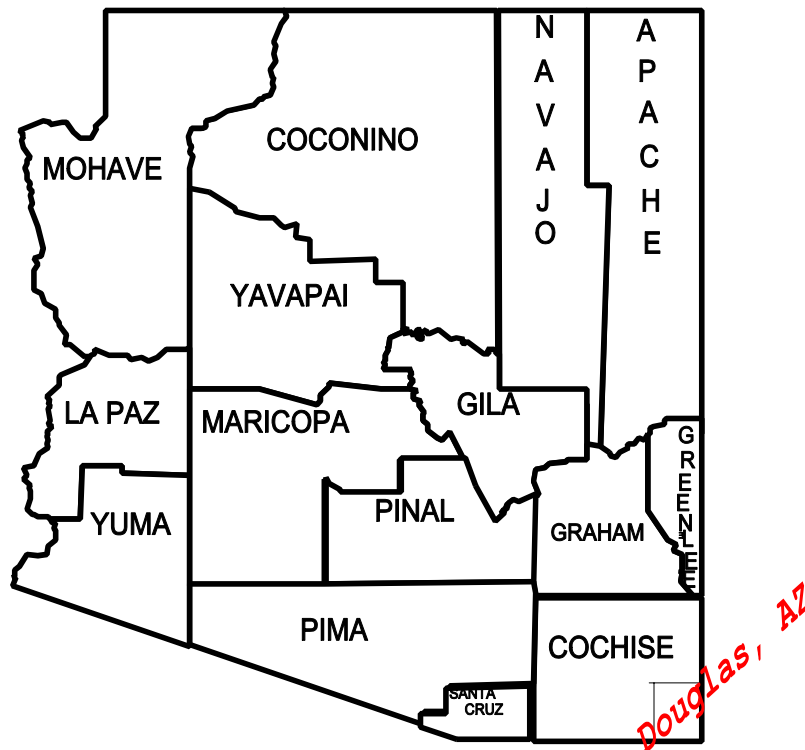
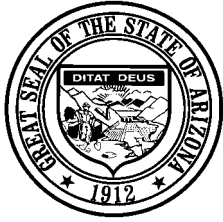


**Arizona Department of Health Services
Office of Prevention and Health Promotion
Diabetes Control Program**

**Douglas Community Health Survey Report
Douglas, Arizona – 1998**



November 1999



Jane Dee Hull
Governor
State of Arizona

James L. Schamadan, M.D.
Acting Director
Arizona Department of Health Services

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contact person:

Tim Flood, MD; Bureau of Public Health Statistics; Arizona Department of Health Services; 2700 N Third Street; Suite #4075; Phoenix, AZ 85004-1186; tflood@hs.state.az.us (602)-542-7333



Final Report

Douglas, Arizona Community Health Survey of 1998

This report summarizes the work carried out by the Binational Technical Team Working Group (BWG). The following participating agencies donated personnel time or financial resources to the project:

ADHS, Diabetes Control Program
ADHS, Office of Border Health
ADHS, Office of Chronic Disease Epidemiology
Cochise County Health Department
the Douglas community
Oficina de Salud Pública de la Frontera, Sonora-Arizona
Secretaría de Salud de Sonora, Mexico
University of Arizona, Arizona Prevention Center
University of Arizona, Rural Health Office

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ABSTRACT

This report presents the results of a survey that measured the prevalence of diabetes and its associated risk factors in Douglas, Arizona, a community bordering the state of Sonora, Mexico.

Trained, community surveyors conducted a cross sectional study, using face-to-face interviews of 915 participants, 20 years of age or older. The study participants were selected from a stratified sample of residents of Douglas, Arizona. Data were collected on demographics, medical history, physical activity, nutrition, and body mass index. In addition, the participants gave a sample of capillary blood that was tested using a portable glucometer. Study participants with abnormal findings were referred for follow-up with their local physicians.

Of the 915 persons interviewed, 93% were of Hispanic origin and 66% were females. Of the total number of participants, 102 (11.1%) said they had been diagnosed previously with diabetes. Of the 813 persons who said they were not previously diagnosed, 803 agreed to give a blood test for glucose. Of these 803 participants who were tested, 21 (2.6%) had elevated glucose levels suggestive of undiagnosed diabetes mellitus (fasting plasma glucose levels above 110 mg/dl or random glucose levels above 200 mg/dl). Follow-up of persons who screened abnormally high was incomplete, but revealed additional cases of diabetes that we did not count in the estimate of the prevalence of diabetes in the community.

A diabetes prevalence of at least 13.6% was found among the surveyed population of persons age 20 or older. The blood glucose of 78% of persons previously diagnosed with diabetes was not under proper control. Our study methods underestimated the prevalence of undiagnosed diabetes. Based on the incomplete follow-up of persons with abnormal glucose screening tests, around 20% of persons who said they had not previously been told they had diabetes were suspected to have diabetes. These findings indicate a need for increased clinical services focused on diabetes.

The Douglas community would benefit from health promotion programs that reduce the risk factors for diabetes. These risk factors include a low level of physical activity, a high prevalence of overweight and obesity, cigarette smoking, and lack of awareness about consuming a healthful diet. We recommend improved care to persons already diagnosed with diabetes. We also believe it is imperative to reduce the risk factors for diabetes among residents who do not yet have diabetes.

