Malnutrition Among Young Children in the Dominican Republic:  
Determinants, Interventions & Implications for Policy  
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Introduction

All children deserve the chance to grow and to thrive, and yet 16,000 children died each day in 2015 before reaching their fifth birthday – over 8,000 of these deaths occurred as a result of preventable illnesses (World Health Organization [WHO], 2016b). The leading causes of death in this under-5 population include complications at birth, pneumonia, diarrhea, and malaria. Malnutrition is a contributing factor for roughly 45% of all under-5 mortality, in part because being malnourished increases a child’s susceptibility to disease (WHO, 2016b). Although many preventable deaths are still occurring, under-5 mortality has improved drastically over the past few decades. Thanks to the efforts put forth towards realizing Millennium Development Goal (MDG) 4, under-5 mortality was reduced by more than half between the period of 1990 to 2015, falling from 91 deaths per 1,000 live births to 43. Nonetheless, this was not enough to reach the MDG target of a two-thirds reduction in mortality by 2015. Significant work remains to be done to achieve the Sustainable Development Goal (SDG) 3 target 3.2 of reducing under-5 mortality to 25 deaths per 1,000 live births by 2030 (WHO, 2016b).

While many countries will have to accelerate their rate of progress in order to achieve SDG target 3.2, some countries have already made substantial headway. The Dominican Republic (DR), for example, cut its under-5 mortality rate from 60 per 1,000 live births in 1990 to 28 in 2013 (WHO, 2015a). This Spanish-speaking, tropical country, with a population of 10.6 million as of 2016, occupies the eastern two-thirds of Hispaniola, an island situated between the Caribbean Sea and the North Atlantic Ocean. The DR has seen marked economic growth over the last several decades, placing it 14th on the list of annual Gross Domestic Products (GDP) growth rates globally (Central Intelligence Agency [CIA], 2016). This growth is most likely why it is now classified as an upper-middle income country even though much of its population (32.4% as of 2015) still lives below the poverty line (World Bank, 2016a; WHO, 2015a).

Arguably much of the improvement in child mortality in the DR can be attributed to its recent economic advancements; however, these seemingly positive changes have brought with them many health-related problems of their own. Poor nutrition remains one of the largest contributing factors for under-5 mortality, yet the definition of poor nutrition is not as straightforward as it used to be. Like many other countries in Latin America & the Caribbean (LAC), the DR is
currently undergoing the nutrition transition (Popkin, 2002). This transition occurs when a low- or middle-income country experiences urbanization, economic growth, and increased use of technology. These developments tend to trigger an increase in the consumption of fat, sugar, processed foods, and high-calorie beverages, all matched by a decrease in physical activity due to less labor-intensive jobs. As a result, there is an increase in nutrition-related chronic disease, such as obesity, and an overall decrease in undernutrition (Popkin, 2002, p. 95). The coexistence of diseases of over- and undernutrition is a global phenomenon known as the “dual burden” of malnutrition, where it is common to see stunting, underweight, and micronutrient deficiencies alongside obesity and obesity-related chronic diseases (Popkin, Adair, & Ng, 2013, p. 9). This dual burden makes the challenge of reducing malnutrition in children under 5 especially difficult. Therefore, it is particularly important to analyze all of the factors that contribute to malnutrition in order to have any hopes of eliminating it in all its forms.

First, this paper will describe the extent and significance of the various types of malnutrition in children under 5 in the DR, including underweight, overweight, and specific micronutrient deficiencies. Then, using the “Framework for actions to achieve optimal fetal and child nutrition and development” from the 2013 Lancet Series on Maternal and Child Health as a guide, it will also attempt to describe the determinants of malnutrition for this population (Black et al., 2013). The discussion will conclude with an assessment of interventions related to optimal child nutrition and development in the DR, followed by an analysis of ensuing implications for policy.

**Nutritional Status of Children Under 5**

**Undernutrition**

As of 2013, roughly 75,000 children under 5 in the DR were stunted, amounting to a 7% prevalence (International Food Policy Research Institute [IFPRI], 2015, p. 1). Stunting is defined as a height for age of < -2 standard deviations (SD) below the WHO Child Growth Standards median and it represents long-term, chronic undernutrition (WHO, 2010, p. 1). Stunting prevalence increased from 8% to 12% between 2000 and 2002, but has steadily declined since then (IFPRI, 2015, p. 1). Of the 7% that are stunted, 2% are severely stunted, defined as height for age < -3 SD below the median (“Dominican Republic 2013 DHS,” 2015, p. 460). Stunting is a concern for any population because it can result in poor performance in school, developmental
delays, and diminished intellectual capacity, all of which may result in worsened economic productivity. Furthermore, stunted women are at greater risk for having more obstetric complications and delivering smaller infants, which perpetuates the cycle of malnutrition (WHO, 2010, p. 1).

Another measure of undernutrition is wasting, which is defined as a weight for height of $< -2SD$ below the WHO Growth Standards median. Wasting represents acute malnutrition, such as weight loss caused by starvation or the presence of infectious diseases, like diarrhea (WHO, 2010, p. 1). In 2013, 25,000 Dominican children under 5 were wasted, which accounts for roughly 2% of the under-5 population (IFPRI, 2015, p. 1). According to some sources, the prevalence of wasting has actually increased between the periods of 2006 to 2013, from 1.9 to 2.4% (WHO, 2016d). Wasting is of public health significance because it can dampen the immune response, leading to an increased susceptibility to infectious disease, increased severity of disease, and a lowered chance of survival (WHO, 2010, p. 1).

The final measurement of undernutrition is underweight, which can represent either stunting, wasting, or both, thus making its interpretation somewhat complex. Nevertheless, underweight, defined as weight for age $< -2SD$ of the WHO Child Growth Standards median, has been associated with increased risk of mortality (WHO, 2010, p. 1). Underweight in children under 5 actually saw an increase between 2000 and 2006, rising from 3.5% to 4.6%. Its prevalence only decreased slightly over the next several years, falling to 4% in 2013 (World Bank, 2016a; WHO, 2016d). The 2003 national banking crisis may provide an explanation for the upsurge in underweight in the first part of the 21st century (Pan American Health Organization [PAHO], 2012, p. 273). The effects of this banking crisis are reflected by the increase in the percent of population living below the federal poverty line, which rose from 32% in 2000 to 43.6% in 2007 (World Bank, 2016a). These numbers remained high over the last fifteen years. It wasn’t until 2015 that the prevalence of poverty finally decreased to its pre-banking crisis level of 32% (World Bank, 2016a). Because poverty has a direct impact on both what types of food and how much a family can afford to eat, it makes sense that overall underweight in children under 5 increased and remained fairly high as a result of the 2003 national banking crisis.
**Overweight**

Because the DR is a dual-burden country, overweight is also an issue among children under 5. Overweight is defined as weight for height > +2 SD of the WHO Child Growth Standards median (WHO, 2010, p. 1). After reaching its peak prevalence of roughly 9% in 2002, the percentage of the DR’s under-5 population that is overweight has decreased, falling to 8.3% in 2007 and 7.6% in 2013. This accounts for approximately 81,000 children (Centro de Estudios Sociales y Demograficos [CESDEM] & ICF International, 2014, p. 177; IFPRI, 2015, p. 1; World Bank, 2016a). Both childhood obesity, which is defined as >+2 SD of the WHO Child Growth Standards median for body mass index and sex, and childhood overweight are problematic in that they may lead to both short-term and long-term adverse health outcomes. Childhood obesity is correlated with an increased risk of adult obesity, which may in turn boost the risk of developing many chronic, non-communicable diseases (NCDs) like heart disease, stroke, and diabetes (WHO, 2010, p. 1; WHO, 2016a).

