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Hunger is not an issue of charity. It is an issue of justice.

-Jacques Diouf, Director-General of the Food and Agricultural Organization (FAO)

Introduction

Guatemalan society is entrenched in a crisis driven by inequality and poverty. Just 3.5% of the total income of the country goes to the poorest 20%, while 50% is earned by the wealthiest 5.6%. Similarly, only 70% of the land is owned by 2% of the population (Groundswell International n.d.), 70.5% of the rural population is impoverished, and 90% of indigenous Guatemalans are likewise disadvantaged (IFAD n.d.). The distribution of wealth in the country is dramatically uneven, and the divisions that it creates are deeply rooted in the country's historical past. The country comes from a rich Mayan tradition, which was disrupted by Spanish imperial rule in 1523. The result was a dichotomous society, with an urban elite and a rural poor. Those systematized divisions persist to this day, reinforced by a violent 30-year civil war. A frequency distribution measure by the UN (of, for example, levels of income) throughout a country, called a Gini coefficient, reveals that the country still suffers from crime, social injustice, human rights issues, and persistent inequality. While a 0 indicates maximum equality, the value given to Guatemala in 2003 was 56.08 (Gragnotati and Marini 2003). As of 2011, the country was ranked 131 out of 187 countries according to the 2011 Human Development Index by the United Nations Development Program, which incorporates life expectancy, literacy, education, and standards of living into its evaluation (Population Reference Bureau n.d.). The result of this centuries-old isolation is chronic poverty and cycles of marginalization in social, political, and economic spheres of the rural poor, especially those of indigenous descent. As a result, those struggling populations face endemic malnutrition and both physical and mental stunting. This kind of structural violence, the systematic ways in which social structures put individuals and populations at risk for harm, is the motivation for intervention. The majority of the population still faces systematically produced public health issues (Smith 1990), but a targeted, community-based intervention can be the first step towards improved health outcomes.

This paper will outline a health intervention aimed at ameliorating malnutrition and stunted growth in rural Guatemala, built on diet and nutritional education, shifts in agricultural practices, and nutritional supplements. First, I will outline the history of the country to provide the context for said effort. Second, I will discuss the issues of chronic malnourishment in further detail. Third, I will examine similar programs with similar goals. Last but not least, I will outline the program, as well as the evaluative measures to be imposed in full.

Part I: History of Guatemala

To address the issues of health in Guatemala, one first has to understand the series of events that explains why the country is in its current state, from the Mayan empire, the Spanish em-

pire, independence, through the 30-year civil war to the present.

In 1523, Pedro de Alvarado claimed the Mayan civilization as a Spanish colony. Thus began the marginalization of the local population with the imposition of colonial rule. The social structure colonizers enforced lowered the status of indigenous peoples and set in place a system that offered differentiated opportunities based on one's ethnicity (Grandin 2000). During an interview about her summer spent working in a health center just outside of Guatemala City, Ebony Easley, of the University of Pennsylvania, recalled numerous stories of the wealthy healthcare providers of Spanish descent ridiculing the poor indigenous people that came seeking help, making jokes about their supposedly poor hygiene and low levels of education, both of which constitute the prevalent stereotype.¹ Her experience underscores the contemporary repercussions of development under Spanish rule, which prioritized just one small subset of the population while disenfranchising the rest. In 300 years of development, certain infrastructural elements were created, but only insofar as they would restructure the operations of the country towards the benefit of Spain itself, primarily in Guatemala City and other large cities rather than in rural areas. The entire country was mis-developed into a natural-resource-based export economy, lacking utilities and public services for the majority of the population living outside major urban centers. This unequal system left the country already at a deficit relative to the globally dominant Western countries by the time it separated from Spain in 1821 (Hale 2002).

