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Charu Sawhney
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**The Capstone Committee for Charu Sawhney certifies that this is the approved
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***Socios para su Salud* – A Program Evaluation of a Community-Based Health
Education Program in Cameron Park, Texas**

Committee:

L. Smith, Kirk, M.D., Ph.D.

Rudkin, Laura, Ph.D.

Weller, Susan, Ph.D.

Dean, Graduate School

***Socios para su Salud* – A Program Evaluation of a Community-Based Health
Education Program in Cameron Park, Texas**

by

Charu Sawhney, D.O.

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Dedication

I would like to dedicate this body of work to my loving parents, Dr. Kailash Nath and Kanchan Sawhney, who have always given me unyielding support, my sister Anshu Sawhney for encouraging me to pursue my dreams, and my friends at UTMB who have filled these past three years with wonderful memories.

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***Socios para su Salud* – A Program Evaluation of a Community-Based Health Education
Program in Cameron Park, Texas**

Publication No. _____

Charu Sawhney, D.O., M.P.H.

The University of Texas Medical Branch, 2009

Supervisor: Kirk L. Smith

INTRODUCTION: Management of chronic diseases such as diabetes requires a multi-faceted approach. Diabetes care involves educating patients on the disease process, their medication regimen, adequate blood sugar monitoring, proper nutritional habits, adequate physical exercise requirements, and preventive measures to avoid future complications. These services are difficult to obtain for patients without medical insurance and for those who live in resource poor settings. Community-Based Health Education Programs, such as *Socios para su Salud*, utilize community health workers or *promotores* to offer comprehensive education on the management of diabetes and focus on prevention strategies to decrease the chronic disease burden of the community. The research done at Cameron Park, Texas examines the efforts of such an outreach program by assessing participation and evaluating diabetic patients' health outcomes.

METHODS: Over the period of October 2007 to October 2008 data of all patients attending classes pertaining to diabetes education and management along with their lab data and patients who had any lab data drawn were compiled into a Microsoft Excel database.

RESULTS: The database included 332 patients, of which 164 were diabetic. Of these 164 diabetics 102 (62 percent) participants had no lab data recorded, 37 (22.5 percent) had one set of lab data, and only 25 (15 percent) had two or more sets of lab data.

CONCLUSIONS: Although strong participation in program activities was demonstrated through sign-in-sheets, it was not possible to evaluate the effectiveness of these sessions, since systematic participation and lab data on attendees was not collected. Consistent data collection methods with the appropriate tools and defined interventions need to be in place for each program course to aid in assessing health outcomes of participants over time.

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LIST OF ABBREVIATIONS

ADA	American Diabetes Association
BMI	Body mass index
CBHEP	Community-based health education program
CDC	Center for Disease Control and Prevention
CHCF	California Health Care Foundation
CHW	Community health worker
CSF	<i>Campesinos Sin Fronteras</i>
DSHS	Department of State Health Services
FSBG	Finger stick blood glucose
GCHC	Gateway Community Health Center
GCHD	Galveston County Health District
HbA1c	Glycosylated hemoglobin A1c
KFF	Kaiser Family Foundation
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NCHS	National Center for Health Statistics
NHANES	National Health and Nutrition Examination Survey
PJD	<i>Proyecto Juan Diego</i>
RWJF	Robert Wood Johnson Foundation
UKPDS	United Kingdom Prospective Diabetes Study
UTMB	University of Texas Medical Branch
UTSPH	University of Texas School of Public Health

CHAPTER 1: INTRODUCTION

Management of chronic diseases such as diabetes requires a multi-faceted approach. Diabetes care involves educating patients on the disease process, their medication regimen, adequate blood sugar monitoring, proper nutritional habits, adequate physical exercise requirements, and preventive measures to avoid future complications. This approach to care is difficult to achieve solely in a physician office visit. Several other health care providers such as nurses, nutritionists, and community educators, as well as the patient, need to be actively involved to properly manage the disease process. These services are challenging to obtain for patients without medical insurance and those who live in resource poor settings. One possible cost effective solution to reaching these populations is to utilize available social resources, such as faith based leaders, public health clinics, non-profit organizations, and community members. These community partners can not only educate patients on healthy behaviors that promote prevention and adequate self-management of chronic diseases, but provide them with practical tools and a safe haven to succeed. Community-based health education programs such as *Socios para su Salud* (Partners For Your Health) do just that by offering comprehensive education on the management of diabetes and practical applications of prevention strategies to decrease the burden of chronic diseases in their community. This program evaluation of *Socios para su Salud* based in Cameron Park, Texas examines the efforts of such an outreach program by assessing participation and evaluating diabetic patients' health outcomes.

CHAPTER 2: SPECIFIC AIMS

As background to this evaluation project this paper will: lay out the systemic problems of the current health care system in regards to a lack of focus on preventive care and inadequate comprehensive primary care; characterize the epidemics of obesity and chronic diseases, specifically, diabetes; describe how chronic diseases disproportionately affect minority populations, in particular Mexican-Americans; and define and describe existing community-based health education programs (CBHEPs).

This information will aid in examining the specific aims of this project which are to:

- (1) describe the community setting of Cameron County, its chronic disease burden and limited resources;
- (2) depict *Socios para su Salud* and the programs it offers to Cameron County residents and;
- (3) assess the reach and effectiveness of these programs in terms of participation and health outcome measurements.

The Texas Department of State Health Services (DSHS) granted *Socios para su Salud* monies to fund interventions and affect change at every level including educating the community in lifestyle modifications known to prevent and control diabetes, removing barriers to apply this knowledge by implementing community-based nutrition and exercise programs, and establishing systems changes to maintain new healthy habits. But are these notable services which *Socios para su Salud* provides to its community being used and are they in effect changing the knowledge base, actions, and health outcomes of its participants? There has yet to be a structured evaluation of the program to answer these questions. This project's goals are to research the evidence and evaluate the effectiveness of these targeted interventions.

CHAPTER 3: SIGNIFICANCE

3.1. Defining the Problem

Diabetes is a chronic disease of which Type II accounts for 90-95 percent of all cases diagnosed. Initially, the disease is characterized by insulin resistance and gradually progresses to relative insulin deficiency from pancreatic beta cell atrophy. Defects in insulin production and/or insulin resistance cause high levels of circulating blood glucose that result in micro- and macro-vascular disease leading to major organ damage and possible death over time. Serious complications of diabetes include hypertension, retinopathy which can lead to blindness, heart disease, stroke, peripheral neuropathy, peripheral vascular disease, periodontal disease, amputations, and chronic kidney disease progressing to end stage renal disease requiring hemodialysis (CDC, 2008). The onset of diabetes and these complications can be delayed and possibly prevented by lifestyle modifications such as proper nutrition and exercise (Ingram, 2005).

In the United States approximately 23.6 million people or roughly 8 percent of the population has diabetes. Of these, 5.7 million have the disease and are undiagnosed. In 2007 alone 1.6 million cases of diabetes were diagnosed in adults age 20 and over. As listed on U.S. death certificates, diabetes was the seventh leading cause of death in 2006 (CDC, 2008). The leading cause of blindness among adults 20 to 74 years of age, kidney failure, and nontraumatic lower-limb amputations is diabetes (ADA, 2008a). In certain ethnic groups, such as Hispanic/Latino, non-Hispanic Blacks and American Indians the prevalence of diabetes is much greater than that found in the majority of the population: 10.4 percent, 11.8 percent and 14.2 percent respectively compared to 6.6 percent for non-Hispanic Whites (CDC, 2008). The Center for Disease Control and Prevention (CDC) has declared that diabetes is reaching near epidemic

proportions. The total prevalence of diabetes has increased from 7 percent (20.8 million) in 2005 to 8 percent (23.6 million) in 2007 (CDC, 2005). In addition, 57 million Americans have pre-diabetes (a condition where individuals have higher blood sugar than normal, but not high enough to be diagnosed with diabetes) and will have the disease if they do not modify their lifestyles. Factors contributing to this rise include higher prevalence of overweight and obesity, changes in diagnostic criteria, enhanced detection, decreasing mortality, a growing elderly population, and growth in minority populations in whom the incidence and prevalence of diabetes are increasing (ADA, 2008b).

3.2. Changes in American Lifestyle

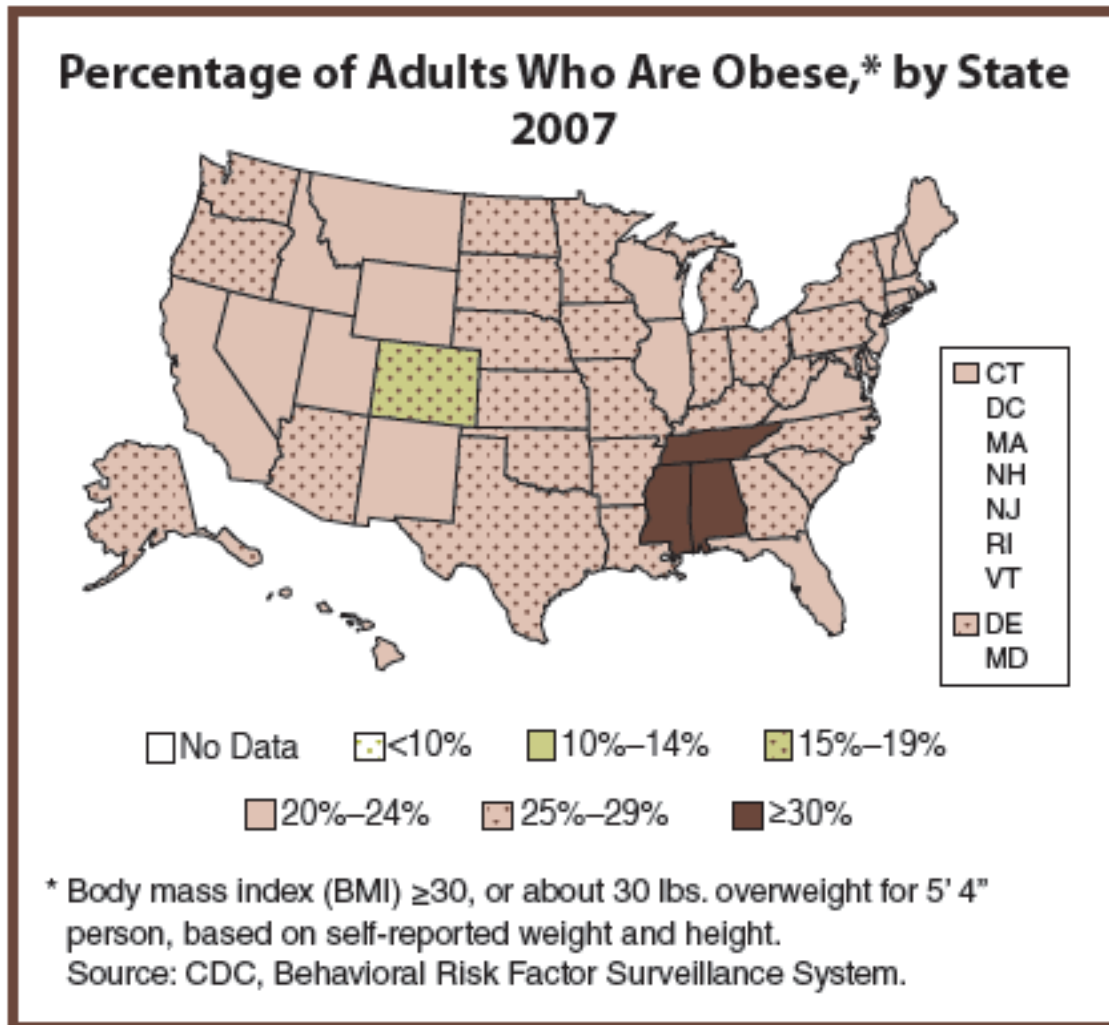
One reason for the dramatic increase in the prevalence of diabetes is the changing lifestyles and diets of most Americans over the past twenty years. The technology boom created a plethora of sedentary activities for children and adults spanning from the professional to personal realm (McClellan, 2003). The nature of modern jobs is less arduous, recreational activities have become increasingly sedentary and people are eating away from home more frequently (Martorell, 2005). People engage less in physical activities such as walking, exercising, and physical work than ever before. During this same period there have also been dramatic changes both in food and food production. Innovations in food preparation, packaging, and storage have made high calorie food items, which are now expansive in their variety and enhanced taste, cheap and easily accessible (McClellan, 2003). Around 90 percent of the money that Americans spend on food is used to buy processed food; however, processing techniques of canning, freezing and dehydrating destroy most of the food's natural flavor. Therefore, processed and fast foods are engineered to please the palate by adding sugar and artificial aromas that mimic the natural flavors of these food products. Over the last several decades this industry

