CHAPTER 2.
HEALTH NEEDS, HEALTH PROVIDERS, PRIORITIES, AND CHALLENGES TO EFFECTIVE MEDICAL TREATMENT

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Introduction

Mexico Health Policy and Health Infrastructure

Federal Level

Puebla is one of Mexico's poorest states and faces systemic health inequity. This health inequity is compounded by the impact of a severe earthquake that affected the region in September 2017. The inequities manifest in areas related to the built environment, including air, water, and housing structure, health system, and health-related social practices. While the Mexican government has invested significantly in new Secretaría de Salud hospitals and clinics, acute shortage of trained medical staff creates a large discrepancy in the health care equity for the poor (Vázquez, Galván-Martínez, Ramírez-Cuadra, & Frenk-Mora, 1992). Puebla falls second to last for all Mexican states on the availability of both doctors and nurses in hospitals, and like many states, has low ratios of paramedical staff (nurses, etc.) to doctors (Secretaría de Salud, 2019).

From 1985-2000, without clear direction of financial allocation, the federal Secretaría de Salud reformed the healthcare system, delegating responsibility of healthcare of the uninsured to the states. Previous to the reforms, the Mexican health system was segmented and even those with social security paid large out-of-pocket expenditures to receive care (Knaul et al., 2012). In the 1990s, the first national health accounts showed that 50% of the health expenditure was out-of-pocket. This result showed that the Mexican people, especially the poor and uninsured, relied heavily on providers not within the public sector (Frenk et al., 1995). Due to the financial burden of health care, Mexico had a low rating of fairness of financial contribution on the World Health Report in 2000 (Etienne et al., 2010). The out-of-pocket costs that many Mexicans paid was the actualization of service rationing through poor and inequitable service, medicine shortages, and incomplete access to covered services (Zurita, González Rosetti, Knaul, & Soberón, 2001). As a result of the inequities, in 2003, the Mexican government created a health reform that legislated the System of Social Protection in Health (SSPH). The 2003 reform was motivated by imbalances in funding and low general spending, characterized by private and out-of-pocket spending, unequal state contributions and unfair allocation of public health resources between the poor and the rich. Since this reform, Mexico has advanced in universally enrolling all people in healthcare coverage, which in turn allows for access to equitable health package services including promotion, prevention, treatment, and rehabilitation services. Through SSPH, Mexico's national health insurance program, Seguro Popular, was introduced and has provided comprehensive health services for 52.6 million previously uninsured Mexicans (Knaul et al., 2012). The reform of the healthcare sector through SSPH was primarily done to improve equitable and sustainable access and achieve successful universal coverage. Seguro Popular guaranteed access to packages with services and more costly and specialized services

for Mexicans working in the informal sector, including in agriculture. For Seguro Popular funding, the federal government and state government contribute. The federal contribution is allotted to states based on a legally mandated formula of enrolled individuals, health needs, and performance, a large change from the previously subjective budgeting before SSPH.

Enrollment of poorer groups were increased by *Oportunidades*, more recently named *Prospera*, which were conditional cash transfer programs that benefitted nearly six million families, usually poor and chronically underserved. The idea of these programs was to give families money for sending their children to school and health centers, allowing families to make important time investments into these events, breaking the cycle of poverty (Dávila Lárraga, 2016).

Currently, 92% of the population is affiliated with some form of public healthcare insurance. People working in the formal labor market are insured under mandatory social security insurance through either the Mexican Institute of Social Security (IMSS) or the Institute of Social Security of State Workers (ISSSTE). 62 million people are insured under IMSS and 12.9 million people are insured under ISSSTE. *Seguro Popular*, which insures those without formal work, covers 54 million people (Doubova et al., 2018). Approximately eight percent of the population are privately insured and an additional eight percent lack health insurance (Doubova et al., 2018).

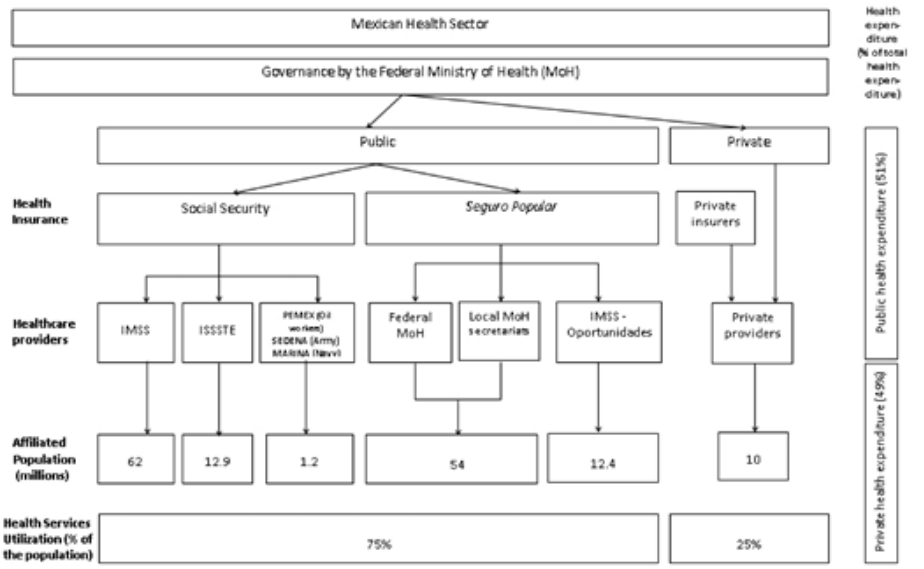


Figure 2.1: A graphical display of Mexican healthcare sector levels (Doubova et al., 2018).

