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A Health Disparity: the Link Between Socioeconomic Status and Type II Diabetes

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**A HEALTH DISPARITY
THE LINK BETWEEN SOCIOECONOMIC STATUS AND TYPE II DIABETES**

**A thesis submitted to
Regis College
The Honors Program
in partial fulfillment of the requirements
for Graduation with Honors**

by

Anne Flower

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TABLE OF CONTENTS

LIST OF FIGURES	iv.
PREFACE and ACKNOWLEDGEMENTS	v
I. INTRODUCTION	1
II. DIABETES MELLITUS TYPE II	5
III. DIABETES AND SOCIOECONOMIC STATUS	14
IV. STRESS AND GLUCOSE METABOLISM	24
V. DEPRESSION AND DIABETES RELATIONSHIP	33
VI. THE HISPANIC PARADOX	40
VII. SYNTHESIS AND ACTION	48
BIBLIOGRAPHY	57

LIST OF FIGURES

FIGURE 1: PATHWAY OF SES AND ALLOSTATIC LOAD	26
FIGURE 2: STRESS EXPERIENCE SCHEMATIC	28

Preface and Acknowledgements

This thesis document is a fitting culmination of my work these last four years at Regis University. Without being a member of the honors community, without being a member of the Tinansa Program, without being a resident of Romero House, and without being an intern at La Casa Clinic, this thesis could have never been. I could have never imagined that any of these experiences would have been mine or would have shaped me so much as they have. I look back on where I have been fondly and I recognize that this thesis speaks volumes to where I am going in the pursuit of health career and a call for social justice.

I have many people who I would like to thank who have been instrumental in my journey through this thesis process. I would like to first and foremost thank my advisor, Dr. Kristi Penheiter, and my reader Dr. Lisa Garza. The two of you helped me immensely from the start of my writing process and I could not have addressed a biological/ sociological issue without both of your expertise. I would like to thank Dr. Thomas Bowie for your guidance and for making me ask the hard questions throughout my collegiate career. Thanks to Melissa Nix and Dr. Damien Thompson for your support and friendship as my elders during the Tinansa Program and after. Thank you to Paul Burson and my Romero House family who taught me the pillars of simplicity, community, spirituality, service, and social justice. Thanks to Dr. Andrew Sciavoni for being my mentor during my internship and the staff of La Casa Clinic for showing me how public health care should be practiced. Last but not least I would like to thank my parents, Dave and Janette, and my sisters, Cari and Julie, for being my constant supports and my best examples of how to live exuberantly. The list of who to thank could surely go on and my gratitude is abundant.

Introduction

“The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without the distinction of race, religion, political belief, economic or social condition.”

- WHO Constitution¹

During my sophomore year at Regis University I applied to be a part of an intentional community called the Romero House. As a member of this program I focused on the ideals of service, simplicity, community, social justice, and spirituality while trying to live in solidarity with those who were living on the margins of society, but within my own community. This living, working experience placed me at La Casa Clinic- a family health center that is a part of Denver Health and is located not more than two miles from the campus of Regis University. Many of the patients at La Casa are residents of public housing and due to their economic situations many of them experience greater difficulties in attaining health and wellbeing. While the existence of the problem was obvious, I could not at first understand the cyclically oppressive nature of chronic illness and I could not articulate how this was an issue of justice.

During my junior year, while I was volunteering at La Casa Clinic, I became involved in initiating and coordinating diabetic group appointments for the patients of Dr. Andrew Schiavoni. While working with Dr. Schiavoni and a team of nurses and health care partners I started to gain a much deeper awareness of the link between socioeconomic status and diabetes, especially in the clinic’s predominately Hispanic patient population. I was not satisfied with simply recognizing that this problem of diabetes prevalence existed and I strived to understand more deeply and question more

¹ WHO, “WHO Constitution.”

fully why it was occurring and how it could be reversed. This goal, driven by new understandings of what service meant and what community meant, led me to return to La Casa Clinic as an intern during my senior year of college. Now I as reflect upon what I have been taught so far and what I have experienced, I recognize that the stories of this health disparity must be told.

During the hundreds of hours that I spent at La Casa Clinic, I gathered a great deal of anecdotal evidence about what the neighborhood around La Casa was like and what unique hardships many of the community members faced. There are some fantastic elements of connectedness and respect between neighbors, like when patients will greet one another with a hug and ask about one another's children and grandchildren, and these elements cannot be completely overshadowed by some of the more distressing realities of life in public housing. The Quigg Newton Public Housing complex is located directly next to the clinic and it holds 380 habitable units in only a few square blocks.² The neighborhood is bordered on one side by a major highway and on the adjacent side by a railroad track, both of which are within a half mile of the units. A survey of the neighborhood completed in 2008 gathered demographics from the residents of 47 units, both English and Spanish-speaking, including household composition, race/ ethnicity, occupation status, federal assistance program eligibility, use of the clinic, use of the Colorado Coalition for the Homeless Family Counseling Center housed within La Casa Clinic, and general satisfaction with the services provided at the clinic and counseling center. I was shocked to learn that 25/47 households were single mother homes, that 38/47 inhabitants were unemployed, that 29/47 had not been employed in at least the last

six months, that all 47 qualified for Medicare/ Medicaid, that 9/47 had an education level of 6th grade or less, that 5/47 had no education at all, and so on.² This was blatant data that forced me to recognize the unfathomable daily reality that so many patients face. Having this quantifiable knowledge meant that I was now better informed but it also made it imperious that I not assume anyone's situation or potential.

The people who have been instrumental in informing my understanding of this issue range from scientists with PhDs to patients who did not even have the opportunity to attend high school. The trends of sickness that I noticed in the patients of La Casa were striking and as I began to read more scholarly information about health disparities my understanding was profoundly increased. I spoke to many patients and tried to understand their situations more deeply than by just the disease that they battled and the parameters that marked their livelihoods. My understanding of the injustice at hand is not simply that certain groups of people are less healthy than others, but that certain groups are so disadvantaged from such an early age that their achievement of good health is intensely difficult, if possible at all. This realization necessitates that structural and practical changes must be made to ensure that all people are granted their basic right of health.

Before I can propose what needs to be changed, I must answer some questions about the health disparity of diabetes prevalence and socioeconomic status (SES). These

² Quigg Newton Counseling, "Quality Improvement," 1-10.

Medicare: National social insurance program for people 65 years and older and people with disabilities regardless of income

Medicaid: Federal and state funded program that is implemented at the state level and provides social welfare for people of low income

questions include: How is Type II diabetes a result of socioeconomic status, including psychosocial components of SES like stress and depression? Why is this trend, that a disproportionately high fraction of the low-income ethnic community is stricken with Type II diabetes, an injustice on a much larger scale? What is the potential for profound change in primary care medical settings and what systematic changes can be implemented to better serve all patients? I hope to unravel the complex difficulty of living with a chronic disease as well as living in poverty on a biological and sociological level.

Throughout my investigation I will offer personal testimonies of how these hardships affect real people, within my own community. Without coming to know the patients of this clinic, I would not have recognized how exhaustive the trials of living in public housing are and how stoically fatal the response to chronic disease is. Without coming to know the physicians, counselors, nurses, and staff of La Casa Clinic I would not have been able to see potential for change and propensity for individuals to achieve states of wellness, given their circumstances. Having not lived in public housing or with the disease of diabetes, I have arrived at my position of understanding through empathy and academic inquiry. I have a unique opportunity to articulate my call for justice because of my standing as a Regis University student and as an involved intern at La Casa Clinic. Though my understanding is by no means absolutely complete, I have witnessed this health disparity first hand and cannot ignore this prohibition of every person's right to achieve health.

Chapter 1: Diabetes Mellitus Type II

Diabetes Mellitus Type II (Type II diabetes) is a chronic disease that plagues nearly one in ten Americans and it often has a fatal outcome. A person is diagnosed with diabetes when he or she has an abnormally high level of glucose in the blood, the repercussions of which are widespread throughout the body and detrimental to many organ systems. Blood sugar level is measured by a test called a Hemoglobin A1c (HbA1c) and a measure of glycosylated hemoglobin superior to 7.0 indicates diabetes. After a diagnosis of Type II diabetes, the goal is for the patient to regain blood sugar control through lifestyle changes or a combination of lifestyle changes and medication. Without blood sugar control, heart health, vision, mobility, kidney function, and nervous system function may become quickly and irrevocably damaged. Type II diabetes is a devastating disease that is becoming more and more prevalent in the American population due to unhealthy lifestyle choices and this toxic trend must be reversed.

There are three types of diabetes that are caused by different genetic and environmental factors. Diabetes Mellitus Type I is sometimes referred to as “juvenile diabetes” because it is diagnosed most often in people under the age of 20 years old and it is caused by the body’s inability to produce any insulin at all. Insulin is a molecule that is produced by the islet cells of the pancreas and it functions to allow cells of the body to uptake glucose for energy or storage. Individuals who have Type I diabetes have an autoimmune disease where the immune system has destroyed the islet cells of the pancreas for a reason not yet totally understood. Without these islet cells individuals do

not produce insulin, meaning that their cells are not able to uptake glucose, and they must take insulin injections for the remainder of their lives.

Type II diabetes occurs when the cells of the body are resistant to insulin uptake and the pancreas is not producing enough insulin to compensate for this resistance. When the cells of the body, like the muscle and fat cells, are resistant to insulin there is a decreased uptake of glucose from the blood, which causes more red blood cells to be bound to glucose and high A1c values. Insulin resistance is directly linked to high levels of fatty acids in the blood, which is one of the reasons why obese individuals are much more susceptible to Type II diabetes.³ While the correlation has been studied in much more depth than the mechanism, fatty acids are thought to act as a physical barrier to glucose that could be taken up by muscle cells. Type II diabetes is not always treated with supplemental insulin since diet and exercise changes alone can reduce fatty acid concentration in the blood; however, certain medications can help.