In 1822, Guatemala joined the Mexican empire, taking a step towards improved health outcomes. However, industrialization and globalization had already cemented the control of those dominant powers over international policy. Guatemala was just beginning to develop itself as an independent country while the international system was increasingly favoring the already developed Western powers (Stiglitz 2002). To combat this unfavorable system, Guatemala became part of the United Provinces of Central America alongside Costa Rica, El Salvador, Honduras, and Nicaragua, though that alliance did not last. In 1839, Guatemala became fully independent, at first under dictatorial rule before the liberal President Justo Rufino Barrios was elected in 1873 (*BBC News* 2014). Barrios began modernization efforts, namely coffee growing and army development, but those benefits primarily aided those of Spanish descent, rather than the population as a whole (Hale 2002). Until President Juan Jose Arrevalo ran on a campaign of social-democratic reforms in 1944, no true attempts to minimize inequality and bridge the dichotomous society were made. President Arrevalo pushed for a social security system and land redistribution for impoverished peasant farmers as a way to combat the structural violence set in place by the Spanish,

1 Interview with Ebony Easley, Philadelphia 04/01/14.

but in 1954 those reforms were halted. A coup backed by the United States placed army Colonel Carlos Castillo in power as part of the fight against the spread of Communism in the Cold War, directly in response to Arevalo's efforts (Calderon 2014). This led to increased tensions in the country that ultimately produced a civil war that would last for 36 years.

In 1960, all developmental progress came to a halt as military rulers instead began asserting autonomous rule and systematically terminating their opposition, which was largely composed of the indigenous Mayan people. Tens of thousands were killed, promoting the growth of anti-government guerilla activity and consequently prompting tens of thousands more to be silenced by death squads. Political unrest came to define the actions of both the government and the people. By 1982, 60,000 civilians had been killed. Furthermore, a military coup that year put General Efraim Rios Montt in power, which increased the toll to 100,000 dead and 50,000 missing by 1989. It was not until the Guatemalan Revolutionary National Unity party and the government held peace talks in 1994 and affected a ceasefire in 1995 that peace was conceivable (Guatemala Human Rights Commission n.d.). By that point, though, the army and security forces, controlled largely by those of Spanish descent, had been shown by a UN-backed commission to have overseen 626 massacres in indigenous villages and claimed at least 200,000 lives. The commission determined that 93% of the human rights atrocities committed during the war were at the hands of the army and security forces (Hale 2002). In 1996, peace accords officially ended the 36-year civil war. Only at the signs of peace did the mindset begin to shift back towards the thinking of President Arevalo, taking greater consideration for the working class than the government and its corrupt leaders.

Recently, the country has been governed by a constitutional multi-party democratic republic, which has ostensibly been trying to stabilize the country and ameliorate the issues plaguing it. In 2004, army bases were closed and 10,000 soldiers were forced to retire, just as victims of the war received 3.5 million dollars in damages along with a formal admission of guilt by the government for the human rights crimes it committed (Guatemala Human Rights Commission n.d.). Two years later, the government and the UN created a commission to identify and dismantle clandestine armed groups that had been threatening the lives of poor, disenfranchised Guatemalans who had opposed the government during the war. The UN stresses, though, that the country still suffers from crime, social injustice, human rights issues, and persistent inequality (Gragnolati and Marini 2003). In fact, Guatemala has one of the worst records of social development indicators, such as maternal and infant mortality, chronic child malnutrition, and illiteracy, in the hemisphere.² Nonetheless, the end of the civil war marked a shift towards improving health outcomes, even for the most impoverished groups. The peace accords and new governmental structure removed the most substantial obstacles to foreign investment, which had hamstrung development efforts for nearly half a century (Smith 1990). In 1998, Guatemala signed the Trade and Investment Framework Agreement with its Central American neighbors; in 2000, it signed a free trade agreement with Mexico, Honduras, and El Salvador that went into effect in 2001; and in 2003, Guatemala, Nicaragua, El Salvador and Honduras agreed to a free trade agreement with the United States (*BBC News* 2014). This series of partnerships and agreements shows how rapidly Guatemala was able to engage the international economic system and take steps towards

development.

Despite this, economic disparities still exist within the country, which is still one of the most unequal in the world. A handful of millionaires have made a fortune on the natural resources and exports of the country, while the masses, who are primarily indigenous or rural-dwelling people, are impoverished. In 2003, the top 10% held 41.2% of the country's income while the bottom 20% held 2% (Smith 1990). The partnerships and free trade agreements opened the economy to international trade, with great promise, but the neoliberal tendencies of the marketplace put local industries at risk. Such tendencies toward the removal of trade barriers and privatization of resources and services only create a system that benefits a small few (Stiglitz 2002), which is why the 2005 Central American free trade deal with the United States saw street protests in Guatemala City (Guatemala Human Rights Commission n.d.). Nonetheless, the establishment of relationships with powerful international actors did increase foreign investment and the diversification of exports (Stiglitz 2002). These recent developments have proven beneficial: the country has been shifting away from the systematic favoring of the well-off Spanish descendants and the denial of opportunities for the poor and working classes, although the inequalities are still very visible. As a matter of fact, the disparity can be seen in the physical size differential of the urban well-to-do and the rural poor as a result of poverty and chronic malnutrition.

