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Doc in the Box: Diabetes Care and Management during COVID-19

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2. Abstract

Of patients with COVID-19, 94 percent of deaths are patients with pre-existing conditions of pneumonia, hypertension, and diabetes. Current research shows the comorbidity of patients with COVID-19 and Type 2 Diabetes. Despite a growing literature on the interaction of these two diseases, most research focuses on physiological interactions. There remains a pressing need for research on the biosocial mechanisms contributing to the interaction between Diabetes and COVID-19. This research focuses on the social conditions constructed during COVID-19 that influence the care and management of Type 2 Diabetes. To investigate the topic, I conducted interviews with healthcare providers and community leaders in Taos New Mexico, having rates of Type 2 Diabetes higher than the national average. I argue that the transfer of diabetes care to online platforms changes the doctor-patient relationship and diminishes the human connection and empathy needed for effective chronic disease care. The subsequent lack of human interaction and the resulting isolation and alienation during the pandemic hinders the necessary lifestyle changes for managing Type 2 Diabetes. The drastic changes in daily life and community roles transform and limit the mechanisms to which we create meaning, leaving diabetic patients the task of constructing new meaning while managing a chronic disease. The high rates of morbidity among COVID-19 patients with diabetes motivate research into the social factors affecting the disease interaction.

3. Introduction

"I've saved a fortune of Kleenex. Before, there were a lot of hugs and counseling and Kleenex. Now they just cry alone and buy their own Kleenex," says nurse and diabetes educator Mary Chavez of The Salvation Hospital Diabetes Self-Management Team. This year marks Chavez's 32nd year working on diabetes management in Taos County. Chavez's interest in diabetes management began during her work at the Navajo Nation when high rates of Type 2 Diabetes began to emerge, but the limited medical knowledge and education about the disease hindered patient treatment. After moving to Taos, Chavez witnessed the same absence of medical knowledge and education complemented by the high rates of Type 2 Diabetes. The high diagnosis rate, rurality of the town, and minimal available treatments spurred Chavez's commitment to diabetes care in Taos. Chavez stresses the importance of human touch, interaction, and support for managing diabetes. However, the onset of the COVID-19 pandemic thwarted the self-management program's work, forcing them to adopt telehealth services and stripping their patients of face-to-face interaction and support.

During the SARS-CoV-2 (more commonly known as COVID-19) pandemicⁱ, Type 2 diabetic patients confront a higher risk of complications and morbidity if contracting the virus (Barron et al. 2020: Chee 2020: Erener 2020: Guo et al. 2020). The death toll of COVID-19 in the US surpassed 500,000 people and continues to growⁱⁱ. However, the CDC predicts that 94 percent of deaths from COVID-19 are associated with pre-existing conditions (Centers for Disease Control and Prevention 2019). A population-wide study done in England assessing the number of COVID-19 hospital deaths and diabetes status, conducted from March through May of 2020, shows that of the total COVID-19 deaths,

one-third of the deceased had diabetes (Barron 2020). Diabetes is among the highest risk factors for death from COVID-19 infection.

There is a growing body of research on the comorbidity of Type 2 Diabetes and COVID-19. However, most research focuses on the biophysical aspects and biological mechanisms responsible for increased risk of morbidity (Barron et al. 2020: Chee 2020: Erener 2020: Guo et al. 2020). The current body of research fails to account for the biosocial factors influencing COVID-19 and Type 2 Diabetes comorbidity. When doing a systematic search, on the database Web of Science, of COVID-19 and Diabetes, there are 4,300 literature results. However, only 850 of the articles were publications from the social sciences and only 27 anthropological publications. This research will add to the current small body of anthropological literature on COVID-19 and Type 2 Diabetes.

The introduction of SARS-CoV-2 to the United States sent citizens home for periods of isolation. The virus's burden hit the US economy, leading to unemployment and financial insecurities across the country (The New York Times 2020). Following quarantines, employers, businesses, schools, and clinics implemented online platforms for work, social connection, learning, and healthcare services to limit human contact (Soto-Acosta 2020). Along with the alternative technological platforms for patient care, the drastic changes to societal functions disrupt the roles and activities we use to derive meaning in everyday life. For patients with Type 2 Diabetes, the diagnosis and treatment of the disease may already interrupt such roles, forcing diabetics to shift and transform previous roles to align with the new lifestyle changes they must adopt to manage their diabetes. Efforts to contain the spread of The Coronavirus changed society, including the way diabetics must manage their disease.

During the pandemic, diabetic patients must navigate a new healthcare system. To examine how changing the social conditions constructed during COVID-19 affect the care and management of Type 2 Diabetes, I conducted interviews with healthcare providers and community leaders in Type 2 Diabetes in Taos, New Mexicoⁱⁱⁱ. For people with Type 2 Diabetes, diagnosis, care, and management of the disease demand long-term lifestyle changes in diet, exercise, and interaction with the medical community (The Mayo Clinic, 2020). Virtual healthcare dilutes the patient-doctor relationship, diminishes the trust between patient and physician, and impedes humanistic and supportive healthcare. The shift in healthcare services and the COVID-19 precautions that limit the lifestyle change needed in the control of diabetes both serve as changes resultant of the COVID-19 pandemic that contribute to the comorbidity of COVID-19 and Type 2 Diabetes.

Although a vaccine spurs hope for the end of social precautions necessary for COVID-19, the slow roll-out of the vaccines in the United States and the rising number of cases and deaths indicate the continuation of online care and social precautions through 2021 (Triesman 2021). Prolonged social distancing and online healthcare will affect the ability of diabetic patients to manage their disease effectively. Expanding the research on the social ramifications of COVID-19 on diabetic patients bolsters our knowledge of the barriers patients face during the pandemic. This research can serve in creating and implementing services designed to mitigate the social burdens on diabetic patients during COVID-19 and lessen the comorbidity of a deadly mix.

4. Comorbidities and Syndemics

Having an interest in the social dimensions of infectious disease during the current COVID-19 pandemic, I chose to construct my research question around the comorbidity of chronic disease and COVID-19. After conversations with local healthcare workers and self-guided research, I narrowed the breadth of inquiry to the prevalence and management of Type 2 Diabetes during COVID-19. Assuming myself to be what anthropologist Barry G. Glaser (1965) terms a novice researcher, “ill-equipped with enough knowledge to develop lenses of conceptual and theoretical frameworks that accurately pinpoint a social process or phenomenon,” I concentrated my initial research on the existing literature framing diabetes and COVID-19 (95). I read previous medical anthropological literature on Type 2 diabetes in varying settings and literature on the anthropology of infectious disease, including research by medical anthropologists Emily Mendenhall, Merrill Singer, and Jo Weaver. My research aided in producing a framework and knowledge base for effective research and informant questioning.

Biomedical practice prioritizes treatment of one pathology. The Center for Disease Control and Prevention website provides “A Disease and Condition Index A-Z” with each disease and condition listed accompanied by a short description of the disease and common treatments. The Index assumes disease to be causal by a singular agent, requiring discrete treatment that spans all populations, environments, and contexts (Singer 2003). As described by medical anthropologist Emily Mendenhall (2016), “prioritizing unidirectional pathologies remains pervasive in the halls of biomedicine and public health” (462). Viewing disease as a singular entity does not satisfy the complexity of them we see in the modern world.

However, research on the social sciences urges the biomedical world to shift to a more holistic approach, with new concepts and terminologies to describe disease resulting from multiple agents and dependent on environmental and social factors (Weaver et al. 2016). Singular causes and treatments cannot accurately account for the variety of factors responsible for the disease.

Although biomedicine still primarily focuses on discrete ontologies, there is a growing awareness of the necessity to research and understand “multi-causal disease agents” (Weaver et al. 2016). The term *comorbidity* arose in the 1970s, but only to describe the misunderstood prevalence of multiple chronic diseases. Time and new ideas of disease complexity led to the working definition of *comorbidity* as “two or more concurrent diseases in one patient, but without a necessary reference to the severity of one or both” (Weaver et al. 2016). Comorbidities are everywhere and all around us: HIV/AIDS and tuberculosis, Asthma and Influenza, and now, COVID-19 and Diabetes.

The pervasiveness of comorbid diseases identified in clinical practice informs the biomedical definition of a syndemic being “two or more epidemics interacting synergistically and in their interaction contributing to excess burden of disease in a population” (Singer 2003). Anthropologist Merrill Singer extended the definition of syndemics to include non-medical issues, informed by the theory of political economy. Identifying disease spread within a population as dependent on social conditions in his research, Anthropologist Merrill Singer (2000) defined a syndemic as:

A set of closely intertwined and mutual enhancing health problems that significantly affect the overall health status of a population within the context of the perpetuating configuration of noxious social conditions.

Before framing his syndemics theory, Singer spent time studying the biosocial factors in human health through his work on the interactions between drug abuse, AIDS, and violence in the inner-city populations of Hartford, Connecticut (Singer 2000). Publishing his findings in his paper "A Dose of Drugs, A Touch of Violence, A Case of AIDS: Conceptualizing the SAVA Syndemic," Singer theorizes the interrelatedness of AIDS contraction and treatment with the social determinants of violence and drug use. He argues that endemics and epidemics are "strongly influenced and sustained by a broader set of political-economic and social factors" (Singer 2000). Singer's research shows a correlation between drug use and violence. Certain drugs, including marijuana, alcohol, heroin, and cocaine, show evidence of causing increased aggression and violence. After establishing the connection between drug use and violence, he expands the link to include AIDS. Citing violence as having a role in AIDS transmission, Singer discusses the likelihood of AIDS being contracted via a form of violence such as rape or sexual abuse. Concluding their inseparability, Singer refers to the interactions between the three determinants (violence, drug use, and AIDS) as SAVA. Singer proves violence and drug use as social factors in inner-city life, integral and relevant to assessing AIDS.

Singer's approach to health incorporates theoretical ideas related to the political economy of health, which Morgan (1987) defines as:

a macro analytic, critical and historical perspective for analyzing disease distribution and health services under a variety of economic systems, with particular emphasis on the effects of stratified social, political and economic relations within the world economic system.

Within the framework of political economy of health, Singer's approach reflects ideas from dependency theory focused on colonialism and capitalism as determinants of health communicated through "poverty, underdevelopment and disease" (Morgan 1987).

Dependency theory compares the developed world to the underdeveloped world, emphasizing the stark difference between the health quality of the two (Morgan 1987). The theory proposes the deliberate “underdevelopment” of regions and geographies rich in natural resources to preserve capitalist production. Dependency theory can explain the health inequity and underdevelopment of regions and nations in relation to capitalist ideologies and production (Morgan 1987). Singer uses dependency theory to conclude that structural barriers to healthcare in underserved and impoverished populations have more of an effect on disease control than clinical treatment, challenging the reductionist biomedical view and treating disease as discrete biological entities (Singer et al. 2017).

In this research, I employ Singer’s framework of syndemics informed by dependency theory to explore the biosocial determinants of Type 2 Diabetes and COVID-19 interaction and comorbidity. This research challenges comorbidity of T2D and COVID-19 as solely dependent on physiological mechanisms. Research surrounding diabetes, obesity, and COVID-19 outcomes shows higher hospitalization rates, ICU admission, ventilation, and morbidity among Type 2 diabetic patients, suggesting the two diseases to be synergistic (Lima Martinez et al. 2020). As the pathophysiological mechanism, underlying interaction between COVID-19 and Type 2 diabetes continues to emerge, existing studies show high expressions of ACE2 in fat tissue, the COVID-19 receptor, that could explain the increase in viral load of COVID-19 in a diabetic patient (Lima Martinez et al. 2020).). This research does not ignore the pathophysiological interaction of COVID-19 and Type 2 Diabetes but unveils the social phenomenon that constructs the biological interaction of T2D and COVID-19.

I argue that Singer's syndemic theory and dependency theory provide an optimal framework for studying the comorbidity of COVID-19 and Diabetes in Taos, New Mexico. Rural, poor, and home to majority ethnic minorities, social determinants and historical subjugation of minority cultures for capital gain largely determine population health and healthcare access in New Mexico. Taos' cultural and ethnic history forge what anthropologist Sylvia Rodriguez coins a "Refuge Region" (Rodriguez 1997). A "rugged, isolated geographical zone, where marginal ethnic enclaves persist in subordinated relation to members of national society" (Rodriguez 1997). The underdevelopment and large population of ethnic minorities, make Taos an optimal place to study the biosocial factors affecting the comorbidity of Type 2 Diabetes and COVID-19, utilizing the syndemic approach.

