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## LINKING RESEARCH TO HEALTH PROMOTION IN TEXAS COLONIAS

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*Abstract: Following the 1993 passage of the North American Free Trade Agreement (NAFTA), the Texas-Mexico border region has experienced rapid growth. Much of this growth has occurred in colonias which often lack proper sewage and water treatment systems. This manuscript reports on activities linking research with health promotion in these communities. Based on meetings that prioritized community concerns, a Safe Drinking Water module was developed and delivered to more than 200 families. Results from the testing demonstrated a significant improvement in correct answers. These data indicate that community health education can be an effective tool in improving health awareness.*

Colonias are rural, unincorporated settlements located within 60 miles of the Texas-Mexico border. Currently there are approximately 1800 colonias, with a population of around 500,000, and their number continues to grow. In part due to their socio-economic status and sub-standard living conditions, individuals living in these communities may be more at risk to come into contact with environmental hazards. Disease tracking systems have reported an increased incidence of infectious diseases and certain types of cancer in the public health region where many of these communities are located (Texas Department of Health, 1999). Recent research has detected elevated concentrations of pesticides in house dust and in the urine of children in colonias (Carrillo-Zuniga, 2004; Garcia et al., 2001; Shalat et al., 2003). The health status of

these communities may be affected by both chemical and biological exposures due to their location near fields using pesticides, as well as the types of work the adults (and oftentimes children) commonly perform in and around those fields.

Health education and outreach is a cost-effective means of empowering communities to improve their health. Many organizations have found that community health workers, called *promotores/as* on the border, are a valued and effective resource in reaching these communities and providing health education or advocacy for other health-related efforts thereby improving the health of communities. Rural and economically disadvantaged communities are often at increased risk of exposure to contaminants in the environment. Valuable information to assess risk can be gained by investigating exposures

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or the impact of genetic polymorphisms on chemical retention. While important knowledge may be gained through research activities in the communities, it is equally important to establish a clear line of communication between the research scientist and families, and to ensure rapid translation of research results into information that can be understood by the community residents. Research scientists also have an obligation to use this line of communication to increase community awareness of various factors affecting health. This communication is not always easily established, as many colonia residents may not trust outside investigators (May et al., 2003). The most successful method of disseminating information in colonias involves information that is personal, interactive, and delivered door-to-door in a dialect that is easily understood by residents (Davidhizar & Bechtel, 1999). For this reason, it becomes apparent that promotoras are a valuable resource in accessing these communities.

A literature search found only one other study (May et al., 2003) using promotoras to conduct community education in the particular format this study uses. Other studies have reported many health promotion and education activities in which promotoras were utilized. Promotoras have served in various capacities in outreach and education activities related to health issues such as diabetes, chronic disease prevention among Hispanic women, smoking cessation, nutrition, physical activity, and food safety education among others (Hunter et al., 2004; Ingram, Gallegos, & Elenes, 2005; Sheth & O'brah, 2004; Woodruff, Talavera, & Elder, 2002). This manuscript describes the Safe Drinking Water project, which utilized promotoras to deliver health educational modules in rural Texas colonias. This project was initiated as a health promotion program to complement an on-going exposure study in rural colonias along the Texas-Mexico border. While the goal of the research component was to measure sources of exposure, the goal of the health promotion program was to identify community concerns and provide educational information. The program utilized promotoras to deliver the educational module and included an assessment of knowledge before and after the instructional activity. The knowledge assessment, a short true-false test, was used to evaluate improvements in knowledge in a rural population. The paper reports on the utility, limitations, and future opportunities of the program based on results with approximately 200 families.

## **METHOD**

### **COMMUNITY DESCRIPTION**

The community health promotion program was conducted in two colonias on the Texas-Mexico border. The colonias ranged in size from less than 300

to more than 5000 households. The smallest community was established less than two years ago and the largest approximately 15 years ago. Many households are multi-family dwellings. A census taken in the oldest community indicated that 98% of the population was Hispanic and that most families had two or more children (Shalat et al., 2003).

