

Health and Environmental Survey
City of Presidio, Texas
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ABSTRACT

In 1982, the Environmental Division of the Texas Department of Health, Regions 9 & 10, conducted an environmental health survey in the border city of Presidio. By 1995, the need for a more current survey was determined because of the city's tremendous population growth and its proximity to Ojinaga, Chihuahua, Mexico. Therefore, another survey was conducted during December 1995. Data was collected regarding the structural makeup of household dwellings, method of water containment, sanitary conditions, general health status, participants' knowledge of communicable diseases, and exposure to potential environmental contaminants. Randomly selected, participants were interviewed over a five-day period. At the conclusion of the interviews, participants were supplied additional bilingual health and sanitation information booklets. Data from the December 1995 health and environmental survey indicate that conditions are slightly better when compared to conditions existing during the 1982 survey. Access to health care in Presidio continues to be limited and approximately two thirds of the study participants reported seeking medical care outside Presidio. Aggressive community-based strategies should be expanded to enhance the existing health care services in this community. In addition, state agencies, city officials, and community leaders of Presidio may wish to concentrate their efforts on enhancing existing needed health and environmental services to ensure healthier working and living conditions in this city.

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INTRODUCTION

Presidio Community Block Survey - 1982

In 1982, the Environmental Division of the Texas Department of Health (TDH), Public Health Regions 9 & 10, conducted an environmental health survey in the City of Presidio. The city is located on the border with Ojinaga, Mexico approximately 254 miles southeast of El Paso. The main objectives of the study were “to evaluate specific health related environmental conditions, to assess the potential for disease due to these conditions, and to recommend local actions to improve the environment and health status of the 2,070 Presidio residents” (1).

A **community block survey** (CBS) of 496 households was used in the project. This type of survey rapidly identifies environmental deficiencies that are directly or indirectly related to the health habits and the health status of the people residing in the community (2). For this survey, data on residential conditions, solid waste disposal practices, water well and sewage facilities, and other conditions affecting health were collected.

The CBS showed that 470 (95%) of the homes were in fair or poor conditions. Rubble or solid waste was evident in 283 (57%) of them suggesting improper solid waste disposal practices. Interviews with 53 randomly selected households found that 31 (58%) used private wells, 51 (96%) used cesspools and 2 (4%) used pit privies for wastewater disposal (1). No public sewage collection or treatment facilities existed during this time.

Presidio Community Survey and Health Assessment - 1995

The Regional Environmental Division determined that a need existed for a more current community survey and health assessment of the City of Presidio because of the tremendous growth and mobility of its population and its proximity to Ojinaga, Chihuahua, Mexico — a much larger city with a population of approximately 23,000 (3). This new survey would assess the health conditions and needs of Presidio, and assist TDH and other public and private agencies in their allocation of resources.

The Office of Border Health (OBH), Regions 9 & 10, with the assistance of the University of Texas-Houston, School of Public Health at El Paso, developed a community-based survey. The purpose of this survey was to collect data from survey participants related to the structural conditions of their homes; water containment and sanitation practices; knowledge of certain communicable diseases; general health status information; and exposure to potential environmental contaminants such as lead, pesticides and other chemicals. No environmental samples or biological specimens were collected for analysis.

Background of Presidio County

Although the Presidio-Ojinaga area has been populated for several hundred years, the City of Presidio was only incorporated in 1981. At the time of its incorporation, the drinking water was supplied by the Presidio Water Supply Corporation. No central sewage collection or treatment system existed, and residents relied on individual systems for sewage treatment and disposal (1).

Geography and Demographics

In 1990, Presidio County had a population of 6,637, a 27.9% increase over the 1980 census report (4). The population of the City of Presidio was 3,148, with 2,174 (69%) of Hispanic origin, and 928 households with an average of 3.4 members. The median household income was \$9,148 with 1,913 residents (60.8%) below poverty level.

Education and Work Force

In 1990, a total of 1,220 (38.7%) of the city's population had not achieved a high school diploma or equivalent (4). Of these, 194 (15.9%) attended 9th to 12th grade, but did not graduate from 12th grade, and the other 1,026 (84.1%) residents had less than a 9th grade level education.

Most occupations were related to farming and ranching. The labor force for Presidio County was 3,752 with 1,472 (39.2%) unemployed. The unemployment rates for both Texas and the United States were 5.6% for the same year (5).

Water and Wastewater Infrastructure

Presidio's water system uses ground water drawn from the Presidio Bolson aquifer with an average water demand of 1.19 million gallons per day for an estimated 882 connections (6). The two existing water wells have the capacity to pump a total of 1,914 gallons per minute. The average water demand per person was established at 379.4 gallons per day.

For wastewater treatment, the city uses five sewer ponds with a total average flow of 220,000 gallons per day and a maximum capacity of 340,000 gallons (7). There were 849 sewer customers with 968 sewer connections. An additional 203 homes were not connected to the system, relying instead on the use of septic tanks with leach fields.

Commercial Facilities and Communication

The city of Presidio has a postal service station where most residents rent a post office box. Three main newspapers circulate in Presidio: *The International Presidio Paper* (bilingual), *The Big Bend Sentinel*, and the *San Angelo Standard Times*. The first two are published weekly, while the third one is published on a daily basis. The *Contacto*, an Ojinaga, Mexico newspaper, is also widely read in Presidio County. Other available news media services include both Mexico and US-based radio stations and four Mexican television stations. Cable service is also available offering additional television and radio stations. There are no local radio or television stations in Presidio itself.

Health Care Services

Health care services are limited in Presidio, and are offered through the TDH clinic and the Presidio Family Health Center (PFHC). The PFHC is administered by the Big Bend Regional Medical Center (BBRMC) of Alpine, Texas. The BBRMC, the nearest hospital, is 89 miles away. Since there is no independent pharmacy in Presidio, patients seen at the TDH or PFHC clinics must obtain some of their medications at these facilities. Otherwise, residents must travel to Alpine or elsewhere to obtain prescribed medications.

Presidio has an Emergency Medical Services (EMS) station with two ambulances equipped with basic life support and advanced capabilities. The EMS station is staffed with five paramedics and three emergency medical technicians.

According to a 1994 EMS Run Comparison Report, 260 emergency runs were recorded with 197 (75.8%) of emergencies reported in the city of Presidio (8). Each call represented an average round trip of 185 miles and approximately 4.5 to 5 hours spent on each emergency (from call out to back in service). In its 1995 Annual Run Response Summary, the EMS reported a total of 294 runs, with 209 (71.1%) of them related to illnesses rather than injuries or accidents (8).

METHODOLOGY

Preliminary Site Visits

The OBH staff made several visits to Presidio to research and assess some issues that should be taken into consideration in the survey. OBH staff also visited Ojinaga, Mexico, to become acquainted with the Mexican health care system and the population's limited resources and access to these services.

Survey Instrument

Staff from the UT-Houston School of Public Health at El Paso assisted the OBH staff in the development of a survey questionnaire to conduct a community assessment and to collect data on the city of Presidio. The questionnaire consisted of 72 questions designed to gather information on demographics, general structural conditions of the homes, sanitation facilities and services, knowledge of environmental risk factors and contagious diseases, general health status of the target population, and possible environmental exposures. Six observational questions were added at the end of the interview to assess both the residential living and the surrounding environmental conditions. In addition, a section was provided to review and record immunization status for children less than 5 years of age. A consent form authorizing TDH to conduct the interviews was included with the questionnaire. Because of the large Hispanic population in the city, the survey and consent forms were translated into Spanish.

Pretest

A draft of the survey was tested for comprehension, length, timing, and organization of ideas. To avoid the introduction of bias due to previous knowledge of the survey's content, the draft was tested in Marfa, Texas — approximately 60 miles from Presidio. After several revisions, the final survey instrument and consent forms were submitted to the TDH Internal Review Board in Austin, Texas. The survey and consent forms were approved with minor amendments on November 10, 1995. Since most of the Presidio residents are Hispanic, 300 copies of the questionnaire were printed in Spanish and only 100 copies were printed in English. The two sections of the questionnaire regarding immunizations and the observational environmental assessment, were color-coded for easy retrieval.