5. Background

I. Diabetes

Often referred to as an epidemic, Diabetes affects an estimated 34.2 million people in the United States, with 90 to 95% of the cases being Type 2 Diabetes (Center for Disease Control 2019). Type 2 Diabetes is the number one cause of non-congenital blindness, non-traumatic amputations, and chronic renal failure. Although Type 2 Diabetes occurs most frequently in adults, there are a growing number of cases in children, teenagers, and young adults (Center for Disease Control 2019). Type 2 Diabetes is a disease categorized by decreased insulin production in beta cells and insulin resistance, although the relative contributions of the two remain disputed and may vary per individual (Scheen 2003). Diabetes has been called our nation's epidemic.

Like with COVID-19, Diabetes is comorbid with a variety of conditions^{iv}. Type 2 Diabetes (T2D) has high comorbidity with heart disease, which is the number one cause of death among adults in the US (American Diabetes Association 2006). Diabetes also has a known history of comorbidity with Tuberculosis (TB). An estimated 15% of Tuberculosis cases are attributable to T2D, exceeding the number of TB cases attributable to HIV/AIDS (Christiana 2019). Diabetes comorbidity with other conditions makes treatment and management of the disease central to maintaining health.

The causes of Type 2 Diabetes depend on genetic and environmental factors. Contrary to popular belief, there is a genetic disposition for developing Type 2 Diabetes. Studies show that the genetic heritability may range from 20-80%, depending on the person (Ali 2013). When an individual has one parent with T2D, they may have up to a 40% chance of getting the disease. Having two parents with the condition may increase risk up to 70% (Freedman and Murea 2012). Previous studies link two genes as possible causes in developing Type 2 Diabetes, calpain 10 (*CAPN10*) and transcription factor 7-like 2 (*TCF7L2*) (Ali 2013). Calpain 10 codes a cysteine protease that plays a role in cell remodeling. Multiple studies show a link between T2D and different gene variants, although calpain 10 exact role in blood-glucose levels remains unclear (Ali 2013). Furthermore, variations in alleles in transcription factor 7-like 2 confirmed in multiple studies show the strongest linkage to developing Type 2 Diabetes.

Although genetic factors play a role in disease development, other familial clusters of T2D may relate to epigenetic factors inherited and passed on through generations (Ali 2013). Common environmental risk factors for developing diabetes include being overweight or obese, stress, lack of physical activity, and diet. Being

overweight or obese may increase the likelihood of cells becoming insulin resistant, as excess fat decreases insulin-producing cell's responsiveness to insulin (Freedman and Murea 2012).

The primary treatment for Type 2 Diabetes is simple in theory: change in diet and exercise. The standard biomedical practice utilizes various tests to diagnose T2D: A1C, Fasting Plasma Glucose, and Oral Glucose Tolerance Test with numerical standards to diagnose Type 2 Diabetes (see Figure 1). Once sugar levels exceed the cut-off values, although insulin injection and non-insulin medications help manage the disease, doctors' main recommendation is lifestyle change (American Diabetes Association).

Category	A1C
Normal	less than 5.7%
Pre-diabetic	5.7% to 6.4%
Diabetic	6.5% or higher

Figure 1.1: American Diabetes Association standard for Diagnosing T2D by A1C.

Result	FPG
Normal	>100 mg/dl
Pre-diabetic	100 mg/dl to 125mg/dl
Diabetic	126 mg/dl or higher

Figure 1.2: American Diabetes Association standard for Diagnosing T2D by Fasting Plasma Glucose (FPG).

Result	OGTT
Normal	> 140 mg/dl
Pre-diabetic	140 mg/dl to 199 mg/dl
Diabetic	200 mg/dl

Figure 1.3: American Diabetes Association standard for Diagnosing T2D by Oral Glucose Tolerance Test (OGTT).

II. Diabetes in New Mexico

With the high rates of obesity in New Mexico, high rates of Type 2 Diabetes come as no surprise. Approximately 11.6% (184,000) of New Mexicans have diabetes, and another 53,000 people are suspected of having diabetes without a diagnosis (American Diabetes Association 2020). The New Mexico Department of Health's annual report from 2019, "How New Mexico Compares," ranks New Mexico ranks 47th among states for diabetes deaths. The number of diabetes death vary based on race and ethnicity, with the highest rates of diabetes among Black and Native American populations (New Mexico Department of Health 2020).

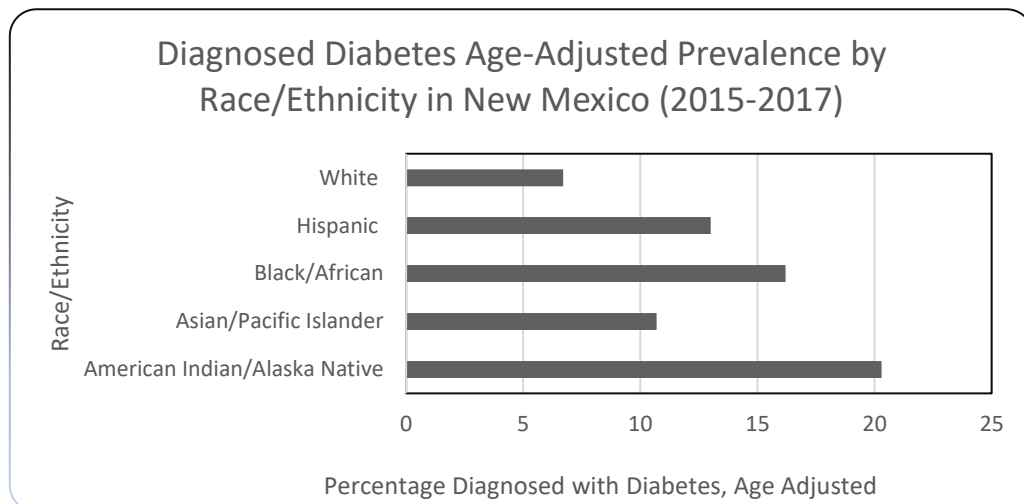


Figure 2: Diagnosed Diabetes by Race/Ethnicity in New Mexico measured by the New Mexico Department of Health.

Managing Diabetes is expensive, and the 184,000 New Mexicans with Type 2 must pay for treatment costs. Diabetes is expensive. Those who suffer from the disease have 2.3 times higher medical expenses than those without diabetes (American Diabetes Association 2020). The state estimated spending 5 million dollars in 2017 on direct medical expenses for people with diabetes. In addition, there are indirect costs related to

loss of productivity due to diabetes. Indirect costs may result from: increased absenteeism, reduced productivity, inability to work, and lost productive capacity due to early mortality (American Diabetes Association 2020). The mere cost of managing the disease is a barrier to effective care and management of diabetes.

III. Inequalities, Health and Diabetes

Socioeconomic barriers and health inequalities are primarily to blame for the high rates of Type 2 Diabetes in the state. New Mexico continually ranks as one of the poorest states in the US. However, poverty and underdevelopment described New Mexico before the 21st century. New Mexico's distance from central authority during Spanish and Mexican rule did not change after annexation to the United States. Social stratification existed within the Spanish caste system, but wealthy American artists added another class to the social hierarchy (Rodriguez 1989). The economic incentives of cultural and ethnic preservation and difference intensified already existing social and societal inequalities. By the 1930's New Mexico was dependent on the federal government. During the Depression, most of New Mexico's wealth belonged to whites, leaving Hispano and Native American communities in economic hardship (Rodriguez 1989)^v. Distance and federal policies perpetuated economic and social disparities among the Hispanic and Native American population in Taos. Theodore Roosevelt's National Civilian Conservation Corps (CCC) employed many Hispanic-American men from small northern new Mexican towns, forestalling migration to urban areas and boosting the economy (Montoya 1995). However, reformers encouraged the commercialization of traditional arts and handicrafts, bolstering Northern New Mexico's dependence on tourism for

economic stability and deepening cultural and ethnic boundaries (Montoya 1995). New Mexico current social and economic inequalities echo the inequalities shaped historically.

Reliance on the federal government and ethnic, social, and economic disparities still describe New Mexico in the 21st Century. In 2014, 20.4 % of the New Mexican population was living in poverty. Since 2014, the poverty rates have decreased but New Mexico remains 49th in the nation behind Mississippi, with 18.2% of New Mexicans living in poverty today (Krasnow 2016; US Census Bureau 2020). New Mexico is a diverse state with a majority-minority population. Less than half the population is non-Hispanic white, with 48% of the population identifying as Hispanic and 9.5% identifying as Native American. Of the total population, 9.4% are immigrants (the majority being Mexican immigrants) (Despres 2017). Poverty rates measured by race show that poverty disproportionately affects minorities in the state, with 1/3 of Native Americans and African Americans living in poverty (New Mexico Department of Health. Furthermore, New Mexico continually ranks the worst states to raise a family and highest in child poverty, with approximately 30% of New Mexico's children living in poverty (Linthicum and Villagran 2018). Inequalities in New Mexico run across racial and ethnic lines.

Although New Mexico's past informs the ethnic disparities that perpetuate into the 21st century, other factors unique to the current social and economic framework contribute to the high poverty rates. For having the 5th largest land area in the US, New Mexico has a small population of 2 million. New Mexico's population in relation to size limits the allocation and spread of resources in the state. The small population generates a limited tax base compared to more populated states, instigating New Mexico's dependence on the federal government (Galvin 2017). Tax revenue continues to shrink as

the working class moves out of New Mexico, contributing to a stagnant economy. The prominence of the oil and gas industry and the lack of other industries limit the company's incentives to invest in New Mexico. However, as the working class leaves and tax revenue decreases, the motivation to invest will only continue to drop. Between 2010-2016, the US Census reported 53,000 people moving out of New Mexico. Although the state population grew by 22,000 or 1.1% in the same six-year time frame, most people moving into the state were under 29 or over the age of 60 (Galvin 2017).

Historical and current ethnic relationships and statewide indicators inform the recorded measures of human health in New Mexico. Healthcare inequalities persist in health status, health behaviors, health outcomes, and access to healthcare that impact New Mexicans perceptions of individual health, trust in the healthcare system, and tendency to seek out medical care for chronic diseases.

An individual's perception of their health often foretells actual health. Data from the Behavioral Risk Factor Surveillance System (BRFSS), measuring individual perceived health status, reports that one out of every five New Mexicans say they have "fair or poor health" (Despres 2017).^{vi} However, the responses exist along ethnic lines, with Hispanos being twice as likely to report "fair or poor health" as whites and Native Americans twice as likely to say "fair or poor health" as Hispanos. Responses also varied by the environment, with 26.7% of people in rural communities reporting "fair or poor health" compared to 21.5% in urban areas (Despres 2017). The BRFSS addresses the insufficient health levels felt by New Mexicans and the widespread health disparities decided by ethnicity.

Health indicators of obesity, physical activity and nutrition also show inequalities by race and ethnicity, with high numbers of obesity across the state (National Center for Health Statistics 2016). One in three adults is obese in New Mexico, ranking 33rd for obesity rates (Despres 2017). There are also high rates of childhood obesity in the state, with one out of four children between the ages of 10-17 being obese in 2016 (Despres 2017). Native Americans have the highest rates of obesity, followed by Hispanics and then whites (Despres 2017). High rates of obesity across a population can increase the risk of severe health conditions as the population ages. Obesity can often lead to the development of Type 2 Diabetes.

All or parts of 32 of New Mexico's 33 counties are considered primary health care coverage shortage areas. New Mexico has an inadequate number of primary healthcare providers for the population size (New Mexico Department of Health 2017). Although New Mexico's number of uninsured residents has decreased between 2011 and 2016, the number of uninsured adults (18-64) in New Mexico still exceeds the national average, with 26.1% of the New Mexico population uninsured and a national average of 21.3%. However, the margin of children covered in New Mexico and those covered in the nation remains almost equal, with 6.1% of children in New Mexico uninsured and 6.0% uninsured in the nation (New Mexico Department of Health 2018). The lack of primary health care providers in New Mexico and the level of rurality in New Mexico creates long distances that people must travel to access healthcare clinics, primary care, or hospitals. Similar to other health indicators in the state, access to healthcare also runs along ethnic and racial lines with and White (94.8%) adults were more likely than American Indian (92.5%), Black or African American (88.4%), and Hispanic (85.3%)

adults to have health care coverage (New Mexico Department of Health 2018). With healthcare shortages in the state, accessing adequate diabetes care is yet another factor that feeds the diabetes epidemic in the state.