State Level

Each Mexican state has a Secretaría de Salud that is responsible for healthcare delivery of the uninsured and partially contributing to healthcare spending. Because federal health funding is related to Seguro Popular enrollment, states have implemented federal level programs like *Oportunidades* and *Prospera* to increase enrollment to Seguro Popular, further increasing the allotment they receive from the federal government. To this end, in some cases, states illegally

split families living in the same household to increase enrollments and federal resources, putting at risk the financial structure that funded state programs. A limitation of federal financing calculations is that the calculation per household is based on the average nuclear family size of 4.3 members, which does not capture the variance in average nuclear family size across states. As a result, the allocation per person was larger for wealthier states where the average family size is smaller, and a lower allocation for states with a larger average nuclear family, producing systemic inequities (Knaul et al., 2012). Puebla is recognized as a low income state, further emphasizing the need to understand healthcare utilization. It is important to note that the state of Puebla has one of the highest rates of percentage of people eligible for Seguro Popular, a marker of number of people in the informal economic sector, usually agrarian work in rural communities, and therefore a marker of poverty.

In the state of Puebla, there are three levels of attention. The first level is the first contact and primarily where preventative health measures are provided, which are usually Casas de Salud, which are run by community members who do not have formal training, and Centros de Salud, which are usually run by a physician and a nurse. In the state of Puebla, there are a total of 572 Centros de Salud, 339 of them are in rural areas, 38 are mobile dentist clinics, 15 traditional medicine facilities, and 1,587 Casas de Salud. The second level is specialized care, or integral care hospitals, and the third level is the highest level of specialization, or general hospitals. In Mexico, these hospitals often have primary care services and can be utilized as first healthcare contact. Within the hospital systems, or the second and third level, there is a code system for services provided where code green is the lowest level, increasing to code yellow, code orange, and then code red. Code green are in the second level and mean the facility does not have specialized doctors, and there are 18 green level hospitals in the state. Code yellow are in the second level and mean that there are four specialist areas, including gynecology, pediatrics, internal medicine, and surgery, along with anesthesiology. There are 14 of these facilities in the state. Code orange are in the second level mean that there are the previous specialists in larger numbers and potentially orthopedics and ophthalmology. There are 10 code orange facilities in the state. Code red, which is the highest designation and within the third level, have more specialists and subspecialists, and there are 20 of these within the state (Secretaría de Salud, 2019).

Figure 2.2: Levels of Attention at Mexican Ministry of Health Facilities doctors (Secretaría de Salud, 2019).

Community Level

In the urban town of Atlixco, there is a large Secretaría de Salud named Hospital General Río Arronte that began operations in April 2015. Services at this hospital include anesthesiology, public health, surgery, obstetrics and gynecology, internal medicine, pediatrics, trauma and orthopedics, emergency care, radiology, and a clinical laboratory. It is a secondary level provider. This hospital serves people with Seguro Popular insurance who need more extensive care or require general surgeries. This hospital is 1.9 kilometers from Colonia Flores Magón, 10.2 kilometers from Santa Ana Coatepec, and 39 km from Xochiteopan.

Photograph 2.1: The entrance to Hospital General Río Arronte in Atlixco, Puebla, Mexico. It is a secondary level provider and is most closely located to Colonia Flores Magón[1].

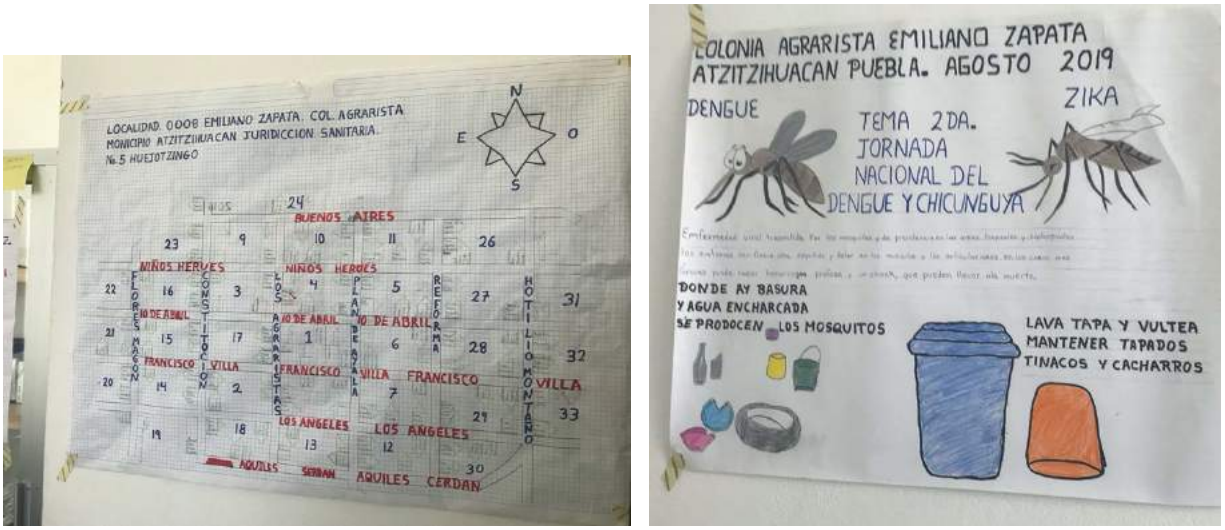
In Santa Ana Coatepec, there are two clinics in the community, a BUAP clinic and an IMSS clinic. Many community members also use Secretaría de Salud Hospital General Río Arronte located in Atlixco. Combis, large public transportation vans, run multiple times a day to Atlixco.

A Secretaría de Salud clinic is located in Xochiteopan, and is staffed with one general physician, who is completing their Social Service requirement, and one to two nurses. This facility was intended for use for both Xochiteopan and Colonia Agrarista community members. The physician present in the clinic is there for six months as a part of their Social Service requirement and after the six month requirement is over, a new doctor resumes the healthcare service distribution (Medcalf, Bhattacharya, Momen, Saavedra, & Jones, 2015). The nurses are present in the clinic throughout the year and help the physician transition by educating the physician about the problems that the community faces. One nurse is currently being paid by the community members due to funding cuts.