Since the city of Presidio has limited access to the media, a bilingual flyer announcing the survey was posted at several visible places throughout the city. Cooperation of public agencies was

requested to promote and advertise the survey. The flyer was posted at the following sites: the Post Office, City Hall, the Employment Commission, and the West Texas Utilities Company. Father Bustamante, of the Santa Teresa de Jesus Catholic Church, distributed a copy of the announcement to parishioners during Sunday services. The announcement was also published in the *International Presidio Paper*.

Mapping of Presidio

One of the most difficult tasks encountered was in determining the location of the homes and the identification of vacant lots and commercial establishments in order to continue with the random selection of the participants.

The first attempt to “map” the city of Presidio occurred during the beginning of October 1995. The OBH staff went to Presidio with a copy of an existing city map and proceeded to identify the residential and commercial areas, the empty lots, government-owned sites, and public locations. Two problems related to this endeavor were encountered. First, identifying “street signs” were not posted in each street, thus making it difficult to identify and match streets with lots. Second, since the existing city map was several years old, some lots and homes did not appear on the map, or other sites identified on the map did not exist anymore.

To overcome these obstacles, the OBH was assisted by the TDH Regional Environmental and Consumer Health Division staff who sketched another map of Presidio that showed only the lots, street names, and boundary lines. In November 1995, the OBH staff and six regional environmental employees went to Presidio with the newly sketched map and spent three days in developing the map with more detail. Lots were identified as vacant, residential, commercial, farming, government/public building, or abandoned structure. This information was eventually color coded for easy identification of potential participants and to assign the random numbers.

A total of 25 subdivisions containing 384 blocks and 3,717 lots were mapped. The lots were color coded and approximately 900 homes were identified for random selection. No prior visits were made to the homes to verify their habitation.

Each lot designated as residential was numbered. The School of Public Health provided the OBH with a list of computerized random numbers to select the participant households and also estimated that reliable information could be obtained by interviewing at least 30% of the 900 households. Randomly selected households were identified on the map with a circle.

Training

On November 30, 1995, eleven OBH staff members, two regional employees, and two volunteer Alpine residents established temporary headquarters in Alpine, Texas. Bilingual

pamphlets were prepared for distribution to participants. These educational materials addressed topics such as Hepatitis A, Tuberculosis, HIV/AIDS, lead poisoning, food and water sanitation, cholesterol disorders, diabetes, and interpretation of food labels. After training on December 1, 1995, four teams were formed. One person led the teams and assigned sites to be surveyed and the two part-time volunteers assisted with interviews.

Data Collection

The fifteen survey members traveled from Alpine to Presidio for five consecutive days. Each evening, they met in Alpine to gather the completed questionnaires and discuss any problems that may have occurred while conducting the survey.

Interviews began on Saturday, December 2, 1995. Unfortunately, participants were not available in many of the selected households during Saturday and Sunday, possibly because some residents visit relatives in Ojinaga, Mexico during weekends. Each team made at least one additional attempt to interview each selected household. If a participant was not available after two attempts, the team would approach the household living next door to the unavailable participant. These additional attempts delayed the project. Time and resources were more effectively utilized by following this alternate strategy without compromising the random selection. **A total of 316 surveys were completed** between December 2 and December 6, 1995.

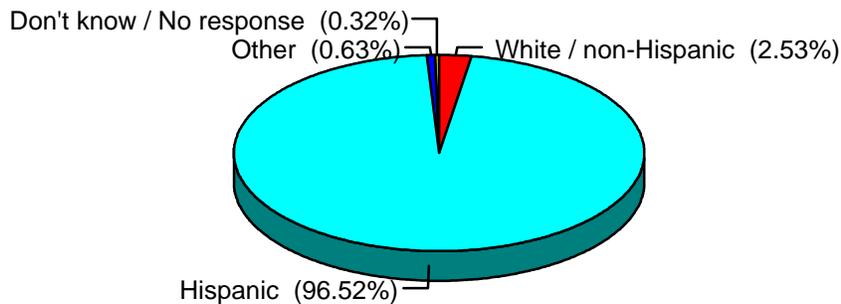
RESULTS

Demographic Characteristics

Ethnicity

In this survey, of the 316 participants interviewed, 305 (96.5%) identified themselves as Hispanic (**Figure 1**). Eight participants (2.5%) identified themselves as white non-Hispanic and 2 (0.6%) identified themselves as “other.” Most of the interviews, 217 (68.6%), were conducted in Spanish.

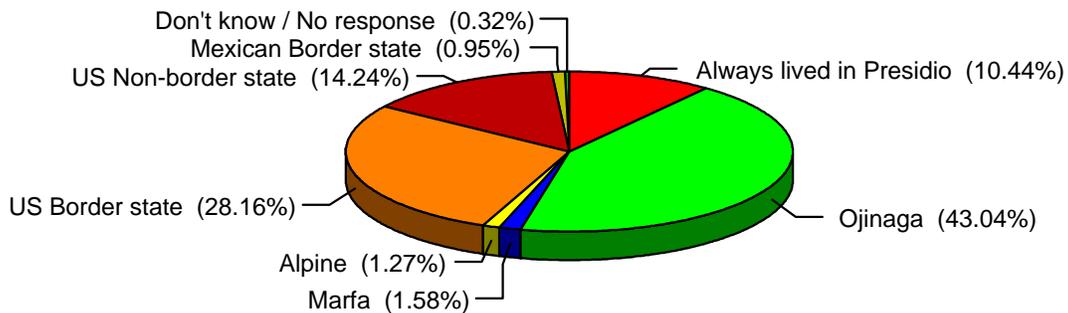
Figure 1. ETHNICITY



Residence History

When participants were asked about their place of residence before living in Presidio, 136 persons (43.0%) reported having lived in the bordering Mexican city of Ojinaga and 89 (28.1%) reported having lived in a U.S. border state. Only 33 (10.4%) persons answered as having always lived in Presidio (**Figure 2**).

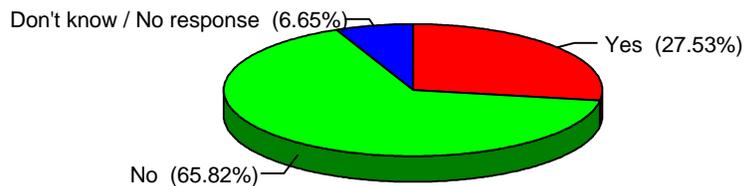
Figure 2. RESIDENCE PRIOR TO LIVING IN PRESIDIO



Work History

Eighty-seven (27.5%) households had family members who had worked as farm or field laborers during the past year (**Figure 3**). Most of them worked in or near Presidio. When working in the surrounding areas of Presidio during the past year, only 14 (16.1% of the 87) managed to work 12 full months.

Figure 3. HOUSEHOLD MEMBER WORKED AS FARM LABORER



Of the 87 farm-related workers, 61 (70.1%) engaged in work related to picking/packaging fruits or vegetables. Fourteen (16.0% of the 87) farm laborers had worked spraying fruits/vegetables during the preceding 12 months. However, only one (7.1% of the 14) managed to work for 11 months while 4 (28.5%) worked a total of 12 months primarily in or near Presidio.

The University of Texas System reported 219 residents of Presidio County (out of 2,038 employed) worked in farm labor occupations and that 2,343 migrant/seasonal farm laborers also worked in Presidio County (4). The report mentions that approximately one-in-five persons living in the border counties is a migrant/seasonal farm laborer, and the border counties have a higher percentage of migrant laborers and persons working in farming, forestry, fishing, and other service occupations than any of the non-border counties of Texas.

Public Assistance and Benefits

In 1995, Presidio's unemployment rate fluctuated between 37% and 39%, consistently higher than the Texas and U.S. rates of 5.6% (5). The high unemployment rate may explain the observed heavy dependency on public assistance.

When questions related to public assistance were asked, 151 (47.7%) participants reported receiving food stamps. This suggests many food stamp recipients reside in the city.

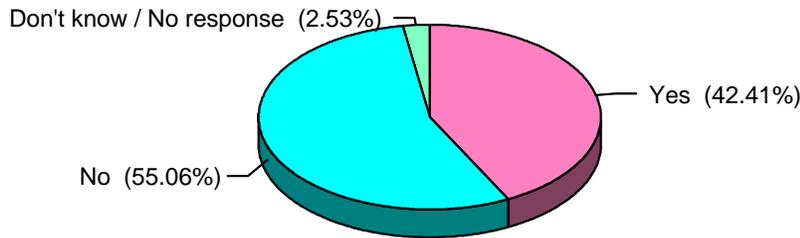
The University of Texas System reported that "almost one-third of the population of the border counties participates in the food stamp program every month, with 12.7% for Texas and

27.4% for Presidio County,” (4). Additionally, the TDH Bureau of Health Data and Policy Analysis projected 2,546 (33.4%) food stamp recipients in this county with an estimated population of 7,612 (9).

