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**Geography**

**Medical Geography of the Pima Indian Reservation Diabetes Epidemic:**  
**The Role of the Gila River**

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## **Medical Geography of the Pima Indian Reservation Diabetes Epidemic: The Role of the Gila River**

### **Introduction**

When the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), began their thirty-year clinical research study with the Pima, they were seeking to answer the question “Why do Native Americans, Hispanics and other non-white peoples have up to ten times the rate of diabetes as Caucasians?” (NIDDK). Extensive research has been done on genetic susceptibility, diet composition, and the effects of active versus sedentary lifestyles. Research has not taken into account the geographic causes of this epidemic. Through a case study of the geographic contributions of the diabetes epidemic amongst the Pima Indians I seek to prove that the loss of access to the Gila River water was the most significant overlooked cause of the epidemic. On a larger scale I seek to prove through my analysis that “Native-Americans, Hispanics, and other non-white peoples have up to ten-times the rate of diabetes as Caucasians”, not because of their race/ethnicity but because of environmental, social, economic and historical causes.

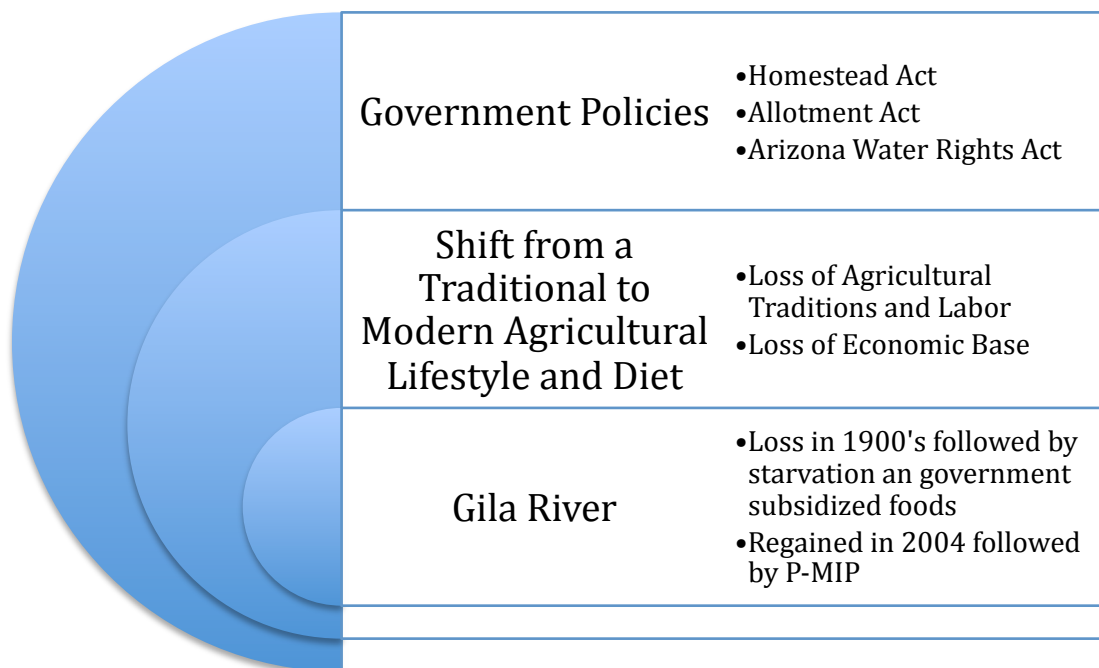
According the 2010 UN report on the state of Indigenous Communities, Worldwide, more than 50 per cent of indigenous adults suffer from Type 2 Diabetes– a number predicted to rise (UN 2010). The most famous and well-researched population study of Non-Insulin Dependent Diabetes Mellitus (NIDDM) has been conducted in partnership with the Pima Indians of South Western Arizona in partnership with the NIDDK and the National Health Institute (NIH).

It is important to call attention to and generate more scholarly work on the topic because the body of research on the built, natural and social environmental causes of diabetes is much less developed than the body of research on genetic causes. Some of this may be attributable to the western medical philosophy of allopathic treatment, and the never ending search for “a magic bullet” cure, and a portion is likely due to the funding sources of the research. Many pharmaceutical company’s economic best interests lay

within funding research that will provide them the opportunity to provide retrospective care (Unnatural Causes).

Furthermore the emphasis on genetic research as opposed to environmental causes of the disease is disempowering and misleading to the community and individual. It gives the impression their health is beyond the control when that is not at all the case. As epigenetic research shows, the expression or inhibition of a genetic susceptibility to disease is dependent on the individual's environment.

I will conclude by demonstrating how the return of water to the reservation acted as a catalyst for a counter-diabetes movement by allowing for a return to agriculture traditions.



