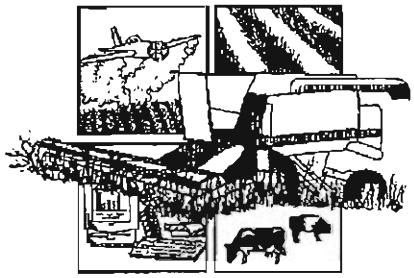

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Project Title:
"Hispanic Farmworker's Interactive Plays"

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Abstract
Hispanic Farm Workers Interactive Plays

The purpose of this community-based project is to provide health education and farm safety training to Hispanic farm workers and their families living in Walla Walla, Benton-Franklin and Yakima counties. This research was developed around the assumption that theater is an effective method for providing farm health and safety education to Spanish speaking agricultural workers. The hypothesis being tested is, "appropriate farm health and safety knowledge increases as a result of attendance at a one-act Spanish play enacted by a community players group."

The most urgent health and safety education needs were identified by a series of focus groups and key informant interviews. The data gathered was used to develop four Spanish one-act health and farm safety plays. Twenty play performances were presented across the three county region of Eastern Washington that is most densely populated by Hispanic seasonal and migrant farm workers.

The project tested the effectiveness of theater as an educational tool, identified the nature and extent of barriers to providing this type of education, and an evaluation of the perceived effects of the project on the community. It compared settings of plays and the effects of environment on retention. Finally, two methods of dissemination were addressed.

The one act plays are enjoyed by the Hispanic community and increase workers' awareness of health and safety issues. The plays are the most effective in community event settings. However, dissemination is a problem due to the cost and/or time commitment in producing the plays.

Hispanic Farm Worker's Interactive Plays
Summary Report

Introduction

The Center for Farm Health and Safety at Eastern Washington University received funding to test theater as a medium for distributing important farm health and safety information to Hispanic migrant and seasonal farmworkers in a three county region of Eastern Washington. The intent of this summary report is to provide NIOSH with an outcome and process evaluation of the three distinct phases of the project.

The Phase I Community Setting and Phase III Dissemination were funded by the National Institute for Occupational Safety and Health. The program was so well received in the community that an additional year, Phase II Work Setting, was funded by Washington State Department of Labor and Industries.

Each of the specific aims of the project are addressed in, "Hispanic Theater Evaluative Assessment Report," in appendix A of this summary. This independent evaluation of Phase I, II and III, was funded by the Pacific Agricultural Safety and Health/NIOSH Center at the University of Washington. Additional findings from the Phase I Community setting may also be seen, in Appendix B, in the forthcoming publication, "Theater as a Mechanism for Increasing Farm Health and Safety Knowledge," (Elkind, Pitts & Ybarra, 2000).

Significant Findings

Phase I - Community Setting

To provide data for the evaluation of the plays, participants were asked to complete a pretest prior to viewing the play and an identical posttest immediately afterwards. The pre/posttests were designed to measure changes in knowledge, attitude and reported behavior. All of the 301 completed pretest-posttest questionnaires were tabulated. Of these, 185 were farm workers and 115 were non-farm workers. Responses were analyzed for the whole sample and then separately for farm workers and non-farm workers. See Tables 1, 2, and 2.A in the Hispanic Theater Evaluative Assessment Report, Appendix A. for statistical findings for all participants.

During this phase of the project we tested the null hypothesis, "no increase of appropriate farm health and safety knowledge occurs as a result of attendance at a one-act Spanish play enacted by a community player's group." It was necessary to reject the null hypothesis because 13 of 17 questions designed to measure information directly from the plays demonstrated a significant degree of positive knowledge change (p .10). Table 2.A in the Hispanic Theater Evaluative Assessment Report, Appendix A, demonstrates the mean positive change in knowledge was 13.6% for the whole sample on all questions.

The qualitative analysis in Phase I of the project suggests that a good deal of knowledge had been gained or reinforced and some behavior change had occurred or was likely to happen as a result of one act play performance viewing.

Phase II - Work Setting (funded by WA State Department of Labor and Industries)
In the Phase II work setting three of the four plays were shown at two different work sites. Health and safety information was presented to a total of 267 Hispanic farm workers, of whom 85.2% were male and 14.8% were female. Each of the three distinct plays was accompanied by pre-and post-play self-report questionnaires. The majority of the questions came from the NIOSH community setting evaluation, and therefore the questions were pre-tested. Participants also completed a follow-up survey that included all of the pre- and post-questions used in the three plays.

A total of 13 questions were designed and presented as repeated measures in the pre-play, post-play, and follow-up questionnaires to determine possible gains in knowledge. A total of 10 of these 13 were shown to produce knowledge gains in the desired positive direction (see Tables 3 and 4 in the Hispanic Evaluative Assessment Report, Appendix A). In the work setting, the overall change in knowledge between the pre- and post-play assessments for the combined 13 questions was 7.7%.

The quantitative and qualitative analysis of the pre-/post-play and follow-up data in Phase I and Phase II suggests that workers do retain the health and safety information presented in the plays. However, a comparison of the data collected in Phase I and Phase II suggests that the Phase I stage of the project is more efficacious than the Phase II stage of the project because 1) 13 of the 17 questions on the post-test were answered in a manner that was significantly different from how the audience members had answered the questions on the pre-test, whereas 10 of the 13 questions on the post-test were answered in a manner that was significantly different from how the audience members had answered the questions on the pre-test at the work site performances and 2) the overall knowledge gain in Phase I was 13.6%, whereas the overall knowledge gain in Phase II was 7.7%. The difference between these findings is discussed in the outcome section of this report.

The results of this phase of the study suggest that positive gains in knowledge can be accomplished via theater as a medium for disseminating work-related health and safety information to Hispanic farm workers and that retention of this knowledge is maintained over time. However, it is likely that voluntary settings are more beneficial during leisure hours than mandated sessions at work for the retention of safety information from plays.

Phase III – Script Dissemination
Overwhelmingly community groups are excited about the program and view the plays as another safety training tool. Of the 50 groups who initially requested the scripts, 35 have received the play production packet. To date, five groups have definite plans to produce the plays. Community groups have identified the time commitment involved in recruiting actors, play rehearsals, scheduling and advertising the plays as the major obstacles to producing the plays.

Similarly, the grower community is excited about the program and willing to support the program in the short term. However, due to the economic difficulties associated with labor intensive crops in Eastern Washington growers are unable to provide long term financial support to sustain the program. Alternative funding sources to maintain a community players group may be necessary to sustain the availability of one act plays.

Usefulness of Findings

Based on the quantitative and qualitative analysis, theater is a medium that can convey health and safety messages to farm workers and their families. Workers do retain the information they learned at the play performances. However, behavior change is difficult to measure. Longitudinal studies are needed rather than short-term indicators. To change behavior workers must have the necessary equipment and/or safety procedures. For example, field sanitation such as toilets and water facilities must be available for workers to wash their hands before and after using the bathroom. The qualitative interviews from the Phase I portion of the project suggest that farm workers are interested in safety and health issues and are willing to share this information with other workers and family members. Thus, the information may be retained and shared with others but without proper conditions on the farms behavior cannot change.

Theater is "user friendly" with farm workers and their families because it does not rely on literacy or English language proficiency. Several organizations have used popular theater of many varieties to provide health and safety education to Hispanic farm workers and their families. Many of these programs lack rigorous evaluation components and have provided few findings for comparison. The findings would be most useful if an organization were available to produce the plays. Ideas are necessary and concepts to be tested as perhaps several community groups could partner with a school or university theater department to minimize the financial cost of producing the plays. The findings from this project may also support existing programs that use theater as an intervention method for other information dissemination needs in these communities.

Several future possibilities emerge as we examine the difficulties in sustaining this method of health and safety play-style intervention program. To date, thirty-five groups have received the play production packet and five groups have definite plans to produce the plays. To overcome the logistics of producing the plays, groups may need to partner with other organizations such as universities or schools. Perhaps the high schools may provide a more cost effective and on-going means of sustaining the program. By utilizing students in the play performance and script translations, the younger Hispanic population is becoming involved in the education and safety promotion of culturally related individuals. Students involved in the production of the plays may make the plays more personal to the larger Hispanic work population hopefully resulting in higher retention levels. Perhaps it will be teachers and students who adopt the program and provide the safety training either at the worksite or to parents in school auditoriums. The play production may be a powerful esteem-building tool for students and a way of educating the farm labor workforce as well. Producing the plays in this fashion could substantially reduce the financial expense involved and students may be able to make the time commitment necessary for rehearsals.

Many of the barriers to providing farm health and safety education are well documented. Issues such as economics, immigration status, and language barriers. In both the farm worker and grower community economics play an important role in terms of farm safety decision making. For example if a farm worker family wash their clothes at a Laundromat they may not have enough money to wash contaminated work clothes separate from the rest of the family's clothes. Similarly, a farmer may have to choose between retrofitting his tractor and buying more seed, fertilizer or other supplies.

Workers who are undocumented do not move freely about their community for fear they will be deported. It is difficult to provide health and safety education to these individuals and families because of this fear. They are less likely to attend voluntary performances or belong to the groups sponsoring the plays.

Growers and supervisors identified the translation of safety information by bilingual crew bosses and others as a problem. One grower association called this situation the "weak link," because the foreman or other bilingual person delivering the safety information may not accurately translate the safety information or procedure. Thus having bilingual crew bosses discussing the play information may be less advantageous than persons connected to the players group or health/safety community.

Another aspect that affects worker safety is the "machismo" influence. This relates specifically to single male workers who think they are invincible to farm hazards. It is particularly difficult to influence the safety practices of these workers. Though the plays may aid in this situation, cultural change takes time.

As stated earlier, the barriers to presenting the plays and adopting the program center on the time commitment involved in producing the plays and the financial cost of sustaining the program. Community groups will need to partner with others to minimize the time and financial costs of producing the plays. Growers, similarly will need to partner with government organizations and others to develop a mechanism to sustain the program.

Appendix A

Hispanic Theater Evaluative Assessment Report

Hispanic Theater Evaluative Assessment Report

Overview

The Center for Farm Health and Safety's Hispanic theater project tested a medium for the distribution of important farm health and safety information to the large, Spanish-speaking migrant and seasonal farm worker population in Washington state. The project developed a method for involving the community in presenting plays to workers and their families. It identified the most urgent farm health and safety needs of Hispanic workers and their families, addressing those needs in plays performed in Spanish. Data gathered from the key informant interviews and a series of focus groups directed the development of the four play scripts. They presented health and safety information that farm workers, growers, and healthcare providers had identified as a priority. Play performances were in two different settings: community-based (at festivals or fairs) and work-based (as mandatory safety trainings for employees).

Quantitative and qualitative analysis of the pre-/post-play and follow-up data suggests that workers do retain the health and safety information presented in the plays and that gaining important health and safety information can lead to positive behavioral change in those areas. Viewers should be able to use the knowledge gained from play performances and employ that knowledge in the workplace or at home, creating behavioral change. Although we were not able to gather direct evidence of post-play behavioral change through injury reports or personal observation, farm workers from the community-based project's follow-up interviews did report a change in farm health and safety behavior after viewing the plays.

Based on feedback from workers, growers, and community members at the 20 play performances and the 50 community groups who requested the play scripts, the program succeeded in responding to the health and safety needs of Hispanic farm workers. The use of live theater in other areas with Hispanic migrant and seasonal farm worker populations is also likely to disseminate health and safety information. Live theater can now be used as another safety training tool specifically designed for the Hispanic agricultural workforce.

Overall, the work setting was less interactive than community events due to harvest demands. Participants were not able to interact with the actors or health and safety experts, nor were they able to take home safety materials. Workers' expectations were to attend a safety training session, whereas in the open community setting, participants expected to attend a leisure activity. In the open community setting, there were numerous distractions, including young children to supervise and noise from other activities; however, individuals had more time to interact with the project staff, actors, and health and safety experts.

Evaluation Method

The method used to evaluate the project was derived from an investigation of the work of Peter Rossi (1999) and the NIOSH organization's TIER model (1999). To aid in making decisions about the quality of this project, it was evaluated according to four sections discovered in those works: Needs, Methods, Outcomes, and Impacts. These sections assess the degree to which the project addressed a need in the target population, the validity of the process by which the project sought to ameliorate that need, the significance of the immediate, quantitative and qualitative results of that process, and the long-term evidence of the amelioration of the need (the intended goal of the project). The four sections appear in this report under the following heading and subheadings: Project Development (Needs and Methods), Process Evaluation (Methods and Outcomes), and Outcome Assessment (Outcomes and Impacts). These headings are being used because the evaluation sections are so closely related that it would be repetitive to address all the aspects of each section for this project under separate headings.

This report operates under the assumption, gained from the investigation of the resources listed above, that a research project begins with the need of a given population, and all else follows from there. According to the sources, a project always focuses on that population and its need, through all stages of research. The project is grounded in theory and the knowledge gained from similar past studies. A careful analysis—both quantitative and qualitative—is needed to determine the value of the project and to point to changes for future studies. The sources also indicate that to what extent the project caused the desired change is investigated and then the success the project had in accomplishing its stated goals is assessed.

Objectives

The three-year Hispanic Theater project was funded by three sources: the National Institute for Occupational Safety and Health (NIOSH), the Washington State Department of Labor and Industries (L&I), and Pacific Northwest Agricultural Safety and Health Center (PNASH). The specific objectives for the theater project and its evaluation efforts are:

Phase I – Community Setting

- Identify the most urgent health and safety needs of Hispanic farm workers and their families.
- Develop four one-act plays written and presented in Spanish.
- Partner with community organizations to produce each of the four plays.
- Increase farm workers' knowledge of hazards and awareness of farm health and safety information through the four play performances (to be determined by analyzing the results of pre-/post-play surveys).
- Identify problems associated with providing health and safety education for farm workers and their families
- Pretest the program

Phase II – Work Setting

- Perform three of the four plays for a local grower's employees.
- Refine the evaluation tools used in Phase I.
- Conduct a pre-/post-test to demonstrate the comprehension of the audience of key instructional points at the grower's sites.
- Gather secondary data on injuries and employee sick days.
- Design and mail out a follow-up survey to the participants at the grower's sites.
- Partner with Washington State Department of Agriculture (WSDA) Farm Worker Education Program to offer a one-day forum for the Inland Northwest Farm Safety Network focusing on farm worker issues to expand the dissemination of the Spanish play scripts within and beyond existing community groups.
- Analyze data from surveys and records at the grower's sites.