**Micronutrient Deficiencies**

Vitamin A deficiency (VAD) is a common concern in low- and middle-income countries and its consequences can be best observed during stages of life with increased nutritional needs, such as early childhood (WHO, 2009, p. vii). VAD is most often caused by a diet chronically deficient in vitamin A-rich foods, which leads to a decrease in the body’s vitamin-A stores. Without enough Vitamin A, growth of tissues, maintenance of normal metabolism, and resistance to illness is impaired. VAD can lead to preventable childhood blindness and anemia and, because of the decreased ability to fight infections, may increase the severity of and probability of dying from infectious disease. The acquisition of an infectious disease in Vitamin A-deficient individual may further reduce intake of Vitamin A-rich foods and quicken Vitamin A loss from tissues. This could lead to a vicious cycle of VAD and infection for at-risk groups, including young children and pregnant or lactating women (WHO, 2009, p. 1).

VAD is commonly assessed using two parameters: 1) clinically-evaluated eye signs for night blindness and 2) biochemically-measured amounts of retinol in serum. For the latter, the WHO defines VAD as a serum retinol threshold of <0.70 µmol/l (WHO, 2009, p. 2). The prevalence of serum retinol <0.70 µmol/l can then be used to classify VAD as either a mild, moderate, or
severe public health problem (WHO, 2009, p. 8). Reliable VAD data can be hard to come by. In the WHO’s publication, *Global prevalence of vitamin A deficiency in populations at risk 1995-2005*, the DR did not have adequate survey data, so a regression-based estimate was created using reported prevalence of VAD and markers of population health status (WHO, 2009, p. 6). Although no date was given for this data, one can assume it came from the time period denoted by the report, between 1995-2005. This report estimates that 0.6% (95% CI: [0.0%-8.2%]) of the under-5 population in the DR, or 7,000 children (95% CI: [0-91,000]), had clinically-assessed night blindness. The WHO classified this as a mild public health problem (WHO, 2009, p. 27). More significant, perhaps, was the estimated prevalence of serum retinol <0.70 μmol/l: 13.7% (95% CI: [1.5%-62.8%]) of children under 5, or 152,000 (95% CI: [16,000-697,000]) children. Even though the confidence intervals are wide, the WHO still classified this to be of moderate public health significance (WHO, 2009, p. 38). More recent data on VAD in children <5 in the DR comes from the 2015 Nutrition Country Profile, released by the International Food Policy Research Institute (IFPRI). It states that VAD among children 6-59 months old was 8% in 2013; no further information is available as to how this estimate was obtained (IFPRI, 2015, p. 1).

Another common nutrient deficiency with public health significance is anemia. Anemia is generally defined as a low blood hemoglobin concentration and can occur for various reasons; just over 50% of anemia cases are attributable to iron deficiency, although this proportion may differ across regions (WHO, 2015b, p. 1). Other common causes of anemia include other micronutrient deficiencies, such as folate, riboflavin, vitamin A, and vitamin B12, inherited or acquired disorders, or the presence of acute and chronic infections. Iron-deficiency anemia (IDA) is a significant contributor to overall global mortality and can impair cognitive and motor development, cause fatigue, and decrease productivity (WHO, 2015b, p. 1). Similar to data on VAD, information about anemia is not as readily available as other indicators of malnutrition such as stunting or wasting.

The WHO released a report entitled *The Global Prevalence of Anaemia in 2011*. In this publication, anemia is defined as a blood hemoglobin concentration of <110 g/L for children and severe anemia is set at <70 g/L (WHO, 2015b, p. 11). Similar to the classification of VAD, prevalence of hemoglobin concentration <110 g/L can be used to classify anemia as a mild,
moderate, or severe public health issue (WHO, 2015b, p. 12). Although estimates exist for anemia in children under 5 in the DR in this report, it is important to note that these estimates are not based on national or subnational data (WHO, 2015b, p. 24). It is unclear what source was used for the DR data, a major limitation to interpreting the findings. Nonetheless, the estimated mean hemoglobin concentration in g/L for children aged 6-59 months in the DR was 115 (95% CI: [105, 123]). The estimate for the percentage of children aged 6-59 months with anemia was 33% (95% CI: [12%, 63%]) and severe anemia 0.5% (95% CI: [0.0%, 2.7%]). This classified anemia in children under 5 in the DR as a problem of moderate public health significance (WHO, 2015b, p. 20). In order to estimate how much is attributable to iron-deficiency, the researchers estimated how much of the anemia would be amenable to iron supplementation. In the Region of the Americas, the WHO region that includes the DR, 56% (95% CI: [48%, 63%]) of anemia cases in children are approximated as being IDA (WHO, 2015b, p. 12).

**Determinants of Malnutrition in Children Under 5**

**Explanation of the Framework**

In 2013, the Lancet released their second series on Maternal and Child Nutrition, a follow-up from their original set of publications on the subject in 2008 (The Lancet, 2008; The Lancet, 2013). In the first paper of this more recent series by Black et al. (2013), entitled *Maternal and child undernutrition and overweight in low-income and middle-income countries*, they introduce a new framework (Figure 1) intended to be used as a guide for how to enhance growth and promote optimal nutrition in children:

> This new framework shows the dietary, behavioural, and health determinants of optimum nutrition, growth, and development and how they are affected by underlying food security, caregiving resources, and environmental conditions, which are in turn shaped by economic and social conditions, national and global contexts, resources, and governance. (p. 428)

In addition to outlining these determinants, the framework provides examples of different types of interventions and programs that can help to achieve optimum fetal and child nutrition and development, including nutrition-specific, nutrition-sensitive, and environmental-level interventions. Nutrition-specific interventions address the most immediate causes of malnutrition, nutrition-sensitive interventions describe some of the more common underlying determinants for malnutrition, and the enabling environment interventions outline what needs to
be done at the macro-level to ensure programs can thrive in a supportive setting (Black et al., 2013, p. 428).

For the purposes of this paper, the 7 boxes in the middle of the diagram will be adapted to outline the environmental, nutrition-sensitive, and nutrition-specific determinants of malnutrition in children under 5 in the DR. While this framework attempts to show the ideal circumstances for how optimal growth and nutrition can occur, this paper will instead describe the current situation in the DR, including both the contributing and protective factors for malnutrition. For example, in the part of this paper that corresponds to the blue box containing “Low burden of infectious diseases,” the existing state of infectious diseases among the under-5 population will be described, even if the burden is not “low.” The paper will go in order from the most macro-level determinants, corresponding to the central orange box, to the intermediate-level underlying determinants, corresponding to the three central green boxes, and will finish with the most micro-level, direct causes of malnutrition, corresponding to the three central blue boxes (Figure 1). While not all of the information in each of the 7 boxes is reflected in the titles of the

![Figure 1: Framework for actions to achieve optimum fetal and child nutrition and development](image-url)
following sections, the most pertinent information, and the components of each box for which data was readily available, will be addressed as thoroughly as possible.

Environmental-Level Determinants

Demographic & Epidemiologic Transitions

As mentioned previously, the DR is presently undergoing the nutrition transition. This transition does not occur in isolation, though; historically speaking, two other noteworthy changes likely take place before or concurrently with the nutrition transition. The first is the demographic transition: as a country becomes more industrialized, traditionally high birth and death rates start to decrease significantly, resulting in an increased life expectancy (Popkin, 2002, p. 93). In the DR, the total fertility rate has fallen from 2.99 children per woman between 2000-2004 to 2.31 in 2016. Furthermore, the birth rate has decreased from 26 per 1,000 persons between 2000-2004 to 18.6 in 2016, while the death rate decreased from 5.51 per 1,000 persons to 4.6 over the same time period. This has resulted in a steadily increasing life expectancy, rising from 74.35 to 78.1 years between 2000-2004 and 2016 (CIA, 2016; PAHO, 2007).