IV. A Prickly Pear atop a Cactus

Now Diabetic New Mexicans confront managing their Diabetes during the global COVID-19 pandemic. Coronavirus Disease 2019 (COVID-19) is a new coronavirus first identified in Wuhan, China, in December 2019 (Centers for Disease Prevention and Control 2020). Coronaviruses constitute a large body of virus's common among humans and many other species, including bats, cats, camels, and cattle (Centers for Disease Prevention and Control 2020). Coronaviruses in humans are often associated with upper respiratory infections. The novel coronavirus or COVID-19 is thought to have come from bats, eventually spreading to humans. However, the virus's exact source has not been identified (Centers for Disease Control, 2019). The first identified case in the United States occurred in Washington State on January 21st, 2020, where a man returning from Wuhan, China, was hospitalized from the virus (Al Jazeera 2021). By mid-march, the US reported 100 deaths from the virus and cases in every state (Al Jazeera 2021). States began announcing closures in schools, public buildings, and cancellations of large gatherings when President Donald Trump issued a state of emergency on March 13th, 2020 (Al Jazeera 2021). By September, the United States surpassed 200, 000 deaths (Al Jazeera 2021). In December, two vaccines created by Pfizer and Moderna were sent to the FDA for approval of emergency distribution, with the first vaccine being given to a nurse in New York on December 14th, 2020. On February 22nd, the United States

reached 500,000 deaths, more than WWI, WWII, and the Vietnam war combined (Al Jazeera 2021).

On March 11th New Mexico reported the first case of COVID-19 in the state (KRQE News 2020). Only two days after, New Mexico Governor Michelle Lujan Grishman implemented school closures and banned all large public gatherings in response to the virus' presence in New Mexico (KRQE News 2020). By the end of March, New Mexico had limited all social gatherings to 10 people, demanded all non-essential workers work from home, and limited restaurants to take-out and delivery to contain the spread of the virus (KRQE News 2020). On March 23rd, the governor announced the stay-at-home order for all New Mexican citizens. The order lasted on May 15th, making it a longer stay-at-home order than in other states. New Mexico saw some surges in cases in the summer and the fall, but many cases and fatalities remain low compared to surrounding states (KRQE News 2020). Despite New Mexico's high poverty levels, aging population, and widespread liver disease (a risk factor for COVID-19), the state, compared to other states, averted a high death toll and number of cases (Romero 2020). Besides the social factors putting New Mexico at risk, the state has the lowest number of ICU beds per capita in the country (Romero 2020). The lack of medical resources and health inequalities felt by diabetic patients only grow during the pandemic's uncertainty.

To apply syndemic theory and dependency theory, we must analyze the historical foundations and interactions that inform the economic underdevelopment of the Taos today. By analyzing where and how Taos fits into the larger history of New Mexico and the nation, we can assess the factors that kept the town largely underdeveloped compared

to other areas of the nation. When applying dependency theory, we can see how historically, wealthier classes in Taos have kept minority populations in subservience and inform the current social and economic inequalities relevant to Type 2 Diabetes and COVID-19 in Taos, New Mexico. Therefore, the following background sections analyze the people, setting, and history of Taos.

V. The Rio Grande Valley

Nestled in the Rio Grande Valley of Northern New Mexico is the small town of Taos. With an estimated 6,000 people in 2020, The Town of Taos website describes the town as home to “three cultures living side by side, and a heritage of colorful people” (Town of Taos 2019). The “three cultures” referred to by the town refer to the collision, integration, and interaction of the Native American population of Taos Pueblo, the enduring Spanish community, and the wave of Anglo American artists, migrating West from the late 19th century to the mid 20th centuries (Rodriguez 1990). The historical interactions between the three cultures in Taos inform the current cultural and social dynamics valuable in analyzing the communal and social changes motivated by COVID-19.

Before Spanish exploration and colonization of the Rio Grande Valley in the 16th and 17th centuries, the valley was home to the Taos Pueblo people (ancestors of inhabitants of Taos Pueblo today) (Taos Pueblo 2012). Evidence of Puebloan culture dates as far back as 1000 years ago (Taos Pueblo 2012). The two structures called Hlauuma (north house) and Hlaukwima (south house), located in the central plaza, are considered the oldest continuously inhabited communities in the USA.



Figure 3: Photo of the North House, Hlauuma.

Taos' rich and current culture owes its existence to the town's long history of occupation, colonization, simulation, and transculturation, beginning with Spanish exploration and colonization of the Rio Grande Valley. The Spanish introduction to Taos began a tradition of resistance and revolution, beginning with native resistance against Spanish settlement, treatment, and cruelty. Spanish influence began in Taos in 1540 when explorer and captain Hernando Alvarado arrived under Francisco Vasquez de Coronado of Spain (Miezer and Reyes 2012). Taos existed as a trading outpost until the settlement of Northern New Mexico under the Spanish-appointed governor Don Juan Oñate in 1615 (Miezer and Reyes 2012).

Spanish settlement in Northern New Mexico led to growing ethnic tensions between settlers and New Mexican Pueblos. Catholic missionaries converted Native Americans to Catholicism and “Hispanicize” the Native population (Miezer and Reyes 2012). The Spanish expected New Mexican tribes to learn Spanish, wear Spanish clothing and take up Spanish customs (Miezer and Reyes 2012). The Spanish implemented the *encomienda* policy, which granted land to Spanish settlers and control over the Indians living on that land (Miezer and Reyes 2012)^{vii}. Owners of the

land, *ecomenderos*, were expected to promote Catholicism and Spanish customs (Miezer and Reyes 2012). However, the encomienda system was a system of slavery, where the Spanish brutally treated Native Americans (Miezer and Reyes 2012).

Taos' resistance and revolution began with the Pueblo Revolt in 1680. Taos Pueblo's colonial resistance before the Revolt, Taos Pueblo became the headquarters for the planning and organization of the Pueblo Revolt leading up to the execution. Fed up and angry with the subjugation, genocide, and exploitation that accompanied Spanish occupation, leading to a collective resistance of Northern New Mexican tribes in 1680 (Ponce 2002). Leading the resistance was priest and medicine man Popé of Santo Domingo Pueblo. Popé and other pueblo leaders united the 46 Pueblos in the surrounding area to drive the Spanish out of New Mexico to successfully drive out the Spanish for the next 12 years (Ponce 2002).

However, after 80 years of Spanish occupation, the Pueblo Revolt failed to erase Spanish culture, tradition, and influence. Over time the differing Puebloan languages, culture, and geographic distance degraded the cohesive effort needed to expel and keep the Spanish out of the territory (Silverberg 1970, 155). Furthermore, after the Spanish expulsion, droughts destroying crops and raids by Apache and Navajo tribes left Northern New Mexican tribes open and vulnerable for the Spanish's return (Silverberg 1970). By 1692 the Spanish had once again gained control of New Mexico (Miezer and Reyes 2012). Traditions of resistance did not end with Native resistance to Spanish settlement. Forms of Resistance continued through the periods of Mexican and American influence and authority in the area. Taos remained part of the Spanish colony of New Spain until New Spain gained independence from Spanish rule in 1821, becoming the Republic of

Mexico. The Republic of Mexico largely ignored New Mexico, and Taos became a hub of illegal trade as well as “a flourishing contraband center for burgeoning Saint Louis—Santa Fe trade” (Rodriguez 1997). Shortly after being annexed into the United States, Northern New Mexicans led the Resistance of 1847, still considering themselves Mexican and defying American rule. However, the resistance was short-lived, and the US and Anglo influence entered into Northern New Mexico.

The failed resistance of 1847 ushered in the New Mexico territorial period and American colonialism. American influence created drastic social and economic change in Northern New Mexico. Land speculation by Anglo settlers encroached on land claims and grants of the Spanish and Native American settlements in Taos (Rodriguez 1990). New Mexico offered land for natural resource extraction. The “regional mining, timber, cattle, and agricultural booms” required cheap labor, encouraging a new industry of Mexican workers in the area (Rodriguez 1990). However, the booming natural resource industry dwindled in 1906 when the federal governments deemed more than half of Taos County National Forest and Federal land, leading to economic stagnation before statehood in 1912 (Rodriguez 1990).

The cycles of colonization, resistance, and partial integration apparent in Taos' history resulted in the three prominent but segregated cultures comprising the community today. However, the historical subjugation of minority cultures is responsible for the hierarchical social structure in the place. Resistance and integration are distinct factors in shaping the current social and cultural dynamics in Taos.

Taos's diversity and underdevelopment would eventually enchant the next group of white artistic elites. Taos' existence as a refuge region with an extreme climate and

long-standing presence and cohabitation of Spanish and Native American populations conjured mystery and desire in Anglo Americans' eyes. The landscape and ethnic mixing persuaded Anglo migrants and painters from the East Coast and the Midwest (Rodriguez 1997). The "refuge region" and social inequalities characteristic of the Taos community owe their origins to the early 20th century with the arrival of Anglo-American artists.

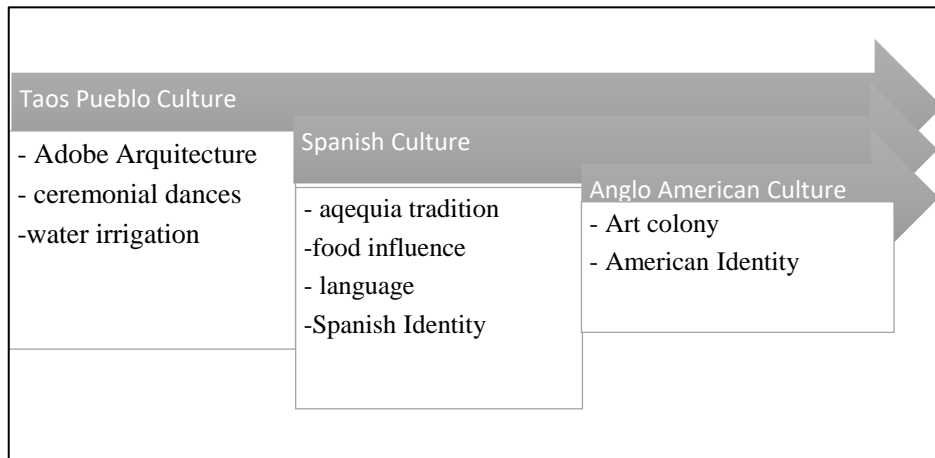


Figure 4: Cultural aspects from the “three cultures” that compose modern day Taos.

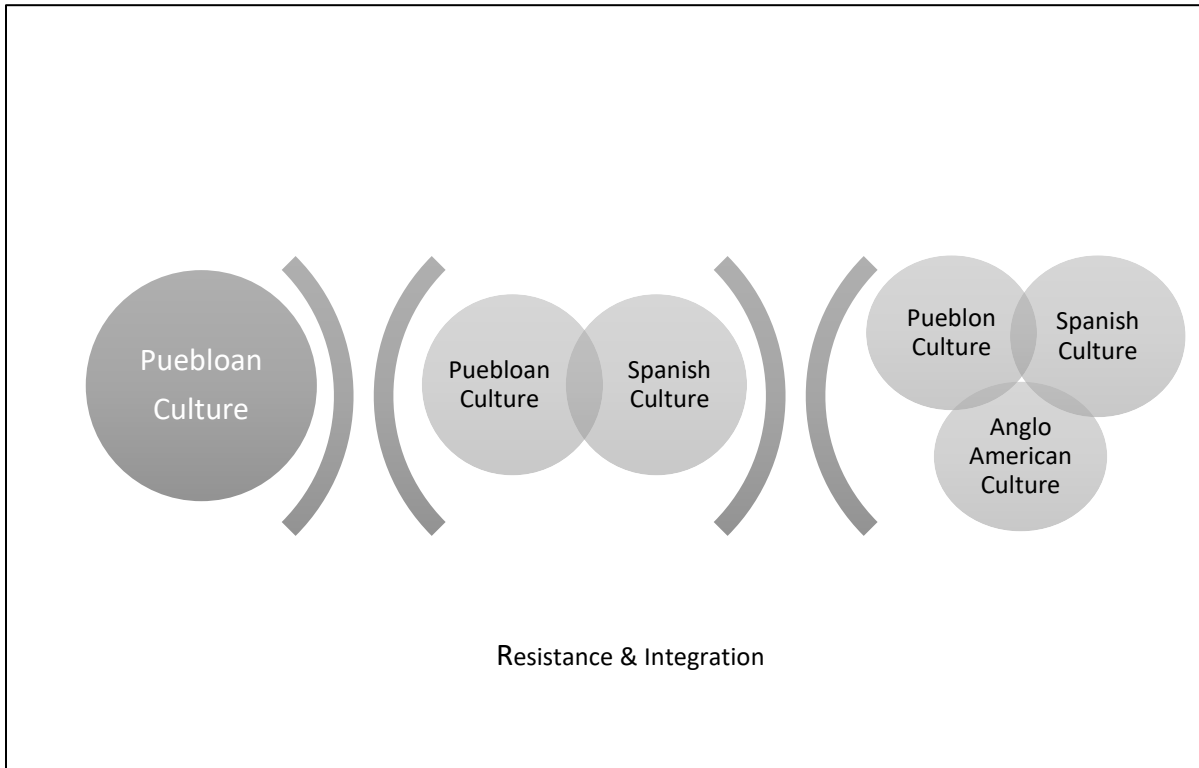


Figure 5: Visual representation of the colonization, resistance and partial integration apparent in the historical social dynamics of Taos