Phase III – Script Dissemination

- Disseminate the program through community networks.
- Distribute to community groups four pre-tested plays and a method of organizing community members, and aid them in the production of each play/program.
- Conduct research to evaluate the dissemination of information and community organization strategies.
- Refine the dissemination process in order to mobilize local communities to present the plays.
- Design a methodology for adapting the plays to radio.
- Design an evaluation method to determine the effectiveness of two models of dissemination, i.e., community theater and radio theater.
- Develop a method for involving and sustaining community volunteers in the production of plays to Hispanic farm workers and their families.
- Work with the grower's network to sponsor future plays to expand the dissemination of the Spanish play scripts within and beyond existing community groups.
- Explore issues that came out of the evaluation, such as literacy and cultural communication patterns. (Examine literacy and how it impacts the presentation of farm health and safety education. Explore cultural communication patterns and how they influence the development of safety intervention and research programs.)
- Evaluate the perceived effects of the project on the community.

Project Development

To evaluate the effectiveness of theater as an educational tool, it was necessary to develop an intervention program which tested the medium. The program was designed to increase Hispanic farm workers' knowledge of hazards and awareness of farm health and safety information through theater. The program included the development of scripts for community based plays, a method for involving the community in presenting plays to Hispanic farm workers and their families, pre-testing and presenting the plays in a variety of community settings, an evaluation of the process, revising the method and evaluation tools for use in a work setting, measuring the success of the plays in the work setting, and measuring outcomes including the potential for change in knowledge as well as indicators

of behavior change. This section is divided into Project Origins, Project Preparation, Phase I – Community Setting, Phase II – Work Setting, and Phase III – Script Dissemination.

Project Origins

Hazards of agricultural work have been well documented. To eliminate hazards the structural conditions of agriculture and the context in which the farm workers are employed require a good deal of reformulation and change. However, the injuries and health effects are occurring in the present. One accepted partial remedy is to educate farmers, workers and their families about the many hazards and adverse conditions. Education will help to create awareness. Through knowledge it will be possible for workers to weigh potential consequences and make appropriate behavioral decisions. Our intention, thus, is to provide appropriate mediums for education that will help farm populations protect themselves against numerous agricultural hazards.

Migrating or having resettled from Mexico and other Latin American countries, many of the workers in this population group are poorly educated and come from poverty conditions. They arrive in this country with a reliance on traditional medicine, lacking much of what may be considered basic health and safety knowledge often taken for granted on our farms. Partially as a result of the lack of safety practices in Region 5 of Washington State, farm workers ranked highest out of 335 occupational categories for illness and injury claims (Paradis, 1999). At the present time, education appears to be the best alternative available to aid these workers in avoiding the hazards of their occupational surroundings.

The provision of health and safety education to Hispanic farm workers is a challenge due to low literacy skills, lack of English language proficiency and cultural communication barriers (Mines, 1992, Grieshop, Stiles, and Villanueva, 1966). To meet this challenge, community theater was selected to be tested as a medium for providing this information to the Hispanic farm worker population.

There is a worldwide, centuries old tradition of play-acting, role-playing, psychodrama or sociodrama used as an educative device (Wagner, 1976). Educational use of drama has in recent years been the cornerstone of many projects around the globe. Several researchers identify popular theater as a tool for creating awareness of participant resources, problem solving, entertaining and holding interest, and fostering collective thinking and action. Theater provides a familiar medium, which defuses feelings of educational inferiority or illiteracy (Andruske, 1994, Kidd and Byram 1978). The most important feature is its representation of local situations and problems (Leis, 1976). It is this quality that makes theater a powerful tool for education.

In the Latino community, there is a rich and long tradition of using the "novela," a form of "soap opera" to convey messages (Pilar, 1977). Novelas in television, print, and radio provide public health information as well as entertainment. Building on this framework, theater, in the form of a one-act "novela," was chosen as the method to provide farm health and safety training to Hispanic farm workers and their families. Theater provides education through demonstration and imitation without demanding a high level of literacy

or English-speaking skills from the audience. Thus, it should result in meaningful lessons in a comfortable environment.

According to observational learning theory, observers procure cognitive abilities and new patterns of behavior by observing the performance of others. This learning may take varied forms, including new behavior patterns, judgmental standards, cognitive competencies, and generative rules for creating behaviors (Bandura, 1986). People can learn approximately what to do through modeling before they perform a behavior. The potential to learn by observation enables people to expand their knowledge and skills by observing the actual performances of others and the consequences for them. Observers are able to extricate conceptions of behavior illustrated in words and images, and then generalize beyond their present environment. Thus, viewers should be able to use the knowledge gained from play performances and employ that knowledge in the work place or at home, creating behavioral change. Though change in knowledge cannot predict change in behavior, knowledge change can help us estimate the likeliness of a behavior.

This research was developed around the assumption that theater is an effective method for providing farm health and safety education to Spanish speaking people of Mexican or Latin American descent (Hispanic) who are agricultural workers. Specifically, the hypothesis being tested is: Appropriate farm health and safety knowledge increases as a result of attendance at a one-act Spanish play enacted by a community players group. To test the hypothesis, an intervention that included four Spanish one-act plays enacted by community-based actors was developed. The plays were produced in both community and work settings in the three county region of Eastern Washington that is most densely populated by seasonal and migrant farm workers.

Project Preparation

To identify the most urgent health and safety needs of Hispanic workers in the three-county region targeted by the project, we developed a number of partnerships across the region. To establish credibility with farm workers, advocates, and the grower community, it was important to identify and collaborate with partners who had a history of working with the farm worker community and who had knowledge about the area's agricultural production. We selected the Special Populations Department at Walla Walla Community College as the project's off-site location, and they assisted with translation services. This department regularly provides a transition program, GED classes, and English as a Second Language classes in this community. Before receiving funding for the theater project, preliminary work with staff at the Special Populations Department assisted the Center in conducting a farm worker focus group at the Head Start Center in Walla Walla. The Yakima Valley Farm Worker Clinic provided injury and accident data and advised on the health issues presented in each of the play scripts.

The next step was to enlist the support of each of the regional health districts in each county. Personal interviews were conducted explaining project aims and soliciting collaboration and referrals to other organizations that might be interested in participating in the project. This information gathering process came with its own set of difficulties. The first focus group scheduled in Walla Walla was at the Head Start Center. We were

scheduled to talk to families after their parent meeting, but no one showed up for the focus group. Staff were extremely kind and said families may still be working. We rescheduled, and the next time there were six persons in attendance. The initial contact with Walla Walla Community College was also awkward. The director of the Special Populations Department could not see how the Theater Project would be of help to their program. He had scheduled another meeting and cut our discussion short. Approaching the discussion from a different perspective the next day (i.e., "What can the Center do to benefit your program?") was much better received. Our persistence paid off, and we succeeded by not being discouraged by no shows, by focusing on goals that we may have in common, by being willing to revise our expectations, and by changing meeting places and times to fit others' schedules. All of these actions were a form of trust building.

During this time, a series of media releases about the theater program attracted several other partners, namely, Yakima's Providence Hospital's Healthy Communities Alliance Program's parish nurse at St. Joseph's Catholic Church, and the Yakima Department of Labor and Industries. These partners were instrumental in the development of key informant interviews and a series of focus groups across the Columbia Valley. There were three farm worker focus groups, a focus group of healthcare providers, a focus group of growers, and a focus group of community leaders or farm worker advocates. Contact with the various health district offices varied in terms of interest level. Two offices actually responded to letters about the project soliciting their involvement. Benton-Franklin and Yakima assigned individuals to network with Center staff. Walla Walla Health District never did get involved in the project. They also did not have any bilingual staff available. Generally, cold telephone contacts and mailings tend not to be very effective. In person interviews with specific agendas are a more efficient use of time, even when it meant traveling across the three county region to schedule personal connections and not scheduling interviews too close to each other in order to accommodate touring an apple packing shed or a farm worker housing/garden area. Organizations also seemed to be more receptive if they had a memorandum of agreement outlining the work expectations and receiving financial compensation.

The participants in the growers' focus group represented over 1,800 growers. A total of twenty-two individuals, seventeen of Hispanic origin, participated in the various focus groups. Participants identified four broad categories or health and safety themes: 1) Cultural beliefs about disease and health and workers' interactions with the healthcare system (agencies, physicians, government, medical coupons, programs); 2) Pregnancy and delivery concerns and children in the fields and child labor; 3) Spraying and spreading chemicals (pesticides, fertilizers, herbicides) and safety environment (masks, protective clothing, toilet facilities, availability/potability of water, etc.); 4) Injuries to limbs and back (hearing loss, tractor rollovers, helmets), machinery and ergonomics, and the right to a safe workplace.

These categories were refined and led to the development of four Spanish one-act health and safety play scripts: **El Regreso de Miguel** (preventing, Hepatitis A, TB awareness and alcohol education), **Sueños y Desafíos** (pesticide safety), **La Fuji Mágica** (pregnancy/prenatal concerns and drowning prevention), and **Dora Evelia** (proper

bending, lifting and ladder safety). A pre-/post-play repeated measures questionnaire tested the effectiveness of theater as an education tool.

Phase I - Community Setting

Across the Columbia Valley, community groups such as Migrant Head Start Centers, churches, schools, Employment Security Offices, and Health Clinics received notices about play performances. In addition, local Spanish and English newspapers, radio, and television stations advertised play performances. As a means to intrigue and interest a larger audience, the project developed two foto-novelas to advertise the second and fourth play performances. A foto-novela is a Spanish term referring to a pamphlet, consisting of pictures, brief captions, and dialogue bubbles, that conveys a story and can be described as a cross between a comic book and a soap opera. These foto-novelas were distributed at the first and third play performances. However, though the foto-novelas were well received and enjoyed as a separate training device, this method of advertising did not appear to be significant in bringing additional families out to see the plays.

The play performances appeared in schools, community colleges, church festivals, and Head Start Centers. Some of these plays were held in parks, while others were in school auditoriums and in small rooms barely large enough for the actors, the props, and the audience members. The venue sizes were not the only problems encountered, however. Working with a specific lead person to bring a play to a certain location was more successful than just advertising through traditional media and showing up the day of the play. Most of the people who interacted with Center staff to schedule plays were already extremely busy and were willing to offer minimal assistance.

There were also problems with the play performance timeline being so rigid. For example, we tried to schedule a play at Sunnyside High School. We called the contact person several times and left a message but the date scheduled for the performance was getting close so we had to locate another site in order to have enough time to advertise the location. In the meantime the contact at Sunnyside called us and we had to say we had rescheduled to another location. This was not good from a public relations stand point; particularly since the person's name was probably a referral from another project contact. We wondered how many times this may have happened and what those individuals thought about the project's credibility. This type of scenario happened another time when we asked some one from the Catholic church to review the pregnancy/prenatal play script to make sure it was appropriate to perform for a youth class at St. Joseph's. He took so long reviewing the script that we had to reschedule the performance to another site. This was a very important partner who had assisted us from the beginning of the project. We felt that this event had undermined the relationship we had built with this individual.

During Phase I a total of 14 plays were shown at 14 locations to 301 people, and 200 participants identified themselves as farm workers. The 14 play performances appeared between July and October of 1999. Most audience members saw only one play.

The performances were designed to involve the workers and their families on several levels. First, at each performance, workers and their families were invited to ask questions of the actors immediately following each play. In addition, health and/or safety

experts were available after each play to respond to audience questions. Following play performances, project staff members and actors distributed a broad array of health and safety materials pertinent to the topics presented in the plays. Community groups were enthusiastic about the program and willing to facilitate performances. However, recruiting audiences for the first fourteen performances turned out to be more difficult than anticipated.

The best audience turnout seemed to be at church festivals or when plays were shown immediately following another event, such as a parents' meeting at a Head Start Center, or when there was some incentive provided, such as a meal or transportation. Many community performances had audiences with children of all ages in attendance. Therefore, parents were often providing supervision of the children or older children with more literacy assisted parents with the parents' pre-/post-test. Another challenge during Phase I of the program was the quality of the sound system in various settings. In general, recruiting the farm worker audience was difficult except at church festivals. Thus, we searched for a means of recruiting audiences who would be more directly available to a farm setting. The solution was to test the program in an employer-sponsored setting as part of their mandatory safety training.

Phase II – Work Setting

At two sites, Haas, Inc. used three Spanish one-act plays at their safety meetings as intervention tools. Safety and health information was presented to a total of 267 Hispanic farm workers, of whom 85.2% were male and 14.8% were female. The 40-minute plays, Dora Evelia (bending/lifting safety), Sueños y Desafíos (pesticide safety), and El Regreso de Miguel (preventing Hepatitis A), appeared on September 15th and 25th and October 6th, respectively. Pre- and post-play self-report questionnaires were used, printed in Spanish and English, to evaluate changes in respondents' knowledge regarding the specific safety topic presented. To maintain the confidentiality of participants' responses, a sign-up sheet that matched respondents' names to numbered questionnaires was used. The master list of names and matching questionnaire numbers was kept separate from completed questionnaires, assuring respondent confidentiality.

Each of the three distinct plays was accompanied by pre- and post-play self-report questionnaires designed specifically for the play and printed in both Spanish and English. A follow-up survey was mailed four months later to assess long-term knowledge retention. The majority of the questions for the questionnaires came from the Community Setting evaluation, and therefore the questions were pre-tested. Based on the results of those questionnaires, the pre-/post-tests were altered to improve response numbers. Changes were made to further accommodate the non-literate participants, and the staff offered individual assistance and read the questions aloud.

The events took place at two distinctly different sites in Yakima County and at different times of the day. The farm owner deemed participation mandatory and, as an incentive for the workers' participation, offered a meal (the same for each site) at each play presentation. The farm owner determined both locations, with one site located near Toppenish, WA and the other outside of Mabton, WA. At the Toppenish site, the plays

appeared in the late mornings (approx. 11:00 am) in a quiet, relatively secluded, open-air environment located within the farm's boundaries. The Mabton site showed the plays in the early evening (approx. 6:00 p.m.) of the same days, also outside, but in a location that bordered a noisy highway. The number of respondents varied at the presentations of the plays in Toppenish—58, 90, and 107 respectively—showing an increase in attendance at each successive play. The number of respondents at the Mabton site also varied at the presentations of the three plays—60, 35, and 68 respectively.

Five of the six play productions did not allow for personal interaction and material distribution, so the bulk of the information transmission rested on the clear, appealing performance of the actors. The actors were polished because they had completed 14 prior play performances in community-based settings for our NIOSH project. It was not feasible to distribute safety materials because the workers' schedules demanded an immediate return to work. However, during the final play performance in Mabton, workers were able to interact with the actors as this particular performance was the last one of the series and daylight was fading. The supervisor dismissed the workforce, and these workers were able to take home education materials on HIV and other health and safety issues, printed in both English and Spanish. This reinforcement, the time of day, and the level of background noise differentiated the two sites.

Phase III – Script Dissemination

There were two distinct methods of disseminating the theater program. The first method of dissemination was to provide the play scripts to community groups in Walla Walla, Benton-Franklin, and Yakima counties. Soon after the six performances at the employer-sponsored sites, the four play scripts along with a tutorial videotape and production instruction guide were shared with the 24 community groups that would most likely produce the program. An additional 26 groups nationwide requested the play scripts after the program results were presented at the 2001 Western Migrant Stream Forum Conference in February, 2001.