The second change, which occurs along with the demographic transition and is perhaps even more closely tied to the nutrition transition, is known as the epidemiologic (or health) transition. This transition is defined as, “the shift from a pattern of prevalent infectious diseases associated with malnutrition, periodic famine, and poor environmental sanitation to a pattern of prevalent chronic and degenerative diseases associated with urban-industrial lifestyles” (Popkin, 2002, p. 93). There is ample evidence that the DR is both becoming more urbanized and suffering from an increased prevalence of chronic disease. In 2016, 79% of Dominicans lived in urban regions compared to only 35% less than 5 decades ago; 2.9 of the 10.6 million persons in the DR reside in the capital, Santo Domingo (CIA, 2016; PAHO, 2012). With regard to an increased prevalence of chronic disease, both the DR and the majority of countries in LAC are in the third stage of the epidemiologic transition. Stage 3 is characterized by rampant chronic disease, such as cardiovascular disease (CVD), as opposed to stage 2 where chronic disease risk is not as prominent. In stage 4, public health interventions have already succeeded at lowering exposure levels (Acosta et al., 2010, p. 2). This is reflected by the fact that CVD has been the main cause of death in LAC for the previous two decades (Miranda et al., 2013, p. 2). In the DR specifically,
ischemic heart disease was the number one cause of death in 2012, accounting for 18.6% of or 9.1 thousand total deaths. Stroke came in second with 11.3% of total deaths, killing 5.5 thousand people (WHO, 2015a). The burden of disease is another helpful measure and is calculated according to disability-adjusted life years (DALYs), the sum of years of life lost from premature death, disability, or disease. In 2012, cardiovascular disease and diabetes were the primary contributors to DALYs in the DR. Maternal, neonatal, and nutritional diseases were the 5th largest contributors while infectious diseases like HIV, TB, and malaria were 8th, followed by acute respiratory infections and other infectious diseases ranked 9th and 10th, respectively (WHO, 2015a).

After examining the realities associated with the demographic and health transitions in the DR, it becomes more apparent why these changes are intertwined with the nutrition transition. As the DR shifts toward being more urban and industrialized, there are increasingly more “western” food options available and lifestyles that require less physical activity. All of these factors help to create an obesogenic environment. It is therefore not surprising that while roughly 7% of children under 5 were stunted in 2013, approximately 8% of children were overweight (IFPRI, 2015, p. 1). This dual burden of disease exists at the population level, but can also exist within households or even individuals (Tzioumis, Kay, Bentley, & Adair, 2016). Children in poor families may be overweight while their parents still suffer the consequences of inadequate access to food during their youth. Furthermore, some of these children with excess adiposity may have concurrent micronutrient deficiencies due to a lack of nutritionally-dense foods in their diet, even while they have an excess of calories (Popkin, Adair, & Ng, 2013, p. 9).

Economy
The DR is currently experiencing a period of rapid economic growth. Its GDP (purchasing power parity) was $149.9 billion in 2015 and its Gross National Income (GNI) was $64.5 billion or $6,130 per capita in current US dollars (CIA, 2016; World Bank, 2016b). Traditionally, the DR’s economy centered around its main exports: sugar, coffee, and tobacco. Recently, however, service has supplanted agriculture as the economy’s largest industry due to an increase in tourism, construction, and free trade zones (CIA, 2016). These changes have occurred in the setting of globalization, defined as the process by which countries have grown more
interdependent on one another as the exchange of goods, services, and ideas increases. This exchange has inevitably become easier with ever-evolving technological advances (“Globalization”, 2016). One example of global interconnectedness exists in the form of increased dependency on remittances for income. According to a Pan American Health Organization (PAHO) report in 2012, roughly 1 to 1.5 million Dominicans lived outside the country and sent back remittances to their family members, making this the DR’s second highest source of revenue at the time. The World Bank estimated that $5,196,000 was received in remittances in 2015, compared to only $315,000 in 1990 (CIA, 2016; World Bank, 2016b).

Perhaps the most obvious example of globalization, though, occurred in the form of the Central America-Dominican Republic-Free Trade Agreement (CAFTA-DR). This trade agreement was signed in 2004 with the purpose of promoting the exchange of commodities, funds, and services between the US, five Central American countries, and the DR (Hawkes & Thow, 2008, p. 346). Free trade agreements such as this are thought to increase availability and decrease prices of certain food groups associated with the nutrition transition, such as animal products and processed foods. A study published in 2008 examined this exact hypothesis, specifically as it relates to CAFTA-DR. The authors concluded that, although direct causation could not be proven, CAFTA-DR will likely enable dietary shifts and quicken the process of the transition by increasing consumption of meat, highly processed foods, and foods outside of the traditional dietary patterns of the countries within the agreement (Hawkes & Thow, 2008, p. 354).

Unfortunately, this study only assessed the five Central American countries and not the DR; however, the situation is more than likely comparable in the DR as it has many similarities to the countries that were included in the analysis.

While economic growth and globalization lend to the nutrition transition and rise of chronic disease among children in the DR, there are certainly additional economic determinants of malnutrition in the DR. Quite simply, the DR is plagued by vast inequalities in income that result in significant health disparities. The wealthiest 10% of the population receives 40% of the GDP, while the poorest 50% collects less than 20% of the GDP (CIA, 2016). The Gini index, used to calculate income inequality, gave the DR a score of 46 in 2012, 0 being perfect equality and 100 perfect inequality. Perhaps even more striking, the DR ranked 113th out of 145 countries with a Gini index score in 2012 (IFPRI, 2015). As such, stunting prevalence varies greatly by wealth.
quintile. In 1996, the mean prevalence of stunting was over 25% for the poorest quintile and almost negligible for the wealthiest quintile. Although the gaps have closed to some extent since then, stunting was still more than three times as prevalent in the poorest quintile as it was in the wealthiest in 2007: the numbers were roughly 18% and 5%, respectively (IFPRI, 2015). These statistics indicate that socioeconomic status has a significant impact on the nutritional status of children under 5 in the DR. It would be interesting to see if and how child overweight varies by wealth quintile, but that data was not readily available at the time of this analysis.

*Government Structure & Policies*

A country’s political system determines the process for legislation, how well laws are enforced, and what types of policies are put in place. In this way, politics and government absolutely function as determinants for under-5 nutritional status. It was not long ago that the DR experienced extreme political turmoil. Starting in 1930 and until his assassination in 1961, the Dominican people suffered under the autocratic rule of Rafael Leonidas Trujillo. Trujillo, undoubtedly one of the most corrupt dictators in Dominican history, used to murder and torture those who disagreed with him (Compassion, 2016). In fact, he was responsible for the massacre of 15,000 Haitian migrant workers in 1937 (Ferguson, 2003, p. 6). Although difficult as it was to recover from such an extremely dark period of dictatorial rule, the DR has been relatively stable in the recent past under its democratic republic system. President Danilo Medina Sanchez was reelected in May of 2016, marking the start of his second four-year term. The DR is separated into 31 political provinces, in addition to a separate National District, which contains the capital and the seat of the central government (CIA, 2016; PAHO, 2012, p. 271).

