' and they give you creams, and creams do not help anything, including the itching."

Some expressed a strong expectation that medical treatment would include a definitive diagnosis and a prescribed medication that would cure the complaint. As one man said:

"Some [doctors] say it is an allergy; well, what are we going to do with a (diagnosis of) allergy? We need treatment and not just for them to say it is an allergy."

In contrast to the feeling of dissatisfaction with care for minor to moderate symptoms, most participants had a great deal of faith in the ability of local hospitals to treat workers with serious, life-threatening problems.

A small number of participants had insurance coverage under the Washington Basic Health Plan, a state-funded program that provides subsidized basic health insurance for individuals and families up to 200% of the federal poverty level (7). These services are provided through contracts with health care providers. Those in the focus groups who had this coverage generally found it affordable. They were extremely enthusiastic about participating in this plan and even encouraged other participants in the focus group to enroll. They perceived one of the main benefits to be the ability to visit a physician at low or no cost without the knowledge of their employer. These workers felt that the physician was working for them and not for the employer, and seemed less reluctant to seek medical care if they felt ill while on the job.

While, many of the focus group participants lacked confidence in local clinics to treat pesticide-related problems, they were very satisfied with the care they received from the same clinics for other health problems. Most participants had used the local clinics serving farmworkers for their family's health care needs, and they spoke highly of the care they had received.

In response to specific questions regarding the aspects of clinics that would encourage or discourage their use, four main factors were cited by many respondents: paperwork, familiarity of the staff with the farmworker's community, bilingual staff and location. Paperwork appeared to pose a significant barrier to a substantial proportion of individuals. They were not comfortable with signing anything without thoroughly understanding the content and purpose of the document. A few participants spoke of their aversion to paperwork in general, and indicated that the requirement of filling out forms would discourage them from going to a clinic:

"... now I know more than before; I know where to go and how to fill the forms. That used to be what made me afraid, not knowing how to fill out the forms."

Having a bilingual staff and a convenient location were also mentioned as factors that would increase their predisposition to seek medical care if they felt ill. Opinion was divided on the value of using a clinic familiar to the farmworker community for work-related problems. While some respondents clearly trusted the local clinic systems, other respondents expressed

a preference for going somewhere where they could remain anonymous. As one participant commented: "I'd rather drive to Vancouver where they don't all know everyone."

Supervisor attitude

The attitude of the supervisor or employer was also put forth as a reason participants would or would not seek medical care. Participants told stories of supervisors who insisted a worker go to a hospital or clinic, and other supervisors who discouraged workers from seeking health care. In some instances, supervisors drove the ill worker themselves or assigned another worker to drive. According to participants, these actions were more apt to happen when a worker was visibly injured as a result of an accident (e.g., an injury resulting from a ladder fall), but happened less frequently in instances of pesticide illness. One woman spoke of her interaction with her supervisor as she and her friend worked sorting apples. Her friend became ill and she did not. She recounted how her supervisor seemed skeptical that her friend's symptoms were caused by pesticide exposure. "How can it be that some (workers) get sick and some don't?" he reportedly asked her.

Other farmworker concerns

At the conclusion of the session, participants were asked what other issues they thought were important and what they would like to tell the Department of Health and the State Board of Health about their conditions. In general, once a topic was introduced, most of the other participants expressed agreement with the original speaker.

Personal protective equipment (PPE)

Several participants were concerned about the availability of gloves and masks. As this was a topic that was brought up by the participants, the facilitators did not try to frame the discussion around which types of workers should be provided PPE under the Worker Protection Standard. Several participants held the view that every fieldworker-not just those working directly mixing or applying pesticides-should be provided PPE.

"We need protective gear, because we do not have it, in order to protect ourselves."

There were also concerns that the PPE provided was too old or dirty to be effective. Other respondents described situations where workers did not want to use the PPE because they felt it was too uncomfortable.

"There are a lot of people that do not want to use the equipment."

"They did not give us gloves or protection. We mixed powder with water to make a liquid, and then we poured it into the tank, and afterwards I felt itchy. They told us it was the dirt, but they would not tell you about the chemicals."

In contrast, other participants described situations where the provision and use of PPE was well institutionalized.

"It is a good requirement. It is also the same at the place where I worked around here. If I did not bring glasses, I did not work. Because they told us about what happened to them a few times, and we had a meeting where we signed (a form) and they gave you everything (PPE)."

"Where I work, they give us an apron and protectors, right? And away to plug one's ears because there is also a lot of noise. And some days they give you gloves, but they don't last, and one ends up buying them to protect oneself. "

Quality of training and protective information

There also was a wide range of experience in the type and quality of safety training received. As with the discussion regarding the use of PPE, the facilitators conducted "active listening" and elicited responses on this topic from other participants; they did not try to distinguish between training requirements for workers and those for handlers. Just as participants had spoken of employers who did a good job of providing PPE, participants also spoke of employers who did a good job of providing training:

"Where we work, in three different farms, they gave us some written forms and they showed us videos on how to protect ourselves. About how to deal with insecticides and how to use ladders, and several examples of self protection as a worker."

"You know what, they inform you directly, they play the video, and it explains in Spanish. "

"On some farms there have been videos for instruction. Yes, on some, before you go to pick fruit, you are shown a [video] and told about protection. They tell you and instruct you, here you cannot go in, or they show you a sign in Spanish and English..."

In contrast, other workers clearly felt that they had not received adequate training.

"Training, no I haven't received training, just very little information."

"In one case at work where he was spraying, nobody said anything to him but just go ahead and do it."

"The owner did not tell me and he did not explain or anything. I do know how to drive any machine... but I had never sprayed before. He told me it is easy, just do it this way. The owner did not explain anything to me. The important thing is what if a person does not have the training to do anything? The owner cannot force him to do it. They should respect a person's rights, even if he is a Mexican who cannot speak English or anything, but he is a person."

At the end of the session, facilitators pointed out a display table containing pesticide training materials used by the Washington State Department of Agriculture and DOH. Only a few of the workers said they had seen any of these materials. Participants also expressed a need for more widespread training on health and worker safety topics, legal rights of workers, including workers' compensation, and access to bilingual resources via a toll-free number for answering questions.

The most frequently mentioned trusted source of information for pesticide-related issues was a local Spanish language radio station, KDNA. Unions, Columbia Legal Services, and "some health people" were also referred to as trusted sources of information:

"We need to know this (information) and not just from anybody but from someone who knows what they are talking about and someone who cares whether we live or die. "

Field and camp sanitation

When asked what issues or problems they felt to be the most serious, many participants mentioned problems with field sanitation. Having access to water in the fields was mentioned by several participants, and there was a clear understanding of the importance of hand washing.

"Another is water in the field to drink and wash one's hands before eating while at work on the fields. One goes on working, handling the fruit, and ends up eating with contaminated hands, and that way it (the pesticide) goes in."

"And the water in those places is not enough; there is only a little bit of water."

"[The lack of water] is the cause of a lot of sickness. We need to wash our hands, right?"

There was also a great deal of concern about access to and the condition of sanitation facilities in the field:

"Many times they do not have the bathrooms. Where are we supposed to go? Once a gentleman needed to go to the bathroom and there was not even one there, so he just sat down and did his necessities there. He didn't even have any paper so he used grass and he had to go to the clinic; he was suffering allergy from the spray."

"What happens is that it takes up to four days to clean the bathrooms that are contaminated (dirty) and when you go into one you can't stand it due to the heat inside the bathroom. The bad odor makes you want to go away."

"Even if it [the port-a john] is clean on Monday morning, it doesn't mean by Friday it is still clean..."

Enforcing existing regulations

Throughout the discussion, there was a pervasive theme regarding "bad actors." While participants stated that many employers generally follow regulations, they stressed that there are also employers who consistently do not follow regulations. Most participants shared the perception that there was a group of employers who consistently did not provide basic facilities, equipment and training. These employers were apparently well known to participants. Further, participants felt that the State was doing nothing to identify these "bad actors" and enforce existing regulations.