In this survey, 134 (42.4%) households reported receiving Medicaid assistance (Figure 4). This rate is double the TDH 1995-projected rate of 21.8% recipients for this county (9).

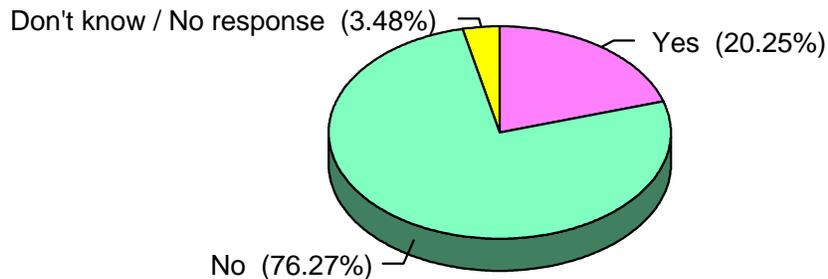
The University of Texas System reported that during 1993, nearly twice as many persons (15%) from the border counties compared with the state of Texas (8.2%) participated in the Medicaid program. Overall participation for Presidio County was 14.5% (4).

Figure 4. RECEIVE MEDICAID BENEFITS



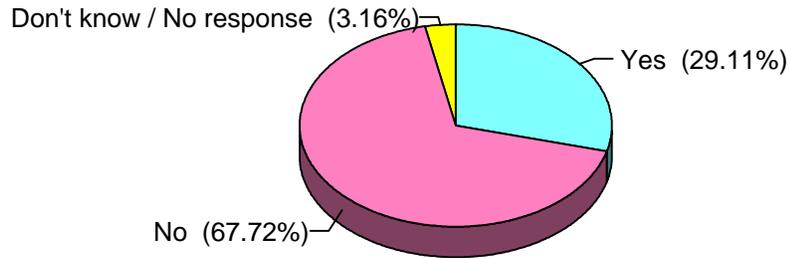
The University of Texas System also reported that during 1993, the average monthly number of Presidio County participants in the Women, Infants, and Children (WIC) Program was 431 (6.5%) from a total population of 6,637 (4). When survey participants were asked about enrollment in the WIC program, 64 (20.2%) of the 316 households responded that they receive WIC assistance (Figure 5).

Figure 5. RECEIVE WIC BENEFITS



A total of 92 (29.1%) participants responded that someone in the household receives Medicare benefits (*Figure 6*). The University of Texas System reported a median age of 31.5 for the population of Presidio County, with 13.9% of the residents being 65 years or over (4).

Figure 6. RECEIVE MEDICARE BENEFITS

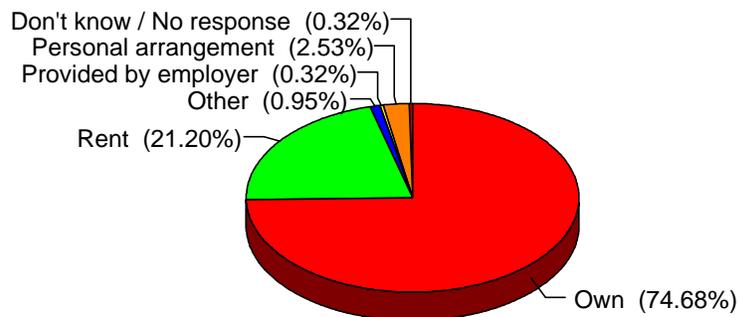


Living Conditions

Housing

This survey reflects that 236 (74.6%) participants owned their properties and 67 (21.2%) rented housing units (*Figure 7*).

Figure 7. OWN OR RENT HOME

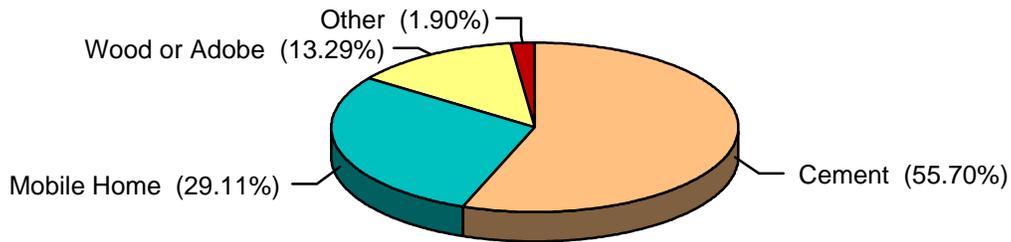


Presidio has many empty lots. In its 1994 statistics, The University of Texas System reported that Presidio county had 2,890 housing units with 2,255 (78%) of them occupied and 635 (22%) vacant. Of the occupied units, 1,559 (69.1%) of them were owned and 696 (30.9%) were rented (4).

Construction and Condition of Homes

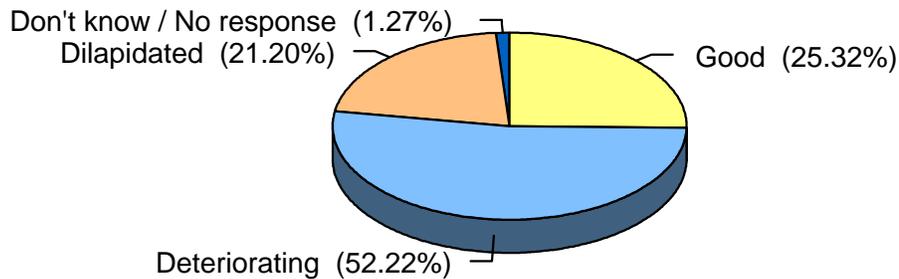
Most of the homes, 176 (55.7%), were of cement-based construction and 92 (29.1%) were mobile homes with some attachments built on them (**Figure 8**). Forty-two (13.2%) of the homes were made of wood or adobe. However, some homes had a combination of more than one construction material.

Figure 8. CONSTRUCTION MATERIAL OF HOME



Some exterior deteriorating conditions were noted in 165 (52.2%) of the homes and 67 (21.2%) were classified as dilapidated. Only 80 (25.3%) of the homes were reported to be in good condition (**Figure 9**). The conditions of the homes were documented during the mapping procedure and corroborated when the survey was conducted.

Figure 9. CONDITION OF RESIDENCE



As previously mentioned, this part of the survey was observational in nature and consisted of the interviewer rating the construction and condition of the homes. The homes were evaluated

for the following construction materials: cement, mobile home, wood, and adobe. The following legend was used to rate the condition of the homes:

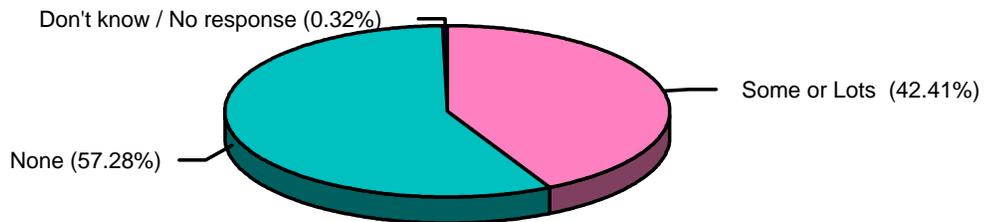
- Good..... a residential structure that has no exterior deterioration
- Deteriorating..... a residential structure with some exterior deterioration
- Dilapidated..... a residential structure with considerable exterior deterioration

The homes were also classified according to the criteria used in the 1992 TDH Community Block Survey. This community survey postulated that the health status of a community is directly related to the conditions of the homes. However, this definition does not apply if persons other than the occupant have assumed the housing maintenance responsibility.