has monopolized and trained the taste buds of Americans to enjoy, become accustomed to, and eventually crave their foods (Schlosser, 2001). This trend coupled with confusing and inconsistent dietary recommendations from the Government and mass media has led people to choose easier to prepare, cheap, and satiating foods above what is healthy (McClellan, 2003).

An environment of increased caloric intake and decreased activity has been the foundation and impetus for the obesity epidemic (Martorell, 2005). According to the most recent National Health and Nutrition Examination Survey (NHANES) survey in 2005-2006, 33.1 percent of adult men and 35.2 percent of adult women over the age of 20 are obese. In addition, 39.5 percent of men and 26 percent of women are overweight (NCHS, 2009). More concerning is that in this same year 16 percent of children between 6 and 19 years of age were obese. Obesity not only increases the risk of developing diabetes, but also increases the risk of other health conditions such as hypertension, osteoarthritis, dyslipidemia, coronary artery disease, stroke, gallbladder disease, sleep apnea, and some cancers (endometrial, breast and colon). These chronic health problems are a significant financial burden to individuals, their families, society, and the United States economy. Each state carries its own burden with three states having greater than 30 percent of its adult population obese, 27 states having between 25 to 29 percent of its adult population obese, and 19 states and Washington DC having between 20 and 24 percent of its adult population obese (Figure 1). Colorado stands alone in having the least amount of obese adults in its population at between 15 to 19 percent (NCCDPHP, 2009).

Figure 1: Percentage of Adults Who Are Obese, by State 2007

Obtained from CDC report Obesity at a Glance -
<http://www.cdc.gov/NCCdphp/publications/AAG/pdf/obesity.pdf>



3.3. Cost of Diabetes

Once diagnosed, type II diabetes treatment requires an intensive management plan to control blood glucose levels, blood pressure, and lipids along with continuous preventive care for the eyes, kidney, and feet. The toll of diabetes on health care dollars spent is significant. It is estimated that the total cost of diabetes in 2007 was 174 billion dollars. Medical expenditures

accounted for \$116 billion encompassing \$27 billion for diabetes, \$58 billion for chronic diabetes-related complications, and \$31 billion for excess general medical costs, along with an additional \$58 billion for indirect costs. These indirect costs included increased absenteeism, reduced productivity, disease-related unemployment disability, and loss of productive capacity. To fully understand the magnitude of these amounts, one of every five health care dollars is spent caring for someone with diagnosed diabetes (ADA, 2008b). To change the burden of chronic diseases for the American individual, family, community, and economy as a whole, there needs to be a stronger emphasis on prevention.

3.4. Prevention

The Office of Disease Prevention and Health Promotion within the US Department of Health and Human Services created a framework called Healthy People in 1990, to launch a comprehensive, nationwide health promotion and disease prevention agenda which worked towards improving the health of Americans by the year 2000. These efforts are continued through Healthy People 2010, which is a set of health objectives for individuals, communities, and professionals to achieve toward a healthier lifestyle over the first decade of the new century. Healthy People 2010's overarching goals are to improve life expectancy and quality of life along with eliminating health disparities. Focus areas of the program include diabetes, educational and community-based programs, health communication, nutrition, obesity, physical activity, and fitness (Healthy People, 2009). These areas highlight the need to refocus health promotion and prevention toward chronic diseases. Throughout the 20th century several public health accomplishments such as sanitation, clean water technologies, discovery of vaccinations (e.g. inactivated and oral polio), and the advent of antimicrobial drugs led to a significant decline in mortality and the prevention of acute diseases in general. However, the nature of disease in the

present century is dominated by chronic ailments such as diabetes, hypertension, coronary artery disease, and illnesses of the elderly. Although these health issues have a hereditary component, they are significantly affected by daily nutrition and activity choices. Therefore, an individual's health and quality of life is directly tied to the lifestyle he or she elects to live. Unfortunately, the options available in any given community to live a healthy lifestyle and prevent disease are highly dependent on socioeconomic status.

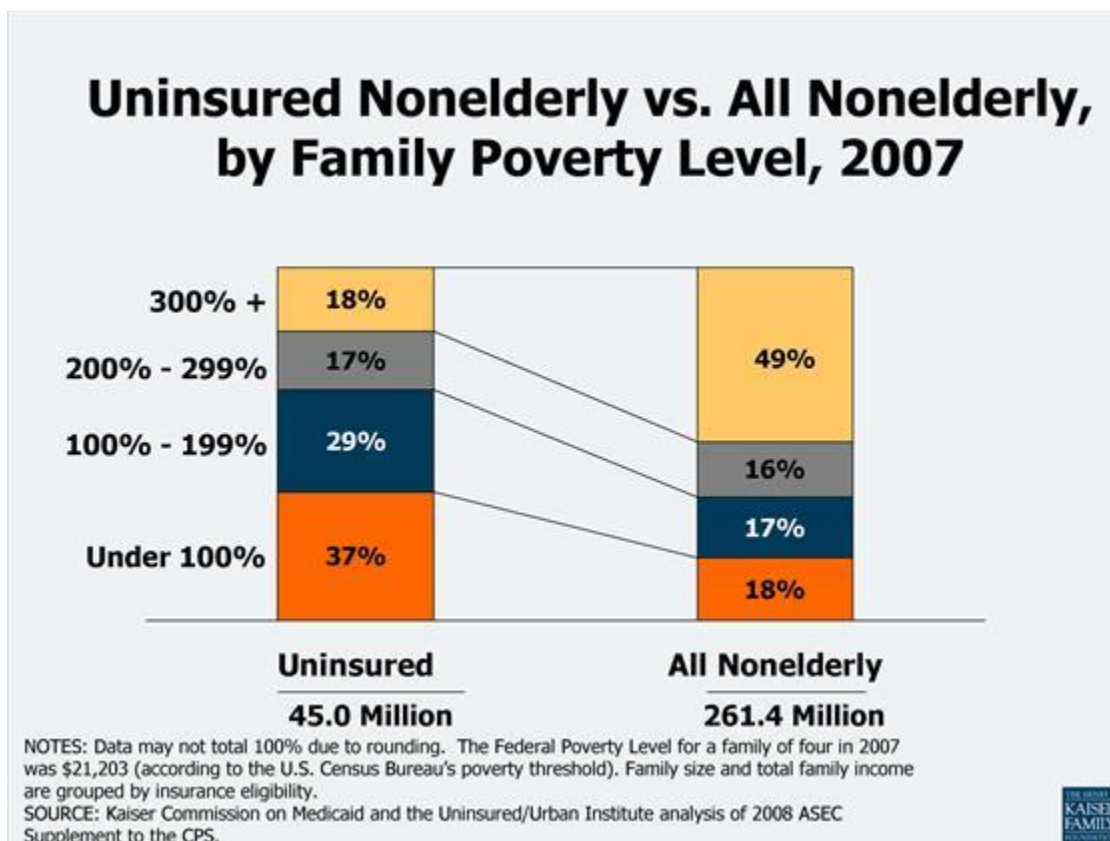
3.5. Factors Affecting Health

The incidence, prevalence, and management of any disease is contingent upon resources and opportunities provided to the patient. Access to medical insurance, a health care provider, medications, healthy foods, safe and affordable avenues to exercise, and general medical knowledge are key components of population health which affect a disease process, how well it is managed once diagnosed, and which populations succumb to complications that increase morbidity and mortality. The United States is experiencing a health care crisis in which 1 in 6 people or 15.6 percent of the population is without medical insurance (Strayhorn, 2005). Having medical insurance and a primary care provider is crucial to key self-management practices needed to treat and manage diabetes.

Of the nearly 46 million people uninsured in the United States the majority are likely to be poor and have a lower income than a higher income. This is demonstrated in Figure 2 which shows over half the nonelderly uninsured population below 200 percent of the federal poverty level, 37 percent below the poverty line, and 29 percent lying between 100 percent and 199 percent of the federal poverty level (KFF, 2008c).

Figure 2: Uninsured Nonelderly vs. All Nonelderly, by Family Poverty Level, 2007

Obtained from The Henry J. Kaiser Family Foundation -
<http://facts.kff.org/results.aspx?view=slides&topic=4>



This gap is further delineated when looking at the insurance coverage by federal poverty level of children and adults separately (Figures 3 and 4). 45 percent of the uninsured adults and 20 percent of the uninsured children fall under 100 percent of the federal poverty level (KFF, 2008c). The fact that the uninsured are concentrated amongst lower income individuals is explicable as they are less likely to be working, and if they are working, are less likely to work full time and therefore unlikely to receive the opportunity to purchase medical insurance or be able to afford coverage (ASPE, 2005). On the other hand, US health care premiums have risen 98 percent between 2000 and 2007, whereas wages have only increased by 23 percent. The

average yearly family private health insurance policy (\$11,480) now costs more than the earnings of a full-time, minimum wage worker (\$10,712) per year. Thus, even individuals working full time find it difficult to afford health insurance (Daschle, 2008). In reality, over 80 percent of the uninsured population comes from a family that is working, with nearly 70 percent having at least on full-time worker (Figure 5). Many of these uninsured workers are self-employed or work for small firms where private health insurance benefits are not likely to be offered (KFF, 2008c).