### **HEALTH STATUS ASSESSMENT**

The health promotion program was developed through the Community Outreach and Education Program (COEP) with the Center for Environmental and Rural Health (CERH) at Texas A&M University. The COEP model focuses on delivering health education through household visits. The program involves a multi-step process; and the success and improvement of the program requires that the overall process recycle (Figure 1). The initial step in the process was to obtain an assessment of existing conditions in the colonia from multiple perspectives. This assessment included the following activities: meetings with the local health department to identify major health concerns for the area, environmental and biological monitoring to identify potential sources of exposure, and/or meetings with teachers, physicians, nurses and physicians' assistants to determine the most frequent type of disease and/or injury observed. Initial meetings with the local health department indicated that health problems in these two communities included diabetes, asthma, access to clean drinking water, and lead exposure.

### **COMMUNITY INVOLVEMENT AND COMMUNITY PRIORITIES**

The second step in the process was to involve the community in the project. A community wide meeting was scheduled by the promotoras to allow the families to identify and rank their concerns. Both of the communities included in the study have a neighborhood community resource center that can support meetings. Incentives such as the provision of a light meal (i.e., tamales) and some form of entertainment for the children (i.e., coloring books, videos) were used to increase attendance and participation at meetings.

Several town meetings were conducted in each colonia. An average of 12-20 colonia residents attended the meetings after being notified by the promotoras and announcements at the community resource centers. The CERH investigators provided a short presentation at the beginning of each meeting, outlining a broad definition of environmental health that includes the impact of environmental chemicals, nutrition, genetics, and infectious agents. The presentation also outlined the health problems identified by the local health department and described for the families the overall goals and objectives of the

Figure 1. Overall design of the Community Health Promotion Program (as described to families at the community meeting)



health promotion program.

At the end of the meeting, community members were asked to complete a questionnaire ranking their perceptions of environmental problems. They were also given an opportunity to express their concerns on the environment or other conditions in the community that may impact their health. A consistent theme observed among colonia residents at these community meetings was concern about the health of children. In addition, they often reported concerns about asthma, frequent colds, water quality, nutrition, pesticide exposures, and diabetes.

Following the completion of the community meeting, the CERH staff reviewed and summarized the results of the questionnaire and discussions with residents and selected three primary issues. To date, COEP has prepared modules on issues regarding safe drinking water and food safety, while a third module on home safety is currently being prepared.

#### DEVELOPMENT AND PRESENTATION OF HEALTH MODULES

Each health education modules was developed in consultation with CERH researchers that have experience in the focus area addressed by the module. Modules typically consist of approximately 60 pages and take between 35 to 45 minutes to present to the families. The content of the modules is based on safe drinking water guidelines from agencies such as the USEPA, among others. The format of the modules includes a short introduction on the issue, why the issue is a concern to the health of the families, what can be done at home to reduce the risk of disease or exposure due to the issue, and a prevention section.

The material was first developed in English and then translated into Spanish. A second translator then reviewed the material and made corrections as needed following discussion with the first translator. Following this process, the material was presented by the COEP staff to the promotoras that would eventually deliver the training. The promotoras reviewed the material and suggested revisions to make the material culturally sensitive and reader-friendly. The material was then revised based on the discussions with the promotoras and flip-charts were prepared for the module. Each flip-chart was prepared from headline slides. A picture and brief summary of the information appeared on the front side of the flip-chart for the family to read, while the backside provided more detailed information that the promotora discussed with the family. The final Spanish-translated education modules were submitted to the Texas A&M Institutional Review Board (IRB) for review, along with consent forms and assessment tools.

Following IRB approval, the promotoras were instructed to schedule appointments for household visits with a small number of families in order to pilot-test the module and assessments. CERH staff observed the administration of the module and assessments during the pilot-testing and held a training meeting following the observation to discuss any changes that promotoras felt needed to be made after administering the module and assessments for the first time. After the modules have been finalized, the promotoras were instructed to go ahead and begin scheduling appointments with the participants of this study. Most household visits were scheduled during the day while older children are in school.