"We know who they are and so do you. There are laws about this..."

"Everybody knows that for years they've [done this]. Nobody but undocumented new people will work for them. "

Discussion

Disease surveillance is crucial for identifying products and practices which put workers at risk of illness and injury (8). More than 75% of occupational pesticide illnesses are reported to DOH directly or indirectly as a result of visits to health care practitioners (9). Clearly the degree of underreporting depends on the proportion of affected workers who seek out medical care when they feel they have symptoms due to pesticide exposure. However, there have been surprisingly few efforts to investigate the factors that contribute to underreporting. To understand this behavior requires an understanding of the knowledge, perceptions and beliefs of farmworkers.

There was a clear consensus among the farmworkers in these focus groups that they would not seek medical care for mild to moderate symptoms that they believed to be due to pesticide exposure. While we are not aware of any other studies that have focused on farmworkers' responses to perceived instances of pesticide-related illness, such behaviors have been reported by health care personnel and farmworkers in other areas of the US (1,2,3,4,11). We are aware of only two surveys that have collected information on this topic. In an investigation of farmworkers in California who had confirmed pesticide exposures, 40% of these farmworkers reported that their co-workers had also been exposed but had not sought medical treatment (5). In a survey of 191 dairy farmers who were certified pesticide applicators, only 10% of those who reported feeling ill after using pesticides also reported seeking medical treatment (12). In Louisiana, only 52% of individuals who reported being ill due to pesticide exposure had visited a physician's office or emergency room (3). Even so, in 2000-2001 DOH investigated a total of 277 cases among agricultural workers and virtually all of these (>99%) involved individuals who were asymptomatic or who had mild illness.

Several studies have documented low usage of health care by farmworkers, particularly by Hispanic males (1,13,14,15,16,17). Many of the underlying reasons presented in these works are the same as those described by the focus group participants. The direct economic impacts from the loss of wages (1,2,4,14,18) and the cost for treatment due to a lack of insurance (4,13,18,19) are two of the most commonly cited barriers to the use of health care. The lack of transportation from the work site to the clinic (1,18,19) has also been identified, as well as the fear of deportation for workers who are not legal residents or who do not have work authorization (2,15). While we did not ask the focus group participants about their legal status, data from the National Agricultural Workers Survey indicate that more than half of the farmworkers in the US lacked authorization to work (19).

Employers in Washington State are mandated to have workers' compensation insurance, and the cost of the initial medical appointment for an injury or illness is covered by this insurance. However, many of the participants were not aware of this, which may have contributed to the inclination not to seek medical care in the event of a work-related illness. In California, only a third of the workers were aware that most employers were required to provide workers' compensation insurance, and half of those who saw a physician had paid out-of-pocket (13). However even those in this study who did know that their first visit to a doctor would be fully covered were reluctant to participate for fear of retaliation by their employer. Under the current Washington Industrial Safety and Health Administration (WISHA) system, farmworkers who enter a clinic or a physician's office will be asked if their injury is work related. If they respond "yes," employers are eventually notified of the claim. This notification is required by law (20, 21). Fear of the employer has been observed in several studies, and appears to impact not only health care seeking behaviors, but the worker's ability to follow safe work practices or to voice concerns about worker safety (1,4,6,11,16,22,23,24,25).

The farmworkers in this study also expressed some lack of trust and confidence in the willingness and ability of local health care providers to diagnose and treat pesticide-related symptoms. While they expressed a very high degree of satisfaction with the level of access and quality of care for other health problems, their concerns regarding retaliation seemed to extend to the medical community. The workers' compensation system reporting requirements seemed to underlie the farmworkers' perception that, in the case of pesticide-related illness, the physician works for the employer, not for the farmworker. This sentiment was also reported by Thompson, et al. (24) among farmworkers participating in focus groups and key informant interviews also conducted in Yakima County. These farmworkers also expressed the belief that doctors would not diagnose pesticide-related illness as being due to pesticides. While the universal workers' compensation program is clearly a significant benefit for farmworkers in Washington, this program was seen by many of the participants as part of the problem in that the employer was notified of any claim made for a work related visit to a HCP. Since such attitudes have not been reported by other investigators, they may be unique to this region, and possibly related to Washington's insurance program.

There was little confidence that the health care community in Yakima would effectively treat pesticide illness complaints. This attitude may be due, in part, to the inherent difficulty in diagnosing whether a relatively common symptom (e.g., dermatitis, nausea, headache) is pesticide-related (26,27). Communication between HCPs and farmworkers has been cited as a common problem due to both language barriers and cultural differences (3,13,14,15,17). However, many of the clinics serving this population have bilingual staff and long-standing relationships with the Hispanic community. Furthermore, any negative attitudes regarding health care providers did not appear to apply to medical care for other problems. Most of the participants seemed to be very happy with the care that their families received at local clinics for problems unrelated to their work.

This study did not ascertain the extent to which cultural underpinnings or traditional belief systems may be involved in the decision to "wait-out" mild to moderate symptoms, rather than actively seek medical care. Other studies have identified a number of factors that are associated with a higher probability of a person taking protective action, such as a sense of control, availability of information about protective actions, perceived benefits of the action, and experience and/or perception of past harm (28,29). For many of these farmworkers, the following factors would have discouraged the seeking of medical care: they did not have control over their ability to seek medical care for lack of transportation; they lacked information about the workers' compensation program; they believed that doctors could do little to treat their symptoms; and they believed they would lose wages and perhaps their job if they sought medical care. A study of Mexican immigrant farmworkers by Vaughan (28) found that many thought their employment opportunities to be very limited, and thus, that their occupational risks from pesticides were involuntary. The workers who held such attitudes were less likely to use protective measures.

As a lead-in to questions regarding their health-care seeking behaviors, we asked the focus group participants what they knew about pesticide exposures and effects, and whether they had experienced symptoms that they thought were due to pesticide exposure while on the job. Many of the focus group participants reported being exposed to pesticides and experiencing symptoms that they attributed to pesticide exposure while on the job, and most of the symptoms were consistent with those seen in confirmed cases of pesticide-related illness (30). However, the experiences described in the focus groups are simply the respondents' perceptions regarding symptoms they remember experiencing while on the job. Determining whether a specific episode of illness is associated with pesticide exposure requires a careful investigation by trained staff. Furthermore, as the question was designed primarily as a lead-in to the questions concerning the use of medical care, the question asked the participants about

any time they had felt ill and attributed the symptoms to pesticide exposure. As such, the duration of work experience that each person would be drawing from would likely be different.

While few surveys of farmworkers have asked about exposure and illness experiences, the available results are in general agreement with the responses of our focus group participants. A community-based survey of 571 farmworkers carried out in Yakima County found that 33% felt they were exposed to pesticides daily, and an additional 30% felt they were exposed "once in a while" (31). One-third reported daily exposure to contaminated clothing, and 29% reported daily exposure of skin. Twelve percent reported early re-entry into a sprayed field during the past three months (32). These farmworkers were also asked about symptoms they experienced in the past three months that they thought were related to pesticide exposure. The most commonly reported symptoms were burning eyes (27%), headache (20%), and skin rash (15%). The overall proportion of workers who reported at least one symptom thought to be due to pesticides was not reported.

A study of 191 dairy farmers in Wisconsin, who were also certified pesticide applicators, found that 32% reported dermal exposure and 32% reported inhaling pesticides during the last application (12). Twelve percent reported never, or almost never, using gloves; and 54% reported never, or almost never, wearing other protective equipment. Overall, five percent reported having felt sick after having used pesticides during the previous year; with an average of 2.8 episodes of self-reported illness. These farmers applied pesticides for an average of only 40.5 hours during the previous year.