The third type of diabetes is gestational diabetes and the onset is by pregnancy. This form of Type II diabetes will often resolve after the pregnant woman gives birth, though she is now at a greater risk for developing non-gestational Type II diabetes in the future. A diabetes diagnosis is warranted most typically when an individual has an A1c level superior to 7.0. Type II is differentiated from Type I by additional blood tests that can indicate if insulin is present in the blood at all. If no insulin appears to be produced, then the individual may have Type I diabetes instead of Type II. These three forms of

³ Boden, "Type 2 Diabetes and Fatty Acid," 499-504.

diabetes are different in their causes and treatments, but they all are diagnosed by abnormally high levels of glucose in the blood.

Diabetes is a catastrophically prevalent disease in the United States and the number of people diagnosed with diabetes is exponentially on the rise. According to the Centers for Disease Control and Prevention (CDC) over 25.8 million people are living in the United States with diabetes.⁴ This amounts to 8.3% of the population suffering with the disease and its associated health complications. An additional 79 million people are living with prediabetes, where A1c levels are higher than preferred, but not quite high enough to warrant a diagnosis of diabetes.⁴ For the population of the United States aged 65 years and older, 26.9% of people have been diagnosed with diabetes.⁴ Diabetes has been exposed as an epidemic in the United States, where testing is routine for those who have access to regular medical care. Still, a staggering number of people in the United States remain undiagnosed. As more Americans become tested and people in other countries around the world become more and more westernized, the incidents and diagnoses of diabetes will certainly increase to unmanageable proportions.

What is worse than the realization that almost one in ten Americans is living with diabetes is the reality that diabetes is a leading cause of death as well. In fact, it was the seventh leading cause of death in the United States in 2007 and was the underlying cause of death for 71,382 individuals.⁴ Diabetes was implicated as a contributing cause in an additional 231,404 deaths in 2007 bringing the total of diabetes-related deaths to over

⁴ CDC, "Diabetes Fact Sheet 2011."

300,000.⁴ This would be like the population of Cincinnati, Ohio or Pittsburgh, Pennsylvania being completely decimated by one disease. The exact biochemical and physiological reasoning behind the pancreas not producing enough insulin is unknown, but there is a great deal of evidence about the reasons why the body is unable to adequately absorb sugar from the blood.

Age and weight are two of the leading risk factors for Type II diabetes. As people age the pancreas often functions at a lower level and the immune system may be less effective than it once was. This combination of problems means that the pancreas is producing less insulin, islet cells may be degraded by the immune system and muscle cells are taking up glucose from the blood at a slower rate. This is one reason why Type II diabetes is normally seen in patients who are older, often over the age of 45, and why almost one third of the US population over the age of 65 has been diagnosed with diabetes. Being overweight, especially being considered obese, is a huge risk factor for diabetes. This is because a high amount of fatty acid in the blood is directly related to healthy cells being unable to uptake glucose. People who are considerably overweight face a multitude of health problems including diabetes, heart disease, and respiratory diseases. The alarming realization about the link between weight, age and diabetes is that more and more people are being diagnosed with Type II diabetes at younger ages. This is because the younger generations have less healthy diets, are exercising less and their body weights are greatly increasing. Previously, a diagnosis of Type II diabetes in a 20-year-old was almost unheard of. However, if there are enough fatty acids in the blood

and the pancreas cannot compensate, the 20-year-old could be facing fighting Type II diabetes for the rest of his or her life.

Other risk factors that impact a diagnosis of diabetes include family history and race/ ethnicity. Family history of diabetes is a risk factor, but the exact genetic mechanism of passage from parent to offspring is not yet fully understood. There is currently research interest in finding a genetic component for increased propensity for developing diabetes, but to date there has been no definitive mechanism of inheritance. The familial link that is probably most prevalent in people with Type II diabetes is lifestyle imprinting that was passed from parent to offspring. For example, if a mother with Type II diabetes is the primary decision-maker and food preparer in her family, then her family eats whatever she prepares for them. If she does not know how detrimental sugary, highly caloric food is to her health or does not see the need to avoid it, her children will surely eat it at least until they have been taught or shown otherwise. These children will then grow up eating in ways that are harmful to their health and they may continue to eat that way until their health has deteriorated and they too have diabetes.

Dietary education and healthy, fresh, affordable food are often lacking in certain areas, especially those where the residents have lower incomes. Low-income areas often house populations of immigrants and people of diverse ethnicities, referred to comprehensively as non-Hispanic whites (NHW). According to the CDC, as of 2011, 7.1% of NHWs have been diagnosed with diabetes, while 11.8% of Hispanics and 12.6% of non-Hispanic blacks have been diagnosed.⁴ This reveals a shocking trend that racial and ethnic groups suffer a greater risk of being diagnosed with diabetes. This risk is not

simply due to diverse ethnic origins alone. The fact that a disproportionately high fraction of residents of public housing are people of color indicates that a lack of resources could be to blame for this racial disparity.

When an individual is diagnosed with diabetes, he faces the risk of the serious complications if he is not able to get his blood sugars under control. Diabetes can be a devastating disease and it can cause heart disease/ strokes, high blood pressure, retinopathy, kidney disease, neuropathy, and amputations. Retinopathy is damage to the retina of the eye that can lead to blindness and neuropathy is damage of the nervous system that can lead to decreased sensation in the appendages and a painful, burning, tingling condition. These conditions can be fatal, but they usually first lead to disability and a lack of livelihood for diabetics. Along with these strictly physical complications come the detriments to mental health and an increase in depression. These complications of mental health may be less commonly tracked, but depression can create a situation where it may be impossible for sick individuals to make the necessary lifestyle changes to control or improve their blood sugar levels. This situation is catastrophic for all involved.

A diabetes diagnosis does not have to be a fatal one and it is possible for a person to decrease his A1c level enough to be considered diabetic no longer. This is not a simple task though and the basis of control often comes from lifestyle changes. These changes do not have to be drastic and something as simple as 30 minutes of exercise five days per week can be monumental in increasing control. When people exercise, their muscles take energy in the form of glycogen from storage in the muscle itself. Then, when those reserves run out, glucose is taken from the blood. This use of blood glucose

lowers blood sugar levels and aids in control. Blood sugar will be again raised when the person eats, but if he eats a meal that is balanced and does not contain a great deal of starch or unnecessary sugar, his body will break down the food and use it as fuel. Sugar is not ingested simply through eating candy and sweets, but from carbohydrates and starches when the body breaks them down into their basic components for digestion. Simply carbohydrates, like white bread and corn, are broken down quickly which makes them sources of simple sugar and short-lasting energy. This is why it is very important for diabetics to monitor their food intake, to eat balanced meals, and to eat small meals throughout the day. These guidelines are universal for people to maintain health, but they are especially pertinent for diabetics who cannot regulate their blood sugar normally.

Medications are one aspect of a diabetes control regiment that is often met with hesitation and resistance. Many patients believe that not taking medication makes them appear less sick, but it will be detrimental to their health in the long run and in the immediate time frame. Medications can aid in the process of glucose absorption in the cells and can make the pancreas produce more insulin. One class of medications called Biguanides, which includes Metformin (Glucophage), work by decreasing the amount of glucose produced by the liver. Thiazolidinediones, which include Rosiglitazone (Avandia) and Pioglitazone (ACTOS), work by reducing glucose production in the liver and by helping muscle and fat cells to better use insulin. These two classes of medications are not the only ones available, but they are two of the most commonly prescribed.

No diabetic control regimen is complete with just one mode of lifestyle or medicinal change. All patients should strive to make lifestyle changes, which may be coupled with medications and supplemental insulin. The goal of adequate glucose control is wellness, both physically and mentally. Two of the greatest challenges of diabetes are its related complications and comorbidities. Heart disease is the leading cause of death in the United States and uncontrolled diabetes can lead to cardiovascular damage and disease. Obesity is one of the greatest precursors to diabetes and it is also one of the leading causes of heart disease. Exercise and lifestyle changes, coupled with medication, are the best treatment plans for both heart disease and diabetes. While exercise inherently drops blood sugar levels, it also directly increases cardiovascular health. Comorbidities are frightening and often seem like death sentences, but that does not have to be the case and treatment can be highly effective.

Diabetes is clearly an epidemic in the United States and around the world. Since it disproportionately affects the elderly, the overweight, people of color, and people of lower socioeconomic statuses, this means that entire factions of our society are more likely to die from the disease and fight the hardships that are associated with living with it. As more and more young people start to be affected by Type II diabetes, more and more people will be dying younger and living more difficult lives. No one deserves to be ill, though it is an inevitable part of life. What is most irrational about diabetes is the cohort of low-income people of color who are most affected by it. These people often lack medical care and the resources to advance their own health. Diabetes should not be an increasing epidemic in this country, especially among people who are considered

“disadvantaged” to begin with. The root of this problem is deeper than poor blood sugar control and diabetes may be a symptom of a much greater problem of justice.

Chapter 2: Diabetes and Socioeconomic Status

The United States is largely organized by strata. One of these greatest stratifications is socioeconomic status (SES) or more generally termed, “the social ladder.” There are some clear implications of the rung upon which a person stands which include how big of a house he can afford, what type of car he drives, how much purchasing power he has, and what he does with his leisure time. These nuances of difference are actually what separate individuals in the middle and upper classes from one another. There are, of course, the people on the lower rungs of the ladder who do not own houses, may not even be able to afford rent on apartments, cannot afford to own or lease cars, and have their incomes fixed by disability, unemployment and lack of opportunity. While the strata here may seem drastic, the most unjust reality for people of low SES is that they are more prone to illnesses, have less access to medical care, and face higher rates of premature mortality.