Household visits were scheduled for one host family, which was requested to invite two neighbors to participate in the health education program. The promotoras and neighbors form a small unit that may reinforce the information and provide peer pressure to implement improvements to health practices. Each of the families was provided a gift card for a local grocery store as an incentive for participation. During the original household visit, the promotoras obtained the families' consent to participate in the study. Promotoras were careful to explain any aspects of the study that the potential participants may not understand. Following the community members' consent to participate, promotoras conducted pre-test knowledge and technical assessments which were used as a baseline measure of behaviors and knowledge related to the topic of the module. The education module was then presented, and a post-test knowledge assessment was conducted afterwards.

#### **KNOWLEDGE ASSESSMENT**

The pre- and post-test knowledge assessment for the safe drinking water module included 10 true-false questions aimed at assessing the effectiveness of the module for explaining simple concepts of water quality and infectious disease. These questions were developed based on the principals presented in the safe drinking water module. Formulation of the questions involved consideration of many factors, including the educational level of the participants, question difficulty, cultural appropriateness, and possible sources of confusion. This assessment was developed in English and translated to Spanish by CERH staff members using the same process described above for the development of modules. It was also pilot-tested in the communities with the safe drinking water module in the process described above. Guided by project protocols, promotoras read each question to the participant during administration of the pre- and post-test knowledge assessment to ensure that the participants understood the question. Typically the participant is the female head of household for the family and she is asked to invite two neighbors (usually also female head of households) to her home to participate in the study as well. Thus with proper scheduling, for each home visit, the promotora is able to provide health education information to three families.

#### **COMMUNITY RELATIONS**

Over several years, the CERH and promotoras have developed a strong relationship with several of these communities through frequent community meetings and multiple visits to individual homes. While many families in these communities have a limited educational background, most have a substantial amount of common sense and are very ca-

pable of understanding the concepts presented in the educational modules. In addition, the families are well aware of the condition of their surroundings, are concerned about the health of their children, and are very receptive to learning about changes that may improve their health. Following the completion of each health education module, the entire education outreach process was repeated. Thus, conditions in the community were again assessed and a community meeting was held to present a summary of previous results and to solicit recommendations for the content of the next module.

#### **STUDY SITES AND POPULATION**

The study plan was to deliver the safe drinking water module in two South Texas colonias between March 2004 and January 2005. Both colonias are located adjacent to agricultural fields potentially exposing them to elevated levels of pesticides. Previous exposure studies (Carrillo-Zuniga et al., 2004; Garcia et al., 2001) observed elevated levels of pesticides in the urine of small children. For the exposure studies, eligibility of households for participation was based on the presence of one or two children in the household between the ages of 6 and 48 months, and geographical proximity to the agricultural field. For the current health education activity, however, families were recruited from these same communities without regard to their geographical proximity to the agricultural field or the ages of the children.

#### **COMMUNITY A**

Community A includes approximately 5,000 families. The colonia has been in existence for more than 15 years. Many houses are located in close proximity to an approximately 500 acre agricultural field. The field is divided into portions used for grain production and cattle grazing, while the land closest to the colonia is used for growing watermelons and onions. A variety of pesticides including chlorpyrifos, methyl parathion, and diazinon are commonly used on these crops (Texas Agriculture Extension Service, personal communication). Because of the age of this colonia, many of the houses are more substantial, and about 50% of the houses have air conditioning. A survey of families in Community A indicates that approximately 25% of the men are employed in construction, 25% in trucking, and less than 10% in farming (Shalat et al., 2003). The colonia is served by a municipal water supply, but (based on unpublished data collected by project investigators) roughly 60% of colonia residents purchase filtered water due to concerns about the taste and color of municipal water.

