

Challenges to Farmworker Health at the U.S. Mexico Border: A Report on the Health Status of Yuma County Agricultural Workers



Picture by: Floribella Redondo

Challenges to Farmworker Health at the US-Mexico Border

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TABLE OF CONTENTS

Title Page	1
Table of Contents	2
List of Terms and Abbreviations	3
Acknowledgments	4
Executive Summary	5
Highlights and Significant Findings	7
Translation of Findings	9
Outcomes/Relevante/Impact	11
Scientific Report	13
Results	18
Presentations	25
References	28

LIST OF TERMS AND ABBREVIATIONS

MEZCOPH – Mel and Enid Zuckerman College of Public Health
MASRC – Mexican American Studies and Research Center
CSF – Campesinos Sin Fronteras
DH – Coalición de Derechos Humanos
YCFSC – Yuma County Farmworker Services Coalition
BCISS – Border Community and Immigration Stress Scale
BMI – Binational Migration Institute

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The authors, collectively and in unity with the agricultural workers that participated in the study and the organizations that comprise the Yuma County Farmworker Services Coalition, are determined to continue advocating and taking the necessary actions in addressing the study findings to improve the quality of life of the agricultural workers, their families and all residents of the US Mexico border.

EXECUTIVE SUMMARY

This report summarizes the findings of a cross-sectional, population based survey conducted from August 2006 to February 2007 using a randomized proportionately representative household sample of farmworkers in the three communities of Somerton, Gadsden, and San Luis located along the US Mexico border in southern Yuma County, Arizona. This report aims to describe the process used to develop and carry out this study within the context of community-based participatory action research and to provide a demographic profile and descriptive analysis of farmworkers in Yuma County, Arizona. The study is an example of an innovative, public health collaboration between three partner organizations - Campesinos Sin Fronteras, Derechos Humanos, and the University of Arizona Mel & Enid Zuckerman College of Public Health and Mexican American Research Studies Center.

Households were identified using community maps and randomly selected census blocks. Standardized Spanish instruments were developed collaboratively with MEZCOPH, MASRC, Derechos Humanos and Campesinos Sin Fronteras personnel based on reliable and validated surveys used by the California Hired Farmworker Health Survey in the California Agricultural Workers Health Survey (CAWHS), the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System Survey (BRFSS), prior mistreatment surveys developed for another study by MASRC and conducted in south Tucson in 1993, 2003 and again in 2006 (Border Immigration Interaction Survey), which included open ended and qualitative components to derive narratives of mistreatment episodes, previous and new measures of culturally-specific stressors, acculturation and ethnic identity and additional health information.

The survey was conducted door-to-door. Individuals were identified as farmworkers prior to being asked to participate in the study. Interviewers articulated the purpose of their visit, stated they were conducting an anonymous survey of farmworkers in the Yuma area and were asked if someone in the household was over 21 years of age and working or had worked in the fields during the past year. If someone in the household met the criteria, they were invited to participate in the interview. If more than one adult in the household met the eligibility criteria, the interviewer would list in descending order of age, each man on one list, and each woman on another. Beginning with males, the interviewer would choose the one with the birth date closest to the interview date. If there were no males present in the household, then the woman with the birth date closest to the interview date would be invited to participate. The overall response rate was 92.7%.

In addition to the household survey, two hundred opportunistic surveys were completed in order to capture the farmworker population that may have been missed in the household survey. The opportunistic survey was an abbreviated version of the household survey and was administered during a farmworker health fair hosted by Campesinos Sin Fronteras known as *Dia Del Campesino Health and Information*. The *Dia Del Campesino Health and Information* event was initiated 14 years ago to honor and demonstrate appreciation for the community's agricultural workers' hard work and immense economic contribution to the community. Farmworkers participating at the *Dia Del Campesino Health and Information* were recruited using the same criteria as the household survey with the exception of the birth date criterion.

The most salient features of the Yuma County sample (299 household surveys and 200 opportunistic surveys) is a population of farmworkers that are young, married, men from Mexico who acquired little or no formal education and whose annual earnings are very low. Greater than 50 % of families are living below poverty level (59%), while 95% are living below 200% of the Federal Poverty Level. The median age of the household participants is 44 years of age and 49 years of age for the opportunistic survey. About 50% are foreign-born, 78% are married, and 62% have attained less than a 9th grade education.

Greater than half of the participants in the household survey reported having health care insurance, forty one percent of whom conveyed they had acquired employer-sponsored health insurance in the US. In contrast, among opportunistic survey participants 60% had health insurance, 36% of whom acquired coverage within the US. In both groups, a small percentage (7%) received benefits from both the US and Mexico.

In the household sample, approximately 21% reported having a diagnosis of hypertension, 12% of arthritis and 16% diabetes. These figures were higher for men; 31% reported a diagnosis of hypertension and 20% arthritis. In the opportunistic sample, 29% reported a diagnosis of hypertension, and 15% each of arthritis and diabetes. When asked to rate their health status, 37% of the household sample and 39% of the opportunistic sample classified their health as “regular” (or “fair”).

Also very prevalent were ailments related to the musculoskeletal system. These findings are not surprising considering the intensive, repetitive and physically demanding nature of agricultural labor. Back pain was most prominent (36% in the household sample and 47% of the opportunistic group), followed by hands (29% and 44%, respectively), feet (31% and 43%, respectively), and knees (27% and 42%, respectively). The higher figures reported by the opportunistic sample reflect the comparative demographics of respondents, who as a rule were an older group, and largely male.

A high prevalence of depression and stress was found in our preliminary analysis of the 499 household surveys. Among those interviewed in their homes, 20% had experienced depression for more than 2 weeks in the previous 12 months, and 26% for more than a week during the previous 30 days.

Stress related to farmworkers’ migrant status, their foreign or racial minority position, and the current political environment were experiences reported by participants. The need to speak better English was cited as a stressor by 73% and 41% experienced stress from the need to travel far from their families to earn a living. Moreover, greater than 40% reported stress caused by worry related to obtaining health services for their families, and many were worried about supporting themselves and their families in the long term.

An additional 29 farmworkers and family members of farmworkers were invited to participate in a focus group to learn more about the underlying causes of stress. Focus group findings confirmed the results obtained through the household and opportunistic surveys. Participants described stress related to inadequate English skills and separation from families. Many also reflected on stress caused by abusive or discriminatory interactions with officials from Customs and Border Protection as well as with local police. Younger focus group participants in particular reported incidents of abuse. In addition, participants reported work-related stress, including abuse from foremen and supervisors. They further conveyed stress associated with agricultural work itself. Farmworkers in the focus group expressed a need for better working conditions, including higher salaries, health insurance and other benefits, and opportunities to develop their skills and learn English.

HIGHLIGHTS AND SIGNIFICANT FINDINGS

Challenges to Farmworker Health at the US-Mexico Border was an exploratory, R21 study implemented collaboratively with two community-based programs which included a randomized household survey of 299 community residents in southern Yuma County who had worked as farmworkers within twelve months of the interview, and an opportunistic survey of 200 farmworkers, many of whom cross the border daily to work in Arizona and California fields.

To address concerns identified by the partnering organizations, a cross-sectional, population based survey was designed and conducted from August 2006 to February 2008 using a randomized proportionately representative household sample of farmworkers in three communities of Somerton, Gadsden, and San Luis located along the US Mexico border in southern Yuma County. Households were identified using community maps and randomly selected blocks. Standardized Spanish instruments were developed based on reliable and validated surveys used by the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System Survey, prior mistreatment surveys (Border Immigration Interaction Survey) developed for another study by MASRC/BMI investigators and conducted in south Tucson in 1993, 2003 and again in 2006, previous and new measures of culturally-specific stressors, acculturation and ethnic identity. We also included open ended and qualitative components to derive narratives of mistreatment episodes and additional health information as well as the California Hired Farmworker Health Survey in the California Agricultural Workers Health Survey (CAWHS). The surveys were conducted in southern Yuma County during the peak agricultural season for lettuce and citrus. Areas of particular interest were stress and depression, chronic illness, musculoskeletal ailments, work-related injuries, and access to health and social services. The six central domains of stress identified in the study on a Border Community and Immigration Stress Scale (BCISS) were a) border and migration stressors; b) acculturation stressors; c) barriers to health care; d) discrimination; e) economic strains; and, f) family separation. A Preliminary analysis also indicated the need for more investigation into the health of older men who are current or former farmworkers, and children and other family members of farmworkers, who are not farmworkers themselves. Group interviews were subsequently conducted to further investigate significant themes, particularly regarding stress in the context of border residence as a farmworker or farmworker family member.