### Direct and Indirect Causes

| Direct Causes       | Indirect Causes              |
|---------------------|------------------------------|
| Change in Lifestyle | Loss of Access to Gila River |

|                        |                          |
|------------------------|--------------------------|
| Change in Diet         | Government Policies      |
| Genetic Susceptibility | Economic Status          |
|                        | Damming of Western Water |
|                        | Labor Losses             |
|                        |                          |

The chart shows all causes that led up to, or currently contribute to the epidemic, and have been segregated into two categories. The first category I consider ‘direct causes’. It includes only three commonly known and well-researched contributions to type II diabetes, genetics, diet, and lifestyle. I consider these direct causes because they can contribute to the development of diabetes amongst any individual regardless of any other external geographic, social, economic or historical factors.

The second category, ‘indirect causes’, constitutes those that have created the built, natural, and social environments of the Pima. The principal indirect cause for the focus of this argument is access to Gila River Water. I argue that this was the critical geographic cause of the epidemic because it acted as the catalyst for all three direct causes, and was the direct result of all other indirect causes.

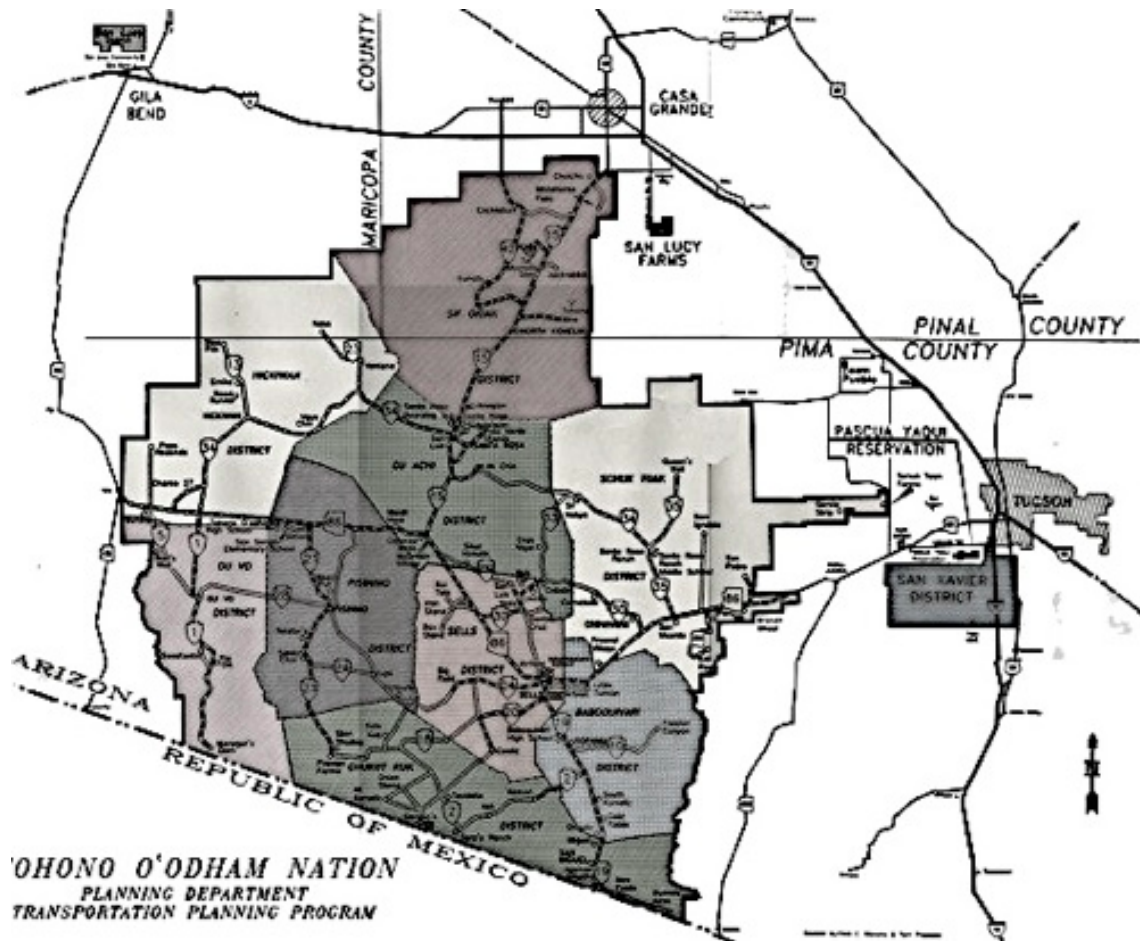
Access to and loss of water directly impacted genetics because patterns of intermittent draught affected food availability, which allowed for the successive evolution of the ‘thrifty gene’, which causes people to store fat more efficiently for times of famine. In a modern Western diet, this trait results in obesity and thus Diabetes. Water was an important factor in lifestyle and diet because diminished water flow following settlement up river of the Pima is directly responsible for the loss of the Pima’s agricultural supply and the physically demanding lifestyles that accompanied farming. Finally, I am able to demonstrate that the re-allocation of Colorado River water correlates with a reduction in the incidence rates of NIDDM amongst the Pima, although this cannot prove a causation.