This harsh, disproportionately high correlation between SES and morbidity/mortality has become much more widely analyzed in the past 15 years and one group has emerged as the frontline leaders on investigative intervention. This group is the John D. and Catherine T. MacArthur Network on Socioeconomic Status (SES) and Health and their most recent compilation is titled *The Biology of Disadvantage*, which was the feature of the February 2010 New York Annals Academy of Science publication. They compiled the latest and most sophisticated work of the past few years to answer the question, “How does SES get under the skin to affect health?”⁵ What they found was

⁵ Adler, “Preface BOD,” 1-4.

striking, though not completely unexpected. The correlation between low SES and mortality was sickening. Taking into consideration nine years of mortality data gathered after 1999, people on the middle of the SES ladder are one and one-half times more likely to die a premature death than their counterparts on the top of the SES ladder, who make over \$100,000 per year. Furthermore, people on the bottom rung on the SES ladder, making less than \$10,000 per year, are three times more likely to die a premature death than those on the top of the SES ladder are.⁶ For every affluent mother who loses a child, three mothers of low SES experience the same tragedy. For every affluent widow who faces parenting and financial woes, there are three widows of low SES who may not have nearly the same resources with which to cope and survive. The pinnacles of health disparities are the ones that end lives and these are the most pressing issues of *The Biology of Disadvantage*.

Socioeconomic status is not the simplest thing to define since each individual has a different values system and markers of success. The MacArthur Foundation and many other authorities define SES based primarily on income, but they also consider education and occupational status. These three are all largely informative of one another since the levels of education that people have often determine their occupations, which often determine their wages. The fourth factor in this equation should be housing or living situation. Certain neighborhoods are exclusively created for those who have the financial

⁶ MacArthur, "Reaching for a Healthier Life."

Section 8 Housing: Eligible low-income individuals can receive vouchers towards monthly rent payments. Individuals pay 30% of their income for rent and vouchers cover the rest for private housing, where vouchers are accepted.

Public Housing: Eligible low-income individuals pay rent based on a formula developed by HUD. Public housing units are constructed in complexes for multiple residents and the monthly rent payments range from 30% of income to \$25 for individuals who have no income.

means and income to afford them. Conversely, those who have little or no means with which to afford housing are sequestered to the same neighborhoods of federally subsidized housing, be it Section 8 or public housing. Here, entire neighborhoods are disproportionately prone to disease and morbidity and these sorts of tragedies are perceived as more common than they would be for the rest of the general population.

What is it about people of lower SES that makes them more prone to noncontagious disease and death? It cannot be their financial resources alone, though that is the clearest differential between people of differing socioeconomic statuses. According to U.S Department of Housing and Urban Development (HUD) there were over 8.7 million Americans living in public housing in 2009.⁷ The average income for a public housing home of 2.2 people was \$12,569. The average income for a Section 8 Housing home of 1.6 people was \$8,869. The poverty line for a family of two in 2012 is \$15,130.⁸ Poverty is marked by the reality that people living in this situation are lacking in some profound way. This way in which they are lacking is resources. The resource is not simply financial collateral, but it is a compilation of environment, recreation opportunities, health food markets, and social support structures.

It is not simply an anecdotal assumption that people living in poverty are more prone to disease and less able to treat the disease when afflicted. A previous understanding of the link between poverty and disease focused on individual attributes as the causes of health problems. Recently, neighborhood dynamics have been studied and linked to detrimental health. The physical and social environments that constitute a

⁷ HUD, "Resident Characteristics Report."

⁸ U.S. Dept. HHS, "2012 Poverty Guidelines."

neighborhood have direct implications on social, behavioral, and personal characteristics that constitute health.⁹ For example, in a neighborhood where there are few parks, recreation programs, and parental investment in child activities, children will simply be less active than their peers in other neighborhoods. What is even more distressing is that these children may grow up with the imprinted idea that exercise and activity are not important or valuable.

While adults may have a theoretical ability to change their living situation or the neighborhood in which they live, children simply do not. Dozens of recent studies have shown that low childhood SES is dramatically linked to adulthood increased mortality rates and incidences of cardiovascular disease, respiratory disease, and lung, liver, and stomach cancer.¹⁰ Also, the longer a child lives in a low SES neighborhood, the greater his/her risk of cardiovascular disease becomes.¹⁰ It can therefore not simply be a matter of genetics or birthright that causes low SES to be detrimental to health. A proportional relationship of years spent living in poverty to propensity for disease demonstrates that the environment is the factor that is truly to blame for disease and mortality.

Inactivity and poor eating habits during childhood lead to the same sorts of behaviors in adulthood, which are the lifestyle causes of Type II Diabetes. Obesity is evident in children who are inactive and their propensity for metabolic and cardiovascular disease as an adult is much greater than that of children who are not obese. One study of 1,402 fourth grade students in Texas called the “Bienestar School Health Study”

⁹ Diez Roux, “Neighborhoods and Health,” 125-145.

¹⁰ Cohen, “Childhood SES and Adult Health,” 37-55.

compiled health parameters for this predominately low-income population.¹¹ The study confirmed that many of the children were physically inactive and were eating too much high-caloric, nutrient-poor food. In fact, what the study found was that 33% of the children in the cohort were obese and 7% had high blood glucose levels.¹¹ At the ages of 8, 9, and 10 years old one third of the children were already obese and one in five of those obese children had metabolic systems that could not compensate for the sugar that they were ingesting. The mechanisms behind what directly causes Type II diabetes are not entirely clear, but body mass index (BMI) and insulin resistance directly correlate to distance from a wealthy area and to the level of local poverty.¹² This understanding dictates that Type II diabetes is a product of neighborhood SES, especially for children and those who have lived in such situations the longest.

In Colorado the federally-funded food assistance program aims to alleviate the burden of food costs on families and individuals who do not earn enough money to afford nutritious food. For a family of two the net household income can be no more than \$1,226 per month for the family to receive \$367 per month in food assistance.¹³ This means that the program provides \$2 per person per meal if the family is eating three meals per day. In the Quigg Newton neighborhood 30/47 households surveyed were receiving food stamps at the time of the study.² It may be possible to afford nutritious, healthy food on such a budget, but such constraints necessitate that the person shopping be rather thrifty. This also assumes that the individual who has the purchasing power

¹¹ Trevino, "Diabetes Risk, Energy Insufficiency," 1846-1852.

¹² Auchincloss, "Insulin Resistance, Wealthy Area," 389-397.

¹³ CO Dept. Human Services, "Can I Get Food Assistance?"

over the food is the diabetic and/or this person has a high level of understanding of what food is healthy food and what diabetics in particular should consider in their diets. Often times, especially for diabetics who are not the primary decision-makers in their households, the food that is purchased is out of their control and they feel helpless to make dietary changes if needed. Also, parents sometimes feel like they have to make diabetic-special meals for themselves because their diet is not appealing to their children, spouses, or others in their home. While all people should eat healthfully together, it is clear that with only \$2 per person per meal preparing two separate meals would be an even greater financial hardship. Ideally, growing up in a household with a diabetic would make the family focus on healthy eating because the effects of poor eating are much more drastic for a person who has a chronic disease. Unfortunately, the meager allotment that federal food assistance offers does not always make this potential actualized and education about healthy eating and meal planning is still absent.

Local poverty and low SES may be facts of life, but if there is not a change in the way in which these neighborhoods are resourced, then the next generation of children who are currently growing up in poverty will surely be the sickest yet. Health should not and cannot be a result of birthright and upbringing. If this is to be the sad reality, then there will be an astounding fraction of the working-age population who are disabled by diseases like diabetes or whose lives are ended prematurely. As of 2009, there were 842,000 children living in public housing and an additional 2.3 million children living in Section 8 Housing.⁷ Children make up 40% and 47% of these respective populations of public housing.⁷ The Quigg Newton Neighborhood dynamics emulate this trend and

29/75 inhabitants accounted for in the survey, or 39% of residents, were children.²

Furthermore, of the 30 homes in the survey where children lived, 25 were single mother homes while only 5 were two parent homes.² Maybe one could argue that SES is deserved for adults, but no one could claim that children deserve to live with toxic environmental hazards that cause disease. The designation of “poor child” cannot translate unequivocally to “disease-ridden adult.”

Furthermore, there is a direct correlation, no matter how seemingly prejudicial, between race, SES and Type II diabetes. The more critical component of Type II diabetes is SES and studies have shown that individuals of the same race are more prone to disease than others are based on SES. One such study found that Type II Diabetes affected 14% of Mexican Americans living in low-income neighborhoods, while it only affected 6% and 11% of Mexican Americans living in high-income and middle-income neighborhoods respectively.¹¹ Neighborhood income level alone made one group of the same ethnicity over twice as likely to be diagnosed with Type II diabetes. This realization demonstrates that while no one “deserves” to become ill, SES makes up to 8% of people living in low-income neighborhoods sick, who may have been healthy in another living situation.

Analysis of between race data is thought provoking and brings to life questions of how the striations in our society are more so segregations. *The Biology of Disadvantage* states quite clearly that neighborhoods are formed out of, “residential segregation by race/ethnicity and socioeconomic position.”⁹ This relationship is then directly related to the distribution of resources and by way of simple deduction, race is then a prerequisite to

resource availability and attainment. In 2009, 25.3% of Hispanics in the United States were living below the poverty line, while only 12.3% of white were.¹⁴ In the Quigg Newton Neighborhood Quality Improvement Project 32/47 households identified themselves as being of Hispanic heritage, 6/47 as white/ Caucasian, 5/47 as African American, and 4/47 as American Indian/ Alaskan Native.² Hispanics are diagnosed with diabetes more than whites are and African Americans are diagnosed more than even Hispanics are. More Hispanics live in public housing than do whites, and still more African Americans live there than do Hispanics. It is obvious through this analysis that SES is more a precursor to disease than race is, but the conversation around race, SES, and disease is emphatically unsettled.