Figure 3: Adults' Health Insurance Coverage by Family Poverty Level, 2007
Obtained from The Henry J. Kaiser Family Foundation -
<http://facts.kff.org/results.aspx?view=slides&topic=4>

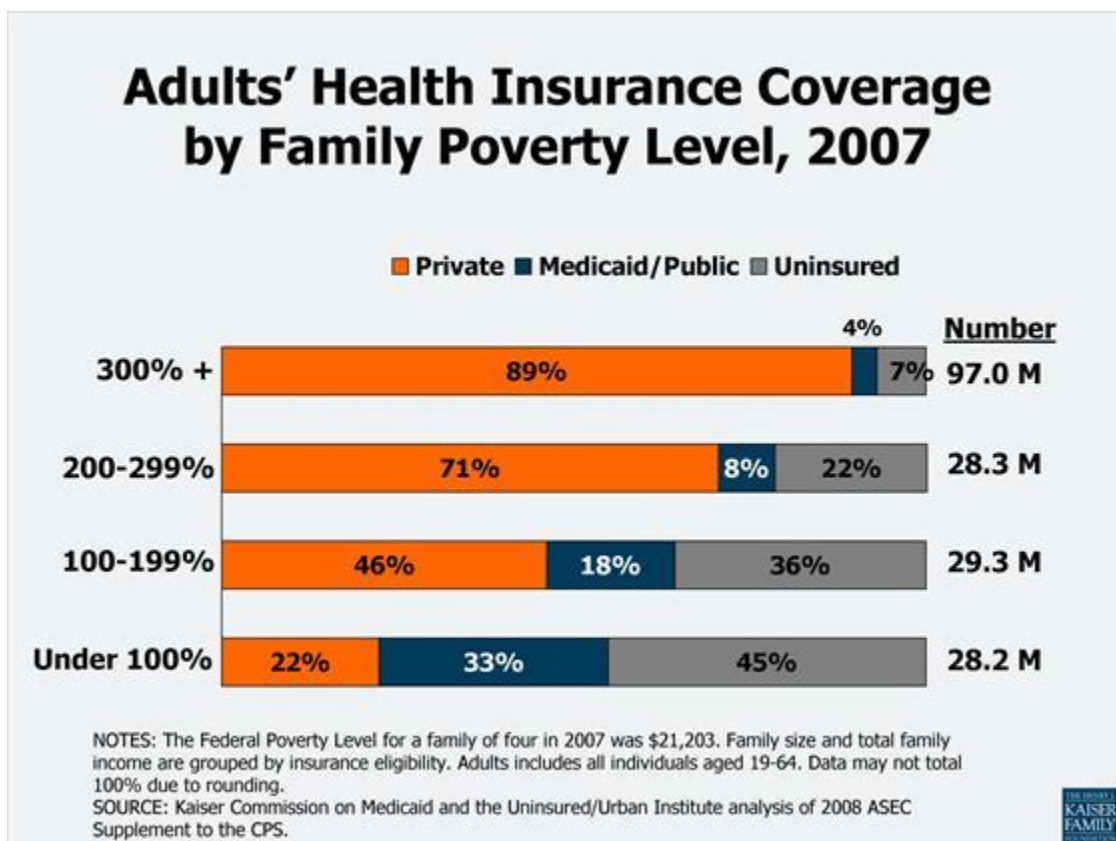


Figure 4: Children's Health Insurance Coverage by Family Poverty Level, 2007
 Obtained from The Henry J. Kaiser Family Foundation -
<http://facts.kff.org/results.aspx?view=slides&topic=4>

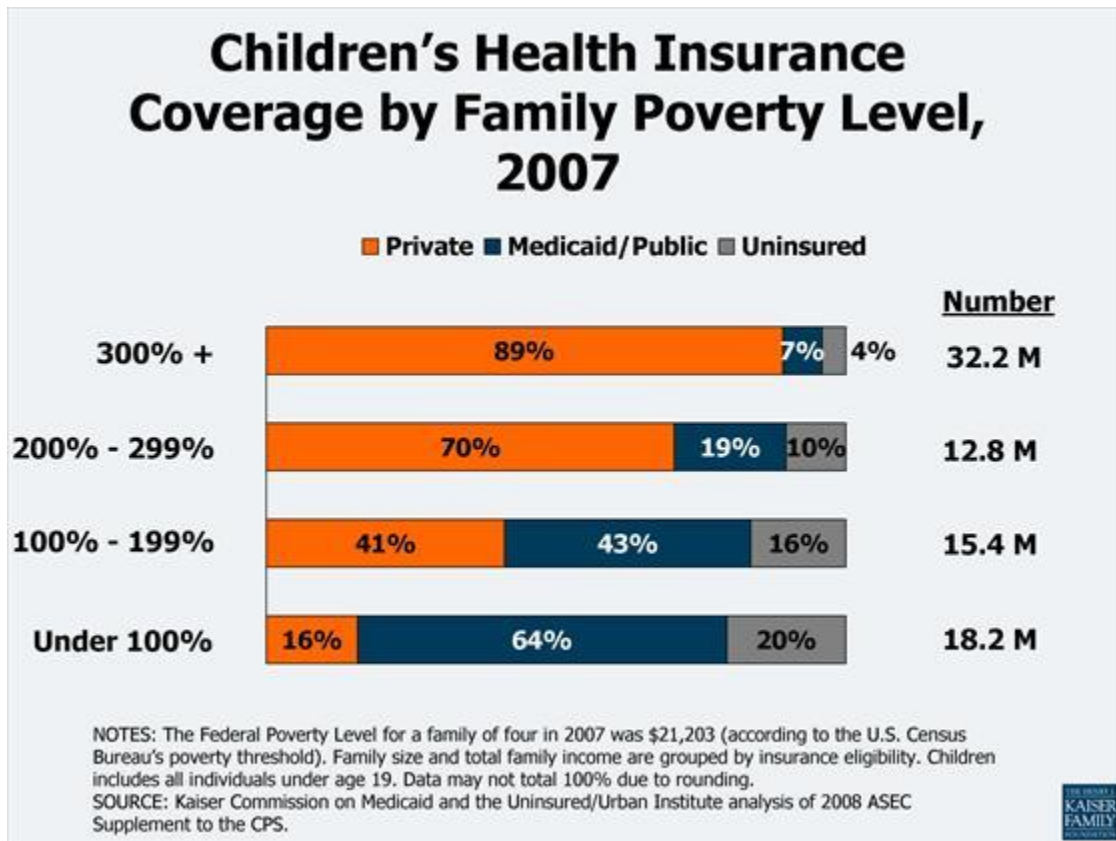
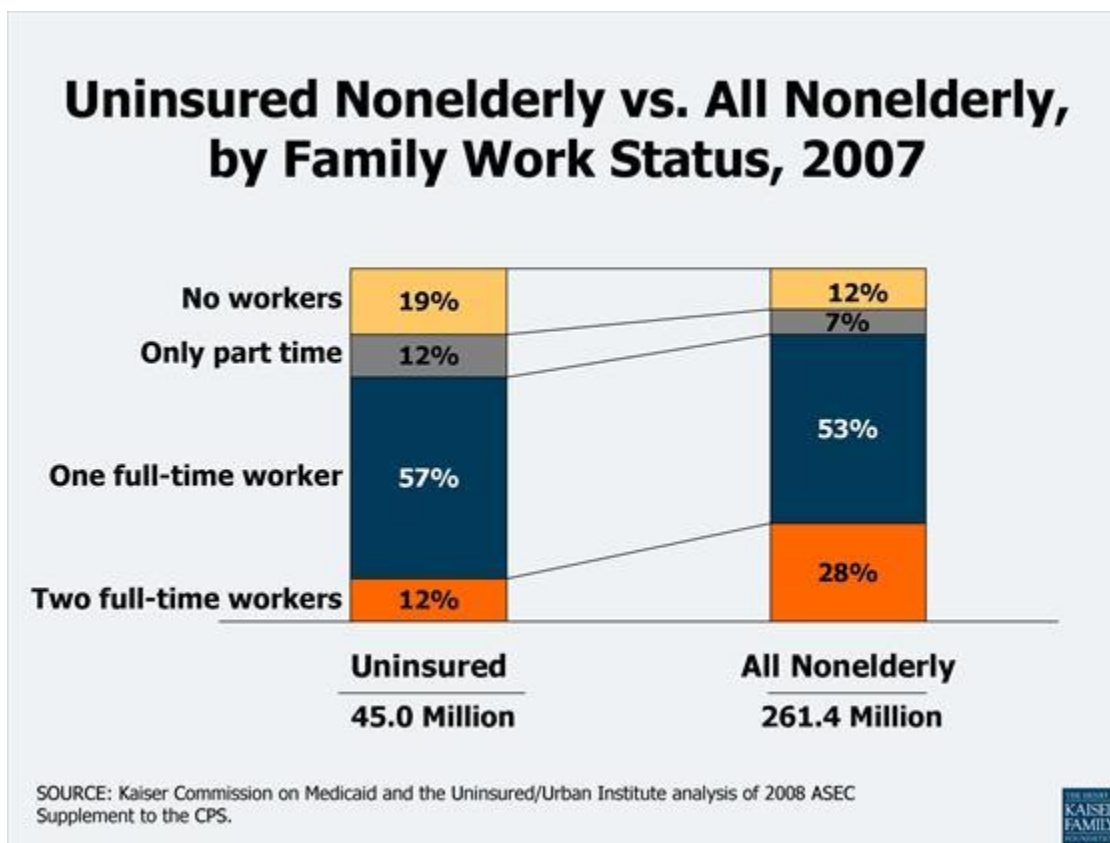