As stated by Rod Lewis, the Former General Counsel of the Gila River Indian Community, “There is a direct connection between the diversion of water on the upper Gila River and health status and economic status of Pimas and Maricopas.” (Unnatural

Causes). The improvements and declines in the nutritional status of the Pima have been directly correlated to the availability of water to cultivate agriculture. Even though the government allotted significant land for farming in 1887 it did not provide the reservation with water and the crops failed. Without their harvest the Pima became malnourished. Draughts in the region further worsened their health status. When the government provided subsidized foods in the 1930's, starvation quickly turned towards obesity and diabetes. The epidemic worsened steadily each decade until rates peaked at around an average of 65% for both sexes in the 1960's. During the early 1970's the Pima took their water rights battle to court and received a Colorado River allocation. Full water rights were re-gained in 2004 with the Arizona Water Rights Act, a result of the earlier, Central Arizona Project (CAP). The Pima have since been cultivating community and industrial scale agriculture by means of the Pima-Maricopa Irrigation Project (P-MIP).

The agricultural lifestyle and traditional foods being cultivated in the community are examples of a self-initiated movement towards diabetes prevention. The diabetes mortality rate amongst American Indians in the state of Arizona stayed between 74% and 76% from 1980 to 2000, and decreased to 59% between 2000 and 2004. (Cioazan, Diabetes in Arizona Status Report 2005). The surprising decrease in diabetes rates was accompanied by the agricultural development phase of P-MIP in 2001. There was no significant advancement in allopathic or prophylactic treatment of diabetes in that time period, and half a century is not sufficient time for the human genome to evolve, leaving environmental causes to be a likely cause of the decreasing rates.

### **Gila River Indian Reservation**



[http://www.tocaonline.org/TOCAAnalysis/Entries/2011/10/1\\_Community\\_Context\\_\\_The\\_Tohono\\_Oodham\\_Nation.html](http://www.tocaonline.org/TOCAAnalysis/Entries/2011/10/1_Community_Context__The_Tohono_Oodham_Nation.html)

### ***An Agricultural Tradition:***

The modern day Pima and Maricopa tribes are the descendents of the Hohokam, who constructed complex systems of ditches in the region dug with wooden sticks and stone axes. Simple bush dikes and diversion dams controlled water flows enough for the Hohokam to develop an irrigation empire. In the Salt River Valley, the total length of the irrigation works are estimated at 150 miles (US Bureau of Reclamation). The Pima and Maricopa tribes utilized the Hohokam irrigation ditches as well as another system known as ak-chin farming developed by their neighbors, the Ak-Chin O'odham, that utilized the

flood plains along the edge of the Gila River following the monsoonal spring rains (TOCA).

Before their first encounter with the Spanish the Pima cultivated *Zea Maize*, sweet corn, brought North through trade with indigenous groups of Mexico. As well as a variety of squashes, and tepary beans, a sturdy heat resistant bean able to combat the desert sun (DeJong). The combination of growing squash, beans, and corn together, known as ‘the three sisters’ was a common agricultural practice for many North American tribes. Grown together in a technique called companion planting, the three sisters facilitate each other’s growth. The corn provided a stalk for the beans to grow on, and the squash provided ground cover to ward off weeds. Modern nutritional analysis has also shown that corn and beans together make a complete protein, meaning that the body is provided with the full set of Amino Acids that must be obtained in the diet in order to continue bodily processes. Maize was later accompanied by wheat after it was obtained through trade with the Spanish (DeJong).

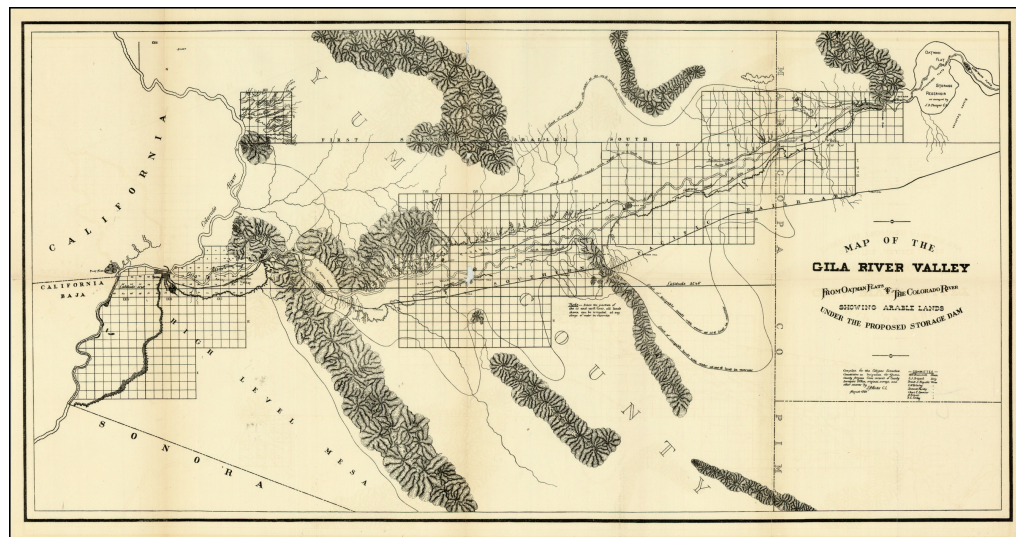
Through generations of agricultural traditions the Pima adapted many successful agricultural techniques to grow life in the desert. By efficiently using the monsoonal spring rain in a flood plains system along the edges of the river, they were able to distribute the high water volume evenly amongst their fields. The seeds they planted were heat resistant, and fast germinating, even the corn, which was known as “60 day corn” for the amount of time it needed before it could be harvested was able to grow quickly. The tepary beans in particular grew well in the desert because they are one of the most heat and drought resistant crops in the world. The growing season was very short and the crops were eaten fresh or preserved to last the winter. Throughout the year they were able to collect cholla buds, cacti fruit, mesquite bean pods and acorns and hunted rabbits deer and javalina for protein (TOCA). After the Pima adopted wheat and obtained work animals through trade with the Spanish, they were able to use their irrigation system to grow wheat as a winter crops which supplied more resources to trade, boosting their economy in allowing them to obtain more agricultural technology and continue cycle (DeJong).