In the age of modern medical genetics, many people strive to find the gene that causes breast cancer, the gene that causes Alzheimer's, and possibly the gene that causes Type II diabetes. If diabetes disproportionately affects people of certain ethnicities, could it be something in their genetic, ethnic makeup that makes them more susceptible? This would not make diabetes the first disease to have a perceived racial component since it follows diseases like sickle-cell anemia and Tay-Sachs disease. Sickle-cell anemia conferred malarial resistance for individuals living in sub-Saharan Africa and Tay-Sachs developed from a limited gene pool in a certain population of Ashkenazi Jews. Diabetes clearly confers no such health protection or strictly affects a small, distinct population, weakening the argument for a strictly ethnic genetic correlation with diabetes.

¹⁴ U.S Census Bureau, "Income, Expenditure, Poverty, and Wealth," 465-466.

Correlating Type II diabetes to race starts a dangerous conversation about a “superior” or “better” race. However, positively correlating poverty and race could be even more offensive, discriminatory, and debased. As obviously as there is not a gene for poverty, there is clearly a cyclically oppressive component to SES. The environmental, resource and nurture components of upbringing are the ones that determine lifelong health habits. These all are largely determined by neighborhood and can be augmented in a positive way warrant a reallocation of resources and care.

The fact that Type II diabetes disproportionately affects people living in low SES, indicates an obviously detrimental cycle. The “cycle of poverty” is not a new concept since wealth, or lack thereof, is often times inherited. In the specific case of Type II diabetes, average medical care costs 2.3 times more for a diabetic than it would for a non-diabetic.⁴ People living in low SES neighborhoods are more prone to disease, which costs much more than the average yearly medical care would, and these people have much less ability to pay for care. While there are systems of Medicare and Medicaid on the federal and state levels, not all people are able to access them effectively or to access them before they are already ill. Even when receiving support from Medicare/ Medicaid, like the 47/47 inhabitants of the Quigg Newton Survey, there are many extenuating costs of healthcare that go beyond the scope of what Medicare/ Medicaid can provide.² Some of these expenses include healthful food, exercise equipment or gym memberships, transportation to medical appointments or to exercise facilities, recipe guides, and dietitians. Preventative care is the most just way to deal with the issue of Type II diabetes and this begins with allocating community resources to areas where the

individuals are disproportionately without the means by which to promote their own health and that of their families.

While clearly an issue of justice, medical care for people of low SES is also an issue of financial practicality for hospitals, insurance companies and people who pay into their own health care. When people do not have primary care providers that they can go to, they use the much more costly alternatives of emergency rooms or hospitals when they become ill. Even many serious illnesses, that would warrant ER visits, could be prevented if patients would see primary care providers that they trust often. A study showed that people in the lowest SES quantile group were 44% more likely to have an ER event than people of the highest SES quantile were.¹⁵ This indicates that there is a clear problem on the level of primary care and that the environments of the lowest SES quantile may be the most hazardous to health. It is not simply a matter of finance that people of one SES, who may not have insurance, should not be having more regular ER visits. It is also a psychological and justice issue that these people should not have to endure more trying and traumatic situations due to their SES.

¹⁵ Booth, "Avoidable Hospitalization," 101-106.

Chapter 3: Stress and Glucose Metabolism

Stress is a multifaceted complexity of external stimuli and internal biological response mechanisms. A stress stimulus, real or perceived, alerts the brain to danger and prepares the body to effect a response. In the short term, this biological defense mechanism is paramount in its ability to raise hormone levels and create the “fight or flight” response. However, if the hormones produced are not utilized or if the stress stimulus is not resolved, then the effects are highly detrimental to many organ systems. If this heightened level of hormones and alertness is prolonged, the body faces serious consequences that could lead to glucose dysregulation, diminished health and diseases like Type II diabetes.

One of the most profound instances of prolonged toxic stress is in environments of low SES. Here, not only are the stressors greater, but the resources and outlets to deal with stress are considerably less than in neighborhoods of other SES's. The physical environments of public housing complexes are inherently stressful due to the number of people that are living in a small amount of space. The noise level, crowding, and temperature fluctuations are consistently elevated in these sorts of housing units. Family dynamics are notoriously unfavorable and many homes have only a single parent. This reality can be quickly interpreted by the statistic that the average household size for Section 8 Housing is 1.6 persons and 47% of the residents of Section 8 Housing are children.⁷ Single parent homes inevitably mean that the parent is entirely lacking spousal support, which is a large anti-stress resource. Then, there is also the stressor of low income and having to afford the costs of life- from food, to housing, to medical, to car, to

clothing, to all sorts of other expenses. As if the wage alone was not enough of a detriment to wellbeing, the occupation that pays such a wage is often manual labor, or night shift, or otherwise dangerous in itself. Not having access to affordable, healthy food is also a drastic stressor and this issue leads to an inevitably poor diet. There is clearly very little about living in public housing that is relaxing, reassuring or security-promoting.

The stressful physiological effects of low SES are not just apparent in adults. Children who live in these situations are perceptive to the cues that were once thought to be adult, or at least adolescent, issues. The negative physiological effects of toxic stress have been observed in children 5-years-old and younger, older children, adolescents, and young adults.¹⁶ The compilation of these studies used amount of glycosylated hemoglobin (amount of glucose/sugar bound to red blood cells) as a parameter to compare children of different SES and to compare their physiological stresses. Glycosylated hemoglobin is less able to carry oxygen and it hinders the transport of other essential molecules throughout the body and to the appendages, eyes, and organs, causing pain and other side effects. In each of these respective age groups, the children and adults living in the lowest income bracket had the highest levels of glycosylated hemoglobin. What is even more distressing is that these children are experiencing stress much earlier than their peers and during a critical time in brain development. A major component of brain development involves the limbic system, which controls emotion and behavior. In a circuitous manner, children of low SES have impaired limbic system

¹⁶ Seeman, "Socio-economic differentials," 223-239.

development, which leads to impaired limbic function, which impairs their decision-making abilities, which causes them to make decisions that may prolong their low SES (like dropping out of high school), which may cause their children to be born into low SES, the stressors of which impair their limbic system development and function (Figure 1).¹⁷

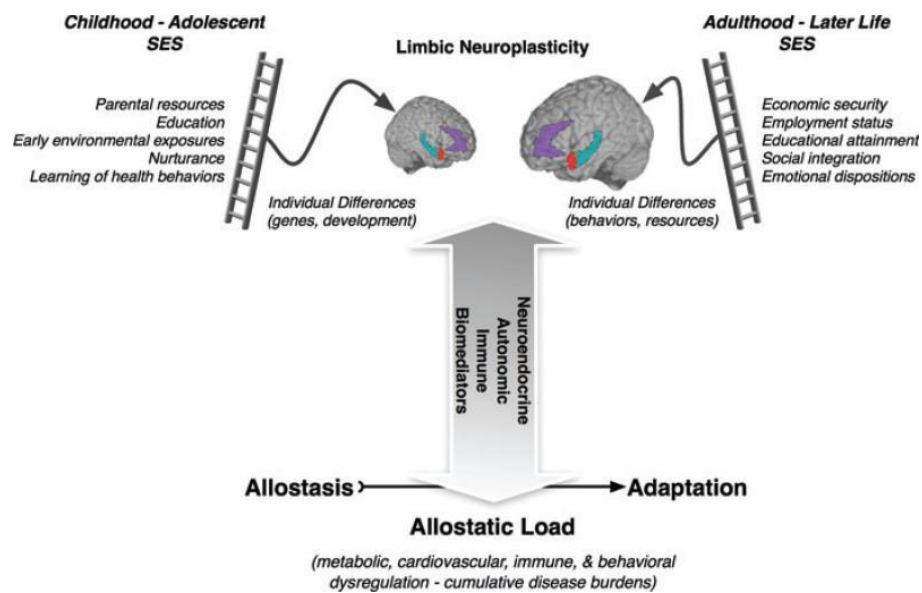


Figure 1

Neurobiological pathways of SES and allostatic load. Psychosocial factors related to SES can affect brain development (especially of the limbic system) in childhood/ adolescence and they can affect behaviors in adulthood. When these stressful events and psychosocial factors affect body regulation and allostasis they can lead to the negative health detriment of allostatic load (Figure from McEwen, “Central Role,” 197).

The language of biological stress is centered around deviations from allostasis (physiological homeostasis) and allostatic load. Allostatic load is defined as, “the wear-and-tear on the body and brain resulting from chronic dysregulation (i.e., over-activity or inactivity) of physiological systems that are normally involved in adaption to

¹⁷ McEwen, “Central Role,” 197.

environmental challenges.”¹⁸ The body is constantly interpreting stimuli and effecting responses in an attempt to maintain a comfortable, healthy state of being. When the body senses that it needs food, it initiates the hormones for a hunger response. Similarly, when the body senses a danger or another stressor, it initiates the hormones for a reactionary response that is powered by glucose. In the short-term, allostasis is highly beneficial and necessary, since it enables the body to move, run, or otherwise act. However, in the long-term allostatic load is detrimental to the metabolic, immunologic, cardiovascular, and nervous systems.