Figure 5: Uninsured Nonelderly vs. All Nonelderly, by Family Work Status, 2007

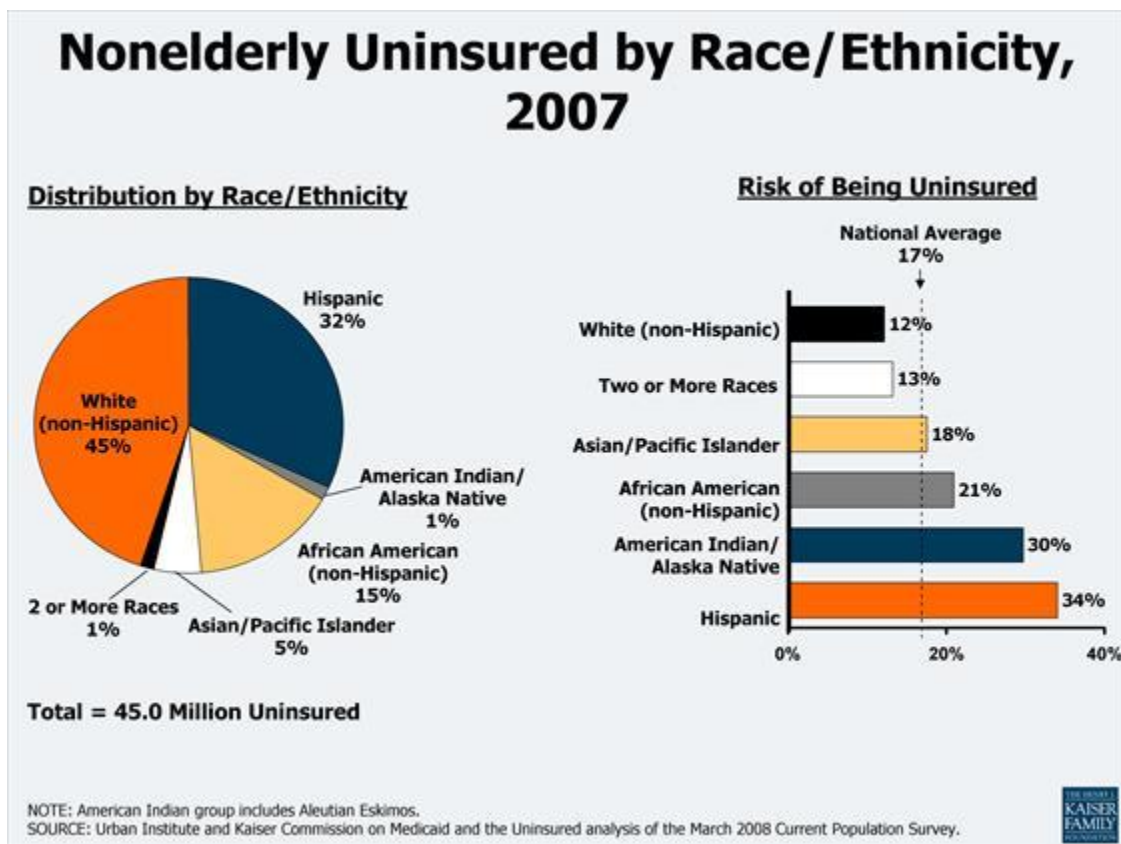
Obtained from The Henry J. Kaiser Family Foundation -
<http://facts.kff.org/results.aspx?view=slides&topic=4>



The uninsured are more likely to be white than other races or ethnicities by number, comprising about half the uninsured population (45 percent). However, the uninsured are disproportionately concentrated in the Hispanic minority group (Figure 6) (KFF, 2008a). Hispanics represent 15 percent of the United States population but comprise 32 percent of the uninsured. This does not seem to be associated with a higher poverty rate in the Hispanic population (ASPE, 2005). In 2007, the national poverty rate was 12.5 percent. Non-Hispanic whites had 8.2 percent in poverty whereas the poverty rate for Hispanics (21.5 percent) was slightly lower than for African-Americans (24.5 percent) (U.S. Census Bureau, 2008). Research has shown that Hispanics are more likely to be uninsured because they tend to be employed in

jobs that do not offer health insurance, such as construction and agriculture. It is important to note that when offered insurance Hispanics accept it at the same rate as Whites and African-Americans (ASPE, 2005).

Figure 6: Nonelderly Uninsured by Race/Ethnicity, 2007
 Obtained from The Henry J. Kaiser Family Foundation
<http://facts.kff.org/results.aspx?view=slides&topic=70&start=11>



3.6. Hispanic Population

Minority populations are affected with diabetes and its complications at a disproportionate rate. Specifically, the Hispanic population's prevalence of diabetes and secondary complications such as retinopathy, neuropathy, and renal failure is twice that for non-Hispanic whites (Teufel-Shone, 2005). Of the 45.5 million Hispanics living in the United States

(U.S. Census Bureau, 2008), about 4.7 million (10.4%) have diabetes and millions more have pre-diabetes (CDC, 2008). Hispanics are not only the largest minority group in the United States they are also the fastest-growing. Additionally, Mexican Americans are more likely to be diagnosed with diabetes at a younger age and tend to have higher fasting glucose levels, increased insulin resistance, and more perilous types of diabetic complications (Brown, 2002). The increasing prevalence of chronic diseases and poor medical insurance coverage amongst Hispanics has become a significant health burden for the communities in which they reside (Teufel-Shone, 2005).

In 2007, California (13.2 million) had the largest Hispanic population of any state, followed by Texas (8.6 million) and Florida (3.8 million). However, Texas had the largest numerical increase of Hispanics between 2006 and 2007, trailed by California and Florida. Hispanics comprise the highest proportion of the population in New Mexico at 44 percent, with California and Texas being next in line at 36 percent (U.S. Census Bureau, 2008). Texas also bears a significant burden of the uninsured, with 25 percent of residents, or 1 in 4 people, without medical insurance. In fact, Texas is the state with the largest number of uninsured patients in the country (Table 1). Therefore, the dilemma of the uninsured Hispanic population is doubled in this border state (Table 2) (KFF, 2008b).

Table 1:

Health Insurance Coverage of the Total Population, states (2006-2007))

Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2007 and 2008 Current Population Survey (CPS: Annual Social and Economic Supplements).

<http://www.statehealthfactsonline.org/profileind.jsp?cat=3&rgn=45>

	US #	US %	TX #	TX %
Employer	159,311,384	53.4%	10,918,949	46.7%
Individual	14,541,782	4.9%	1,043,274	4.5%
Medicaid	39,296,423	13.2%	2,902,073	12.4%
Medicare	36,155,452	12.1%	2,426,647	10.4%
Other Public	3,253,122	1.1%	282,240	1.2%
Uninsured	45,657,193	15.3%	5,832,884	24.9%
Total	298,215,356	100%	23,406,068	100%

Table 2:

Distribution of the Nonelderly Uninsured by Race/Ethnicity, states (2006-2007)

Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2007 and 2008 Current Population Survey (CPS: Annual Social and Economic Supplements).

<http://www.statehealthfactsonline.org/profileind.jsp?cat=3&rgn=45>

	US #	US %	TX #	TX %
White	20,264,169	45.1%	1,459,588	25.4%
Black	6,941,043	15.4%	637,476	11.1%
Hispanic	14,558,422	32.4%	3,415,422	59.5%
Other	3,207,147	7.1%	228,552	4%
Total	44,970,781	100%	5,741,037	100%

Addressing chronic health conditions of minority populations in Texas is challenging.

With limited resources made available to patients without access to health insurance it is next to impossible to facilitate management and treatment regimens to halt the disease from progressing to irreversible complications. Physicians face this daunting task daily. How do they provide the education, medications, and supplies needed for patients to control their diabetes?

3.7. An Outdated System

The delivery of healthcare predominantly involves a physician responding to an individual patient's complaints during clinic visits. The goals of the visit are aimed at the specific complaint. Management and treatment is physician-directed and focuses on pharmacologic and technologic interventions to accomplish short-term goals or to avoid hospital admissions. Often, there is limited time and attention directed at self-management practices. It is crucial for a patient to visit a physician regularly to check lab work, titrate medications, and have a physical exam, however, it is equally as important to discuss nutrition, exercise, and stress management practices. The current traditional methods of healthcare delivery do not address the needs of individuals with diabetes whose disease progression is heavily influenced by individual behaviors. The infrastructure of current physician practices is not structured to provide such comprehensive educational services. This lack of focus on long term management guidelines for diabetic patients is facilitating an increase in diabetes related complications (Norris, 2002). As a health care system we spend more time, money, and resources treating the complications and late manifestations of diabetes rather than focusing on prevention through appropriate disease self-management practices.

Compounding the situation are the millions of diabetics who lack health insurance and thus access to a primary care physician. Studies have shown that under circumstances of limited capital and resources, individuals will delay or avoid seeking medical care, filling prescriptions, or sticking to treatment guidelines. Since these patients have what they deem to be more urgent matters to deal with on a day-to-day basis, health falls low on their list of priorities and is often ignored until a serious problem manifests itself. Inevitably this leads to more frequent complications and emergency room visits creating higher healthcare expenditures. An economically feasible and more accessible way to deliver certain aspects of healthcare to those

who have limited access is through community-based health education programs utilizing community health workers (CHWs). The goal of these programs is to help reach under-resourced populations, connect them with other patients, family members and the community-at-large to provide critical health promotion and prevention education, and advocate for resources through community empowerment and civic engagement (Babamoto, 2009).

CHWs, also known as lay health educators, community health advocates, community health outreach workers, community health representatives, or in Spanish-speaking communities, *promotores de salud*, are regular members of the community who seek to bridge the gap between the residents of a particular resource poor area and its health care resources. The ultimate goal for CHWs in an underserved community is to form an alliance between health care providers and patients to provide access, identify high risk patients to direct them to appropriate providers, teach residents how to appropriately utilize health care services, and impart education on health promotion, prevention, and disease management practices. The utilization of CHWs in the healthcare field is not foreign. They have been deployed in the United States as well as other countries for decades in the areas of HIV education, immunization programs, high-risk maternal outreach initiatives, and cancer-screening campaigns (Babamoto, 2009).

The Texas Department of State Health Services has a CHW training and certification program to develop and implement statewide standards and administrative rules to certify health workers. The 77th legislative session called to implement such a training and certification program to establish a network of *promotores* in Texas. They recruit individuals who possess competencies in communication, interpersonal relations, service coordination, capacity-building, advocacy, teaching, and organizational skills. Applicants must be 18 years of age and are not required to be American citizens, have a social security number, or have graduated from high

school. They do however, need to complete a certified training course and renew their certification every two years. Becoming a certified CHW is an excellent opportunity for employment as CHWs are paid positions. It also increases opportunities for further education, and is a great source to earn respect, self-confidence, and self-worth through helping others. Texas is the first state in the United States to implement such a standardized training and certification program for *promotores* and is setting an example for others. *Promotores* work hand in hand with the communities they serve and have the real potential to empower community residents to help themselves (Texas DSHS, 2009).