A survey of 88 farmworkers in Colorado found that just under half believed that they had been sent into a field to work before it was safe to enter (33). Most of the farmworkers surveyed also reported symptoms of pesticide illness: just under half reported skin irritation, headaches, inflamed eyes, nose or throat irritation. Thirty-two percent reported vision problems, and 26% reported dizziness and weakness. Farmworkers interviewed as part of the California Agricultural Workers Survey reported slightly fewer symptoms, with about one-quarter reporting itchy eyes and 15% reporting headaches in the past year (13). In a small study of farmworkers in North Carolina, Elmore et al. (11) reported that most felt they were exposed to pesticides while on the job. They reported that they worried about the health effects of pesticides, but that they had to work. Vaughan (29) reported that 25% of the farmworkers interviewed worried frequently about the effects of pesticides, and an additional 32% worried "some of the time."

The workers who participated in the DOH focus groups generally understood the major routes of exposure to pesticides. Most investigators have found similar results (24,28,29,31). Some of the common misunderstandings about pesticide exposure found by other investigators include a belief that exposure only occurred when pesticides could be felt on the skin or tasted, that the skin was an effective barrier against pesticides, and that the effect that pesticides would have on an individual depended on that person's 'strength' (1,11,34). In this as well as other studies, most farmworkers appear to know the basic symptoms of acute exposures, but not potential effects from long-term exposures (1,11,24). In contrast, the study of Wisconsin dairy farmers found several to have strong beliefs in a link between pesticides and cancer (35).

When asked what issues were the most important to them, the participants in our focus groups discussed field sanitation and the availability of adequate PPE. Many of the participants in these focus groups felt all farmworkers should be provided gloves for all farm work. The Worker Protection Standard, developed by the US Environmental Protection Agency to control adverse exposure to pesticides, does not require gloves or other forms of

PPE be provided to workers who do not handle pesticides (36). Lack of PPE has been cited' as a concern among farmworkers in several studies (11,24). A recent review of inspections in California found that the majority of PPE violations were due to the employer not providing appropriate PPE or PPE in useable condition (37); in 12% of the cases the violation was due to a worker not using the PPE. In the Wisconsin study of farmer-applicators (12), 12% reported never or almost never using gloves, and 54% reported never or almost never wearing other protective equipment.

Field sanitation was the other issue of concern to these farmworkers, particularly hand washing facilities and the condition of toilets in the field. The US Department of Labor reports that nationwide 87% of farmworkers have access to toilets while working in the field (19); in other surveys this proportion ranges from 30% to 95% (13,32,38). No studies have addressed the condition of the toilets. The availability of water, soap and clean towels for hand washing appear to be more variable, with estimates ranging from 35% to 84% (10,13,19,32,33,37). Other investigators have also observed the reluctance of farmworkers, particularly those from Mexico, to wash their hands in cold water (34,38).

In this study, the farmworkers felt that most of the growers followed the regulations and provided the required facilities, while a few growers consistently did not. Throughout the focus groups, the participants expressed frustration that the State did not inspect these 'bad actors' and force them to follow the regulations. Poor enforcement of regulations has been cited as a concern of farmworkers in other studies (24).

In Washington State, there are over 35,000 farms* (39). Compliance with pesticide regulations and investigation of complaints regarding pesticide use, storage, or licensing is the responsibility of the Washington State Department of Agriculture (WSDA), while the responsibility of ensuring that employers follow workplace health and safety regulations lies with the Department of Labor and Industries. The Washington Industrial Safety and Health Act, Compliance and Consultation Division (WISHA) of L&I conducts inspections of workplaces in response to employee complaints and referrals from other state agencies and health care providers. They also conduct scheduled inspections and follow-up inspections after violations have been found. WISHA covers all employers, regardless of the number of employees. This is a broader mandate than OSHA, the federal Occupational Safety and Health Administration.

In 2001, WISHA conducted 27 inspections involving pesticides, eight in response to employee complaints and eleven as a result of a referral (30). Serious violations were documented during 21 of the 27 inspections, and 14 of these resulted in monetary penalties ranging from \$150 to \$28,400. Twenty-seven percent of the serious violations were decontamination-related (e.g., lack of soap, water towels, change of clothes or other supplies), 19% were respirator-related, and 15% were communication-related (e.g., no hazard communication training, no list of hazardous chemicals, no material safety data sheets).

During 2001, WSDA investigated 152 complaints regarding pesticide applications (30). Of these, 36 were complaints regarding human exposure, and all were responded to within 24 hours. Eighty-nine were from an agricultural setting. Of the 67 investigations that involved human or animal symptoms, substantiated pesticide use problems, or a violation of the worker protection standard (i.e., severity rating of 2 or higher), 25 resulted in a Notice of Intent to suspend the pesticide.-applicator's license and/or levy a fine for the violation. Two cases were referred to the EPA. Official Notices of Complaint were issued in 28 cases, while a verbal warning and an advisory letter were issued in one case each. In ten cases, WSDA felt that the situation did not warrant an official action.

* This only includes farms which had \$1,000 or more in sales.

Limitations of this study

Listening to approximately 60 farmworkers in a focus group setting yielded a rich slice of information about the risks and constraints they face as hired farmworkers. What makes these responses so valuable is that they directly illustrate the actual views and perceptions of these workers and their corresponding actions. The advantage of using focus groups is the ability to interactively explore topics in depth. The trade-off is that the people who participate are not randomly selected from all farmworkers, so they may not proportionately represent the views of this larger group. As such, the results derived from these focus groups may not be generalizable to the whole population of farmworkers in Washington.

We designed the study to elicit a broad range of experiences and attitudes by conducting several sessions, and by using three different community organizations to recruit participants. Furthermore, we worked closely with the contacts who were recruiting participants to maximize the diversity of participating Yakima Valley farmworkers. We wanted to make sure that we did not recruit only workers who had experienced particular problems with pesticides or concerns about the health care system. Nonetheless, the "Informed Consent" information was distributed to some potential participants. This mentioned that we would be discussing pesticides and health care during the session, which may have preferentially attracted people who were interested or concerned about these issues.

Relying on established institutions to recruit participants meant that participants were connected in a direct way to the institution. This could in turn mean such participants were more connected to the health care system than other new arrivals or other unattached individuals with no knowledge of, or connection to, established institutions. Our study most likely missed the most disenfranchised and migratory members of the farmworker population of Washington.

While this study was designed to maximize consistency between the groups, one of the focus groups was somewhat different from the rest. Just before a focus group for males began, supporters of the United Farmworkers Union held a rally directly across the street from the church where focus groups were held. Many of those who participated in the rally came to the church afterwards, wanting to participate. While some of these people entered and participated in the discussion, others were not allowed to enter when the session became full. Twelve people comprised a full session. It did not set a positive tone. After the facilitator's introductory comments about the purpose and process of the focus groups, and a brief discussion about why we needed to limit the number of people in the room, the attitude of the group improved. Transcripts from this session were compared with transcripts of the other sessions. No significant differences in content were noted, except that this group appeared to be more knowledgeable about specific pesticides, referring to "organophosphate pesticides" and "Ziram."

Conclusions and recommendations

It was clear from listening to these farmworkers that many of them experience illnesses they believe are due to pesticide exposure, but they are reluctant to seek health care for mild to moderate illness because of the costs, fear of job loss, and lack of trust in their health care providers in diagnosing and treating pesticide-related symptoms. Knowing that many farmworkers feel that they experience pesticide-related symptoms is important for improving communication between farmworkers and other stakeholders.