[1] Retrieved from: http://municipiospuebla.mx/nota/2015-03-25/atlixco/con-inversi%C3%B3n-de-299-mdp-inauguran-complejo-m%C3%A9dico-en-atlixco

Colonia Agrarista is the smallest community and is located the farthest from a formal healthcare facility, and as such faces unique barriers to receiving healthcare treatment. The center of Colonia Agrarista is approximately 2.6 kilometers from the clinic in Xochiteopan, requiring most residents to either walk, use their horse, or use a car to get to the clinic, as public transportation is not regularly available between the two communities. In Colonia Agrarista, there is a Casa de Salud, which employs one staff member who is a community member. The Casa de Salud has very basic supplies like bandages, medicines, and equipment. After the earthquake, the community built a small building out of cinderblocks to maintain services that was being utilized until August 2019. Since then, the governmental contractors have built a formal Casa de Salud, as seen in photo 2.4, a structure that has a waiting room, one patient bed, and basic supplies. The woman who works there has little formal training and no professional medical education. She is able to provide basic support through handing out medicines, measuring blood pressure, measuring blood glucose, and taking maintaining basic demographic surveys. In photograph 2.2 she is seen speaking with our collaborators and students outside of the previous Casa de Salud.

Photograph 2.2: An employee of the Casa de Salud speaks with team members after discussing her work in Colonia Agrarista. She is a member of the community who works in the Casa de Salud in the afternoons during weekdays (Image taken by Taniel Kilajian, July 2019).



Photograph 2.3: A few examples of the posters in the new Casa de Salud. On the left is a map with all of the houses in Colonia Agrarista. She is tasked with taking demographic surveys including ages of all community members. To the right is a public health poster about mosquitos and how to decrease mosquito breeding (Images taken by Veronica Remmert, October 2019).

Photograph 2.4: The picture above is the new Casa de Salud constructed during August 2019 and finished in early October of 2019. The structure was built by government contractors and replaced a cinderblock room that was created after the Earthquake in 2017 (Image taken by Dr. Peter Ward, October 2019).

Epidemiology

In Mexico, communicable diseases and noncommunicable diseases coexist and are evidence of stratification and systemic inequity. Despite Mexico's status as a middle-income country,

Mexico is entering the advanced stage of the epidemiological transition, much like high-income countries, such that a majority of the disease and injury burden are from noncommunicable diseases. Puebla and other southern states are the least developed and have higher poverty and mortality than the national average as a result of lack of infrastructure and development (Stevens et al., 2008). The rates of noncommunicable disease and injuries were highest in southern states, including Puebla. Within Mexico, noncommunicable diseases caused 75% of total deaths and 68% of total disability- adjusted life years (DALYs). Obesity, high blood glucose levels, and alcohol are the main noncommunicable disease risks in the country. Undernutrition and communicable, maternal, and perinatal diseases caused another 14% of deaths and 18% of disability-adjusted life years (DALY) in the country as whole and are as high as 23% in Southern states like Puebla. In Mexico, leading causes of death are ischemic heart disease, diabetes mellitus type 2, cerebrovascular disease, liver cirrhosis, and road traffic injuries (Stevens et al., 2008).

Since 2000, diabetes has been the leading cause of death in women and is the second leading cause of death in men in Mexico ("Situación de salud en México- Indicadores Básicos," 2001). Diabetes prevalence in Mexico in 2016 reached 9.7% in males and 11.0% in females, where 63.4% of the total population are overweight, 27.6% are obese, and 25.4% are physically inactive (WHO, 2016). It is expected that 11.7 million Mexicans will have diabetes by 2025, emphasizing the need for appropriate public health measures and behavioral health modifications to lower diabetes disease burden (King, Aubert, & Herman, 1998). Diabetes has a large impact on the Mexican health system and infrastructure, as it was the 11th most frequent cause of hospitalization in 2000, where the mean length of a hospital stay is 6.1 days versus 3.5 days for people without diabetes. According to the 1993 National Survey of Chronic Diseases, individuals with the lowest income were the socioeconomic group with the highest prevalence of diabetes.

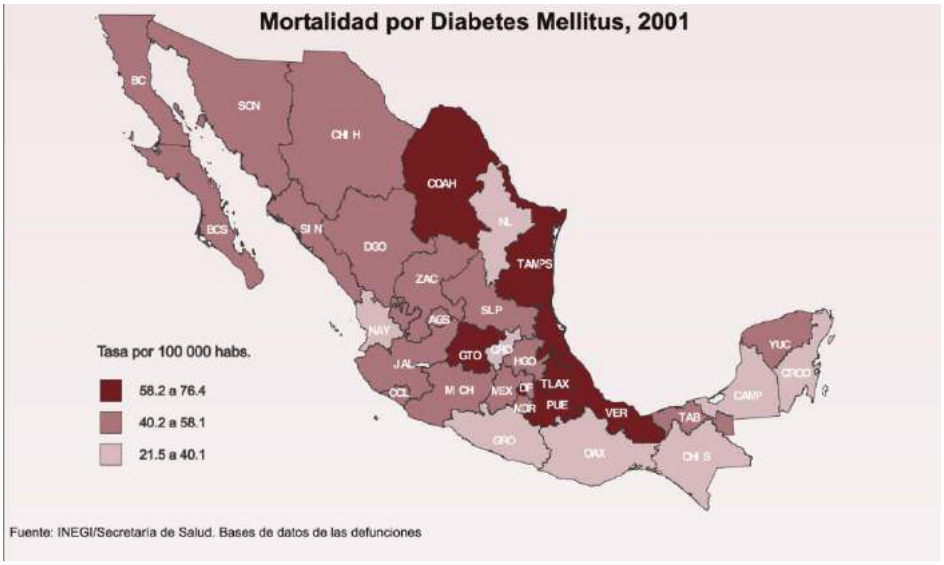


Figure 2.3: Mortality of Diabetes Mellitus in Mexico by state. Puebla is one of the states with the mortality being between 58.2-76.4 per 100,000 habitants("Situación de salud en México- Indicadores Básicos," 2001).

Hypertension is one of the leading causes of mortality in Mexico and from 1996 to 2000 the prevalence increased from 25% to 33.3% (S Barquera, Durazo-arvizu, Luke, Cao, & Cooper, 2008). In 2006, the prevalence of hypertension rose to 43.2% in the country. The significant increase could be related to the aging population and the unprecedented raise in percentage of people who are overweight or obese (Simón Barquera, Campos-nonato, Hernández-barrera, & Flores, 2009), and have type 2 diabetes in the country (Monroy, Peralta, & Esqueda, 2002). In Puebla in 2006, it was found that 40.2% of people had hypertension. The diagnosis rate is also very low because 61.1% of the population with hypertension were not aware of their condition, and only 29% of participants in a study had adequate control (S Barquera et al., 2008). Inadequate education and general lack of knowledge can exacerbate the condition because patients are unaware or lack access to equitable and sustainable treatment and therefore control.