3.8. Overview of Community-Based Health Education Programs (CBHEP)

In regions that have a large number of uninsured or underinsured members, particularly in resource poor areas, local community programs are establishing frameworks to provide education in prevention through lifestyle modifications and disease self-management guidelines. The goal is to help patients live healthier lives. These regions are often populated by a particular minority group and programs culturally tailor their efforts to increase responsiveness and probability of success. Diabetes education programs focus on diabetes control and prevention to include such salient features as identifying all individuals in the community with diabetes, diagnosed and undiagnosed; providing diabetes awareness, prevention, and control strategies through community-based outreach; addressing and minimizing perceived and real barriers that inhibit access to diabetes education and care; and providing safe venues to implement lifestyle modifications. This is accomplished by trained CHWs that live in the community they serve. Such individuals are uniquely qualified to engage community members in their own health status, breaking down the boundaries imposed by traditional educational programs in which teaching occurs in a facility outside the community, by engaging residents in their homes and

community settings to provide disease prevention and management education. CHWs teaching patients about lifestyle modification and disease management in the context of their own physical and cultural environment increases the perceived feasibility of self-management and facilitates more frequent and active participation on the part of patients.

Community-based health education programs provide a different approach to the delivery of health and disease management education. The ultimate goal of these education programs is to enable participants to develop the skills and confidence to manage their disease on a day-to-day basis and deal with the impact it is likely to have on their life. This is in contrast to more traditional approaches which focus on defining the disease process and administering medications. CBHEPs are patient centered and focus on issues and problems perceived and experienced by the patient. Along with lifestyle modification and disease management education the programs emphasize basic skills of problem solving and decision making. They are conducted in community settings, such as churches, schools, community centers, and participants' homes, which are not only more convenient but more familiar to the participants. These settings allow for educational sessions to be based on the personal schedule of the participants versus the traditional professional schedule. Therefore, the sessions are more accessible as they can be offered in the evenings or on weekends. The classes are usually taught by members of the community that understand the participants' needs and more importantly, speak their language, including due respect for nuances of education, socioeconomic status, and region. These CHWs are culturally competent, trusted individuals who do not have to be health professionals but do need to complete appropriate training (Lorig, 2000).

Another unique aspect of a CBHEP is its family centered nature. Many times the educational efforts are also focused on the participant's family unit to improve family members'

knowledge, behavior, and attitude towards a disease process such as diabetes. This inevitably improves the participant's success rate in managing his/her disease and potentially prevents other family members from developing the same ailment. Focusing on the family unit is important in the Hispanic community because there is a strong sense of family connectedness. Hispanic adults in the United States cite their family members' perceptions and preferences towards diabetes as a significant barrier to making the necessary dietary and physical activity level changes in their lives. This is understandable as a family's behavior and attitude towards another family member's attempt at a healthier lifestyle can support or challenge a patient's confidence and ability to implement change (Teufel-Shone, 2005). For example, it is extremely difficult to eat healthy if the only food products being purchased or cooked in the home are high-calorie, fried items. Similarly, it is also challenging to engage in exercise activities if the participant's family does not engage in these types of events together. Therefore, it is optimal to educate the whole family toward goals of prevention and treatment of chronic diseases.

3.9. Examples of CBHEPs in Border Towns

The use of *promotores* or CHWs toward an integrated approach for chronic disease management has increasingly been utilized over the last five to ten years. There are substantial benefits to providers and patients using a *promotore* based health promotion and disease management model. Providers are able to use their time more efficiently knowing that their patients' social needs will be addressed and they will have access to additional education to reinforce the treatment plan. And patients will get individualized care by having more time dedicated to being educated on the disease process and treatment plan. These benefits can result in improved diabetes control over time (Brownson, 2006). Several Border States such as Texas, Arizona, and California have health initiatives that employ CHWs.

The California Health Care Foundation (CHCF) is an independent group committed to improving healthcare delivery in California by focusing on efforts to improve the quality of care for Californians with chronic diseases, improve access to efficient and affordable healthcare to the underserved population, and promote greater transparency and accountability in California's healthcare system. In 2005, the Central Valley diabetes program titled, "Raising the Bar: Improving Diabetes Care in California's Central Valley" was launched in three counties: Merced, Tulare, and Fresno. They formed a coalition between CHWs, community health centers, hospitals, the county health department, and various health plans to provide education on diabetes self-management skills, come to a consensus on standards of care, and create an electronic health registry system. This not only addressed the needs of the community where chronic diseases, specifically diabetes were on the rise, but allowed for an electronic system to track the progress of participants. The electronic registry made it possible to identify patients who needed further care in improving their disease management practices (CHCF, 2009). Through Project *Dulce*, CHCF provided an intense six month training program to *promotores* who were members of the community with diabetes (Whittier Institute for Diabetes, 2008). Once certified the *promotores* delivered educational sessions at participants' homes or in group settings at county health clinics. The CHWs were able to shape their own program to address the needs of their individual communities. When difficulties arose, CHCF provided innovative solutions to the problem at hand. For example, when patients had difficulties scheduling screening eye exams due to lack of specialty providers, transportation, or health insurance, CHCF partnered with the University of California at Berkeley to establish a telemedicine program between county health clinics and the University. CHCF purchased retinal cameras, trained their clinical staff, and provided UC Berkeley with funds to purchase a web-based

application to obtain, manage, and interpret the images. Over the following years, utilizing CHWs to improve diabetes care in their communities has allowed the program to accomplish just that by lowering glycosylated hemoglobin A1c levels (HbA1c) levels, reducing hospitalizations for diabetes related complications, and forming strong partnerships for future projects to sustain this success (CHCF, 2009).

Campesinos Sin Fronteras (CSF) offers a diabetes management program to medically underserved poor migrant workers, seasonal farm workers, and new immigrants who live in rural border communities of Yuma County, Arizona. The program's goals are to build strong partnerships with various medical providers and community resources to improve diabetes self-management care of the target population. The *promotores* are effective resources for health information as they are former farm workers and have an intimate knowledge of their communities. Their role is to provide advocacy, education, and support for people with diabetes to help them manage their disease on a day-to-day basis. Participants are recruited by CHWs in schools, churches, faith-based organizations, stores, neighborhood events, and health fairs. *Promotores* provide education to families in their homes, offer individual counseling for problem-solving, encourage participants to attend weekly support groups and cooking classes, conduct self-management classes, and aid participants in ordering glucometer supplies and other basic care services. The program has realized that *promotores* can play a crucial role in helping people manage their disease process and deal with the negative emotions associated with having diabetes. CSF, like other *promotore* based health education models, has managed to create collaborations with local clinicians, community organizations, and agencies to provide optimal diabetes care to their population (RWJF, 2008).

There are two programs trying to advance diabetes self-management care in Texas and both are associated with federally qualified health centers. One is in Galveston, Texas associated with the 4Cs clinics and the other is in Laredo associated with the Gateway Community Health Center (GCHC). In Galveston, the 4Cs clinics are managed by the Galveston County Health District (GCHD) and have clinical partnerships with the University of Texas Medical Branch (UTMB) and Mainland Medical Center. These clinics serve the low-income medically uninsured population in the area and have partnered with community leaders to provide self-management classes called, “Whisking your Way to Health,” which incorporates cooking and nutrition classes along with diabetes support groups. The classes and support groups are held at various locations to include health centers, hospital clinics, food fairs, faith-based organizations, community centers, and low-income housing projects. These sessions are run by trained volunteer coaches who come from both a lay and professional population base. Volunteer coaches are trained and guided by GCHD staff and have been able to spread education to those most at need in Galveston County (RWJF, 2008).

GCHC in Laredo offers a 10 week *promotore*-led self management course that meets biweekly and also provides weekly phone calls for support. They focus on strengthening the knowledge and skills of participants related to blood glucose monitoring, physical activity, healthy eating, goal setting, and problem solving. The integration of *promotores* into the care of patients with diabetes has allowed GCHC to appreciate that more optimal and comprehensive care is being delivered. Galveston and Webb county plan to use these *promotore*-based models of health promotion and education to improve their community’s health outcomes and subsequently, ameliorate their patients’ risk profiles (RWJF, 2008).

CHAPTER 4: BACKGROUND

4.1. Cameron Park

This program evaluation focuses on a CBHEP in Cameron Park. Cameron Park is located in Cameron County, 140 miles south of Corpus Christi in the Rio Grande Valley region of south Texas (Figure 7). The county is bordered on the north by Willacy County, on the west by Hidalgo County, on the east by the Gulf of Mexico, and on the south by Mexico. The county's largest town and county seat is Brownsville. Cameron Park is a *colonia* on the outskirts of Brownsville. In Spanish, the term *colonia* means neighborhood or community, however, "The Office of the Secretary of State defines *colonia* as a residential area along the Texas-Mexico border that may lack some of the most basic living necessities, such as portable water and sewer systems, electricity, paved roads, and safe and sanitary housing (Texas Secretary of State, 2009)." According to the 2000 U.S. census, Cameron Park, with a population of 5,961 people, is the poorest community of its size in the nation with a per capita income of \$4,103 (U.S. Census Bureau, 2001). More recent city data indicates that as of July 2007 the population of Cameron Park had increased to 6,858, with the distribution between males and females being equal. The Texas median age is 32.3 years, whereas, the median age of Cameron Park is much younger at 21 years. The estimated median household income in 2007 was \$19,001 and was \$16,934 in 2000. This is in comparison to Texas's median household income in 2007 at \$47,548. 99.3 percent of Cameron Park is Hispanic. For the population 25 years and older 19.3 percent have either completed high school or attended an institution of higher education, however, only 2.7 percent have completed a bachelor's degree and fewer (0.4 percent) have a graduate or professional degree. The unemployment rate in Cameron Park in 2007 was 21.9 percent,

whereas the unemployment rate in Texas in 2007 was 4.4 percent. The average household size is 4.7 people and in comparison it is 2.7 people in Texas (On Board Informatics, 2008).

Figure 7: Location of Cameron County
Obtained from Public Records -
http://publicrecords.onlinesearches.com/TX_Cameron.htm



With such a high unemployment rate and low per capita income, Cameron Park carries the significant burden of disease that such poverty and lower educational attainment imposes. Most residents do not have private insurance and their jobs do not offer insurance benefits. Moreover, most families have a working member making them ineligible for federal or county assistance. These working poor are, therefore, effectively barred from primary care and from the providers who might otherwise diagnose and treat the high incidence of chronic disease, such as diabetes in this population. Even residents who are aware of and interested in lifestyle modifications such as diet or exercise regimens, have limited access to proper foods and venues

to engage in physical exercise. Local grocers cater to a high salt/high fat diet and Cameron Park lacks adequate infrastructure being deficient in park areas, playing fields, or even a basic sidewalks. Lack of access to healthcare along with chronic neglect of the community has left many *colonia* residents seemingly indifferent to health issues despite the high prevalence of chronic diseases in this community.