In response to how they perceived their personal health, 81% reported having regular or good health status. Twenty percent reported feeling depressed in the last year for greater than two weeks in the household survey compared to 26% of those participating in the opportunistic survey. Feeling depressed in the last 30 days for greater than one week was higher in participants in the household survey (26%); six percentage points higher than when asked over the last year. It should be noted that both the house-to-house and opportunistic survey were conducted during the peak season. Had the survey been conducted during the six month period where most farmworker apply for unemployment or employed in other activities, the percentage of farmworkers responding to questions related to depression or health status may have been different.

Causes of stress based on a set of questions that have been used in other studies conducted by the Binational Migration Institute provided insight into the environmental reality of farm work in the United States. From preliminary analysis of the household survey, the most frequent intense stressors, reported as very or extremely stressful in the study, were needing to speak better English (48%); being away from family because of economic reasons (46%); feeling it is more difficult to gain success because of ethnicity (24%); suffering discrimination in the workplace (15%); having difficulty integrating US and Latino cultures (17%); feeling discriminated in seeking health care services (16%); worried how family would receive health care services (36%); worrying if family or friends encountered problems with immigration officials; (23%); encounters with immigration officials (17%); encounters with local police (21%); limited contact with friends or family because

of immigration status (17%); not going to a hospital because of immigrant concerns (12%); and too much violence in the community (25%).

Overall, the stress scale developed for this survey, Border (BCISS) in this population, identified a particularly alarming degree of stress associated with mono-lingual Spanish, family separation and meeting health care needs, with over a third of all respondents reporting such stresses in an intense way. Discrimination and concern with authorities or officials were two other salient themes. Such levels of reported intense distress (i.e., in many cases over 33%) is rare within a population-based study of stressors. While these preliminary findings indicate key stressors, future publications will report further analysis by sub-group (men, women, citizenship and permanent residence status, etc) and associate total stress with the diverse general and specific health outcomes. Clear links of stress measures are expected to be found related to a broad range of health outcomes, and the effects particularly strong within specific sub-groups. Moreover, some items were developed in the context of local and state immigration related trends, given migration rates of Mexican decent workers and enhanced federal enforcement efforts nationwide, we expect the assessments to have wide utility in many other communities with a high proportion of migrants or where health care access and affordability is a main community concern.

TRANSLATION OF FINDINGS

It is important to note here that our focus in this study on farmworkers had more to do with broader health effects and impacts on this population as a vulnerable and underserved group in terms of stress and access to health care beyond the workplace, and so workplace-specific recommendations are only one aspect of the study. Health status, stress, and access to services became a focus of community-based service providers through the involvement of the Yuma County Farmworker Services Coalition, who acted as a guide in developing public information and training events for providers and farmworkers alike, based on the experience of Campesinos Sin Fronteras interviewers and the preliminary data analysis of the household and opportunistic surveys.

The first step in acting on study findings locally, based on the information needs identified in the process of implementing the survey, was to develop a resource guide by and for promotores, incorporating access and eligibility information for the target population for key health and human services, as well as job-related and legal information, and basic human rights. A series of trainings were implemented for farmworkers “Know Your Rights” and one larger “Council” at which immigration attorneys responded to participants’ specific questions about immigration law and their rights, current legislation, and avenues to document abuses. The “Know Your Rights” trainings aim to educate on the definition and characteristics of an “abuse” and how and to whom to report domestic violence, discrimination, police and border patrol abuses and human rights violations.

Study findings found that stress and depression are contributors to the poor health status of the farmworker population, and should be considered within the panorama of challenges to farmworker health. According to the National Institute for Occupational Safety and Health (NIOSH), work-related stress can be caused or exacerbated by long hours and shift work, a poor social environment, lack of opportunity for growth, and unpleasant or dangerous physical conditions. All of these factors apply to agricultural labor and relate to reports from participants in the focus groups. NIOSH also reports that stress on the job can increase the likelihood of cardiovascular disease, musculoskeletal disorders, psychological disorders, and workplace injury, as well as suicide, cancer, ulcers, and impaired immune function.

Migrant farmworkers’ experience of racism as cited in the surveys and focus groups is not only an identified cause of stress, but has larger repercussions for their overall health status. Studies have found that racial/ethnic discrimination is commonly linked to poorer mental health status, and can be associated with deteriorated physical health as well. In some cases, there appears to be a direct relationship between racial discrimination and morbidities, though researchers also recognize that health behaviors can be the pathway through which racism negatively impacts health. The majority of studies in this area have focused on Black-White health disparities in the US and immigrant groups in other countries; there is a need to take a closer look at the issue with Mexican migrant and seasonal farmworkers.

Campesinos Sin Fronteras is actively identifying and applying for funding to create programs that will address specifically the stress related findings from the study. In partnership with a social justice group comprised of local professionals, Community Leadership Alliance, with CSF as the lead advocate, met with the Board of Directors from Arizona Western College to discuss ways to increase access to education for farmworkers in South Yuma County. Moreover, English as a Second Language (ESL) classes were established through CSF’s advocacy efforts in 2008. CSF has also been successful in persuading City and County officials to participate in a county-wide Education Access Council. These efforts led to the establishment of ESL classes within the offices of the Mexican Consulate in Yuma. The first cohort of students graduated in December 2008 and the second cohort will be completing their classes in January 2009.

The Education Access Council has been tasked with fund raising to sustain the ESL classes. One of the strategies used by the Council has been to target local merchants and prominent business leaders to involve

themselves in the effort through monetary contributions or as members of the Council. The CSF along with established partnerships locally will address work related recommendations in the near future.

Increasing service utilization is of significant importance. Problems with health service delivery arise from poor communication, including those stemming from language and communication differences and not knowing how the health system works, uncertain living conditions, ambivalence regarding the use of contraceptives, and problems accessing information about contraception. Migrants are particularly affected having left behind supportive networks and other resources only to find support in settlement communities limited or denied. In Arizona, in particular, migrants contend with the effects of recent legislation that is increasingly scrutinizing their access to public services. Provisions of Proposition 200, enacted into law in Arizona in 2004, require applicants to produce proof of citizenship or legal residency when requesting any local or state public service. The law also obligates agents of public services to report to immigration authorities those who could not provide valid documents. Proposition 200 has been compared to California's Proposition 187 passed by voters in 1994 but later deemed unconstitutional. Arizona's HB 2448, signed into law in 2006 by Governor Napolitano, also obligates state employees to verify the immigration status and eligibility of applicants to the indigent health care system (known as the Arizona Health Care Cost Containment System) through the alien verification system administered by the United States Department of Homeland Security. Largely driven by an anti-immigrant political rhetoric, such legislative acts appear to be creating a "chilling effect" (Ferreira-Pinto 2005) that prevents many Latinos from using community services, including those dedicated to health care because of the possible negative consequences associated with immigration enforcement practices. It is important to consider that while many may indeed be entitled to public services, there is also considerable probability that among them are family members who may not be. Therefore, to avoid additional scrutiny, even those who are eligible for public services may hesitate to participate in health care entitlement programs.

Finally, a Binational Network created by the collective efforts of the Arizona Delegation of the US Mexico Border Health Commission, Campesinos Sin Fronteras, Derechos Humanos and two research teams working on similar, to some extent parallel, studies will apply lessons learned to address the health problems and socioeconomic challenges faced by migrant and seasonal farmworkers using a binational approach. Refer to Outcomes Section for further detail.

OUTCOMES/RELEVANCE/IMPACT

The findings of this study will be used to develop community-based interventions to address the major stressors reported by farmworkers in this region. As a follow-up to the focus groups, the research team brainstormed possible community-based interventions to address the key stress factors. The following interventions were discussed, and will be further explored and developed with the larger research team and local community partners:

Legal Assistance. An ombudsman housed at a community center or office such as Campesinos Sin Fronteras could receive and handle farmworker complaints. Students from Phoenix, San Diego and Tucson law schools could possibly provide weekly/monthly legal clinics or offer tele-services. Telemedicine technology is already available at college and universities in Phoenix and Tucson and at a number of sites in the Yuma area.

Health System Navigator. Many participants expressed confusion about the U.S. healthcare system and social services available to them. A promotora or social worker could help farmworkers and their families navigate the U.S. healthcare system, sign up for public healthcare programs and connect with community-based resources. Americorps programs in other areas of the country currently fund this type of position.

Medical Assistance On-Site in Fields. Workers reported difficulty in leaving the fields to visit the doctor, and work-related injuries were often not reported or treated. An on-site practitioner or mobile unit could ensure workers receive the attention they need. Discussions with local community health centers in the area, jointly with agricultural growers will explore potential onsite services to address these concerns.