#### **COMMUNITY B**

Community B, a relatively new community,

Table 1. Number of Respondents and Percent Answering Correctly on Each Question of the Pre-Post Knowledge Assessment in Community A

(Total Respondents = 68)

Question	Pre-test		Post-test	
	N=	%	N=	%
1	66	62	68	90**†
2	68	97	68	100
3	66	92	68	96
4	68	94	68	99
5	68	93	68	94
6	64	13	68	87**†

\* Number of correct answers on post-test significantly differs from number of correct answers on the pre-test

† P-value is less than .005 for this question

consists of less than 300 families. Most structures in this colonia are less than two years old. This colonia is located adjacent to a 40 acre cotton field. Due to this close proximity, many residents complain of odors when airplanes “crop-dust” the field. This causes most of the residents to close their windows when the spraying activities are being conducted. Many of the houses are small trailers with construction of the larger home attached. Some residents in Community B commented that while a municipal water service was available, they could not afford the cost of the initial connection. Water was instead purchased from a “watermill,” which is a reverse osmosis system using a nearby city water source. These filtered “watermills” typically sell water for approximately 20 cents/gallon.

#### DATA AND STATISTICAL ANALYSES

Quantitative data analysis was performed using SPSS statistical software. The statistical methods being used rely on comparison; therefore respondents who did not complete both the pre- and post-test knowledge assessments were excluded from calculation. Correct answers were coded with a value of 1, while incorrect answers were coded with a value of zero. The difference in number of correct answers on the pre-test and the number of correct answers on the post-test was examined through comparison of the overall mean for each question in each community as calculated in SPSS. Paired t-tests were performed to determine the paired sample differences in means, p-values, and 95% confidence intervals for each question on the pre-post test.

### RESULTS

#### PRE-TEST AND POST-TEST KNOWLEDGE ASSESSMENT IN COMMUNITY A

In Community A, promotoras were able to collect a completed pre- and post-test from 68 families. A comparison of results of the knowledge assess-

ments before and after delivery of the safe drinking water module is provided in Table 1. The data in Table 1 include the number of respondents for each question on both the pre-test and post-test, as well as a numerical representation of the percentage of correct answers for each question. Overall, the mean correct response for each question improved after administration of the health education module. Improvement on questions 1 (whether the same water is used for drinking and washing clothes) and 6 (the number of drops of chlorine to be used to properly treat one quart of water) was statistically significant, with p-values of less than .05 for each question.

#### PRE-TEST AND POST-TEST KNOWLEDGE ASSESSMENT IN COMMUNITY B

In Community B, promotoras were able to collect a completed pre- and post-test from 105 families. A comparison of results before and after module delivery is displayed in Table 2. The data in Table 2 also present the number of respondents for each question on both the pre-test and post-test, and the percentage of correct answers for each question. Overall, the mean correct response for questions 1 through 5 improved. In contrast, the mean score for question 6 declined in the number of correct answers from the pre-test to the post-test.

Families in both colonias exhibited a significant improvement in knowledge that water used to wash clothes is from the same source as drinking water. Community B also demonstrated a significant improvement on question 5, regarding the appropriate length of time to boil water for removal of microbial contaminants.

### DISCUSSION

The Community Outreach and Education Program with the Texas A&M Center for Environmental and Rural Health has established

Table 2. Number of Respondents and Percent Answering Correctly on Each Question of the Pre-Post Knowledge Assessment in Community B  
(Total Respondents = 105)

Question	Pre-test		Post-test	
	N=	%	N=	%
1	105	44	105	62*††
2	105	100	104	100
3	105	96	105	99
4	105	97	105	99
5	105	90	105	96*†
6	94	9	103	5

\* Number of correct answers on post-test significantly differs from number of correct answers on the pre-test

† P-value is less than .05 for this question

†† P-value is less than .005 for this question

a promotora program in the Texas-Mexico border region that provides health promotion activities related to environmental research projects on-going in the communities. This health promotion approach in programming or content can serve as a valuable tool for other investigators working in communities. The format and content of the community health education also served as a source of feedback while providing a better understanding of environmental health issues to community residents. This provides an invaluable opportunity for research investigators to have a truly significant impact on health in the communities in which their research activities are taking place. Moreover, this program empowers the communities and provides residents with the tools needed to improve their health. Retention of subjects in research programs has been greater than 85%. This retention rate is due, at least in part, to the increased interaction of the researchers with the community.