The report also presents information about medical care and screening for breast and cervical cancer and lupus received by Douglas residents.

SURVEY FOR DIABETES AND ITS RISK FACTORS

Introduction

This survey addresses perceptions that the prevalence of type 2 diabetes and its associated complications is elevated in the area of Douglas, Arizona, an Hispanic community at the border between the United States and Mexico.

Previous studies have assessed the rate of diabetes in Hispanics, but these studies were not specific for the border region. For example, the Behavioral Risk Factor Survey (BRFS) in Arizona has estimated the prevalence of diabetes among all state residents age 18 and older to be about 3%.¹ The Hispanic Health and Nutrition Examination Survey (HHANES) conducted across the United States during 1982-84 estimated that the prevalence of *previously diagnosed* type 2 diabetes was 2-3% for Hispanic persons ages 20-44, and 14% among those 45-74. Inclusion of *undiagnosed* cases raised the total prevalence of type 2 diabetes to 3.8% and 24% of Hispanics in those respective age groups.² The rate of diabetes for Mexican-Americans has been estimated to be almost twice that of Non-Hispanic Whites.³ Health officials in Douglas perceive that the prevalence of diabetes is even more common than has been reported in the current BRFS or HHANES of 1982-1984.

Risk factors such as hypertension, obesity, early-life weight gain, poor diet, and inactivity have been associated with type 2 diabetes. Current literature notes that Mexican-Americans exhibit greater prevalence of certain type 2-associated conditions (e.g., obesity, hypercholesterolemia) and higher rates of complications (renal failure, amputation, peripheral vascular disease)^{4,5} and type 2-related mortality than Anglo diabetics.⁶ While lower rates of cardiovascular complications were once reported for some southwest Hispanics, Arizona Hispanics now exhibit comparable incidence rates of heart disease and stroke as Non-Hispanic Whites.⁷

Communities along the Arizona-Mexico border (see Appendix 1 for map of the border) increasingly recognize diabetes as a major health issue. They also are interested in knowing the overall health profile of their inhabitants and the challenges and opportunities available to intervene at the community level. For instance, the community is interested in measuring the level of breast and cervical cancer screening and prevalence of lupus erythematosus.

To address these issues and specifically to determine the prevalence of diabetes in this area, a Binational Technical Team Working Group (BWG) was formed. The BWG consists of academicians, healthcare professionals, and community representatives from Arizona, USA and Sonora, Mexico. At the invitation of the Cochise County Health Department (Appendix 2), the BWG chose Douglas, AZ (directly across the border from Agua Prieta, Sonora) as the community to be studied. The BWG developed the study protocol, sampling frame, and data collection instruments. The BWG currently also is studying diabetes in Agua Prieta, the sister city to Douglas.

The town of Douglas covers an 8 square mile area and is located 118 miles southeast of Tucson. Douglas was founded in 1901 as the site for a copper smelter and the city was incorporated in 1905. The estimated population of Douglas in 1998 was 15,150 permanent residents.⁸ International commerce is an important part of the local economy; Douglas also has 15 manufacturing plants.⁹

Methods

This study was conducted using a stratified, random, cluster sample, based on US census blocks in Douglas, Az and in the neighboring community of Pirtleville, AZ. (We collectively refer to these communities as “Douglas.”) Strata were identified by ethnicity (Hispanic/Non-Hispanic) and socio-economic status (SES), as indicated by census block information. The sampling unit was an occupied housing unit, which was randomly chosen from selected census areas. After 3 unsuccessful visits, replacement sampling was used in cases of unoccupied or non-contacted housing units. Once allowed into a house, the interviewers explained the nature of the study and took a census of all adult residents. Each adult 20 years of age or older then was asked to participate in the study.* That is, more than one person from each household could be eligible for participation if they met the age criteria.

The BWG developed, translated, and piloted a face-to-face questionnaire during the summer of 1997 (see Appendix 3). The survey was conducted by 11 interviewers who were residents of Douglas. They received three days of training on questionnaire administration, body measurements, pricking a finger to take a sample of capillary blood, and measuring the blood level of glucose by using a portable glucose monitoring device (Sure-Step meter). Data collection for Douglas, Arizona was conducted from December 1997 to May 1998. The interviewers asked about standard demographic items and various health risk factors, such as physical activity, nutrition, family history, and health practices. The interviewers conducted the glucose screening test and other measurements on the spot at the home of the subjects. The data were entered into Epi-Info version 6.04, and analyzed using SPSS version 8, and dBase version 5.5.

* Initially we excluded persons age 75 or older as ineligible for the survey, but about halfway through the project we allowed persons in this age group to be eligible for inclusion in the sample.

Results

The identification, selection, and participation of households and subjects are shown in **Figure 1**. As indicated in the figure, a total of 567 households participated in the survey and a total of 915 persons completed the interview and provided data for analysis.

Demographics

Of the 915 persons interviewed, 608 (66%) were females and 307 (34%) were males. The age of participants ranged from 20 to 82 years of age, with a mean of 45 years and a median of 43 years. Ninety-three percent (848) of the participants said they were of Hispanic origin and fifty-nine percent were born in Mexico. Although 70% of the participants read and spoke English, 48% preferred Spanish as the language of communication. In this study, 68% of the participants had a spouse or were living in consensual union.