The recent stability in the DR allowed the government to make steady progress toward the MDGs and now the SDGs. As mentioned in the introduction, the DR has made excellent headway concerning MDG 4, which aims to reduce the under-5 mortality rate by two-thirds; in addition, it is fast approaching SDG target 3.2 of a minimum 25 deaths per 1,000 live births in children under 5 (WHO, 2015a; WHO, 2016b). Another important MDG relating to the nutritional status of children under 5 is MDG 1c. This target aimed to reduce the proportion of people who suffer from hunger globally by 50% between 1990 and 2015 (Food and Agriculture Organization [FAO], International Fund for Agricultural Development [IFAD], & World Food
Programme [WFP], 2015, p.9). This so-called “hunger target” is measured by the total prevalence of undernourishment (PoU), as well as the prevalence of underweight in children under 5 (CU5) (FAO et al., 2015, p. 19). The DR was one of only 29 developing countries to reach both the World Food Summit goal (halving the number of undernourished people) and the MDG 1c target (halving the proportion of hungry people) by 2014-2016 (FAO et al., p. 12). This success is in part due to the political climate at large, namely the efforts that were put forth by the entire LAC region:

> Progress for both indicators stems from economic growth combined with a stronger commitment to social protection, especially over the last decade. Many countries have made hunger and malnutrition eradication a high political priority. At the continental level, important commitments started in 2005 with the Hunger-Free Latin America and the Caribbean Initiative and, through various other initiatives, eventually led to the Plan for Food Security, Nutrition and Hunger Eradication 2025 of the Community of Latin American and Caribbean States (CELAC), adopted by all countries of the region in January 2015 during its third Presidential Summit. (FAO et al., 2015, p. 24)

These region-wide efforts further prove that the political climate at large can have a major impact on the health and nutritional status of children. Still, specific changes had to take place within the DR in order to see these changes realized. Some of the policies that made success possible for the DR, including major health reform, will be discussed in the following section.

**Healthcare System & Reform**

The DR has undergone extensive transformations in the health sector in the past few decades. Many of these changes were prompted by the passing, in 2001, of two laws: the General Health Law and the Law Establishing the Dominican Social Security System. These laws, respectively, helped to establish a National Health System (NHS) and the Dominican Social Security System. The first law regulates the activities performed by the State to promote health as a right for all, including a push for decentralization of the delivery of public health services, and the second established the foundation for a social protection system with universal insurance coverage (PAHO, 2007). Then, in 2005, an agenda meant to coordinate the different actions of the various organizations created under the NHS, called the Strategic Agenda and Critical Roadmap for Health Reform, was developed with four main objectives for improving the health sector. These include strengthening the role of the Ministry of Public Health and Social Assistance (SESPAS) for essential public health functions, guaranteeing universal insurance, promoting access to high
quality drugs for all, and strengthening the organization of regional public health systems (PAHO, 2007, p. 27). In 2005, SESPAS set out a “Zero-Tolerance Strategy” aimed at reducing the seven health problems in line with the MDGs. These seven problems included both maternal and infant mortality, specific infectious diseases, and vaccine-preventable diseases (PAHO, 2007, p. 5). The following year, the Ten Year National Health Plan 2006-2015 (NHP) was implemented. Over 600 stakeholders were involved in developing the plan, including non-governmental organizations (NGOs), the government, donors, and political parties (Global Health Initiative [GHI], 2014, p. 9). The NHP was designed to address emerging issues, such as those diseases associated with the epidemiological transition, and long-standing issues associated with inequalities, including maternal and child health and nutrition. The NHP’s strategic objectives included the strengthening of patient care, government stewardship, public health, and local-level providers; the development of social health insurance, a health civil service system, and health information and surveillance systems; the integration of approaches for women’s health; and the ensuring of health financing (GHI, 2014, pp. 9-10).

In addition to the downward trends in hunger and child mortality, other key health statistics reflect the successes of the health care reforms. The subsidized insurance plan has enrolled over two million Dominicans since its inception, leading to increased healthcare access for the most impoverished Dominicans and a reduced burden of out-of-pocket payments (GHI, 2014, p. 8). In fact, the percent of out-of-pocket health expenditures by Dominican citizens as a percent of total spending on health fell by more than half, from 43% in 2000 to 21% in 2014 (World Bank, 2016a). The amount of money spent on private health services, including private insurance and out-of-pocket payments, decreased as a percent of GDP. The opposite occurred for public health expenditures, which saw increases in both percent of GDP, from 2% in 2007 to 2.9% in 2014, and percent of total government expenditures, from 10.6% in 2007 to 17.4% in 2014 (World Bank, 2016a). However, this was not enough for the DR to attain its benchmark goal of 5% of GDP for public expenditure on health (GHI, 2014, p. 10). This shows that although tremendous progress has been made, much work remains to be done. Still, young children and other vulnerable groups in the DR have undoubtedly benefited from the given political commitments to improving the healthcare sector. That these reforms are less than two decades old most likely
means that the health and nutritional status of children under 5 will only continue to improve with time.

*Dietary Guidelines*

The development of the country’s first dietary guidelines in 2009 represents an important environmental-level determinant for child malnutrition in the DR (Despacho de la Primera Dama, 2009). SESPAS spearheaded the process, but widespread political commitment and involvement was required for the creation of these guidelines: 38 total agencies were involved, including international organizations such as the Food and Agriculture Organization (FAO) and PAHO. The DR-Dietary Guidelines (DR-DG), using the illustration of “The Pestle of Nourishment and Nutrition,” focuses on over- and undernutrition with an emphasis on food security and poverty reduction (Fuster, 2016, p. 609). Unlike guidelines in some neighboring countries, namely Cuba and Puerto Rico, the DR-DG target the entire healthy population, including children under 2. This allowed the DR to incorporate a discussion about the importance of infant feeding, incorporating both lactation and complementary feeding, into their dietary guidelines (Fuster, 2016, pp. 609-610).

The DR-DG defines seven food groups: cereals; starchy vegetables; fruits and vegetables; legumes; fish, poultry, beef and entrails; eggs, milk and dairy; and fats, sugar and iodized salt. They additionally outline an 8th category, maternal milk (Fuster, 2016, p. 609). The guidelines don’t really define serving size for any of these food groups, but do recommend consuming at least 1 cup of legumes, 2-3 vegetables, and 3 fruits per day (Fuster, 2016, p. 610). Furthermore, the document contains 10 key recommendations, including suggestions to increase the consumption of fortified foods, starchy root crops, beans, grains, fish, eggs, and dairy, as well as to vary the colors of fruits and vegetables eaten on a daily basis. Some recommendations go beyond food and eating, such as washing your hands before each meal, exercising a little every day, and drinking at least 8 glasses of water daily. In relation to infant feeding, the recommendations state that mothers should give maternal milk starting at birth until 6 months, after which point foods from the pestle, or *pilón*, should be added little by little (Fuster, 2016, p. 611). Important in the context of the dual burden of disease, the DR-DG do not distinguish between lean and other meats; in fact, they encourage the consumption of red meat, beans, and
leafy greens to reduce the prevalence of anemia (Fuster, 2016, p. 612). Lacking from the DR-DG includes a discussion on portions; the pestle imagery focuses on overall dietary pattern but is not very helpful in displaying proportionality (Fuster, 2016, p. 610). Additionally, the DR-DG make no distinction between whole and refined grains and do not include a recommendation to limit salt; they do, however, recommend consuming only iodized salt, which is likely a reflection of the high-presence of goiter and other thyroid issues discovered in the DR in the 1990s (Fuster, 2016, pp. 612-613; Malasanos et al., 2007).