Since residents of colonias are predominantly Hispanic, health promotion strategies and materials were developed and implemented in a culturally sensitive manner to be most effective (Davidhizar & Bechtel, 1999). Promotoras from the community were pivotal members of the health promotion project. They provided input and feedback along with interaction with the community that was used to assure culturally appropriate materials, presentations, and assessment tools. They had the confidence of the targeted community members and served as a liaison as well as advocates of the community with other project personnel and investigators (Hunter et al., 2004). An additional strength of this program is that it aggressively took community education activities into residents' homes, rather than only serving those residents who visit a community resource center seeking health information. This approach fostered a stronger relationship between researchers, project

staff, and the community. It is believed that administering the presentation to groups of neighbors may reinforce peer pressure and hopefully lead to prolonged behavioral changes. In these sessions community residents openly discussed the educational materials and other issues they felt were impacting their health. However, one limitation of the current study is that improved tools are needed to evaluate the impact of educational materials and to assess long-term behavioral changes.

The use of promotoras to provide health education provides a valuable resource by which researchers can link with communities. With promotoras as the point of contact, researchers are able to establish a closer relationship with individual families and increase the probability of continued participation in studies. In the long-term, this relationship is also likely to improve communication between the researcher and families.

Although the promotoras largely served to enhance opportunities to work with the communities, there were some limitations to the program. First, the quality and consistency of the individual promotoras is critical to the success of education. When the promotoras simply read the module material, families did not improve scores on knowledge assessments, and in some instances actually got lower scores on the post-test. Alternatively, when the promotora developed a relationship with the family, and held a more open discussion of the educational material, the family not only demonstrated improved knowledge with regards to the module, but often provided valuable information on other health issues in the community. This observation is based primarily on discussions with promotoras. For future programs, it is anticipated that improved methods for training promotoras can partially alleviate this problem, although to a large extent, the quality of module delivery is dependent on the personality and experience

of the promotora. In the current program, COEP researchers participate in at least one household visit with each promotora and provide comments on the presentation style. Promotoras were advised to establish a more open relationship with the families and ask questions during the presentations. However, poor results from selected groups indicate that some promotoras failed to follow these suggestions.

Problems were also encountered with the assessment tool (pre- and post-test). Many of the true-false questions were too easy for the families as more than 90% of the respondents answered correctly on the pre-test. In the future, assessment tools will most likely be piloted in the community more extensively. It is also likely that future assessment tools will use a multiple choice rather than true-false format in order to increase the difficulty of the questions and more appropriately fit the education level of the community.

On a limited number of occasions, families cancelled appointments. Since the promotoras typically work in teams of at least two, in part for security reasons, this creates scheduling problems. Experience suggests that, when possible, appointments should be confirmed by phone and scheduled during the week, preferably during times when school is in session. Following this protocol can reduce cancellations which were experienced more frequently during summer when older children were not attending school.

Finally, it is possible that prior knowledge of research activities by the families may have created a bias in the community. At the first community meeting where environmental health was discussed and health concerns were prioritized, more than 70% of the respondents ranked childhood exposure to pesticides as their greatest concern. It is unclear if this response accurately reflects overall community concerns, or represents a biased response from those families that had participated in prior research studies on pesticide exposure.

The Community Outreach and Education Program with the Texas A&M Center for Environmental and Rural Health provided health

education to approximately 200 families living in rural Texas colonias. The project used an innovative approach that linked a community health promotion program to a preceding research project. The use of promotoras, individuals known and respected by colonia residents, in educating the residents was crucial to the effectiveness of the program. In addition, the promotoras served an integral role in facilitating the interaction of researchers and other project staff with the targeted families in the colonia.

Although to date only two health education modules have been completed, existing data indicate that the modules were well received by the colonia residents and effective as a health education tool. A comparison of pre- and post-test results further demonstrated a significant improvement in understanding of environmental health problems by the colonia residents.