Intensive English Classes During the Off-Season. One participant who has been in the United States for twenty years never learned English because during the off-season classes are only offered a few hours a day, one or two days a week, for a few months at a time, which the participant considered insufficient. Other participants agreed that intensive, six-month English classes are needed during the off-season and stated that the unemployed should not have their unemployment benefits reduced for enrolling in such classes. According to a policy of the Department of Economic Development (DES) unemployed agricultural workers are prohibited during the off season from enrolling in English classes, or any courses that would further their education, while receiving unemployment benefits. According to DES, unemployed workers are expected to seek employment, not pursue educational interests. Nearly all participants expressed a desire to learn English, one saying it would make him a better member of the community.

Job Creation and Training Programs. Many participants expressed a desire to seek employment outside the agricultural fields, but noted a shortage of jobs in other industries. Especially as the trend of hiring H-2A contract workers from Mexico continues, government job creation and training programs could help displaced workers find employment in other sectors. Businesses may need incentives to relocate or hire more workers in the Yuma area, and should be made aware that they can apply for grants under the Arizona Job Training Program. The “earn while you learn” model could also be explored.

A Binational Approach to Framing Challenges and Constructing Solutions. Mexican migrant and seasonal farmworkers are a transborder population affected not only by the social and political conditions of the US, but of the climate and conditions in Mexico as well. Clearly, farmworkers on both sides of the international boundary are impacted by economic factors in both countries. Access to basic health care services is also a pervasive issue affecting this population known to be marginalized in both Mexico and the US. The realities of farmworker life within Mexico mirror those of migrant farmworkers in the US as reported in the literature. In order to comprehensively address the health problems and socioeconomic challenges faced by migrant and

seasonal farmworkers, a binational approach must be explored. Improved policies can be implemented to protect farmworkers' health and safety and address the social and political factors affecting their lives.

In an effort to begin to address these binational challenges, the NIOSH study team in collaboration with the Arizona Delegation of the US Mexico Border Health Commission invited a binational team of researchers from the State of Sonora and MEZCOPH to community forum held in South Yuma County during Border Binational Health Week to share the findings of a recent study conducted in Sonora on the state of health of jornaleros (farmworkers). The sharing of findings at the forum generated potential solutions and recommendations that will be published at a future date. In brief, the participants at the forum, including members of the research teams, governmental and non-governmental organizations that serve the farmworker population and interested community members as well as farmworkers agreed to the establishment of a Binational Network. Creating the Binational Network would serve to improve communication and collaboration (sharing information, strategies, materials, and resources) between health and social service agencies to successfully enrich their services and advocate collectively and effectively for their clients. Moreover, through a collective voice the Network will endeavor to pursue the following noble agenda: (1) The institutionalization of agricultural labor standards on both sides of the border as a step toward improving farmworkers' lives; (2) The implementation of a model of corporate social responsibility with agricultural companies, in order to institutionalize better working conditions and benefits (social and health) for farmworkers and their families.

SCIENTIFIC REPORT

Introduction

The fruits and vegetables easily purchased in grocery stores all over this country are cultivated, harvested and processed by a marginalized and nearly invisible population of migrant and seasonal farmworkers. Farmworkers work very long hours during the peak agricultural seasons, have very low wages, and as a rule, very few receive benefits that the general population takes for granted such as health care, sick leave and vacation. Additionally agricultural work is considerably more dangerous than other types of employment. According to the Bureau of Labor Statistics agricultural workers (including agriculture, forestry, fishing, and hunting) had the highest rate of fatal occupational injuries in the United States in 2006: 29.6 deaths per 100,000 employed (Bureau of Labor Statistics, 2007). Furthermore the National Agricultural Worker's Survey (NAWS) found that thirty percent of all farmworkers had family incomes below the poverty line. The average individual income from all sources, as well as from farm work only, was \$10,000-\$12,499 and the average total family income range was between \$15,000 - \$17,499 (NAWS, 2005). The Arizona Department of Economic Security reports that in 2006 the hourly mean wage for farmworkers in Arizona totaled \$7.45 per hour (Arizona Workforce, 2008).

An accurate estimate of the number of farmworkers in the United States is difficult for many reasons including the migratory and seasonal nature of the work. The Health Services and Resource Administration (HRSA) estimate that there are over 4 million migrant and seasonal farmworkers in the United States (HRSA, 1990). The 2001-2002 (NAWS) described the average farmworker as Mexican origin, male and young. They found that approximately 75% of farmworkers were born in Mexico (NAWS, 2005). Even though such a large population of farmworkers exists in the United States, very little research has been done on the impact of farmworker labor, factors associated with being a farmworker, or on their general health and well-being. This study was undertaken in order to develop a profile of farmworker health focusing on the U.S-Mexico border, particularly in the area of Yuma County, Arizona.

According to a recently published report "Migrant and Seasonal Farmworkers Enumeration Profiles" there is an estimated 67,704 migrant and seasonal farmworkers in Arizona (Larson 2008). Yuma County is known as the lettuce capital of the nation and lettuce is Arizona's leading cash crop. Other major crops include broccoli, cauliflower, citrus, and melons, cabbage, and celery (AZDA 2005). Yuma County has the largest number of farmworkers in the state, employing greater than half (61%) of the farmworker population in Arizona (Larson 2008).

Background

The rationale for conducting the study was based on the existence of health problems and health disparities well documented in the Arizona-Sonora region. There is a gap in knowledge about farmworker health in general and specifically on the impact of being an agricultural worker in a prevailing atmosphere of fear and discrimination. Arizona's state legislature has in recent years promulgated and passed several initiatives limiting access to healthcare and public health benefits among other services. There has also been a steady increase in the militarization of the US Mexico border with placement of not only human resources to control migration and maintain homeland security, but use of technology to detect, detain and eventually deport or prosecute undocumented migrants. Arizona has served as a model for the other 49 states in the union also inclined to stem the flow of migration into their respective states from Mexico, Central and Latin America.

A study conducted by the Binational Migration Institute (BMI) revealed that Latino citizens and legal residents residing in South Tucson were mistreated at alarming rates: 19% in 1993 and 16% in 2003 (Rubio-Goldsmith 2003). The BMI is housed within the Mexican American Studies and Research Center focusing on the production and dissemination of scientific data concerning implementation & enforcement of U.S. and Mexican

immigration policies and how they affect the legal rights (constitutional, civil, and human rights) and public health of all transnational Latinos (undocumented migrants, legal residents, and U.S. citizens). Such abuses as well as the overall climate of suspicion may potentially have negative community wide health effects (mental and physical—e.g., depression, stress, barriers to seeking health services).

This report aims to describe the process used to develop and carry out this study within the context of community-based participatory action research and to provide a demographic profile and descriptive analysis of farmworkers in Yuma County, Arizona. It is an example of innovative public health collaboration between three partner organizations to conduct a study of farmworkers' health.

Partnering Organizations

In 2005 a collaborative relationship between three different organizations was formed: Campesinos Sin Fronteras in Somerton, Arizona. Derechos Humanos in Tucson, Arizona, and The University of Arizona Mel & Enid Zuckerman College of Public Health (MEZCOPH) and Mexican American Studies and Research Center (MASRC), also in Tucson, employing a community-based participatory framework to design and conduct a cross-sectional, population based survey, with the long-term goal of informing public policy. While MEZCOPH faculty and staff have worked extensively, greater than 15 years, with Campesinos Sin Fronteras in various other research studies and evaluation contracts, the partnership with the Coalición de Derechos Humanos was novel.

In preparing the application for the National Institute for Occupational Safety and Health (NIOSH) R21 study, the three core partners of this project identified several major concerns in farmworker communities along the U.S. - Mexico border:

- The continuing struggle for access to health care;
- The documented risks of occupational injuries and exposures;
- Risks associated with agricultural work and lifestyle; and
- Heightened risks associated with border residence (including stress and depression associated with the “racialized” application of border immigration policies, human rights abuses of farmworkers and increased barriers to health care as the result of legislation being proposed and passed in Arizona).

To address these concerns a cross-sectional, population based survey was designed and conducted from August 2006 to February 2007. The following section provides a brief overview of each organization forming the partnership convened to undertake the study.

Campesinos Sin Fronteras

Campesinos Sin Fronteras (CSF) is a community-based, grassroots, minority service organization in Yuma County, Arizona. They have been in existence since 1997 and are well respected within the community. The vision of Campesinos Sin Fronteras is to promote family, social, and economic stability among the migrant and seasonal farmworker community of Yuma County and border communities. They achieve their vision through education, advocacy, and hands on involvement of promotores to reach and educate the target population. CSF provides programming that serves the community in areas that include diabetes, hypertension, cholesterol, HIV/AIDS, environment, and tobacco programs as well as serving in a philanthropic capacity. These programs cater directly to the farmworker community. Board members and staff of Campesinos Sin Fronteras are former farmworkers or share a family history that enables them to understand and be sensitive to the disadvantaged situation of farmworkers with respect to the living and working conditions, which include poor housing, lack of health services, high unemployment rates, under-representation, lack of affordable housing, low educational attainment, and the impact of U.S. immigration policies.