Play scripts in a Spanish/English format and a videotape of each play performance were produced to give community groups an idea of what the play should look like. The videotapes were only for the purpose of play production and were not to be used as training tools. The project coordinator, bilingual assistant, and the play director developed the play instruction guide, and the guide listed all of the procedures involved in play production.

In addition to disseminating the play scripts through community groups, the program was disseminated through the grower community. Several grower organizations were contacted to determine the feasibility of creating a mechanism to sustain the theater project. Feedback from one grower association indicated that growers support the theater intervention program in the short term as part of their pesticide safety training; however, they have several concerns about establishing an on-going theater company. Some of these concerns center on the current difficult financial climate in labor-intensive crop production in Washington agriculture. Growers are also concerned that the employee base may change in terms of education, language, and familiarity with pesticide safety.

They also question "live theater" as the most cost-effective method of safety training for their workforce.

To date, 50 community groups have requested the play scripts. Thus far, five groups have definite plans to produce the plays. The Center has submitted a proposal to work with grower groups to develop a mechanism to sustain the program.

Evaluation Criteria

In order to assess the project based on the sources consulted, certain criteria by which to evaluate success were established. To assess the process of the project, the following indicators were used.

- To what degree did the project effectively deal with obstacles?
- To what degree did the project have a logical conception?
- To what degree did the project contain methods that followed from previous findings?
- To what degree did the project include periodic evaluations to ensure proper methods were being used?
- To what degree did the project make the proper modifications (if necessary) suggested by the periodic evaluations?
- To what degree did the project include qualified instructors?

The following evaluation of the process, then, will be based on these indicators of success. In order to evaluate the outcomes of the project, the indicators were based on the answers to the following questions:

- To what degree did the project meet its goals?
- To what degree did the participants perceive that the intervention was valuable and to what degree was their awareness raised?
- To what degree were the participants' responses to the evaluative questionnaire consistent (external validity)?
- To what degree were the participants subsequently involved in activities aimed towards the amelioration of the targeted problem?
- What was the level of community involvement after the intervention as compared to before the intervention?

These two lists of indicators for process and outcome assessment are not reiterated in the following evaluation. The conclusions in the Evaluation section are the direct result of asking the above questions of the project.

Evaluation

The evaluation includes two stages: process and outcome. The process evaluation lists the project goals stated in the proposal submitted and discusses the actions that were taken to meet the goals. The outcome evaluation analyzes the measurable results of the project and determines the immediate effectiveness of the intervention. While the Project

Description section provides a detailed account of the program, further information that is pertinent to the evaluation is included in the following section. The objectives related to data analysis appear in the Outcome Assessment section, while all other objectives appear in the Process Evaluation section.

Process Evaluation

Overall, the Center achieved all of the objectives set forth for the Hispanic Theater project. The project goals addressed in this section include all objectives from the three-year Hispanic Theater project. The objectives appear under the phase of the project for which they were achieved.

Phase I – Community Setting

- **Identify the most urgent health and safety needs of Hispanic farm workers and their families by conducting a series of focus groups.**

  A total of six focus groups were conducted in the three county region: three farm worker focus groups, one focus group of growers, one focus group of healthcare providers and one focus group of farm worker advocates/community leaders. Seventeen focus group participants identified themselves as Hispanic and 5 as Caucasian participants. The following describes the process involved in the 2 farm worker focus groups in Walla Walla and one farm worker focus group in Yakima:

  Participants were recruited by the Washington State Migrant Council Early Headstart Center. The first focus group was held after a parents' meeting. A Special Populations staff member facilitated the group of six participants (3 women and 3 men). The second farm worker group was held at the Head Start Center at the Walla Walla Labor Camp. The Director of the Head Start Center recruited participants. Staff from the Special Populations Department at Walla Walla Community College facilitated the focus group. The playwrights and the play director were also in attendance at this focus group meeting. The third farm worker focus groups was held at St. Joseph's Catholic Church in Yakima. The participants were recruited by the parish nurse. Each farm worker focus group followed an agenda which introduced participants, discussed the purpose of the focus group, explained and read aloud the consent form and asked questions such as:

  1) Do you understand the purpose of this meeting?

  1) Where have you come from and how long ago did you come here?

  2) The fear of immigration officials, does it affect workers health?

  3) Have there been cases of people that have become sick at the work place and could not regain their health because of immigration problems, or transportation problems?

  4) Where do you work and what type of work do you do?

5) Does the farm provide protective equipment?

6) Have you asked for safety instructions in Spanish?

7) Are people without a license sent to handle chemicals?

8) Have you had or seen any accidents on the job?

9) In response to handling chemicals, "Are there many people who become ill because of the chemicals?

10) Do you receive instructions about how to lift or move heavy things?

11) What is the age range of the people in attendance?

To put workers at ease they were also asked questions about their favorite holidays and how they celebrate them. The farm worker focus groups were designed to create an atmosphere that workers would feel free to express their concerns. Consequently the discussion varied slightly in each farm worker focus group. Workers in attendance came from the following states in Mexico, Michoacan, Guerrero, Oxaca, Jalisco, Sinola, Zacatecas. Farm worker participants also came from California and Texas.

Healthcare Focus Group

The healthcare focus group was held at Providence Hospital in Yakima. The participants were recruited by a nurse at a community clinic. Participants identified issues of cultural beliefs and how they impact health care. They also talked about the difficulty of providing care to this population due to the reimbursement system (Medicaid primarily). Healthcare providers noted that language continues to be a barrier to health care as the patient may have a family member interpret for them and/or family members may contradict medical advice given by the health practitioner. Fragmentation of the healthcare system was a primary concern.

Grower Focus Group

Participants were recruited by an individual from the Yakima Department of Labor and Industries. A Labor and Industries staff member facilitated this focus group. The grower's focus group consisted of three individuals who represented over 1800 growers. The grower's focus group identified the following concerns, workers know the appropriate precautions but do not heed safety precautions or use protective equipment properly. Growers noted that there is a breakdown of communication in terms of understanding health and safety, and even using interpreters has problems. For example a worker is trained for a particular job who may have a 2nd or 3rd grade education and be bilingual or speak limited English and then that person tries to explain something to another person (monolingual) who may have even less education. There is opportunity for an error in the translation from one person to the next person. Growers noted that, a "safety culture" is difficult to create with workers who only work 30 days. For example, if they do piece work, the incentive is to work

hard, this makes it difficult to do training that takes them away from earning money." Growers do believe there is an increased risk of injuries or accidents with new workers. The greatest burden is on the small employers. Large companies can afford professional expertise. According to one participant, only 20 growers in Washington State have a full time safety person.

Advocates/Community Leaders Focus Group

The participants for this group were recruited by the parish nurse at St. Joseph's Catholic Church. There was an attorney, the parish nurse, a church member, two agricultural workers and a government official in attendance. These individuals express concerns about pesticide exposure, lack of field sanitation, unsafe protective equipment, and the risk to pregnant women due to falls and pesticide exposure. They note that the newly immigrated families are fairly healthy, not yet assimilated or 'disconnected' from their family of origin support systems. These families attend church but are basically alone with no supports other than the church. The participants note that workers are often fired if they report work place violations.

Key Informant Interviews

Key informant interviews were conducted with personnel from the Regional Health Districts in Benton-Franklin and Yakima, the Yakima Valley Farm Worker Clinic, Northwest Justice Project, Columbia Legal Services, and the Yakima Department of Labor and Industries. In addition to the information gathered at the key informant interviews and focus groups, injury and accident data was provided by the Yakima Valley Farm Worker Clinic and Yakima's Department of Labor and Industries.

- **Develop four one-act plays written and presented in Spanish.**

  The following categories were refined and led to the development of four Spanish one-act health and safety play scripts: cultural beliefs about disease and health and farm workers' interactions with the healthcare system (health organizations, physicians, government agencies, medical coupons and health programs); pregnancy and delivery concerns, children in the field and child labor; spraying and spreading chemicals (pesticides, fertilizers, herbicides); and the safety environment (the use of masks, protective clothing, sanitation facilities, and availability of water). The safety play scripts that were developed as a result of the refinement of those categories are as follows: **El Regreso de Miguel** (preventing, Hepatitis A, TB awareness and alcohol education), **Sueños y Desafíos** (pesticide safety), **La Fuji Mágica** (pregnancy/prenatal concerns and drowning prevention), and **Dora Evelia** (proper bending, lifting and ladder safety).

  The four one-act plays were written by two playwrights from the Seattle area. The authors of the plays were Lupita Patterson, an experienced playwright whose first language is Spanish, and Leticia Lopez, a first-time playwright, whose second language is Spanish. Patterson wrote El Regreso de Miguel and Sueños y Desafíos, and Lopez wrote La Fuji Mágica and Dora Evelia.

- **Partner with local community organizations to produce each of the four plays.**

To facilitate play performances sites, the Center partnered with Walla Walla Community College's Special Populations Department, the Yakima Valley Farm Worker Clinic, Northwest Communities Education Center/Radio Cadena in Granger, the Washington State Migrant Council(WSMC) Head Start Centers, Yakima's Washington Middle School and Prosser's King Riverview Elementary.

The play director was a theater major and McNair Scholar student from Eastern Washington University. Actors were recruited from the Yakima area. Recruitment was advertised by the public radio station, Radio Cadena, in Granger. Several auditions were held at Yakima Community College and the Radio Cadena office. A core of six actors, some with agricultural work backgrounds, performed in the 20 performances over the two year project. There were a number of new actors recruited for several roles but overall the initial actors remained involved in the performances. Rehearsals took place at Radio Cadena and the South East Community Center in Yakima.

The parish nurse at St. Joseph's Catholic Church, Providence Hospital's Healthy Communities Alliance Parish Nurse Program responded to a Yakima Herald article about the program and this led to an invitation to show the play at St. Joseph's Annual Festival. This contact also led to an invitation from the parish nurse at Our Lady of Guadalupe Catholic Church in Granger. A nurse at the WSMC Head Start program in Sunnyside heard about the program through advertising with their agency and arranged to bring a group of workers to a performance at Sacred Heart Catholic Church in Prosser. This nurse also sponsored a barbecue and provided transportation for the workers.

The Washington State Department of Labor and Industries hosted a grower focus group. Their employee attended the play performance at St. Joseph's Festival. They provided injury and illness data for the Center on a number of farm worker grant proposals.

Spanish and English radio and print media also promoted play performances. A photo-shoot and article for the Yakima Herald resulted in an on-going partnership with Northwest Communities Education Center/Radio Cadena in Granger. This organization has partnered with the Center on a dissemination grant proposal to adapt the plays to radio and also provided rehearsal space for the actors.

Recruiting and sustaining community partnerships required persistent contact with individuals who had similar goals. Phone and email contact, scheduling appointments, conducting interviews and seeking input as to what aspects of the theater program would be beneficial for their programs, all served to increase Center visibility in the communities the project targeted. Partnerships with Walla Walla Community College, Yakima Valley Farm Worker Clinic, the Department of Labor and Industries, Washington Growers' Assoc., WSDA Farm Worker Committee, Providence Hospital's Healthy Communities Alliance Parish Nurse Program, WSMC Head Start Centers and other listed above contributed to the success of the program.

Phase II – Work Setting

- **Perform three of the four plays for a local grower's employees.**

  John I. Haas, Inc. used three Spanish one-act plays at their safety meetings as intervention tools at two sites—Mabton and Toppenish. The plays used were El Regreso de Miguel (preventing, Hepatitis A, TB awareness and alcohol education), Sueños y Desafíos (pesticide safety), and Dora Evelia (proper bending, lifting and ladder safety). Each play was shown twice (once at each of the two sites), for a total of 6 play performances. We presented safety and health information to a total of 267 Hispanic farm workers, of whom 85.2% were male and 14.8% were female.

- **Refine the evaluation tools used in Phase I.**

  The yes/no format of the questionnaires used in Phase I was changed to multiple choice in order to gain greater insight concerning the farm workers' knowledge base. To help accommodate non-literate respondents and improve response numbers, the assessment tools that were used in the Community Setting study were further improved by including visuals in addition to written text on one of the play questionnaires. Staff also read the questions aloud at the performances, and staff and other volunteers were available for individual assistance. Questions to gather demographic data were also included on the revised surveys.

- **Conduct a pre-/post-test to demonstrate the comprehension of the audience of key instructional points at the grower's sites.**

  We used pre- and post-play self-report questionnaires, printed in Spanish and English, to evaluate changes in respondents' knowledge regarding the specific safety topic presented. The pre-play questionnaires used for each of the plays consisted of questions related to the play topics. For a complete analysis of the results of these questionnaires, see the Phase II – Work Setting subsection in the following Outcome Assessment section.

- **Gather secondary data on injuries and employee sick days.**

  At the onset of the L & I project, we hypothesized that numbers of injuries and sick days would decrease if the performances of the plays were effective. L & I did provide injury data for the years from 1995 to 2000. Unfortunately, we found no way of isolating the injury data for workers that participated in the research project. In fact, the injury data we did receive for the 3-month post-play period did not detail the specific type of injury sustained. Also, the short amount of time between the presentation of the plays, the end of harvest, and the end of the year 2000 did not allow time for injury data to be significantly affected by the information disseminated through the plays. The vast majority of the Hispanic work force that participated in the research aspect of this project would not remain with Haas, Inc. after harvest ended in mid-October 2000; therefore, we had no way of tracking the injury rates of the test population after the play performances. One aspect that did stand out in the analysis of the injury data was that the topical foci of the three plays corresponded with the major areas of injury found in the L & I injury data we received, validating

the importance of disseminating valuable health and safety information in these areas.

- **Design and mail out a follow-up survey to the participants at the grower's sites.**

  The follow-up survey was in Spanish/English and included all of the pre-and post-questions used in the three plays, amounting to thirteen total questions. Of the 267 respondents involved in the pre- and post-play assessments, the grower provided 188 mailing addresses for a follow-up evaluation. The 188 workers returned a total of 35 questionnaires, or 18.6%.

- **Partner with WSDA Farm Worker Education Program to offer a one-day forum for the Inland Northwest Farm Safety Network focusing on farm worker issues to expand the dissemination of the Spanish play scripts within and beyond existing community groups.**

  The Center partnered with the Washington State Department of Agriculture's (WSDA) Farm Worker Education Committee, and WSU Cooperative Extension to bring the second annual Inland Northwest Farm Safety Network Conference on November 3, 2000, focusing on farm worker issues. The agenda included topics such as: 'For Healthy Kids' (Fred Hutchinson Cancer Research Center); Marketing Strategy-Hands-on Pesticide Handler Training (WSDA); Worker Protection Standard (L&I/WSDA); Grants and Funding Opportunities (L&I Safe@Work Grant and Pacific Northwest Agricultural Safety and Health Center - PNASH); Northwest Food Processors; Safety Plays (Center for Farm Health and Safety); a farm worker housing panel and brainstorming session on sustainability of the network facilitated by Partnership for Rural Improvement. This year the Network conference is being sponsored by WorkSafe in Ellensburg and is scheduled for November 9th. The conference theme will be the broad spectrum of agricultural safety.