To address these issues, we recommend the following:

- Continue efforts to improve reporting of pesticide-related illness by health care providers.
- Educate farmworkers regarding existing mechanisms for self-reporting of possible pesticide-related illnesses, unsafe workplaces, and incidents of perceived job discrimination resulting from the use of health care for job-related illness or injury.
- Raise awareness among growers, health care providers, involved agencies and other stakeholders about the barriers farmworkers face in accessing health care for pesticide-related illness.
- Improve the distribution of existing educational materials targeting farmworkers. Promote educational efforts among farmworkers regarding:
 - Their use of the workers' compensation system and the safeguards that protect their rights when they use the system.
 - The risks of pesticide exposure to workers who are not pesticide applicators and the requirements for PPE use under the Worker Protection Standard.
 - The difficulties and limitations in diagnosing mild to moderate pesticide-related illness.
- Examine the process of employer notification in the workers' compensation system to determine if changes need to be made to reduce any real or perceived threats to farmworkers' job security.
- Encourage timely and aggressive investigation of all complaints of job reprisals resulting from a worker's use of the health care system for a job-related illness or injury.
- Work with health care providers to better understand and address factors that may limit their credibility with farmworkers. Gather information from health care providers about the difficulties associated with diagnosing and treating patients with potential pesticide-related illnesses.

In addition to problems associated with use of health care, these farmworkers forcefully expressed concerns with field sanitation, and a strong desire to have access to personal protective equipment for all farm work, not just for pesticide applicators. To address these concerns we recommend the following.

- Explore ways to better assure that farmworkers have access to clean drinking water, adequate water for washing, and sanitary latrines while working in the field.
- Employers should be encouraged to provide, at a minimum, clean gloves in good repair for any farmworker wishing to wear them while on the job.

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Appendices

Appendix A

Focus Group Information Sheet:
Pesticide Sickness

Focus Group Information Sheet: Pesticide Sickness

Researchers:

Joanne Prado, Public Health Educator
Lynden Baum, and Jim VanDerslice
Washington State Department of Health
PO Box 47846, Olympia, WA 98504
toll-free: 1-877-485-7316

APPROVED THROUGH
JUL 23 2002
DSHS/DOH Human
Research Review Board

Why Are We Doing this Study?

We are from the Washington State Department of Health. The Department is responsible for counting how many people get sick from pesticides. We also work to prevent people from getting sick from pesticides. We are concerned about pesticide illness among farmworkers. We are doing a study to learn what farmworkers do when they feel sick and why they go or don't go for health care. We hope this will help us to find out how many farmworkers are getting sick from pesticides.

We are asking you to take part in our study because you have been a farmworker. We plan to talk with both men and women who were farmworkers.

What Are We Asking You to Do?

We are asking you to take part in this group meeting with other farmworkers. During the meeting, we will talk about pesticide illness. We want to know about times when you or your friends have felt sick because of pesticides at work. We want to know if sick people got health care, and where they would go to get treatment. We want to find out what kind of symptoms people have when they get sick from pesticides. This *meeting will take about 1-1/2 hours*.

If everyone agrees, we will tape record the meeting so we won't forget anything that is said. We will write down what is on the tape and then destroy the tape. This will happen about two months after the meeting.

Are You Required to Take Part?

No. This study is completely voluntary. There won't be any penalties if you decide not to take part, decide not to answer questions, or leave the meeting early. You will not lose any services or benefits, no matter what you decide..

What Are the Benefits?

We will give each of you a \$35 gift certificate from Safeway for your time. We will pay you even if you decide not to take part, or don't join in our talk about each question.

At the end of the meeting, we will answer any questions you have about safe way to use pesticides and how to keep from getting sick. We will give you information to take home, if you wish.

What Are the Risks?

Some of the things we will ask might be hard for you to talk about. You might have bad memories about a time when you or a friend was sick. We have heard that sometimes a worker might be fired for going to a doctor when the worker feels sick from pesticides, or for talking about how pesticides are- used at a farm. To protect you from this, we will not ask for your names or tell any grower what you said.

How Will We Protect Your Identity?

We ask each person who takes part not to use any worker names or the names of any farm or grower. We ask everyone who takes part to keep private what we talk about and the people who are here today. But other people in the group might tell someone else what you say.

We will not tell your boss, any grower, or anyone else what you said or that you were here today. Only the researchers will listen to the tape.

If you use names during the meeting, we will not write them down or use them in any way. Our study reports will describe what people said in these groups, but we will not list names, or anything else that could identify any of the farmworkers who take part.

Who Should You Call if You Have Questions?

If you have any questions about this study or about your rights as someone who takes part, you can call the research team listed at the top of this sheet anytime toll-free at 1-877-485-7316.

Hoia de Informacio'n de Grupo de Enfoque: Afecciones por Pesticidas

Investigadores:

Joanne Prado, educadora de salubridad publica
Lynden Baum y Jim VanDerslice
Washington State Department of Health
P.O. Box 47846, Olympia, WA 98504
Telefono sin cargos: 1-877-485-7316

¿Por que efectuamos este estudio?

Somos del Washington State Department of Health (Departamento de Salubridad del Estado de Washington). El Departamento tiene la responsabilidad de averiguar que cantidad de personas se enferman debido a los pesticidas. Tambien nos esforzamos por evitar que haya gente que contraiga males debido al use de esos productos. Nos preocupan las afecciones causadas por los insecticidas entre los trabajadores agricolas. Estamos efectuando un estudio para descubrir que hacen dichos trabajadores cuando se sienten mal y porque buscan o no atencion para la salud. Esperamos que esto nos ayude a descubrir cuantos labriegos se estan enfermando debido a los pesticidas.

Le estamos pidiendo que tome parte en nuestro estudio porque ha sido trabajador agricola. Pensamos hablar tanto con hombres como con mujeres que hayan estado trabajando en el campo.

¿Que es to que le pedimos que haga?

Le solicitamos que tome parte en esta reunion de grupo con otros trabajadores agricolas. Durante esa reunion hablaremos de los males causados por los pesticidas. Deseamos saber cuantas veces se han sentido mal ustedes y sus amigos en el trabajo, debido a los pesticidas. Nos gustarfa averiguar si las personas enfermas obtuvieron atencion medica y a donde fueron a recibir tratamiento. Deseamos saber que tipos de sintomas experimentan las personas cuando tienen afecciones debidas a los pesticidas. La reunion durara aproximadamente hora y media.

Si todos estan de acuerdo, glabaremos en cinta la reunion para no olvidarnos de nada de to que se diga. Escribiremos lo que contenga la cinta y, luego, la destruiremos. Esto tendra lugar aproximadamente dos meses y medio despues de la reunion.

¿Se le exiqe que tome parte?

No. **Este estudio es completamente voluntario.** No habra ningun tipo de castigo si decide no participar en el, no desea responder a las preguntas, o abandona temprano la reunion. Sea to que sea que decida, no perdera servicios ni beneficios.

¿Cuales son los beneficios?

Para compensar su tiempo, le entregaremos a cada uno de ustedes un certificado de regalo de 35 dólares de Safeway. Le pagaremos aun cuando decida no tomar parte o **si no** participa en nuestra conversaci6n sobre todas y cada una de las cuestiones.

Al terminar la reunion, responderemos a las preguntas que tenga sobre modos seguros de utilizacion de pesticidas y como evitar enfermarse. Si to desea, le entregaremos informacion para que la lleve a su casa.

¿Cuales son los riesgos?

Es posible que les resulte dificil hablar de algunas de las cosas que preguntaremos. Puede que tengan malos recuerdos de los momentos en que ustedes o sus amigos se sintieron mal. Hemos oido decir que algunas veces los trabajadores pueden verse despedidos por ir a ver a un medico cuando se sienten enfermos debido a los pesticidas, o por hablar sobre como se utilizan esos productos en una propiedad agricola. Para protegerles contra esto, no les pediremos sus nombres, ni les informaremos a ninguno de los cultivadores sobre to que hayan dicho.

¿Como protegeremos su identidad?

Les pedimos a todos, los participantes que no usen nombres de trabajadores, ni los de granjas ni cultivadores. Asimismo, les pedimos a todos los que tomen parte que mantengan en confidencia los temas tratados y las personas presentes el dia de hoy. Sin embargo, otras personas del grupo podran contarles a otros to que dijeron.