4.2. Results of a Survey in Cameron Park

In 2007, the University of Texas Houston School of Public Health (UTSPH) Brownsville Regional Campus partnered with *Proyecto Juan Diego* (PJD), a 501c3 health advocacy organization based in Cameron Park, to complete a door-to-door survey of Cameron Park residents about physical activity and healthful food choices in 400 randomly selected homes. PJD is a community-based organization, which advocates for health care access and was the foundation for *Socios para su Salud* as it supports a CHW program. The 121 question survey asked detailed questions about basic demographic information; physical activity level in regards to work, transportation, and leisure activity; healthy eating habits to include how many times one has eaten fruits, vegetables, or calorie-dense food; family support towards promoting a healthy or unhealthy lifestyle; how amenable their environment was to engaging in physical activity; prevalence of diabetes, hypertension, and obesity by measuring waist-hip circumference; and how often one visits a physician. The survey was administered by trained outreach workers who read the questions to participants and manually marked their answers. Due to the fact that the survey was administered by trained workers, the response rate was extremely high at 99 percent (397/400). This survey provides a unique glimpse into the community's lifestyle habits and beliefs on healthy living. Below is a brief summary of the results (UTSPH, 2007).

Of the population surveyed, 43.5 percent were 25-44 years old and approximately 86.2 percent of the sample was female. In regards to household composition, 49 percent of households had two people over 18 years of age and 21.4 percent had three people over the age of 18. There were more children between ages 7-17 years than under age six in the households surveyed. 26.5 percent of households had one child and 20.7 percent had two children between ages 7-17 years, whereas, 23.8 percent had one child and 15.8 percent had two children less than six years of age. Almost all of the surveyed population (98 percent) considered themselves as Mexican or Mexican-American and approximately 87 percent only spoke Spanish. These results reaffirm the homogeneity of Cameron Park's population and the need for culturally tailored and language appropriate health education programming and materials. On a scale of excellent, very good, good, normal and bad, 51 percent of participants reported their general health status as very good (UTSPH, 2007).

Obesity is measured by the body mass index (BMI), the ratio of one's weight to height. An adult with a BMI between 25 and 29.9 is considered overweight, and obese if the BMI is 30 or higher. Central obesity is determined through measurements of waist circumference. Men with a waist circumference greater than or equal to 40 inches (101.6 cm) and women with a waist circumference greater than or equal to 35 inches (88.9 cm) are considered to have central obesity. In this Cameron Park survey 295 of 400 participants had their waist measurements completed and 47.5 percent had an average waist circumference of 80-100 cm, 38.6 percent had an average waist circumference between 100-120 cm, and 8.5 percent had an average waist circumference greater than 120 cm. Moreover, 29 percent of the surveyed population had high blood pressure and 20 percent had self-reported diabetes. Of those who stated that they had high blood pressure, 70 percent reported taking medication regularly to treat the condition. Similarly,

of those with self-reported diabetes, 75 percent stated they either took insulin or pills to treat their condition (UTSPH, 2007). These percentages reiterate the high prevalence of obesity and chronic diseases in the Hispanic population, especially, one concentrated in a resource poor setting.

In regards to physical activity, 59 percent of the survey population stated that they engaged in some type of exercise activity in the last month and 54 percent were trying to lose weight. 42 percent engaged in walking, 15 percent engaged in jogging, 10 percent participated in aerobics, 6 percent in soccer, and 28 percent engaged in dancing as their physical activity in the last month. Although 63.4 percent of people stated that it was easy to create a routine for moderate to vigorous physical activity of 30 minutes a day, only 2 percent of the surveyed population felt it was important to do so. 21 percent of participants reported their family members exercised with them frequently or very frequently in the last 3 months, 19 percent offered to exercise with them, and 23 percent encouraged them to exercise frequently or very frequently in the last 3 months (UTSPH, 2007).

On dietary behavior participants were asked about their vegetable and fruit intake the day prior. 67 percent reported eating no orange/yellow vegetables and 31 percent reported eating orange/yellow vegetables one time the day before. When questioned about eating salad and other green vegetables, 51 percent did not eat any and 44.3 percent ate salad or other green vegetables one time. More of the surveyed population reported eating fruit one time the day prior (52 percent) versus eating vegetables, and 30 percent did not eat fruit even one time the day before. Paradoxically, 69 percent reported eating no meat and 32.5 percent reported eating only one meat serving the day before. Also, 81 percent of the surveyed population reported that they did not eat in a restaurant or fast food establishment; therefore, people ate food that was prepared

at home. Although most individuals did not eat a substantial amount of fruits or vegetables the day prior, a majority of them (60.5%) stated they found it easy to consume five portions of fruits and vegetables a day and stated it would be pleasant to do so (73%). On the other hand, 59 percent of participants reported that their family and friends have encouraged unhealthy nutrition a few times or frequently in the last three months. In looking closely at this data, one can deduce that the diet of residents in Cameron Park consists mainly of items such as potatoes, tortillas, beans, and cheese as a majority of the residents stated they had not eaten vegetables or meat the day prior (UTSPH, 2007).

PJD distributes a newsletter called “*Tu Salud Si Cuenta!*” (Your Health Matters!) and approximately 42 percent of the surveyed population reported they had read the newsletter 1-3 times in the last six months. 62 percent of participants stated they had never heard about PJD, yet, a majority of the surveyed population (58-78 percent) was aware of services which were provided to the community including prevention classes, English classes, a GED program, stress management classes, citizenship classes, exercise classes, diabetes classes, and nutrition classes (UTSPH, 2007).

4.3. *Socios para su Salud*

In 2006, the University of Texas Medical Branch (UTMB) Stark Diabetes Center, which had began focusing on the *colonias* of south Texas, turned its attention to expanding the existing health education and promotion outreach program offered by PJD in Cameron Park. PJD utilizes Texas DSHS certified CHWs, under the supervision of a Masters-level community nurse to educate residents on diet, exercise, disease prevention, and management. The Stark Diabetes Center collaborated with PJD, local churches, the county health department, the Brownsville Community Health Center, and the UTSPH regional campus in Brownsville to provide more

optimal and cost-effective primary care to underserved communities in need. A needs assessment done in 2006 indicated that Cameron Park residents did not have access to the established medical system, therefore, it became imperative that means be developed and implemented to address disease in a non-clinical setting such as a CHW program. In 2007, the Stark Diabetes Center initiated a community-based chronic disease prevention and control program in Cameron Park called *Socios para su Salud*, utilizing the CHWs and community nurse of PJD. The mission of *Socios para su Salud* is to facilitate an environment in which patients take control of their health through beneficial lifestyle modifications and disease self-management, complementing clinic-based care with community-based health education, promotion and preventive care.

CHAPTER 5: METHODS AND RESULTS

5.1. *Socios para su Salud* – Program description

The first goal of this program evaluation is to describe the services offered by *Socios para su Salud* and the community's participation in these services. Direct observation of *Socios para su Salud* in Cameron Park, Texas was completed between September-October of 2008 to research the services offered by this CBHEP. Following is a description of all health related classes offered by *Socios para su Salud*, how often they were taught, who taught the various classes, how these educators were trained, who participated in the classes, and what information or lab data was collected from the participants. Data collection methods focused on activities conducted in the previous year starting October 2007 and ending in October of 2008.

The *promotora* (all are female) or CHWs of *Socios para su Salud* conducted home based education sessions located in various participant homes in Cameron Park and the contiguous communities of Meadow Brook and Paseo Placo. Participants who volunteered their homes were called community team leaders. Ten community leaders volunteered their homes and were responsible for hosting and bringing in an average of five people a week to education sessions occurring once a week for three months. They were also responsible for recruiting one person and training that individual to become a future community team leader. This training process lasted another three months and ensured the continuation of the program. If a community leader stayed involved for one year they were compensated \$75. During their education sessions, *promotoras* utilized 35 Power Point presentations on various topics such as coronary artery disease, hypertension, hyperlipidemia, arthritis, diabetes, stress management, and obesity. These presentations were in Spanish and were created by the *promotoras* in collaboration with medical

students and physicians. Five *promotoras* employed by PJD visited two homes weekly. Either the participants chose which topic to cover or the *promotoras* themselves selected a relevant topic. These CHWs undergo a certification process through the Texas DSHS. They are required to either complete formal training in eight skills to include 20 hours of training per skill or complete 1,000 documented community hours encompassing these skills. They must also complete a 20 hour recertification course every two years. All community members were encouraged to attend these weekly sessions. If a *promotora* suspected that someone was an undiagnosed diabetic or an uncontrolled diabetic she would check their blood sugar during the session. When medical students were present, they were able to check participants' blood pressures. When appropriate, participants would be referred to the community health clinic and other classes offered by PJD. This data (finger stick random blood glucose and blood pressure) was done on an as needed basis. In other words, either patients asked for their levels to be checked or *promotoras* felt the need to check participants blood pressure or blood sugar based on their complaints and appearance. Many classes also had short pre-and post-quizzes that were collectively completed at the beginning and end of each session. All attendees of classes signed in on a sign-in sheet.

Diabetes classes were taught by a CHW once a week in classrooms at the PJD complex located near the geographic center of the colonia. The *promotora* utilized CDC education materials for self-management, which consisted of eight modules. Initially, the material was covered in four hour sessions twice a week for eight weeks, however, due to problems retaining participants the schedule was revised to one four hour session per week. During this session the *promotora's* goal was to cover the most important points of the eight modules. People who attended the classes were those diagnosed with diabetes, those who have family members with

diabetes, and people who feel they are at risk of developing diabetes. One certified CHW was in charge of the diabetes classes. She had completed a specific diabetes training program offered by the migrant council called Diabetes Empowerment Education Program. Throughout the year several data collection methods were used amongst these participants to include collecting weekly finger stick blood sugar (FSBG) levels, HbA1c levels every three to six months, and a lipid panel every six months to one year. Participants who were confirmed diabetics were not prioritized to obtaining these labs as anyone present on lab collection days could obtain a FSBG, HbA1c, or lipid panel. Individuals in the diabetic classes were encouraged to attend other classes offered by PJD. All attendees of classes signed in on an attendance sheet. Participation was varied with class attendance ranging from three community members to 15. Therefore, laboratory data was not collected systematically on participants.

Several of the *promotoras* joined efforts to teach nutrition and cooking classes at the PJD classrooms and kitchen. These classes were both taught four times a year in two day long sessions. For the nutrition classes the CHWs utilized a University of Texas Pan American University curriculum and participants got certificates of completion at the end of the two day course. Both of these classes were very popular with the community and had excellent attendance. All attendees of classes were required to sign-in.