Although it remains to be seen what specific effects, if any, the DR-DG have had on the Dominican dietary pattern since their implementation in 2009, it is still important to acknowledge their presence as they shape the overall food and nutrition environment in the DR. They will, if they haven’t already, likely impact the advice given and types of food provided in government-sponsored programs, and are therefore an important determinant for under-5 nutrition in the DR.

*Ethnicity & Racism*

Although similar to many other countries in the LAC region in terms of language, climate, and stage of demographic transition, the DR has a unique culture influenced by the various forces at play during colonization. The original inhabitants of the island, the Taino people, greeted Columbus upon his arrival in 1492. However, soon thereafter their population dwindled as a result of inhumane treatment by the Spanish settlers. Finding themselves in need of an adequate workforce, the Spanish brought slaves from Africa to Hispaniola in 1503 to work the plantations (Compassion, 2016). Nearly two centuries later, Spain officially acknowledged French authority over the western third of the island, which shortly became Haiti (CIA, 2016). Haiti occupied the DR between 1822 and 1844; since then, the DR has been independent, except for a brief stint of Spanish rule between 1861 and 1865 and an 8-year occupation by the US government ending in 1924 (Compassion, 2016).

It is important to acknowledge these various occupancies and oppression because they contribute to the social context for malnutrition in the DR. Potentially the most important consequence of this history is the impact it had on Dominican identity and how they view others in terms of skin
color, and what effect this has on the health of certain subgroups in the DR. Despite a large presence of Haitians in the DR and some shared aspects of culture and genetics, Dominicans tend to be extremely prejudiced against Haitians and other persons with dark skin (Ferguson, 2003). This is a significant social issue, especially when considering that an estimated 500,000 to 1 million Haitians, both documented and undocumented, live in the DR (GHI, 2014, p. 5). Racism, and more specifically antihaitianismo, can be traced back to resentment against the Haitian occupation of the DR in the 1880s and the anti-Haitian propaganda spread by Trujillo during his reign. Both are fundamental components of Dominican identity:

In essence, dominant Dominican identity is the negation of all that is Haitian. If to be Haitian is to be black, then many Dominicans wish to deny their own blackness. In a country where most people are, to some extent, African-descended (a recent demographic analysis states 16 per cent white, 11 per cent black, 73 per cent mixed), blackness is widely viewed as a negative attribute. Colour consciousness, at the same time, is acute, and Dominicans employ a plethora of terms to describe subtle differences in pigmentation, such as mulato oscuro (dark mulatto), trigueño (wheat-coloured) or indio oscuro (dark Indian). (Ferguson, 2003, p. 20)

This “color consciousness” plays out in a social stratification of sorts, where a higher proportion of light-skinned Dominicans hold more esteemed positions in society and dark-skinned Dominicans tend to comprise the lowest social class and hold the lowest-paying jobs (Ferguson, 2003, p. 20). The situation is arguably worse for Haitians than for dark-skinned Dominicans, where Haitians and their offspring are considered to be more primitive, less worthy, and are often unfairly blamed for many problems in the DR (Ferguson, 2003). These prejudices carry with them important repercussions for both foreign-born Haitians and children born to Haitians while in the DR, known as Dominico-Haitians, such as worse living conditions and disparate access to healthcare and other services (Ferguson, 2003, p. 21). Take the Dominican bateyes as an example. Many Haitians who come across the border in search of employment live in bateyes, work camps that were constructed in the early 20th century to house temporary contract workers for sugar plantations. The bateyes were never intended to act as housing for families year-round, but they ended up doing just that (Ferguson, 2003, p. 11). As of 2002, there were roughly 500 established bateyes in the DR of which 65-75% of the 250,000 residents were Haitian. In 2001, a report came out that of the bateyes owned by the State Sugar Council, roughly a third had no access to drinking water or education, two-thirds no sanitation facilities, and a sixth no access to health services (Ferguson, 2003, p. 14). Furthermore, in these bateyes are many single mothers
and children. These children have often had to work in the sugar-cane fields and either cannot or do not go to school, creating a cycle of seemingly inescapable poverty (Ferguson, 2003, p. 15).

With the lower social class, worse-paying jobs, reduced access to health care and education, and worse living conditions faced by Haitians in the DR, one could hypothesize that Haitian and Dominico-Haitian children in the DR are more likely to be malnourished than their Dominican counterparts. It is difficult to find statistics for malnutrition in the DR stratified by ethnicity; however, because of the large proportion of Haitians living in bateyes, the bateyes may be used as a proxy.

The comparison between the nutritional status of children under 5 living in bateyes against children under 5 in the general Dominican population was actually the focus of a thesis submitted to Georgia State University in 2014 (Madrid, 2014). In 2007, the United States Agency for International Development (USAID) started releasing a Dominican Republic Special DHS alongside the Dominican Republic Standard DHS; the Special DHS focused specifically on the bateyes (Madrid, 2014, p. 19). This thesis found that 15.9% of children under 5 living in bateyes were moderately or severely stunted as compared to 10.8% of children living in other areas in the DR. As such, batey children were 1.34 times as likely to be moderately stunted and 2 times as likely to be severely stunted compared to children under 5 in the general population (Madrid, 2014, p. 28). These statistics demonstrate how severely the racially-stratified societal views in the DR impact child nutritional status. And, to be certain that the Special DHS for bateyes and the Standard DHS can be used as a suitable proxy for race and ethnicity, one must look no further than the demographic composition of both surveys: roughly 34% of the adults who completed the Special DHS in 2007 were from Haiti, as opposed to 10% of those who completed the Standard DHS questionnaire. Similarly, almost 90% of the Standard DHS respondents in 2007 reported being from the DR while only 54% of the Special DHS respondents reported this (Madrid, 2014, p. 40).

Religious & Health Beliefs
The various forces at play during the DR’s colonial period and the continued influence of the United States have also had a substantial impact on both religious and health beliefs on the
island. Although statistically speaking 95% of Dominicans identify as Roman Catholic, the popular religious ideology in the DR falls entirely into its own category, known as *religiosidad popular Dominicana* (CIA, 2016; Vazquez, 2005, p. 226). Stemming from both Spanish and African influences, these beliefs combine voodoo, Spiritism, and folk healing with traditional Catholic rituals, including prayer and belief in the Saints (Vazquez, 2005, p. 226). Not all Dominican Catholics fall in line with this belief system, but for those that do, there may be important health consequences. This is because these religious beliefs are intertwined with health beliefs, impacting the way many Dominicans attempt to prevent and cure illnesses. Many Dominicans believe that the causes of disease go beyond the physical realm (Babington, Kelley, Patsdaughter, Soderberg, & Kelley, 1999). Some Dominicans may seek out a healer, or *curandera*, who offers a special prayer or prescribes a bath with specific herbs to cure an ailment. Amulets are given to children to protect against evil, and drinking of curative teas may be used to relieve certain aches or pains (Vazquez, 2005, p. 226). Others pay respect to Catholic saints, use sacraments, or pray in order to maintain good health. In addition to these more mystical and spiritual practices, modern Western biomedicine is used. Dominicans often seek out physicians and modern medicine to relieve headaches, pain, or cold and flu symptoms (Babington et al., 1999, p. 23).

Although there are no statistics detailing how health and religious beliefs directly impact the nutritional status of children under 5 in the DR, it can be assumed that the health beliefs and practices of households and the wider culture in general act as important determinants for the health of young children.