No le revelaremos a su patron, a ningun cultivador, ni a cualquier otra persona lo que digan ni el hecho de que hayan estado hoy aqui. Solo los investigadores escucharan la cinta.

Si usa nombres durante la reunion, no los pondremos por escrito, ni los utilizaremos de ningun modo. En los informes de nuestro estudio se describira to que dicen las personas en esos grupos; pero no haremos listas de nombres ni de ninguna otra cosa que pudiera identificar a cualquiera de los trabajadores agricolas participantes.

¿A quien deberan llamar si tienen preguntas que hacer?

Si tienen cualquier pregunta que deseen hacer sobre este estudio o sus derechos como participante, podran llamar al equipo de investigadores indicados en la parte inicial de esta hoja, en cualquier momento y sin cargos, al telefono 1-877-485-7316.

Appendix B

Health Seeking Behaviors of Farmworkers
Experiencing Pesticide Related Illness
Focus Group Guide

Health Seeking Behaviors of Farmworkers Experiencing Pesticide Related Illness

Focus Group Guide

APPROVED THROUGH
JUL 23 2002
DSEHS/DOH Human
Research Review Board

1. SCRIPT, QUESTIONS, AND INSTRUCTIONS

1.1. Moderator introduction and purpose

Good Morning. Thank you all for coming. My name is Joanne Prado and I am from the State Department of Health. My assistant is Miguel Juarez from "Para Ninos Saludables" project in Sunnyside. We wanted to talk with you today because you are the experts when it comes to the health of farmworkers, at least when it is your or your families health. We'd like to hear what you have to say about how commonly farmworkers feel sick because of pesticides at work. We will hear also, about why you think farmworkers may or may not get medical care if they feel sick because of pesticides. The Health Department has a role in tracking and preventing illnesses caused by pesticides and by having you and other groups like this one in for discussion, we hope to more thoroughly understand the situations of farmworkers. and apply that knowledge to our work in tracking and preventing illness.

We want to give each of you a paper which describes what we will do today (pass out the Information Sheet) and I want to go over each part of this so everyone understands.

Read and go over each section of the information sheet. Ask for questions.

Now I would like everyone to promise not to tell anyone anything that is said during this discussion, today. *OK?" The facilitator will then see if everyone nods in agreement.*

Now I'm not able to remember everything that you will say today, so (assistant's name) will be taking notes. He won't be writing down your names, just your comments and ideas. If you want to look at his notes to double-check, you certainly can do that at any time. What usually happens though, is that we get into a good discussion with lots of people saying many things, so it is hard for him to write everything down. We'd like to record this discussion if everyone here would agree to that. If not, that is OK. We will use the recording to type all your comments, but we won't type any names. Then we'll destroy the tape so no one would know what you said. Would it be OK to record our discussion?

IF EVERYONE INDICATES YES, START TAPE RECORDER. IF ANYONE IS HESITANT, CHECK WITH THEM DIRECTLY.

Does anyone have any questions or concerns before we start? O.K. then, let's begin.

1.2. Opening question and presentation

OK so its (day) and were here at (location). First I'd like to ask about your work. What was the last job you had working in the fields? Who would like to start?

ELICIT A RESPONSE FROM EACH PARTICIPANT.

Purpose: Ice breaker, will identify common characteristics. Gives each a chance to participate right at the beginning.

1.3. Discussion Object

SHOW STORY BOARD OF A SCENE WHERE FARMWORKERS ARE IN THE FIELD AND THEY ARE BREAKING FOR LUNCH. AT LUNCH, ONE WORKER COMMENTS TO HIS COUSIN THAT SHE/HE IS NOT FEELING WELL. (Scene depicts female workers for female focus groups and male workers for male focus groups.)

So tell me. What do you see here? Why do you think this could be happening?

Purpose: to foster conversation and interaction from "a safe distance."

Yes, any one of those things could be happening with him/her. Supposing that the reason he/she feels bad is because they sprayed the trees earlier that day with a kind of pesticide that can make people in close contact; smelling and touching the tree branches, sick. What kinds of symptoms do you think he/she is feeling? (Probe lightly for possible symptoms.)

1.4. Key Questions

Have you or someone you know ever become ill because of pesticides from work?

Tell me about this.

What did you/they feel like? What kinds of symptoms did they/you have?

How long were they/you ill?

What did they/you do to feel better? Where did they/you go for help?

Did they/you go to a doctor? 1.4.1. Did seek medical care

IF SO: What happened when they/you went to the doctor?

What did the doctor tell you?

Did it help?

Did you have to pay for the visit?

1.4.2. Didn't seek medical care

IF NOT: Why didn't they/you seek medical care?

FACTORS TO EXPLORE:

SEVERITY OF ILLNESS
DISTANCE AND TRANSPORTATION TO HEALTH CARE
LANGUAGE / COMMUNICATION WITH DOCTOR OR CLINIC STAFF
FEAR OF IMMIGRATION AUTHORITEIES
FEAR OF RETALIATION BY EMPLOYER
ABILITY TO PAY
KNOWLEDGE OF WORKER'S COMP COVERAGE
KNOWLEDGE OR HEALTH EFFECTS (E.G. SYMPTOMS NOT SERIOUS
WILL GO AWAY)
ATTITUDES ABOUT TOUCHING IT OUT & NOT ASKING FOR HELP
(COMPLAINING AS A SIGN OF WEAKNESS)
USE OF ALTERNATIVE CARE, SELF-CARE

1.4.3. Prevalence of not seeking health care - mild symptoms

Would you say that most people who have some mild symptoms like (insert their wordy mild symptoms) may be caused by exposure to pesticides in the fields, would they go to a doctor or not?

And what would be the main reasons that they would not go?

1.4.4. Prevalence of not seeking health care-- severe symptoms

So if a farmworker had some severe symptoms like (insert their words for severe symptoms) would they go to see a doctor?

PROBE: What do you think; most people or not many?

What would be the main reasons that a farmworker would not go to a doctor when they felt really sick?

1.4.5. Attributes of accessible health care

If someone working in the fields around here felt sick for whatever reasons and wanted to see a doctor or other medically trained person, like a nurse practitioner or physician's assistant, what would you tell them? Where would you tell them to go?

Why there?

PROMPT FOR AND EXPLORE ATTRIBUTES/BA RRIERS AS LISTED ABOVE.

So those (use their words) might all be places where a farmworker could get medical care. (Prompt if not mentioned: What about emergency rooms around here?) Do you think that would be a good choice? Why or why not?

2. ENDING QUESTION

Well, that has about covered the main questions that I had for you. But tell me, suppose you could tell the head of the Department of Health and everyone on the Board of Health one or two things that need to happen so that farmworkers stay healthy, whatever it is, what do you want to say?

Purpose: Enable reflection. Allow for fuller input: Begin to bring closure to the discussion.

3. SUMMARY

GIVE SUMMARY OF THE MAIN POINTS FROM THE AREAS ABOVE, EITHER DIRECTLY OR CONTINUING ON WITH THE STORYBOARD.

Did I get this right? What did I miss that is important to know?

Purpose: Defines and checks the input and big ideas that emerged from the discussion

4. EDUCATION OPPORTUNITY

Ok now it is your turn to ask us questions. Do you have any questions about pesticides?

How many of you know about a worker's right to medical care coverage under the workers' compensation program? Let me explain...

Purpose: Correct misinformation. Provide information about resources.

5. CLOSING

Thank you all very much for your time. We have really learned a lot from you. Please have some food and stay awhile longer if you want. If you are interested in getting a copy of our final report of all (six) of the groups that we are doing, you can ask (LOCAL CONTACT) sometime after (August.) Or if you want me to send you a copy you can leave me your name and an address where I can mail it to you, and you'll get it that way. Here is my card with our toll-free number on the back. Thank you so much for your time. This has been so informative and lots of help.