Coalición de Derechos Humanos

Derechos Humanos is a community based organization located in Tucson, Arizona. Since its inception in 1976, Derechos Humanos/Alianza Indigena Sin Fronteras (DH) mission has been to speak out and mobilize people at risk in the general community to fight against anti-immigrant and lethal border enforcement policies at the Southern U.S. border. The primary goal is to bring about a border policy that encompasses four areas: stem the tide of border violence and deaths, a fair immigrant 'legalization' process, a U.S. trade policy that protects human and labor rights of the migrant workers both here and in sender countries, and finally to end the militarization of the borderlands. Since 1993, the primary focus of DH has been the documentation of abuse at the hands of law enforcement agencies. Through the development of their community promotoras de Derechos Humanos, the abuse clinic, and community outreach presentations, workshops and trainings, DH facilitates community empowerment, particularly among communities of color.

University of Arizona, Mel & Enid Zuckerman College of Public Health and Mexican American Studies and Research Center (MASRC)

MEZCOPH AND MARSC

The University of Arizona Mel and Enid College of Public Health (MEZCOPH) was established in 2000. The MEZCOPH ranks among the top five in American Indian and Hispanic/Latino graduate students enrolled. It is one of the 40 accredited schools of public health and the only one in a 12-state Mountain/Pacific region that stretches from Mexico to Canada (website). Faculty and staff of the College involved in this project have served the state of Arizona through prior work at the Arizona Health Sciences Center since the late 1970's. The mission of the College is to "promote health of individuals and communities with a special emphasis on diverse populations of the Southwest". Priorities include rural and border health, Hispano/Latino and American Indian health. The investigators of MEZCOPH involved in this project have a long history of providing leadership and building partnerships at the Arizona-Mexico border that have resulted in the implementation of community-based participatory research projects over the past 20 years. This has resulted in the development and maintenance of long-term partnerships with many organizations, agencies, and individuals along the U.S. - Mexico border.

Working in collaboration with MEZCOPH at the University of Arizona is the Mexican American Studies and Research Center (MASRC) which is a unit of the College of Social and Behavioral Sciences. As the leading public policy research center addressing issues of concern to the largest minority group in Arizona, MASRC works collaboratively with key community agencies in promoting leadership and empowerment of Mexican Americans within the state and the nation. The Center achieves these goals through its applied research agenda, publications, scholarly forums, and its comprehensive curriculum (website).

Specific Aims

The specific aims of this study were to:

1. Form a partnership with two community-based organizations to conduct a study of farmworkers' health in the US-Mexico border area of Yuma County, Arizona.
2. Develop and conduct a comprehensive health survey of farmworkers in three border agricultural communities of Yuma County. The survey will be adapted from the recent California Agricultural Workers Health Survey (CAWHS) (see Appendix A) and a recent Border-Immigration Interaction Survey (BIIS) conducted by the Mexican American Studies and Research Center at the University of Arizona (see Appendix A). Modules on stressors related to border residence and on the relation of border residence to health care-seeking behavior will be developed, validated and included in the survey. A random sample of farmworkers living in households in the three study communities will be surveyed.

In addition, an opportunistic sample of farmworkers not living in households, or living in unmapped households but working in Yuma County, also will be surveyed.

3. Create a health risk profile of the local farmworker population based on survey results.
4. Compare survey results with the results of the CAWHS survey of the California farmworker population to identify similarities and differences between these populations.
5. Analyze the survey data with special attention to the relation, if any, between the characteristics of border residence and the experience of stressors such as depression, anxiety, fear and anger; and the relation, if any, between the characteristics of border residence and access to health services.
6. Conduct group interviews of local farmworkers to explore the survey results in greater depth.
7. Present the survey and interview findings at community forums/town meetings in each of the three study communities. The forums will provide an opportunity to disseminate the survey results and to engage the communities in interpretation of the findings. The forums also will provide the opportunity for community members to join the study team in generating hypotheses appropriate for a large-scale intervention.
8. Utilize the survey findings as an evidence base and as baseline data for developing an R01 proposal for a CBPR intervention addressing stressors and access to health services by farmworkers in the US-Mexico border region.

Methods

To address concerns identified by the partnering organizations, a cross-sectional, population based survey was designed and conducted from August 2006 to February 2007 using a randomized proportionately representative household sample of farmworkers in the three communities of Somerton, Gadsden, and San Luis located along the US Mexico border in southern Yuma County, Arizona. Households were identified using community maps and randomly selected census blocks. Standardized Spanish instruments were developed collaboratively with MEZCOPH, MASRC and Campesinos Sin Fronteras personnel based on reliable and validated surveys used by the California Hired Farmworker Health Survey in the California Agricultural Workers Health Survey (CAWHS), the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System Survey (BRFSS), prior mistreatment surveys developed for another study by MASRC and conducted in south Tucson in 1993, 2003 and again in 2006 (Border Immigration Interaction Survey), which included open ended and qualitative components to derive narratives of mistreatment episodes, previous and new measures of culturally-specific stressors, acculturation and ethnic identity and additional health information.

After preliminary analysis of the 499 surveys (299 household and 200 opportunistic), themes in need of further investigation were prioritized, , and four focus groups were subsequently conducted with male farmworkers, female farmworkers, young men and women farmworkers, and young male and female members of farmworker families to enrich the survey data:

1. Group 1 consisted of farmworker men, of an age that is within the s.d. of the average age, as per the survey results.
2. Group 2 consisted of farmworker women of an age that is within the s.d. of the average age, as per the survey results
3. Group 3 consisted of both farmworker men and women, who are younger, between 18 and 30 years of age.
4. Group 4 consisted of both male and female members of farmworker families who are not farmworkers themselves. They may or may not be employed in other occupational sectors.

Finally, the partnership implemented community forums in each of the study communities to present the preliminary research findings as a basis for generating hypothesis and the perceived accuracy of the results as well as the implication for needed additional action for more research and direct community action.

Two hundred and ninety nine household surveys were completed by promotores from Campesinos Sin Fronteras. Promotores, also known as Community Health Workers, are individuals identified within a community and for the most part work within a community setting and serve as liaisons between providers and the consumer that has traditionally lacked access to care (Witmer, 1995). According to Hunter, et. al., “CHWs [promotores], who may once have been viewed as an expendable add-on to disease prevention, health promotion, and primary care efforts, appear more and more convincingly to be a highly effective bridge between those who give and those who receive health care.” According to various studies, promotores have been shown to yield better results in collecting data, implementing programs, and interventions than academic researchers (Sixta, 2008, Reinschmidt, 2006, Hunter, 2004). Promotores are members of the community in which they are working and have as in this case many shared experiences (Reinschmidt, 2006) with survey participants. This was confirmed in this study as evidenced by the high response rate (92.3%).

In addition to the household survey, two hundred opportunistic surveys were completed in order to capture the farmworker population that may have been missed in the household survey. The opportunistic survey was an abbreviated version of the household survey and was administered during a farmworker health fair hosted by Campesinos Sin Fronteras known as “El Dia del Campesino”. The Dia Del Campesino Health and Information event was initiated 14 years ago to honor and demonstrate appreciation for the community’s agricultural workers’ hard work and immense economic contribution to the community. The purpose of this event is to recognize this often overlooked, yet important segment of the population by providing them with free medical screenings, immunizations, entertainment, food and information on employment, housing, immigration, education and other support services. Now approaching its 15th year, this annual event gathers over one hundred volunteers and 50 health and human service organizations that offer their services as early as 4:00 a.m. Approximately 3,000-4,000 farmworkers cross the San Luis, Arizona port of entry in busloads at 3:00 in the morning. Before heading to the fields, farmworkers participate in the fair where many receive free health screening for glucose, cholesterol, bone density, blood pressure, oral and ophthalmology exams as well as immunizations to prevent influenza and pneumonia. Information on employment, housing, immigration, legal aid, and other social services is also provided. For many this may be the only medical services they receive in a 12 month period. By surveying during the health fair, farmworkers not residing in the United States or not secured through the household survey were captured through the opportunistic process. This includes workers who cross the border daily or weekly and those in the United States without mapped households.