Phase III – Script Dissemination

- **Distribute to community groups four pre-tested plays and aid them in the production of each play/program.**

  The project developed a production instruction guide along with a tutorial videotape to assist community groups in the production of the plays. A production packet with the play scripts, production instruction guide, and tutorial videotape was disseminated to each community group who participated in the project. In addition to these initial 24 groups, the project was presented at the 2001 Western Migrant Stream Forum Conference, and an additional 26 groups requested the scripts. To save on the cost of reproducing the tutorial videotapes, these groups were asked to identify the play they would be most likely to produce. To date, 35 groups have received a play script packet.

- **Conduct research to evaluate the dissemination of information.**

The research consisted of two components, which were: 1) a simple count of the groups that received the play scripts along with a production instruction guide and a tutorial videotape, and 2) a follow-up interview with all the recipients of those materials. The project developed a production packet to disseminate information to community groups. The play scripts along with a production instruction guide and a tutorial videotape were initially sent to 24 groups in November of 2000. Following a presentation at the Western Migrant Stream Forum Conference in February of 2001, an additional 11 groups received the production packet. Many of these groups have also requested the research findings to support their own projects or for presentations in professional meetings.

- **Refine the dissemination process in order to mobilize local communities to present the plays.**

  In order to facilitate the local communities' production of the plays without assistance, the Center edited videotapes of the play performances and created a Production Instruction Guide. Editing the videotapes of the plays proved to be a lengthy process. Each of the four one-act plays were dubbed with Center graphics, an introduction, sound, program sponsors, and acknowledgements. These videotapes were designed as tutorial aids in the production of the plays and not as stand alone training videos.

  To aid community groups further in the production of the plays, a Production Instruction Guide was developed. This guide was based upon the play production experiences of the project coordinator, bilingual project assistant, and the artistic play director. The Spanish/English guide lists each of the steps involved in producing the plays as well as the responsibilities of each key person involved in play production. For example, the Production Manager's responsibilities are: 1) Enlist the help of dependable co-workers and, if possible, recruit an experienced play Director, 2) Partner with or obtain sponsorship from credible organizations within the farm worker community, 3) Determine the budget and consider the costs of payroll, building rental, advertising, telephone, transportation, etc., 4) Oversee the production process, coordinate with the play Director, and supervise the Director, the Publicity Manager, and the House Manager/Facilitator.

- **Design a methodology for adapting the plays to radio.**

  Early in the Spring of 2000 the Center began working with Radio Cadena/Northwest Communities Education Center to look at the feasibility of adapting each of the four one-act plays to radio. Radio Cadena would work closely with the playwright to modify each play script by adding narration and sound effects and by changing the vocabulary for clarification. A proposal for Radio Cadena to adapt the plays to radio did not receive funding, and the effort to produce radio plays was postponed.

- **Design an evaluation method to determine the effectiveness of two models of dissemination, i.e., community theater and radio theater.**

The Center developed a method of evaluating the effectiveness of two methods for presentations of farm health and safety information to Hispanic farm workers; to compare the diverse mediums of presentations of health and safety information in terms of the impact on attitudes, knowledge and behavior; and to compare the effectiveness of two dissemination processes, one through local radio and the other through a captive audience of workers in an educational setting and two large agri-businesses with corporate support for the project. The methods include presenting four video/audio-taped one-act plays followed by radio broadcasts of the same plays. A foto-novela to accompany each of the plays for participants in attendance at each play. The video/audio-taped presentations at the three sites would be evaluated. Dissemination of the videotapes and radio productions would also be evaluated using a variety of qualitative and quantitative research methods. The evaluation depended upon funding of Radio Cadena to produce radio plays. This part of the program has not yet been funded.

- **Develop a method for involving and sustaining community volunteers in the production of plays to Hispanic farm workers and their families.**

  There were three levels of community-based involvement. The first level is the broad base of Hispanic healthcare providers, advocacy organizations, educational institutions, and Latino cultural/civic groups. The second level of community volunteers were the individuals recruited from these groups that were willing to assist the project. The third group of community volunteers made up a 'core' group of farm workers and others that produced, presented and acted in the plays. Many of the contacts made during the scheduling of the various focus groups and key informant interviews formed an on-going network of community volunteers. Several times over the course of the project these groups received progress reports. Through telephone contact and electronic mail groups were kept up to date of play schedules, and other project activities. The project coordinator worked closely with the play director and actor's troupe.

  Although measures were taken to sustain the program within the community, funding issues prevented the full realization of these developments. Scripts, videos, and production guides and materials were developed and distributed to volunteer groups, however the time commitment involved in producing the play is a challenge for many groups. Thus community groups will need to partner with schools and university theater departments to be able to sustain the program.

- **Work with the grower's network to sponsor future plays to expand the dissemination of the Spanish play scripts within and beyond existing community groups.**

A variety of growers have been involved in every aspect of the project. From their participation in the focus groups, partnering to secure a Labor and Industries Safe@Work grant, attendance at play performances, participation in the Inland Northwest Farm Safety Network Conference, and on-going support of a mechanism to sustain the theater program. The various grower organizations that the Center has collaborated with are: the Washington Growers League, Washington Growers Clearing House, Hop Growers of Washington, and the Washington Wine Grape Growers Association. One of the growers, John I. Haas, Inc., received funding from the Washington State Department of Labor and Industries to show three of the plays to their workforce in Mabton and Toppenish in the Summer of 2000. Another grower, Broetje Orchards, welcomed the presentation of plays in their residential community. Broetje, a three thousand-acre apple orchard located in Prescott, Washington, supported the three-year Theater Project by inviting the Center to show the plays to their workforce and by participating in the research portion of the project. Broetje Orchards provides housing, a private school, and other facilities for 500 workers on a permanent basis.

Growers supported the theater program for the short-term but are reluctant to establish a permanent mechanism for pesticide safety training for the future. However, several say they would support the program if it did not include a long-term funding commitment and were more cost-efficient.

- **Explore issues that came out of the evaluation, such as literacy and cultural communication patterns. (Examine literacy and how it impacts the presentation of farm health and safety education. Explore cultural communication patterns and how they influence the development of safety intervention and research programs.)**

  Currently, the Center is working on a one-year pilot project to research the link between literacy and comprehensibility of safety materials. This data will lead to the development of a literacy assessment tool. To date, 25 interviews have been conducted with migrant and seasonal workers in the Walla Walla area. This data is being coded and analyzed and will be the framework for the development of the literacy assessment tool. The results of this study will be available October of 2001.

Outcome Assessment

Overall the project was well received by the communities. The communities most involved in the project were located in Walla Walla and Yakima counties. The program was so well received in Yakima that the Washington State Department of Labor and Industries funded an additional year to bring six performances of three of the four plays to a hop enterprise, John I. Haas, Inc., in Toppenish and Mabton. This section is divided into three subsections to assess outcomes of each of the project's three phases separately.

Phase I – Community Setting

One goal of this project was to increase farm workers' knowledge of hazards and awareness of farm health and safety information through community based plays.

To provide data for the evaluation of the plays, participants were asked to complete a pre-test prior to viewing the play and an identical post-test immediately afterwards. The pre-/post-tests were designed to measure changes in knowledge, attitude, and reported behavior. Questions were pre-tested on a group of farm workers in a labor camp. To test for changes in respondents' knowledge regarding the topics covered, questions were developed based on the main information presented in each play. For example, play 1 contained information on Hepatitis A. One question asked, "Can washing hands with soap and water help prevent Hepatitis A?" For each question, respondents could answer Yes, No, or Don't Know.

We tested the null hypothesis that "no increase of appropriate farm health and safety knowledge occurs as a result of attendance at a one-act Spanish play." In order to test this null hypothesis, responses to questions based upon direct information from the four community based plays were used. All of the 301 completed pre-/post-test questionnaires were tabulated. Of these, 185 were farm workers, and 115 were non-farm workers. Responses were analyzed for the whole sample and then separately for farm workers and non-farm workers.

We first cross-tabulated the pre-test with the post-test questions in terms of their correct versus incorrect responses. Two tailed Chi-square tests of significance of these cross-tabulations indicate association between the correctness of knowledge on pre-/post-test questions (see Table 1). To determine whether the association suggested movement from incorrect answers or "don't knows" to correct responses, a Marginal Homogeneity (MH) statistic was calculated with its one tail test of significance (see Table 2). The Marginal Homogeneity test is a non-parametric test developed for contingency tables consisting of multi-nominal, ordinal-level data (Kurtz, 1999). The MH test is typically applied to a pre-/post-test situation, as it uses assumptions appropriate to repeated measures and through weighting procedures, provides a conservative estimate of change (Agresti, 1980).

There were several cross-tabulations where the Chi-Square (X^2) statistic could not be performed due to small numbers in a particular cell. Conversely, since the MH is based on a Chi-square (X^2) statistic, there are also questions for which the Marginal Homogeneity test could not be performed because 100% of respondents had the same response on the post-test.

A total of 301 respondents completed pre-/post-tests after viewing one of the four plays; 107 viewed play 1, 93 viewed play 2, 38 viewed play 3, and 63 viewed play 4. Of the 17 questions respondents showed improvement on, eleven have Chi-squares significant at less than the .10 level. This means that overall, 11 of the questions demonstrate a significant association with the pre-/post-test variable (see Table 1 for complete statistics).

To better understand how and where change is occurring, the Marginal Homogeneity test was then employed. Here we see movement in the direction of learning for all questions in the whole sample—a significant change from pre- to post-test for 8 of the questions in the farm worker sample and 6 questions in the non-farm worker sample. In fact, 5 of the 6 questions which are significant at p .10 for non-farm workers are different from the significant 8 farm worker questions using the MH statistic (see Table 2). In other words, 13 of the 17 questions show a significant change in knowledge in the desired direction for either farm workers or non-farm workers.

Three of the four questions that do not show significant change based upon the MH statistic do show very significant Chi-square association between variables at the p .01 level, but these questions have very high initial correct responses (91-96%) and less than 4% change. For example, a question in play 1 asks whether Alcoholics Anonymous helps people quit drinking. In the responses to this question, 96.6% were correct prior to the play and 100% after, which demonstrates a great deal of association but little positive change.

To gain a better understanding of differences between response groups, demographic variables were introduced into the MH statistical analysis. There were no significant differences in these questions in terms of responses from diverse age categories. Using gender in the MH statistic, one question was significantly different; women more than men appeared to learn that "older women are more at risk for miscarriages." The Chi-square statistic for males verses females pointed to two questions which were found to be significantly different. While both groups together significantly increased on the question, "Can exercise help prevent back pain?" (X^2=p .01), males seemed to account for this increase significantly more than females (males X^2= p .01; females X^2= p .10). Also, while both groups together significantly increased on the question, "Does occasional drug use in the first 2 months of pregnancy increase the risk of miscarriages?" (X^2= p .01), females seemed to account for this increase significantly more than males (females X^2= p .01; males X^2= p .05).

Now the analysis returns to testing the null hypothesis that "no increase of appropriate farm health and safety knowledge occurs as a result of attendance at a one-act Spanish play." It is necessary to reject the null hypothesis because 13 of 17 questions designed to measure information directly from the plays demonstrated a significant degree of positive knowledge change (p .10). Therefore, a significant number of people demonstrated a gain in knowledge from before the plays to directly after the plays. In fact, eliminating the questions where almost everyone responded correctly on the pre-test creating little room for change, there were 14 possible positive change questions.

The farm worker group significantly changed in the correct direction in 8 out of 14 possible responses. Thus, we believe that the plays increase knowledge in the farm worker group. Table 2.A demonstrates that the mean positive change in knowledge was 13.6% for the whole sample on all questions. The variance which made up this mean ranged from 4% to 44%. In rejecting the null hypothesis, we have been unable to disprove the hypothesis. Therefore, the hypothesis that "appropriate farm health and safety knowledge increases as a result of attendance at a one act Spanish play enacted by a community players group" appears valid.

To better understand the results of this research and its potential indication of behavioral change, a qualitative analysis was undertaken in the form of follow-up telephone interviews. After viewing one of the plays, a total of 183 individuals consented to follow-up interviews. Thirty farm worker households of those who were randomly selected participated in telephone interviews about two months later. Two-thirds of the persons interviewed were females. A standardized set of open-ended questions was used. Respondents were asked to share their opinions about the plays and to comment on the overall approach of theater as an educational method. Findings were synthesized for main themes and summarized.

More than half of the respondents recalled messages from the plays. They generally believed that the play reinforced or sharpened the knowledge they already had. Overall, respondents indicated that they liked the plays very much and recalled the story lines easily. Those interviewed believed the plays were realistic and written with stories pertaining to their lives. Most said they would attend additional plays if given the opportunity. Many of the respondents had discussed the play with others afterwards.

When asked about behavioral issues, one-third of the respondents indicated that they had changed their behavior after seeing a play. They reported behavior changes including washing work-clothes separate from other family clothing, washing hands more frequently, scheduling a clinic visit to rule out TB, visiting a physician rather than relying on over-the-counter medications, and being more cautious about sharing food from others' homes.

The follow-up interviews held two months after viewing suggest that participants do retain some of the health and safety messages presented in the plays. While self-report of behavior change is always questionable, the interviews suggest that participants were able to generalize the health and safety messages beyond the play performance settings. This provides a more solid basis for potential behavior change.

Phase II – Work Setting

As part of the outcome assessment it is necessary to evaluate the data from the work setting as well.

Once again, the initial question that motivated this study was whether Hispanic farm workers retain health and safety information as a result of viewing a one-act play presented in Spanish by a community players group. Three plays were used in this study, Dora Evelia (bending/lifting safety), Sueños y Desafíos (pesticide safety), and El Regreso de Miguel (preventing Hepatitis A) to disseminate safety and health related information. Data combined from all three plays were used to determine the effectiveness of theater as an educational tool for Hispanic farm workers. The results of this phase of the study suggest that positive gains in knowledge can be accomplished via theater as a medium for disseminating work-related health and safety information to Hispanic farm workers and that retention of this knowledge is maintained over time.

We conducted all statistical analyses using the SPSS Base 9.0 computer software package. The variables we analyzed were the answers produced by the respondents on pre-, post-, and follow-up play self-report questionnaires designed specifically for each play. We included respondents' data in analyses only if both their pre- and post-play responses or their post- and follow-up play responses were present for the specific question and relationship we were analyzing. This type of within-subjects design uses repeated measures to evaluate changes in respondent knowledge attributed to exposure to a specific event, in this case, each specific play. Analysis of data gathered using this design depends on how dependent variables are scaled. In this research, we scaled dependent variables on nominal scales, necessitating the use of a nonparametric test.