Residents of Douglas displayed a wide range

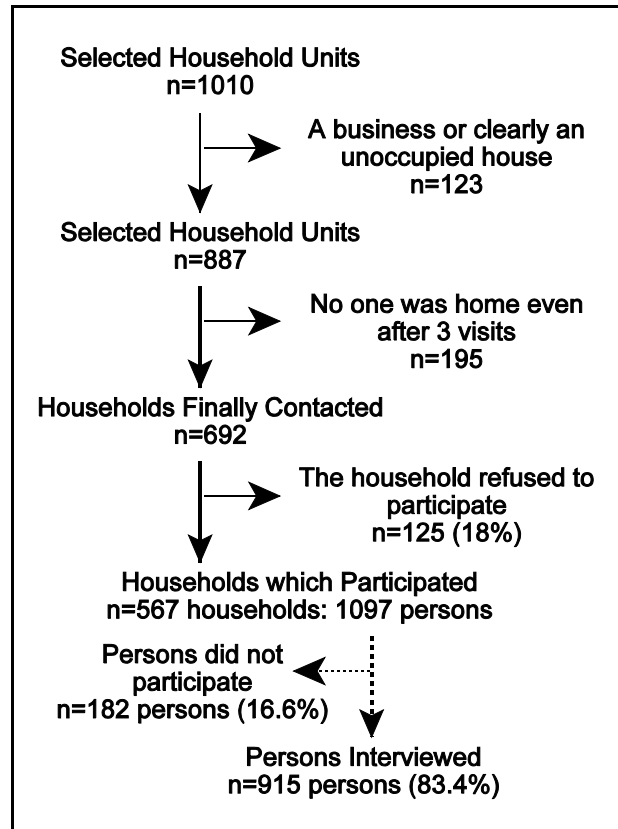


Figure 1. Selection of participants in the Douglas community health survey, 1997-1998.

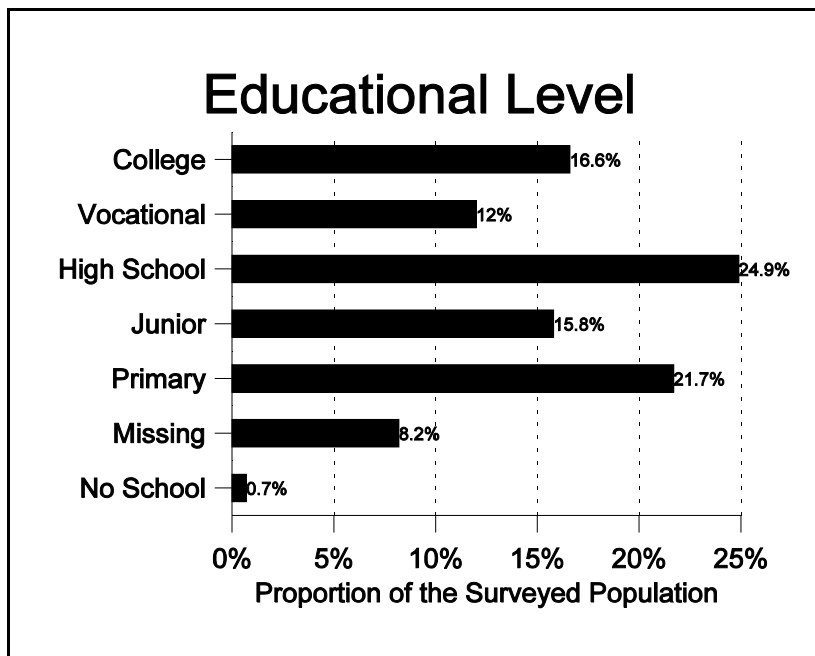


Figure 2. Educational characteristics of Douglas participants.

of educational experience. Presumably, this reflects a wide range of reading comprehension: 37.5% had not completed high school, 37% had completed either high school or vocational education, 17% had a college education and 9% had either no schooling or did not respond to the question (**Figure 2**).

Of the 915 participants, 378 (41%) were employed outside of the home, 340 (37%) were homemakers, 23 (3%) were students, 38 (4%) were unemployed, 58 (6%) were

disabled from working, and 78 (9%) were retired.

Population-Based Information

We compared the demographic information obtained in this Douglas study to the information from the 1990 US Census (**Table 1**). In our sample, a lower proportion of males participated (34%) than were present in the US census (47%). However, the age and ethnic composition of respondents matched well with the 1990 census. This implies that the sample was a good representation of the population from Douglas.

General Health Status and Health Care

Of the 915 persons interviewed, 72% felt they were in good, very good, or excellent health condition. Of the total participants 34% did not have any health insurance, 23% were enrolled in Medicaid (AHCCCS) and 18% were enrolled in a group health plan such as: Cigna, Intergroup, or others. Of the 915 subjects, 650 (71%) said they received their health care in the United States and although less than 1% had Mexican health insurance, 196 (21%) mentioned going to Mexico for their health care. Of the 650 persons receiving their health care in the U.S., 80% listed the Arizona Family Care Association (a local clinic) as their first source of care. Of the 196 respondents receiving their health care in Mexico, 94% go to private doctors. Although 92% of the participants mentioned having a clinic or health center in case of emergency or for routine health care, 19.2% also noted problems getting or using medical services during the past 12 months. The three major reasons why people would not get care or health services were: “Did not have insurance,” “No physicians available,” and “The office wait was too long.”