Part II: Malnutrition, Poverty, and Stunting

Widespread and sustained inequality continues to drive poverty and malnourishment. Even before the civil war, nearly half of the population had been undernourished to the point of stunted growth. The war only exacerbated the issue, with more than 50% of children under five-year-old now facing limited physical growth and mental development (Pan American Health Organization 2001). It is endemic in rural areas and the central government has been unable to produce significant positive changes. Instead, a significant portion of the population is marginalized, especially the rural and indigenous poor (Annis 1981). The "invisible killer" disproportionately affects that demographic, such that the average ten-year-old is taller than most "full grown" adults in rural Guatemala (Pan American Health Organization 2004). The most recent data, from a study of 893 children from 0 to 5 years of age, determined that 52.2% showed signs of stunting (Pan American Health Organization 2007). In the first thousand days of their lives, a period proven to be critical to development, over 50% of Guatemalans do not receive the nutrients necessary for bone and brain development (World Health Organization 2007). As Kathryn Dewey, a professor in the department of nutrition at the University of California, Davis, states, there is a "golden interval" before the age of two: "This is the period when brain growth is very extensive and babies are developing their immune systems," and stunting that occurs by the age of two-years-old is generally irreversible (Rice 2010). The chronic issue is ubiquitous and leaves those afflicted at a permanent disadvantage.

One contributing factor is the pervasive cycle of poverty in Guatemala. In 2010, 13.5% of the population was living on less than \$1 USD per day, and, in 2011, 30.4% were living entirely below the minimum level of dietary energy consumption. During this time, the government had been spending roughly 16.2% of its total expenditures on health, or roughly \$325 per capita, on urban dwellers (World Health Organization 2007). Malnutrition is driven by poverty and governmental oversight,

² Interview with Fran Bargi, Philadelphia 04/11/14.

which further perpetuate the problem by increasing the burden of morbidity on poor populations, which limits their economic capacity. Breaking this cyclical relationship could not only improve the nutritional and health standards of these populations, but also boost their productivity and reduce health expenditures, improving the economic status of the country as a whole (Bennett 2011). Alas, that has not happened so far.

Rural Guatemalans endure abject poverty and ill health more often than not, and alternatives are scarce. The rural communities are kept at a physical distance due to a lack of roads and terrain conditions unfavorable for agriculture. The land that is suitable for farming is often on steep slopes, which necessitates a reliance on generally unreliable rainfall for water. Moreover, the practice of slash-and-burn farming is prevalent, which reduces long-term land productivity even for basic crops, and reliable clean water sources are few and far between (IFAD n.d.). Beyond these practical issues, the volatility of food prices in Guatemala continually threatens the poor. Professor Adriana Petryna at the University of Pennsylvania, giving a lecture on nutrition, described this as “a silent tsunami, affecting everyone: the middle class sacrifices healthcare to eat three meals a day, the middling poor pull children from school and cut back on vegetables to afford rice, and the true poor cut everything to one or two meals of nutritionally lacking rice.” She emphasized that the most nutritious food is often the most expensive option, while in at-risk areas the most accessible, cheap, and popularly preferred options are nutrient-lacking.³ In fact, many communities have succumbed to the powerful marketing efforts of Coca-Cola and Pepsi, which provide sanitary, though unhealthy, soft drink alternatives to the questionable water, which has compounded the undernourishment crisis with obesity concerns.⁴