ASSISTANT TURNS OFF TAPE RECORDER, LABELS TAPE.
ASSISTANT PASSES OUT GIFT CERTIFICATES. WRITTEN NOTES
ARE ON TABLE IF ANYONE WANTS TO VIEW OR QUESTION.

Moderator is prepared to receive comments or questions during this period and respond as needed (information, referral, other follow-up action.)
Moderator will make written notes of them directly after group has left.

Appendix C

Washington State Institutional Review Board Approval Letter



STATE OF WASHINGTON

DEPARTMENT OF HEALTH

Human Research Review Board • P.O. Box 45205 • Olympia, WA 98504-5205

RECEIVED
JUL 26 2001
DOH-HEALTH SERVICES
ENVIRONMENTAL

July 23, 2001

James A. VanDerslice, Ph.D.
Office of Environmental Health
Assessments P.O. Box 47846
Olympia, Washington 98504-7846

RE: DOH Project Application A-062201-H, "Health Care Seeking Behaviors of Farmworkers Experiencing Pesticide Illness"

Dear Dr. VanDerslice:

Your response to the issues raised by the Board was satisfactory, and therefore we have approved your proposal. Bill White, Assistant Secretary, Environmental Health, accepted the Board's approval recommendation and has extended final departmental administrative approval. Thus, you are free to proceed with your study as planned, using the amended study procedures negotiated with and approved by the Board.

Approval of this project is valid through July 23, 2002. A progress report will be required if your project continues past this date. Any proposed changes in study purposes, design or methods are subject to prior review and approval by the Review Board. You are required to submit a final report at the conclusion of the project. Your file will remain active until we have received this report.

Good luck with your project!

Sincerely,

Margaret Frederick, M.P.H.
Associate Executive Secretary
Human Research Review Board

Administrative Approval:

Bill White
Assistant Secretary
Environmental Health

cc: DSHS/DOH Human Research
Review Board A



Appendix 2

Results of Key Stakeholder Interviews on the PIMS and PIRT

Results of Key Stakeholder Interviews on the PIMS and PIRT

A. Introduction

In 1989, the Washington State Legislature established suspected pesticide poisonings as reportable condition and mandated the Washington State Department of Health (DOH) to investigate all such reported suspected pesticide poisonings. In response, the DOH Pesticide Program developed the Pesticide Illness Monitoring System (PIMS) data program and has statutory responsibility (RCW 70.104.030-060) for:

- Active investigation of all reported human suspected pesticide illnesses.
- Investigation of suspected cases of animal poisoning that may relate to human health.
- Reporting all suspected cases of pesticide poisoning to the PIRT Review Panel.
- Educating medical providers to recognize, medically manage, and report pesticide poisonings.
- Technical assistance and consultation regarding health effects of pesticides to physicians and other state and local agencies.
- Initiate all investigations within 48 .hours.

The Pesticide Incident Reporting and Tracking (PIRT) Review Panel was also established by the legislature in 1989 to serve as a scientific body and to coordinate among several state agencies that investigate pesticide incidents. PIRT is chaired by DOH but is an inter-agency body with statutory authority (RCW 70.104.070-090) to:

- Establish guidelines to centralize pesticide incident data from six agencies.
- Review and make recommendations for investigation of pesticide incidents
- Monitor agency response time to reports of pesticide incidents,
- Review pesticide incidents of unusual complexity,
- Identify inadequacies in law that result in insufficient protection of public health and safety and,
- Review, approve and issue an annual report to the Legislature.

In 2000, DOH was awarded a three-year grant from the National Institute for Occupational Safety and Health (NIOSH) for "Improving Data Quality in Pesticide Illness Surveillance". The specific aim of the grant is to increase the value of the information generated by Pesticide Program for designing interventions. One of the grant objectives was to conduct stakeholder interviews.

B. Purpose of Stakeholder Interviews

The DOH and the PIRT Review Panel have a responsibility to assess the effects of pesticide exposure in the workplace, identify trends, issues, needs, and make recommendations for improved pesticide use practices. The Pesticide Program, PIRT Review Panel and its stakeholders use PIMS data to assess trends in acute pesticide illnesses and develop, implement and evaluate interventions. Stakeholders are also impacted by interventions based upon PIMS data. The stakeholder interviews will be used to:

- Assist in evaluation of the quality of data collected by the Pesticide Program and PIRT Review Panel.
- Enhance the utility of PIMS data and expand dissemination of program information derived from PIMS data.

Information collected from the interviews will be presented to the DOH Pesticide Program and the PIRT Review Panel and for their consideration and feasibility of implementation.

C. Method (Stakeholder Interviews)

The Pesticide Program staff identified organizations and individuals who might use PIMS data or the PIRT Review Panel annual report from the PIRT Review Panel interested party list, lists of participants at local and regional pesticide issue conferences, and program contacts. Resources supported a total of 48 interviews conducted in September and October of 2003. A former staff member familiar with the Pesticide Program conducted 31 of the interviews. The interview list (See Appendix A) included health care providers (HCP's), individuals associated with farm worker advocacy groups, environmental groups, agricultural groups, non-agricultural applicator groups, governmental interests (e.g., Washington State Department of Agriculture, U.S. EPA, NIOSH), local health jurisdictions (LHJ's), university researchers and individuals involved with pesticide safety outreach and prevention. In addition this report includes comments from legislative staff members whose committees receive the PIRT Panel Report and staff from the Governor's Office of Financial Management. Information from 13 separate interviews conducted at a Western region agricultural safety and pesticide health conference in San Francisco are also included.

Staff recommended an interview format, which was used by the interviewer with the first five interviews. The format was then reviewed, modified and used for the remaining interviews. Nineteen of the 31 individuals were interviewed in person, the remainder by telephone. Interviews, both personal and by telephone lasted from 45 minutes to one hour. The 13 additional interviews conducted at the regional conference were done in person with a less complex survey tool. The interviews centered on three components, the DOH pesticide program, PIRT Review Panel and the PIRT annual report. Questions asked of stakeholders focused on:

- Awareness of Pesticide Program components.
- Attitude regarding the quality and benefits of each of the three components.
- Suggestions for improvement of the Pesticide Program, PIRT Review Panel and the data generated in their respective reports.
- Potential research/work area if funding were available.
- Pesticide data sources used by stakeholders in addition to PIRT Annual Report.

Although the survey was essentially qualitative, some quantifiable results were obtained. Where percentages are shown they are based on those giving a response: individuals answering, "don't know" have been excluded. Percentages need to be treated with some caution because this was not a probability sample and may have some usefulness in supporting qualitative findings.

Because of the different nature of the contact and familiarity individuals have with the Pesticide Program or the PIRT Review Panel the interviewer needed to make judgments about which questions to pursue with each individual.

D. Results

D1. Awareness of Pesticide Program and PIRT Review Panel

Individuals routinely involved in pesticide safety and health issues in Washington State are generally aware of the DOH Pesticide Program and the PIRT Panel and its annual report. The only exception was a county environmental health director who was new to Washington.

A conference sample of 13 non-Washington participants at a California Agricultural Health and Safety Conference in August 2003 found that three individuals were aware of the PIRT report. All three were involved with California Pesticide Worker Safety and Health Programs and only one individual indicated that they used Washington data.

Awareness of the components of the Pesticide Program varied among Washington stakeholders. All participants, except one, were aware of the investigative function. However, 80% were aware of outreach efforts to health care providers and only one of the four local health jurisdictions interviewed were aware of this aspect of the Pesticide Program. Most participants were aware of the Program's involvement with pesticide safety training as staff often present at pesticide health-related conferences and licensing/ re-certification programs. Only a few participants were aware of the program's participation in local health fairs, but most participants were not surprised that Program participated in this activity.