Various chronic diseases were identified among this population. Twenty-five percent said they had been diagnosed with high blood pressure, 12.8% mentioned circulatory problems, and 23.4% noted arthritis (see Appendix 4).

As a measure of encounters with health care systems, the survey asked respondents whether they had any visit to a health care provider in the past 12 months. Six hundred sixty-nine persons (73.1% of the entire sample) had a visit during the past year. About one-half or more of the

Table 1. Demographic information.

	1990 Census	Douglas Study
Gender		
Males	47%	34%
Females	53%	66%
Ethnicity		
Hispanic	84%	93%
Non-Hispanic	16%	7%
Age Group		
20 - 29	19.8%	18.6%
30 - 39	20.2%	23.2%
40 - 49	15.8%	20.9%
50 - 59	14.1%	15.8%
60 - 69	15.1%	14.5%
70 or more	15.0%	7.0%

respondents recalled having one or more of the tests shown in **Table 2**.

Table 2. Various tests performed during the past 12 months among the 915 respondents in Douglas.

	Number and percent tested.
Blood pressure checked	695 (76%)
Test for blood sugar	470 (52%)
Urine test	484 (53%)
Vision test	409 (45%)

Risk Factors

Modifiable risk factors play an important role in delaying the onset of diabetes and controlling diabetes once it occurs. These risk factors include overweight (as measured by a person’s Body Mass Index, BMI), physical activity, consumption of a healthy diet, smoking, and alcohol consumption.

Overweight: The BMI describes the relationship between weight and height (namely, a person’s weight in kilograms divided by height in meters squared). The BMI correlates with the amount of body fat. The American Health Foundation recommends a “healthy weight range,” defined as a BMI less than 25 for individuals 20 years of age or older. A BMI between 19 and 25 is defined as the “healthy weight range” in the Dietary Guidelines for Americans (see Appendix 5).¹⁰

Among participants in this study, the median weight was 75.2 kilograms (165 pounds), and the median height was 64.2 inches (5'4").

This translates to a median community BMI of 28.3 among the persons surveyed. An ideal weight for this height should be between 105 - 140 pounds to produce a BMI between 19 and 25. As shown in **Figure 3** there were 344 (38.2%) participants who were overweight (BMI 25 - 29.9), and 311 (34.5%) participants who were obese (BMI of 30 or more).

Alternatively, the Behavioral Risk Factor Survey classifies a person as overweight if a man’s BMI exceeds 27.8 or a woman’s BMI exceeds 27.3. According to these criteria, 49.2% of the men and 54.8% of the women in the Douglas survey were overweight. For comparison, the BRFS in 1998 has found that 21.6% of adult Arizonans are overweight, according to these criteria.¹¹

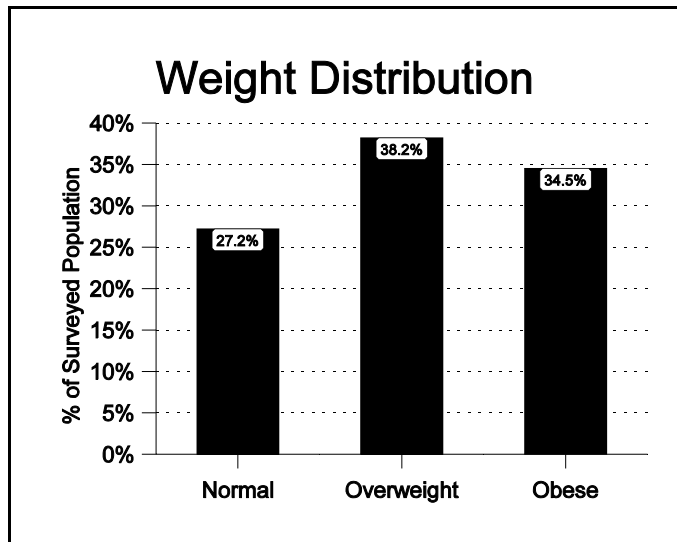


Figure 3. Classification of interviewed subjects from Douglas according to their Body Mass Index (BMI) and the new *Dietary Guidelines for Americans*.

Physical activity: Physical activity was measured through various factors such as means of transportation, work activities, home activities and leisure activities. After combining these factors in the analysis, only 32.6% of the population are considered to be physically active with daily physical activity that lasted 20 minutes or more (**Figure 4**). However, 83% of the participants said they walked, moved or lifted objects at their work place. The most common occupations were housewife, construction, and factory work. The most common leisure

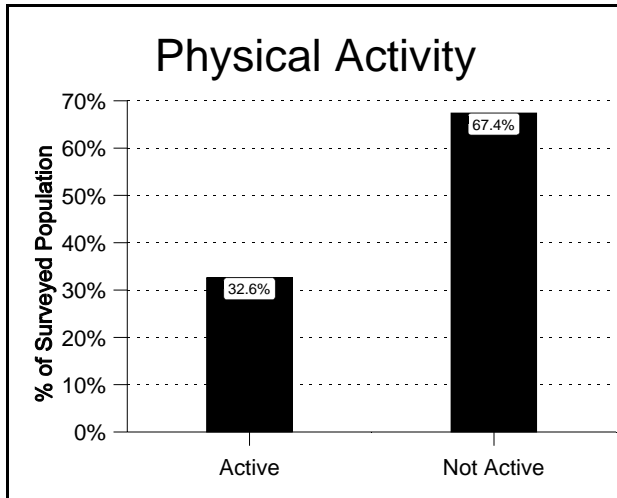


Figure 4. Activity level of subjects interviewed from Douglas in 1998.