The Pima adapted their crop percentages to what was worth the most through trade. During the California Gold Rush, when the Pima lands served as the only outpost

in the journey from Mexico and the last place to get supplies before crossing the Sonoran Desert. The early years of settlement Pima actively participated in the young American economy through agriculture (DeJong).

### ***Losing the Gila***

In the geographic context of an arid desert with intermittent periods of extreme draught, water is more valuable than gold. In the late 1800's the encroaching American settlement of the west stressed the water resources. The majority of settlement following the Homestead Act of 1862 occurred up river of the Pima, greatly reducing agricultural output (DeJong). As late as the 1920's, the community utilized traditional methods to cultivate over 20,000 acres in the floodplain of the Sonoran lowlands. By 1949, that number had declined to 2,500 acres (TOCA). In the early years of settlement the Pima sought nearby areas with higher water volume, but the concurrent implementation of the Allotment Act restricted their ability to migrate. The problem was greatly exacerbated by successive droughts, marking the start of a long era of malnutrition and starvation that would worsen progressively until government action was taken in the 1930's (DeJong).



Map of Proposed River Dams from the City of Florence

<http://www.raremaps.com/gallery/detail/20704?view=print>

### ***Starvation and Government Dependency***

A comprehensive study undertaken by the Indian Health Service in 1902 reported only one case of diabetes amongst the Pima (Unnatural Causes). The series of events that unfold over the preceding century led to rates of over 60%. Surface water stopped reaching the Pima's croplands by the 1890's, despite the 1908 "Winters v. United States" decision defining and protecting indigenous water rights (Unnatural Causes). The issue was made worse by a twenty-year draught from the 1890s into the early 1900s.

Records of the period between 1900 and 1930 tell of elderly Pima found starved to death in their homes. In fact, the entire community was starving. Most families got by selling Mesquite wood, which could grow with almost no water. The famine was so great that one legal record described the conviction of a Pima man, called "Old Pap", both a husband and a father, who was charged with grand larceny for stealing a white man's horse and trading it for food for his family.

In 1904 a investigation committee sent to advise President Roosevelt on the status of the Pima advised that unless the reservation was provided with the irrigation they would soon drive "toward hopeless pauperism and laziness the largest body of skilled and trained agriculturalists ever known in the history of our Indian tribes" (DeJong). The building of subsequent dams commenced to supply the growing Southwest population with water, but the Pima would not receive adequate irrigation until they fought for it in court eighty years later. But the issue was not entirely ignored. The Pima would be offered a ground water aquifer for their crops, which chief Azul initially refused because his tribe believed it caused "kidney and bowel problems, and killed cattle and horses" (DeJong). Nonetheless, groundwater was resorted to as their only option. Their superstitions soon proved to be valid. Crops would not grow because ground water proved it to be far too alkaline for agricultural uses.

By 1920 most of the Pima agricultural lands were depleted. The labor force had been depleted because many young Pima men left the reservation to fight in the war, while others immigrated to Mexico seeking better living conditions. By the 1930s the damming of the Colorado River waters controlled the distribution of water to the southwest, little of which the indigenous tribes had access to. Without the resources to actively participate in the burgeoning economy of central Arizona, the Pima became almost entirely dependent on the US government (DeJong).

By the era of the depression the government implemented a subsidized surplus food program providing such foods as white flour, cheese, refined sugar, lard, and canned foods. A famous commodity product of this era was Indian Fry Bread, a resourceful combination of flour, lard and vegetable shortening. Fry bread is often mistaken as a traditional Indian food, although realistically it is a stretch from the high fiber, nutrient dense foods of the Pima's agricultural past. There were no traditional Indian foods, and fresh produce was not available until 1996 (Unnatural Causes). Although the Pima were saved from starvation, they were soon to face the opposing form of malnutrition. They had too many calories with too few nutrients.

### ***Diabetes Epidemic and Genetic Research***

By the 1950's diabetes had become epidemic in the community. Levels increased for thirty years until we saw a slight decrease in the 1980s.