Home Surroundings and Facilities

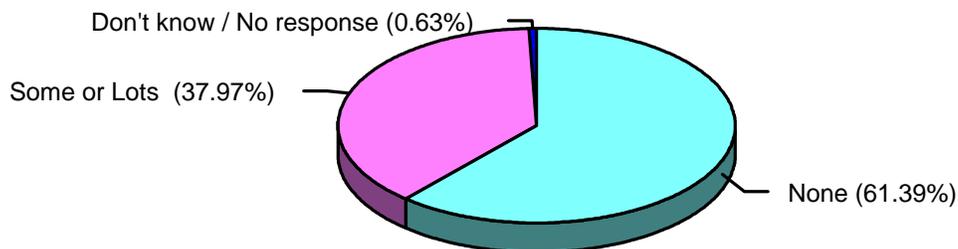
A total of 181 (57.2%) of the 316 surveyed homes had no surrounding rubbish while 134 (42.4%) had some or lots of rubbish (**Figure 10**).

Figure 10. SURROUNDINGS WITH RUBBISH



A total of 194 (61.3%) of the households reported no insect or rodent harborage in their surroundings. However, 120 (37.9%) did report having some or lots of it (**Figure 11**). Fifty-eight (18.3%) of the households had livestock in their yards.

Figure 11. INSECT / RODENT HARBORAGE



Sewage Disposal

Flush toilets installed in the participants' homes were reported by 312 (98.7%) households, with only 3 (0.9%) using pit privies and 1 (0.3%) using a portable toilet.

Cooling and Heating Methods

A total of 201 (63.6%) of those surveyed reported using a swamp cooler to cool their homes and 113 (35.7%) reported using fans. Of homes with heating systems, gas heaters were the most commonly used by 136 (43%) households. Portable heaters were used by 77 (24.3%) households. Twenty-one (6.6%) households reported not having any heating system.

Health Knowledge and Perceptions

Questions were formulated to measure the participants' general knowledge of Hepatitis A, Tuberculosis, and HIV/AIDS. While these diseases have different modes of transmission, they are increasing in Texas, and along the border.

Hepatitis A

One-hundred-twenty-seven of the participants (40.1%) replied that Hepatitis A can be transmitted in contaminated food. One-hundred-fifty-four (48.7%), recognized that drinking contaminated water was a risk factor, and 198 (62.6%) recognized that poor hand-washing practices could transmit the disease (*Table 1*).

TABLE 1. Recognition of Hepatitis A Transmission

Modes of Transmission	Respondents
Hepatitis A transmitted in contaminated food	127 (40.1%)
Hepatitis A transmitted in contaminated water	154 (48.7%)
Hepatitis A transmitted by poorly washed hands	198 (62.6%)

NOTE: Totals are more than 100% because participants gave multiple responses.

Over half the participants, 182 (57.5%), knew that yellow eyes and skin were symptoms related to viral Hepatitis A illness. However, only 113 (35.7%) respondents recognized dark urine or stomach (abdominal) pain as symptoms of Hepatitis (*Table 2*).

TABLE 2. Recognition of Hepatitis A Symptoms

Symptoms of Hepatitis A	Respondents
Yellow eyes and skin as a symptom	182 (57.5%)
Dark urine as a symptom	113 (35.7%)
Stomach (abdominal) pain as a symptom	113 (35.7%)

NOTE: Totals are more than 100% because participants gave multiple responses.

The incidence of Hepatitis A in the Texas border region is higher than the statewide rate. The rate of the disease reported in the Texas border area is 34.9 per 100,000 which is over twice the state rate of 15.4 (4). Morbidity of Hepatitis A is also higher in the Hispanic population, especially in children 5 to 9 years of age (10).

In 1993, Texas reported 2,798 cases of Hepatitis A. Of these, 246 (8.8%) were reported in the 6 border counties of PHR 10 (10). However, from 1986 to 1993, Presidio County reported only 6 cases of Hepatitis A. It is widely accepted that the actual number of cases in Presidio is probably much higher, due to the under-reporting associated with being a border community.

Tuberculosis

Participants were asked whether having a positive TB test infers having TB disease. More than one-third of the households, 122 (38.6%) **incorrectly** responded that having a positive TB test also means having TB disease (Table 3). Only 88 (27.8%) **correctly** responded that a positive TB test was not a diagnosis of TB disease while another third of the households, 105 (33.2%), did not know the answer.

TABLE 3. Positive TB Test Infers TB Disease

Question: Does Positive TB Test Infer TB Disease?	Respondents
Positive TB Test infers TB disease (incorrect)	122 (38.6%)
Positive TB Test does not infer TB disease (correct)	88 (27.8%)
Don't know / No answer	105 (33.2%)

NOTE: Totals are more than 100% because participants gave multiple responses.

Other questions asked about the following TB symptoms: coughing up blood, weight loss, shortness of breath, and chills. Over half the respondents identified the first three symptoms as related to TB disease with 167 (52.8%) for coughing up blood, 186 (58.8%) for weight loss, and 172 (54.4%) for shortness of breath.

TB has reemerged as a leading public health problem in the U.S., especially where HIV is prevalent. A person with TB infection but without HIV infection has a **10% lifetime risk** of developing active TB. A person with **both**, TB and HIV infection, has an **8% annual risk** of developing active TB (**10**).

During the period 1986 to 1992, a total of 14,740 TB cases (average annual incidence rate of 12.2 cases per 100,000 population) were reported to the Texas Department of Health, Tuberculosis Elimination Division (**10**). The incidence rate for the Texas border counties was reported at 28.1 cases per 100,000 population which was twice as high compared to the state rate of 14.6 cases per 100,000 population (**4**). Also, the death rate per 100,000 population for TB in the Texas border counties was 1.4, while the state rate was 0.6.

Except in 1990, Tuberculosis rates in Presidio County had surpassed the state rates as shown in **Table 4**.

TABLE 4. TB Rates (per 100,000) for Texas and Presidio County

Year	1989	1990	1991	1992	1993
Texas	11.0	13.2	14.6	14.2	13.6
Presidio	17.0	0.00	29.7	28.9	27.7
Source: Texas Department of Health. <i>Epidemiology in Texas</i> , 1989, 1990, 1991, 1992, 1993					

HIV/AIDS

Participants were asked if the HIV virus was the “germ” that causes AIDS. More than half the respondents, 176 (55.6%), knew that HIV was the “germ” that causes AIDS. On the other hand, 138 (43.6%) gave a negative response to this question or did not know the answer.

When modes of transmission for AIDS were addressed, the majority recognized the following risk factors: using contaminated needles, 259 (81.9%); having multiple sex partners without protection, 259 (81.9%); and from an infected mother to her baby before or during birth, 246 (77.8%) (**Table 5**).

TABLE 5. Risk Factors for HIV/AIDS Transmission

Risk Factors	Respondents
Using contaminated needles	259 (81.9%)
Having multiple sex partners without protection	259 (81.9%)
From an infected mother to her baby before or during birth	246 (77.8%)
NOTE: Totals are more than 100% because participants gave multiple responses.	

Over half the participants, 186 (58.8%), knew that they could not tell if someone was infected with the AIDS virus by the way the person looked. However, 38 (12.0%) *incorrectly* believed that the physical appearance of a person would invariably identify a person infected with the HIV/AIDS virus and 90 (28.4%) did not know the answer.

In 1991, HIV/AIDS infection was the ninth leading cause of death in the U.S. border states with rates of 15.0 cases per 100,000. This rate is higher than the nationwide rate of 11.7 cases per 100,000 (11). Among 15 to 24 year-olds, HIV/AIDS has been the sixth leading cause of death since 1991 (12). One in five reported AIDS cases is diagnosed when the person is in his/her 20s, an indication that HIV infection occurred during the teen years (12).

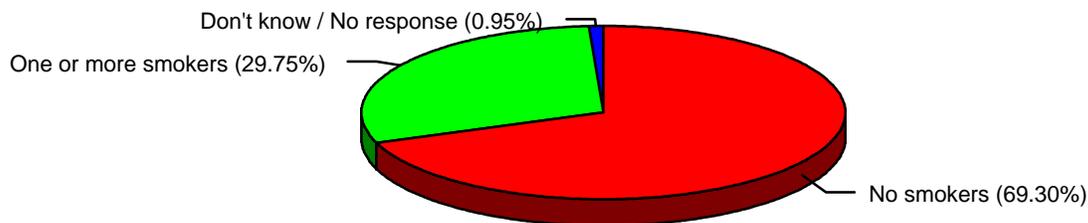
Since the beginning of this HIV/AIDS era, more than 30,000 Texas residents have been diagnosed with AIDS. It is presumed that the number of people in Texas infected with HIV represents two-and-one-half times the total number of reported AIDS cases (13). In 1991, HIV/AIDS was the tenth leading cause of death in Texas (4). In 1994, Texas ranked fourth in the U.S. with 5,627 reported cases of AIDS (14).