**Nutrition-Sensitive Determinants**

*Access to & Use of Health Services*

The DR is not lacking in healthcare personnel or facilities, in large part due to the reforms in the early 2000s. As mentioned previously, the 2001 General Health Law solidified SESPAS as the lead organization within the Dominican health system. The law also changed how health services were delivered at the local level with its emphasis on decentralization. It did so by establishing a Regional Public Health Service whose purpose is to meet the needs of low-income individuals by providing them with high quality health services in a timely manner (PAHO, 2007, p. 29).
now sizeable health infrastructure in the DR has the potential to reach even very remote regions. This is reflected by the roughly 1,100 primary health care centers and 200 hospitals in the country. Where the public health system is lacking, the country’s large network of NGOs steps in to provide public health services at the community level (GHI, 2014, p. 8). In terms of healthcare personnel, PAHO (2007) stated that the total number of health professionals increased in all categories of SESPAS between 1994 and 2004 (p. 21). It was also reported that as of 2006, there were: “18,450 physicians (20 per 10,000 population); 3,603 nurses (3.9 per 10,000 population); … 8,320 dentists (9 per 10,000 population); 3,940 pharmacists (4.3 per 10,000 population); and 15,511 auxiliaries/nursing technicians (15 per 10,000)” (PAHO, 2007, p. 21). Although there is definitely room for improvement with some of these numbers, they help to demonstrate a seemingly adequate health workforce in the DR.

The second health reform law in 2001 helped to facilitate the provision of health services by establishing the Family Health Insurance system, a system that is both mandatory and universal. In March of 2011, 10 years after this new health system was implemented, over 4.4 million people were using the Family Health Insurance program. Of the Dominicans classified as being moderately or extremely poor, roughly 64% of them were participating in the new insurance program. In fact, between 2007 and 2011, participation in the insurance program increased by 166% (PAHO, 2012, p. 281).

In regards to the utilization of health services among young children and their caregivers, there are several statistics that support the viewpoint that Dominicans have sufficient access to healthcare. In 2013, 98.6% of births were attended by a skilled health worker. Of one-year-old children in the DR, 88% were immunized against measles in 2014, up from 79% in 2007 (WHO, 2015a; WHO, 2016d). Of children between 12 and 23 months, 85% received their DPT immunization, an improvement over 69% coverage in 1990 (World Bank, 2016a). Furthermore, 92.4% of children were vaccinated against tuberculosis and 66.1% received all three polio vaccinations (“Dominican Republic 2013 DHS,” 2015, p. 460). The 2013 DHS reported that among children under 5, 52% of children with diarrhea, 65.1% of children with fever, and 66% of children with an acute respiratory infection within the previous two weeks sought advice or treatment from a healthcare provider or institution (CESDEM & ICF International, 2014).
Despite the healthcare reforms and promising data regarding utilization of care in children under 5, many Dominicans experience barriers when it comes to accessing health services. There are disparities in access by geographic region: physicians and nurses tend to be more heavily concentrated in larger, more economically-developed cities. The National District, which contains the capital, has 37.1 physicians per 10,000 residents. Conversely, the province of La Romana, a province lacking a city akin to Santo Domingo, only has 8.3 doctors per 10,000 population (PAHO, 2012, p. 281). In addition, the 2013 DHS reported that of women aged 15-49 years who were asked about their problems in accessing care, 37.9% needed to secure money for the consult or treatment and 21.6% reported distance as a barrier. The distance barrier was more significant for women living in rural regions as compared to those in urban regions: 30.8% and 18.7%, respectively. The monetary hurdle had an inverse relationship with both wealth quintile and educational attainment, but the trend was actually more pronounced for education. Only 27.6% of women with an education beyond secondary school reported needing money in order to access healthcare, as compared to 66.4% of women with no schooling (CESDEM & ICF International, 2014, p. 152). Considering that women are the primary caregivers for young children, it is likely that their perceived barriers translate into barriers for their offspring in accessing care.

In summary, disparities in healthcare access and subsequently its utilization exist according to geographic residence, wealth, and educational attainment. This puts those children living far from metropolitan regions, those born into low-income families, and those whose caregivers have lower educational attainment at a higher risk for poor healthcare access and utilization.

*Education*

Education is an important health determinant: the less education a person has received, the more likely they are to be in poor health. This is because level of education has an impact on many other important factors, such as what type of job a person qualifies for and consequently how much money he or she can make; whether or not a person can make informed health decisions; health beliefs and access to health care; and living environment, including availability of clean water and sanitation facilities. In the DR, children are required to attend school between ages 7
and 14 (Compassion, 2016). However, it was only within the last few years that public schools in the DR switched from a half day to a full school day (Manning, 2014). Despite this positive change, there remains a dearth of good teachers, facilities, and funding for education, so the quality of the education these children are receiving is still quite low (Compassion, 2016). In fact, the DR only spent 2.1% of its GDP on education in 2007, placing it 163rd on the list of 173 total countries ranked by the World Factbook (CIA, 2016).

Even though the educational system in the DR is still highly inadequate, there have been improvements in recent decades. In the setting of the DR’s recent urbanization and economic shift away from agriculture and towards the service industry, Dominicans are noticing that those with more education can obtain better jobs; as a result, Dominicans have started placing a higher value on education over the last 25 years (Compassion, 2016). This trend is reflected by the steadily increasing primary school completion rate. In 1990, only 23.2% of students who began elementary school successfully completed it. Twenty-two years later, this number increased to 91.1% (PAHO, 2012, p. 273; WHO, 2016d). As of 2013 the DR was spending 3.8% of its GDP on education, moving it from the 163rd position to the 101st (United Nations Development Programme [UNDP], 2015).

Although these improvements are promising for the nutritional status of future generations, the situation is of concern for the current group of children under 5 in the DR. These children are being raised by parents who experienced the educational system when it was at its worst. More specifically, they are being raised by women affected by this system, as it is customary in Dominican society for women to be in charge of childrearing (Vazquez, 2009, p. 219). The 2013 Demographic and Health Survey (DHS) examined height-for-age (stunting) and weight-for-height (wasting) of children under 5, stratified by mother’s educational level. There was no obvious trend for wasting, however the amount of severe and moderate-to-severe stunting was much lower among children raised by mothers with a secondary education or higher. For the group corresponding to mothers with no education, 10% of children under 5 were moderately or severely stunted. For mothers who completed the first four years of primary school, 9.1% of their children were moderately or severely stunted, and for those who finished all of primary school, 10.2% of children under 5 were stunted. These numbers are cut almost in half for mothers who
completed some or all of secondary school, with only 5.8% of these children being 2 or 3 SD below the height-for-age median, and dropped even further for mothers who received an education beyond secondary: only 4.3% of their children were moderately or severely stunted (“Dominican Republic 2013 DHS,” 2015, p. 460). Therefore, although a statistical analysis was not completed to determine if these differences were statistically significant, it is readily apparent that the educational attainment of the mother can have a significant impact on the nutritional status of the child. This may be in part mediated by the correlation between maternal education and socioeconomic status.

Hygienic Environment
A hygienic living environment is undoubtedly intertwined with the nutritional status of a young child (Prüss-Üstün & Corvalán, 2006). If a child lives in an unsanitary environment and contracts an infection, this infection will weaken an already vulnerable immune system, making them more susceptible to other diseases. Furthermore, this weakened, sick state will likely lead to reduced caloric intake, resulting in worsened nutritional status. Or, if the contracted disease was diarrhea, the child may become directly malnourished and dehydrated by nature of the disease (Prüss-Üstün & Corvalán, 2006, pp. 44-45). Either way, once the child is malnourished, this can then lead to a chronically poor immune system, making the child ever susceptible to disease and creating a vicious cycle. Diarrheal and other infectious diseases will be further discussed in the Infectious Disease Burden section.