The NIDDK began the 30-year study of diabetes amongst the Pima in 1965. The Pima presented an interesting opportunity for genetic research because they were a genetically homogenous community. The initial study question was "Why do the Pima have such high rates of NIDDM" (NIDDK)? Little was understood about the growing diabetes epidemic in the entire United States, and the study was also used as an opportunity to study the etiology and progression of the disease in the general population.

Anthropologist Robert Ferrell contributed the only answer to the original study question as to why the Pima display such high rates of NIDDM in 1984 when he hypothesized about the presence of the "thrifty phenotype". It is believed that the Pimas had adapted to a feast-famine situation, where there were sporadic disruptions in their food supplies. Knowler et al (1993) believe that the recent increase in diabetes incidence following the availability of an abundant food supply points out that the efficient storage of energy during periods of feast and famine probably has led to obesity, insulin resistance, and diabetes (King).

### ***Genes or Environment?***

An influential study published in 2006 looked at the diabetes rates amongst the Pima in Arizona and the Pima in Mexico, who had originally migrated during the loss of

the Gila in the 1890's. The study concluded, "The much lower prevalence of type 2 diabetes and obesity in the Pima Indians in Mexico than in the U.S. indicates that even in populations genetically prone to these conditions, their development is determined mostly by environmental circumstances, thereby suggesting that type 2 diabetes is largely preventable" (Schultz).

Regarding the Pima studies, the NIDDK states that, "Finding the gene or genes that may increase a person's risk for getting diabetes and obesity is the most effective way scientists have to learn what's wrong in a diabetic person." They gained much knowledge on the disease in general, but this statement is far from the original research question regarding the Pima.

The NIDDK study was unable to fully answer their research question by considering genetics alone and ignoring the environmental factors in which the disease arouse. The Pima have such high rates of diabetes because their traditional way of life was taken away from them, forcing them into government dependency. Pacific Islanders, African Americans, and Aboriginal peoples in Australia, all suffer from type II diabetes at rates double or triple the national averages. So what is really going on all over the world, aside from genetic abnormalities that is putting certain groups of people at higher risk of NIDDM than others? S. Leonard Syme, an Epidemiologist at UC Berkeley, answers this phenomena by explaining, "They have totally different histories. They are all different populations, and yet they all have the same manifestation...what's going on? What's the common denominator? And in every case, we're talking about people who have been dispossessed of their land and of their history. They haven't been able to re-create it. In all these far-flung parts of the world the social circumstance of being ripped from roots ends up with the same manifestation of disease" (Unnatural Causes).

Genetic studies have been well funded through America's capitalist driven healthcare systems. Certain parties have made significant profit from the epidemic (UC). Nothing is definitively proven but many have speculated on the misappropriation of funds for diabetes prevention. As stated by one member of the Pima community, "we are willing to spend \$200,000 on genetic research, but not willing to spend \$40,000 for a P.E. teacher" (Unnatural Causes).

### ***Acquiring Water Rights***

As the NIDDK study came to a close, the majority of the results showed that genetics are a contributing factor to NIDDM, but the expression of the gene, and thus the development of the disease, is dependent on environmental circumstances. What did this do for the community? Hypothesized genetic susceptibility had not lead to the creation of a genetic therapy, or prophylactic treatment. They believed that the cure lied in changing the environment that causes their condition.

During the same era of the NIDDK another momentous event was occurring within the community that would arguably have a greater impact on the epidemic than the research. The Central Arizona Project was underway in supplying 173,100 acre-feet of water to the community to restore their agriculture. The settlement resulted in the Pima-Maricopa Irrigation Project (P-MIP), a self-governed community initiated intended to organize the use of the water. The project centers on the Native American Rights concept of Self-Determinism, meaning that the outcomes of project are determined by, and benefit the community. The concept behind self-determinism is to break the cycle of government dependency and return to sovereignty.

By examining diabetes incidence of the Pima over time the correlation with water becomes more evident. A statistical study conducted in 2000 analyzed the percent changes in BMI and NIDDM during the latter 20<sup>th</sup> Century. The study concluded that abrupt lifestyle changes that occurred after 1930 caused the dramatic rise in incidence of obesity and NIDDM, the epidemic peaked in 1965, and declined afterward. The researchers speculated that the decline was caused by lifestyle interventions, which were proven to be effective against the disease onset, but also stated that the extent to which the interventions are effective in community settings remains to be determined (Pavkov 2007).