activities among the participants were running, dancing, and bicycling. The community appears to be a logical place to implement a program to address the high rate of obesity and sedentary lifestyle using some existing intervention programs and models.¹²

Fruit and vegetable consumption: Of the 915 participants, only 229 (25%) think that 5 or more servings of fruits and vegetables should be eaten each day for good health. An even lower proportion (24%) of the previously diagnosed diabetics thought that 5 or more servings should be eaten for good health. Nevertheless, we calculate that 34% of the 915 participants are eating 5 or more servings of fruits and vegetables per day, 5% of the participants eat less than one or no serving of

fruits and vegetables per day, 29.5% eat one but less than 3 servings per day, and 31.6% eat 3 to 4 servings of fruits and vegetables per day.

Appendix 6 summarizes the statewide information from the Behavioral Risk Factor Survey about BMI, physical inactivity, and lack of consumption of 5-a-day.

Tobacco and alcohol use: Additional risk factors for diabetes and other chronic diseases are smoking and alcohol consumption. Of the total respondents, 23.2% currently smoked, and an additional 19% had smoked in the past. Among current smokers, the average number of cigarettes smoked was one-half pack per day. For comparison, the 1997 BRFS found that about 21.0% of Arizona adults are currently smokers. Of the 915 respondents, 78 (8.5%) reported chronic drinking behavior (two or more drinks of alcohol per day, i.e., 60 or more per month). This percent is higher than the 2.6% reported in the 1997 Arizona BRFS.¹³ In terms of binge drinking behavior, 13.9% of the respondents mentioned drinking five or more drinks on one or more occasions during the previous month. In contrast, 8.8% of the Arizona adult population reported such binge intake in the 1997 BRFS.

Previously Diagnosed Diabetics

Of the 915 subjects interviewed, 102 (11.1%) replied that they had been told by a physician they had diabetes or high blood sugar.* The mean age was 57 years for the 102 participants that self-reported a diagnosis of diabetes. Their median age was 58 years. Of the 102 individuals previously told they had diabetes, 75 (73.5%) were presently under medical treatment for their diabetes, 14 (13.7%) were medically treated at one time but not at the present time and 13 (12.7%) had never being medically treated. Of these 102 subjects, 69 (67.6%) went to a health care provider for care related to their diabetes during the last 12 months.

Of those presently under medical treatment, 59 (57.8%) used pills, 14 (13.7%) used insulin, and 3 (2.9%) used both a combination of pills and insulin. Seventy-three (71.6%) diabetics said that the health care provider gave them instructions about dietary control, but only 48 (65%) mentioned they always followed the recommendations. Seventeen of the diabetics reported using alternative treatments (e.g., herbs, teas, or other non medical treatments) in addition to the use of pills, insulin or dietary control. Only 45 (44.1%) individuals noted that a doctor had examined their feet during the past 12 months.

Blood Glucose Screen

Of all the 915 participants, 903 (99%) agreed to give a drop of capillary blood from a finger stick to be used for a blood glucose screening test. The results of this test ranged from 24 mg/dl to 498 mg/dl. The distribution of glucose results is shown in **Table 3**. Of the 903 persons tested, only 76 (8.4%) were fasting at the time of the finger stick. The fasting results ranged from 28 mg/dl to 333 mg/dl. Of the participants screened under fasting conditions, 14 (18.4%) had an elevated glucose level (≥ 110 mg/dl).

Table 3. Glucose level of participants, by fasting and diabetes status.

Glucose Level, mg/dl	Previously Diagnosed with Diabetes, n=100*		Not Previously Diagnosed with Diabetes, n=803**	
	Fasting No. (%)	Random No. (%)	Fasting No. (%)	Random No. (%)
Less than 70		1 (1)	9 (1)	19 (2)
70 - 109	1 (1)	14 (14)	52 (6)	433 (54)
110 - 125		3 (3)	4 (0.5)	141 (18)
126 - 139		3 (3)	2 (0.2)	70 (9)
140 - 199	4 (4)	21 (21)	1 (0.1)	56 (7)
200 or more	3 (3)	50 (50)		16 (2)
Total	8 (8)	92 (92)	68 (8.5)	735 (91.5)

*2 persons refused testing and are not counted here.

**10 persons refused testing and are not counted here.

The table shows that 78 (78%) of the persons previously diagnosed with diabetes did not have

* An additional 19 persons said a doctor had told them they had diabetes, but it was during a pregnancy and not at any other time. We did not consider this information by itself as sufficient to classify these persons as having diabetes.

their glucose under control (i.e., fasting glucose level 80-120 mg/dl; random glucose level 100-140 mg/dl). Of the participants saying they had not been diagnosed with diabetes, 149 (18.6%) were found to have elevated glucose levels (fasting level ≥ 110 or random level ≥ 126 mg/dl).