Known Access Issues and Barriers to Care and Quality

In 2000, almost 60% of the population in Mexico did not have access to health insurance despite the goal for universal health coverage. The total health expenditure was low and favored states with higher incomes, leading to inequity in services and access available to low-income Mexicans, especially those that lived in low-income states (Knaul et al., 2012). Individuals often had to make out-pocket costs to pay for medical care, leading to health inequity and larger cost burdens. To ensure the appropriate expansion of healthcare coverage to the poor, the System of Social Protection in Health (SSPH) became incorporated with the national health system, introducing Seguro Popular and universal insurance for informal workers (Gutiérrez, García-saisó, Dolci, & Ávila, 2014).

Results and Discussion

Community-Level Health Challenges

We started the survey by asking respondents to reflect on what they considered to be the biggest health problems affecting their communities. Families reported both specific diseases, namely diabetes, and broader health system issues related to access and quality of care, as the major health problems affecting their communities (Table 2.1). Diabetes ranked in the top three highest perceived problems across all four communities. The other two health problems were broader issues that included “access to care” and the “availability and quality of medicines.” These responses were distinct from health care associated costs, which were reported as a problem but to a lesser degree. Colonia Flores Magnon did not identify the issue related to medicines in the top three, but rather “quality of health care services” generally.

The burden of chronic disease and disability was high among households surveyed. Half (49%) of households surveyed reported a family member with a chronic illness, ranging from 39% in the rural community of Colonia Agrarista, to 57% in the urban Colonia of Flores Magón. Diabetes, hypertension, and musculoskeletal conditions were the top three chronic illnesses reported among families across all four communities. Nearly a quarter (22.5%) of families reported a family member with a disability.

Table 2.1: Perceptions of Health Problems

Pueblos and Sites	San Fco. Xochiteopan	Colonia Agrarista	Santa Ana Coatepec	Colonia Flores Magón
% of Households Reporting a Chronically Ill Household Member	50% (40)	38.88% (21)	50% (30)	56.52% (26)
% of Households Reporting a Household Member with a Disability	50% (40)	38.88% (21)	50% (30)	56.52% (26)
Top 3 Chronic Illnesses in the Households	1. Diabetes 2. Hypertension 3. Musculoskeletal Conditions	1. Musculoskeletal Conditions 2. Diabetes 3. Hypertension	1. Musculoskeletal Conditions 2. Diabetes 3. Hypertension	1. Diabetes 2. Hypertension 3. Musculoskeletal Conditions
Top 3 Health Problems in the Community	1. Access to Care 2. Diabetes 3. Medicine Availability/ Quality	1. Access to Care 2. Diabetes 3. Medicine Availability/ Quality	1. Access to Care 2. Diabetes 3. Medicine Availability/ Quality	1. Diabetes 2. Access to Care 3. Medicine Availability/ Quality

Source: Household Surveys

Diabetes

The national prevalence of diabetes in Mexico in adults was estimated to be 8.9% in 2012 (Meza et al., 2016). Across all four communities, respondents reported a high percentage of diabetes in their families, ranging from an average of 20% in Colonia Agrarista to a high of 39% in Colonia Flores Magón. To further explore the burden of chronic illness, and, specifically, diabetes, we conducted a focus group around this issue in the rural community of Colonia Agrarista. Many people stated that 'el susto' or a strong emotion, can cause diabetes. They shared an example of this perception where a woman was shocked with a surprise birthday party, and then only a few weeks later was diagnosed with diabetes. They stated that 'el susto' was the cause of her diabetes diagnosis. There was also a general consensus that the effects of insulin were similar to an illicit drug. They state that if one uses insulin, a person will get worse, as it makes "people go blind" and is "something that should be avoided." In a key informant interview we conducted with the physician at the first level Secretaría de Salud health center in in San Francisco Xochiteopan, she stated that it is hard for her to treat patients as they often resist changes in medicines because they are scared from the experiences of others. Reasons for these misperceptions may be related to delays in diagnosis, low health literacy, lack of health education and promotion, misinformation spread among community networks, negative experiences with medicines and the health care system, among others. These misperceptions need to be explored further, and future interventions to address diabetes must be culturally appropriate and locally adapted.

Given the significant epidemiologic burden of diabetes, obesity, and metabolic syndrome among the Mexican population, we explored dietary risk factors related to these conditions (Table 2.2). A quarter of families reported drinking sugary beverages, such as soda or juice, daily or most days of the week. Nearly half of families reported eating processed foods, such as cookies, candy, or chips, at least two days per week. The peri-urban community, Santa Ana Coatepec, and the urban colonia, Flores Magón, had higher percentages of reported unhealthy dietary practices compared to the two rural communities. We also asked about the healthy dietary practices of fruit and vegetable consumption. While we did not collect this data in our first surveyed community of San Francisco Xochiteopan, three-quarters of families in the rural community of Colonia Agrarista reported eating fruits and vegetables two days per week or less. We did explore diet and nutrition in a focus group discussion conducted in the rural, agrarian community of San Francisco Xochiteopan. It was clear that most dietary practices are driven by economics. Frijoles (beans) and maize (corn) tortillas are the stable foods, eaten daily, and regularly eating a variety of other foods, including meat, fruits, and vegetables, was unaffordable. It also emerged that while the health risks of sugary beverages were generally known, people simply like the taste and have little inclination to give it up. Also, cultural labor practices nearly require Coca-Cola as a reward for the work done.