Personal Health Practices and Health Status

Smoking

The survey found that 94 (29.7%) of surveyed households had one or more smoker(s) and 219 (69.3%) of surveyed households had no smokers (Figure 12). No questions were asked regarding the ages of smokers living in these households.

Figure 12. NUMBER OF HOUSEHOLD MEMBERS WHO SMOKE



One out of every five deaths in the state of Texas is related to smoking. For 1993, the costs attributed to smoking were estimated at more than \$5 billion for adults 35 years and older, with direct health care costs of \$1.44 billion and indirect costs of \$3.66 billion (15). These costs totaled

more than seven times the amount collected from state taxes on cigarette sales. Persistent smokers experience a 7% to 15% increase in outpatient visits over five years, a 30% to 45% increase in hospital admissions, and a 75% to 100% increase in hospital days. A TDH survey related to access to cigarette vending machines found that youngsters were successful in obtaining cigarettes in 90% of their attempts (15).

Environmental Tobacco Smoke (ETS) is considered a carcinogenic substance in humans, for which no safe lower limit can be set. ETS causes **30 times** more lung cancer deaths than the deaths caused by all regulated air pollutants combined. ETS increases the severity of asthma and asthma attacks for the two million to five million asthmatic children in the United States. Exposure to ETS causes 150,000 to 300,000 lower respiratory tract infections in U.S. infants and children less than 18 months of age. Exposure to ETS may cause reduced lung function and middle-ear disease in children, and may also contribute to Sudden Infant Death Syndrome (SIDS) in infants (15).

Respiratory Problems

Conditions related to upper respiratory infections were discussed immediately after the smoking questions. In this survey, results and percentages for upper respiratory diseases were based on a survey sample of 316 households with a total population of 1,010 household members. Each respondent was asked about the total number of household members (adults and children) having been diagnosed by a physician as having asthma, pneumonia, bronchitis, and allergies. Responses are documented in **Table 6**.

TABLE 6. Upper Respiratory Tract Infections

Disease	Adults	Children	Total Persons	% of 1,010
Asthma	22	14	36	3.5%
Pneumonia	16	1	17	1.6%
Bronchitis	18	10	28	2.7%
Allergies	88	54	142	14.0%
Total Diagnosed	144	79	223	22.0%

Many persons were reported as suffering upper respiratory diseases, especially asthma and allergies. Since only two of the main streets in Presidio were paved, the constant dust and volatile particles dispersed into the air may have been a contributing factor to upper respiratory conditions.

Reports of increased rates of birth defects in communities along the Texas-Mexico border have created concerns regarding rapid industrial development and associated exposures to hazardous air pollutants (HAPS). These exposures are thought to be caused by air emissions, waste discharges, and soil contamination containing a variety of substances. In a study of ambient air

quality where eight metals were toxicologically weighted for their monthly averages, the site with the highest levels of metals was located along the Texas-Mexico border (16).

In 1991, the death rate in Presidio of 30.1 per 100,000 exceeded the Texas border counties' death rate of 25.0 per 100,000 for Chronic Obstructive Pulmonary Disease (COPD) and related conditions (4).

Chronic Conditions

Participants were asked if they had household members diagnosed by a physician as having diabetes, hypertension, high cholesterol, obesity and anemia. Again, the responses and percentages are based on the survey sample of 316 households with a total population of 1,010. The results are shown in **Table 7**.

TABLE 7. Chronic Conditions

Chronic Condition	Adults	Children	Total Persons	% of 1,010
Diabetes	62	0	62	6.1%
Hypertension	144	0	144	14.2%
High Cholesterol	82	0	82	8.1%
Obesity	138	12	150	14.8%
Anemia	31	6	37	3.6%
Total Diagnosed	457	18	475	47.0%

Many participants reported hypertension and obesity. In 1991, diseases of the heart had the highest mortality rates in specified groups in Texas with rates per 100,000 reported at 230.9 for the entire state but a lower rate of 169.3 was reported for the border counties. Other cerebrovascular diseases were the third leading cause of mortality with rates reported at 49.4 in Texas and a lower rate of 32.6 reported in border counties. Even though the rates for these conditions in the border counties were lower than the state rates, they still represent a problem. Diabetes mellitus continues to be of concern because it was the seventh leading cause of mortality with rates of 21.2 in Texas, and a higher rate of 25.4 in border counties (4).

As shown in **Table 8**, Presidio County (which includes the cities of Presidio and Marfa) had death rates higher than that of the Texas border counties for the same chronic conditions. Because of its small population, the rates for Presidio County may seem higher than the rates for the border counties.

TABLE 8. 1991 Death Rates for Texas, Presidio County, and Texas Border Counties for Certain Chronic Conditions*

Disease	Texas Death Rates (per 100,000)	Texas Border Counties Death Rates (per 100,000)	Presidio County Death Rates (per 100,000)
Heart Disease	230.9	169.3	195.8
Cerebrovascular Diseases	49.4	32.6	45.2
Diabetes	21.2	25.4	45.2
Nutritional Deficiencies	1.4	1.6	15.1
Chronic Obstructive Pulmonary Disease	31.3	25.0	30.1

* Source: University of Texas System. *Texas-Mexico Border County Demographics and Health Statistics*. 1994.

Nutrition

The participants were asked if any of the household members had gone to bed hungry within the last year. Out of the 316 participants, only 2 (0.6%) stated they or their children had gone to bed hungry. Of the 190 households with children, 157 (82.6%) stated that their children have 3 meals a day. Nineteen (10%) reported that their children have two meals a day, and 3 (1.5%) stated that their children have only 1 meal a day. Of the 143 households with children in school, 53 (37.0%) reported that their kids get school breakfast and 125 (87.4%) reported their kids get school lunch.

The participants were also asked if they had ever received dietary instructions for certain chronic conditions like diabetes, high blood pressure, weight control, and cholesterol control. Their responses are shown in **Table 9**.

TABLE 9. Received Diet Instructions for Certain Chronic Conditions

Chronic Condition	Participants	Percent (%) of 316
Anemia	16	5.0%
Cholesterol	60	18.9%
Diabetes	50	15.8%
Hypertension	67	21.2%
Weight Control	81	25.6%

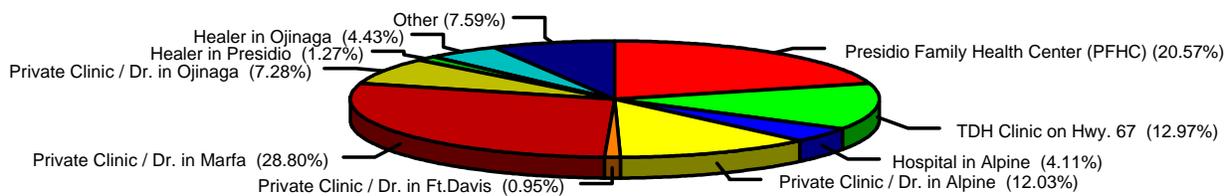
In 1991, the death rate in Texas from nutritional deficiencies was 1.4 cases per 100,000 while the rate for the state border counties was 1.6. The death rate for this condition in Presidio was **15.1** for the same year, when 5.4% of the population in the border counties received benefits from the Women, Infant and Children’s Nutrition Program (WIC). Also, 29.2% of the population in Texas border counties participated in the Food Stamp Program compared to 12.7% for the state population as a whole (4).

Access To and Use of Health Care Services

Medical Services Most Often Utilized

As previously mentioned, only two clinics provide limited health services in Presidio: the TDH public health clinic on Highway 67 and the Presidio Family Health Center (PFHC) on O’Reilly Street. Participants were asked about the medical services that they most often used. Ninety-one (28.8%) reported that they would go to a private clinic or doctor in Marfa; 65 (20.5%) reported they would go to the Presidio Family Health Center; 41 (12.9%) reported they would go to the TDH clinic; 38 (12.0%) reported they would go to Alpine; and 23 (7.2%) reported they would go to a private clinic or doctor in Ojinaga, Mexico (**Figure 13**).