Presumed Diabetics

For the purpose of analysis in this section, we define a person to have diabetes or an abnormal glucose test if: 1) they said a doctor previously told them they had diabetes or high blood sugar,* or 2) we found a fasting glucose level of 126 mg/dl or higher on our screening test, or 3) we found a random glucose level of 200 mg/dl or higher. We defined a person to have Impaired Fasting Glucose if the fasting level was greater than or equal to 110 mg/dl and less than 126 mg/dl. Based on these criteria, there were 123 persons surveyed whom we classify as diabetic or whose glucose result was abnormal (**Table 4**). For purposes of analysis, we defined these 123 persons as “presumed diabetics.” Of the 123 persons, 102 were previously known to have diabetes, and 21 were not previously known to have diabetes.

Table 4. Number, with percentage of each age group shown in (), of surveyed population from Douglas, \$20 years of age, with diabetes mellitus or an abnormal glucose screening test.[&]

n=number in sample	AGE GROUP					
	20-39 n=379	40-49 n=188	50-59 n=144	60-74 n=189	75+ n=5	≥ 20 n=905
Previously Diagnosed with Diabetes	12 (3.2)	13 (6.9)	29 (20.1)	46 (24.3)	2 (40)	102 (11.3)
Abnormal Glucose Test, but Not Previously Known to be Diabetic						
Suspected Undiagnosed Diabetic (Fasting ≥ 126)	1 (0.3)	0	2 (1.4)	0	0	3 (0.3)
Elevated Random Glucose (Random ≥ 200)	0	1 (0.5)	4 (2.8)	9 (4.8)	0	14 (1.5)
Impaired Glucose Tolerance (Fasting ≥ 110 and < 126)	1 (0.3)	1 (0.5)	1 (0.7)	1 (0.5)	0	4 (0.4)

[&] The figures exclude ten persons who refused to take the screening glucose test.

The glucose test in this study was used for screening and to establish an epidemiologic, presumptive diagnosis of diabetes as described above. However, a definitive, clinical diagnosis would require an elevated fasting plasma glucose level found on different days.¹⁴ The uncertainties inherent in the device used to measure blood glucose also should be considered here. Glucose was measured by using a monitoring device (glucometer) approved by the Food and Drug Administration. Like many of these meters, the Sure-Step meter tests for the level of glucose in capillary (whole) blood. It does not measure glucose in the plasma. Plasma glucose values are 10-15% higher than whole blood values.¹⁴

* The 19 women who said they only were told they had diabetes or high blood sugar during a pregnancy but not at another time are not presumed to be diabetics unless their screening glucose test was elevated.

The profile of the 123 presumed diabetics (as defined in the previous table) compared to persons without diabetes is shown in **Table 5**. The presumed diabetics appear to be considerably older, but are similar in other demographic characteristics.

Among persons with diabetes, 70.7% have insurance. This is similar to the 65.7% of persons without diabetes who have insurance. This finding may reflect the older median age of the presumed diabetics, and a higher number who are insured through Medicare.

Of the 123 presumed diabetics, there were at least 109 who responded that they had any visit to a health care provider in the past year. This agrees with our finding that a very high proportion (93.5%; 115 of the 123) of persons whom we presume to have diabetes also said they had a one or more of the screening tests (**Table 2**) performed in the past 12 months. A lower proportion (77.8%) of the presumed non diabetics had one of these tests.

In contrast, of the 102 persons with previously diagnosed diabetes only 69 (67.6%) say they had a health care visit for care related to their diabetes. Current recommendations are for medical evaluation directed toward diabetes at least annually. The findings in our study indicate that the previously diagnosed diabetics are not receiving care directed toward controlling diabetes as frequently as is recommended.

Follow-up of Abnormal Glucose Levels

There were 149 subjects not previously known to have diabetes whose screening glucose level was elevated: fasting levels ≥ 110 mg/dl or random levels ≥ 126 mg/dl. The interviewers instructed these persons to see a physician for follow-up evaluation. Three months after conducting the glucose test in the home, the interviewers attempted to re-visit these participants to verify whether they followed the recommendation to “see a physician.” Ninety-one of these 149 participants either were untraceable (25 persons), or had not yet followed our recommendation (66 persons). Only 58 of the 149 participants had consulted a physician. Forty-three of these persons said they had normal glucose levels on subsequent evaluation. After

Table 5. Profile of the presumed diabetics compared to non diabetics from Douglas, 1998.[^]

	Presumed Diabetics n=123	Non Diabetics n=782
Male	48 (39.2%)	253 (32.4%)
Female	75 (60.9%)	529 (67.6%)
Hispanic	117 (95.1%)	722 (92.3%)
Non Hispanic	6 (4.9%)	60 (7.7%)
Age Group		
20-39	14 (11.4%)	365 (46.7%)
40-49	15 (12.2%)	173 (22.1%)
50-59	36 (29.3%)	108 (13.8%)
60-74	56 (45.5%)	133 (17.0%)
75+	2 (1.6%)	3 (0.4%)
Median age	58 years old	41 years old
Insured	87 (70.7%)	514 (65.7%)
Not Insured	36 (29.3%)	278 (35.5%)

[^] The figures exclude 10 persons who refused the screening glucose test.

a follow-up blood test, 13 persons (22.4% of the 58 who saw their physician) were diagnosed as having diabetes, and 2 as having impaired fasting plasma glucose.