A hygienic environment is frequently measured by the prevalence of improved drinking water sources and improved sanitation facilities. An improved drinking water source is one that guards the water against contamination, especially fecal matter, by how it is constructed. This includes but is not limited to a protected well or spring, a public standpipe, or piped water running into a house (WHO, 2012). Improved sanitation facilities are those that hygienically prevent individuals from coming into contact with human waste. These include sewers, septic systems, pour-flush toilets, etc. (WHO, 2012). As of 2016, roughly 85% of Dominicans used improved drinking water sources and 84% used improved sanitation facilities. While the access to improved drinking water is relatively similar between urban and rural regions, 85.4% and 81.9% respectively, the difference is more pronounced for improved sanitation facility access. In urban
regions, 86.2% of persons had access to improved sanitation facilities compared to only three-quarters of persons in rural regions (CIA, 2016). Open defecation, a practice that is especially detrimental to the health of any community, is fortunately on the decline in the DR, decreasing from 10% prevalence in 1990 to 3% in 2015 (IFPRI, 2015, p. 2).

Therefore, the group of children most likely to have their nutritional status negatively impacted by an unsanitary environment are those residing in rural communities, as they are more likely to use unimproved drinking water sources and especially unimproved sanitation facilities. A population that is perhaps even more vulnerable are those children living in *bateyes*. Although the statistics are somewhat outdated, the 2001 report about the *bateyes* owned by the State Sugar Council found that 32% of *bateyes* had no access to drinking water and 66% no sanitation facilities (Ferguson, 2003, p. 14). Children living in these conditions will undoubtedly have an increased risk of contracting disease and consequently a higher likelihood of being malnourished.

*Feeding & Caregiving Resources*

A caregiver cannot hope to provide care or properly feed his or her family without the appropriate resources. One paper, which examined the resources for care and how they impact a child’s nutritional status, growth, and survival in South and Southeast Asia, gave the following definition for such resources:

Human resources at the family level include the caregivers’ knowledge, beliefs, and education, and the physical and mental health and confidence to put that knowledge into practice. Economic resources include the caregivers’ autonomy and control of resources, economic support, and time (plus control of that time) in order to provide care. Organizational resources include alternate caregivers and community care arrangements, and emotional support from family members and community networks. (Engle, 1999, p. 134).

These various resources will be examined to the best extent possible, mainly as they relate to mothers, as they are the primary caregivers in the DR (Vazquez, 2005, p. 219).

Gender roles in the DR impact the resources of caregiver education and emotional support. Surprisingly, gender differences in education actually favor women over men. Recent data show that females seem to be more likely to complete secondary school than males: 66.5% of females
and 57.5% of males enrolled in and 64.9% of females and 51% of males attended secondary school in the period between 2008-2012 (CIA, 2016). The root of the problem is not in school completion, then, even though these numbers do show that around a third of women still don’t complete secondary school. Rather, the problem is in the expectations placed on women to forgo the pursuit of any further educational opportunities when they become mothers, which is often at a very young age (Vazquez, 2005, p. 219). As of 2013, the median age at first birth among women between 25-29 years old was 21.3 (CIA, 2016). According to Vazquez (2005), once a woman has a child, the general cultural expectation is that she would dedicate herself completely to child care. The expectations for men are quite different – they feel entitled to spend much time outside the home with friends as long as they provide financially (p. 219). Vazquez (2005) also describes that while legal marriages, religious marriages, and consensual unions are still common in the DR, it remains normal for some Dominican men to have more than one household or more than one partner (p. 218). This may result in a lack of emotional support from male partners for caregiving in the home.

Emotional support and other organizational resources, such as alternate caregivers, may come instead from other members of the family. The extended family, which can include grandparents, aunts, uncles, cousins, stepchildren, and the spouses of grown children, is the most common structure for families in the DR (Vazquez, 2005, p. 218). One study, which administered a cross-sectional survey to 151 caregivers in 5 rural and peri-urban villages in the DR, found that 36% of the households interviewed contained one or more grandparents. Furthermore, 26% of the interviewed caregivers were grandmothers and 7% were aunts. Grandmothers had significantly less educational attainment than the mothers interviewed in this sample (Mills, Mills, & Reicks, 2007, p. 62). Although this study is not necessarily representative of the DR, it confirms both the dominance of female caregivers and the importance of the extended family in at least 5 regions of the country. Additionally, it shows that the extended family may lend extra support and resources for mothers as they provide care and food to their children, but it may not always be the best type of support. In other words, the lower educational attainment of grandmothers may have a negative impact on both the type of advice given to young mothers and the childrearing practices they employ. If these older generations are not using a school-based education to inform their caregiving behaviors, they are most likely relying on community-learned, culturally-
accepted practices, which likely have both positive and negative components. Finally, further damage may come in the form of the *familia postiza*, described by Vazquez (2005) as non-relatives who are considered to be family; the presence of these non-kin individuals in the household can increase the chances of adultery and child abuse in Dominican families (p. 218).

The final category of caregiving and feeding resources to be examined in this section are economic resources. More specifically, the female caregiver’s autonomy and control of resources within the household. Two studies with findings still relevant today, even though they were both published in the mid-1990s, examined the effects of female-headed households on food consumption and nutritional status of children in the DR (Johnson & Rogers, 1993; Rogers, 1996). The first study by Johnson & Rogers (1993) discovered that in the lowest expenditure quartile, children from male-headed households were of significantly worse nutritional status than children from female-headed households. This was the case even though the female-headed households had overall less calories available and less money to spend on food. They posited that this was because, “caretakers in female-headed households were more likely to divert income towards superior dietary sources for infants than those of male-headed households” (p. 1300). Another significant finding was that percent of income earned by women was an important predictor of nutritional status of the children among the lowest expenditure quartile. This may be because in female-headed households in the DR, or households in which women earn a significant portion of the total income, women have more of a say in financial decisions and will use this power to make better nutritional and other care-taking decisions for the child (Johnson & Rogers, 1993, pp. 1300-1301). The second study only added to these findings and explained that it was more the characteristics of a female-headed household, rather than the headship itself, that predicted better child nutrition outcomes. These characteristics include food expenditure and dietary adequacy. Female-headed Dominican households tended to provide their children with more calories from animal-source foods, such as meat, chicken, fish, dairy, and eggs, while male-headed households tended to place an emphasis on calories that provided more dietary bulk, such as inexpensive starch staples. Additionally, children may receive more of their fair share of the calories in households that lack an adult male (Rogers, 1996).
All of the above highlights how much of an effect human, economic, and organizational resources can have on the quality of caregiving and feeding practices in the DR. The quality of caregiving and feeding practices then has a substantial impact on child nutritional status. Another important takeaway is the central role that Dominican women play in child development. As such, it is likely that interventions which educate women, empower them to make household decisions, or provide them with organizational resources have the potential to significantly influence the health and nutritional status of young children in the DR.

Food Security – Availability, Economic Access, & Use of Food

The Nutrition Landscape Information System (NLiS) Country Profile reports, put forth by the World Health Organization (WHO), use three indicators to define food security: the percent of the population below $1 per day, the percent of the population below the minimum level of dietary energy consumption, and the percent of households consuming sufficiently iodized salt. For the DR, these numbers and their corresponding years were 2.3% in 2012, 12.3% between 2014-2016, and 11% in 2007 (WHO, 2016d). The first two numbers are promising and may reflect much of the economic progress made in the DR as of late, while the third statistic may allude to several issues. First, that the DR may have a difficult time enforcing legislation, as salt iodination was mandated in the DR in 1994, and second, that many families may still be purchasing non-iodinated salt even though it was banned during a widespread public health campaign (Fuster, 2016, p. 613; Malasanos, et al., 2007). Nonetheless, despite the valuable information provided by these particular data points, these statistics don’t fully depict the availability of, access to, and use of food in the DR. Other factors that influence food security include economic status, the surrounding environment, and Dominican culture (Weisberg-Shapiro & Devine, 2015).