In addition, prenatal care, childhood education, and the choices of the mother contribute to the stunting of children. Often, parents receive very little education themselves, sometimes linked to their own childhood malnourishment, which thus affects the education and nourishment of their children. For those with the financial resources, private obstetricians are available, but the indigenous and rural poor do not enjoy that luxury (IFAD n.d.); they are unable to make the long trip to a public hospital and instead remain in their local community for birth (Annis 1981; Charles 2014).⁵ Even if they are able to make the trip, trained officials are not always available and the care they provide is often rushed. Rural populations are consequently further distanced from the government and lose trust in the services it provides. As Barg and Weiss state, “Approximately 80% of all childbearing women are attended by traditional birth attendants who have little or no formal education” (Barg and Weiss 2013). With under-educated or under-nourished parents and uneducated midwives, children are similarly unlikely to attain higher levels of education, and are likely to experience cognitive deficiencies (Bennett 2011). This can be seen in the different rates of school enrollment between the relatively well-off urban centers and the poor rural areas: the rate is 65% in Guatemala City and just 20% in Quiche and Alta Verapaz, two poor, rural areas (IFAD n.d.). Consequently, instead of transmitting information about breastfeeding through educated health personnel, such knowledge is often transmit-

ted informally through the community. Thus, a stigma against breastfeeding exists in favor of less-nutritious baby formulas. Contrary information does exist, but it is packaged in a highly Westernized way, often with the American food pyramid, which inherently puts the rural poor at a distance (Bhatt n.d.; Centers for Disease Control & Prevention n.d.; Easley 2014).⁶ In this way, the dichotomy between the rural poor and both the government and the urban elite is systematically perpetuated.

Additionally, pervasive prejudice further disenfranchises the rural and indigenous poor, reducing their potential for better health outcomes. As Easley discusses, most Guatemalan healthcare providers are of Spanish descent, especially near cities, primarily due to the enrollment costs of medical school. Those providers often treat the indigenous and rural people disrespectfully, even if they have the means to pay. She recounts anecdotes of healthcare providers switching between speaking in English and Spanish to confuse and demoralize the rural people, who likely only know Spanish, and the indigenous Mayans, whose first languages are often indigenous.⁷ In this way, the divide is socially reinforced, as the rural and indigenous peoples are “othered.”

The state recognizes endemic and chronic malnutrition as an issue, however it remains a low-priority concern. More often than not, attempted interventions are outsourced rather than homegrown, with varying degrees of success.

Part III: Precedent Intervention Evaluation

There have been a number of attempted interventions both in Guatemala and elsewhere, and we can learn lessons from all of them about what it takes to make sustainable change within a community.

One of the most sustainable and beneficial programs in Guatemala has been the Guatemala Health Initiative (GHI) that the University of Pennsylvania began in 2005. It is a partnership with a hospital in Santiago Atitlan, the Hospitalito Atitlan, which is the only hospital that provides 24/7 emergency care for hundreds of miles around Lake Atitlan.⁸ The mission of the partnership is to address the “reciprocal needs of Guatemalan stakeholders and the mission of the university” (Barg and Weiss 2013). The community is primarily constituted by Tz’utujil Mayans and is located in the Western Highlands of Guatemala. It is primarily a subsistence economy, like most rural economies in the country, but it is also influenced by tourism and remittances from abroad.⁹ The area has the most limited access to healthcare in all of Guatemala and, as in many poor communities, respiratory and diarrheal illnesses and malnutrition are all prevalent among children, while diabetes, hypertension, and pulmonary disease are common among adults. To place the area in context: the maternal mortality in Santiago is the third highest in Guatemala, malnutrition rates are fourth highest in the world, and seventy percent of the children in the area have stunted growth of varying degrees.¹⁰ Thus, the goal of the GHI is to utilize community-initiated programs that can improve health in the community, especially those that target maternal and child health. The initiative works with the Hospitalito Atitlan to strengthen medical services in a socially relevant and ethical way for resource-poor people by increasing

3 Class lecture, called “Nutrition,” held on 04/21/14 by Dr. Adriana Petryna during ANTH 273: Globalization and Health at the University of Pennsylvania Museum of Archeology and Anthropology.