In addition to completing the survey, DH trained staff at CSF to do “Know Your Rights” Workshops. These workshops empower individuals to protect themselves by informing them of their legal rights and how to document and report law enforcement abuses. There are no other programs like this in Yuma County. CSF is able to provide this knowledge in the form of workshops to their community as well as by handing out “Know Your Rights” cards at various venues in the area. CSF also compiled and disseminated a directory of services to avail the community with information about legal, social and healthcare services

Participant Eligibility. Three hundred (299) of the surveys were conducted door-to-door. Individuals were identified as farmworkers prior to being asked to participate in the study. Since the recruitment occurred on private property it protected individual privacy. For the household survey, interviewers stated the purpose of their visit, stated that they were conducting an anonymous survey of farmworkers in the Yuma area and were asked if someone in the household was over 21 and working or had worked in the fields during the past year. If someone in the household fit the description, they were invited to participate in the interview. If more than one adult in the household fit the eligibility criteria, the interviewer would list in descending order of age, each man on one list, and each woman on another. Beginning with males, the interviewer would choose the one with the birth date closest to the interview date. If there were no males in the household, then the woman with the birth date closest to the interview date would be invited to participate.

The opportunistic survey was an abbreviated version of the household survey. Farmworkers participating at the *El Dia Del Campesino Health Fair* were recruited using the same criteria as the household survey with the exception of the birth date criterion.

Participants for the focus group were recruited from job sites by the promotores from Campesinos Sin Fronteras. The format and specific questions for the interview were developed in response to the preliminary analysis of the survey results. Two of the group interviews were held in the conference room of YPIC, in Somerton and the adult male and female farmworker groups were conducted at the San Luis Community Center in San Luis, Arizona.

Interviewer Training. Campesinos Sin Fronteras (CSF) subcontracted with the University to hire and supervise interviewers and provide oversight of the data collection process. All individuals working on the project from CSF were required to pass the Rochester Exam and were provided extensive training on data collection, confidentiality, and privacy issues. This training included an overview and point by point review of ethical interviewing practices, the anonymous nature of the survey, non-disclosure of respondents' identities, addresses or any other identifiers under any circumstances, and the confidentiality of all interview content. Role plays were utilized in the training when appropriate. CSF and UA research staff trained the interviewers together and worked collaboratively to oversee the data collection process. The UAIRB included CSF as a study site and Federalwide Assurance was granted to the study.

RESULTS

Selected Demographic and Descriptive Characteristics of Participants. Reflecting farmworker demographics, more men than women were interviewed in both the household and opportunistic surveys (see Table 1). Seventy-eight percent (78%) of farmworkers in the household survey reported being married. The majority of farmworkers interviewed were among the 35-54 year age groups, 64% in the household survey and 57% among those from our convenience sample.

Table 1

Demographics

		Household (N=299)	Opportunistic (N=200)
Gender	Men	52%	72%
	Women	48%	28%
Age	21-34 years	17%	9%
	35-44	34%	27%
	45-54	30%	30%
	55-64	14%	25%
	65 and older	4%	10%
Marital Status	Married	78%	N/A
	Single	12%	
Birthplace	Mexico Border	47%	29%
	Mexico Other	49%	68%
	US	4%	3%
Immigration Status	Naturalized US	10%	8%
	Lawful Permanent Resident	77%	83%

Table 1 shows the frequencies for categorical demographic and access to care variables while Table 2 provides a snapshot of the level of education and poverty characteristic of the study sample.

Table 2

Demographics

		Household Survey (N=299)
Education	6th grade or less	45%
	7 to 9th grade	27%
	High School Grad	10%
Poverty	Between 59% and 81% have family income below the 100% poverty level (range due to variation in household size)	

Our survey coincides with other studies in which the majority of farmworkers reported completing a sixth grade education or less (Hovey & Magana, 2000). Moreover, 59-81% of those interviewed are living below the 100% federal poverty level (Table 2). In the household survey, 31% of those employed as farmworkers in the Yuma County area reported their place of birth as the neighboring state of Sonora. The next most common place of birth was Baja California Norte (16%), followed by Sinaloa (9%), Jalisco (8%), Guanajuato (7%), Michoacan (7%), other states from Mexico (18%). Only 4% were reportedly born in the U.S. In comparison, the opportunistic survey recorded only 17% were born in the state of Sonora.

Migratory Status. The majority of participants reported they were legal residents of the U.S. in the household and opportunistic survey, 77% and 83%, respectively. Less than 1% of participants in the opportunistic survey reported not having legal documents to work in Arizona compared to 5% of the participants from the household survey.

Employment History. Household survey participants (38%) reported having worked in the agricultural fields one to ten years compared to 23% of participants in the opportunistic survey. Sixty-three percent of subjects in our opportunistic survey cross the U.S. Mexico border daily to work in the field mainly to harvest crops (44%), 17% work in the packing process and another 23% are employed in the weeding process. Farmworkers most commonly reported harvesting lettuce (58% household and 55% opportunistic), followed by citrus crops (32% of opportunistic participants), while only 12% of household participants reported harvesting citrus crops (Table 3).

Table 3

Work History

		Household	Opportunistic
Product/Crop	Broccoli Lettuce Melon Citrus Other (includes Cauliflower)	8% 58% 2% 12% 20%	4% 55% 2% 32% 5%
Do you cross the border to work in the US...?:	Yes, Daily No	0% 96%	63% 31%
Work Activity	Harvesting Packing Operating Machinery Other (mostly “desajje”)	33% 29% 5% 18%	44% 17% 0% 23%
How many years have you worked in the fields?	Less than 10 years 11-20 years 21-30 years More than 30 years	38% 20% 26% 16%	23% 30% 24% 21%

Access to Care. Greater than half of the participants in the household survey reported having health care insurance, forty-one percent of whom conveyed they acquired insurance from the US through their employer. In contrast, participants in the opportunistic survey, 60% informed they had health insurance, 36% of which acquired coverage within the US. In both groups, a small percentage (7%) received benefits from both the US and Mexico (Table 4).

Table 4

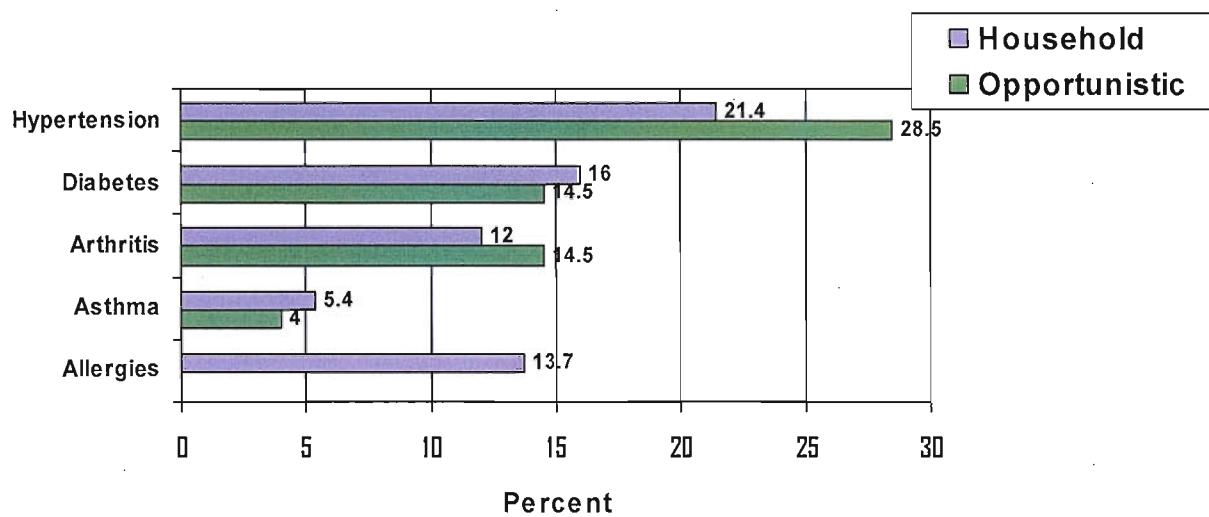
Health Care Coverage

		Household (N=299)	Opportunistic (N=200)
Health Insurance	Yes	54%	60%
	No	46%	40%
Where Insured?	In US	41%	36%
	In Mexico	6%	16%
	Both	7%	7%
During past 12 mos. any time you were not covered?	Yes	24%	41%

Physical and Mental Health Status. Roughly one in five in the household sample reported having diagnoses of hypertension (21%), 12% of arthritis and 16% diabetes. In men, these figures were higher for hypertension (31%) and arthritis (20%). In the opportunistic sample, 29% reported diagnoses of hypertension, and 15% each of arthritis and diabetes (Table 5). When asked to rate their health status, 37% of the household sample and 39% of the opportunistic sample classified their health as “regular” (or “fair”).