Table 2.2: Nutritional Practices

Pueblos and Sites	San Fco. Xochiteopan	Colonia Agrarista	Santa Ana Coatepec	Colonia Flores Magón
% of Households Who Drink Sugary Beverages "Daily" or "Most Days per Week"	14% (11)	24% (13)	30% (18)	30% (14)
Processed Food Consumption (cookies, chips, candy) at Least 2 days per Week	41% (33)	29% (23)	45% (27)	63% (29)
Meat Consumption 2 Days per Week or Less	ND*	98% (54)	73% (44)	52% (24)
Fruit Consumption 2 Days per Week or Less	ND*	78% (42)	27% (16)	26% (12)
Vegetable Consumption 2 Days per Week or Less	ND*	69% (38)	33% (19)	26% (12)

Source: Household Survey

*Question not asked during survey as it was added after this community due to discussion from focus group.

Burden of Other Health-Related Conditions

In addition to chronic disease, we also explored the burden of other health-related conditions, including acute illnesses, injuries and accidents, pregnancy, and mental health (which will be reported in Chapter 3). The two most common acute illnesses were "gripe" (equivalent to a "cold" or "flu") and gastrointestinal illnesses. The latter is concerning, given the high prevalence of unclean water and other hygiene-related issues discovered in the housing

environment, that is discussed in detail in Chapter 5. Pregnancy was relatively uncommon among households surveyed, with only about 10% of respondents reporting that someone in their household had given birth in the last two years, and everyone reported delivering in a health care facility. Severe accidents and injuries were reported by 15% of survey respondents, including those related to cooking, working, falling, or using a motor vehicle. Falls were the most commonly reported accident, which we know disproportionately affects the elderly and can be related to uneven surfaces and other mobility impediments in the home environment (Prince, Corriveau, Hébert, & Winter, 1997). We explore this relationship further among households surveyed in Chapter 5. Overall, while 15% is a relatively low rate, severe accidents and injuries carry a very high rate of morbidity and mortality. They can also be economically burdensome to poor families, due to the potential of extended hospital stays, time spent away from work, and future disability.

Table 2.3: Other Health Related Conditions

Pueblos and Sites	San Fco. Xochiteopan	Colonia Agrarista	Santa Ana Coatepec	Colonia Flores Magón
Top 3 Acute Illnesses	1. Cold/ Flu- 104.94% (85) * 2. Cough- 34.57% (28) 3. Gastrointestinal- 30.86% (25)	1. Cold/ Flu- 70.91% (39) 2. Gastrointestinal- 43.64% (24) 3. Cough- 18.18% (10)	1. Cold/ Flu- 60% (36) 2. Gastrointestinal- 25% (15) 3. Chicken Pox - 18.33% (11)	1. Cold/ Flu- 76.09% (35) 2. Gastrointestinal- 43.48% (20) 3. Cough- 30.43% (14)
Severe Accidents per Household in Past Year				
Yes	12.35% (10)	20% (11)	16.67% (10)	15.22% (7)
No	85.19% (69)	78.18% (43)	83.33% (50)	84.78% (39)
Do Not Know/ DNR **	2.46% (2)	1.82% (1)	0	0
Pregnant Household Member in Past 2 Years				
Yes	13.58% (11)	10.91% (6)	6.67% (4)	13.04% (6)
No	85.19% (69)	87.27% (48)	93.33% (56)	86.96% (40)

Source: Household Survey

*Note that some of the acute illness percentages are greater than 100% because the data was taken per household member, such that multiple members of the household can have the cold/ flu in the past three months.

** DNR= Did not respond

Health Care Utilization and Access

"Access to care" was one of the top three problems related to health across all four communities. Over half of families surveyed reported difficulty accessing health care ("medium" or "very" difficult). The two most communities furthest from Atlixco were San Francisco Xochiteopan and Colonia Agrarista, and both had the highest percentage of people who stated that it was "very" difficult in receiving treatment. Specifically, three-quarters (75%) of respondents in Colonia Agrarista, the most rural community surveyed without any hospital or

clinic in their community, reported this high level of difficulty accessing care. Conversely, the urban Colonia of Flores Magón had the highest number of respondents who stated that it was not difficult to receive treatment (26%). Travel time, transportation costs, opportunity costs associated with travel (i.e., lost wages, need for childcare), distance to trusted provider, and access to medicines are all burdens that rural communities face, impacting their difficulty level in accessing care. Location in relation to healthcare services seems to be an important factor that affects the perceived difficulty in accessing healthcare services. To get to their medical appointments, different modes of transportation were used, including walking, combis (large public transportation vans), and cars, either rented or borrowed. In the peri-urban and urban communities, most people either walked or used a combi to access health care, reflecting the proximity of health clinics and hospitals to these communities, and the presence of public transportation. In San Francisco Xochiteopan, the majority of people walked, as the Secretaría de Salud clinic was right in their community. Others used cars, likely to access private or other specialty services in the urban areas. While there was a combi present in San Francisco Xochiteopan, it only ran to and from the city of Atlixco once a day, making it relatively inconvenient for community members. In Colonia Agrarista, by contrast, most people took a car, because the nearest clinic was several kilometers away in San Francisco Xochiteopan, and there was no public transportation in Colonia Agrarista either. Only 20% of those surveyed in Colonia Agrarista reported owning a personal vehicle, therefore most people would have to borrow a car in order to get to the clinic, likely driving their perceptions of difficulty accessing health care services. The mean time to get to a medical appointment was 50 minutes in Colonia Agrarista, but only 19 minutes in Flores Magón.

Table 2.4: Access to Care

Pueblos and Sites	San Fco. Xochiteopan	Colonia Agrarista	Santa Ana Coatepec	Colonia Flores Magón
Mean Time to Get to Appointments (minutes)	41.6	50.4	26.3	19.4
Principal Mean of Transportation to Medical Appointments				
Bus	1% (1)	0	3% (2)	2% (1)
Walking	51% (41)	36% (20)	27% (16)	43% (20)
Borrowed car	15% (12)	35% (19)	0	4% (2)
Personal Car	12% (10)	11% (6)	23% (14)	17% (8)
Combi	16% (13)	13% (7)	45% (27)	33% (15)
Rented Car	5% (4)	0	2% (1)	0
Difficulty Level in Accessing Healthcare Services				
Not Difficult	20% (16)	11% (6)	23% (14)	26% (12)
Little Difficulty	22% (18)	13% (7)	23% (14)	15% (7)
Medium Difficulty	22% (18)	33% (18)	33% (20)	35% (16)
Very Difficult	35% (28)	42% (23)	20% (12)	24% (11)
Do Not Know / DNR	1% (1)	2% (1)	0	0