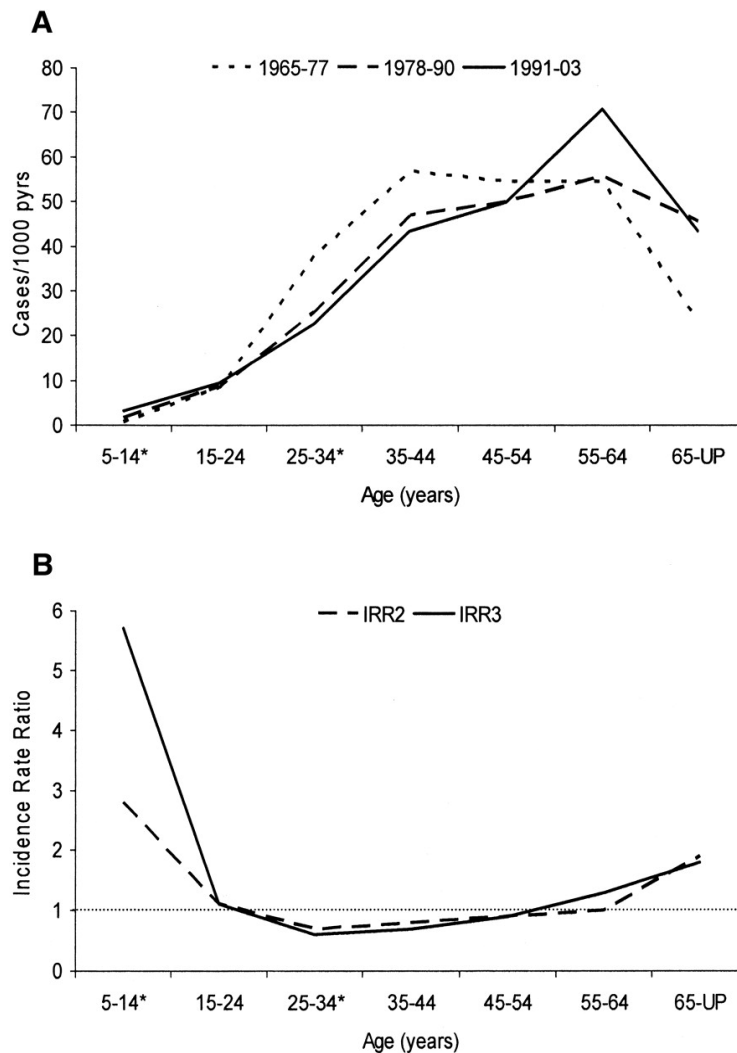
A series of twin studies proved that genetics determine the majority percentage of BMI outcome, which can, if above the healthy range, cause diabetes. This seems to counter the circumstances we have witnessed in the Pima population (Stunkard 1994). BMI has been attributed to 70% genetics and only 30% environmental conditions. The body of research on the Pima often references this series of twin studies conducted first in Europe and later in the United States. The results of this research makes it seem rational

to pursue a genetic cure. The relationship between Body Mass Index, Obesity, and Diabetes is deceptive. Obesity is linked to NIDDM because of the high percent of body fatness caused by chronic high levels of blood glucose. BMI is not representative of percent body fat because it does not take into account weight correlated to body composition. The body's weight is composed of water, organs, bones, muscle and fat. Muscle in particular can skew the results of BMI because muscle weighs significantly more than fat, so athletes may be graphed as obese, contrastingly, people with a high percentage of body fat may weigh less.

Furthermore, there have been no definitive results in the research on the genetic role of body fatness, although studies have correlated genetics to behaviors that may cause obesity, such as a tendency to be sedentary or to overeat. Other studies have found a genetic susceptibility to tend towards visceral fat accumulation, which is linked to the development of chronic diseases (CDC). In the case of the Pima we must assume a greater influence on the environment. The genes of the population did not evolve within the rapid period of modernization that occurred during the twentieth century, and given the rates of diabetes prior to 1930, environmental changes appear to be the most significant factor.

### ***Current Trends in Diabetes Incidence and Water Rights***

Taking the hypotheses a step further there is also a correlation between the decrease in the NIDDM rates during the 1970's and the Central Arizona Water Project allocation to Pima-Maricopa County. The rates of incidence over time are displayed in the graph below.



A: Age-specific, sex-adjusted incidence rates of type 2 diabetes in three time periods. In each period, sex-adjusted incidence rates increased up to 55–64 years and then declined. B: IRRs relative to the first time period. IRR2, IRRs in the second relative to the first period; IRR3, IRRs in the third relative to the first period. \*Ptrend < 0.05.

### ***Summary of Important Features in the above graphic***

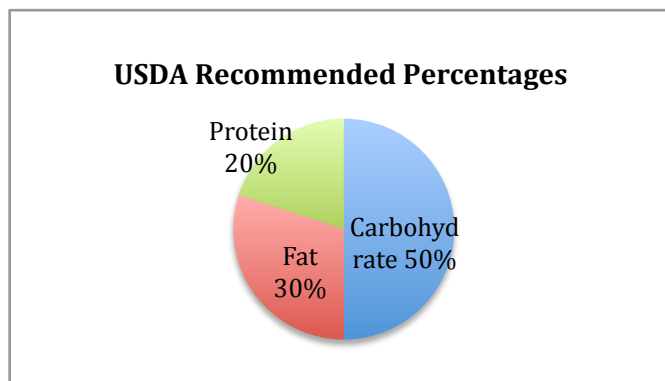
“The lifestyle changes that occurred in the first half of the 20th century may have contributed to an abrupt and dramatic rise in diabetes incidence, which peaked before 1965. Lifestyle interventions are effective at reducing the incidence of diabetes among high-risk individuals in short-term clinical trials (28–30). To what extent these interventions are effective in community settings remains to be determined.”