To analyze the data, we used the McNemar test, which is recommended for repeated measures test questions that generate data that are both nominal and binary (Bordens & Abbott, 1996). "The McNemar test determines whether the initial response rate (before the event) equals the final response rate (after the event). This test is useful for detecting changes in responses due to experimental intervention in before-and-after designs," and we employed it in the analysis of test results related to this research (SPSS Base 9.0 User's Guide, 1999, p. 367). Although many of the questions asked respondents to choose the correct answer among three choices, the incorrect answers were collapsed to produce a dichotomous variable appropriate for the McNemar test (see Tables 3 and 4 for the results of these tests).

The pre-, post-, and follow-up play questionnaires associated with the play Dora Evelia contained three repeated questions. The pre- play question number 2, *"To avoid being electrocuted, what is the closest you should come to power lines?"* generated highly significant results ($p \leq .000$; two-tailed) and was the most robust finding of increased knowledge for any of the plays (see Tables 3 and 4). Pre-play questions 3 and 4 showed gains in knowledge that were not significant. The post-play and follow-up data generated no significant results for these three questions indicating that, for those who returned their surveys, specific knowledge was still cognitively available.

The pre-, post-, and follow-up play questionnaires associated with the play Sueños y Desafíos contained four repeated questions. Pre-play question number 1 had respondents choose which of the following is the correct safety practice: a) *Wash hands after using the bathroom*, b) *Wash hands before using the bathroom*, or c) *Wash hands before and after using the bathroom*. We applied the McNemar test generating significant results ($p \leq .01$; two-tailed) in knowledge growth (see Tables 3 and 4). We analyzed the remaining three repeated questions and generated non-significant results, suggesting that this material was probably known prior to the presentation of the play and changed little, if any, as a result of play viewing. The post-play and follow-up data generated no significant results for these four repeated questions, indicating that, for those who returned their surveys, specific knowledge was still cognitively available.

The pre-, post-, and follow-up play questionnaires associated with the play El Regreso de Miguel contained six repeated questions. Analysis of these questions found three non-significant results and three that proved significant in the pre-, post-play data. We analyzed pre-play question number 5, *"Can Alcoholics Anonymous help people quit drinking?"* and generated significant results ($p \leq .05$; two-tailed) of increased knowledge. Pre-play question number 6, *"Is there a cure for tuberculosis (TB)?"* also produced significant results ($p \leq .01$; two tailed) of increased knowledge. Pre-play question 2, *"Does Hepatitis A happen only in children?"* also produced changes that were virtually significant ($p = .052$). Pre-play question number 7, *"Is a bad cough that lasts for weeks a possible sign of...?"* produced a fairly sizable loss in knowledge that was not quite significant. The question, *"When someone's skin or eyes turn yellow, is that a sign of...?"* produced a sizeable gain in knowledge on the follow-up that was not quite significant ($p = .125$; two tailed) due to the small number of cases involved (see Tables 3 and 4).

In order to fully ascertain the result of this research, one must combine many interrelated findings to form a comprehensive conclusion. A combined total of 13 questions were designed and presented as repeated measures in the pre-play, post-play, and follow-up questionnaires to determine possible gains in knowledge. A total of 10 of these 13 were shown to produce knowledge gains in the desired positive direction (see Tables 3 and 4). If we examine 3 of the 13 questions from the play Sueños y Desafíos, we find that they had very high initial correct response rates (91.7-97.5%) and 2.1% or less change in knowledge from pre- to post-play (see Tables 3 and 4). These high initial correct response rates leave little room for any significant learning to take place and for this reason were considered ineffective questions and weighted as such.

Of the 10 remaining questions, 8 were shown to have positive gains in knowledge. Five of these 10 questions showed significant results in the desired positive direction of knowledge gained: two questions were significant at $p \leq .05$, two questions were significant at $p \leq .01$ (with both of these at $p \leq .005$ or less), and one question was significant at p .001. There was one question with a fairly sizable loss of knowledge

occurring between the pre- and post-play measures (see Tables 3 and 4). One possible explanation of this result is that the play El Regreso de Miguel contained health and safety information for two separate diseases (i.e., Hepatitis A and Tuberculosis), which may have led to some confusion on the part of audience members.

When we examine the overall change in knowledge between the pre- and post-play assessments for the combined 13 questions, we find a mean change of 7.7% in the desired positive direction with a range from –9.0 % to 52.4% (see Tables 3 and 4). This mean percent of change, 7.7, without any further examination, may seem low. But, if we examine the 5 questions with significant results from the 10 questions that produced positive gains in knowledge, and eliminate the 3 ineffective questions from the play Sueños y Desafios, we find a mean of 19.2% increase in knowledge gained with a range from 10% to 52.4%, which is a more respectable gain.

Further examination of the follow-up survey results helps to establish the existence and retention of specific health and safety information over time by those who returned their surveys. However, we must use caution when considering the significance level of these results due to the small number of respondents per question (i.e., 15 to 20). When we analyze the data from the follow-up survey with the post-play questionnaire, we find none of the questions exhibited a significant change in knowledge, with 1 question showing a sizable albeit insignificant increase. As stated earlier, this increase in knowledge from post-test to the follow-up survey is not statistically relevant because the number of respondents is so few.

Another item for consideration involves the length of time workers have been employed in the area of farm work. For the play Dora Evelia, 57.7% responded that they had worked more than 10 years in this field of labor, and 81.1% worked at least 5 years. For the same play, 54.7% responded that they plan to work in this profession until they retire, with an additional 23.6% responding that they plan to work at least 5 to 10 more years in this type of labor. With the vast majority of workers already familiar with many of the dangers associated with farm work, this study was able to seek out areas of need and present specific health and safety information in such a way that it increased knowledge in a seasoned work force.

These facts lend themselves to the validity of the research finding that knowledge can be accomplished via theater as a medium for disseminating work-related health and safety information to Hispanic farm workers. Thus, we turn one last time to the null hypothesis, "no increase of appropriate farm health and safety knowledge occurs as a result of attendance at a one-act Spanish play," which we must finally reject in its entirety.

Comparison of Phase I and Phase II

Although the analyses of Phases I and II of the project utilized different statistics to interpret the data obtained, both the Chi square statistic and the McNemar test are valid tools to use on this project's data set. At first, it seems as though it might be difficult to compare the results because the Chi square statistical significance level was set at alpha .10, whereas the McNemar's statistical significance level was set at alpha .05. However, upon review of the results of the tests run on the Phase II data, there is only one more change that would be statistically significant had the alpha level been set at .10, which would have changed the overall report of the results very little. Thus at this point, it could be concluded that the Phase I stage of the project is more efficacious than the Phase II stage of the project because 1) 13 of the 17 questions on the post-test were answered in a manner that was significantly different from how the audience members had answered the questions on the pre-test, whereas 10 of the 13 questions on the post-test were answered in a manner that was significantly different from how the audience members had answered the questions on the pre-test at the work site performances and 2) the overall knowledge gain in Phase I was 13.6%, whereas the overall knowledge gain in Phase II was 7.7%. The difference between these findings could be for any number of reasons.

There are some reasonable explanations for these findings. In the Phase II setting, the audience members had already been in the field working for part of the day, which can be very taxing; thus, it would be reasonable to expect some measure of fatigue. Labor jobs rank among the lowest in job satisfaction, and performing these sorts of jobs on hot summer days might prove only to exacerbate whatever negative mood has been induced (Friend and Burns, 1977). Masters, Barden, and Ford (1979) found levels of retention to be lower when subjects were in a negative rather than a positive mood. Also, research on massed practice has demonstrated that the formation of new connections in serial and paired-associate learning can be interfered with by fatigue (Underwood, et.al. 1961). Thus, it seems reasonable to state that the efforts the audience members had put into the work they had just done confounded their abilities to absorb and retain the information in the plays, whereas the audiences at the community plays were usually at a picnic hosted by a church and were probably in a much better state to receive information.

Another factor that could account for some of the differences noted in the retention levels between the Phase I and Phase II audience members is that the people in attendance at the community-based plays were there voluntarily. It has been shown that there are a number of substantial differences between people who volunteer to do something and those who do not (Clary et. al. 1998; Penner et. al. 1998). For instance individuals that volunteer have a tendency to exhibit more pro-social attitudes (Penner et. al. 1998). Another possibility is that the workers were required to attend the plays, and thus many may not have wanted to be there, a factor which would affect the attendees receptiveness to the information presented in the plays. The community-based settings, on the other hand, were completely voluntary. These ideas, of course, are not the only possible explanations for the notable differences in the knowledge

that the audience members gained.

Another suggestion might be that the controlled work setting had a number of distractions that the community settings did not have. The worker play presentations were much larger than the community presentations, the time allotted for the plays was constrained by the grower, and there was a meal served at the sites.

Lastly, when people put stake into something, they are aligning their attitudes with whatever behavior it is that they are performing; this concept is referred to as Cognitive Dissonance theory (Festinger, 1957). If they do not enjoy the event they are involved in they have the choice of changing their opinion about it or ending the event altogether; whereas when an individual is required to perform a behavior they can simply note that they do not want to be doing such a thing and rest easy with their objection, knowing that they wanted very little to do with the event in the first place. In the later case the participant has already justified doing a poor job and thus has less qualms about doing so.

Phase III – Script Dissemination

The plays were well received by the community, as evidenced by the high level of involvement of local community organizations, the responses on the pre-/post-play questionnaires, and the number of organizations who requested the play scripts after the performances. The play scripts along with a production instruction guide and a tutorial videotape, were distributed to 35 community groups and a follow-up interview was done with all the recipients to determine what the groups were doing with those materials. A small percentage of the groups indicate that they plan to produce the play some time in the next year or in the future. One follow-up contact led to a referral to a high school teacher who will have students read the four scripts in his class Spring of 2001, along with promoting the use of the scripts in the English as a Second Language Classes at Davis High School in Yakima. This instructor also plans a larger event to produce the plays for parents in the Spring of 2002. Other examples of dissemination efforts are: La Puente de Amistad Health Center, Arizona loaned the pesticide safety play to several promotores (outreach healthcare workers) and will produce the play for 'Farm Worker Appreciation Day' in December of 2001; For Healthy Kids (Fred Hutchinson Cancer Research Center) plans to produce the pesticide safety play in the near future; Farm Safety 4 Just Kids, Earlham, Iowa, is having the local Spanish class review the scripts as an assignment. A professional with Centers for Disease Control will produce the Hepatitis A play in South Georgia during the peak of harvest; and the Community Health Partnership, Chicago, Illinois, will use the bending/lifting foto-novela and produce the play in the Spring of 2002.

Growers supported the theater program for the short-term but are reluctant to establish a permanent mechanism for pesticide safety training for the future. However, several say they would support the program if it did not include a long-term funding commitment and were more cost-efficient.

Discussion and Conclusions

The project was a learning experience, and each difficulty shaped the next step and improved subsequent project strategies. Community theater has proven to be an effective method for reaching Hispanic farm workers with farm health and safety information. The difficulties now rest in the ability of the community to sustain this method for increasing the knowledge and awareness of the target population and the challenges associated with the possible diversification of dissemination methods.

Challenges and Concerns

We encountered some difficulties throughout the course of the Hispanic Theater project. By confronting these problems, we learned what not to do in the future and also how we might better reach the farm worker population in the future.

Trust

One crucial aspect of the Hispanic Theater project was to partner with local groups who work with and are trusted by the farm worker and grower population. Both communities are distrustful of government entities. We think in the Hispanic community, particularly, relationships and trust are given even greater emphasis. On several occasions when we tried to set up an advisory group, only one individual showed up to the meeting. A comment was made that "You cannot just pass out lots of paper and expect people to be involved." We were never successful in establishing an advisory committee. People would say that they would come but then not show up. We think face-to-face contact is more important with this community. They highly value formal and informal personal interaction. Therefore, the Center had to collaborate with individuals and organizations who had credibility in the farm worker community.

Network

Thus, we partnered with individuals who were working directly with program participants (farm workers, growers, healthcare providers, daycare providers, etc.). Examples of those individuals and their assistance are the following:

- **Special Populations Department, Walla Walla Community College** functioned as the off site project location. Staff there provided translation services, collaborated with Head Start directors at the Labor Camp and facilitated the play performances.
- **Northwest Communities Education Center/Radio Cadena** provided rehearsal space for the actors troupe, publicized the performances and developed a method of adapting the plays to radio.
- **Yakima Valley Farm Worker Clinic** provided oversight on the health issues presented in the plays and access to outreach workers to promote the program.
- **Washington State Department of Agriculture Farm worker Education Committee** promoted the program and partnered with the Center to facilitate the Inland Northwest Farm Safety Network Conference focusing on farm worker issues, November, 2000.
- **Providence Hospital's Healthy Communities Alliance - Parish Nurses** recruited participants for the farm worker focus groups and promoted the program.

- **Head Start directors** facilitated play performances at parent meetings.
- **Labor and Industries representatives** recruited growers for the focus group, provided injury data and attended performances to answer participants safety questions.
- **Washington State Migrant Council** promoted the program with their childcare centers and funded a play performance for staff members.
- Several **priests** invited play performances to church festivals.
- One **WSMC nurse-educator** transported workers and their families and arranged a meal as an incentive to attend the play.

Without the help of these local community members, the project might not have been as successful. Even with these helpful community members, though, there were difficulties.

The network developed for the Theater project needed sustained contact on the part of Center staff to maintain interest in the project and to foster future partnerships. When contacts were not followed up due to the play performance schedule, they tended to erode. In addition, staff turn-over at various organizations was problematic. Follow-up contacts, then, were made with new individuals who had to be reoriented and informed about the project before they could assist. These contacts were consequently less valuable than the on-going partnerships.

Continuity

Sometimes other project demands or responsibilities would interfere with the relationship building that was so crucial to sustaining interest in the Theater program. Consequently, continuity was one of the most difficult things to sustain. This difficulty was also due in part to the need to advertise the plays, create materials, and test instruments. Work was sometimes devoted to these tasks rather than to relationship building tasks. Both were important, but one often took precedence over the other. Some relationships suffered as a result of this dynamic.

Sustainability

Sustaining the Hispanic Theater project without the Center's help became a main concern. The project was meant to be an example of what communities could do to improve safety on the farm and to provide guidelines for future efforts. The logistical concerns the organizations expressed are the following:

Overwhelmingly, groups who received the play scripts suggest that they are understaffed and focused on their own projects. They also note that the time commitment involved in producing the plays, such as rehearsals, recruiting actors, scheduling plays, advertising, and promoting play performances entails a good deal of organizing and networking.

Community groups may need to collaborate with other organizations to sustain the program. Another option is to have the grower community develop a mechanism to sustain the program by creating a "funding pool." The grower response to this idea is as follows: 1)The economic climate in labor intensive crop industry is very poor, and the

grower community cannot make the theater program a high priority this year and 2) Over time, growers think their employee base may change in terms of education, language and familiarity with pesticide safety. The theater program may not be the best cost/benefit ratio. Growers support the theater program for the short-term but are reluctant to establish a permanent mechanism for pesticide safety training for the future. However, they would support the program if it did not include a long-term funding commitment and could be more cost-efficient.