Upon arrival in New Mexico, the new artists had an economic and social advantage over the local Hispanos and Taos Pueblo people^{viii}. Their education, artist title, and wealth catapulted these artists to positions of power in Taos. Their presence proved an asset to the economy due to their ability to purchase foods and goods, rent homes and hire local labor (Rodriguez 1997). American artists Bert Phillips, Ernest Blumenschein, and Joseph Sharp were the pioneers of the Taos Society of Artists and the founding of the Taos Art Colony in 1915 (Taos Artists Society at Fechin House)^{ix}. The Taos Society of Artist's work and influence became popular, attracting future wealthy artist and social elite Mabel Luhan Dodge. Luhan and other artists' money and avid support for Native and Hispanic traditions define Taos' environment today. Dodge supported and funded

public buildings like the hospital and the public library. She and other artists fought against efforts to implement electricity in Taos Pueblo or construct non-adobe buildings, to conserve "authentic" signage of Puebloan presence and culture (Rodriguez 1997). However, other Taoseños, including other Anglos and the majority of the Hispanic population, promoted modernization and assimilation. The Artistic elite's influence and wealth won the debate and encouraged underdevelopment in the area (Rodriguez 1997). However, Taos's historic architecture, cultural tradition, and underdevelopment have become marketable, alluring tourists from across the country for "authentic" Native American and Hispanic cultural experiences.



Figure 6.1: *Montana Black-foot Indian* by Joseph Henry Sharp.



Figure 6.2: *Taos Landscape* by Ernest Blumenschein.

The history of colonial resistance and power relations inform the ethnic and cultural relations of Taos today. Although historical, ethnic relations of colonialism and resistance are not unique to Taos, the transformation of colonial resistance and cultural preservation into social and economic capital is. Taos Pueblo, Spanish culture, and local

art attract national and international tourists. Taos' economy largely relies on revenue from the booming tourist industry of the area. A tourist "might regard these adobe hamlets as living fossils: backwaters of ancient ways inexplicably spared by modern times" (Montoya 1995). Signage and pamphlets marketing the Southwestern allure, ethnic diversity, and natural wonder market Taos in a romantic and idealistic image: An escape from modernity into a preserved sanctuary of culture and purity. By employing dependency theory, we can conclude the revenue from the tourist industry depends on the continued subordination of minority populations and the marketing of minority cultures. The idealistic marketing overshadows the underdevelopment and poverty emergent historically and persistent today.

6. Methods

As my home town, Taos provides a familiar setting and a rich pool of resources and research connections. My research began with an initial list of healthcare providers and community leaders acquired through previous research in Northern New Mexico. I found all other community leaders and health providers via snowball sampling. Providers were primarily physicians of different subspecialties who work with Type 2 Diabetic patients or other health professionals who work exclusively with or closely with diabetic patients. Although not statistically representative, the providers interviewed served approximately 75 percent of the total diabetic population in Taos.

All perspective informants were either emailed or called and offered a summary of the objectives and the purpose of this research, along with possible risks detailed in an

oral consent form. I obtained consent orally before the start of an interview. I notified participants that they could request to terminate the interview or ask questions at any point during an interview. As a small community with limited medical resources, most community leaders and health care professionals are well-known and recognizable. Therefore, I informed each participant that I would use pseudonyms for names and titles to avoid revealing any participant's identity or social standing. Due to the necessary social mitigations during the COVID-19 pandemic, I conducted all interviews online. To facilitate a streamlined interview process for providers and professionals, the use of verbal consent outweighed that of a written consent form.

All interviews were conducted between June 2020 and January 2021. During that period, I conducted eight semi-structured interviews. The research utilized the semi-structured interview method, which allows the researcher to develop good rapport and discuss sensitive topics during the research (Bernard 2017). To conduct structured interviews amidst the new and growing COVID-19 pandemic with emerging science, medical perspectives, and social repercussion felt inappropriate. For this research, I guided the direction of the conversation with some prepared questions but allowed for the interview to change and progress, letting the “informants teach [me] what I needed to know” (Bernard 2017).

I conducted eight interviews via Zoom or a telehealth platform. Due to healthcare workers' demands during the pandemic, healthcare professionals' time and availability were somewhat limited. Therefore, I conducted interviews under the time frame to which the professionals could allot to me. Interviews were typically an hour in duration. In

addition to all interviews being transcribed and analyzed, I recorded field notes throughout each interview.

I asked participants about their role as community leaders and health care providers in controlling and managing cases of Type 2 diabetes in the community during the coronavirus. Also, I asked how access to resources and delivery of services has impacted patients who have diabetes and other challenges they may face in delivering services. A sample of key questions follows (see figure 6).

-
- From your experience, what is the prevalence and occurrence of Type 2 Diabetes in Taos New Mexico? Describe the environmental and social risk factors of Type 2 Diabetes in Taos. Has your role in the community significantly changed since the start of the covid-19 pandemic? If so, how?
 - How have cases and treatment of Type 2 diabetes changed since the onset of the pandemic? What are the challenges in treating Diabetes during COVID-19?
 - What associations and stigmas do think surround diabetes in this area? Does this affect treatment of the chronic disease?
 - How do you think people perceptions, fears and beliefs about COVID-19 have affected their likelihood to seek out services for pre-existing conditions or chronic diseases?
 - Literature shows a link between depression and diabetes and now more than ever people are isolated, alone and alienated. What affect has the layer of COVID-19 had on your clientele?
 - What are some of the challenges associated with using online conferencing or telehealth?
-

Figure 7: Sample of Key Question for Semi-Structured Interviews

I analyzed interviews using The Constant Comparative Method (CCM) of qualitative analysis (Fram 2013; Glaser 1965). Glaser and Strauss (1967) described the CCM as a method to analyze and develop a theory that explains how some aspect of the world works, formerly known as the grounded theory. The researcher first chooses a setting, phenomenon, or object of interest. This research focuses on the social conditions relevant to the comorbidity of Type 2 Diabetes and COVID-19 in Taos, New Mexico. Once having a set of data, the research finds patterns, relationships, and trends “grounded” in the data to construct a theory about the object, phenomenon, or theory of

interest (Fram 2013). As an inductive approach, the researcher begins with a theory and collects data to test that theory (Fram 2013).

The Constant Comparative Method (CCM) entails breaking down data into what Glaser (1965) describes as discrete incidents and coding them into categories of interest. Categories often arise based on the repetition of informant language and patterns in textual themes. When placing a new incident within a category, the researcher should compare that incident with other incidents within that category. Glaser (1965) concludes that within this constant comparison of incidents within categories emerges “the dimensions, the conditions under which [the category] is produced or minimized, its major consequences, the relation of the category to other categories and other properties of the category.” After coding and re-coding incidents into categories, theoretical properties emerge and shape theoretical frameworks of theory.

After transcription, all interviews were read and coded to identify emerging themes in the interview. For this stage of my analysis, I was aided by the computer software ATLAS-ti. Beginning with 70 initial codes, I then added, subtracted, consolidated and split to narrow the focus on key themes for analysis.

-
- | | | |
|-----------------------------|---------------------------|-------------------------------|
| • Access | • Denial | • Misinformation |
| • Associations (Diabetes) | • Diagnosis | • Non-patients |
| • Authority | • Depression | • Obesity |
| • Avoidance | • Diet | • Politics |
| • Belief Systems | • Distance | • Socialization and Isolation |
| • Challenges to Telehealth | • Education | • Stigma (COVID-19) |
| • Change | • Exercise | • Stress |
| • Communication/Connection | • Fear | • Suffering |
| • Complications of Diabetes | • Generational Change | • Telemedicine |
| • Culture and Tradition | • Genetics | • The Unknown |
| • Access | • Identity | • Traditional Foods |
| | • Lifestyle Changes | • Treatment |
| | • Meaning | |
| | • Media Influence | |
| | • Associations (Diabetes) | • Authority |
| | | • Avoidance |

- Belief Systems
- Challenges to Telehealth
- Change
- Communication/Connection
- Complications of Diabetes
- Culture and Tradition
- Denial
- Diagnosis
- Depression
- Diet
- Distance
- Education
- Exercise
- Fear
- Generational Change
- Genetics
- Identity
- Lifestyle Changes
- Meaning
- Media Influence
- Misinformation
- Non-patients
- Obesity
- Politics
- Socialization and Isolation
- Stigma (COVID-19)
- Stress
- Suffering
- Telemedicine
- The Unknown
- Traditional Foods
- Treatment

Figure 8: Sample Initial Codes for Qualitative Analysis

Once I consolidated and condensed codes, I formed a semantic network of the relationships and connection between codes used to discern the major themes and develop a thesis for the paper. After consolidating my 70 initial codes, many of the codes

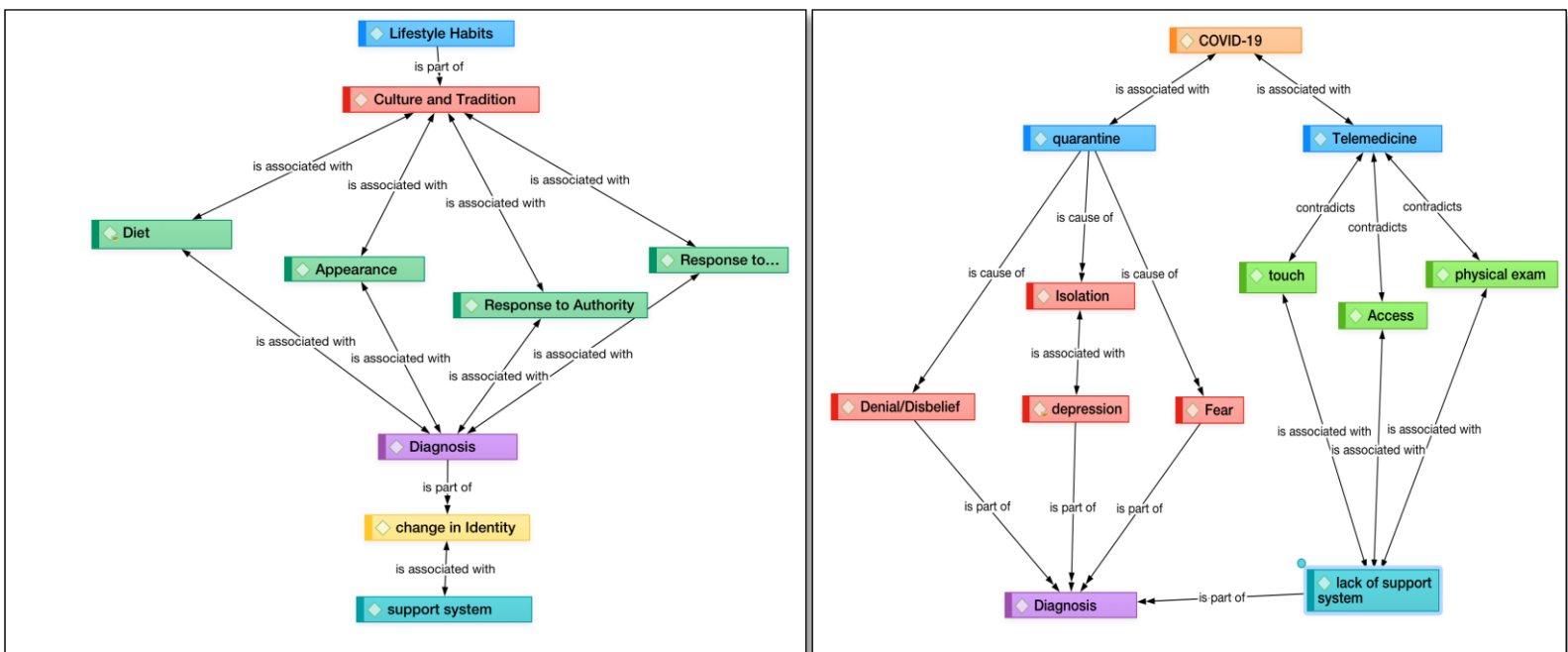


Figure 9: Sample of Semantic Networks for Qualitative Analysis

related culture and tradition to lifestyle change. However, informants discussed lifestyle change in relation to diabetes and concerning COVID-19. Therefore, a lifestyle change

for diabetic patients before and during the pandemic created the two major themes discussed in this paper. I began with lifestyle change after diabetic diagnosis specific to Taos social and cultural norms. Then I introduced the effect of COVID-19 on these lifestyle changes to describe the social conditions unique to COVID-19 that impact the lifestyle change necessary for effective diabetes management.