4 Interview with Fran Barg, Philadelphia 04/11/14.

5 Interview with Dudley Charles, Philadelphia 04/01/14.

6 Interview with Ebony Easley, Philadelphia 04/01/14.

7 Ibid.

8 Interview with Dudley Charles, Philadelphia 04/01/14.

9 Interview with Fran Barg, Philadelphia 04/11/14.

10 Interview with Dudley Charles, Philadelphia 04/01/14.

clinical activities and community health education. It employs videotapes, lectures, and community projects that specifically aim to engage with women (Barg and Weiss 2013). Albeit a program in just a small community, the efforts of the GHI in advancing the quality of care and health in Santiago suggest that there is hope in the fight against national health issues in Guatemala, especially malnutrition.

An older program to combat malnutrition in Guatemala used a supplement known as “Incaparina,” and a more recent program first employed in Africa has created what is called “Plumpy’nut.” Dr. Nevin S. Scrimshaw developed Incaparina with the Institute of Nutrition of Central America and Panama, which he founded in 1949. He noticed a protein malnutrition that affected infants and young children in developing countries around the world, which prompted him to develop Incaparina (International Nutrition Foundation 2013). The name is derived from INCAP, the acronym for his institute, and “harina,” the word for flour in Spanish. It only costs one penny to make a glass of the nutritional food. As *The New York Times* (2010) describes, “Cooks were instructed to add water to the gruel, cook for 15 minutes and flavor it with sugar, cinnamon, vanilla, or chocolate.” It spread throughout Guatemala, El Salvador, Honduras, and Nicaragua (Martin 2013). It is still available for sale online for just \$2.85, marketed as “a mixture of corn and soy flour that provides a high quality protein. Enhanced with vitamins and minerals that promotes growth, development and maintenance of the body” (Guatemala4Ever n.d.). The issue with this supplement, though, is that it does not remain fresh after opening and requires preparation that the most resource-deprived populations may not be able to execute. Also, the requirement to add water presents risks in poor countries and communities, where the water is likely unsanitary (Rice 2010).

This is the beauty of Plumpy’nut, which does not require refrigeration or preparation and stays fresh after it is opened (Morrison 2013). The 500-calorie, protein, vitamin, and mineral-rich product was invented by the pediatrician Andre Briend, of the French company Nutriset, who designed it for Niger to be able to be made “by poor people, for poor people, to the benefit of patients and farmers alike.” The ingredients are F100, a dried milk fortified with vitamins and minerals, peanuts, milk, sugar, and oil (Rice 2010). Moreover, because it is an oil-based paste with low water activity, it is extremely bacteria-resistant (Prudhon, Briend, Prinzo, Daelmans, and Mason n.d.). According to *CBS News*, a daily dose costs about \$1 USD, which is a relative bargain, and it has proven very successful thus far (Cooper 2007). During the 2005 famine in Niger, it was distributed to 60,000 children with severe acute malnutrition and 90% of the population recovered completely (Morrison 2013). For that reason, Dr. Milton Tectonidis, the chief nutritionist for Doctors Without Borders, calls it “a revolution in nutritional affairs” (Cooper 2007) and why Paul Farmer’s Partners in Health Charity is now manufacturing products similar to Plumpy’nut with the help of community workers and farmers in Haiti. These kinds of products have proven successful and, in fact, can be “surprisingly tasty, with the consistency and sweetness of a cookie filling” (Rice 2010).

Furthermore, there are three agriculture-based interventions that operate in different places around the world that exemplify good work that can be done: 2Seeds, World Neighbors, and Groundswell International. 2Seeds operates in Africa to promote the best agricultural practices and financial stability, World Neighbors develops sustainable agriculture and

promotes community health around the world, and Groundswell International operates throughout the world spreading agro-ecological farming practices, innovation, and farmer-to-farmer cooperation in addition to trying to strengthen local organizations.

What is notable about 2Seeds is its ability to develop a wide variety of projects that share the same core values: financial and operational sustainability, accountability, and community ownership. Each project is conceived within the community it aims to serve, beginning with “an assessment of the challenges of food and income security that local farmers face.” The project leaders from 2Seeds are there primarily as catalysts, while the community leaders actually implement the best agricultural practices with cutting-edge ideas and technologies from around the world revealed by 2Seeds members. They currently have nine projects in operation throughout Africa. Most notable is the Kijungumoto Project, which combines agricultural and market trainings with an incentive-based rewards system. The goal, which has been successful since the project began in 2012, is to educate local farmers on best practices and management strategies using a demonstration, while pushing them towards increased yields and improved crop management on their own plots (2Seeds Network n.d.).