By use of a low (statistically sensitive) threshold of suspicion for diabetes (that is, 126 persons whose random glucose was between 126 mg/dl and 199 mg/dl) and referring them for follow-up testing, we found an additional 7 newly diagnosed cases of diabetes and 1 case of impaired fasting glucose. These cases are not shown in the calculation of rates in tables 4 or 5.

Attitude toward Diabetes

To assess the issue of a fatalistic attitude about diabetes we also asked the following question (q54): “Do you think you can do something to prevent yourself from developing diabetes?” Seven hundred and eight (77%) of the participants thought there was something they could do. Two hundred and seven (23%) of the participants did not think they could do anything; their responses, reflective of the barriers we face, are listed in Appendix 7.

Among the 915 respondents, 451 (49%) had heard, seen, or read anything in the last 12 months about ways a person can avoid or prevent diabetes. This indicates that the community has a fair degree of sensitization to, and awareness of, diabetes messages. However, there also appears to be room to increase awareness.

Discussion

Previously reported rates of diabetes vary, depending upon the definitions used, and the specific survey. Direct comparisons between the studies are not always possible.

Results of the Third National Health and Nutrition Examination Survey, 1988-1994 (NHANES-3) were published shortly after this study in Douglas was begun.¹⁵ The NHANES-3 has estimated the prevalence of previously *diagnosed* diabetes to be 5.6% for Mexican-Americans 20 years of age or older. In that survey, 3.4% of Mexican-Americans living in the United States were found to have *undiagnosed* diabetes and 7.3% to have impaired fasting glucose. Mexican-Americans of age 40 - 74 had a diabetes prevalence of 20.3% (diagnosed and undiagnosed) using the 1997 criteria of the American Diabetes Association. In addition 12.2% of those interviewed in NHANES-3 had impaired fasting glucose. Combining the two groups, 32.5% of Mexican-Americans age 40-74 in the U.S. had diabetes or impaired fasting glucose.

As mentioned earlier on page 2, the HHANES of 1982-84 found a prevalence of 14% among Hispanics age 45-74.

Our study found that 16.9% of adults, age 40-74 in Douglas, say they already have been diagnosed with diabetes.* In addition, we found 3.1% in this age group who are undiagnosed,

*This figure is obtained from **Table 4** as follows: $(13+29+46)/(188+144+189) = 88/521 = .169$

based on an elevated glucose level in the capillary blood screening.* The true level of undiagnosed diabetes may be somewhat higher; however, the refusal of many persons to seek a follow-up glucose test leaves this question unanswered.

Limitations of the Diabetes Study

Several factors limit the accuracy of this study. A higher proportion of females than males participated in the study. Because the reported prevalence of diabetes is about 10% higher among Mexican-American females than males,¹⁵ our estimate of the diabetes prevalence in Douglas might be a little higher (perhaps by 10%) than is truly the case. Most participants were not fasting when we screened for hyperglycemia. This fact would miss many of the true diabetics whose random glucose levels might range between 126 and 200, but who would not usually be sent for a definitive fasting test. In fact, we did recommend that these subject seek a follow-up test, but few subjects took our advice. Seven of those that did seek a follow-up test were found to have previously undetected diabetes, but we did not include them in the count of persons with diabetes. For similar reasons, we may have under-detected persons who had impaired fasting glucose. Also, a portable glucometer tends to underestimate the number of persons with diabetes; the true number might be higher if a venous specimen had been used for screening.

A strength of the study was its use of door-to-door sampling. This resulted in a relatively high participation rate. The demographic profile, especially age and Hispanic status, of the persons who participated matched well with the profile of the community. This would imply that the sample was representative of the whole community in Douglas.

Comparison to Other Border Communities

Other border communities are considering conducting surveys of the prevalence of diabetes. In order to compare results between communities of differing age composition, it is common practice to standardize the rates. We have standardized the rates to the Year 2000 United States million population. This table is shown in Appendix 8.

*This figure is obtained from **Table 4** as follows: $[(0+1)+(2+4)+(0+9)]/(188+144+189) = 16/521 = .037$

Conclusions and Recommendations

The community has good reason for concern about the prevalence of diabetes and its risk factors. There are short term and long term steps that can be taken to control the diabetes problem in the community.

1. The crude prevalence of diabetes among persons age 20 or more in the Douglas community is at least 13.5%. Among persons age 40-74 the crude prevalence is at least 20%.
2. For the long term control of diabetes, the residents of Douglas can and should address the following four major risk factors. Control of these community-wide risk factors will require the cooperation of local government, schools, businesses, state and academic institutions, and our partners on the Sonoran side of the border.
 - a. **Physical Inactivity:**
By increasing the number of persons who are physically active, the community can reduce this risk factor. Currently, 47% of the participants in the Douglas study reported no leisure-time activity within the past month. This is higher than the findings from the 1996 Arizona BRFSS (33.3%). The *Healthy People 2000* Objective for this risk factor is to reduce the number who have no leisure-time physical activity to 15%. The Surgeon General now recommends 30 minutes of moderately intense activity on most days of the week.
 - b. **Tobacco Use:**
Tobacco use in the Douglas community is the same as the general population in Arizona, but is higher than the *Healthy People 2000* Objective which is to reduce the smoking level among adults to less than 15%. Reduction of this risk factor will lessen the frequency of vascular complications, such as heart disease and limb amputation.
 - c. **Fruit and Vegetable Consumption:**
The Douglas study found 34% of the population are consuming the 5 servings of fruits/vegetables per day which is higher than the level reported in the 1996 Arizona BRFSS but lower than the *Healthy People 2000* Objective. The Objective is to have at least 50% of the population eating five servings of fruits/vegetables per day.
 - d. **Overweight:**
Obesity and overweight, as measured by the body mass index (BMI), appear to be a community-wide problem that could be reduced by applying intervention programs piloted and demonstrated to be effective in other communities.
3. There is a lack of health care coverage in the Douglas community, where 34% of the participants say they have no health care coverage. This is two times higher than the rate

found in the 1996 Arizona BRFSS and even higher than the figure of 28.4% reported by Hispanics in the 1996 Arizona BRFSS.