Production

The constraints involved in a work setting are primarily around the length of time workers are released to participate in the play presentation. Their work schedule is such that it is difficult to hand out additional safety materials to reinforce messages or take home to share with other family members. In addition, workers may not feel comfortable talking freely about work conditions or other issues while in the presence of supervisory staff. Therefore, the information collected during work presentations may not accurately reflect worker thoughts or beliefs.

The very nature of live theater certainly presents several challenges, including the amount of time needed for rehearsals, the constant recruitment of actors, the travel time involved in covering the number of worksites across a three county region, and the lack of a home base and rehearsal space for the theater company. All of these factors influenced the promotion and presentation of the plays. However, our project overcame those challenges and succeeded in transmitting much-needed health and safety information to the farm workers. Although we used a non-traditional medium, the workers both enjoyed the plays and absorbed the information.

Successes

The Hispanic Theater project was a success despite the difficulties encountered. The plays did increase the awareness of the farm workers concerning farm health and safety. While this knowledge gain may not have immediately resulted in a behavioral change, the knowledge does appear to be retained over time by the attendees at the plays, so the long-term effects have yet to be determined. The project addressed issues that were important and relevant to the farm worker community and disseminated the information in a method that encouraged learning.

Settings

The plays were viewed by 568 Hispanic farm workers and their families and a number of other involved individuals (including crew bosses and others who interact with this population, such as advocacy groups who are receiving an educational tool that can be disseminated to their constituents), so the assistance from the community members outweighed the difficulties we experienced. The plays provided the workers with new health and safety information, and some of the messages also reinforced information that participants already knew. The value of the messages contained in the plays varied. Some messages were extremely valuable. For example, as a drowning deterrent, one of the plays revealed that "water in an irrigation canal is traveling at the rate of 40 miles an

hour." Another aspect of the value of the message is that the play presentations acted as a vehicle to bring workers, growers, health care providers and safety experts together around common themes so that they could interact and reinforce the importance of safety education. The plays reinforce the notion of a "work safe" environment. A few of the messages were already known by participants, though. For example, one play reminded the viewers that they should always wash their hands before smoking or eating.

Still, the plays were informative, and the new information appears to have stayed with the viewers of the plays. Analysis of the pre-/post-test in both the community-based and work-based settings shows that workers and their families do retain some of the health and safety messages presented in the plays. The qualitative analysis suggests that a good deal of knowledge has been gained or reinforced, and some behavior change has occurred or is likely to happen as a result of one act play performance viewing. It provides further information and validation for the hypothesis. Based on the analysis of quantitative and qualitative data, there is a significant increase in farm health and safety knowledge when participants attend a one-act Spanish play conducted by a community players group.

Behavioral Change

Due to limitations in the experimental design, it is not possible to determine to what extent these changes represent a placebo effect of having seen a play that was supposed to contain certain information, testing effects resulting from the use of a pre-test, or an interaction of the two. These limitations and those that emanate from statistical analysis of a self-selected sample, as well as self-report, should be taken into consideration. To strengthen our understanding of these phenomenon, we need to include direct measures of attitude and behavior; the present analysis is predominantly of knowledge gain. A small sample of open-ended interviews considered perceived behavior, but a larger behavioral and attitudinal study is necessary to understand change. The study should be longitudinal in order to consider retention of information and permanent change in behavior over time.

When there is a positive incentive to change, such as preventing children from being exposed to pesticide take-home exposures, individuals will most likely be motivated to change behavior. However, at least some of the safety messages may not lead to behavior change because workers are not motivated or other factors influence their decisions to continue unsafe work or health practices. For example, the economic cost of washing work clothes separately from family clothes, particularly if a family washes their clothes at a laundromat, plays a significant role in that safety decision. Field sanitation is another issue; workers can only wash their hands if facilities are available. So, despite an increase in knowledge and the retention of that knowledge over time, there still may not be a measurable behavior change.

Relevance of Material

Several independent judges evaluated the play-scripts and foto-novelas. Generally their comments were positive. One judge stated that he found "the scripts/stories/themes to be engaging and very appropriate to the 'target audiences.'" He also commented that the subject matter of the plays was "culturally relevant and use language that is familiar to

the audience of farm workers, either in Washington or in California." Another play script evaluator stated, "I think it is an excellent program, and as word gets around, more people will be looking to participate and/or have the programs presented in their schools. A very needed program." The judges also made some recommendations. "The messages come across in the plays and if post production discussions could be held between the audience and cast on their own experiences, the messages could become more meaningful and powerful." Another suggestion was, "that humor could have been incorporated better into the scripts. This could have been done without undermining the central messages of safety."

Conclusion

The similar responses to the plays by both the target audience and other members of the local community suggest that the plays successfully addressed the shared knowledge and values of that community. The project developed a method for involving the community in presenting appropriate farm health and safety plays to workers and their families. Community groups were enthusiastic about the program and willing to facilitate performances; however, recruiting audiences for the first fourteen performances turned out to be more difficult than anticipated. The employer-sponsored setting actually reached the target audience with the least recruitment effort. The plays seemed to be well received by the audience members, and we can therefore infer that the play productions incorporated their norms. However, the plays' ability to effect behavior change as a result of increased awareness is yet to be seen. Follow-up with the groups that plan to produce the plays indicates that, they are enthusiastic about the program and many intend on producing the plays some time in the near future. However, based on the time commitment involved in producing the plays, groups may need to partner with other organizations, universities, or schools to make the play production possible.

The grower community has also shown a high level of interest in the program and is willing to explore methods to sustain the program if they are not required to make a long term funding commitment and if the play production can be more cost effective.

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Table 1

Chi-Square Test of Significance of Cross Tabulations

Plays 1,2,3&4		Chi-Square Asymp. Sig. (2-sided)		
Question #' s:	Answers	All n=( )	Farm Workers n=( ) and ^	Non-Farm Workers n=( ) and ^
Play #1				
3. Does Hepatitis A only happen to children?	(N)	.488 (106)	.592(58)	.860 (45)^
4. Can washing hands with soap and water help prevent Hepatitis A?	(Y)	.746 (106)	.711(59)	NA (47)
7. Can Alcoholics Anonymous help people quit drinking?	(Y)	.824 (107)	NA (61)	.788 (46)
8. Is there a remedy for Tuberculosis?	(Y)	.001* (107)	.101(58)	.004* (46)^
Play #2				
4. Are pesticides only harmful if they are swallowed?	(N)	.001* (93)	.016**(51)	.011** (42)
5. Can a person get sick from coming into contact with pesticides on somebody else's skin or clothing?	(Y)	.028** (93)	.739(51)	.022** (42)
6. Can clothing with pesticides contaminate other clothes if they are washed together?	(Y)	.009* (92)	NA (51)	.033** (41)
7. Can you get sick from coming into contact with pesticides even if you can't see them?	(Y)	.000* (92)	.002*(50)	.007* (42)
Play #3				
4. Can water in an irrigation canal travel up to 40 miles per hour?	(Y)	.939 (38)	.859(25)	NA (13)
5. Are cramps (like menstrual pains) during pregnancy an indicator that a woman is at risk of having a miscarriage?	(Y)	.260 (38)	.288(25)	NA (13)
6. Are older women more at risk of miscarriages?	(Y)	.946 (38)	.958(25)	NA (13)
7. Should exercise such as walking be avoided during pregnancy?	(N)	.001* (38)	.085***(25)	.007* (12)^
8. Does occasional drugs or alcohol use in the first 2 months of a pregnancy increase the risk of birth defects?	(Y)	.000* (38)	.001*(25)	.020** (12)^
9. Does a boss have the right to fire an employee if she is pregnant?	(N)	.066***(37)	NA (25)	.020**(12)
10. Do all women need to be examined by a doctor early in their pregnancy even if they have had pregnancies with no problems before?	(Y)	.000* (38)	.000* (25)	NA (13)
Play #4				
6. Can exercise help prevent back pain?	(Y)	.001* (63)	.004*(50)	NA (13)
7. Can failing to drink enough water cause headaches and fainting?	(Y)	.000* (61)	.000*(48)	.020** (12)^
# Of Significant Questions		**11**	**7**	**9**

Note: *p<.01, **p<.05, ***p<.10

^ Due to non responses on questions farm workers and non farm workers together do not add up to 100% of population sample.

Table 2

Marginal Homogeneity Statistics Level of Significance

Plays 1,2,3&4 Question #' s:	Answers	MH Stat. (1 sided) Std.MH Stat.	Farm Workers n=( ) and ^	Non-Farm Workers n= ( ) and ^
Play #1				
3. Does Hepatitis A only happen to children?	(N)	+.1.19	143 (58)	.021**(45)^
4. Can washing hands with soap and water help prevent Hepatitis A ?	(Y)	+1.79	.037**(59)	NA (47)
7. Can Alcoholics Anonymous help people quit drinking?	(Y)	+NA	NA (61)	.264 (46)
8. Is there a remedy for Tuberculosis?	(Y)	+1.53	.064***(58)	.083***(46)^
Play #2				
4. Are pesticides only harmful if they are swallowed?	(N)	+1.03	.152 (51)	.01*(42)
5. Can a person get sick from coming into contact with pesticides on somebody else's skin or clothing?	(Y)	+1.00	.159(51)	.01*(42)
6. Can clothing with pesticides contaminate other clothes if they are washed together?	(Y)	NA	NA (51)	.001*(41)
7. Can you get sick from coming into contact with pesticides even if you can't see them?	(Y)	+1.41	.079***(50)	.143(42)
Play #3				
4. Can water in an irrigation canal travel up to 40 miles per hour?	(Y)	+2.24	.013**(25)	NA (13)
5. Are cramps (like menstrual pains) during pregnancy an indicator that a woman is at risk of having a miscarriage?	(Y)	+3.13	.001*(25)	NA (13)
6. Are older women more at risk of miscarriages?	(Y)	+1.29	.099***(25)	NA (13)
7. Should exercise such as walking be avoided during pregnancy?	(N)	+.58	.282(25)	.159 (12)^
8. Does occasional drugs or alcohol use in the first 2 months of a pregnancy increase the risk of birth defects?	(Y)	+1.00	.159(25)	.159(12)^
9. Does a boss have the right to fire an employee if she is pregnant?	(N)	+NA	NA(25)	.09***(12)
10. Do all women need to be examined by a doctor early in their pregnancy even if they have had pregnancies with no problems before?	(Y)	+.00	.500(25)	NA (13)
Play #4				
6. Can exercise help prevent back pain?	(Y)	+3.13	.001*(50)	NA (13)
7. Can failing to drink enough water cause headaches and fainting?	(Y)	+1.41	.079*** (48)	.159 (12)^
# Of Significant Questions			8	6

Note: *p<.01, **p<.05, ***p<.10

^ Due to non responses on questions farm workers and non farm workers together do not add to 100% of population sample.

Table 2.A

Percent Responses and Change on Pre / Post Test Information Questions

Play # - Question #	Questions	Answers	n=( )	% Correct Pre	% Correct Post	% Change
1-#3	*Does Hepatitis A only happen to children?*	*(N)*	(106)	67.2%	82.8%	15.6%
1-#4	*Can washing hands with soap and water help prevent Hepatitis A?*	*(Y)*	(106)	88.1%	98.3%	10.2%
1-#7	*Can Alcoholics Anonymous help people quit drinking?*	*(Y)*	(107)	96.6%	100.0%	3.4%
1-#8	*Is there a remedy for Tuberculosis?*	*(Y)*	(107)	81.0%	93.1%	12.1%
2-#4	*Are pesticides only harmful if they are swallowed?*	*(N)*	(93)	72.5%	84.3%	11.8%
2-#5	*Can a person get sick from coming into contact with pesticides on somebody else's skin or clothing?*	*(Y)*	(93)	90.2%	98.0%	7.8%
2-#6	*Can clothing with pesticides contaminate other clothes if they are washed together?*	*(Y)*	(92)	84.3%	100.0%	15.7%
2-#7	*Can you get sick from coming into contact with pesticides even if you cannot see them?*	*(Y)*	(92)	90.0%	98.0%	8.0%
3-#4	*Can water in irrigation canal travel up to 40 miles per hour?*	*(Y)*	(38)	56.0%	92.0%	36.0%
3-#5	*Are cramps (like menstrual pains) during pregnancy an indicator that a woman is at risk of having a miscarriage?*	*(Y)*	(38)	52.0%	96.0%	44.0%
3-#6	*Are older women more at risk of miscarriages?*	*(Y)*	(38)	68.0%	88.0%	20.0%
3-#7	*Should exercise such as walking be avoided during pregnancy?*	*(N)*	(38)	88.0%	92.0%	4.0%
3-#8	*Does occasional drug or alcohol use in the first 2 months of a pregnancy increase the risk of birth defects?*	*(Y)*	(38)	92.0%	96.0%	4.0%
3-#9	*Does a boss have the right to fire an employee if she is pregnant?*	*(N))*	(37)	88.0%	100.0%	12.0%
3-#10	*Do all women need to be examined by a doctor early in their pregnancy even if they have had pregnancies with no problems before?*	*(Y)*	(38)	96.0%	96.0%	0.00
4-#6	*Can exercise help prevent back pain?*	*(Y)*	(63)	72.0%	94.0%	22.0%
4-#7	*Can failing to drink enough water cause headaches and fainting?*	*(Y)*	(61)	91.7%	95.8%	4.1%
Mean	*Averages:*			**80.8%**	**94.4%**	**13.6%**

Table 3

Summary Of Pre-Test/Post-Test Survey Data

	% (n) Correct on Pretest	% (n) Correct on Posttest	% Point Change	Signif. (n)
Play 1: Dora Evelia				
2. What is the closest you should come to power lines? *10 feet*	21.9 (23)	74.3 (78)	+52.4	.000*** (105)
3. When lifting heavy objects, you should… *keep back straight and bend knees*	83.3 (90)	88.9 (96)	+5.6	.210 (108)
4. Exercises to strengthen your back can… *prevent back injuries*	78.2 (86)	84.5 (93)	+6.3	.189 (110)
		Mean Change	+21.4	
Play 2: Suenos y Desafios				
1. Wash hands *before and after* using the bathroom	76.6 (131)	88.3 (151)	+11.7	.002** (171)
2. Wash hands before eating or smoking	91.8 (146)	90.6 (144)	-1.2	.804 (159)
3. Wear long pants and long sleeved shirt when working	98.1 (156)	99.4 (158)	+1.3	.625 (159)
4. Wash and store work clothes separate from family clothes	95.5 (147)	(92.9) 143	-2.6	.454 (154)
		Mean Change	+2.3	
Play 3: El Regreso de Miguel				
2. Does Hepatitis A happen only in children? *No*	69.9 (65)	80.6 (75)	+10.7	.052* (93)
3. Washing hands with soap and water can help prevent… *Hepatitis A*	79.0 (83)	82.9 (87)	+3.9	.481 (105)
4. When someone's skin or eyes turn yellow, is that a sign of… *Hepatitis A*	74.5 (79)	74.5 (79)	0.0	1.000 (106)
5. Can Alcoholics Anonymous help people quit drinking? *Yes*	83.3 (75)	93.3 (84)	+10.0	.012* (90)
6. Is there a cure for Tuberculosis? *Yes, complete the entire treatment*	76.4 (81)	87.7 (93)	+11.3	.004** (106)
7. Is a bad cough that lasts several weeks a possible sign of… *Tuberculosis*	86.0 (86)	77.0 (77)	-9.0	.108 (100)
		Mean Change	+4.5	
		Overall Mean Change	+7.7	

Note: Significance was determined using McNemar's test for related samples. * = probability is less than or equal to .05; ** = probability is less than or equal to .01; *** = probability is less than or equal to .001.