Source: Household Survey

Perceptions of Health Care Quality

A significant minority of families interviewed report lack of confidence and dissatisfaction with health care services in their communities (Table 2.5). Respondents from Santa Ana Coatepec had the most confidence and satisfaction in their health care providers and with health care services in their community, respectively. Perhaps this reflects the plurality, and proximity, of health care services, both public and private, in and around this community. Among the two rural communities San Francisco Xochiteopan and Colonia Agrarista, more respondents from San Francisco Xochiteopan reported "little" or "no" confidence in their health care provider (37% vs 22%) as well as lack of satisfaction with the quality of their health care services (57% vs 42%). 63% of respondents from Colonia Flores Magón reported they are not satisfied with the quality of health care services in their community; however, in discussion with community members, it was noted that technically there are no health care providers within the boundaries of Colonia Flores Magón, although the majority of residents use either the private sector or the second-level Secretaría de Salud hospital very nearby in Atlixco.

Table 2.5: Perceptions of Quality of Health Care Services

Pueblos and Sites	San Fco. Xochiteopan	Colonia Agrarista	Santa Ana Coatepec	Colonia Flores Magón
Satisfaction with Quality of Healthcare Services in the Community				
Yes	35%. (28)	55% (30)	53% (32)	30% (14)
No	57% (46)	42% (23)	37% (22)	63% (29)
Do not know/ DNR	8% (7)	4% (2)	10% (6)	7% (3)
Confidence Level in Provider				
No Confidence	2% (2)	3.64% (2)	5% (3)	13% (6)
Little Confidence	35% (28)	18% (10)	13% (8)	20% (9)
High Confidence	62% (50)	76% (42)	80% (48)	67% (31)

Source: Household Survey

Poor quality health care services, both perceived and empirical, is a known problem in Mexico as well as globally (Jha et al., 2013; "Quality governance in a pluralistic health system : Mexican experience and challenges," 2018). The reasons for this are multifactorial and complex. Medicine availability and quality (coded as "medicines, not including cost") was one of the top three community health problems identified by our survey respondents, reflecting difficulty obtaining needed medicines at their clinic visits. This issue was brought up within the focus group discussion on chronic illness (https://lahn.utexas.org/Puebla/App5.html), where members stated that the Secretaría de Salud clinic does not always have the medicines that are needed, forcing patients to go to a pharmacy to buy them. This was particularly taxing for residents of Colonia Agrarista and San Francisco Xochiteopan as neither community has a pharmacy separate from the Secretaría de Salud clinic. During a key informant interview with the Secretaría de Salud clinic physician in San Francisco Xochiteopan, the physician stated that while the clinic has basic medicines, including insulin and Metformin for diabetes, among others, any medication that is not carried in the clinic, or is out of stock, must be purchased at an outside pharmacy and these medicines are not covered by Seguro Popular. Since the clinic is

a public institution, they cannot sell medications that are not covered by Seguro Popular, requiring people to take transportation to another institution or pharmacy to obtain these medicines. Later in the focus group discussion on chronic illness, there was consensus that it sometimes took multiple trips to a provider to get appropriate care, tests, and medicines, which at times was too burdensome to complete. This likely affected community perceptions of quality of their health care services.

Health Care Utilization

To further explore issues related to access and quality of health care, we asked respondents about their families' health care utilization preferences and practices. Nearly everyone we surveyed across all four communities worked in agriculture and generally, in the informal sector. Therefore, nearly all households would be eligible for free primary care services at the Secretaría de Salud through Seguro Popular. However, over one-third of all respondents utilize the private sector as their primary health care provider. In the two rural communities San Francisco Xochiteopan and Colonia Agrarista, 43% and 50%, respectively, use the first level Secretaría de Salud clinic as their primary provider, while 31% and 36%, respectively, use a private practitioner as their primary provider. As noted above, there is a first level Secretaría de Salud clinic in San Francisco Xochiteopan, but the closest private practitioner would be in the city of Atlixco. The peri-urban community of Santa Ana Coatepec has a mixed health care infrastructure, including an IMSS clinic, BUAP nursing clinic, nearby Secretaría de Salud hospital, and several private practitioners in the nearby city of Atlixco. Nearly half (48%) of respondents in Santa Ana Coatepec report using a private practitioner as their primary provider, the highest of any community surveyed. In general, health care utilization was high across all four communities, possibly reflecting the high chronic disease burden among families surveyed. Health care utilization was lowest in Colonia Agrarista, and while they also reported the lowest chronic disease burden, they reported the highest difficulty in accessing care. Therefore, this relatively lower rate of utilization may reflect under-diagnosis related to relatively less access to care. In the other communities, about one-quarter of families report going to a clinic or hospital 3-4 times in the past 3 months, and approximately 10% of families report going to a clinic or hospital more than 5 times in the past 3 months.

Table 2.6: Health Care Utilization

Pueblos and Sites	San Fco. Xochiteopan	Colonia Agrarista	Santa Ana Coatepec	Colonia Flores Magón
Percentage of People who named Primary Level Secretaría de Salud Services as Primary Provider	43% (35)	50% (27)	20% (12)	2.17% (1)
Percentage of People who named Secondary Level Secretaría de Salud Services as Primary Provider	6.17% (5)	5% (3)	3.33% (2)	34.78% (16)
Private Practitioner as a Primary Provider	31% (25)	35% (19)	48% (29)	37% (17)
Household Utilization Frequency in Past 3 Months				
0 times	23% (19)	36% (20)	37% (20)	35% (16)
1-2 times	38% (31)	42% (23)	32% (19)	22% (10)
3-4 times	30% (24)	16% (9)	22% (13)	30% (14)
5+ times	9% (7)	4% (2)	10% (6)	13% (6)