D2. Attitudes About Pesticide Program and the PIRT Review Panel

Overall most individuals interviewed thought the Pesticide Program and PIRT were doing a good job. However, when asked if they could grade the program only nine individuals felt they had enough knowledge of all aspects of the Pesticide Program to give a grade. Eight gave a grade of B or B+ and one a grade of D. The D grade was

based on the lag time between worker exposures and when the Pesticide Program becomes aware of the incident, which often precludes PIMS from obtaining biological or environmental samples to verify exposure. Similarly, only eight of 31 people interviewed felt comfortable grading the PIRT Panel, yet most of the 31 were aware of the PIRT Panel. Of those that provided a grade six gave the PIRT a 'B' and two gave it a 'C'.

D3. Utility of the Pesticide Program and PIMS Data

When interviewees were asked about what they thought Pesticide Program does well, most answers centered on the investigative phase. Generally all groups interviewed felt the Pesticide Program investigative phase does a good objective job. The quality of the staff was thought to be good and having bilingual investigators was a plus. Several of those interviewed mentioned the use of PIMS data on national issues and how it augments California data. The Pesticide Program was also perceived by several interviewees to work well with other agencies.

D4. Recommendations for the Pesticide Program and PIMS Data

When asked about improvements or augmentation of activities, the responses were quite broad and varied from doing nothing more to a list of items. The interest group to whom an interviewee belonged dictated what kind of changes and improvements they would like to see. Suggested recommendations and concerns are listed under three categories: Administrative, Outreach and Data. Where the recommendation occurred more than once this is indicated in parentheses following the recommendation.

D4a. Administrative: As with the PIRT Report more timely reports were the most often listed request. Several stakeholders also mentioned they would like to see short monthly reports.

- Improve timeliness of annual reports (8).
- Publish a timelier 1-2 page summary of annual data/interim reports (3).
- Do more to market Pesticide Program (3).
- Increase awareness to LHM's-of Pesticide Program expertise (2).
- Re-institute county summaries for LHM's (3).
- Decrease time lag in talking to farm workers about their exposures.
- Increase efforts to improve illness reporting.
- Mitigate the belief that there is some subjectiveness to case classification that could change with changes in personnel.
- Make more effort to ask about and follow up with other farm workers that may have exposure in addition to primary case.
- Investigators ask farm workers if L&I claim was filed and if they need assistance in filing a claim.
- Work/coordinate more with U of W and Fred Hutchinson programs and other groups (2).
- Be more proactive in looking for and verifying exposures (2).
- Speak out be more proactive on pesticide reform issues.

- Evaluate whether time spent on minor health investigations is best utilization of staff time.
- Evaluate the time the Pesticide Program spends on cases that have minor health effects and whether this time could be better used on other activities.
- Work towards better physician reporting.
- Explore use of Ameri-Corps volunteers to enhance outreach activities.

D4b. Outreach: A number of interviewees felt that they would like to see the Pesticide Program increase its educational and outreach activities for several groups.

- Increase prevention and education activities (3).
- Develop training session for LHJ's on toxicology of pesticides.
- Broaden information on Pesticide Program web site.
- Alert LHJ's and HCP's on potential risks with new products as they become available. Especially those that don't conform to what we've seen in past like the organophosphates.
- Increase educational efforts in the urban environment.
- Increase educational efforts with farm workers/users to report pesticide illness.
- Coordinate outreach efforts with more groups.
- Partner with farm worker educational programs.
- Increase HCP educational outreach (3).
- Include information in HCP education on chronic effects from exposure.
- Increase efforts with communities at risk from pesticide exposure (2).
- Increase outreach for HCP's on chronic effects from exposure.
- Identify ways Pesticide Program investigators can become HCP resource.

D4c. Data: The most common request pertaining to PIMS data is that several stakeholders would like to see more detailed breakdown of incidents (e.g. by commodity groups, type of licenses, etc).

- Compare DOH classification with workers compensation claims that are rejected.
- Improve understanding of "possible" classification, as this is not well understood currently.
- Improve explanation of how the Pesticide Program defines (classifies DPP) cases (3).
- List other agencies involved in the case with their case numbers and when opened.
- Identify in reports how individuals were poisoned so WSDA could use in training.
- Minimize the number of unknowns as this is of concern (2).
- Alphabetize summary of DPP cases by active ingredient vs. symptoms.
- Separate occupational cases from residential cases.
- Give separate section to "priority investigations" such as hospitalizations, deaths, clusters and poisoning despite following the label.
- Make more attempts to find a denominator so as to show rates for number of

- illnesses (2).
- Incorporate more epidemiological information (risk factors, demographics (e.g., work experience, etc.) into case report. Need more than just counting cases.
 - Separate cases by different type of applicator licenses and work activities (e.g. commodity groups; landscape applicator vs. PCO; non-licensed vs. licensed) (5).
 - Put case information on web site so others can do analysis of incidents (3).
 - Show the number of cases where the worker did not want the incident reported to another agency, particularly the Dept. of Labor and Industries.
 - Include activity of the individual in summary report.

D5. Potential Research Area if Funds Were Available

Survey participants were asked about areas of endeavor they would like to see the Pesticide Program undertake if funding were not an issue.

- Conduct more environmental monitoring in areas subject to drift and take home exposures (e.g. air monitoring at schools and migrant housing areas, sampling in migrant housing).
- Develop a matrix for pesticide exposures for HCP's (e.g. similar to the Lipid Screening Guide).
- Provide more diagnostic tools/ markers for non-organophosphate compounds.
- Conduct annual surveys to compare the number of self-reported pesticide illnesses with the number actual reported to the Pesticide Program.
- Collaborate with Calif. Rural Studies Program.
- Do more to define the number of unreported cases (2)
- Increase laboratory analyses to give more science and documentation to pesticide exposure and/or illness (3).
- Establish capability within DOH to provide pesticide analyses for the HCP.
- Conduct studies of packinghouse workers and their exposures to fungicides and fumigants.
- Have more Tito's and Mario's in eastern Washington.
- Produce more information on Multiple Chemical Sensitivity.

D6. Data Sources Use by Stakeholders

Individuals that participated in the survey were asked about sources they use for obtaining data. The intent of this question was to not only find out how many use the DOH/PIRT data, but what other sources are used of which we may not be aware. Approximately 55% of those interviewed used the PIRT data. What they were looking for depended upon the interest group they represented. Other sources that were mentioned multiple times were other state (mostly Calif.) pesticide data, WSDA, National Agricultural Statistics Service (MASS), L&I, Employment Security- Labor Market & Employment Analysis (LMEA) and American Poison Control Centers/Toxic Exposure Surveillance System (TESS).

D7. Utility of the PIRT Review Panel and its Annual Report

Only about 25% of survey participants felt comfortable grading the PIRT Review Panel. Several felt it did a good job of coordinating agency reporting and that the PIRT Panel was functioning the way it is designed. Interviewees believe the Report provides valuable information and felt the data presented was relevant to gauging reduction of pesticide incidents. One individual thought that because of its uniqueness it is remarkable that it exists. Several individuals liked the idea of the report presenting 5-year summaries as this helped to show trends. Also mentioned as with the PIMS data the PIRT report augments California data. The fact that the Report is on-line is important to those searching for particular types of exposures. The biggest concern with the usefulness of PIRT is the lag time in producing its annual report. This was a concern to numerous individuals and they would like to see a more timely report. A second area of concern was the inability of readers to easily determine which cases were investigated by more than one agency and to derive the number of separate individual events.

Approximately half of those interviewed like receiving the printed version of the PIRT report. The printed version was liked because of the document volume and as such, the printed version was easier to read. Some individuals also liked to tag sections for reference and some just like reading hardcopy vs. reading on-line. However most of those did indicate that they could print out the web version. The exception to printing the report was based upon printing costs for one interviewee. There were a few individuals who thought if it were possible they would like to receive short updates on case numbers during the year.