Glucose, or simple sugar, is the initiatory molecule in nearly all metabolic processes and it is the energy source for the body. At the onset of the stress response, the release of the steroid hormone glucocorticoid from the adrenal cortex is signaled the brain. This hormone controls glucose metabolism by regulating gluconeogenesis and the uptake of glucose by the blood, muscles, and adipose (fat) tissue. Gluconeogenesis is the process by which glucose is synthesized from another type of substrate and this process is rapidly initiated in a stress response. The increased production of glucose partners with the decreased uptake of glucose by the muscles and adipose tissue so that there is more available glucose in the blood to initiate actions. This inevitably spikes blood sugar temporarily. Healthy individuals, who have competent insulin production and absorption systems, can regulate their increased blood sugar after the response is over and they can return to a normal state. However, when increased sugar in the blood is not resolved, individuals express hyperglycemia, the chronic form of which is diabetes.

¹⁸ McEwen, “Central Role,” 190-222.

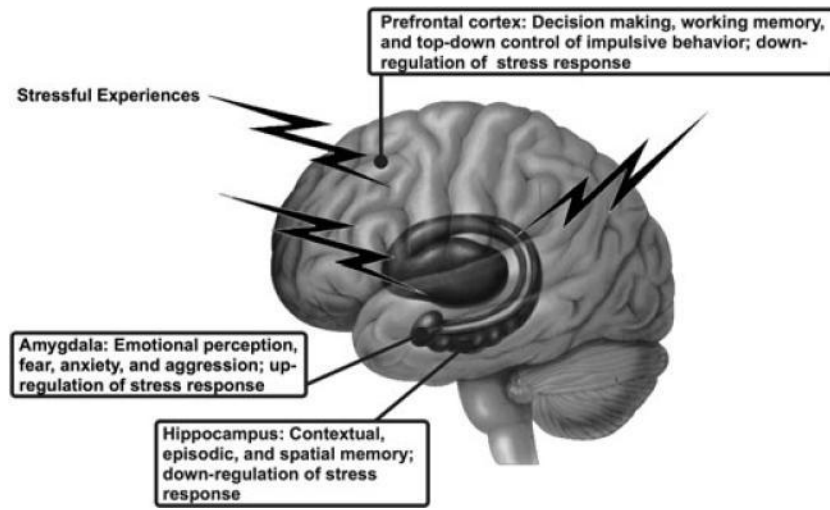


Figure 2

Schematic illustration of the location and key functions of limbic brain areas that play an integrated role in cognitive, emotional, and visceral control processes important for allostasis, allostatic load, and stress responding (Figure from McEwen, “Central Role,” 193).

The brain structures of the limbic system (Figure 2)¹⁹ are closely related to the hypothalamic-pituitary-adrenal (HPA) axis that controls glucose production and metabolism. The brain is the locus of stimuli processing, response effecting, hormone secretion, and physiological coping. The hippocampus is a structure that is implicated in learning, memory, emotional processing, and hormone reception. It is located directly next to the amygdala, which is involved in emotional perceptions like fear and anxiety. The prefrontal cortex is involved in higher intellectual functions like behavioral impulse control and decision-making. The hypothalamus, pituitary gland and adrenal gland make up the HPA axis which when stimulated causes the release of glucocorticoid hormones like cortisol. The way in which the body perceives a stimulus, the emotional tag that the brain ascribes to it, and the memories with which it is associated determines how many

¹⁹ McEwen, “Central Role,” 191.

glucocorticoids are released and how much glucose is produced. For example, a stressor like a gunshot will induce a much more profound release of glucocorticoids than another sound stimulus like an oven timer may. While both sounds elicit a reaction, the gunshot will imply a great danger and will be associated with terror-inducing memories of violence. The oven timer will signify that an action should be taken, like turning off the oven, but the response will not be nearly as profound or prolonged.

Interestingly, recent advances in neuroimaging technology and peaking interest in functional brain anatomy have revealed certain trends in the brain structures of Type II diabetics. What scientists have discovered is that diabetics often have decreased hippocampal volumes and that fit individuals have increased hippocampal volumes.¹⁸ This suggests that hippocampal size and function may be directly linked to amount of glycosylated hemoglobin, since glucose-bound hemoglobin is less able to deliver oxygen to tissues, and that the relationship may be circuitously causal. Those who may have had impaired brain development when young, are more prone to diabetes and those who have diabetes are more likely to have decreased hippocampal size. This is a profound discovery given the role of the hippocampus in limbic system coping mechanisms and given that stress is directly linked to Type II diabetes.

When the body carries a higher allostatic load, it will want to resolve the high level of hormones and the responses are often detrimental to health. Normally, an allostatic response will promote the body towards homeostasis, but an allostatic load response usually turns the body away from beneficial behaviors. The lifestyle behaviors that allostasis or an allostatic load warrant are “smoking, drinking, sleeping, eating a

prudent diet, and regularly exercising.”¹⁸ For those who have resources and education, stress may draw them to health-promoting behaviors like eating a prudent diet or exercising. For those who do not have recreational resources, available health food stores, or emotional support, the outlets of smoking, unhealthy eating, and drinking may be alternatives. Stress is peculiar in the respect that it causes some people to eat too much or sleep too much, while it causes others to eat too little or to sleep too little. No matter the direction away from homeostasis that the response may be, it is clearly detrimental to health.

The clearest problems here are the direct links between stress, low SES, and diabetes. Stress automatically causes more glucose to be in the blood (hyperglycemia), which when chronic is the definition of diabetes. Emotionally and hormonally, allostatic load warrants a behavioral response like eating, sleeping, drinking, exercising, or smoking. For individuals who already may have poor lifestyle behaviors, this response will be to eat more unhealthful food and not to exercise. These behaviors are often imprinted from childhood and adolescence and may be very difficult to change. Furthermore, if the person grew up in a neighborhood of low SES, her limbic system development may have been impaired during development and her ability to process emotions and effect adequate behavioral responses may be compromised. Stress is biological, physiological, psychological, and clearly detrimental. The inherited components of stress that have to do with birth and childhood SES expose yet another institutionalized injustice of health and SES.

The most toxic form of stress is trauma and, horrifically, individuals living in public housing or low SES neighborhoods are no strangers to traumatic events. Through the conversations that I have had with patients at La Casa Clinic, I have come to understand their unfathomable experiences on a much deeper level. The countless scores of abuse, incarceration, drug and alcohol prevalence, violence, and murder shook my naivety to a point where I can no longer pretend that the current mechanisms for success and health are just. I met a woman, named “Valerie,” who was forced to leave her abusive husband years ago when she feared for not only her own life, but the safety of her three small children. After raising her children in the Quigg Newton Neighborhood and being an outspoken leader in the community, Valerie experience an incomprehensible tragedy when she witnessed her own son’s murder on her doorstep. Her son, Stephen, was only 24 years old and he was making a future for himself in the welding industry. Stephen was known by everyone in the community for the barbeques that he would host at the family’s home and all of the children know Valerie for her compassion, generosity and perseverance. Valerie continues to volunteer at the Head Start center in the neighborhood, she takes care of many of the neighborhood children and she continues to feed dozens of people at barbeques and holidays in her son’s memory. Valerie also has Type II diabetes and while she is vivacious and active, she admits that Stephen’s death took a great toll on her health. I can only speculate the stress that Valerie endured when leaving her husband, in her son’s murder and in the daily present reminders of her not-so-distant past.

Quantifiably, stress can be linked to Type II diabetes by measuring blood sugar levels and by making observations about the sizes of brain structures. Less directly, stress can be linked to Type II diabetes by correlating traumatic experiences and hardships to behavior and perseverance responses. Simply recognizing that stress increases blood sugar is enough to merit that its detriments to health be taken very seriously and warned against. Making more holistic connections between SES, stress and response mechanisms indicates that SES, stress and diabetes are complexly and inextricably linked.

Chapter 4: Depression and Diabetes Relationship

Diabetes is a disease that affects the entirety of the body from the brain and the nervous system to the appendages and the tactile senses. It is often accompanied by comorbidities like heart disease, kidney disease, obesity, and depression. The affected systems are thus not simply the autonomic biological ones, but the emotional and psychological ones as well. Interestingly, there is an appallingly apparent connection between Type II diabetes and depression. Some scientists argue that either depression causes Type II diabetes or that Type II diabetes causes depression. Still, others find the connection between the two to not be one sided or linearly causal. A more holistic analysis asserts that the relationship between Type II diabetes and depression is “synergistic” or at least “bidirectional.”^{20,21}

When trying to decide how Type II diabetes and depression are linked it is crucial to look at both the causes of each disease and the implications of each disease on the body and mind. Being diagnosed with Type II diabetes means that a person’s blood cells are in persistent states of hyperglycemia and that his or her pancreas cannot produce enough insulin to compensate for the blood cells’ insulin resistance. When blood sugar is out of control continually, the person faces health complications like neuropathy, nephropathy, blindness, amputations, heart disease, etc. Knowing that these complications could occur and that early mortality is a real possibility, many people become hopeless and depressed. At times, blood sugar control can seem dauntingly unobtainable and individuals feel like failures for not being able to control what is

²⁰ Black, “Depression Predicts,” 2822-2828.

²¹ Vuppurti, “Risk of Progression,” 246-252.

happening in *their* bodies. Chronic disease creates a fatalistic mentality that inevitably brings about the emotional responses of fear and sadness along with the psychological effect of depression. This detrimental regression is expressed by the statistical reality that diabetics are two times more likely to suffer depressive symptoms than non-diabetics are.²² These symptoms include emotional feelings and physical pains, aches, irritability, insomnia/ oversleeping, overeating/ loss of appetite, cramps, and digestive problems.⁴ These symptoms of depression are in addition to the already present symptoms of Type II diabetes. When combined it is clear that daily life is much more difficult and painful and that the long-term prognosis is considerably worse.