Figure 13. WHERE MEDICAL SERVICES ARE OBTAINED



Perceptions and Use of the TDH Clinic

TDH also wanted to know the clients’ perception of the quality of services provided at the TDH clinic. More than half, 176 (55.6%), of the respondents had visited the TDH clinic. Of these, 144 (81.8%) stated that they had always received good service. The survey also requested information about the staff’s politeness and interest in their medical needs, problems related to language difficulties, length of waiting time before being seen, and any other problem(s) encountered at the TDH clinic. Responses to these questions were as follows: 146 (82.9%) reported that the TDH staff was always polite, and 138 (78.4%) said that the TDH staff also appeared interested in their

medical needs. Twenty-five (14.2%) reported they had problems due to language barriers. While 42 (23.8%) stated they *always* had to wait for a long time to be seen, 53 (30.1%) responded that they *sometimes* had to wait a long time before being seen and 79 (44.8%) reported *never* having to wait a long time (*Table 10*). Some respondents mentioned that the services offered were inadequate, such as unavailability of a doctor, the services needed were not available, or prescribed medications were not given.

TABLE 10. Perception of Services Provided at the TDH Clinic

	Always	Sometimes	Never
Receive good service	144 (81.8%)	25 (14.2%)	6 (3.4%)
TDH staff polite	146 (82.9%)	24 (13.6%)	5 (2.8%)
TDH staff interested in medical needs of patients	138 (78.4%)	27 (15.3%)	10 (5.6%)
Problems at TDH clinic due to language difficulties	25 (14.2%)	10 (5.6%)	138 (78.4%)
Long wait at TDH clinic before being seen	42 (23.8%)	53 (30.1%)	79 (44.8%)
NOTE: Totals are more than 100% because some households gave multiple responses.			

Of the 140 households which had not used the TDH clinic, the survey asked for possible reasons. Thirty (21.4%) responded that they preferred to go to another clinic or hospital. Twenty-four (17.1%) reported not using the services because of lack of money and 13 (9.2%) reported that the reason was they did not have Medicaid or any insurance. The clinic not having needed services was the response given by 19 (13.5%) of the participants, and 28 (20%) had not used the clinic because they did not need the services the clinic provided (*Table 11*).

TABLE 11. Reasons for Not Using the TDH Clinic

Preferred another clinic or hospital	30 (21.4%)
Lack of money to pay	24 (17.1%)
Did not have Medicaid or other insurance	13 (9.2%)
Did not have needed services	19 (13.5%)
Do not need the services provided	28 (20%)
Other	26 (18.6%)
NOTE: Totals are less than 100% due to rounding	

Perceptions and Use of Presidio Family Health Center

The same questions were asked about the participants' perceptions of the Presidio Family Health Center (PFHC). One-hundred ninety-four (61.3%) had visited the PFHC. Questions were also asked about the services provided by this clinic. Users of the clinic had always received good service according to 149 (76.8%) respondents (**Table 12**). The PFHC staff was always polite according to 157 (80.9%) respondents, with 155 (79.8%) saying the staff was always interested in the respondents' medical needs. One-hundred fifty-three (78.8%) reported not having problems due to language barriers. While 101 (52.0%) reported never having to wait a long time before being seen, 91 (46.9%) had to wait sometimes or always.

TABLE 12. Perceptions of Services Provided at the PFHC Clinic

	Always	Sometimes	Never
PFHC staff always provides good service	149 (76.8%)	32 (16.4%)	12 (6.1%)
PFHC staff polite	157 (80.9%)	31 (15.9%)	5 (2.5%)
PFHC staff interested in medical needs of patients	155 (79.8%)	26 (13.4%)	12 (6.1%)
Problems at PFHC clinic due to language difficulties	21 (10.7%)	18 (9.2%)	153 (78.8%)
Long wait at PFHC clinic before being seen	34 (17.5%)	57 (29.3%)	101 (52.0%)
NOTE: Totals are more than 100% because some households gave multiple responses			

Other problems mentioned regarding the PFHC included: slow service, lack of transportation, difficulty in making appointments, difficulty getting in during an emergency, unavailability of a doctor, unavailability of needed services, unavailability of a dentist, and prescribed medications not provided. Of the 122 participants not using the PFHC, reasons given for not using the PFHC included: preferred another clinic or hospital, 29 (23.7%); did not have Medicaid or insurance, 19 (15.5%); did not have money to pay, 19 (15.5%); did not have needed services, 16 (13.1%); and, did not need their services, 33 (27%) (**Table 13**).

TABLE 13. Reasons for Not Using the PFHC Clinic

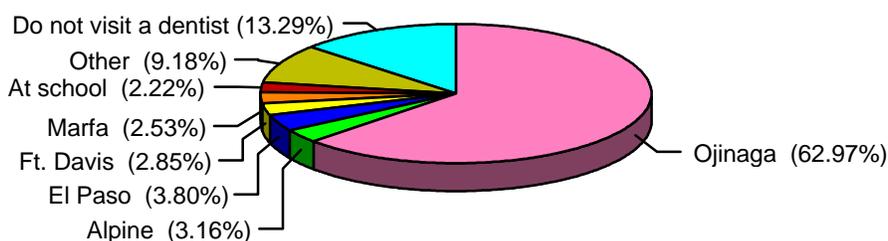
Preferred another clinic or hospital	29 (23.7%)
Do not have Medicaid or other insurance	19 (15.5%)
Do not have the money to pay	19 (15.5%)
Did not have needed services	16 (13.1%)
Do not need the services provided	33 (27.0%)
Other	15 (12.3%)
NOTE: Totals are more than 100% because some households gave multiple responses	

In 1991, the Texas border counties had 1,694 physicians, or 101.1 physicians per 100,000 population. In 1991, Presidio County had only 1 physician, or 15.1 per 100,000 population (**4**).

Dental Services

Most of the survey respondents, 199 (62.9%), go to a dentist in Ojinaga, Mexico. The remaining participants reported going to visit a dentist in Alpine, 10 (3.1%); El Paso, 12 (3.8%); Fort Davis, 9 (2.8%); Marfa, 8 (2.5%); at school, 7 (2.2%). Forty-two (13.2%) respondents did not visit a dentist at all (**Figure 14**).

Figure 14. WHERE DENTAL SERVICES ARE OBTAINED



In 1991, the state of Texas had a rate of 40.3 dentists per 100,000 population while the Texas border counties only had 18.5 per 100,000 population. The County of Presidio had only 1 dentist practicing in Marfa, 60 miles North of the City of Presidio (4).

TDH does provide limited dental services to indigent children who do not qualify or have access to any other dental care. The TDH Region 9 & 10 Mobile Dental Unit (MDU) travels to Presidio County every two years to provide dental services to children under the school free-lunch program. TDH also has the “Emergency Dental Treatment (Fee-for-Service) Program,” available to children in this county. The MDU visited the Presidio Independent School District in 1992, 1994 and 1996 (17). **Table 14** shows the total number of children served and the value of the treatments provided during these years.

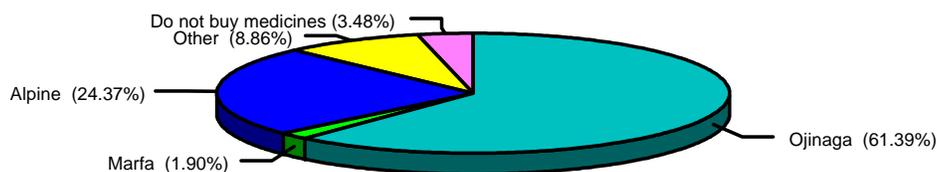
TABLE 14. Services Provided by the TDH Mobile Dental Unit (MDU)

Services	1992	1994	1996
Patient Examined	183	256	403
Patients Treated	99	55	94
Sealant Surfaces	321	84	230
Value of Treatment on Reduced Fee **	\$27,777	\$13,475	\$33,899
Value of Treatment on Usual Fee	\$38,204	\$20,014	\$50,123
** Based on Title XIX (EPSDT) fee schedule which is below private practice fees			

Pharmacy Services

When participants were asked where they obtained their prescribed medications, 194 (61.3%) answered going to Ojinaga, Mexico (**Figure 15**). Other survey participants obtained their prescriptions as follows: Alpine, 77 (24.3%); Marfa, 6 (1.9%); other, 28 (8.8%). Eleven participants (3.4%) reported not buying any prescribed medications. In 1991, Texas border counties had 749 pharmacists or 44.7 per 100,000 population. Presidio County only had 2 pharmacists or 30.1 per 100,000 population (4).