7. Findings

I. Identity, Lifestyle and Loss

Barbara Hoffman has been a social worker for 32 years, spending 16 of those years as a social worker for the Taos Public Schools. Although Hoffman does not specialize in providing services for children with Type 2 Diabetes (T2D), in her 32 years at the schools, she has worked with children at risk for T2D if not already diagnosed. In our conversations, Barbara gave a story from her experience as a social worker:

I think some people just don't want to hear the reality. If we talk about a family where food is love and they know that their *hito* is really chubby or obese, they may not want to hear it. I am thinking of a family that I work with. The mom is super obese and her youngest, who is a 4th grader, really struggles with his weight, as well as his two older siblings. I will have a session and this little boy is eating Takis or Hot Cheetos and drinking a soda. He does not have the diagnosis of Diabetes, but I cannot imagine he will not end up with one. How do you talk to a mom about her child's weight when she herself has the same issue?

Hoffman tells a story echoed in all informant interviews; Family culture and tradition construct human lifestyle habits. The social constructions used to shape and fortify our daily routines depend on context: language, culture, appearances, religion, and

background (Nagel 1994). The context and social norms we grow up with impact how we respond to changes in lifestyle habits. Informant interviews reveal the social foundations responsible for creating lifestyle habits for Taoseños.^x In Taos, resistance to change is a historical and current social and cultural norm rooted in colonization, resistance, and partial integration.

i. Why Change What Isn't Broken?

Taos' historical culture and tradition marketable by the tourist industry have local implications, influencing drastic change on the community and individual level. Informants tell unique stories about the role of generational change in shaping historical and current patterns of behavior in Taos. For Taoseños, the combination of efforts to preserve culture and tradition during colonization and annexation paired with the marketability of Taos' historical tradition and culture encourage the continuation of cultural practices symbolic of tradition. Generational and cultural resilience to drastic change informs the modern community dynamics and individual response to change. Informant interviews acknowledge that the "culture of resilience" translates to the communal and individual resistance to drastic change.

A Type 2 Diabetes diagnosis is a drastic change, as are the necessary lifestyle changes that come along with it. For many people, the diagnosis of pre-diabetes or Type 2 Diabetes comes as a surprise during routine check-ups, when individuals have no symptoms associated with the disease. When a medical professional tells an individual to make drastic lifestyle changes to lessen future suffering, the complication and the results

are intangible, but the self-sacrifice great. Therefore, making patients less likely to initiate lifestyle change.

Working in different capacities, family care physician Dr. Jeremiah Martinez has worked with patients with T2D for the past 40 years. Now a family physician at El Medio clinic in Taos, Martinez estimates two-thirds to three-fourths of his patients have diabetes. Still, he could only credit 5-10 percent of those patients with making significant lifestyle changes. He describes the difficulties associated with making a lifestyle change:

People never really suffer from their diabetes at first. If you've got a broken bone or pneumonia or something you're suffering from, then you are anxious to receive treatment or do whatever you can to get better. However, if you feel fine and all they have is a piece of paper that says their blood sugars are high, then it's hard to convince people that they need to change their lives or take medicine or lose weight, or whatever they have to do. That is the first big challenge. Convincing people to take action before they start suffering.

What Dr. Martinez describes is the difficulty to respond to intangibles. Why change your lifestyle habits if those habits do not pose direct consequences? Especially when those habits shape your cultural and individual identity? Mendenhall (2019) postulates that individuals living and managing diabetes have an “identity shift” or a “period of reckoning” where they must renegotiate their personal, social, and communal roles based on the social and physical restrictions decided by context (140). For New Mexicans, this means renegotiating identity within the New Mexican cultural, social, and community constructs long supported and imposed the tourist industry.

Textbook diabetes management recommends a change in diet, exercise, and increased interactions with medical services. In other words, a diabetes diagnosis forces people to adopt new realities and implement drastic change. However, non-adherence to recommended lifestyle changes is not an uncommon response when diagnosed with a

chronic disease. Ahlin (2012) argues that following a chronic disease diagnosis, patients define themselves as the victim; Victims of the disease, and victims to medical professionals' demands. Newly diagnosed patients find ways to justify not changing their lifestyle to conserve the habits they had before diagnosis (Ahlin 2012). Ahlin describes the disease as in competition with the personal interests and needs or those of others. Family care physician and informant Jeremiah Martinez put it best when he said, "As humans, we are resistant to change." Change is hard for everyone, but resistance to change is an embedded cultural and social means of survival for Taoseños.

ii. You are What You Eat

When a doctor in Taos tells a patient to change their diet, social implications accompany dietary restrictions. All informant voices expressed mutual agreement on the role of diet in T2D rates in Taos, beginning with critiques of the national food industry. Informants regarded processed food consumption as the primary catalyst for the fast-growing rates of obesity in the US, confirming New Mexico as no exception to the national trend. Local pediatrician Alicia Vigil comments on daily proof of the national problem when she says, "My favorite is when kids walk into my office with their favorite shirt that says Cheeto. I already know there is a problem when Cheeto walks in the room."

What we should eat does not always align with what tastes good. The USDA Dietary Guidelines for Americans (2020-2025) promotes an average caloric intake of 2,000 calories per day, providing the public with guided portion amounts for each food group. With the slogan of *Make Every Bite Count*, the USDA recommends limiting foods

with added sugars, saturated fats, sodium and alcoholic beverages (Dietary Guidelines Advisory Board 2019). However, as an informant, Dr. Paul Gray describes, “people will buy what tastes good, but things that taste good tend to be pretty high in calories and low in nutrient density.” Foods with added sugar and saturated fats produce high-profit margins for the food industry (Ludwig and Nestle 2008). Informant Processed foods are a staple in the American diet. Moss (2013) believes Americans eat twice the amount of recommended salt per year and consume an average of 70 pounds of sugar per year. Moss blames the processed food industry for their use of salt, sugar and fat to make products tasty, marketable and convenient.

For low-income families, buying tasty food at a low price can be a godsend. Families can afford to purchase whole meals and more food for a lower price. The food industry's ability to produce and sell processed foods for lower prices makes them more accessible to people of lower socioeconomic status than healthier foods. Fast food companies and cheaper grocery stores congregate in areas of higher demand. However, these areas are often low-income, where high rates of obesity accompany a lack of education about nutrition. Large food companies, aware of their audience, market unhealthy foods to Black and Latino youth. Harris (2019) reports that 86 percent of commercial spending on black-targeted TV programming was for fast food, candy, unhealthy snack advertising, and 82% of the ad spending on Spanish language TV programs. The easy access, affordability, and marketability of processed foods in the American food industry target low-income populations and facilitate the obesity epidemic in the nation.

Beyond speculation, studies show the correlation between processed foods and obesity. The National Institutes of Health found that people with an ultra-processed food diet consumed more calories and gained more weight than those eating minimally processed foods (Hall et al., 2019). Often consumption of ultra-processed foods runs along racial lines. Black Americans are two-and-a-half times as likely as white Americans to have low access or enough food for an active and healthy life (Hall et al. 2019). For Latino Americans, the rate is double that of white Americans (Hall et al. 2019). The figures demonstrate the social and racial inequalities significant in the nation's obesity problem. All informants commented on the food industry's role in obesity and Type 2 Diabetes in New Mexico. Hoffman mentions New Mexico as no exception to the national epidemic:

Then there is the huge issue of diet, locally and nationally. The big issue is the high sugar and high carbohydrate foods, which we all love and we all get addicted to as children. The food industry works as hard as they can to addict us in the first place and to keep us addicted. They have learned how to make yummy, yummy, yummy, wonderful, delicious food that is super super bad for us.

Hoffman reports the effects of the national food industry on his patients.

However, when talking about dietary risk factors for Taoseños, no informant, including Hoffman, addressed the national problem of processed food consumption without mentioning the diet culturally specific and nuanced to Taos. New Mexican cuisine is a fusion of traditional Pueblo Native American foods, Hispano Spanish and Mexican Foods, but high in calories and fat. (Dent 1993) However, the historical isolation of New Mexico limited the spread and influence of the cuisine, making it unique to the region. New Mexican food has a unique blend of spices, including red and green chile peppers, anise, and piñon nuts (Dent 1993).



Figure 9.1: New Mexican Enchiladas at *Sadie's Restaurant* in Albuquerque New Mexico.



Figure 9.2: New Mexican Stuffed Sopapillas at *Sadie's Restaurant* in Albuquerque New Mexico.

New Mexican dishes feature large quantities of beans, rice, cheese, corn, and red meat, making the diet high in carbohydrates and fats. Typical dishes to the New Mexican cuisine include *enchiladas* (shredded chicken and melted cheese rolled in corn tortillas and smothered in red chile sauce), *Stuffed Sopapillas* (sweet fry bread stuffed with beans, meat, and cheese), and *Carne Adovada* (cubes of pork marinated and cooked in red chile sauce, garlic, and oregano.^{xi} The high calorie and high-fat content of traditional foods like enchiladas pose another health risk for New Mexicans.

Social and cultural constructs dictate the daily foods we eat food, how we prepare food and the context in which we consume food. On a biological level, food is the means of human survival (Long-Solis and Vargas 2005). However, food consumption and production have implications for gender, social status, religion, culture, community, and identity (Long-Solis and Vargas 2005). An entity heavily rooted in culture and essential for life but dependent on people and geographies makes food an entity resistant to change (Long-Solis and Vargas 2005). We are what we eat.

Food is central to human identity. The abundance of foods across different cultures and geographic regions illuminate the diversity of foods among humans while also showing the oneness or similarities among peoples. For New Mexicans, the uniqueness of the cuisine and its confinement to the region contribute to the New Mexican identity. Families pass down recipes and cooking skills from generation to generation.

Food also has social implications. Food takes a central role in large family gatherings and social events. The dishes served may vary by occasion or celebration.^{xii} Informants detailed New Mexicans' tendencies to host large family gatherings centered around traditional foods to the area. For New Mexicans, the food one grows up eating is the food they continue to eat into adulthood, despite the high-fat content and caloric values. When asked to comment on the prevalence of T2D in Taos, informants related "*high rates*" to "*local foods*." All informants estimated the rates of the disease to exceed the national average. Barbara Hoffman responded with, "I think some of the foods that we love in Taos are not always the best for our bodies," when asked about her estimate of rates and prevalence of T2D in Taos. Martinez discusses a similar opinion:

Around here the culturally traditional foods are high sugar, high carb, so lots and lots of things made with flour and lots and lots of things are made with sugar. We love our rice and potatoes. In Taos, you are asking people to back off on the things they were raised on. The behavior of all of us, you know, unfortunately, is to really scarf up on foods.

For Taoseños, generational lifestyle changes driven globally by globalization and technological advancements support more sedentary lifestyles. However, old diets accompany new lifestyles.

One could blame the decrease in physical activity unaccompanied by diet changes for Taos' the high rates of obesity. All informants correlated diet and lack of physical activity to obesity. When asked about the primary social and environmental risk factors for developing Type 2 Diabetes, all informants reported diet in their top three responses. Dr. Paul Gray, an internal medicine doctor and co-owner of a private medical group, works with patients at the elderly living center. From his experience with the elderly population in Taos, he details the shift in generational physical activity unaccompanied by a change in diet:

In Taos, just a few generations ago, what you ate didn't matter. You woke up with the chickens in the morning, then you had to go chop wood and bring in the wood. Then you went back out to feed the chickens. Maybe then you had a huge breakfast, but then you went out to the field to take care of the animals. You did hard work. You made fences. People worked really, really, really hard till the sun went down, so eating big meals was fine and actually necessary. Well, that went away a couple of generations ago. Now we eat the same meals or more, with all the goodies that there are at the grocery store, but you don't work it off.