Diabetes incidence actually declined in the most obese group even as the proportion of the population in this group increased, suggesting that changes in the age at

which obesity develops, the rate of weight gain, or both may influence the effect of obesity on diabetes incidence” (Pavkov).

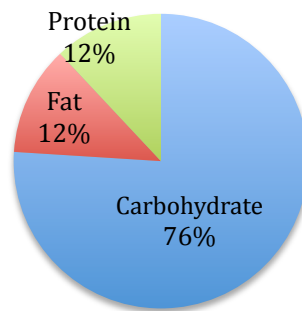
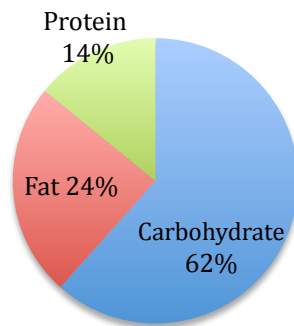
### ***Re-cultivating Traditional Foods and Lifestyles***

For lack of a “magic bullet” to cure diabetes, the research focused on the effects of the other two direct causes, traditional diet and lifestyle. One epidemiological study gave traditional foods to a control group in a dietary intervention to attribute the percent change in fat to the rates of NIDDM. The study concluded that the change from high fiber, high carbohydrate foods contributed to onset of the epidemic (Boyce). For the purposes of this study the term traditional implied the foods eaten one hundred years prior to the study (approximately 1903), when only one case of type II diabetes had been reported in the population.

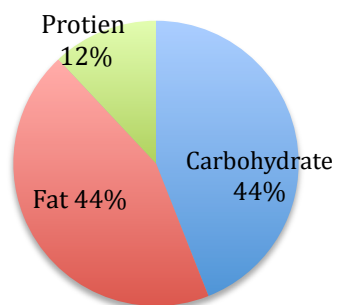


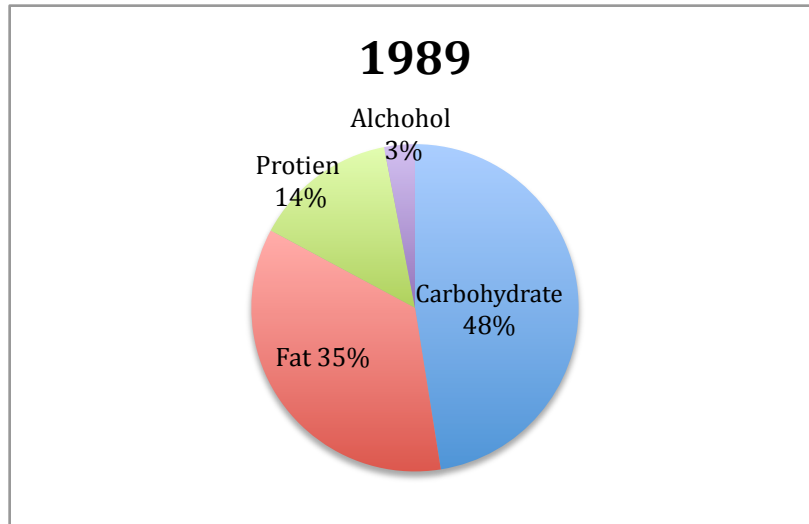
### **Percent Change in Food intake Amongst the Pima**

(According Boyce and Swinburn 1993)

**1930****1950**

S

**1971**



Traditional foods grown by the Pima were high in fiber and carbohydrate, two qualities that correlate with a low glycemic load, a quality proven effective in regulating insulin levels for people with NIDDM.

Within twenty years of completing the Coolidge Dam in 1930, the percent fat intake doubled from 12% to 24%, and doubled upon that by 1971. (Boyce, UC). The first doubling of fat intake can be attributed to government subsidized foods, the second can likely be attributed to the expanding “modern, western lifestyle”; particularly the presence of fast food. The final graph shows a decrease 9% in fat intake, suggesting that the first water allocations from the CAP were beginning to have an impact the economy, the agriculture, and as a result, the health of the Pima.

### ***Traditional Lifestyle***

A similar study conducted the following year emphasized the role of the Pima’s traditional agricultural lifestyle in diabetes prevention. The study compared Diabetes rates of the Pima in Arizona with a genetically comparable population in Mexico who still lived a lifestyle similar to that of the Pima around 1900. The Mexican Pimas showed rates of 11% for women and 6% for men compared with the Arizona Pima that year with rates of 37% and 54%. The diet was not the same as the traditional Pima diet so that

factor was not considered in the study. These results questioned the dogma that genes contributed far more than environment to NIDDM (Ravussin).

### ***Importance of the Study:***

Much research has been attributed to the subject of diabetes in the Pima, yet none have yet approached it from a geographic perspective, which emphasizes the role of indirect environmental causes such as access to water.