Figure 15. WHERE PRESCRIBED MEDICINES ARE PURCHASED



Environmental Risk Factors

Potential Exposure to Pesticides

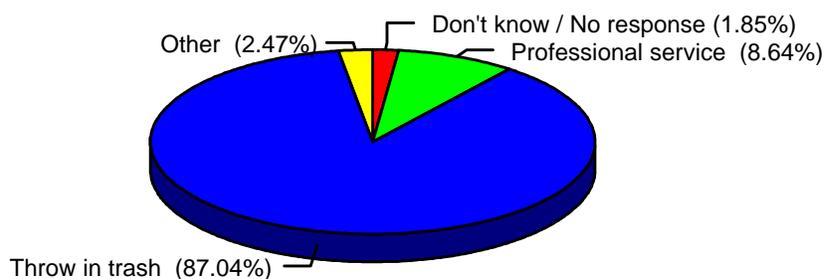
Participants were asked whether household members worked as field or farm laborers during the previous 12 months, and about any work history related to picking/packaging or spraying fruits or vegetables.

Eighty-seven (27.5%) of the households had members working as field or farm laborers during the preceding 12 months, mostly near Presidio. Of these 87, 61 (70.1%) worked picking/packaging fruits and/or vegetables. Also, 14 (16.0%) worked spraying fruits and vegetables, mostly near Presidio.

Half the households, 162 (51.2%), used pesticides/herbicides in or around their homes. Of these, 141 (87.0%) disposed of the containers in the trash. Only 14 (8.6%) used professional services to apply pesticides, eliminating the need of household disposal. Other methods of disposing of pesticide containers were reported by 4 (2.4%) of the pesticide users (*Figure 16*).

According to the Texas Agricultural Extension Service, a pesticide is “a substance or mixture of substances intended to prevent, destroy, repel or mitigate a pest.” Pesticides are classified according to formulation, target, mode of action and chemistry. The Environmental Protection Agency (EPA) has determined that each pesticide presents its own health hazards, with insecticides and fumigants being the most toxic. While pesticides do not belong to one specific family of chemicals, the largest number of pesticides are in the organophosphate group (*18*).

Figure 16. DISPOSAL OF PESTICIDE CONTAINERS



More than 100,000 individual pesticide products are registered by the EPA. Of these, more than 11,000 are registered by the Texas Department of Agriculture. These include insecticides, fungicides, herbicides, disinfectants and plant growth regulators. As shown in *Table 15*, a variety of chemicals are used in crops harvested in West Texas.

TABLE 15. Pesticides Used in West Texas and High Plains *

Chemical	Crops
Dicrotophos	Cotton
Dimethoate	Alfalfa seed, sorghum
Chlorpyrifos	Alfalfa seed, sorghum
Methamidophos	Melons, cabbage
Acephate	Peppers
Ethyl parathion	Alfalfa, cotton
Methyl parathion	Alfalfa, onions
Mevinphos	Melons, watermelons, peppers
Phorate	Sugar beets
* Adapted from <i>Physician's Guide to Pesticide Poisoning</i> , Texas Agricultural Extension Service, 1995, page 20.	

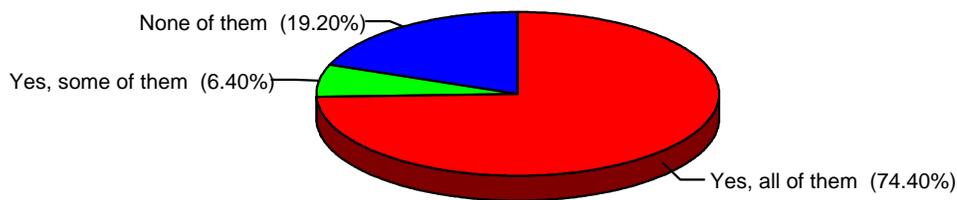
In recent years, many people who have claimed permanent disabilities claimed they acquired the disability because of contact with lawn pesticides and herbicides. In May 1991, a former champion ice skater reported sunning in her yard while a neighbor sprayed herbicides in his lawn. The spray mist drifted to her yard killing her cat and dog, and caused a blindness in her left eye that left her with a permanent disability (19).

The TDH Environmental and Occupational Epidemiology Program (EOEP) conducts active surveillance of occupational pesticide poisonings in Texas. In 1994, 26 incidents of acute pesticide poisoning involving 33 workers and one death were reported. Agricultural settings accounted for most of the illnesses with 19 incidents of poisoning reported (20).

Rabies

The survey found that 125 (39.5%) of households had pets. Participants were asked whether their pets were vaccinated for rabies within the past year. Ninety-three (74.4%), reported vaccinating all of their pets, 8 (6.4%) of the participants had vaccinated some of them and 24 (19.2%) stated their pets were not vaccinated at all (Figure 17). The participants were not asked for proof of vaccination for their pets.

Figure 17. PETS VACCINATED FOR RABIES



In 1994, TDH tested 11,834 animals with 590 (5%) of them being positive for rabies. Most (79%) of the animals which tested positive for rabies were wildlife, with foxes (24%) being the main reservoir (20). However, the most important rabies concern is in domestic animals because they are in contact with humans. Owners of pets are required by law to vaccinate their dogs and cats against rabies annually. In 1991, Presidio County only had 2 veterinarians practicing in the nearby community of Marfa (4).

Use of the River

When questions were asked regarding the use of the Rio Grande, 281 (88.9%) of the households reported not using the river. However, 29 (9.1%) of the participants reported having used the river for fishing, and 7 (2.2%) reported having bathed in the river. Six households (1.8%) reported that they had used the river for other purposes.

On April 6, 1995, *The Big Bend Sentinel* published a warning against swimming in the Rio Grande and Rio Conchos. Dr. Jesus Acosta, director of **Subsede Sanitaria** in Ojinaga, Mexico, said that dangerously high levels of coliform bacteria had been found in these rivers during recent studies (21). He stated that the Rio Grande and Rio Conchos rivers contain multiple bacteria types that could cause dangerous health problems to humans. According to this article, in spite of warnings by health authorities against the use of the rivers, people continue using these contaminated waters. The article also mentioned that local doctors had reported chronic and other bronchial and digestive infections probably due to the population's unhealthy use of the rivers.

Exposure to Lead

The survey contained questions related to the use of imported Mexican glazed pottery and the use of home remedies. Some imported Mexican pottery may contain and leach lead when used for cooking or storing food. Fifty-six (17.7%) participants reported using imported Mexican pottery for these purposes.

When asked about the use of home remedies, 4 (1.2%) reported they had used “*azarcon*” and only 1 (0.3%) reported they had used “*greta*.” These two folk remedies contain lead and are used to treat indigestion or stomach pain.

While 81 (25.6%) reported not using any folk remedies, 234 (74.0%) reported they had used some folk remedies or herbs. “*Manzanilla*” (camomile) was the herb mentioned most often by 194 (61.3%) households. Also, 103 (32.5%) households mentioned using “*yerba buena*” (spearmint).

Communications

Television and Radio Stations

When asked about public means of communication, 308 (97.4%) reported having a working TV. Of these, 189 (61.3%) were Cable TV customers. Twenty-three (7.2%) of the participants reported not watching any TV. As shown in **Table 16**, most of the TV audiences focused on Spanish TV stations.

TABLE 16. Television Stations Watched

Spanish TV Station	Participants	Percent of 308 households
Galavisión	185	60.0%
Telemundo	118	38.3%
Univision	130	42.2%
Other	37	12.0%
NOTE: Percent totals more than 100% because some households gave multiple responses		

Most of the participants, 274 (86.7%), reported they listened to the radio, with 207 (75.5%) listening to “Radio Ranchito AM” and 96 (35.0%) listening to “Radio Pegüis AM” These two radio stations are in Ojinaga, Mexico. “Radio Esterio 102 FM” is another Spanish language radio station to which 132 (48.1%) of the participants listen.

Regarding the availability of residential telephones, 252 (79.7%) of the participants reported having a working telephone.

Perceived Health Problems and Health Services Needed

The interviews ended with open-ended questions in which participants had the opportunity to express their ideas and perceptions. Participants were asked what they believed were the major health problems in Presidio. A total of 181 (57.2%) reported lack of street paving. Respiratory problems and colds were reported by 88 (27.8%) of the participants and lack of a pharmacy was

reported by 45 (14.2%). Twenty-three (7.2%) reported lack of physicians and 12 (3.7%) reported lack of a hospital. Other health problems mentioned included diabetes with 33 (10.4%) and cardiac and pulmonary problems with 27 (8.5%) (*Table 17*).