Table 4

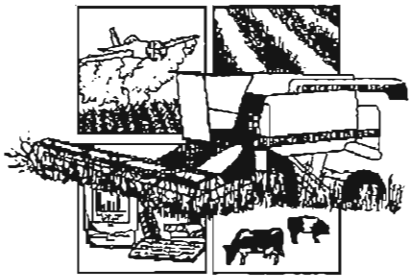
Summary Of Post-Test/Follow-Up Survey Data

	% (n) Correct on Post-test	% (n) Correct on Follow-up	% Point Change	Sig. (n)
Play 1: Dora Evelia				
2. What is the closest you should come to power lines? *10 feet*	73.7 (14)	68.4 (13)	-5.3	1.00 (19)
3. When lifting heavy objects, you should… *keep back straight and bend knees*	89.5 (17)	100.0 (19)	+10.5	NA (19)
4. Exercises to strengthen your back can… *prevent back injuries*	90.0 (18)	95.0 (19)	+5.0	1.00 (20)
		Mean Change	+3.4	
Play 2: Suenos y Desafios				
1. Wash hands *before and after* using the bathroom	85.0 (17)	85.0 (17)	0.0	1.00 (20)
2. Wash hands before eating or smoking	88.9 (16)	100.0 (18)	+11.1	NA (18)
3. Wear long pants and long sleeved shirt when working	100.0 (19)	100.0 (19)	0.0	NA (19)
4. Wash and store work clothes separate from family clothes	100.0 (19)	100.0 (19)	0.0	NA (19)
		Mean Change	+2.8	
Play 3: El Regreso de Miguel				
2. Does Hepatitis A happen only in children? *No*	83.3 (15)	94.4 (17)	+11.1	.625 (18)
3. Washing hands with soap and water can help prevent… *Hepatitis A*	80.0 (12)	86.7 (13)	+6.7	1.00 (15)
4. When someone's skin or eyes turn yellow, is that a sign of… *Hepatitis A*	58.8 (10)	82.4 (14)	+23.6	.125 (17)
5. Can Alcoholics Anonymous help people quit drinking? *Yes*	82.4 (14)	82.4 (14)	0.0	1.00 (17)
6. Is there a cure for Tuberculosis? *Yes, complete the entire treatment*	82.4 (14)	88.2 (15)	+5.8	1.00 (17)
7. Is a bad cough that lasts several weeks a possible sign of… *Tuberculosis*	87.5 (14)	81.3 (13)	-6.2	1.00 (16)
		Mean Change	+6.8	
		Overall Mean Change	+4.8	

Note: Significance was determined using McNemar's test for related samples. The test statistic could not be calculated where 2 x 2 table was not met. * = probability is less than or equal to .05; ** = probability is less than or equal to .01; *** = probability is less than or equal to .001.

Appendix B

Theater as a Mechanism for Increasing Farm Health and Safety Knowledge



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Theater as a Mechanism for Increasing Farm Health and Safety Knowledge

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Hazards of agricultural work have been well documented. To eliminate hazards the structural conditions of agriculture and the context in which the farm workers are employed require a good deal of reformulation and change. However, the injuries and health effects are occurring in the present. One accepted partial remedy is to educate farmers, workers and their families about the many hazards and adverse conditions. Education will help to create awareness. Through knowledge it will be possible for workers to weigh potential consequences and make appropriate behavioral decisions. Our intention, thus, is to provide appropriate mediums for education that will help farm populations protect themselves against numerous agricultural hazards.

This research was developed around the assumption that theater is an effective method for providing farm health and safety education to Spanish speaking people of Mexican or Latin American descent (Hispanic) who are agricultural workers. Specifically the hypothesis being tested is: appropriate farm health and safety knowledge increases as a result of attendance at a one-act Spanish play enacted by a community players group. To test the hypothesis an intervention which included four Spanish one-act plays enacted by community-based actors has been developed. The plays were produced in the three county region of Eastern Washington that is most densely populated by seasonal and migrant farm workers.

We will discuss the agricultural context; argue that theater is an effective and appropriate educational tool; describe the process used to design the intervention; present research methods and findings which test the hypothesis; and conclude with a discussion of the research.

Background

Migrating or having resettled from Mexico and other Latin American countries, many of the workers in this population group are poorly educated and come from poverty conditions. They arrive in this country with a reliance on traditional medicine, lacking much of what may be considered basic health and safety knowledge often taken

for granted on our farms. Partially as a result of the lack of safety practices in Region 5 of Washington State, farm workers ranked highest out of 335 occupational categories for illness and injury claims (Paradis, 1999). At the present time education appears to be the best alternative available to aid these workers in avoiding the hazards of their occupational surroundings.

The provision of health and safety education to Hispanic farm workers is a challenge due to low literacy skills, lack of English language proficiency and cultural communication barriers (Mines, 1992, Grieshop, Stiles, and Villanueva, 1966). To meet this challenge, community theater was selected to be tested as a medium for providing this information to the Hispanic farm worker population.

There is a worldwide, centuries old tradition of play-acting, role-playing, psychodrama or sociodrama used as an educative device (Wagner, 1976). Educational use of drama has in recent years been the cornerstone of many projects around the globe. Several researchers identify popular theatre as a tool for creating awareness of participant resources, problem solving, entertaining and holding interest, and fostering collective thinking and action. It provides a familiar medium, which defuses feelings of educational inferiority or illiteracy (Andruske, 1994, Kidd and Byram 1978). The most important feature is its representation of local situations and problems (Leis, 1976). It is this that makes it a powerful tool for education.

In the Latino community there is a rich and long tradition of using the "Novela," a form of "soap opera" to convey messages (Pilar, 1977). Novelas in television, print and radio provide public health information as well as entertainment. Building on this framework theatre, in the form of a one-act "novela," was chosen as the method to provide farm health and safety training to Hispanic farm workers and their families. Theater provides education through demonstration and imitation without demanding a high level of literacy or English-speaking skills from the audience. Thus it should result in meaningful lessons in a comfortable environment.

According to observational learning theory, observers procure cognitive abilities and new patterns of behavior by observing the performance of others. This learning may take varied forms, including new behavior patterns, judgmental standards, cognitive competencies, and generative rules for creating behaviors (Bandura, 1986). People can learn approximately what to do through modeling before they perform a behavior. The potential to learn by observation enables people to expand their knowledge and skills by observing the actual performances of others and the consequences for them. Observers are able to extricate conceptions of behavior illustrated in words and images, and then generalize beyond their present environment. Thus, viewers should be able to use the knowledge gained from play performances, and employ that knowledge in the work place or at home, creating behavioral change. Though change in knowledge cannot predict change in behavior, knowledge change can help us estimate the likeliness of a behavior.

RESEARCH APPROACH

To evaluate the effectiveness of theater as an educational tool, it was necessary to develop an intervention program which tested the medium. The program was designed to increase Hispanic farm workers' knowledge of hazards and awareness of farm health and safety information through theater. The program included the development of scripts for community based plays; a method for involving the community in presenting plays to Hispanic farm workers and their families; pretesting and presenting the plays in a variety of community settings; an evaluation of the process; and measuring outcomes including the potential for change in knowledge as well as indicators of behavior change.

Community networks were identified and a needs assessment was conducted as part of the formative approach to identify the most urgent health and safety needs of Hispanic farm workers and their families. Injury and accident data was also provided by the Yakima Valley Farm Workers Clinic and the Washington State Department of

Labor and Industries. A series of focus groups were comprised of 22 farm workers, growers, healthcare providers, advocates and community leaders.

In addition to the information gathered in the focus groups, as part of the formative approach, key informant interviews were held with community network members. Growers, agricultural workers, healthcare providers and advocates identified safety problems and participated in the development of "play-scripts", assisting the two independent playwrights. The most urgent health and safety issues identified by these focus groups and interviews were: 1) disease and illness prevention; 2) pregnancy/prenatal concerns and children at the workplace; 3) ergonomics--ladder safety, lifting, falls, etc.; and 4) pesticides and other chemicals.

These categories were further refined and resulted in the development of four Spanish one-act plays: "**El Regreso De Miguel**" (Michael's Return) a play about preventing Hepatitis A which includes Tuberculosis awareness and alcohol education; "**Sueños y Desafíos**" (Dreams and Challenges) a play about pesticide safety; "**La Fuji Mágica**" (The Magic Fuji Apple) a play about pregnancy/prenatal concerns, and drowning prevention; "**Dora Evelia**" a play about ergonomics, proper bending, lifting and ladder safety. The play scripts, written in Spanish at an appropriate education level, were sensitive to literacy and cultural issues. A panel of safety experts as well as information culled from safety and health literature such as the EPA booklet, "Protect Yourself from Pesticides," DOH's flyer, "Hepatitis A Vaccine," CAL/OSHA's, "Farm Labor Contractor Safety and Health Guide," provided details for the novelas. The playwrights wrote the play scripts around the health and safety messages. Safety experts consulted with the playwrights to insure the accuracy of the messages, attended performances and assisted with the refinement of each script.

Outcome Analysis/Evaluation

To provide data for the evaluation of the plays, participants were asked to complete a pretest prior to viewing the play and an identical posttest immediately

afterwards. The pre/posttests were designed to measure changes in knowledge, attitude and reported behavior. Questions were pretested on a group of farm workers in a labor camp. To test for changes in respondents' knowledge regarding the topics covered, questions were developed based on the main information presented in each play. For example, play 1 contained information on Hepatitis A. One question asked, "Can washing hands with soap and water help prevent Hepatitis A?" For each question, respondents could answer Yes, No, or Don't Know.

We tested the null hypothesis that "no difference occurs in appropriate farm health and safety knowledge as a result of attendance at a one-act Spanish play enacted by a community player's group." In order to test this null hypothesis responses to questions based upon direct information from the four plays were used. All of the 301 completed pretest-posttest questionnaires were tabulated. Of these, 185 were farm workers and 115 were non-farm workers. Responses were analyzed for the whole sample and then separately for farm workers and non-farm workers.

We first cross-tabulated the pretest with the posttest questions in terms of their correct versus incorrect responses. Two tailed Chi-square tests of significance of these cross-tabulations indicate association between the correctness of knowledge on pretest/posttest questions (See Table 1). To determine whether the association suggested movement from incorrect answers or "don't knows" to correct responses, a Marginal Homogeneity (MH) statistic was calculated with its one tail test of significance (See Table 2). The Marginal Homogeneity test is a non-parametric test developed for contingency tables consisting of multi-nominal, ordinal-level data (Kurtz, 1999). The MH test is typically applied to a pretest/posttest situation as it uses assumptions appropriate to repeated measures and through weighting procedures provides a conservative estimate of change (Agresti, 1980).

There were several cross-tabulations where the Chi-Square (X^2) statistic could not be performed due to small numbers in a particular cell. Conversely, since the MH is

based on a Chi-square (X^2) statistic there are also questions for which the Marginal Homogeneity test could not be performed because 100% of respondents had the same response on the posttest (Kurtz, Landis, and Koch, 1988).

A total of 301 respondents completed pretest/posttests having viewed one of the four plays; 107 viewed play 1, 93 play 2, 38 play 3, and 63 play 4. Of the 17 questions respondents showed improvement on, eleven have Chi-squares significant at less than the .10 level. This means that overall 11 of the questions demonstrate a significant association with the pre/posttest variable.

To better understand how and where change is occurring the Marginal Homogeneity test was then employed. Here we see movement in the direction of learning for all questions in the whole sample, a significant change from pre to post test for 8 of the questions in the farm worker sample and 6 questions in the non-farm worker sample. In fact, 5 of the 6 questions which are significant at P=< .10 for non-farm workers are different from the significant 8 farm worker questions using the MH statistic. This means that 13 of the 17 questions show a significant change in knowledge in the desired direction for either farm workers or non-farm workers.

Three of the four questions that do not show significant change based upon the MH statistic do show very significant Chi-square association between variables at the P=< .01 level but these questions have very high initial correct responses (91-96%) and less than 4% change. For example, a question in Play 1 asks whether alcoholics anonymous helps people quit drinking. In the responses to this question 96.6% are correct prior to the play and 100% after, which demonstrates a great deal of association but little positive change.

To gain a better understanding of differences between response groups demographic variables were introduced into the MH statistical analysis. There were no significant differences in these questions in terms of responses from diverse age categories. Using gender in the MH statistic, one question was significantly different;

women more than men appeared to learn that "older women are more at risk for miscarriages." The Chi-square statistic for males verses females pointed to two questions which were found to be significantly different. While both groups together significantly increased on the question, "Can exercise help prevent back pain?" (X^2= p< .01); males seemed to account for this increase significantly more than females (males X^2= p<.01; females X^2= p<.10). Also, while both groups together significantly increased on the question, "Does occasional drug use in the first 2 months of pregnancy increase the risk of miscarriages?" (X^2= p<.01). Females seemed to account for this increase significantly more than males (females X^2= p<.01; males X^2= p<.05)

Now the analysis returns to testing the null hypothesis that "no difference occurs in appropriate health and safety knowledge as a result of attendance at a one-act Spanish play enacted by a community players group." It is necessary to reject the null hypothesis because 13 of 17 questions designed to measure information directly from the plays demonstrated a significant degree of positive knowledge change (P=< .10). This means a significant number of people demonstrated a gain in knowledge from before the plays to directly after the plays. In fact, eliminating the questions where almost everyone responded correctly on the pre-test creating little room for change, there were 14 possible positive change questions.

The farm worker group significantly changed in the correct direction in 8 out of 14 possible responses. Thus, we believe that the plays increase knowledge in the farm worker group. Figure 1 demonstrates the mean positive change in knowledge was 13.6% for the whole sample on all questions . The variance which made up this mean ranged from 4% to 44%. In rejecting the null hypothesis we have been unable to disprove the hypothesis. Therefore, the hypothesis that "appropriate farm health and safety knowledge increases as a result of attendance at a one act Spanish play enacted by a community players group" appears valid.