- a. The demographic profile reveals the strong influence of the Hispanic culture. Many residents were born in Mexico. About half of the community prefers or requires Spanish language for communication of health messages. The diabetes control effort in Douglas would be enhanced by considering the input and role of the care delivered on the Sonora side of the border.
4. A high proportion (around 90%) of the persons presumed to have diabetes saw a physician or other health care provider in the past year. However, one-third of persons known to have diabetes did not see a health care worker for diabetes-directed care during the past year. Opportunities for diabetes-directed care, such as foot exams, dietary instruction, and control of the risk factors described above are being missed. It appears that patients could be under tighter control of their diabetes by receiving the care recommended by the Centers for Disease Control^{16,17} and the American Diabetes Association.¹⁸
5. For the short term we call for intensified management of persons with diabetes. This could occur through empowering patients to take charge of their own care, educating physicians about the latest guidelines for patient care, or by increasing the role of promotoras and diabetes educators. A combination of all these steps would complement each other. Implementation of these actions will require an infusion of dollars and personnel.
6. We recommend that Douglas adapt the *Healthy People 2010* objectives for diabetes control in planning their local activities.¹⁹ The community can refer to the numerous publications that address the control of diabetes.²⁰

OTHER HEALTH CONDITIONS STUDIED

Breast and Cervical Cancer Screening

Although Pap smears and mammograms have proven to be effective in detecting cancer in early stages and in reducing the number of early deaths, not all eligible women are being screened.²¹ Mammography is recommended every year for women 40 years of age and older.²² Pap Smears are recommended yearly for females 18 years of age and older. In order to determine healthcare utilization by the Hispanic women in the Douglas community, we asked questions relating to early detection in this study.

Of the 915 participants in the Douglas study, 608 females were interviewed. Of the 337 females age 40 and older, 89 (26%) females have never had a mammogram. Of the 608 females age 20 and older, 56 (9.2%) have never had a Pap smear.

In comparison, Arizona Behavioral Risk Factor Surveys from recent years report that 14% to 26% of comparably aged women in Arizona have never had a mammogram,²³ and 3.4% to 17.2% have never had a Pap smear.²⁴ (The BRFSS shows considerable year-to-year variation for these questions.) Thus, the data indicate that women in Douglas receive these cancer screening tests at rates similar to that of the entire State.

Systemic Lupus Erythematosus (SLE)

Nested within the Douglas community health assessment was an attempt to assess the prevalence of SLE in the community. The clinical manifestations of this rare autoimmune disease are diverse. The disease may be intermittent and mild, or it may be associated with life-threatening organ system failure. The cause of SLE is unknown, but the literature provides data to suggest a relationship between hormonal, genetic, and environmental factors.²⁵ Studies indicate that environmental factors including viruses, ultraviolet light, and chemicals can trigger an autoantibody response, making exposed individuals susceptible to developing autoimmune diseases such as SLE.

The reported prevalence of this disorder ranges from 14/100,000 to 50/100,000 population in the United States. While little data exists regarding rates of SLE among Hispanics, many clinicians believe the rate to be much higher, and the disease more aggressive, among Hispanics.²⁶

In 1994, residents of Nogales, Arizona asked ADHS to address their concerns about a possible link between environmental contaminants and SLE. Nogales also is a border community, predominantly of Hispanic origin. ADHS subsequently funded researchers from the University of Arizona to survey the population and determine the local rate of SLE. The researchers reported a point prevalence rate of 94 cases per 100,000 population.²⁷ Residents of Douglas also have expressed concerns about their rate of SLE. For example, a local support group in Douglas

has counted 21 persons who report they have SLE.

In an attempt to address these concerns, the present study aimed to determine the prevalence of positive responses to three or more questions on the Liang screening questionnaire for Lupus Erythematosus.²⁸ This Douglas survey incorporated screening questions developed by Dr. Matthew Liang for use in research settings to identify persons who potentially may have lupus. This screening tool includes 10 questions and is administered in conjunction with a clinical and serologic evaluation. Subjects responding to 3 or more of the 10 item survey are referred for further testing. We included an additional question: “Has a doctor ever told you that you have Lupus?”

Of the 915 participants in the study, 14 (1.5%) said their doctor had told them they have Lupus. Of the remaining 901 participants, 78 (8.6%) responded affirmatively to 3 or more of the screening questions and were considered eligible for further evaluation for Lupus. These 78 participants were referred to a rheumatologist from the University of Arizona for a follow-up evaluation. The results of these evaluations will be reported separately by the rheumatologist in the future.

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APPENDICES