Three types of physical exercise classes were offered weekly: salsa dance classes three mornings a week, a walking program two mornings a week, and an aerobics class four evenings a week. The salsa and aerobics classes were taught at the local San Patricio Parish Hall and the walking program took place at two walking trails located within the *colonia*. The salsa dance class usually had 20 to 30 people attend and had one community instructor. If she was not available for some reason there was no one to take her place and the class was cancelled. The

walking program also had 20 to 30 participants and was taught by one instructor who was a community member. The program was modeled after Walk Across Texas, a program created by the Texas AgriLife Extension Service in 1996 to encourage the habit of regular physical activity, and counted steps to follow participants' progress. This data collection was sporadic in that sometimes participant names and their steps were recorded and other times only participant names were recorded. Due to weather restrictions the class was conducted for about six months out of the year. The aerobics class was the most popular with 30 to 40 people attending. The instructor was a community member who herself had lost 70 pounds. This class was held the most consistently (four times a week); however, it still had only one instructor. At a few points throughout the year weight and waist-hip circumference levels were measured on participants.

There were two community health fairs that PJD sponsored yearly. Several different volunteer service providers contributed to the fairs in order to collect everyone's blood pressure, FSBG, total cholesterol values, and weights. These health fairs were large and between 100 to 200 participants from the community attended. Collection of the participants' lab data was done on one master sheet by the *promotoras*. From this information appropriate referrals were made to health care providers and various PJD programs. General information on a range of disease processes was offered along with refreshments and a venue to promote healthy living habits. In addition to the above programs PJD also offered various other services which are not directly related to health, such as summer youth programs, English classes, parenting classes, leadership workshops, women empowerment courses, and personal development courses.

It was not possible to evaluate the effectiveness of these sessions, since systematic data on attendees was not collected. Participation was consistently measured using sign-in-sheets, however, many individuals were not filling out several items on these sign-in-sheets making it

difficult to assess which individuals attended. Problems in evaluating these sheets included illegible hand writing, women signing in with their husbands' names, several individuals with the same name without corresponding birthdates to differentiate them, and people who changed the spelling of their names on different sheets. Although at times it was difficult to assess exact participation numbers for any one individual, it was apparent that except for the diabetes education classes and some home-based education sessions held throughout the year, participation for each program at *Socios para su Salud* was strong. Community members were utilizing the services offered and taking advantage of the health and non-health related services.

5.2. Data Collection

The second goal of this program evaluation was to assess if one's participation in *Socios para su Salud*'s health service programs led to improvements in individual health outcomes. This was accomplished by compiling all biological data collected on any participant in the program over the past one year and comparing it with their attendance in various PJD activities. An Institutional Review Board approval was secured through UTMB prior to analyzing this data. The process by which the database was compiled is described below.

Six months prior to the site visit in Cameron Park, a UTMB physician assistant student compiled names of participants in various programs of PJD, their demographic information, and available lab data into an Access database. This database was utilized as a foundation for the Microsoft Excel spreadsheet created for this program evaluation. After this initial template was transferred over to Excel, the first data added into the database were patients who had any type of lab drawn over the past one year. The sign-in-sheets for diabetic classes were then compared to the list created and additional names of participants not on the list, but who were attending the diabetes classes, were added to the database. Since the focus of this project is diabetic patients,

these were the individuals which were specifically focused on. At this point, there was a master database of 332 patients of which 164 were diabetic. Patients who were not diabetic were included either because they had lab data or they were on the original Access database. From this point forward the sign-in-sheets for every class between October 2007 and October 2008 were evaluated and information was added on the master Excel database for only the diabetic patients. The goal was to document which diabetic patients were using the services that PJD provided such as the exercise, nutrition, and cooking classes. The ultimate goal was to evaluate if attending these various classes helped diabetic patients improve their health outcomes measured by lab data (FSBG, HbA1c, weight, total cholesterol, lipid panel, and/or waist circumference).

5.3. Participation and Health Outcomes

The home based education sessions conducted at team leaders' homes and run by *promotoras* needed to have a certain number of people present in order for the team leaders to get compensated, therefore, participation levels of these classes was consistent. The sessions were usually held in the afternoons and an average of five people were present. These general educational classes were held during business hours with mainly women and their children attending. Overall, with health related programs, a majority of the participants were female. Males were less likely to attend PJD programming because the sessions were held during business hours and also, due to well defined gender roles in the Hispanic community. It is usually the woman who takes responsibility of matters in regards to nutrition, education, and religion in the family unit.

The PowerPoint presentations utilized for these home based education sessions were created by the *promotoras* themselves using online resources or health care providers using their

general knowledge. At the time of the program evaluation there were no quality control measures in place to ensure that the educational materials utilized were accurate and current. In that medical information is constantly being updated and guidelines are changed, these presentations need to be reevaluated on a yearly basis for accuracy and up to date medical information. Unfortunately, *Socios para su Salud* did not have the resources to employ someone to conduct these measures.

Consistent participation in the diabetes classes was sparse and difficult to verify. Possible reasons for this could be emotional fear and denial of diagnosis and subsequent prognostic indicators, difficulty in attending more than one class, and belief that the disease is in control with medications currently being taken. This is difficult to confirm as no systematic methods were in place to evaluate program effectiveness. In contrast, the nutrition and cooking classes were only held four times a year and were extremely popular. Usually, people had to be turned away due to the session being full (40-60 members). These classes were interactive and not only taught participants how to cook healthy but had hands on exercises to allow participants to practice the skills they learned. The exercise classes were also popular and had a consistent number of participants at each session. Weather restrictions including heat, cold, and rain limited the walking program sessions for about 6 months out of the year. The instructors of the walking, aerobics, and salsa classes were not formally trained but were community members who volunteered and expressed interest in teaching. Unfortunately, there were no substitutes; therefore, if the instructor became ill, had a family emergency, or was on vacation, the exercise classes were temporarily suspended. This type of inconsistency in class schedules has the potential of losing current and prospective members. On the other hand, these classes give community members a safe and reliable place to engage in physical exercise that they would not

have otherwise. Nearby, in Brownsville there are commercial gymnasiums, however, most people in Cameron Park will not be able to afford membership fees or have the transportation means to get there. The general health fairs had 100-200 people attend and were usually very successful. These fairs became an excellent tool to promote PJD to the surrounding community and to recruit individuals to specific classes based on their risk factors.

The biological data that was collected on various groups of participants at different times included a complete lipid panel, total cholesterol levels, HbA1c levels, and fasting blood glucose levels. Over the year, collection of participant lab data was inconsistent, sporadic, and not targeted to high-risk individuals or individuals with existing chronic disease diagnoses. Several limitations including financial restrictions and lack of a data collection tool prevented consistent lab data collection or record keeping. Table three summarizes the results of the lab data aggregated onto the Excel spreadsheet. In the compiled database, after taking names in the initial Access database, adding any participants who had lab work or attended the diabetes class in the past year, there were a total of 332 participants. Of these, 170 (51 percent) participants had one set of data however only 33 (10 percent) had two sets of lab data over time. More importantly, of the 164 patients identified to be diabetic, 102 (62 percent) participants had no lab data recorded, 37 (22.5 percent) had one set of lab data, and only 25 (15 percent) had two or more sets of lab data.

Table 3: Number of Individuals with Lab Data

Compiled Database	332
Participants with no data	115
1 set of lab data	170
2 sets of lab data	33
3 sets of lab data	9
4 sets of lab data	1
5 sets of lab data	3
6 sets of lab data	1
Diabetics in Database	164
Diabetics with no data	102
Diabetics with 1 set of lab data	37
Diabetics with 2 set of lab data	14
Diabetics with 3 set of lab data	6
Diabetics with 4 set of lab data	2
Diabetics with 5 set of lab data	2
Diabetics with 6 set of lab data	1

The patients who participated in the diabetes classes were not all confirmed diabetics and there was no data gathered on whether participants had physicians and were getting lab work done elsewhere. Stronger relationships between local physicians could aid in acquiring lab data on diabetic patients attending PJD programming. In other words, a CBHEP utilizing *promotoras* to intervene in patient education should work in conjunction with the physicians or health care providers managing a participant's disease process. This can prove to be difficult as most residents of Cameron Park do not have medical insurance or a primary care physician. However, the residents in Cameron Park do have access to an indigent clinic, hence, a better partnership between *Socios para su Salud* and this clinic can be defined to increase utilization of the clinic, aid in promoting educational efforts of the CBHEP to potential participants, and work together to improve patients' health outcomes. The data gathered demonstrates that the services PJD provided to the community were being utilized, however, due to the lack of a consistent lab data

collection and recording system, it was not possible to analyze if diabetic participants' health outcomes were improved after participation in the various programs.

In a CBHEP, most employees are extremely busy, many times being pulled in several directions at once. At *Socios para su Salud*, the CHWs were part time employees as the budget did not allow financial support for full time employees. This made it difficult for the CHWs to manage and run various programs offered by PJD and not exceed their work hour limit.

Logically, the goal of CHWs and CBHEPs are to offer services to their respective communities, not necessarily measure how effective they are in offering these services. While certified CHWs receive specialized training, most have not graduated high school and therefore, may lack the educational background or skill sets to create, implement, and manage a data collection program. Moreover, their main goal is to implement programming and educate participants, not collect and analyze biological data. The executive director of *Socios para su Salud* is a nurse practitioner who recognizes the need for the CBHEP to have better and more accurate methods for data collection, but has been unable to implement such measures due to time constraints and lack of financial resources. The rudimentary methods currently being used were not sufficient to conduct a health outcome assessment. In order to accomplish this goal, additional CHWs will need to be hired and trained to implement a data collection method and subsequently, analyze participation and health outcome data from the program.

CHAPTER 6: DISCUSSION

The first goal of this program evaluation which was to describe the services offered by *Socios para su Salud* and the community's participation in these services, was accomplished however, the second goal of assessing if one's participation in *Socios para su Salud*'s health service programs led to improvements in individual health outcomes could not be adequately evaluated. After collection of all data measures, it was evident that there was not enough information collected on participants to determine a positive or negative effect of PJD program services on a given patient's overall health. Moreover, the data that was present could not be verified as sound data collection principles were not utilized. The first step to enable collection and assessment of high-quality data is to institute accurate data documentation and collection methods. This information can be subsequently utilized for proper and appropriate data analysis. Valid tools such as a more detailed sign-in sheet should be created and employed by a CBHEPs CHWs after appropriate training. On the other hand the task of data pooling and statistical analysis will need to be conducted by a professional public health clinician, statistician, or epidemiologist.