Table 5

Illnesses Diagnosed by Physician



Musculoskeletal ailments were also very prevalent, not surprising considering the intensive, repetitive and physically demanding nature of agricultural labor. Back pain was most prominently noted (36% of the household sample, and 47% of the opportunistic group), followed by hands (29% and 44% respectively), feet (31% and 43% respectively), and knees (27% and 42% respectively). The higher figures reported by the opportunistic sample reflect the comparative demographics of respondents, who as a rule were an older group, and largely male (Table 6).

Table 6

Musculoskeletal Pain:
In the past 12 months have you experienced pain in your...?

	Household	Opportunistic
Back	35%	47%
Neck	23%	35%
Knees	27%	42%
Shoulders	20%	0.50%
Hands	29%	44%
Feet	31%	43%

Preliminary analysis of the 499 surveys included a high prevalence of depression and stress. Among those interviewed in their homes, 20% had experienced depression for more than 2 weeks in the previous 12 months, and 26% for more than a week during the previous 30 days.

Farmworkers reported experiencing stress related to their migrant status, their foreign/racial minority position, and the current political environment. Seventy-three percent cited the need to speak better English as a stressor, and 41% experienced stress from the need to travel far from their families to earn a living. Over 40% reported stress caused by worry related to obtaining health services for their families, and many were worried about supporting themselves and their families in the long term.

One particularly relevant element of this study focused on testing and refining a new measure of stress, and its associations with health status and barriers. Socio-cultural and contextual stressors are well known to be linked to chronic and mental health markers (Gibbons et al., 2004; Koval, et al., 2000; Romero et al., in press; Clark et al., 1999). In addition, there is another unique layer of potential stress and social disruption associated with intense immigration enforcement that has not been tapped with previously developed measures. Of particular foci, the socio cultural stress scale employed used a format consistent with Lazarus's (2000) model and was substantively adapted from the bicultural stress scale for adolescents (Romero & Roberts, 2003; Romero, Carvajal, et al., 2007) and the adult Hispanic Stress Inventory (Cervantes, et al., 1991). This scale (see below) include stress due to intergenerational cultural gaps, within-group discrimination, out-group discrimination, monolingual, immigration, legal and economic stressors, among their interactions; with new items created given the heightened local migration pressures and potential health care access barriers. Preliminary descriptive data with another sample on the above scale ($n = 174$) showed perceived discrimination in seeking health care, worrying about your family's health care and hearing prejudiced comments to be among the most common and stressful (intense) events reported. Such factors are increasingly known indicators for health problems (Krieger, 2003; Noh & Kaspar, 2003; Williams, et al., 2003) and contribute to minorities' disengagement from health care systems (Bird, et al., 2001; Institute of Medicine, 2002; Shavers, et al., 2002; Smedley, et al., 2004). Also important to note, we included a qualitative component to the survey and asked the respondents to indicate other sources of stress. In examining of these open ended responses, in no case was another specific (or related stressor) not covered by our scale mentioned by 5% or greater of our sample respondents. This suggests our instrument, termed the Border Community & Immigration Stress Scale (BCISS), well sampled the major domains of stress in our border population.

Some other analysis using the household survey ($N = 299$) centered on our stress assessment. The most frequent intense stressors (reported as very or extremely stressful) in the BCISS were Needing better English (48%);

Being away from family (46%); Harder to succeed because of ethnicity (24%); Discriminated in job (15%); Integrating US/Latino cultures (17%); Discriminated in seeking health care (16%); Worrying about family's health care (36%); Worrying about family/friends with immigration (23%); Interactions with immigration officials (17%); Interactions with police (21%); Limited contact with friends/family because of immigration (17%); Not going to a hospital because of immigration concerns (12%); and Too much violence in the community (25%). Overall the BCISS in this population identified a particularly alarming degree of stress associated with mono-lingual Spanish, family separation and meeting health care needs, with over a third of all respondents reporting such stresses in an intense way. Discrimination and concern with authorities/officials were two other prominent themes. Such levels of reported intense distress (i.e., in many cases over 33%) is rare within a population-based study of stressors.

We also further examined properties of the BCISS and associations with other health outcomes. When expressed using the 0-4 range for each item (no stress/not experiencing (0) to extremely stressful (4), the scale had high internal consistency ($\alpha = .88$). An exploratory factor analysis (maximum likelihood estimation) was also estimated. This analysis most strongly supported a six (6) factor structure (64% of the total scale variance). The factors most represented job limitations, general immigration/deportation concerns, family separation, general discrimination/racism, health care concerns, and cultural conflicts/other acculturation issues. Those six factors accounted for 64% of the total variance in the scale.

Total stress in the scale was also examined in relation to global health, physical health, mental health and depressive symptoms. In the full sample only a relation between depressive symptoms reported for one week and stress was found ($r = .29, p < .001$). In women ($n = 144$), stress was negatively associated with global health ($r = -.18, p < .05$) and positively associated with more depressive symptoms sustained for 1 week ($r = .17, p < .05$). For men however, stress had more and stronger associations with other outcomes ($n = 156$). Stress was associated with more mental health problems reported in the last 30 days ($r = .24, p < .01$), with more depressive symptoms sustained over a two week period ($r = .19, p < .05$) and with more symptoms sustained at least one week ($r = .38, p < .01$). Overall this data suggests an important link between the contextually relevant stressors and health indicators.

The results of further analysis on the associations of border related stress (using the combined respondent samples) and other predictors of health showed significant findings in various health domains. Immigration related stress was a significant predictor of mental health among the farm workers; those who were stressed as a result of immigrated related issues had their mental health problems increased by 2.08% as compared to those who were not stressed. Males were less likely to have mental health issues as compared to females (OR 0.511, p-value 0.023). People who were depressed were 6.614 times more likely to report mental health issues than people who were not depressed. Ages 50-59 was also significantly associated with mental health problems where people in this age group were 3.235 times more likely to have mental health issues as compared to people less than 30 years old (OR 4.235, P value 0.034). There were no significant differences between males and females.

The effects of immigration related stress was also analyzed with other health domains including physical health and overall health status. Results of physical health showed stress, age and BMI were statistically significantly associated with increased physical health issues. For a unit increase in stress, physical health concerns increases by 12.4%. Similarly, for a unit increase in age, physical health concerns were increased by 5% and finally for a unit increase in BMI, physical health concerns increased by 4.7%. There were significant differences by gender. For females, the following variables were significantly related to physical health: age (0.184, $p < 0.015$) and income (4.097, $P < 0.010$). However, for males Age (0.098, $p < 0.039$) and depressive symptoms (6.844, $p < 0.004$) were significantly associated with physical health. There were no significant interactions by sex ($p < 0.5022$) and age ($p < 0.6817$). However, age was found to be a confounder (10.46%) but sex was not (3.42%).

Finally, for overall health status, the predictors for overall health were age (OR=1.044, p<0.035), depressive symptoms (OR=8.043, p<0.045) and insurance status (OR=0.413, P<0.011). Stress being the predictor variable was not significantly associated with overall health status, age raises overall health concerns by 1.044 times. Similarly, depressive symptoms raised those concerns by 8.043. Lack of insurance did not seem to raise overall health issues but rather was a protective factor. Other factors that were considered in the analysis and were not significantly associated with the various health domains were legal status, level of education, marital status, number of family members and acculturation.

In addition to economic worries, the surveyed farmworkers reported stress tied to a climate of fear or oppression in their border community. Stressors included the difficulty of getting ahead in the US due to their race, encounters with police and border patrol officials, the construction of the border wall, and the unjust treatment of others of their race.

In addition to the 499 surveys, focus groups were conducted with 29 farmworkers of Mexican descent in Yuma County to learn more about the underlying issues that cause them stress. Findings from the focus groups confirmed the results of the surveys, with participants describing stress related to insufficient English skills and separation from families. Many also described stress caused by abusive or discriminatory interactions with officials from Customs and Border Protection and Border Patrol. Younger focus group participants in particular reported incidents of abuse. In addition, participants reported work-related stress, including abuse from foremen and supervisors, as well as stress associated with agricultural work itself. Farmworkers in the focus group expressed a need for better working conditions, including higher salaries, health insurance and other benefits, and opportunities to develop their skills and learn English.

Discussion and Future Work

The relationship between the partnering organizations proved to be challenging during the initial phases of the study. While the MEZCOPH and CSF have a long history of collaborative work, the relationship between Derechos Humanos and CSF required cultivation and nurturing. Part of the challenge as well involved the distances between the Tucson based organizations to the study site (240 miles between Tucson and Yuma). Every effort was made to maintain a physical presence in Yuma and periodic communication via teleconferences between the three partnering organizations. Campesinos Sin Fronteras research staff traveled as frequently as permissible to Tucson to follow up on data management concerns and to perform preliminary analysis of data collected as well as contributing to the interpretation.