In the converse causality depression can cause Type II diabetes. In these cases, the physical and emotional distresses of depression cause people to not participate in health-promoting behaviors like exercise, proper eating, interacting with friends, or finding enjoyment in daily activities. When people do not have the capability to be active and engaged, their health deteriorates and their lifestyles make them clear candidates for obesity, heart disease, and diabetes. Type II diabetes arises quite often from poor lifestyle habits and when people do not have an adequate perception of self-worth, they are very unlikely to change their behaviors and work towards their health. For whatever reason a person became depressed in the first place, now the chronic disease of diabetes will only make his or her situation less hopeful and more fatalistic.

It is not a simple coincidence that more people of lower SES are diagnosed with depression *and* more people of low SES are diagnosed with Type II diabetes. As

²² De Groot, "Depression Among Type 2," 1602-1604.

determined previously, low SES environments are inherently more stressful, people living there are more prone to toxic stress (which leads to disease), and disease are harder for them to treat than they would be for a person of a higher SES. Resources, financial and psychological, are often lacking in low SES households as well. These same psychosocial resources that could help alleviate stress are the same that are absent when a person starts to face depression. Not having an outlet with whom to discuss daily troubles and then not having an accessible professional for guidance on large issues is the combination that leads to poor psychological health and to diseases like depression. This observation is only possible to make by comparison. Looking at cases of diabetics in poverty versus diabetics of affluence clearly reveals that poverty increases the risk for depression in diabetics.²² Diabetes or depression alone is a difficult chronic illness to deal with, but the two are more and more frequently being battled together.

La Casa Clinic provides a unique resource to help combat the psychological distress that accompanies living in public housing, having a chronic disease or having any other sort of mental illness. This resource is the Colorado Coalition for the Homeless Family Counseling Center. The center has many skilled psychiatrists and case managers on staff, including Carlos and Diana. These two, along with the rest of the staff, offer their services at no charge to clients and their main goals are to address issues in their clients' lives that may keep them from retaining their livelihoods or housing. Having met and worked with both of them, I know from experience that not only do they listen compassionately and offer advice and solutions, but they are extremely creative in working with clients to help them afford their rent, find employment, seek job skills, and

endure some of the most difficult of times. They do see many patients who have survived traumatic events and the majority of their patients are mothers, many of whom are battling depression. Diana and Carlos see clients who suffer from either depression or disease, but they more often treat the combination of the two. Their work is to help community members attain psychological wellness so that physical wellness and a stable home life are possible.

Understanding the relationship between diabetes and depression requires analysis of data from individuals in certain social situations. A recent study investigated this link in a population of 2,830 Mexican-Americans who were over the age of 65. The data showed that nearly one-third of the cohort had diabetes and that 25% of that group reported significant levels of depression.²⁰ When the group was divided into those who suffered from depression and those who did not, 47% of the adults with depression also had diabetes.²⁰ Nearly one out of every two Mexican-American adults in this study who suffered from depression also had diabetes. This is an incredibly high number given that only one in four of the diabetics reported to suffer from depression. Possibly this sort of data shows that diabetes may be diagnosed first and that over the course of the disease that individual's emotional wellbeing deteriorates.

A clear illustration of why the progression of this chronic disease is depressing would be to look at the comorbidities of Type II diabetes. When an individual is initially diagnosed with diabetes, he or she may not have any clear physical signs that there is an internal problem in glucose metabolism and uptake. In fact, many people who have good blood sugar control may never encounter some of the more catastrophic effects of high

levels of glycosylated hemoglobin. However, the longer a person lives with diabetes, the greater his or her risk for associated health complications becomes. Some of these conditions include neuropathy, nephropathy, kidney disease, heart disease, vision problems, respiratory problems, and so on. Nephropathy, or kidney disease and damage, is found in 1/3 of diabetics who have been living with the disease for over 20 years.²¹ Clearly, diabetes takes a prolonged detrimental toll on health, but it can also attack organ systems immediately. Neuropathy, or the disease and damage of neurons in the nervous system, is seen in 60-70 percent of diabetics.²³ This condition is accompanied by a painful burning and tingling sensation in the appendages and issues with digestion and cardiovascular health. Neuropathy is a leading cause of disability because of the loss of sensation that it causes in patients. A condition such as this is horrible to live with and it is not at all surprising that such comorbidities would increase the occurrences of depression. This also shows that “morbidity” and “mortality” are closely linked since the morbid, or disease, aspect greatly influences the mortal, or living, potential.

One of the greatest determinants of health, both physical and psychological, is livelihood. When people hold jobs that are satisfying, pride-evoking, enjoyable, and profitable they are fulfilled and productive. Conversely, when people do not have jobs at all or work tasks that are physically detrimental, they do not take pride in their occupations and their health suffers. What is even worse than this disheartening situation is when people are unable to even look for work since they are physically or psychologically unable to hold a job. This condition, disability, is what often befalls

²³ NDIC, “National Diabetes Fact Sheet 2011.”

diabetics who have health complications due to their disease. When people have “difficulty performing activities of daily living and routine social activities,” they are diagnosed with functional disability.²⁴ This functional disability may be unrelated to disease, but more often it is a direct consequence of perpetual feelings of pain, distress, and fatalism.

Functional disability is interesting in the sense that it does not simply state that a person is unable to hold a job and be a productive member of the workforce, but that he or she has difficulties in performing daily tasks and being a part of social interactions. Someone with functional disability may wake up in the morning feeling like the day’s simplest tasks are intangible, that going out into public is daunting, or that seeing friends and family is not a source of contentment. Unjustly though, functional disability is prevalent in approximately one in four adults according to the 1999 National Health Interview Survey of over 30,000 U.S adults.²⁴ This statistic is dwarfed by the reality that 51.3% of depressed adults, 58.1% of diabetic adults, and 77.8% of comorbid depressed and diabetic adults from the same survey suffer functional disability.²⁴ A sole diagnosis of depression or diabetes puts an individual at a greater than 50% chance of disability, while the combination of depression and diabetes raises rates of disability to a staggering 77.8%. For these individuals, their daily mortality is brought into consideration when they are unable to participate in and enjoy the simple parts of daily life.

Such a shocking correlation between diabetes, depression, and disability expresses that wellbeing and being healthy are much more profound than simply not

²⁴ Egede, “Diabetes, Major Depression,” 1-13.

being sick. While some people have diabetes, and are considered sick, they may be able to control their blood sugar and other health factors so that their wellbeing is high. In the same regard, individuals who may not have exorbitantly high blood sugar levels may experience functional disability due to the psychological ramifications of combatting a chronic disease. The trials of diabetes management are daunting on their own at times, and they cannot be compounded by depression and disability as commonly as they are now. Being well is not a right, but being diagnosed with a disease like diabetes should not be a death sentence either. Individuals need to understand that they have control in promoting their own health, that depression is not the warranted psychological symptom of disease and that disability does not have to be their fatalistic outcome.

Chapter 5: The Hispanic Paradox

Independently of one another, SES and race/ ethnicity is each a risk factor for Type II diabetes. However, these two risk factors are inextricably linked and the negative effects that the SES-associated stress and depression have on health is profound. As clear as this correlation may be, mortality data reveals that there is something paradoxical about how prevalent diabetes is in the Hispanic community, but how low Hispanic mortality rates are compared to those of whites. Right now there is no succinct, reputable biological explanation for this Hispanic paradox. What is indisputable, however, is that *something* is different between groups and, more universally, one disease cannot be treated in a homogenous way for all afflicted people.

The U.S. Census Bureau Statistical Abstract of the United States: 2012 revealed that the percentage of whites living below the poverty line is 12.3% while the percentage of Hispanics living below the poverty line is 25.3%.¹⁴ With such a staggering differential between the economic characteristics of each ethnic group, it is fitting that the disparities in the general health of whites versus that of Hispanics would be equally as grave. This is the current situation and 11.8% of Hispanics have diabetes while 7.1% of Whites fight the same disease.⁴ If the link between culture, poverty and disease were that simple then mortality data would mimic this disproportionality.

The reality of the matter is, however, that mortality data is counterintuitive to the current understanding of how SES and ethnicity affect health. The CDC National Vital Statistics Report from 2007 states that the mortality rate for Hispanics in that year was

546.1/100,000 while the mortality rate for whites in that year was 736.3/100,000.²⁵ This mortality data reveals that in 2007, a white man, woman or child was 1.4 times more likely to die than a Hispanic man, woman, or child. Data that dates back to 1997, when “Hispanic” was added as a racial category to the CDC collection, shows that Hispanics consistently and indisputably have lower mortality rates (Figure 3).²⁶ This realization that Hispanics of lower SES are observably living longer than their white peers of higher SES illustrates the Hispanic Paradox.²⁷

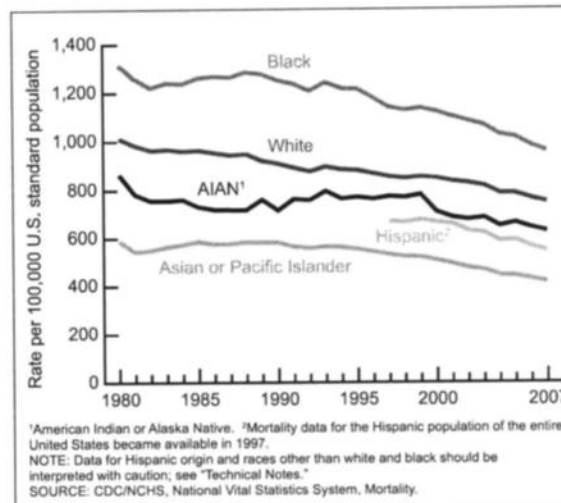


Figure 3: Age-adjusted death rates, by race and Hispanic origin: United States, 1980-2007

This paradox is not a cultural phenomenon that stands alone or is indicative of nothing greater than that there is something different happening to Hispanics than to whites. What it shows most vehemently is that culture, as more of a lifestyle than a racial characteristic, is a great factor in health. Only since 1997 has the CDC used “Hispanic” as a race-related category in their morbidity and mortality data. Also, only since 1989

²⁵ Xu, “Deaths,” 1-135.