Groundswell International aims to combat “the effects of the financial crisis, repeated disasters, [and] environmental deterioration” by aiding a shift in farming and related social practices. Specifically, they promote agro-ecology, which “centers on food production that makes the best use of nature’s goods and services while not damaging these resources.” This means aligning ecology to farming systems, economics to culture and society, and food production to communities. It employs farmer experimentation to improve soil, seed, and water management, while simultaneously trying to limit the number of technologies and practices taught so that change can be easily affected: “It is better to teach 100 farmers a few practices that work, rather than a few farmers 100 practices that work.” In this way, they set in motion new systems within communities that address challenges like hunger, poverty, community health, and income that allow for local people to take the lead in implementing productive, practical, and palatable solutions (Groundswell International n.d.).

All of these historical circumstances provide context for the health intervention that can combat the ill effects of malnutrition and reduce the prevalence of stunting among rural communities in Guatemala.

Part IV: Project Outline, Timeline, and Significance

The inequality between the urban elite and the struggling, chronically undernourished rural populations that are systematically disregarded by the social and political infrastructure is clear. The following intervention would begin to bridge that gap by engaging community leaders in creating a shift towards improved diet and nutritional education. In short, seeds for new agricultural products would be provided to better nourish the community members in conjunction with educational workshops that would instruct locals on how to effectively and sustainably farm the crop. Additionally, to ensure long-term health benefits, the intervention would also include the provision of supplies for immediate consumption that can combat acute cases of malnutrition. All of this would occur at the first introduction of the program, which would remain active in the community for five years to establish the relationships essential for its success.

This program would first be implemented in Santiago Atitlan. A variety of seeds of nutrition-rich crops and fertilizer would be supplied for community use in this rural Guatemalan area. These would include new weather-resistant corn varieties, new bean and squash variants, and weather-resistant soybeans. In this community of already engaged community members with pre-existing ties to international aid efforts, farmers would experiment with these seeds to determine which are the simplest to grow with the least capital investment. Simultaneously, the community would be trained in workshops that focus not only on the crop, but also on effective farming techniques for less-than-favorable terrain. Workshop attendees would be divided into groups overseen by program workers to make program implementation more considerate of individual cofactors affecting community members. The draw for these workshops would be packets of a product similar to Plumpy'nut, which would be provided free of charge by those implementing the program. These workshops would occur periodically throughout a five-year trial period to both ensure the transfer of knowledge from provider to community member and also to refresh old concepts and introduce new ideas about sustainable agriculture. To assist in this educational effort, information would be printed on the packages of the provided nutritional supplements, which would eventually be created from a new recipe designed using those crops that were proven most practical and cost-effective by the community members. Moreover, a volunteer community member would be specifically chosen to first comprehend fully and then disseminate completely the information to community members who did not attend the workshops but would benefit from them. In this way, the community would be equipped to combat malnutrition with or without international help.

Once the program is established in this way, the international aid workers would remove themselves from active participation, remaining available for help in times of emergency but not in the daily work of the community members. With these people extracted, this health intervention program could be assessed for any flaws that come up in their absence, and an evaluation could be made as to whether or not the program ought to expand. First, food security would be measured, as part of the goal of the program is to increase farmer productivity such that fewer and fewer meals would need to be shrunken or skipped to ration food. Second, the income of the participants in the program would be measured to determine if a positive change occurred since its implementation.

This program could improve the life experiences of the rural and indigenous Guatemalans, made better by the efforts of organizations working with the community to create the most effective and sustainable program. Funded by microloans and potentially by grants from the World Health Organization, National Institutes of Health, Pan American Health Organization, or partnerships with American universities, the Guatemalan rural poor would be provided with the tools necessary for their success: seed, fertilizer, and education. This economic activity has been unsustainable because of poor agricultural practices, high capital investment costs, and competition with cheap brands like Coca-Cola and Pepsi-Co. There are socio-cultural dynamics at play in the country that limit the effort of the government in improving the lives of the rural poor. This program moves beyond that to work in concert with target communities on an individual basis to break the cycle of health inequalities, relieve issues of malnutrition, and create new lives for previously marginalized Guatemalans.

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