From informant accounts, the issue of diet is both national and local for Taoseños. Taoseños are victims to the food industry, where processed and unhealthy foods are yummy and inexpensive. However, local New Mexican foods, high in calories and fats, layer atop the national processed food epidemic. To change diet often means New Mexicans must give up foods passed down through generations, rooted in culture and essential to personal identity. The importance of making and eating foods in social relationships impedes the prospect of New Mexicans making personal dietary changes. People with diabetes have to separate who they are from what they eat.

iii. Its Normal

Like the foods we eat, context, community, and culture influence social perceptions of disease. The high rates of obesity and diabetes in Taos construct the social responses to the infection. When asked about existing stigmas or associations of diabetes in Taos, participants used the terms “normal,” “normalized,” or “cultural” when talking about diabetes in New Mexico. The local pediatrician at The Taos Pediatric clinic, Dr. Alicia Vigil, works with families and kids of all backgrounds. For her, having diabetes in Taos has become cultural:

I guess it's cultural. We all become chunky monkeys because we are four feet eight or everybody had [diabetes] in the family. What do you do for the holidays? What is your food of choice? It's not lettuce. It is the cultural determinant of what we look like.

Dr. Vigil describes the contextual and cultural components that encourage the normalization of the disease. The common occurrence of diabetes compounded by the short stature and diet of the area construct the social and cultural acceptance of the disease. Informant Dr. Paul Gray supposes that weight and appearance norms in Taos are cultural and generational. Gray describes the different connotations that being overweight has for his older and immigrant clientele.

Here a lot of older people don't feel obesity is a bad thing. Again, when obesity is not shunned, there's less to push for people to be thinner. I see a different mindset for people who have recently arrived here or immigrant groups. For example, I just saw a guy in his late 40s or early 50s and he had lost some weight. He came in and his body mass index was in a healthy range on the high side, but he thought he was much too skinny, which feeds back to the idea that if you're successful you should be a little plump or a little heavier. He works hard and he has a successful business, but he told me his wife and brother thought he was too skinny.

Informants reveal that like food, appearance and weight have cultural and generational significance. If medical explanations of obesity and its complications do not align with cultural belief systems, there is less of a tendency to make any lifestyle change. When you look like the people surrounding you, there is less of a tendency to change what you look like.

iv. Why should I listen to you?

Like with appearance and diet, the tendency to see the doctor can be cultural or familial, for many Taoseños routine medical visits are not part of their lifestyle. Three of six of the informants were careful to distinguish between *patients and non-patients* during interviews. Informants referred to their *patients* with Type 2 Diabetes as a subset of the Taos population and not indicative of the entire community. Dr. Martinez states that *non-patients* are the people often reticent to seek medical care:

People here tend to feel that if they're not sick, there is no point in going to the doctor. Some of us are raised to go to see the doctor on a regular basis and we forget that other people may be raised differently. For other people, going to the doctor costs money that you don't have. We didn't go to the doctor till we were on death's door, or we didn't go to the dentist until we had a toothache. And so, you know, getting that sort of regular care is not necessarily as much of a built-in behavior characteristic of a community like Taos that tends to have low income and lower educational levels.

Dr. Martinez describes *non-patients* as marginalized communities in Taos. When being diagnosed with diabetes, the thought of increased interaction and reliance on healthcare providers may invoke fear. Fear of being lectured or fear of being told they must create a lifestyle change. Patients raised routinely seeking out medical services validate doctors' recommended behavior changes, having trust in biomedicine rooted in

familial and cultural belief systems. Dependency theory and the subservience of minority cultures to the interests of wealthier populations help to explain the possible mistrust in doctors and medicine. As a form of authority, biomedicine may be representative of other forms of oppression historically felt through the processes of colonization, resistance and partial integration. When lectured by an authority without prior experience or confidence in biomedicine, there is a fear of seeking out services. Informants expressed patients' unwillingness to see providers for fear of being lectured or fear of verbal reinforcement of the health problems they already knew they had. Dr. Gray describes his theory on resident's avoidance of medical services.

There's the people who go to see the doctor on a regular basis and then there's the large number of people who kind of know they've got different health problems, but don't want to go because they know what they're going to be told, like changing your diet and losing weight and things like that.

Pediatrician Dr. Vigil describes a similar theme, saying sometimes she has to “play the cop.” When asking her patients why they haven’t been into see her for a while, a common response is “because I knew you were going to yell at me.”

No one likes being told what to do. Psychologists refer to this human tendency as *freedom of reactance*: a response to a threat to personal freedom. Brehm (1981) defines psychological reactance as "a set of motivational consequences that can be expected to occur whenever freedoms are threatened or lost." Brehm's findings concluded that when there is a threat to individual freedoms, there is an innate response to regain individual freedom when circumstance threatens it. In the context of diabetes medical treatment, treatment recommendations may threaten personal freedoms. For *non-*

patients in Taos, the easiest way to conserve personal freedoms is avoidance of medical advice.

Although resistance to lifestyle lectures from authority figures may be universal, for Taoseños, unwillingness to seek medical services has cultural and historical roots. Returning to Brehm's discussion on *The Theory of Reactance* (1981), the degree of reactance depends on the degree of threat complemented by the importance of that freedom in an individual's life. The changes in diet, appearance, and interaction with the medical system are personal freedoms connected to identity and informed by culture. Eliminating these freedoms could warrant a high degree of resistance.

Furthermore, resistance in Taos has been an indispensable tool for survival. Cultural and traditional preservation demanded resistance to new forms of authority in Taos. This tradition of resistance became an attractive entity transformed into a form of capital in the tourist industry. The tourist industry supplied 40 percent of Taos county's jobs for the past two decades (Headwaters Economics 2018). Dr. Phillips, a practicing internal medicine doctor (specializing in infectious disease) at the Salvation Hospital in Taos, has worked with patients across the country and internationally in Haiti and Peru, treating patients with contagious disease. When comparing his medical career in Taos to other places, he claims "a place like Taos has many people are suspicious of authority." The informant and podiatrist Yvette echoed the same sentiment when being interviewed, observing that "in Taos, there is a certain attitude, in the middle-aged population and the demographic I largely see, not to seek care or ask questions." Forms of oppression and resistance rooted in Taos' colonization and encouraged by the tourist industry influence culture and ethnic distrust of medical authorities.

Two informants mentioned the existence of both biomedical and alternative medicine systems in Taos. Taos is home to various alternative, integrative and traditional medical practices, with a sub-population who relies on these forms of medicine before seeking consultation or treatment in western medicine. When asked about social and environmental barriers for diabetes and treatment, social worker Barabara Hoffman mentioned the family's reliance on *home remedies* before seeking biomedical treatment.^{xiii} However, informant interviews did not provide evidence of any tendencies to supplant home remedies for biomedical treatment. Informants rather reported the coexistence and co-use of both systems of many patients.

Informant interviews do not provide evidence of replacing one form of treatment for another; interviews do prove the coexistence and co-use of both systems. The use of home remedies provides residents with another tool for preserving existing tradition through drastic periods of change and cultural transformation. Biomedicine may symbolize forms of authority, and western influence and home remedies constitute another form of resistance. A form of resistance that is again proven profitable by the tourism industry. The "Visit Taos" website boasts of Taos as a place where "people find themselves [...] with just the thing to make you feel most relaxed and rejuvenated." Under the convincing introduction, "Visit Taos" offers links to yoga studios, hot springs, and stores to find home remedies.

v. Fear, Fatalism and Denial

Changes to diet, exercise, and interaction with the medical system all come with a diabetes diagnosis. These changes interrupt lifestyle habits inseparable from personal identity and relationships. The weight of such a diagnosis accompanies by a treatment

formulated around change means many patients meet their diagnosis with denial, fear, and fatalism.

The difficulty of changing lifestyle habits rooted in family and community culture and tradition in Taos may explain why “everyone knows someone or is related to someone with diabetes.” However, despite familiarity with diabetes, there is also fear, fatalism, and denial surrounding Type 2 Diabetes. Dietician Angelica Trujillo and diabetes educator Mary Chavez of The Salvation Hospital Diabetes Self-Management Team label denial and fear are typical reactions following a Type 2 Diabetes diagnosis. Patients who are newly diagnosed recall the suffering of diabetic family members and fear of their own. Diabetes diagnosis has connotations with amputations, heart attacks, and dialysis. However, Trujillo and Chavez expressed an ignorance surrounding current recommendations for Type 2 Diabetes management, having fears rooted in complications common before modern treatment methods.

I think because of the genetic disposition in the Hispanic community and the family history, almost everyone we serve knows somebody or they are related to somebody who has diabetes. In the previous generation, there wasn't the same access or diabetes care in general, so diabetes could lead to much more severe complications. People have the idea that diabetes is really severe or it cannot be managed.

Fear breeds sentiments of fatalism. For families in Taos, incidents of diabetic complications are not isolated and occur across generations. However, remembrance of familial diabetic complications often distorts newly diagnosed patient's hope and confidence in the advancements in diabetes care. The attitude of fatalism results in patients avoiding or postponing preventative medicine and treatment, leading to further complications for patients and fear for future generations.

Feelings of denial and fatalism following a chronic disease diagnosis are not uncommon. A chronic illness diagnosis can constitute a form of loss, a loss of self (Charmaz 1983). Charmaz (1983) describes the suffering felt among chronically ill patients in four dimensions: leading restricted lives, experiencing social isolation, being discredited, and burdening others. Mary Chavez interview echoes Charmanz's theory of suffering T2D patients:

I think we see a lot of denial at the first diagnosis. Psychologically, people are not ready to believe that they have it because it changes everything. There are quite a few patients who don't share the fact that they have diabetes with their co-workers or even their close family members.

Charmanz theory of loss can apply to diabetic patients in Taos. T2D patient's restrictions of habits and routines can equally restrict representations and associations of self. A loss of self forces patients to redefine relationships with close contacts, family, and friends, often accompanied by isolation and depression.

There is a strong link between Type 2 Diabetes and depression. Type 2 Diabetes often precedes a depression diagnosis, with the risk of developing depression being the highest during the first year after diagnosis (Jeon 2018). Similarly, depression may increase the risk of developing Type 2 Diabetes. Although some research suggests a biological link between the conditions, other research stresses the behavioral and social links between T2D and depression (Jeon 2018). Research on Diabetes and Depression in Dehli India by Weaver and Mendenhall (2016) suggests the socioeconomic status and income are critical factors in assessing depression among diabetic patients. Mendenhall and Weaver suggest that depression can result from social, economic, and political change, leading to an increase in diabetes cases.

vi. Redefining Community

Diabetes management and the necessary lifestyle changes in diet, exercise, and interaction with biomedicine force patients to redefine identity and roles in the Taos community. The lifestyle change, the felt loss, and the resistance and isolation accompanying that change demand new levels of support from social contacts and medical professionals. Four of the six informants talked about the importance of trust, support, and humanistic healthcare in diabetes management. Taos Diabetes Self-Management Program describes support and empathy as their main job. A multi-disciplinary team consisting of a dietician, two nurse educators, and a pharmacist provides education, support, and resources for their diabetic patients. Dietician Isabelle Sanchez described their role in the community:

The biggest part of our work is providing that support and empathy for our patients. In the department, we always had a flow of people coming in, conversations, jokes, and a group way of problem solving, casual and informal. Patients can cry, talk, complain, vent, or just sit and it's our job to listen.

Sanchez describes a support system and community available to patients as they shift lifestyle habits and redefine social and communal roles. Dambha et al. (2019) show that empathetic medicine in diabetes management works. Dambha et al. (2019) found that support and empathy are integral in effective Type 2 Diabetes care, showing an association between primary care physician empathy and lower risk of cardiovascular events and mortality among Type 2 Diabetics. Family physician Dr. Martinez mentions his success as a physician treating Diabetes when offering reminders and support:

I mean, we're all just little kids at heart. And we all kind of just need the constant reminder to remember to do this and remember to do that. I try to keep it positive, like "oh you lost a couple pounds or your sugar is a little lower or you're doing a great job." All that has actually worked to a fair degree.

What Dr. Martinez describes are components of humanistic and empathetic healthcare. However, what Dr. Martinez describes may be a utopia for diabetic patients, but not the reality. Howick and Rees (2017) predict that the amount of paperwork and time restraints on physicians inhibit the practice of empathetic and humanistic care. Despite a correlation between patient-centered and humanistic care and decreased patient anxiety, stress, and pain, there has been a decrease in the importance of humanistic healthcare (Howick and Rees 2017). Support and empathy prove to work in the care and management system, but the medical system's restraints to provide the time and resources that support are often unavailable or under stress.