An open line of communication among the stakeholders in the projects was also found to be important to the success of the program. The families must always be assured that the researchers and project staff as well as the promotoras are willing to listen to their concerns. In addition, when concerns are raised that required more immediate or hands-on attention, the ability to collaborate with the local health department is important. The researchers and project team also gained insights into the benefits of community participation from the project. It is anticipated that the investment in the project will be rewarded with increased cooperation and participation by colonia residents in future research activities.

Our project supports the notion that colonia families are truly interested in improving their health and only require the appropriate tools and knowledge to make healthy behavioral changes. At this stage of the program, our experience has been favorable, both at the level of the larger community meeting to introduce the program and at the smaller household visits to implement the program. Linking the health promotion effort to a previous research project in the colonia was expected to reinforce the targeted health issue. Additional reinforcement of the health message was through peer pressure from

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health education to groups of neighbors and repetition through a review-question-comment period with the colonia residents at the community meeting (McLaughlin et al., 2004). Linking a health education project to a preceding research project, as in this report, appears to be an appropriate approach to enhance health knowledge that in turn may potentially assist in improving health behaviors.

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## REFERENCES

- Carrillo-Zuniga G., Coutinho C., & Shalat S. L., et al. (2004). Potential source of childhood exposure to pesticides in an agricultural community. *Journal of Children's Health, 2*(1), 1-11.
- Davidhizar, R., & Bechtel, G. A. (1999). Health and quality of life within Colonias settlements along the United States and Mexico border. *Public Health Nursing, 16*(4), 301-306.
- Garcia, S. S., Ake, C., Clement, B., Huebner, H. J., Donnelly, K. C., & Shalat, S. L. (2001). Initial results of environmental monitoring in the Texas Rio Grande Valley. *Environment International, 26*(7-8), 465-474.
- Hunter, J. B., de Zapien, J. G., Papenfuss, M., Fernandez, M. L., Meister, J., & Giuliano, A. R. (2004). The impact of a promotora on increasing routine chronic disease prevention among women aged 40 and older at the U.S.-Mexico border. *Health Education and Behavior, 31*(4 Suppl), 18S-28S.
- Ingram, M., Gallegos, G., & Elenes, J. (2005). Diabetes is a community issue: The critical elements of a successful outreach and education model on the U.S.-Mexico border. *Preventing Chronic Disease, 2*(1), A15.
- May, M. L., Bowman, G. J., Ramos, K. S., Rincones, L., Rebolgar, M. G., Rosa, M. L., et al. (2003). Embracing the local: Enriching scientific research, education, and outreach on the Texas-Mexico border through a participatory action research partnership. *Environmental Health Perspectives, 111*(13), 1571-1576.
- McLaughlin, T. J., Humphries, O., Jr., Nguyen, T., Maljanian, R., & McCormack, K. (2004). "Getting the lead out" in Hartford, Connecticut: A multifaceted lead-poisoning awareness campaign. *Environmental Health Perspectives, 112*(1), 1-5.
- Shalat, S. L., Donnelly, K. C., Freeman, N. C., Calvin, J. A., Ramesh, S., Jimenez, M., et al. (2003). Nondietary ingestion of pesticides by children in an agricultural community on the US/Mexico border: Preliminary results. *Journal of Exposure Analysis and Environmental Epidemiology, 13*(1), 42-50.
- Sheth, M., & O'brah, M. (2004). Diarrhea prevention through food safety education. *Indian Journal of Pediatrics, 71*(10), 879-882.
- Texas Department of Health (1999). *Annual Epidemiology Report*. Austin, Texas: Texas Department of Health. Retrieved February 17, 2005, from <http://www.tdh.state.tx.us/epidemiology/99annual/casereports/cht174.htm>
- Woodruff, S. I., Talavera, G. A., & Elder, J. P. (2002). Evaluation of a culturally appropriate smoking cessation intervention for Latinos. *Tobacco Control, 11*(4), 361-367.