²⁶ Xu, “Deaths,” Figure p.4

²⁷ Franzini, “Understanding the Hispanic Paradox,” 496-518.

has “Hispanic” been a personal descriptor on the U.S Standard Certificate of Death. Highlighting the differences between people based on their ethnicities is a detrimental practice if the aims are solely to create distinctions and to postulate summaries about one group of people versus another. Between cultures and within culture data is innovatively fundamental when it is used to understand a patient population or to treat a patient who may have a disease like diabetes.

To understand how culture affects health, it is fitting to look at how typical Latin American or Mexican culture differs from the typical culture of white person in the United States. When immigrants come to the United States from a Latin American country or from Mexico, they may maintain many of their cultural values or few of them. Acculturation is “the process by which immigrants adopt the attitudes, values, beliefs and behaviors of a new culture.”²⁸ In the specific case of Hispanics, some of the well-studied cultural characteristics that are subject to change are smoking, drinking, exercise, and body mass index (BMI).²⁹ Data shows that Hispanics are less likely to drink or to smoke than their white peers are, but they also exercise less.²⁸ When this Hispanic group becomes more and more acculturated, they adopt some cultural norms that are beneficial, like exercise, but they may also adopt some that are detrimental, like drinking, smoking, and higher BMIs. The Hispanics who experience the least negative effects of acculturation are those who experience the highest degree of poverty.²⁷ This group does not have the monetary means to purchase alcohol, cigarettes, or food like soda, fast food, or anything other than dietary staples like rice and beans. In this way, the middle-

²⁸ Abraído Lanza, “Do Healthy Behaviors Decline,” 1243-1255.

income, acculturated Hispanics are the least healthy, while those in the lowest quantile are “protected” from some of these health-robbing behaviors.²⁸ These people also hold jobs that are physically demanding, which increases their physical activity level and exercise-related heart health. This is not to say that these people are free from the stressors of a low SES neighborhood and this may be where their health detriments come from.

It is impossible to say if acculturation is positive or negative on a whole and the reality is that most people adopt some norms, while not others. When addressing the health and wellbeing needs of a Hispanic population, traditional cultural practices or attitudes can absolutely not be disregarded. In fact, disease prevention and treatment programs should focus on cultural identity and more specifically, individual identity. Diabetes is not an epidemic that can be solved with one homogeneous “cure all” formula. The epidemiology of what causes the disease is the same on a molecular level of blood glucose, pancreatic function, and associated biological pathways that begin in the brain, but the patient situations are vastly different. Diabetes is a disease that *people* are stricken with, one that their lifestyles provoke, one that their body systems fight, and one that robs families of loved ones when mortality is the outcome. In this way, the disease must be indicted, but the person must be treated with his or her wellness as the ultimate goal.

In 2004, the Future of Family Medicine Project clearly defined this goal of primary care medicine to explicitly treat the person, rather than simply disease or

injury.²⁹ The new language used to describe clinics and primary care practices was one of a “personal medical home” which is now more widely called a “patient-centered medical home” (PCMH). At its core, the project aimed to address needs of the patients like accessibility, comprehensive care, and integrated medicine.²⁹ By addressing such patient needs, the clinic would physically be a place where patients felt comfortable going to, as if it were their home. The clinic would then be utilized more readily and patients could receive routine preventative care as well as intervention to treat disease early in its course, when the possibility of a positive outcome is greatest. Additionally, providers would aim to treat not just the issue for which the patient has come to the clinic, but also any additional medical or psychological ailments. The provider would suggest further counseling and health-coaching when appropriate and these services could be accessed in the medical home as well. By creating an environment where individuals and families felt comfortable, where services were readily accessible, and where patients and providers were highly satisfied, the health and wellbeing of all involved in the medical home would be greatly improved.

The PCMH model has been piloted in clinics throughout the United States and its results have been remarkable in terms of patient satisfaction and health as well as in cost saving analyses. These two, patient health and medical care costs, are directly related since the cost of primary and preventative care is drastically less than the cost of acute care or emergency care. One study of a PCMH Group Health System in Seattle showed that in a 21 month period patients had 29% fewer emergency visits, 6% fewer

²⁹ Martin, “The Future of Family Medicine,” S3-S32.

hospitalizations and an overall medical care cost savings of \$10.30 per patient per month.³⁰ Not only is this advantageous from a financial standpoint, but when patients need emergency care less frequently, they are experiencing fewer stressful, traumatic events. A Future of Family Medicine task force from the Baylor University College of Medicine determined that if the PCMH protocol were implemented nationwide, “health care costs would likely decrease by 5.6%, resulting in national savings of 67 billion dollars per year, with an improvement in the quality of the health care provided.”³¹ This amount is astronomical for the country as a whole, for health care groups who can then utilize funding more effectively, and for individuals who will have to pay less to maintain their health.

Due to this incredible financial potential, along with the fact that individualized, patient-centered care better serves patient needs, the PCMH model is monumental. It has been supported as a, “Progressive step forward in meeting the needs of a very diverse patient population of the United States.”³² This distinction, that a PCMH would more adequately address the needs of a *diverse* population is exactly why the PCMH model would better serve diabetics, especially Hispanics. The Hispanic Paradox exposes the reality that disease pathology, treatment and lifestyle are different in one group of people, like Hispanics, and another, like whites. If medical care were more specific to the culture of one group of people, it would better address the diverse needs of the patient population. Furthermore, if the care were specific to the individual, or patient-centered,

³⁰ Reid, “The Group Health,” 835-843.

³¹ Spann, “Task Force Report 6,” S1-S21.

³² Fiester, “What ‘patient-centered care’ requires,” 20-24.

then culture would be another factor that would be considered in the unique needs of the particular patient. This is the true reason why PCMH's are a better service to patients as individuals and why they have been shown to be so effective since their inception only a few years ago.

Residents of public housing experience many detriments to their health simply due to their socioeconomic statuses and the environments in which they live. Because of these stressors and obstacles, primary care in areas of public housing must be as adequate, if not more adequate, than it is in more affluent areas. This means that PCMH's must be equipped to address the special needs that individuals experiencing poverty face, in addition to the culture-specific needs of the patients. In 1990 the Disadvantaged Minority Health Improvement Act was passed in accordance with the Public Housing Primary Care Program. This act aimed to, "improve the access of disadvantaged individuals, including minorities, to health care and health professions opportunities" (President George Bush, Sr.).³³ The act created clinics in high-need, disadvantaged areas and created opportunities for individuals to serve in such clinics, where they would more fully understand the hardships and needs of their patient population. In his address to the attendees of the Health Care for Residents of Public Housing National Training Conference on the 20 year anniversary of the Public Housing Primary Care Program, Director Dr. Astril Webb synthesized the needs of patients with the future goals of the program. He said, "Facing the future, initiatives are underway to address the needs of residents in public housing who are culturally diverse" (PHPCP

³³ Bush, Sr. "Statement on Signing."

20th).³⁴ Not only are residents of public housing in greater need of primary health services and opportunities for employment in health fields, but their diverse cultural needs must also be addressed. The most fitting way to work towards attaining such goals is to have the clinics created out of the PHPCP be patient-centered medical homes, where patients and providers share an understanding of cultural and socioeconomic individual needs.

³⁴ Webb, "20 Years of the PHPCP."

Synthesis and Action

La Casa Clinic is the sole clinic in Colorado created out of the Public Housing Primary Care Program and the Disadvantaged Minority Health Improvement Act. There had previously been a health clinic in the Quigg Newton Neighborhood and a separate counseling center, but through a federal grant the two were connected and housed in a new facility. One physician in particular, Dr. Steven Bailey, was instrumental in recognizing that this public housing community needed a more comprehensive, specialized clinic to adequately serve the Quigg Newton residents. He is referred to as “the father of the grant” that achieved the current La Casa/ Quigg Newton Clinic and many of the patients who I have come to know regard him highly as “an old-school doctor who really took the time for his patients.” Dr. Bailey has since retired from La Casa Clinic, but his impact is still ever-present in the physical setting, in the way that the counselors treat clients and in the patients who have been members of the Quigg Newton Neighborhood for years or even decades.

Today at La Casa Clinic, there are still far too many patients who are battling chronic diseases and there are some deeply embedded issues that plague the patient population. One of these issues is the prevalence of Type II diabetes and in order to address this problem Dr. Schiavoni, myself and the DM team have begun diabetic group appointments for Dr. Schiavoni’s patients. When I began interning at La Casa Clinic in August of 2010 coordinating diabetic group appointments became my project. Dr. Schiavoni had the idea, passion and mentoring ability, while I had the time and energy to put towards the project. All patients are invited regardless of control and there are both

English-speaking and Spanish-speaking groups. The group meets once every three months and the group appointment serves as both a routine diabetic check-up, where A1c and blood tests are performed, and an interactive educational encounter with varied health professionals. Physician, nurses, health coach, health care partners and intern work together to coordinate a curriculum where patients can learn the basics about diabetes, can champion coordinating their own personal care and can find support from others who are experiencing the same hardships in combating a chronic disease. In this group setting we make suggestions about diet, demonstrate exercise for people of all abilities, invite problem solving of barriers, set goals for diet, exercise, medications, and wellbeing, and empower patients to be health promoters for themselves and their families.