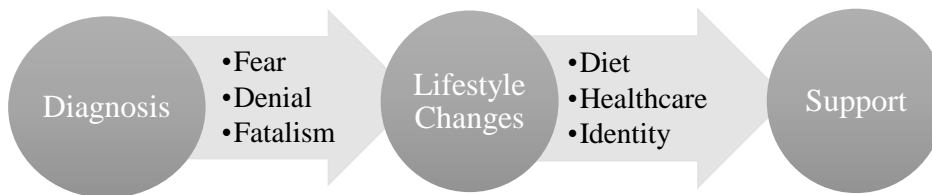


Figure 10: Visual representation of the steps and changes associated with a T2D diagnosis.

II. Doc in the Box

i. Healthcare Online

The introduction of The Coronavirus to the world stage created social and societal changes. States implemented social distancing guidelines, mask-wearing, and restrictions on social gatherings to mitigate the virus's spread. The social restrictions extend to healthcare services. To abide by the necessary distancing guidelines, clinics and doctors implemented online health visits to see patients. For patients with Type 2 Diabetes, the pandemic's introduction forces patients to shift, redefine or even lose parts of the support system to manage their disease.

How do you mimic the doctor-patient relationship during a global pandemic, where mitigation of the virus demands social distance and a mask covering or no contact, but people need the healthcare system more than ever? Clinics and healthcare systems implemented virtual medical appointments to limit in-person contact between patients and healthcare providers. Online medical services allow patients to obtain a level of care without accessing in-person services. In theory, online medical care has potential in diabetes management and 21st-century medicine.

ii. One Barrier for Another

Use of telemedicine in Taos has contributed to access to medical services for people living far from the nearest clinic or hospital. The Town of Taos has the greatest number of health services in Taos County within the surrounding area. For this reason, many patients travel to Taos from surrounding areas for medical care. Now that clients

have the options for virtual visits, distance and transportation have become less of a barrier for accessing healthcare.

Although Telehealth solved one barrier to accessing care in Taos, it created another barrier in the process. The use of Telehealth requires a workable smartphone or computer and an internet connection. However, many Taoseños have neither. In addition, for older patients in Taos, without the technological literacy of the younger generation, there is a substantial learning curve: For Dr. Gray describes that the lack of internet and technology skills creates huge barriers in his daily practice:

For the older population technology is tougher. Most of our older patients don't have a smart phone, broadband or any internet access and dial up isn't really around that much. Very few people actually have broadband compared to other places in the country.

For Dr. Gray, the lack of internet and technology skills creates huge barriers in his daily practice. What fixed one barrier created another.

iii. The Environment

Four of the six informants agreed that the benefits of medical services do not outweigh the detriments. For Dr. Vigil, the professional setting of a medical facility is irreplaceable. The process of making an appointment, waiting in the waiting room, seeing the doctor and following through with treatment, shows patients initiative in their own health, which can translate to personal health and management. Dr. Vigil thinks that Telehealth is “only scratching the surface:”

It's easy to degenerate to chatting. It's really hard to stay focused. And you know, if somebody brings up some sort of social thing or wants to start talking about their grandchild, the next thing you know is that you have chatted for 10-15

minutes, which you wouldn't do in the office. The business of communicating patient education and experience is diluted severely.

What Dr. Vigil describes illuminates the importance of setting in providing medical care.

The use of telehealth can blur the relation of the patient to the physician.

iv. The Physical Exam

Telehealth restricts healthcare providers from conducting a physical exam.

Although not the only aspect of clinical visits, the physical exam may be the most critical and irreplaceable aspect of diabetic care. Long periods of elevated sugars in the bloodstream can lead to nerve damage and numbness in the feet. The numbness associated with the nerve damage disallows diabetics to identify soreness, irritation, or swelling in their feet, leading to a lack of sensation termed diabetic neuropathy.

Untreated neuropathy can lead to sores, ulcers, gangrene, or amputation (American Diabetes Association). Another common complication of diabetes, peripheral vascular disease, affects the blood vessels leading to extremities, resulting in pain, injuries, or infections that heal slowly (American Diabetes Association). Initial signs of diabetic neuropathy or peripheral vascular disease are detected during a physical exam:

There's some things you can't do very well by Telehealth. I can't do the neurologic exam for people with diabetes. We check feet for people with diabetes at least once a year and we use a little monofilament fiber with a 10-gram force. If everybody has one of these at home, and somebody else in the house could do it, we can probably do that by video, but equipping people with monitoring equipment is a challenge.

Physical exams for a diabetic patient include a neurological, dermatological and musculoskeletal that are unavailable with telehealth. The lack of the physical exam may be a factor in the increased rate of amputation during the pandemic.

v. Human-less

When asking participants about the use, effect and efficiency of Telehealth in Taos, all informants expressed the inadequacy of Telehealth in replicating the doctor-patient relationship or delivering adequate care to their patients. Telehealth may give physicians the ability to provide the scientific part of medicine, but not the art form. The trust, connection and human touch necessary to create the human-ness in healthcare cannot be accomplished in the new technological world of medicine. For the Diabetes Management Team at Salvation Hospital, there is no way to replicate the weight of human touch and human trust on a screen.

The biggest change has been how do you deliver diabetes care with the same humanity where you actually had that humanistic approach over the computer or provide services that are more than two-dimensional. Before there were a lot hugs and counseling and Kleenex. I've saved a fortune of Kleenex. Now they just cry alone and buy their own Kleenex. How do you impart caring and involvement with a patient as a diabetes educator now that you can't touch them? Or communicate through body language?

For the dietician of the team, without seeing the patients face it's hard to remember patient's names or their stories. Without their stories, the team cannot develop the same sense of trust, integral to effective diabetes treatment:

It is harder to remember patients now. I used to be able to look at a patient's name on a schedule and be able to remember things they said about their grandkids and now I have to rack my brains and to remember who these people are. There care is kind of cold in a lot of ways.

The dietician statement begs the question of if telehealth is the answer for patients with chronic disease in Taos. In a town with a history of colonization and subjugation and distrust in biomedicine, patient-doctor trust may be the most important component of chronic disease care. For Dr. Vigil, the success of telehealth depends on if there is a pre-existing relationship between patient and physician:

If I had a connection with them previously with me being able to touch them the connection is there and communication is somewhat the same. But if I am going to act like a "doc in a box" and they have never seen me before, it is very different. When you talk about a patient centered medical home, you grow with the family, and they depend on you and you depend on them. If you do not have that connection then all I am doing is yelling into a screen.

The Diabetes Management Team and Dr. Vigil comment on the necessity of trust and support in healthcare, yet its absence during the pandemic. The in-person aspect of clinical medicine could be the most important part due to the inability to replicate the environment, the physical exam and the human interaction. However, the pandemic has stripped away the in-person aspects of medicine, leaving patients to interact with a screen.

III. Lifestyle Change? During a Pandemic?

During the pandemic, diabetics confront a world disadvantageous to the lifestyle changes needed to manage their disease. Wrestling with the same uncertainty felt by all of us during the pandemic compounded by their susceptibility to COVID-19 complications. Diabetic patients struggle to manage mental and physical health. Social isolation and the risk of in-person clinical visits force diabetics to renegotiate their

relationship with medical resources. Diabetic patients in Taos, living through the pandemic, face another loss and redefining of self, equal to re-diagnosis.

i. Fear and stigmatization

During a global pandemic, we should accept fear and denial as responses. Fear is a defense mechanism and response to a threat of personal safety and security, spurring a response advantageous to self-preservation. A higher risk of complications associated with T2D and COVID-19 heightens the level of fear felt by diabetic patients. Although fear is a natural response to a pandemic, the constant flow of information available to the public may heighten our fears.

The recorded comorbidity of Type 2 and COVID-19 and the stigmatization of medical workers during the pandemic encourages diabetic patient's avoidance of the healthcare system. The fear felt among the diabetic community, but not exclusive to the diabetic community, breeds forms of stigmatization surrounding the virus. Being associated with high transmission levels, healthcare workers face stigmatization, and the clinics and hospitals in which they work are considered breeding grounds SARS-Cov-2. The fear of medical facilities impedes patient's tendency to access medical services they may normally turn to for support. Paul Gray felt the fear and uncertainty of healthcare workers during his visit to a local grocery store:

It's funny, when the pandemic first started, even before everybody was wearing masks, I went to Albertsons and people I knew were socially distancing from me, because they knew I worked at the hospital. I noticed early that people didn't want to be anywhere near me because of where I work, assuming that I had something.

In addition, 3 of 6 informants clarified the association between doctors and doctors' offices with COVID-19. Dr. Martinez, a family physician talked about the normalcy of appointment cancellations accompanied by the excuse "I don't want to keep my appointment, because I'm afraid of the virus." Dr. Gray describes the fear he sees in Taos:

There is a certain fear, especially early on in the pandemic and now because we had that big spike. When there is a spike in cases we notice that in hospital centers, that the number of cases other than COVID-19 dropped significantly. It's like we'd had very few people in the hospital with diagnoses, other than COVID and it's not like COVID is preventing people from having angina and COPD or strokes, but rather I people are afraid to come in. When people finally do come in they tell me they may have had symptoms for a long time but they were afraid to come in so they delayed their care. People associate sickness with the hospital. People could tell them that hospitals could actually be one of the safest places to go with a high exchange rate of oxygen, everyone is socially distanced and we sanitize thoroughly.

Local pediatrician Dr. Vigil comments on the avoidance of parents and family to seek out routine care, with a fear of contracting the virus from her or her clinic:

Part of it has to do with a fear. Fear of coming into a building that the media tells them is not safe. I mean we send out text, we tell people it is safe, come on in you need a well visit but that is all we can do.

Dr. Villarreal suggests that the best strategy to lessen the fear among clients requires educating them on the required precautions taken by physicians and clinics and the safety of a clinic in comparison to other public buildings they may frequent. In doctor Villarreal's words "all we can do is try to educate people that we all wear the space suit." However, to successfully educate a clientele requires a level of trust between physician and patient.

I think it is really dependent on the family. If you have a family that is really engaged with you and you have always said to them "this place is where I am going to give you information and this is where I check up with you or I miss you

because I don't see you" If there is a connection of the pediatrician with the family that family will come in.

Patients with Diabetes in Taos face a double-edged sword. To lessen their fears means interacting with a physician, but interacting with a physician means exposing themselves to a virus they know they are at high risk of contracting.

When asked about his perspective on the unique aspects to COVID-19 in contrast to other epidemics in his time as a physician, internal medicine physician Dr. Gray gave the response that “the scale and the response are much larger because everyone feels vulnerable, I mean it is all over the headlines and everywhere around the world.” Gray’s response demonstrates that our innate fear of the unknown drives our thirst for information. However, we filter information through personal belief systems and remember information that supports our belief systems while disregarding information that does not.

Research done by Barrett and Brown (2008) contends that stigma and fear are syndemics with infectious diseases. They propose that stigma and fear present major barriers controlling the spread of a disease, as fear can discourage detection and treatment. Furthermore, Barrett and Brown suggest that marginalized populations with prior distrust in medical systems may not seek care during the pandemic. Finally, they propose that the “stigma epidemic” spreads faster than the disease itself, hindering efforts to contain and control the virus. Among the chief lessons we can learn from infectious disease response is the imperative need for trust and transparency between citizens, officials, scientists, and physicians. However, the barriers and mistakes made during the nation's COVID-19 response show we may not have yet learned our lesson.

The Coronavirus is the first global pandemic of the internet age (Adams and Ramsetty 2020). Information about the Coronavirus circulates on the internet, social media platforms, and news channels creating an *infodemic* (Sood 2020). Although internet platforms allow people to stay informed, they can also contribute to people being misinformed. (Sood 2020). Sood (2020) proposes that access to information, whether true or false, may contribute to fear, anxiety, and panic concerning COVID-19.

The attitudes surrounding COVID-19 are largely divided by political affiliation. In 2020, 83% of Republicans approved President Trump's response to the Coronavirus as opposed to only 19% of Democrats (Hart et al. 2020: Van Green and Tyson 2020). There is also bipartisan opinion on the accuracy and truthfulness of the media coverage on COVID-19. A majority of 73% of Democrats believe that the media gives them the information they need, while only 44% of Republicans agree. Political affiliation correlates with public tendency to adhere to social distancing guidelines, with Democrats being more likely to adhere to social distancing guidelines than Republicans. Data shows that these trends may be heavily influenced by the rhetoric used by political leaders and politicians surrounding the virus.

Informants commented on the polarization surrounding COVID-19 in the Taos community and its influence on the associations and stigmatizations surrounding COVID-19 patients and doctors and the repercussions on the likelihood to access care and treatment. Paul Gray and other informants described their experiences with patients in disbelief of the virus.