The farmworker community in South Yuma County lives in a uniquely challenging environment due to their constant migration and participation in the various migrant streams (Western, Midwestern and Eastern parts of the country), low English literacy skills, low educational attainment, and inadequate housing. Farmworkers are also working and living in a state that serves as a model for other states in the country in the endorsement and approval of anti-immigrant legislation. The demographic profile of South Yuma County is representative of the border region, and is characterized by a population that is over 90% Hispanic (U.S. Bureau of the Census, Census 2000 (Cities of Somerton and San Luis)). The unemployment rates in the agricultural off-season are relatively high (30-43%) (Arizona Workforce Informer, 2006). Many families are living below the poverty level ranging from 25-30% (U.S. Bureau of the Census, Census 2000 (Cities of Somerton and San Luis)). Lastly, 44.5% of residents have achieved less than a 9th grade education (U.S. Bureau of the Census, Census 2000, and City of Somerton).

The U.S. Mexico border region has become an increasingly militarized environment in the recent past. Policies promoting militarization of the border region has contributed undue stress to the population in general, but

particularly to the farmworker community. Regardless of their immigration status, farmworkers endure stress that is further compounded by their inability to access healthcare and other social services. There is ample evidence documenting what most scholars, human rights activists and journalist describe as a “climate of fear” associated with US immigration law enforcement practices, restrictive legislation and increasing political hostility towards the Hispano/Latino population. A greater understanding of the impact of this sociopolitical environment on the health and well-being of farmworkers is vastly needed. Future papers based on this study will provide a more in depth analysis on the stressors related to immigration policies and to the restrictive nature of legislation recently passed in Arizona.

Recommendations for further study

An R01 grant proposal was prepared and submitted in response to an NIH request for proposal announcement in 2008. The R01 was based on the findings of our community based participatory research study on farmworker health, an exploratory R21 study in an agricultural community at the US-Mexico Border in South Yuma County, Arizona funded by NIOSH. Preliminary findings of the study indicate the need for additional research into the health of older men who are current or former farmworkers. Areas of particular interest are: stress and depression, chronic illness, musculoskeletal ailments, work-related injuries, and access to health and social services. The six central domains of stress identified in the study were a) border and migration stressors; b) acculturation stressors; c) barriers to health care; d) discrimination; e) economic strains; and, f) family separation. To further understand the six central domains of stress identified through our previous quantitative survey, we proposed to employ qualitative methods with farmworkers and their families, former farmworkers, and behavioral health and social service providers to explore factors related to these six domains as well as mental health and substance abuse issues. These factors include individual-level and system-level influences, as well as life events, including chronic illness, workplace injury, racial/ethnic discrimination and linguistic/cultural biases in accessing health care or seeking mandated social services, stigmas associated with seeking behavioral health services, work-related disability, aging workers, unemployment and underemployment, family separation, trauma, witnessing violence, border militarization, coping strategies, and other factors unique to the border and agricultural labor.

PRESENTATIONS

Binational Migration Institute (BMI): A multidisciplinary, multi institutional approach to understanding Latino health and human rights concerns on the US Mexico border. Poster presentation during the 134th American Public Health Association, November 4-8, 2006, Boston, MA.

Developing a mixed-method community-wide survey of health and human rights issues for Southern Tucson, Arizona. Jill De Zapien, Cecilia Rosales, MD, MS, Scott Carvajal, PhD, MPH, Jean McClelland, MLS, Maia Ingram, MPH, Raquel Rubio-Goldsmith, JD, MA, Samantha Sabo, MPH, Melissa McCormick, MA, and Floribella Redondo; 134th American Public Health Association, November 4-8, 2006, Boston, MA.

Preliminary findings on relations between health and human rights in a low-income, predominantly Latino, Southwest community. Cecilia Rosales, MD, MS, Scott Carvajal, PhD, MPH, Jean McClelland, MLS, Maia Ingram, MPH, Raquel Rubio-Goldsmith, JD, MA, Samantha Sabo, MPH, Melissa McCormick, MA, Jill De Zapien and Floribella Redondo 134th American Public Health Association, November 4-8, 2006, Boston, MA.

Socio cultural stress, discrimination and health care. Scott Carvajal, PhD, Cecilia Rosales, MD, MS, Jean McClelland, MLS, Maia Ingram, MPH, Raquel Rubio-Goldsmith, JD, MA, Samantha Sabo, MPH, Melissa

McCormick, MA, Jill De Zapien and Floribella Redondo; Psychology Conference, June 2008 Albuquerque, New Mexico

Farmworkers at US-Mexico Border: Challenges to human rights in a militarized environment. Deborah Jean McClelland, MLS, Kathryn Rodriguez, Floribella Redondo, Cecilia Rosales, MD, MS, Georgina Garcia, Maia Ingram, MPH, Jill Guernsey De Zapien, Raquel Rubio-Goldsmith, JD, MA, Scott Carvajal, PhD, MPH and Anna O'Leary, PhD; American Public Health Association, October 2008 San Diego, CA

Socio cultural stress, discrimination and health care. Cecilia Rosales, MD, MS, Scott Carvajal, PhD, MPH, Jean McClelland, MLS, Maia Ingram, MPH, Raquel Rubio-Goldsmith, JD, MA, Samantha Sabo, MPH, Melissa McCormick, MA, Jill De Zapien and Floribella Redondo; American Public Health Association, October 2008 San Diego, CA

Promotoras role in community mobilization and awareness of immigration and human rights for farmworkers and their families at the US-Mexico border. Floribella Redondo, Georgina Garcia, Lorena Madrigal, Kathryn Rodriguez, Deborah Jean McClelland, MLS, Cecilia Rosales, MD, MS, Maia Ingram, MPH, Raquel Rubio-Goldsmith, JD, MA, Jill Guernsey De Zapien, Anna O'Leary, PhD and Scott Carvajal, PhD, MPH American Public Health Association, October 2008 San Diego, CA

Torres E, Redondo F, Meister J, McClellan J, Guernsey de Zapien J. **Information for Action VII: Challenges to Border Health in a Global Economy**; April 17, 2007, Rio Rico, Arizona

Garcia G, **Report to the Coalición de Servicios de Campesinos de Yuma**; 21 de Febrero, 2008

Torres E, Redondo F. **Community Forum**, Somerton, Arizona, April 19, 2008

Farmworker Conference on H2A Visas, Yuma, Arizona, May 2, 2008

1st Jornada Sabatina, sponsored by the Mexican Consulate, Yuma, Arizona, September 6, 2008

1st Yuma County Farmworkers Services Coalition summer conference “Creando Puentes de Oportunidad”/Creating Bridges of Opportunities, June 27, 2008

Agricultural Growers meeting, Yuma, Arizona, September 9, 2008

Binational Challenges and Solutions to Improving Farmworker Health at the US Mexico Border, San Luis, Arizona, October 11, 2008

PUBLICATIONS: MANUSCRIPTS IN PROGRESS

Rosales, C, Ortega I, Aranda P, de Zapien JG, et al. Improving Farmworkers' Lives at the US/Mexico Border: A Binational Approach to Framing Challenges and Constructing Solutions.

Rosales C, O'Leary A, Carvajal S C, Vaughn K, Ingram M, Redondo F, McClelland J, et al. Challenges to Farmworkers Health at the US Mexico Border: Focus Groups Findings about the Major Causes of Stress in Farmworkers in South Yuma County.

Rosales C, Carvajal S C, Ingram M, et al. Farmworker Health at the US Mexico Border.

Carvajal S C, Rosales C, McClelland, DJ, et al. Preliminary Findings on Relations Between Health Markers and Immigration Enforcement Mistreatment.

Carvajal, S C, Rubio-Goldsmith R, Rosales C, et al. Developing and Measuring Latino Acculturation Stressors in a Climate of Heightened Immigration Enforcement.