D8. Recommendations for the PIRT Review Panel and PIRT Annual Report

When asked about improvements or augmentation of activities for the PIRT Review Panel or the Report the responses varied from doing nothing to a list of items. Suggested recommendations are listed under two categories: Administration and PIRT Annual Report. Where the recommendation occurred more than once this is indicated in parentheses following the recommendation.

D8a. Administration: The top two recommendations were to produce a more timely report and present incident and illness numbers so the total number of each is easy to calculate.

- Make the report timelier (8).
- Present cases so individual can determine the exact number of incidents and which agencies overlapped on an incident (4).
- The Panel should be more pro-active regarding pesticide issues.
- Notify the 10-15 major commodity associations/ news groups (good fruit grower, capitol press, etc.) when reports are out. This would help spread the word.
- Provide case data on-line for access by researchers (2).
- Increase the reporting of ecologically related (spills and wildlife) incidents.
- Broaden the membership of the PIRT Review Panel to include industry.
- Provide more in-depth minutes of the PIRT meetings.
- Place each agencies data on respective web sites in same format so it could be

- more easily searched.
- Consider two versions of the individual incident reports, one with more specifics/details.

D8b PIRT Annual Report: The primary suggestion for improvement of the PIRT Review Panel Report was the recommendation by several individuals that there should be a paragraph that outlines the strength and limitations of the data. Recommendations by stakeholders are listed below:

- Give better foundation at the beginning of the report on the strengths and limitations of data (3).
- Show a sample of cases that were found to be Definite, Probable or Possible (DPP) by PIMS that shows time/date of when each agency became involved with the incident.
- Where DOH finds a case to be Definite and WSDA shows no violation occurred give more explanation as to how the incident occurred. This may show that label changes are needed.
- Break out the active ingredients by chemical class for reports (2).
- Use common chemical names.
- Be consistent in reporting age, gender and race.
- Explain better the differences between the severity classifications of PIMS and WSDA.
- In the narrative portion of the incident reports give more clarification as to what the person was doing when the exposure occurred.
- Compare the number of PIMS cases classified DPP with the L&I claims that were rejected and with clarification as to why.
- Provide discussion of chronic health effects, which are not presently discussed in the report.
- Present incident data by commodity groups (2).
- Show incident data by licensed vs. non-licensed applicator and types. Provide an alphabetical index at end of report (2).
- Make more use of trend data vs. individual year data for different groups. (2).
- Indicate in case reports whether samples were taken and the results.
- Broaden the documentation information on cases by including information documented from other studies and exposures (peer vs. non-peer reviewed).
- Show in individual case summaries which agencies were involved.
- Present individual case summaries chronologically rather than by date of receipt.
- Publish data from PIRT Annual Report more widely than just the PIRT report.
- Increase the attractiveness of the format of the PIRT Report.

D9. Office of Financial Management and Legislative Staff Recommendations on Improvement of the PIRT Panel Report

- A report in April that would include incident and activity data for previous year, plus analysis of that data.
- Change content of the executive summary of the PIRT Report to provide a quick overview of key statutory expectations of PIRT. Within the Executive summary include:

1. Table that shows response time performance for each agency.
 2. Combined agency table that summarizes each agencies activities.
 3. Information on key trends/issues/needs summary and recommendations for changes in law or pesticide use practices.
 4. Summary of workplace exposure assessments.
 5. Summary of PIRT activities.
- Section on what agencies are doing differently in terms of new or changed policies, programs or procedures as result of data compiled.
 - Comparison to other states to indicate whether we are doing better, worse, or about the same.
 - Assignment of a single identifying case number to be use by each agency so exact number of incidents is known.
 - Incident rates per number of people, etc. so there is some indicator of the significance of the problem.
 - Standardization of data components across agencies.
 - Include data summaries in PIRT Annual Report Appendix D for Ecology and WPC.
 - Presentation of data (amount of space) should be proportional to number, severity and risk of cases involved.
 - Report to be more useful should answer the following:
 1. What is the number, nature, risk and extent of harm from pesticide incidents?
 2. Who is affected?
 3. What caused the incident?
 4. What is estimated extent and nature of unreported incidents?
 5. What policy, procedural, programmatic, or budget changes have already been implemented, or are needed to reduce the risks from pesticides?
 6. What tools and activities do agencies have to prevent or lessen the harm from pesticide incidents?
 7. How effective are the tools?
 - Stressed need to produce legislative summary by Feb. of each year.
 - Place full report on web site only and do not print to reduce cost and time.

Appendix 3

List of Key Stakeholders Interviewed

List of Key Stakeholders Interviewed

Agricultural Grower Representatives

Washington Growers League / Executive Director
Washington Hop Growers / Administrator
Washington State Farm Bureau / Safety Director
Washington State Pest Control Commission / Director
Washington Friends of Farm and Forest / Executive Director

County Health Departments

Grant County Health District / Director of Environmental Health
Public Health Seattle King County / Mgr. Hazardous Waste Program
Thurston county Health District / Supervisor, Hazardous and Solid Waste Program
Yakima County Health District / Supervisor, Solid Waste/Chemical& Physical Hazards

Environmental Groups

Washington Toxics Coalition / Pesticide Staff Scientist Northwest
Coalition Alternatives to Pesticides / Researcher

Farm Worker Representatives

Columbia Legal Services /Advocacy Coordinator
United Farm Workers of America / Regional Director
Farm Worker Pesticide Project / Executive Director (A non-profit organization on promoting pesticide reforms on behalf of farm workers)

Governmental Agencies

National Institute for Occupational Safety and Health / Coordinator, Pesticide Illness and Injury Surveillance
U.S. EPA Pesticide Program / Health Statistician
U.S. EPA Region X / Worker Protection Standard Coordinator
Washington State Department of Agriculture / Mgr. Certification and Training

Health Care Providers

Columbia Valley Community Health Center / Medical
Director Mattawa Community Health Center / Physician
Yakima Valley Farm Workers Clinic, Toppenish / Physician

Non-Agricultural Applicators

Washington State Pest Control Assn. / Executive Secretary
International Pesticide Applicators / Washington Tree Service, Mgr.

Universities (Outreach and Prevention)

Washington State University Cooperative Extension / Grant County Area
Extension Educator
Washington State University Cooperative Extension / Pesticide Education Coordinator
Fred Hutchinson Cancer Research Center / Community Intervention Investigator "For
Healthy Kids!" project
Eastern Washington University Center for Farm Health & Safety / Project Coordinator

Universities (Research)

University of Washington / Professor of Environmental and Occupational
Health Sciences, Industrial Hygiene & Safety Program
Director, Pacific NW Center for Agricultural Safety and Health Center, University of
Washington School of Public Health and Community Medicine / Professor of
Environmental and Occupational Health Sciences, Toxicology Program / PIRT
Member and Toxicologist
Washington State University Food & Environmental Quality Lab / Researcher

Others

Washington Poison Control Center / RN (Certified Poison Information Specialist)
Work Group on Pesticide Safety and Health / Director and PIRT Member

Additional Interviews conducted by Office of Environmental Health and Safety Staff

Washington State Senate Republican Caucus /Staff
Washington State Senate Agriculture Committee /Staff
University of Washington, Environmental & Occupational Health Sciences / Manager
University of California, Davis / Staff Research Associate
University of California, Davis / Pesticide Safety Educator
University of California, Davis / Environmental Toxicology / Research Assistant
University of California, Davis / Pesticide Training Coordinator
University of California, Davis / Pesticide Safety Educator
California Office of Environmental Health Hazard Assessment / Toxicologist
California Department of Pesticide Regulation, Worker Safety & Health / Branch Chief
University of California, Davis / Area IPM Advisor
California Department of Food and Agriculture / Inspector-Biologist
NIOSH, Program Analyst
University of Washington, Graduate Student
University of Hawaii, IPM Pesticide Risk Reduction and Safety Training Coordinator
National Farm Medicine Center, Wisconsin / Medical Director
Zenith Insurance Company / Director for Safety and Health