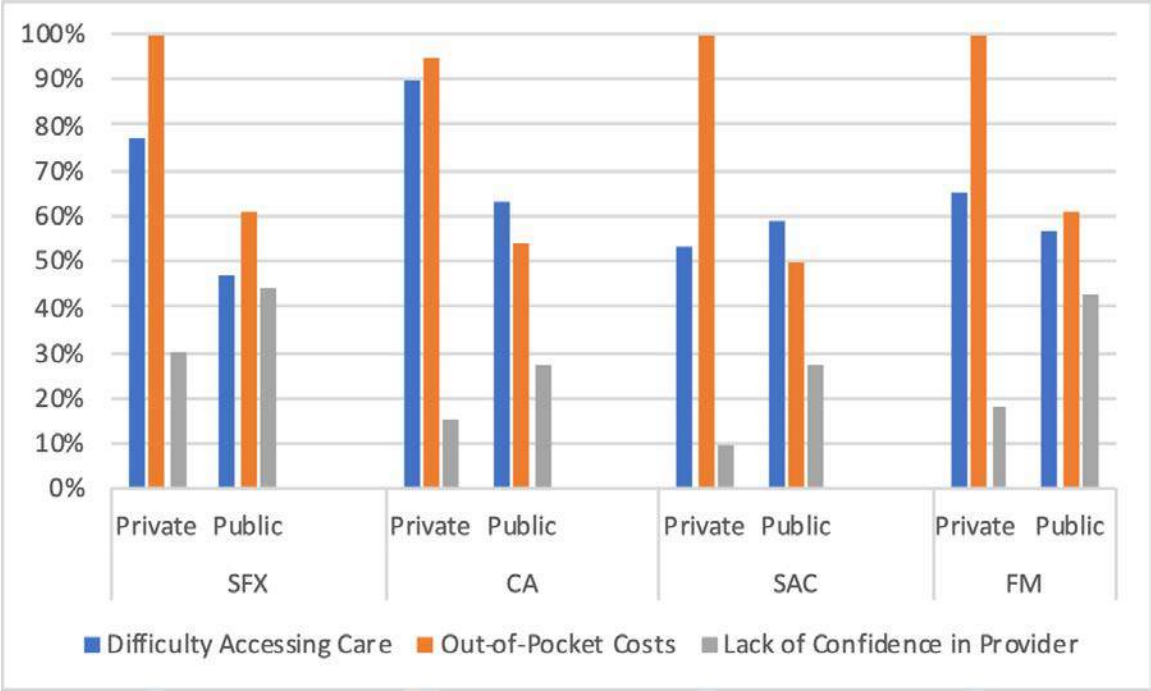
Source: Household Survey

Public vs Private-Sector Health Care Utilization

We conducted a secondary analysis of the data in order to examine perceptions of access and quality according to public-sector vs private-sector utilization preferences. Three-quarters of respondents reported paying "some" of "all" of their health care costs out-of-pocket. Despite universal, public-sector health care coverage for the poor through Seguro Popular and the Secretaría de Salud, Mexico has one of the highest rates of out-of-pocket health care spending among all Organization Economic Cooperation and Development (OECD) countries ("OECD Reviews of Health Systems: Mexico," 2016). This may reflect a multitude of factors, although use of the private sector is a major driver of this. In our survey, among families who reported that their primary provider is a private practitioner, nearly 100% reported paying "some" or "all" of their health care costs out-of-pocket, as seen in Figure 2.4. What's more, nearly 100% of families reported that these out-of-pocket expenditures were difficult financially for their families. In the rural communities of San Francisco Xochiteopan and Colonia Agrarista, families who reported that their primary provider is a private practitioner had a much higher rating of "difficulty accessing health care" compared to families who identified the public sector as their primary provider. Furthermore, respondents who identify a private practitioner as their primary provider report higher use of cars or combis to get to their medical appointments, compared to those who identify the public-sector as their primary provider, who report higher rates of walking. Use of cars or combis for transportation reflects the need to travel longer distances to access care and incurs additional costs for families. Perhaps reflective of these higher costs and access issues, respondents who reported a private practitioner as their primary provider utilized health care services less frequently in the past 3 months than those

who reported the public-sector was their primary provider. In conversation with respondents during and after the survey, we heard repeatedly that most people use over-the-counter medicines to care for acute illnesses instead of receiving care from a provider, in order to minimize out-of-pocket costs. During the focus group on chronic illnesses in Colonia Agrarista(https://lahn.utexas.org/Puebla/App5.html), some people stated that it was very difficult to get an official diagnosis for chronic illnesses. One woman stated that her husband had to go to many different appointments and pay over 5,000 pesos ($250 USD approximately) to see a private specialist and receive a diagnosis. In the public sector some participants of the focus group stated that they needed many different referrals and appointments to have the issue resolved. It became evident during the focus group that many people have to go Hospital General Rio Arronte to have laboratory tests done, sometimes requiring them to return multiple times to get an official diagnosis and treatment plan.

Across all four communities, however, families who identified the private sector as their primary provider rated higher confidence in their health care providers. This is important, as higher degrees of confidence and trust in health care providers can promote improved health outcomes (Birkhäuer et al., 2017). Given that one-third of families, entitled to free public sector primary care, prefer the private sector as their primary provider, and despite high and financially burdensome rates of out-of-pocket health care expenditures, and more difficulty accessing care private sector care, lack of confidence in providers seems to be a greater driver of health care utilization patterns than geographic proximity and cost.