Previous research has shown that group appointments have great potential, especially in addressing some of the psychological aspects of disease. Over the course of a year one study found that patients who attended the group had a change in average A1c from 7.4 to 7.5 while patients in the control, who did not attend a group, had a change in average A1c from 7.4 to 8.3.³⁵ This shows that while A1c values did not improve for the group as a whole, their disease management proficiency was clearly much more advanced than that of people who did not attend the group. Education is a vital component to wellness and educational tools, like computers, are entirely inaccessible for most residents of the Quigg Newton Neighborhood. Due to this imparity, educational resources must me be made accessible to residents of public housing through alternative

³⁵ Trento, "Group Visits Improve," 995-1000.

modes, like in the group appointment setting. Group appointments have proven especially effective for populations of Hispanic patients who in one study decreased their group A1c by 1.19% while the control group decrease by only 0.67%.³⁶ Hispanics, especially first generation immigrants, often times feel alienated in their communities if they do not share a common language with their neighbors or if they experience depression because of a longing for past relationships and ways of life. Bringing together a group of people who not only share the same disease, but also share the same language and experiences heightens their feelings of connectedness, support and empowerment.

Though our group appointments only began a year and a half ago, their effectiveness has been shown through improvements in patient sentiments and in diabetic control. From the first English-speaking group meeting to the next 2/11 patients had dropped their A1c and blood pressures, 3 had dropped their A1c's alone and 5 had dropped their blood pressures alone.³⁷ From the first Spanish-speaking group to the next 4/7 patients had dropped their A1c values.³⁷ The members of the Spanish-speaking group have fiercely deterministic attitudes. Many of the patients are immigrants who have come to this country with the explicit aims of creating a better life for themselves and their families. One older gentleman in our group attended with his wife and they had a shared conviction to learn how live healthfully so that they could teach their children how to do the same. Having come this far, they are not about to surrender to a disease that they may be able to control. At the second meeting the patients who had achieved the

³⁶ Gutierrez, "Shared Medical Appointments," 212-214.

³⁷ Flower, "LCQN DMGV data."

greatest success were able to showcase their improvements, authenticating that control is possible and offering advice for how others could execute similar gains.

This group appointment is efficacious for a number of reasons that can be translated to all medical care encounters. The groups are culture and individual specific so that meal planning guides are comprised of affordable, traditional Hispanic dishes and the exercise suggestions include utilization of the recreation center that is located across the street from the Quigg Newton Neighborhood. The open forum construct of the group provides a setting where patients can interact with one another and the health care providers to pose questions, address barriers and formulate wellness strategies. All too often during the brief 20 minute traditional encounters that patients have alone with their providers, they do not have the space or the ability to articulate some of their concerns or issues that need to be addressed. Some patients lament that the providers, “just don’t get it” in terms of understanding situations more than simply addressing symptoms. In the group setting patients spend almost three hours in the support of their peers and they often find strategies that they are searching for, even if they are not the ones to specifically ask the questions. Patients in these groups are explicitly imparted with the understanding that the health care team is there to serve their needs. This fundamental of the practice of medicine is often lost in the demands for physician productivity and in the impersonal relationship between patients and providers.

La Casa Clinic is a unique setting because it was created definitively to serve the residents of public housing and strives to uphold the ideals of a patient centered medical home. All of the providers and nearly every other member of the staff practice in both

English and Spanish, seamlessly interchangeably. This skill is a phenomenal utility to patients and it expresses that the health care providers are understanding and genuinely concerned with addressing the needs of patients. Many of the physicians also have had remarkable service experiences abroad and in other areas of the United States where disadvantage and economic hardships are rampant. The superior levels of compassion that these sorts of exposures create are fundamental if providers are to really be able to connect with patients and address health issues that are fraught with psychological and circumstantial complexities.

One of the hallmarks of the Disadvantaged Minority Health Improvement Act was to create opportunities for individuals from disadvantaged backgrounds to serve in the medical field. La Casa Clinic has flourished in this regard, but there is still a tangible tension between some patients and the providers when the patients feel that the providers simply do not understand their situations. There are health care partners working at La Casa who grew up in the Quigg Newton Neighborhood and their interactions with patients are unique to their shared experiences. The Family Counseling Center is phenomenal in the sense that one of the psychiatrists has experienced immigrating to the United States and his level of mastery of the associated adversity is unmatched. Also, one of the counselors has lived in the Quigg Newton Neighborhood, has experienced homelessness and now is a benevolent ally to clients because she really does know exactly what it is like to endure these hardships and other injustices. This depth of understanding is only possible when individuals have themselves been through the hardest of times and the fact that they have triumphed makes them invaluable resources.

While it is impossible for any person to change her past circumstances or alter the realities of her upbringing, there are ways that this future physician can yearn to better connect with the community she serves and come to know her patients. The residents of public housing are a vulnerable patient population but they are not destitute or without potential for bettering their situations. The local resident council (LRC) of the Quigg Newton Neighborhood is an active jurisdictional body which meets monthly, invites all members of the community and addresses issues that are affecting the residents of the community. Valerie is a member of the council and she has served on the board of directors in the past. She, and her colleagues, are outspoken at meetings where representatives from Denver Housing and Urban Development are present and they make sure that the voice of the community is heard. At the LRC meeting just before Thanksgiving it was announced that residents could go to a local food bank on certain dates to pick-up their holiday food boxes. Valerie keenly noted that transportation was an issue for many of the elderly residents who could not walk to the food bank or surely could not carry a box full of food supplies over a half mile home. On her note, the LRC paired with the Family Counseling Center to organize a shuttle service. Likewise, they also serve as liaisons between the outside council bodies and the community members so that residents are aware of the policies that directly affect them. The counselors from the Family Counseling Center always attend the LRCs so that they know what is going on in the lives of their clients and so that they can better offer counsel on how clients can navigate their housing dilemmas. One way that the health care providers could become better connected with the community and show their desire to serve it would be to attend

a LRC meeting, though the current time constraints that Denver Health puts on the physicians makes this nearly impossible.

Productivity and an imparted patient interaction quota can no longer be the accepted practice policies for primary care physicians. The twenty minute interaction that providers are allotted with each patient is often not nearly enough time for the patient to be able to divulge what is really plaguing their health and for the physician to make adequate wellness suggestions. If success of the patient-centered medical model is to be actualized, providers need to have less pressure regarding the number of patients that they serve. No, physicians are not expected to be therapists, but if they had more time to address issues of health illiteracy or circumstantial detriments to health, they may be better able to help the patient achieve wellness. Wellness is the ultimate goal of medical care and granting every person's right to health necessitates that the focus be retracted from efficiency and quantifiable productivity and translated to adequacy in health promotion.

I understand that if physicians are spending a greater amount of time with each patient or are serving patients in creative ways, like with group appointments, that there will be an initial shortage of providers for patients. If a provider is seeing only ten patients in a day, as opposed to twelve or fifteen, then there will need to be additional providers to care for those who can no longer be seen in the time allotted. In the longer duration of time, though, patients will need fewer acute or emergency visits and as a matter of justice they will be healthier. Utilizing only a fraction of the projected 67 billion dollars in annual medical care savings that the PCMH model would afford, more

resources could be granted to primary care providers and medical home settings to ensure that all patients were well served.

Savings in areas of the federal budget like Medicare/ Medicaid would allow for support of other federal programs that could further serve those in need, like the residents of public housing. Diana, one of the counselors at La Casa, knows from decades of experience that the Quigg Newton Neighborhood could thrive if there were more resources in the community. These resources include education and job tools (like a computer lab), childcare (like full-day Head Start), and more efficient, less expensive transportation systems. She affirms, “I know what it’s like to be there [living in public housing] and the hardest part is leaving. If you lose your job and are living in public housing, there are safety nets so that you do not get evicted when you can’t pay your rent. Moving out of public housing is a huge step and it is nearly impossible for many people.” If less money is being spent on emergency care for Medicaid/ Medicare recipients, then more people are being granted their right to health and more money can be allotted to programs that help the community to prosper. If people are healthier, then the cyclic nature of disease is being broken. If communities are better resourced and empowered, then the cycle of poverty and trauma are being broken.

The relationship between disease and socioeconomic situation may be overarching and complex, but it is by no means intangible or impossible to rectify. A lack of resources, especially educational tools, persists a health illiterate patient population, many of whom do not have the skills or training to thrive in wellness-promoting occupations. A high degree of experiential trauma and toxic stress causes

dysregulation of organ systems and glucose metabolism. Suffering from depression causes individuals to be less able to promote their own health, which causes chronic illness and disease. Likewise, suffering from chronic disease or enduring trauma often cause depression. This depression, toxic stress, and lack of resources are the volatile factors that exacerbate one another to the point of chronic disease, Type II diabetes being the most epidemically common.

The change in climate and mentality that will lead to a reversal of this toxic trend involves a more comprehensive patient-centered medical home practice and a more empowered patient population. Making a conscious, structural innovation in care to incorporate personal, circumstantial and community factors in a health care strategy is the only way that wellness can be achieved for vulnerable patients. It is impossible for health care providers to absolutely prevent trauma, but they can break the cycle when they work for the wellness of the community as a whole. It is also impossible to prevent diabetes that has already been diagnosed, but the disease's debilitating effects can be minimized and the cycle of sickness broken if patients are better educated, resourced and empowered. The WHO Constitution states that "the enjoyment of the highest attainable standard of health" is every person's right regardless of "race, religion, political belief, economic or social condition."¹ Community resources and attention to care must be greater in circumstances where individuals are disadvantaged because of their economic or social condition, which they could have endured since the day of their births. In this mastery of empathy we can ensure that a culture of wellness thrives within our own communities and that we act for the affirmation of a just future.

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