I have treated people that are in denial. We've had people in the hospital that clearly had COVID and they still didn't believe it even if somebody told them, I don't have COVID, that's fake. They are getting their news from unreliable

sources and believe that it was all a hoax. Then President Trump said something about doctors over diagnosing COVID so they can get more money. Now I have people who believe we're calling it COVID to make more money. There's definitely a divide based on belief system on whether it's real or not or whether we should wear masks or not.

The starkly differing opinions and beliefs surrounding the validity of the pandemic and the necessary precautions creates a cultural of polarization and politicization surrounding the pandemic, affecting patient's ability to receive medical support (Hart 2020).

ii. Isolated and Alone

With widespread distrust and differing opinions surrounding COVID-19, more than ever, people feel isolated and alone. For patients with Type 2 Diabetes, feelings of loneliness and isolation are common. Now type 2 Diabetics face the isolation and depression common to a diabetes diagnosis compounded by isolation and loneliness felt by quarantines and social distancing. Diabetics (T2D) have all the more reason to social distance because of the correlation between diabetes and COVID-19 complications and comorbidity. Diabetic patients must confront the question of priorities: COVID-19 precautions or mental health?

iii. Re-diagnosis

For patients suffering from T2D, the introduction of COVID-19 and the drastic change accompanying it forces patients to confront the same psychological processing as they did during diagnosis, constituting a form of re-diagnosis. The introduction of

COVID-19 to society issued the same feeling of denial driven by fears of the unknown future. Patients confront another form of loss. The communal, familial, and personal roles they assumed before the pandemic was changed drastically, which were also changed upon initial diagnosis with diabetes. Patients must again redefine meaning in life within the scope of restricted issued by the coronavirus response. Like the feelings felt upon diagnosis, patients find themselves renegotiating their interactions and connections with the health care system. A new fear of contracting COVID-19 from doctors leaves patients to self-management without support in a time of stress, uncertainty and vulnerability. Resorting to old diets and lifestyle habits may be the most accessible and comforting way of coping, but worsening their risks of complications if contracting the virus.

iv. The Quarantine 15

During national quarantines, everyone ate more junk food, exercised less, and gained more weight. When referencing this widespread weight gain, people refer to it as “the quarantine 15,” “gaining the COVID-19,” and “fattening the curve” (Bhutani et al. 2021). Bhutani et al. (2021) compare the weight gain during COVID-19 quarantines and lockdowns to the holidays, which accounts for half the annual weight gain in adults. During lockdowns, 22% of Americans reported a 5-10-pound weight gain (Bhutani 2021). The national phenomenon did not escape the homes of Taoseños. Dr. Vigil says she does more yelling these days:

They know that when they come it’s going to consist of me yelling at them because they gained 40 pounds in month. However, during the pandemic that is the reality. The astronomical thing is that kids are gaining anywhere from 10 to 15 to 20 pounds between visits.

The national weight we can attribute to the heightened levels of stress during the pandemic. Numerous studies on diabetes, stress, and weight gain show that stress can efficiently change neurological responses to food. However, mitigating the stress without being able to control the stressor (COVID-19) offers a challenge. Dr. Vigil describes food and family as a coping mechanism during the virus:

Most of us after graduation have a party and we make enchiladas and there are 500 people in the kitchen and that is how it's done. That's how holidays, Christmas and funerals are all done. That's how they are sometimes still done during the pandemic.

For Taoseños the tradition of large family celebration with traditional food is often a comfort and provides a coping mechanism for people during the pandemic. Especially during a time when people feel more socially isolated than ever before.

v. A Convenient Narrative

Despite the valid and understandable fears of diabetic patients during the pandemic, most informants felt the pandemic had created a convenient narrative for patients to avoid or delay care for their diabetes. An excuse to revert to old habits or avoid interaction with the medical system. Dr. Gray says patients " don't want to come in to have their blood pressure checked, or their weight checked." Dr. Vigil claims the pandemic can provide an excellent excuse to avoid the lectures:

I mean, who enjoys sitting in the waiting room for a long time, and then you go in the room and wait for a lecture on your diet and your weight. I mean, you may know you need it, but you're not thrilled about sitting there and getting it done. So what the pandemic has done is given people an excuse, not to go to make those appointments because the governor told them to stay home.

What Dr. Vigil explains is not a phenomenon unique to Taos. What Dr. Vigil describes is a national phenomenon. The number of deaths in the United States exceeds the number of estimates deaths from the virus. These excess deaths are thought to be from chronic conditions and resultant from a deficit of care (Long 2020). For podiatrists, the national numbers of amputations for diabetic patients have increased.

For patients with diabetes, this deficit of care may have more impact than other chronic diseases because of the lifestyle change necessary to treat. The healthcare provider's role is primarily to recommend, remind and motivate.

I mean, we're all just little kids at heart. And we all kind of just need the constant reminder to remember to do this and remember to do that. I try to keep it positive, like "oh you lost a couple pounds or your sugar is a little lower or you're doing a great job."

Without this level of reminding, motivating, and support during a global pandemic, it's easy to lose progress made and revert to old lifestyle patterns. For people facing high levels of stress, a common coping mechanism is seeking support. However, the stigma associated with doctors and clinics leaves peoples supports to their close contacts, which is often not enough. Informant Dr. Vigil describes a "double behavior" common to residents of Mimbre. The lack of education about the virus, the fear, and the thirst for human connection encourages the behavior to expand familiar social contacts while avoiding settings and people they deem "dangerous."

People kind of pick and choose when and where they're concerned about the virus. It's become a mind game. If I'm around people I know, I'm not as afraid of them as hanging out with strangers. That gives me permission to go hang out with friends and family. But I'm going to stay away from strangers at the doctor's office, you know, even though it's equally dangerous as far as spreading the virus. But again, this is all just people being people, I mean, human beings are, who they are.

Dr. Vigil describes a phenomenon not uncommon during infectious diseases. An idea addressed by anthropologist Merrill Singer on Infectious disease is the activation of a behavioral immune system during epidemics and pandemics or any wide-scale infection. The composition of the behavioral immune system depends on culturally constructed behaviors and determines the levels of social response and support for an individual. In the words of Fincher and Thornhill (2012) quoted in Singer:

The behavioral immune system is comprised of ancestrally adaptive feelings, attitudes, and values about and behaviors toward out-group and in-group members, caution or unwillingness to interact with out-group people, and prejudice against people perceived as unhealthy, contaminated, or unclean.

For Taoseños, the medical community constitutes the outgroup considered unhealthy or unclean, while family and friends constitute the in-group. Psychologically for community members, people in a person's in-group pose less of a threat than those of an outgroup, even if they do not align with the biological reality in the spread of viruses. However, people construct their in-groups and outgroups by individual belief systems. Therefore, the ability to shift personal views and beliefs system can be a challenging endeavor:

I think it goes back to the same thing. It is very challenging to convince someone that they are wrong when they have a belief system. You know it is really not easy to change peoples beliefs, some people are open-minded and can take in new information, but that is is rather uncommon. People believe what they are going to believe and you can present all the facts in world and they will still think you are wrong.

The fear, stigma and beliefs surrounding the virus affect the way people respond and cope with new norms. For patients with diabetes, isolation and loneliness along with the mitigation efforts to slow the spread of the virus impede patient's ability to continue effective lifestyle change.

8. Conclusion

Lifelong change and self-management follow a diabetes diagnosis. Doctors commonly recommend a healthy diet, more exercise, and regular medical visits. However, doctors are asking a lot. More often than not, the new lifestyle changes suggested are contrary to the interests, wants, and routines of diabetic patients. To make lifestyle changes often means renegotiating relationships with food, exercise, and medical resources, which are all heavily influenced by the social and cultural context of one's life. Lifestyle change means renegotiating personal identity.

Support must follow diagnosis. Feelings of denial, fatalism, and fear follow a new diabetes diagnosis. Patients often feel alone after their diagnosis, which can lead to depression and anxiety about their future. Such significant lifestyle changes demand that patients have trust and support from the healthcare system. They rely on medical professionals to walk them through treatment and ensure a new but good quality of life.

Now diabetics manage their disease in a new world. One hundred ninety-two countries with cases of COVID-19 and 2,448, 347 deaths worldwide (John Hopkins University of Medicine 2021). The current body of research concerning comorbidities of COVID-19 with other conditions shows a strong link between COVID-19 complications and morbidity of patients with Diabetes. Diabetics hear about their increased risk of severe complications on the internet, social media platforms, and news channels. Although access to such information may keep diabetics informed, it may also contribute to people being misinformed, creating mass fear, anxiety, and panic concerning COVID-19.

A global pandemic sparks feelings of fear and anxiety, but also a social stigma. During COVID-19, people associate doctors' offices and healthcare workers with the virus, causing avoidance of routine medical visits and healthcare. A new era of online health visits dominates healthcare during the pandemic. However, clinicians use online platforms to see patients while limiting in-person contact. Healthcare providers acknowledge the shortcomings of online medical services, especially for diabetic patients. Online platforms limit the empathy and humanness integral and effective to healthcare. Without human touch, interaction, and in-person support, clinician's disservice patients with diabetes, where support is indispensable in lifetime management. Coping with the fear of contracting the virus, the drastic change to their medical support system and everyday life, diabetic patients resort to old lifestyle habits, such as overeating, exercising less, and limiting contact with the medical community.

Although vaccination roll-out brings us hope of normalcy in the coming months, the impact of COVID-19 on society and its citizens will linger on. The world we inhabit after the pandemic will vastly differ from the world we remember before. However, life must go on. This research illuminates the social impacts felt from the pandemic, which will prove invaluable as we navigate life after. Both here to stay, COVID-19 and diabetes comorbidity pose a challenge for the future of public health.

Research into the comorbidities relevant to the COVID-19 pandemic expands scientific and community awareness of possible risks and the necessary means to mitigate serious complications associated with COVID-19 infection. The pandemic's fast and extensive spread led to pauses and halts to accessible programs tailored to diabetic care. However, informant interviews show that support is an integral part of treating fears,

worries, and comorbidities during the pandemic. The research on the social factors significant into high morbidities allows us to navigate treatment and care as the pandemic unfolds.

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10. Endnotes

ⁱ The term SARS-CoV-2 refers to the virus that causes the disease COVID-19 or The Coronavirus. The terms COVID-19 and The Coronavirus in this paper are used interchangeably to refer to the disease pandemic of 2019 (Centers for Disease Control).

ⁱⁱ The number of deaths and cases of COVID-19 are in constant flux. The data in this paper may not reflect the most current numbers. Current numbers can be found on the John Hopkins Coronavirus Website: <https://coronavirus.jhu.edu/map.html>

ⁱⁱⁱ Taos has Type 2 Diabetes rates higher than the national average. The CDC National Diabetes Statistics Report of 2020 reports that 8.2% of the national population has diagnosed diabetes. The estimated percentage of diagnosed diabetes in Taos County (between 2015-2017) was 10.4% (New Mexico Department of Health 2018).

^{iv} Other comorbidities include, stroke, peripheral vascular disease, congestive heart failure, and myocardial infarction (Nowakowska 2019).

^v New Mexicans use the Latino Nomenclatures “Mexican,” “Spanish,” “Chicano,” “Hispanic” and “*Hispano*” to refer to their cultural identity. However, the terms Spanish, Hispanic and *Hispano* are the most common nomenclature for long-standing families in Taos. The majority use of these nomenclatures has roots in historical periods. Prior to Mexican Independence, family and individual nomenclature indicated class and social position in New Mexico (Rodriguez 2021). The nomenclature *Español* (later changed to Spanish after American influence) designated Castilian descent inferred one’s high position in the caste system. After the annexation of the territory to the United States, New Mexicans continued use of the term in efforts to assert their European origins to a US audience. The use of the terms today serves political and cultural agendas: New Mexican families distance from Mexican identities (largely due to the anti-Mexican attitudes and rhetoric in the United States), confer American Citizenship, and conserve connection to the Spanish conquistadors (Rodriguez 2021). The terms Spanish, Hispanic and *Hispano* are used interchangeably in this research when referring to long-standing families with Spanish descent throughout this paper, in order to best mimic the nomenclature used by Taoseños to define cultural identity.

^{vi} The Behavioral Risk Factor Surveillance System (BRFSS) is a series of telephone surveys that collect data on people’s health, including health risk factors, rates of chronic disease and use of preventative medicine. The BRFSS collects data from all 50 states, The District of Colombia and 3 US territories, through a collaboration between states and The Centers for Disease Prevention and Control (Centers for Disease Control 2019).