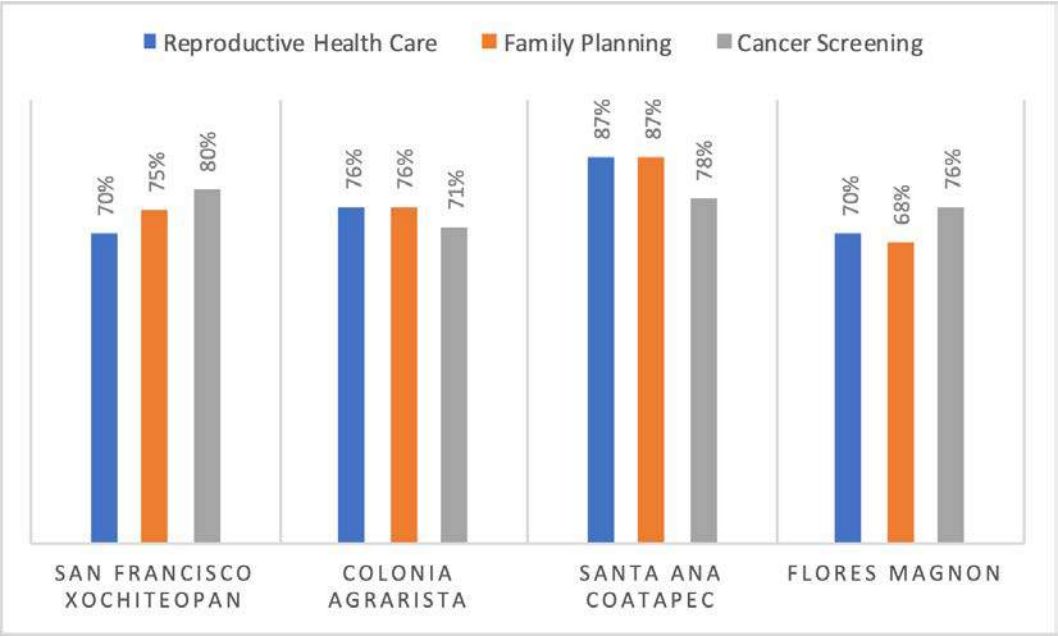


Source: Household Survey

Figure 2.4: Perceptions of Access and Quality of Care According to Public-sector vs Private-sector Utilization.

Women's Health

Lastly, we asked respondents about their perceptions of access to women's health care services (Figure 2.5). Specifically, we asked whether respondents thought there was adequate access to sexual and reproductive health care services, family planning, and breast and cervical cancer screening in their communities. In general, responses were favorable, with over 70% of respondents saying there was adequate access to these women's health care services in their communities. Over 80% of respondents in Santa Ana Coatepec responded favorably to these questions. While perceptions of access to women's health care services was generally good, this stands in contrast to perceptions of general primary care services in the community, as described above. This may be due to the presence of mobile campaigns promoting breast and cervical cancer screening (Photograph 2.5) or a multitude of other factors which will require more empiric studies. Consistent with community perceptions, cervical cancer screening rates in Puebla, Mexico are quite high (Bruni et al., 2019). However, the age-standardized incidence rate of cervical cancer in Puebla was 11.0 per 100,000 women in 2018, much higher than would be expected with this strong screening uptake ("U.S. Cancer Statistics Working Group", 2018). The leading causes of cancer mortality in Mexican women are breast and cervical cancer (Mohar-Betancourt, Reynoso-Noverón, Armas-Texta, Gutiérrez-Delgado, & Torres-Domínguez, 2017). And breast and cervical cancer both continue to be one of the top five leading causes of death among women in Mexico (Knaul et al., 2008). Cervix cancer is still more common among lower socioeconomic women but breast cancer is steadily increasing and closing the gap (Knaul et al., 2008). Therefore, the discrepancies between reported screening rates, disease incidence, and mortality warrants further investigation.



Source: Household Survey

Figure 2.5: Perception of Access to Women's Health Care Services

Photograph 2.5: Mobile Mammography Campaign for Breast Cancer Screening in San Francisco Xochiteopan (Image taken by Dr. Tim Mercer, 2019).

Conclusion

We conducted a broad, community health needs assessment of 242 household in four low-income communities, accompanied by pragmatic and responsive focus group discussions and key informant interviews to more deeply explore the health issues that emerged from the household survey. Through this methodology, we discovered both known, and novel, information about the health of these communities, including nuanced and detailed differences between each community.

This section of our community health needs assessment explored the following health-related categories (mental health and environmental health are reported in other chapters):

- Health Problems and Challenges
- Diabetes
- Nutrition
- Perceptions of Access and Quality of Health Care
- Health Care Utilization
- Women's Health

In general, we found a high burden of chronic disease, specifically diabetes, difficulty accessing care, perception of poor quality of care, and higher than expected rates of private sector health care utilization. More specifically, our main findings include the following:

- The burden of chronic illness and disability is high: approximately 50% of households report a family member with a chronic illness and 25% of households report a family member with a disability.
- Diabetes, Hypertension, and Musculoskeletal conditions were the top three chronic illnesses in the family identified in all four communities.
- Diabetes, Access to Care, and Medicine Availability/Quality were the top three health problems identified across all four communities.

- There were significant misperceptions on the causes and treatment of diabetes among community members including about causes and treatment.
- Unhealthy nutritional practices that increase risk for diabetes were relatively common, and health nutritional practices were not as common as is recommended, and this was more pronounced in rural communities, possibly a marker of poverty.
- Almost all respondents surveyed were eligible for Seguro Popular and entitled to free primary care at the Secretaría de Salud, but nearly 1/3 identify a private practitioner as their primary provider.
- The majority of families surveyed reported difficulty accessing health care in all four communities.
- Approximately 3/4 of families reported paying out-of-pocket health care costs, and over half of these families reported paying these out-of-pocket costs as financially difficult for their families.
- Over 1/4 of respondents reported little or no confidence in their health care provider.
- Respondents who identified a private practitioner as their primary provider had higher rates of paying out-of-pocket costs and rated access care more difficult, compared to respondents who identified a public sector practitioner as their primary provider. Those who identified the public-sector as their primary provider had higher rates of rating a lack of confidence in their provider, compared to those who use a private practitioner.
- Perception about access to women's health care services was generally good, although this stood in contrast to poorer perceptions about access to general primary care services in the community.

We hope this information will be useful to local stakeholders, including community-based organizations, academic institutions, and government in planning future research, health interventions, or health-related policies. This information may also be useful for people living or working in other poor, rural communities throughout Mexico and Latin America. These findings illustrate the importance of engaging with communities to develop a deep understanding of their needs and priorities. Addressing these needs will require a combination of further research, education, clinical care, public health interventions, and new policy proposals. This community health needs assessment galvanized the start of an academic global health partnership between UT and BUAP that will adapt the Academic Model Providing Access to Healthcare (AMPATH) paradigm to work with communities and public-sector health care delivery systems to improve population health outcomes.

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