To better understand the results of this research and its potential indication of behavioral change, a qualitative analysis was undertaken in the form of follow-up telephone interviews. After viewing one of the plays, a total of 183 individuals consented to follow-up interviews. Thirty farm worker households of those who were randomly selected participated in telephone interviews about two months later. Two-thirds of the persons interviewed were females. A standardized set of open-ended questions was used. Respondents were asked to share their opinions about the plays and to comment on the overall approach of theater as an educational method. Findings were synthesized for main themes and summarized.

More than half of the respondents recalled messages from the plays. They generally believed that the play reinforced or sharpened the knowledge they already had. Overall, respondents indicated that they liked the plays very much and recalled the story lines easily. Those interviewed believed the plays were realistic and written with stories pertaining to their lives. Most said they would attend additional plays if given the opportunity. Many of the respondents had discussed the play with others afterwards.

When asked about behavioral issues one-third of the respondents indicated that they had changed their behavior after seeing a play. They reported behavior changes including: washing work-clothes separate from other family clothing; washing hands more frequently; scheduling a clinic visit to rule out TB; visiting a physician rather than relying on over-the-counter medications; and being more cautious about sharing food from others' homes.

The follow-up interviews held two months after viewing suggest that participants do retain some of the health and safety messages presented in the plays. While self-report of behavior change is always questionable, the interviews suggest that participants were able to generalize the health and safety messages beyond the play performance settings. This provides a more solid basis for potential behavior change.

The qualitative analysis suggests that a good deal of knowledge has been gained or reinforced and some behavior change has occurred or is likely to happen as a result of one act play performance viewing. It provides further information and validation for the hypothesis. Based on the analysis of quantitative and qualitative data, there is a significant increase in farm health and safety knowledge when participants attend a one-act Spanish play conducted by a community players group.

Due to limitations in the experimental design, it is not possible to determine to what extent these changes represent a placebo effect of having seen a play that was supposed to contain certain information, testing effects resulting from the use of a pretest, or an interaction of the two. These limitations and those that emanate from statistical analysis of a self-selected sample as well as self-report should be taken into consideration. To strengthen our understanding of these phenomenon we need to include direct measures of attitude and behavior; the present analysis is predominantly of knowledge gain. A small sample of open-ended interviews considered perceived behavior but a larger behavioral and attitudinal study is necessary to understand change. The study should be longitudinal in order to consider retention of information and permanent change in behavior over time.

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Table 1:

Chi-Square Test of Significance of Cross Tabulations

Plays 1,2,3&4		Chi-Square Asymp. Sig. (2-sided)		
Question #' s:	Answers	All n=( )	Farm Workers n=( ) and ^	Non-Farm Workers n=( ) and ^
Play #1				
3. Does Hepatitis A only happen to children?	(N)	.488 (106)	.592(58)	.860 (45)^
4. Can washing hands with soap and water help prevent Hepatitis A?	(Y)	.746 (106)	.711(59)	NA (47)
7. Can Alcoholics Anonymous help people quit drinking?	(Y)	.824 (107)	NA (61)	.788 (46)
8. Is there a remedy for Tuberculosis?	(Y)	.001* (107)	.101(58)	.004* (46)^
Play #2				
4. Are pesticides only harmful if they are swallowed?	(N)	.001* (93)	.016**(51)	.011** (42)
5. Can a person get sick from coming into contact with pesticides on somebody else's skin or clothing?	(Y)	.028** (93)	.739(51)	.022** (42)
6. Can clothing with pesticides contaminate other clothes if they are washed together?	(Y)	.009* (92)	NA (51)	.033** (41)
7. Can you get sick from coming into contact with pesticides even if you can't see them?	(Y)	.000* (92)	.002*(50)	.007* (42)
Play #3				
4. Can water in an irrigation canal travel up to 40 miles per hour?	(Y)	.939 (38)	.859(25)	NA (13)
5. Are cramps (like menstrual pains) during pregnancy an indicator that a woman is at risk of having a miscarriage?	(Y)	.260 (38)	.288(25)	NA (13)
6. Are older women more at risk of miscarriages?	(Y)	.946 (38)	.958(25)	NA (13)
7. Should exercise such as walking be avoided during pregnancy?	(N)	.001* (38)	.085***(25)	.007* (12)^
8. Does occasional drugs or alcohol use in the first 2 months of a pregnancy increase the risk of birth defects?	(Y)	.000* (38)	.001*(25)	.020** (12)^
9. Does a boss have the right to fire an employee if she is pregnant?	(N)	.066***(37)	NA (25)	.020**(12)
10. Do all women need to be examined by a doctor early in their pregnancy even if they have had pregnancies with no problems before?	(Y)	.000* (38)	.000* (25)	NA (13)
Play #4				
6. Can exercise help prevent back pain?	(Y)	.001* (63)	.004*(50)	NA (13)
7. Can falling to drink enough water cause headaches and fainting?	(Y)	.000* (61)	.000*(48)	.020** (12)^
# Of Significant Questions		**11**	**7**	**9**

NOTE *p<.01, **p<.05, ***p<.10

NOTE ^ Due to non responses on questions farm workers and non farm workers together do not add up to 100% of population sample.

Table 2:

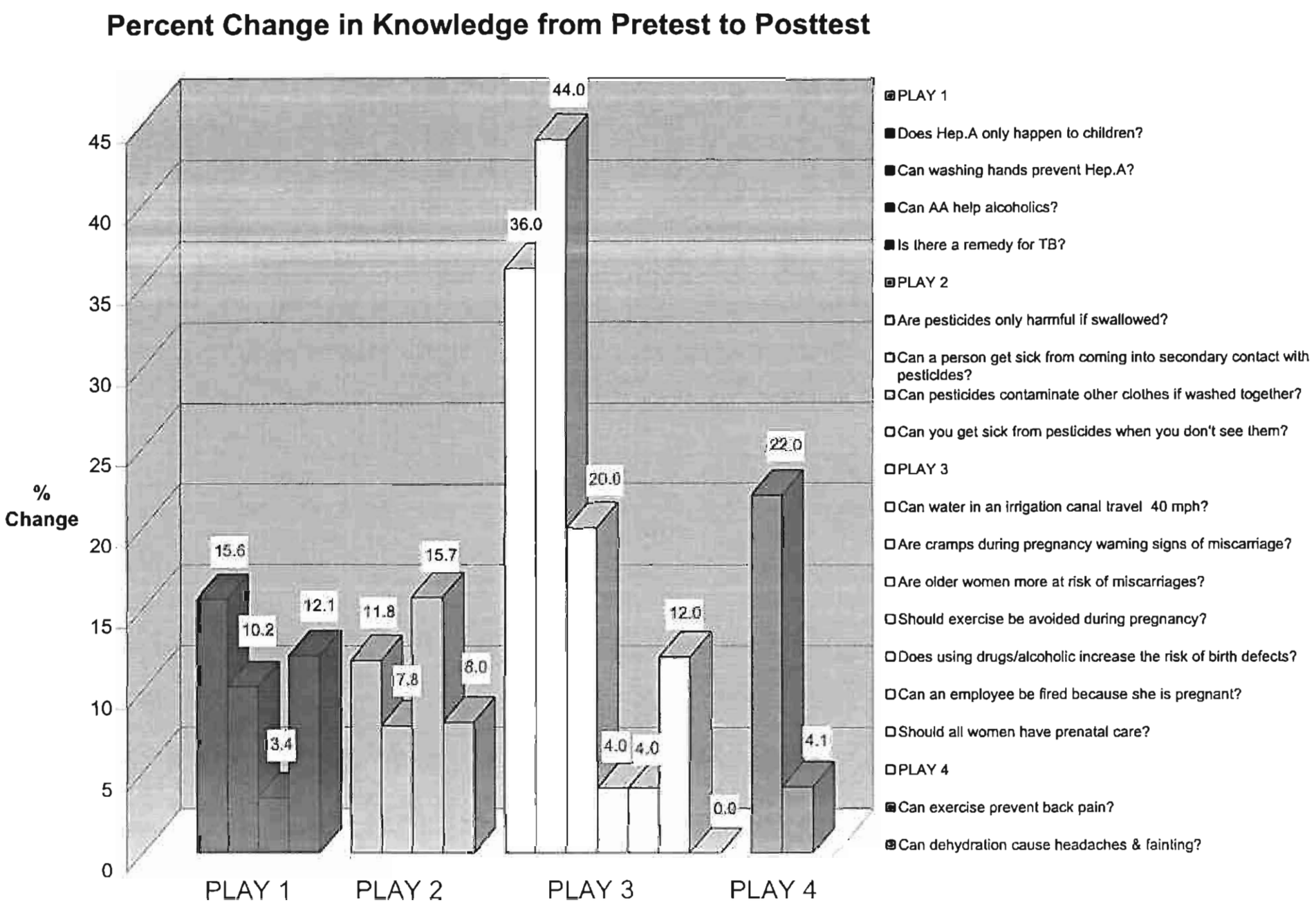
Marginal Homogeneity Statistics and Levels of Significance

Plays 1,2,3&4			MH Stat. (1 sided)		
Question #' s:		Answers	Std.MH Stat.	Farm Workers n=( ) and ^	Non-Farm Workers n= ( ) and ^
Play #1					
3.	Does Hepatitis A only happen to children?	(N)	+.1.19	143 (58)	.021**(45)^
4.	Can washing hands with soap and water help prevent Hepatitis A ?	(Y)	+1.79	.037**(59)	NA (47)
7.	Can Alcoholics Anonymous help people quit drinking?	(Y)	+NA	NA (61)	.264 (46)
8.	Is there a remedy for Tuberculosis?	(Y)	+1.53	.064***(58)	.083***(46)^
Play #2					
4.	Are pesticides only harmful if they are swallowed?	(N)	+1.03	.152 (51)	.01*(42)
5.	Can a person get sick from coming into contact with pesticides on somebody else's skin or clothing?	(Y)	+1.00	.159(51)	.01*(42)
6.	Can clothing with pesticides contaminate other clothes if they are washed together?	(Y)	NA	NA (51)	.001*(41)
7.	Can you get sick from coming into contact with pesticides even if you can't see them?	(Y)	+1.41	.079***(50)	.143(42)
Play #3					
4.	Can water in an irrigation canal travel up to 40 miles per hour?	(Y)	+2.24	.013**(25)	NA (13)
5.	Are cramps (like menstrual pains) during pregnancy an indicator that a woman is at risk of having a miscarriage?	(Y)	+3.13	.001*(25)	NA (13)
6.	Are older women more at risk of miscarriages?	(Y)	+1.29	.099***(25)	NA (13)
7.	Should exercise such as walking be avoided during pregnancy?	(N)	+.58	.282(25)	.159 (12)^
8.	Does occasional drugs or alcohol use in the first 2 months of a pregnancy increase the risk of birth defects?	(Y)	+1.00	.159(25)	.159(12)^
9.	Does a boss have the right to fire an employee if she is pregnant?	(N)	+NA	NA(25)	.09***(12)
10.	Do all women need to be examined by a doctor early in their pregnancy even if they have had pregnancies with no problems before?	(Y)	+.00	.500(25)	NA (13)
Play #4					
6.	Can exercise help prevent back pain?	(Y)	+3.13	.001*(50)	NA (13)
7.	Can failing to drink enough water cause headaches and fainting?	(Y)	+1.41	.079*** (48)	.159 (12)^
# Of Significant Questions				**8**	**6**

NOTE *p<.01, **p<.05, ***p<.10

NOTE ^ Due to non responses on questions farm workers and non farm workers together do not add to 100% of population sample

FIGURE 1


Percent Change in Knowledge from Pretest to Posttest
% Change
0
5
10
15
20
25
30
35
40
45
15.6
10.2
3.4
12.1
11.8
7.8
15.7
8.0
44.0
36.0
20.0
4.0
4.0
12.0
0.0
22.0
4.1
PLAY 1
PLAY 2
PLAY 3
PLAY 4
PLAY 1
Does Hep.A only happen to children?
Can washing hands prevent Hep.A?
Can AA help alcoholics?
Is there a remedy for TB?
PLAY 2
Are pesticides only harmful if swallowed?
Can a person get sick from coming into secondary contact with pesticides?
Can pesticides contaminate other clothes if washed together?
Can you get sick from pesticides when you don't see them?
PLAY 3
Can water in an irrigation canal travel 40 mph?
Are cramps during pregnancy warning signs of miscarriage?
Are older women more at risk of miscarriages?
Should exercise be avoided during pregnancy?
Does using drugs/alcoholic increase the risk of birth defects?
Can an employee be fired because she is pregnant?
Should all women have prenatal care?
PLAY 4
Can exercise prevent back pain?
Can dehydration cause headaches & fainting?

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service
Centers for Disease Control
and Prevention (CDC)

Memorandum

Date: December 14, 2001

From: Michael J. Galvin, Jr., Ph.D., Lead Program Activity for M.G.
Office of Extramural Programs, NIOSH, D30

Subject: Final Report Submitted for Entry into NTIS for Grant 5 R01 CC014511-02.

To: William D. Bennett
Data Systems Team, Information Resources Branch, EID, NIOSH, P03/C18

The attached final report has been received from the principal investigator on the subject NIOSH grant. If this document is forwarded to the National Technical Information Service, please let us know when a document number is known so that we can inform anyone who inquires about this final report.

Any publications that are included with this report are highlighted on the list below.

Attachment
cc: Sherri Diana, EID, P03/C13

List of Publications

None to date.

Title: Hispanic Farmworkers Interactive Plays
Investigator: Pamela D. Elkind, Ph.D.
Affiliation: Eastern Washington University
City & State: Cheney, WA
Telephone: (509) 359-6447
Award Number: 5 R01 CC014511-02
Start & End Date: 8/1/1998–7/31/2000
Total Project Cost: $333,915
Program Area: NORA
Key Words:

Abstract:
The purpose of this community-based project is to provide health education and farm safety training to Hispanic farm workers and their families living in Walla Walla, Benton-Franklin and Yakima counties. This research was developed around the assumption that theater is an effective method for providing farm health and safety education to Spanish speaking agricultural workers. The hypothesis being tested is, "appropriate farm health and safety knowledge increases as a result of attendance at a one-act Spanish play enacted by a community players group.

The most urgent health and safety education needs were identified by a series of focus groups and key informant interviews. The data gathered was used to develop four Spanish one-act health and farm safety plays. Twenty play performances were presented across the three county region of Eastern Washington that is most densely populated by Hispanic seasonal and migrant farm workers.

The project tested the effectiveness of theater as an educational tool, identified the nature and extent of barriers to providing this type of education, and an evaluation of the perceived effects of the project on the community. It compared settings of plays and the effects of environment on retention. Finally, two methods of dissemination were addressed.

The one act plays are enjoyed by the Hispanic community and increase workers' awareness of health and safety issues. The plays are the most effective in community event settings. However, dissemination is a problem due to the cost and/or time commitment in producing the plays.

Publications
None to date.