REFERENCES

1. Arcury, T., & Quandt, S. (2007). Delivery of health services to migrant and seasonal farmworkers. *American Journal of Public Health, 28*, 345-363.
2. Arizona Department of Agriculture. (2005). Yuma County. Retrieved February 15, 2008 from <http://www.azda.gov/Main/yuma.htm>
3. Arizona Workforce Informer. (2008). Retrieved March 18, 2008 from <http://www.workforce.az.gov>
4. Bird, S.T., & Bogart, L.M. (2001). Perceived race-based and socioeconomic status (SES)-based discrimination in interactions with health care providers. *Ethnicity & Disease, 11*, 554-563.
5. Cervantes, R.C., Padilla, A.M., & Salgado de Snyder, N. (1991). The Hispanic stress inventory: A culturally relevant approach to psychosocial assessment. *Psychological Assessment, 3*, 438-447.
6. Clark, R., Anderson, N.B., Clark, V.R., & William, D.R. (1999). Racism as a stressor for African Americans. *American Psychologist, 54*, 805-816.
7. Clingerman, E. (2007). An insider/outsider team approach in research with migrant farmworker women. *Family & Community Health, 30*(1S), S75-S84.
8. Cooper, S., Heitman, E., Fox, E., Quill, B., Knudson, P., Zahm, S., et al. (2004). Ethical issues in conducting migrant farmworkers studies. *Journal of Immigrant Health, 6*(1), 29-39.
9. Finch, B., Frank, R., & Vega, W. (2004). Acculturation and acculturation stress: A social-epidemiological approach to Mexican migrant farmworkers' health. *International Migration Review, 38*(1), 236-262. Retrieved from <http://search.ebscohost.com/>
10. Gibbons, F.X., Gerrard, M., Cleveland, M.J., Wills, T.A., & Brody, G. (2004). Perceived discrimination and substance use in African American parents and their children: a panel study. *Journal of Personality and Social Psychology, 86*, 517-529.
11. Health Resources Service Administration. (1990). An atlas of state profiles which estimates number of migrant and seasonal workers and members of their families. Washington, DC: Health Resources Service Administration.
12. Hiott, A.E., Grzywacz, J.G., Davis, S.W., Quandt, S.A., & Arcury, T.A. (2008). Migrant farmworker stress: mental health implications. *Journal of Rural Health, 24*(1), 32-39. Retrieved from <http://www.ncbi.nlm.nih.gov/PubMed>
13. Holmes, S.M. (2006). An ethnographic study of the social context of migrant health in the United States. *Public Library of Science Medicine, 3*(10), e448.
14. Hovey, J., & Magaña, C. (2002). Cognitive, affective, and physiological expressions of anxiety symptomatology among Mexican migrant farmworkers: predictors and generational differences. *Community Mental Health Journal, 38*(3), 223. Retrieved from <http://search.ebscohost.com/>
15. Hovey, J., & Magaña, C. (2003). Psychosocial stressors associated with Mexican migrant farmworkers in the midwest United States. *Journal of Immigrant Health, 5*(2), 75-86. Retrieved from <http://www.ncbi.nlm.nih.gov/PubMed>

16. Hunter JB, de Zapien JG, Papenfuss M, et al. The impact of promotora on increasing routine chronic disease prevention among women aged 40 and older at the U.S.-Mexico border. *Health Education and Behavior*. 2004 Aug; 31 (4 Suppl):18S-28
17. Institute of Medicine. (2003). *Unequal treatment: Confronting racial and ethnic disparities in healthcare*.
18. Kandula, N., Kersey, M., & Lurie, N. (2004). Assuring the health of immigrants: What the leading health indicators tell us. *Annual Review of Public Health*, 25, 357-376.
19. Kim-Godwin, Y.S., & Bechtel, G.A. (2004). Stress among migrant and seasonal farmworkers in rural southeast North Carolina. *Journal of Rural Health*, 20(3), 271-278. Retrieved from <http://www.ncbi.nlm.nih.gov/PubMed>
20. Koval, J.J., Pederson, L.L., Mills, C.A., McGrady, G.A., & Carvajal, S.C. (2000). Models of the relationship of stress, depression, and other psychosocial factors to smoking behavior: A comparison of a cohort of students in grades 6 and 8. *Preventive Medicine*, 30, 463-477.
21. Krieger, N. (2003). Does racism harm health? Did child abuse exist before 1962? On explicit questions, critical science, and current controversies: An ecosocial perspective. *American Journal of Public Health*, 93, 194-199.
22. Lazarus, R.S. (2000). Toward better research on stress and coping. *American Psychologist*, 55, 665-673.
23. Mobed, K., Gold, E.B., & Schenker, M. (1992). Occupational health problems among migrant and seasonal farm workers. Cross-cultural medicine: A decade later. *Western Journal of Medicine*, 157, 367-373.
24. National Center for Farmworkers' Health Inc. (n.d). Facts about farmworkers. Retrieved February 15, 2008, from www.ncfh.org
25. NC Farmworker Institute. (2007). United States farmworker factsheet. Retrieved February 15, 2008, from www.ncfarmworkers.org
26. Noh, S., & Kaspar, V. (2003). Perceived discrimination and depression: Moderating effects of coping, acculturation, and ethnic support. *American Journal of Public Health*, 93, 232-238.
27. Quandt, S., Hiott, A.E., Grzywacz, J.G., Davis, S., & Arcury T. (2007). Oral health and quality of life of migrant and seasonal farmworkers in North Carolina. *Journal of Agricultural Safety and Health*, 13(1), 45-55.
28. Reinschmidt, K.M., Hunter, J.B., Fernández, M.L., Lacy-Martínez, C.R., Guernsey de Zapien, J., & Meister, J. (2006). Understand the success of promotoras in increasing chronic disease screening. *Journal of Health Care for the Poor and Underserved*, 17(2), 256-264.
29. Rivera, F., Guarnaccia, P., Mulvaney-Day, N., Lin, J., Torres, M., Alegría, M. (2008). Family cohesion and its relationship to psychological distress among Latino groups. *Hispanic Journal of Behavioral Sciences*, 30(3), 357-378. Retrieved from <http://search.ebscohost.com/>

30. Romero, A.J., Carvajal, S.C., Valle, F., & Orduno, M. (2007). Adolescent bicultural stress and its impact on mental well-being among Latinos, Asian Americans and European Americans. *Journal of Community Psychology, 35*, 519-534.

31. Romero, A.J., Martinez, D., & Carvajal, S.C. (2007). Socio-cultural stress as a source of adolescent health disparities in Latinos and non-Latino Whites. *Ethnicity and Health, 21*, 443-463.

32. Romero, A., & Roberts, R.E. (2003). Stress within a bicultural context for adolescents of Mexican descent. *Cultural Diversity and Ethnic Minority Psychology, 9*, 171-814.

33. Rust, G. (1990). Health status of migrant farmworkers: A literature review and commentary. *American Journal of Public Health, 80*, 1213-1217.

34. Shavers, V.L., & Brown, M.L. (2002). Racial/ethnic disparities in the receipt of cancer treatment. *Journal of the National Cancer Institute, 94*, 334-357.

35. Sixta CS, Ostwald S. Strategies for implementing a promotores-led diabetes self management program into a clinic structure. *The Diabetes Educator, vol. 34, No 2*, 285-298 (2008).

36. Smedley, B., Stich, A., & Nelson, A. (2002). Unequal treatment: Confronting racial and ethnic disparities in healthcare. *Institute of Medicine of the National Academies, 2-4*, 87-88, 240.

37. Snipes, S., Thompson, B., O'Connor, K., Godina, R., & Ibarra, G. (2007). Anthropological and psychological merge: Design of a stress measure for Mexican farmworkers. *Culture, Medicine, & Psychiatry, 31(3)*, 359-388. Retrieved from <http://search.ebscohost.com/>

38. U.S. Bureau of Labor Statistics. (2007). National census of fatal occupational injuries in 2006 (US Department of Labor Publication 07-1202). Washington, DC: U.S. Retrieved February 15, 2008 from <http://www.bls.gov/iif/oshcfo1.htm>

39. U.S. Department of Labor. (2005). Findings from the National Agricultural Workers Survey (NAWS) 2001-2002: A demographic and employment profile of United States Farm Workers (A Department of Labor Publication Research Report No. 8). Retrieved February 15, 2008 from http://www.dolleta.gov/agworker/report9/naws_rpt9.pdf

40. Ward, S. (2007). Preliminary tests of an ecological model of Hispanic farmworker health. *Public Health Nursing, 24 (6)*, 554-564.

41. Weigle, M.M., Armijos, R., Hall, Y., Ramirez, Y., & Orozco, R. (2007). The household food insecurity and health outcomes of U.S.-Mexico border migrant and seasonal farmworkers. *Journal of Immigrant and Minority Health, 9(3)*, 157-169.

42. Williams, D.R., Neighbors, H.W., & Jackson, J.S. (2003). Racial/ethnic discrimination and health: Findings from community studies. *American Journal of Public Health, 93*, 200-208.

43. Witmer, A., Seifer, S.D., Finocchio, L., Leslie, J., & O'Neil, E.H. (1995). Community health workers: Integral members of the health care work force. *American Journal of Public Health, 85(8)*, 1055-1058.

44. Woodring, J., Foley, S., Rado, G., Brown, K., & Hamner, D. (2006). Focus groups and methodological Reflections. *Journal of Disability Policy Studies*, 16(4), 248-258. Retrieved from <http://search.ebscohost.com/>