Prior to leaving Brownsville, a more optimal sign-in sheet was created to facilitate capturing better data. The class information will be detailed in asking the name, date, location, and presenter of the session being conducted and patients will be asked to fill out their last name, first name, date of birth, sex, address, phone number, and whether they have medical insurance. It was recommended that CHWs fill out the first row of the sign-in sheet as an example of how to properly fill in all fields. This would correct the difficulties detailed above in analyzing the current sign-in-sheets. In regards to collecting biological information, a specific set of laboratory data should be collected on individuals attending various classes. This can be decided by the

nurse director and a consulting public health clinician. For example, patients attending diabetes classes should have a confirmation of diagnosis of diabetes along with having HbA1c levels checked every 3-6 months and a lipid panel checked every year, and the exercise classes should record a participant's height, weight, waist circumference, and hip circumference every six months to monitor progress. When it comes to the home-based health education sessions, knowledge should be assessed with pre- and post-session survey assessments and basic laboratory data, such as random blood sugar and blood pressure, can be done if resources are available. Blanket testing of random blood sugar, blood pressure, HbA1c, and lipid panels should only be done at health fairs. This information can be used to identify high-risk patients and appropriately refer to a health care provider as well as recruit for other PJD programming. On the whole, a systematic methodology needs to be created to capture appropriate laboratory data on patients participating in various PJD programs. This latter part should be handled by a trained professional who can subsequently collect and analyze the data using a computer programming tool.

Post-analysis data can then be utilized to make conclusions regarding the effectiveness of *Socios para su Salud* as a CBHEP and its effect on participants' health outcomes. The information is not only crucial for the program's self-assessment but it is an opportunity to validate the effectiveness of this model of intervention for health promotion, prevention, and disease management. If findings show that knowledge, behavior, and health of participants is not improving, this will give *Socios para su Salud* an opportunity to improve the services offered, however, if findings show the program has a positive impact on its participants in regards to knowledge base, behavior modification, and health outcomes then this information can

be utilized to secure further sources of funding and can also be applied to replicate and establish similar CBHEPs in other resource poor settings.

The most crucial aspect in diabetes control is prevention of diabetes-related complications that contribute to early mortality, morbidity, reduced quality of life, and excess health care costs (Babamoto, 2009). The Diabetes Control and Complications Trial showed that even a 0.5 percentage point reduction in HbA1c resulted in a significant reduction in diabetes complications (Brown, 2002). Although this program evaluation was unable to conduct a health outcome assessment, there have recently been several randomized clinical trials analyzing the effectiveness of interventions led by *promotores* on diabetic patients' health knowledge, outcome measurements, and clinical indicators. Two such trials are discussed below.

The Starr County Border Health Initiative was designed to determine the effects of a culturally competent diabetes self-management intervention in Mexican Americans with type II diabetes. The initiative conducted a prospective, randomized, repeated measures study where a total of 256 individuals with type II diabetes between 35 and 70 years of age underwent a 52 contact hour intervention over 12 months provided by bilingual Mexican American nurses, dietitians, and community workers. These individuals were divided into an experimental group (128) and a one-year wait-listed group (128) or control group. At the end of the study all participants received the intervention as it would be unethical to withhold diabetes self-management education from control subjects however the intervention was delayed by one year in the control group. The intervention consisted of self-management practices including sessions on nutrition, blood glucose self-monitoring, and exercise along with group support sessions to encourage and promote behavior changes. Health outcomes measured were HbA1c, fasting blood glucose, diabetes knowledge, and diabetes related health beliefs. Analysis of the results

showed statistically significant lower measures of HbA1c and fasting blood glucose at 6 and 12 months and higher diabetes knowledge scores at 3 and 12 months in the experimental group than the control group (Brown, 2002).

In another prospective randomized design participants were randomly assigned to one of three six month diabetes management approaches – CHW, case management, or standard provider care. Participants completed behavioral questionnaires and had diabetes-related health measures and clinical indicators assessed at baseline and post-intervention. Patients were newly diagnosed Hispanic or Latino diabetics in the Los Angeles area. The final study sample consisted of 318 patients. All participants received standard provider care by licensed physicians and/or nurse practitioners and were given a basic packet of education materials tailored for the local Hispanic population regardless of group assignment. Participants in the CHW intervention group received individual educational sessions by trained CHWs based on American Diabetes Association self-management practices over a 6 month period. CHWs also made routine phone calls to assess participants' progress, identify barriers, and aid in problem solving. Participants in the case management intervention group received diabetes care and education in the clinic setting from registered nurses as an adjunct to standard provider care. Patients were seen on a monthly basis in the clinic or as needed and follow-up calls were made as determined by the case manager. The case manager to patient ratio was 1 to 53 study patients, whereas the CHW to patient ratio was 1 to 35 study patients. Participants assigned to the standard provider care group only received clinical care by physicians and nurse practitioners with no additional care from CHW or case managers. Clinical measures assessed were HbA1c and BMI at baseline (within three months prior to study enrollment) and follow-up measurements after study completion. Participants in the CHW group achieved greater improvements in health status, emergency

department utilization, dietary habits, physical activity, and medication adherence than in the other groups (Babamoto, 2009).

In both of these trials participants were Hispanic, predominantly female, and demonstrated low acculturation, income, education, health insurance coverage, and poor dietary and exercise habits. The members of these study populations and the CHW interventions given are very similar to the community of Cameron Park and services PJD provides. Hence, comparable results can be expected in such an analysis of *Socios para su Salud*. However, appropriate data reporting, collection, and analysis methodology need to be in place before one can assess if *Socios para su Salud*'s CHW program is successful in improving its participants' health outcomes. This can be accomplished by focusing efforts on self-assessment, accurate data collection, and subsequent analysis of participant health outcomes. Additional resources including supplementary training for CHWs, funding, hiring experts to develop a systematic method for participation and laboratory data collection, purchasing information technology tools to establish such a system, and creating further collaborations with community health care facilities will be required for constructive change to occur.

CHAPTER 7: CONCLUSION

Diabetes is reaching epidemic proportions, especially in the Hispanic minority group. According to one estimate, the lifetime risk of developing diabetes for U.S. individuals born in 2002 is about 1 in 3 for the general population, but about one in two for the Hispanic population (Martorell, 2005). The efficacy in regards to patient health outcomes of pharmacological treatment for diabetes is well known. The United Kingdom Prospective Diabetes Study (UKPDS), a randomized, prospective, multicenter trial showed that aggressive glucose control with medications was associated with a significant reduction in incidence and progression of microvascular complications (Holman, 2008). However, optimal diabetes care should include individualized, culturally appropriate self-management and behavioral modification education along with pharmacological treatment, as maintenance of diabetes control over time requires both lifestyle modification and medications. In fact a ten year follow-up study of UKPDS patients showed that maintaining tight glucose control over time not only continued to significantly reduce microvascular complications but was also found to reduce the risk of macrovascular complications (myocardial infarction) and death from any cause (Holman, 2008). Thus, a multi-faceted approach needs to be taken towards preventing and treating diabetes.

Utilizing CHWs through CBHEPs is an optimal way to complement traditional outpatient methods of managing diabetes, as the key to adequately controlling the disease process over time is to complement pharmacological treatment with proper self-management guidelines and lifestyle modifications through diet and exercise. Many resource poor settings, especially the *colonias* located at the Texas-Mexico border have a significantly greater burden of chronic diseases. In order to prevent serious complications as well as onset of disease there needs to be a

stronger emphasis on health promotion and prevention efforts. A particular focus should be placed on minority populations, such as Hispanic individuals, as it is amongst these populations that the incidence and prevalence of chronic diseases, specifically diabetes, is more pronounced. CBHEPs are uniquely able to identify with their participant base as they utilize culturally appropriate educational materials and provide safe and accessible venues to implement healthy lifestyles. Clinicians and CBHEPs can form coalitions to enforce positive behaviors such as providing access to resources to improve medication compliance, providing culturally relevant information on the disease process to improve overall knowledge, encouraging dietary behavioral modification through nutrition and cooking classes, increasing opportunities for physical activity by improving the community's built environment, and promoting healthy actions to the surrounding community. These partnerships can also work together to change the environment of resource poor settings to sustain such positive behaviors.

Although a health outcome assessment was unable to be conducted in this program evaluation, there is strong evidence that CBHEPs can be an integral component to bridging the gap between patients and health care providers to optimally manage complex conditions such as diabetes and promote behavioral modifications towards a goal of reducing obesity. The need for strengthening existing CBHEPs in regards to quality control and self-assessment is imminent. Higher standards for program creation, implementation, evaluation, and assessment must to be enforced to maximize the true potential of such programs. This can be possible if essential monies and resources are allocated to institutions that focus their energy on health promotion, disease prevention, and elimination of health disparities towards reducing the chronic disease burden of the community.

The future for *Socios para su Salud* is promising. The Texas Diabetes Council engaged the 81st Texas Legislature for funds to utilize UTMB's Stark Diabetes Center community-based model to promote effective, cost-efficient diabetes prevention and disease management practices. These efforts were successful and the appropriations committee granted Stark Diabetes Center six million dollars over the next two years (2009-2011). This program evaluation will provide a roadmap for focusing the money to appropriate avenues. In partnership with Texas Diabetes Council the funds will be utilized to transform the *colonia* of Cameron Park into a research model for assessing the optimal way to implement, evaluate, and measure health interventions to improve the overall health outcomes of a population living in a resource poor setting. Subsequently, this improved methodology can be ascertained and utilized by other counties to establish a community-based health education program in order to accomplish similar goals of preventing diabetes, its complications, and optimizing management of the disease along with promoting general healthy behaviors in the community.

The health of the state of Texas and this country lies in our ability to curb the obesity and chronic disease epidemics plaguing our population. Major national initiatives that focus on culturally competent behavioral interventions towards improved strategies for diabetes prevention and self-management should be employed. Pharmaceutical advances in the treatment of diabetes will be diminished if concomitant advances in improving patients' knowledge base and lifestyle do not occur (Brown, 2002). Utilization and promotion of CBHEPs can be one aspect towards achieving this imperative task.

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Vita

Charu Sawhney, daughter of Kailash Nath and Kanchan Sawhney, was born on April 28, 1979 in New Delhi, India. Her family permanently moved to the United States in 1987 and she attended high school at I.H. Kempner in Sugar Land, Texas where she graduated in the top ten percent of her class in 1997. She went on to college at The University of Texas at Austin and graduated with a Bachelor of Arts degree in Sociology with a minor in Biology in 2002. She subsequently attended medical school in Fort Worth, Texas at the University of North Texas Health Science Center – Texas College of Osteopathic Medicine. After graduating medical school in 2006, Dr. Sawhney was accepted into a combined Internal Medicine and General Preventive Medicine Residency Program at the University of Texas Medical Branch in Galveston. The family of Dr. Sawhney has resided in Sugar Land, Texas for the last 15 years.

Permanent address: 3102 Millers Oak Lane, Sugar Land, Texas 77498

This dissertation was typed by Charu Sawhney.