Considerable scholarly work has been done on the history of water rights and even more medical and scholarly studies have been conducted on the medical causes of the Diabetes epidemic, yet no *academic* work has so far sought to link the two together. I emphasize the term academic because the importance of the Gila is a well-known fact amongst the Tohono O'odham, but not within the public health community. This brings up a chronic problem of academic research disregarding indigenous knowledge.

### ***Faults:***

There was no direct contact with, or observation of members or representatives of the Tohono O'odham. TOCA was contacted by e-mail but a reply was never received. The Tohono O'odham have had many interjections from the academic community and the research of an undergraduate student unaffiliated with the reservation was likely regarded as insignificant.

The lack of primary resources in the work was compensated for by compiling opposing perspectives from within the extensive amount of information available from secondary sources. Resources that were academic or institutional, were balanced with information obtained from websites and other media created by the community. The research is intended to represent views from outside and within to the community to create a comprehensive representation of the issue.

To this end it is important to note that due to the fact that little indigenous knowledge is represented in academic literature, the majority of sources within the research that portray the perspectives of the Pima are not academically recognized, meaning that their factual legitimacy could be questioned. The importance of

representing the Pima truthfully and holistically outweighed the risk of incorporating non-academic sources.

***Conclusion:***

Ultimately, the two major direct environmental causes of the epidemic, loss of traditional diet and loss of traditional lifestyle, were caused by the loss of the Gila River water, making this event the most significant indirect cause of the epidemic.

The Homestead Act following the acquisition of Arizona territory diverted the Gila River water for upstream farming. The Allotment Act fortified the Pima Indian Territory within the Gila River Reservation, and ironic name given that the river had already dried up.

Drought in the early 1900's exacerbated the Pima's under-nourished situation until they were provided with government subsidized surplus food in the 1930's. Speculatively, as epigenetic research suggests, the period of starvation could have been a cause of the preceding generation's susceptibility to obesity and insulin resistance by expressing the 'thrifty phenotype'. During the thirty-year period of starvation, many members emigrated from the community, decreasing the labor force. The loss of many able bodied young men to fight in the war had the same effect.

Malnourishment began in the 1900's when the river first ran dry. The Pima's agricultural traditions were lost at this time period and continued to deteriorate throughout the 20<sup>th</sup> century. Malnourishment turned to the opposite end of the spectrum following 1930 with the introduction of subsidized foods. This obesity and preceding diabetes epidemic peaked in the 1960's and began to decrease after the Pima received an allotment of Colorado River water from the Central Arizona Project. The community has since sought to re-cultivate their agricultural heritage. The first step in achieving this goal was to obtain full water rights. After this was achieved at the turn of the century, the Pima-Maricopa Irrigation put the water to appropriate uses.

Much research has correlated health to wealth and sickness to poverty, and ultimately this comes down to access to resources. In the desert water is the resource necessary for people to live healthy lives. Its absence caused paralleling forms of malnutrition in the community and its return has begun the difficult work of returning the Pima to health.

### ***Possibilities of Future Research:***

There is enormous disconnect between indigenous knowledge and academia. Indigenous knowledge should be brought into the academic realm, in fact indigenous knowledge should be brought to the forefront of research on indigenous matters. I was unable to encounter Pima traditional foods in the USDA nutritional information bank. The Pima traditional diet could be an effective dietary guideline for diabetes prevention, but first the information must become available. Future research could include an analysis of the three sisters in terms of glycemic load and other factors that may fight diabetes.

### ***Policy Implications:***

Emphasizing the genetic component of diabetes is disempowering to individuals (UC). In order to tackle the complicated multi-factoral disease that is type II diabetes the NIDDK chose to begin by focusing on the genetic causes. For the study population they chose a group who had clearly developed their epidemic as a result of abrupt environmental change. Diabetes has become pandemic; its cause can no longer logically be attributed to a particular race.

Many major epidemics throughout history, such as Polio, Syphilis, and HIV, have decreased significantly before the invention of an allopathic cure or vaccine through behavioral and environmental modification. In the absence of such a “magic bullet” treatment for diabetes, research and policy should be focusing on providing or eliminating what allows for a healthy diet and lifestyle. At this point diabetes prevention should empower individuals to alter their lifestyles and diets. Genetic research will surely continue to play a contributing role, but given the that state of the current pandemic, it should not be our primary objective.

Community programs such as Tohono O’odham Community Action Program (TOCA) has set up prevention programs centered on the primary goal of restoring Tohono O’odham culture. They operate a café that served healthy traditional foods, a community and school garden program that uses water from the CAP settlement, as well

as collaborate to improve overall community economic and cultural resurgence with programs such as the Native Basket Weavers Coalition (TOCA). Self-Determinism in the native community, seen through programs such as TOCA, has been more beneficial for long-term sustainable community health than government intervention or institutional research has so far been. Although the NIDDK study improved our scientific understanding of the disease, the results of the research did not meet the needs of the community (Unnatural Causes).

Furthermore, policy makers outside the scope of public health should consider the impact of their decisions on the health of the population. Government policy decisions and distribution of natural resources can have adverse effects on disease development.

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