TABLE 17. Health Problems Perceived to Exist in Presidio

Lack of street paving	181 (57.2%)
Respiratory problems and colds	88 (27.8%)
Lack of a pharmacy	45 (14.2%)
Lack of physicians	23 (7.2%)
Lack of a hospital	12 (3.7%)
Diabetes	33 (10.4%)
Cardiac and Pulmonary problems	27 (8.5%)
NOTE: Percent totals more than 100% because some households gave multiple responses	

When participants were asked about needed health services, 235 (74.3%) reported needing transportation to health providers/facilities, 161 (50.9%) requested a hospital, and 116 (36.7%) mentioned the need of a pharmacy. Sixty-one (19.3%) mentioned that health services were expensive and 23 (7.2%) requested the pavement of streets to control the dust.

Immunizations

At the end of the interviews, participants were asked if immunization records were available for children younger than 5 years of age. Most of the participants did not have the immunization records available. Since immunization records for only a few children were actually available, the small amount of data generated was not analyzed. However, the TDH Region 9 & 10 Immunizations Division has reported that for children born in 1993 in Presidio County, the coverage for children 24 to 35 months of age with DTP4, OPV3, and MMR1 (4:3:1:) was 89%. The Year 2000 national goal is 90% coverage (22).

FINDINGS AT A GLANCE

Demographic Characteristics

Most of the surveyed population (96.5%) identified themselves as Hispanic, and each household consisted of approximately 3.2 persons. About half (45.2%) of the surveyed households had children between 5 and 17 years of age.

Many of the surveyed persons (43.0%) reported living in the bordering Mexican city of Ojinaga before moving to Presidio, and 28.1% reported living in a U.S. border state.

Work History

There is a high percentage of seasonal and migrant farm laborers in Presidio. However, while 27.5% of the households had members who worked as farm laborers, only few managed to work a full year. A high unemployment rate may explain why almost half the participating households (47.7%) reported receiving food stamps and almost the same percentage of households (42.4%) reported receiving Medicaid.

Living Conditions

Most of the participating households (74.6%) owned their properties. Unfortunately, 52.2% of the surveyed homes were in deteriorating conditions and 21.2% of the homes were severely dilapidated. Most of the surveyed households (98.7%) had proper sewage disposal.

Rubbish was found in the surroundings of 42.4% of the surveyed homes, a small reduction of 15% when compared with the 1982 surveys when 57% of the homes had rubbish. Over one third (37.9%) of the homes had environmental conditions in their surroundings that could harbor roaches, rats, and other carriers of disease.

Health Knowledge

Hepatitis A

Almost half the participants (48.7%) recognized that drinking contaminated water is a risk factor for Hepatitis A. Most participants (62.6%) also knew that poor hand-washing practices could transmit this disease. Only 6 cases of Hepatitis A had been reported in Presidio County from 1986 through 1993, and this low figure probably represents under-reporting.

Tuberculosis

Over one-third of the respondents (38.6%) *erroneously* thought that having a positive TB test was a diagnosis for TB disease. While over half the participants recognized some symptoms for TB disease, the remaining participants did not know or missed the correct answer. The TB rate in Presidio County surpassed the state rate in 1989, 1991, 1992, and 1993.

HIV/AIDS

While most of the participants recognized the risk factor(s) for the transmission of AIDS only 55.6% knew that HIV was the “germ” that causes AIDS.

Personal Health Practices and Health Status

Almost one third (29.7%) of the households had smokers, and 22.0% of the surveyed population of 1,010 individuals were reported to having been diagnosed with one or more upper respiratory infections such as asthma, pneumonia, bronchitis, or allergies.

Almost half (47.0%) of the surveyed population reported being diagnosed by a physician as having one or more of the following chronic conditions: diabetes, hypertension, high cholesterol, obesity, and anemia. However, hypertension and obesity were the more often reported chronic conditions, followed by high cholesterol. In 1991, the death rates for diseases of the heart in Presidio County (which includes the cities of Presidio and Marfa) exceeded the state rates for these conditions.

Access to and Use of Health Care Services

Just over a fourth (28.8%) of the participants reported that they would go to a private clinic or doctor in Marfa when in need of medical services. While 20.5% of the participants would go to the Presidio Family Health Center, only 12.9% would go to the Texas Department of Health Clinic.

More than half (55.6%) of the participants had visited the Texas Department of Health Clinic with 81.8% of those receiving services saying they always received good service. A higher percentage (61.3%) had visited the Presidio Family Health Center, with 76.8% of the participants who received services saying they always received good service. Users of both clinics and their level of satisfaction were similar. Most of the survey participants (62.9%) go to a dentist in Ojinaga, Mexico, and almost the same number of participants (61.3%) obtained their prescribed medications there also.

Environmental Risk Factors

Pesticides

Since the economy of the county of Presidio is based primarily on agriculture, potential exposure to agricultural pesticides may be significant. When participants were asked about potentially work-related agricultural exposure, 27.5% of the households reported having members who worked as field or farm laborers during the past year. Of these, 70.1% reported having worked picking and/or packaging fruits or vegetables and 16.0% reported having sprayed vegetables and/or fruits. Most of the reported farm laborers worked in or near Presidio. However, only few managed to work a full year.

More than half of the participants (51.2%) used pesticides or herbicides in or around their homes, and 87.0% of these disposed of the containers in their trash.

Rabies

More than a third (39.5%) of the participating households reported having pets (cats and/or dogs) at home. Of the households having pets, 74.4% reported vaccinating all pets, while the rest (25.6%) of the participants vaccinated some or none of their pets.

Use of the River

Even when it has been reported that the Rio Grande contains microorganisms and other contaminants that may cause health problems in humans, 11.0% of the participants reported they had used the river for fishing, bathing, or other purposes.

Perceived Health Problems and Health Services Needed

More than half (57.2%) of the participants reported the lack of street paving as a perceived health problem. About one-quarter (27.8%) reported respiratory problems and colds while 14.2% reported lack of a pharmacy as a health problem. Lack of physicians as a health problem was reported by 7.2% and lack of a hospital was reported by 3.7%.

Health services needed in Presidio include transportation as reported by 74.3% of the participants. Half (50.9%) requested a hospital and 36.7% reported the need of a pharmacy.

LIMITATIONS OF THE STUDY

This survey was prepared and administered in a considerable short period. While households were randomly selected, many potential participants were not available during the first two days of the activity and several homes were uninhabited. Consequently, other alternate households were selected. It is unknown if the substitution of households significantly changed the results of the surveys.

All results obtained are based on the participants' responses and perceptions. Not all the interviewers were fluent in Spanish; this not only delayed the interview process but also may have led to different interpretations of the questions asked. Also, limited transportation and long distances covered by the interviewers limited the total number of participants enrolled in the survey.

No survey was conducted in nearby Marfa and in any of the surrounding unincorporated county areas designated as a "*colonia*." The results regarding living conditions, environmental risk factors, and perceived health problems and services needed may have been different if any "*colonia*" had been included in the survey.

Since the survey contained questions regarding access to health care, any potential participant who worked in or was related to a person who worked in either of the two existing health clinics was not enrolled in the survey. This procedure was intended to avoid the introduction of bias.

RECOMMENDATIONS

Access to health care services is limited in Presidio. The low numbers on reportable conditions and other environmental exposures may therefore be due to under-reporting. A binational health care task force should be established to share health information and reportable conditions.

An aggressive information strategy should be promoted in order to enhance the use of existing health services. In addition, public agencies must work with the community to attract health care resources.

To diminish environmental risk factors and to control the transmission of infectious diseases, health education should be offered covering topics that include: (1) proper disposal of pesticide containers; (2) recognition of pesticide poisoning; (3) proper nutrition and prevention of certain chronic conditions; (4) prevention of exposure to infectious diseases; and (5) smoking reduction or cessation. The material used in these educational efforts should be available in English and Spanish. The educators should be bilingual and culturally sensitive.

Deteriorating conditions of the homes and the lack of paved streets are important environmental risk factors that may contribute to respiratory infections. Substandard housing contributes to the harborage of vectors and predisposition to disease transmission. Economic resources should be identified for repairing the homes and paving the streets.

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