A family’s economic status has a direct impact on what types of foods can be purchased and how often food shopping needs to occur. A recently-published study that interviewed a small group of women living in Santo Domingo, found that the women in this study purchased food on a daily basis because: 1) they either were unemployed or worked in the informal sector and thus had the flexibility to shop during the day and/or 2) they did not have enough money to purchase more than what they needed for that day’s meals (Weisberg-Shapiro & Devine, 2015). Furthermore,
nutritionally-dense animal-source foods like meat and poultry tend to be more expensive, so the children of extremely poor families may not consume these foods on a regular basis.

The surrounding physical environment impacts food security for families in the DR in several ways. First, many women in the aforementioned study had unreliable refrigeration, preventing them from buying large quantities of food and storing them at home (Weisberg-Shapiro & Devine, 2015, p. 294). This may be a result of no refrigerator in the home or unreliable electricity in the town. Next, many of these women reported a lack of variety in food options in the corner stores where they did their daily shopping, thereby limiting nutrient diversity (Weisberg-Shapiro & Devine, 2015, p. 299). Overall, the DR has seen a dramatic decrease in the availability of fruits, vegetables, roots, and tubers. According to the FAO in 2002, fruit and vegetable availability decreased from 652g per person per day to 346g over a 20-year period. Meanwhile, the availability of roots and tubers decreased from 176g per person per day to 62g over a 30-year period (Mills et al., 2007, p. 59).

Food availability further varies by region in the DR. Mills et al. (2007) discovered that “geography and seasonality limited what people were able to grow, buy and eat in some areas” (p. 66). Mountain communities, for instance, could not grow certain fruits because of the high elevation and may be located further from markets that sell nutrient-rich foods (Mills et al., 2007, pg. 66). However, while some communities are limited in their options because of their location, others are finding that their options are ever increasing. Foreign food franchises started making their way to the DR in the late 1970s and by 2005, there were roughly 250 franchises (including non-food franchises in this estimation) with about 900 establishments (Fuster, 2016, p. 608). This statistic is over 10 years old, though, so it is more than likely that the numbers have increased drastically since then. And, although fast-food establishments tend to appear more in touristy, urban areas, there are still plenty of options for processed snack foods in rural towns. For instance, in the town of Constanza, a rural farming community in the center of the island, children can be seen purchasing and consuming sodas, candy, and chips on a regular basis from the local colmados, or corner stores.
Finally, in regards to culture, the DR places a large emphasis on commensality, or the practice of coming together to eat as a family (Weisberg-Shapiro & Devine, 2015, p. 298). It is common for Latino women in general to regard providing food to their family to be of central importance (Weisberg-Shapiro & Devine, 2015, p. 298). In fact, if the mother is unable for whatever reason to cook for her family, another female member of the family will fill in for her so that the family doesn’t miss out on a home-cooked meal (Weisberg-Shapiro & Devine, 2015, p. 295). Unfortunately, though, due to the previously-outlined economic and environmental determinants of food security, some of these meals may be insufficient in calories or devoid of important nutrients. This then creates ample opportunity for malnutrition to occur in young children.

**Nutrition-Specific Determinants**

*Infectious Disease Burden*

The DR is very much a dual-burden country when it comes to the prevalence of infectious disease. Meaning, despite the rise of chronic disease, infectious disease is still pervasive. Three likely explanations for this have already been discussed: many children still reside in an unhygienic environment, some may have difficulty accessing health services, and widespread vitamin A deficiency weakens a child’s immune system, putting them at an increased risk of becoming infected. According to the Central Intelligence Agency (2016), Dominicans have a “high” degree of risk for contracting major infectious diseases. Example food and waterborne diseases include bacterial diarrhea, typhoid fever, and hepatitis A. In the case of vector-borne disease, dengue fever remains a concern (CIA, 2016). Tuberculosis prevalence has overall declined since 2000 when its prevalence was calculated at 162.9 cases per 100,000 population. However, it continues to be a high-priority for public health officials due to the constant influx of people from Haiti (PAHO, 2012, p. 277). HIV rates have remained fairly stable in the recent past, with just 0.8% of persons aged 15-49 testing positive among those who took an HIV test (CESDEM & ICF International, 2014, p. 286).

As far as the infectious disease burden among children under 5 in the DR, the third major cause of death in this population in 2013 was acute respiratory infections. This accounted for 13% of total deaths, while prematurity and congenital anomalies remained the two primary causes of death. In the same year, diarrhea accounted for 5% of total deaths in children under 5 (WHO,
2015a). The 2013 Dominican DHS found that of families interviewed, 18% of children under 5 had had a diarrheal episode in the two weeks prior to the survey (CESDEM & ICF International, 2014, p. 165). And, although age group is not specified, an estimated 442 children tested positive for HIV in 2009 (PAHO, 2012, p. 276).

Certain behaviors increase a child’s risk for acquiring or dying from infectious disease while other behaviors help prevent these risks. An example of a protective behavior is vaccination. Children receiving the vaccines mentioned in the Access to & Use of Health Services section are protected against contracting measles, diphtheria, pertussis, tetanus, polio, and tuberculosis. Conversely, improper knowledge of how to treat diarrhea can worsen the overall morbidity and mortality for diarrhea among young children. It was previously mentioned that 52% of caregivers consulted a healthcare provider when their under-5 child had diarrhea. However, only 30.7% of caregivers gave increased fluids to their child, 48% provided an oral rehydration salt (ORS) packet, 11.3% made a home solution for oral rehydration therapy, and 22.6% reported not offering any treatment (“Dominican Republic 2013 DHS,” 2015, p. 460).

It is of utmost importance to reduce the burden of infectious disease among children under 5 because of the strong relationship between infection and undernutrition (Prüss-Üstün & Corvalán, 2006, pp. 44-45). Undernutrition may be strictly a result of not eating enough food, but this is often not the case in low- and middle-income countries. Children living in rural areas or those in low-income or low-educational attainment families may have a higher risk of repeated infections. Infection can in turn dampen a child’s appetite, resulting in a decreased intake of nutritious foods, and/or it can worsen the body’s ability to absorb and utilize nutrients from food. Ultimately, this results in an increased likelihood of stunting or wasting in children under 5 (FAO et al., 2015).

**Breastfeeding**

Breastfeeding as a practice is quite common in the DR. In fact, the 2013 DHS found that 89% of women with children under 2 reported ever breastfeeding their child. This number did not differ greatly by zone of residence, with 92% reporting ever breastfeeding in rural regions and 88.4% reporting it in urban regions (CESDEM & ICF International, 2014, p. 178). A qualitative
descriptive study by Babington (2006), which took place in a small town of roughly 40,000 residents, explored women’s beliefs on child feeding practices using focus groups. Although it is limited by its small size – the focus group consisted of a convenience sample of 10 women – it still provides helpful insight into women’s views of breastfeeding. These women held the belief that all mothers in the DR breastfeed, which is why they have such healthy babies. They claimed that formula was expensive and hard to come by unless you had your baby in a hospital in Santo Domingo, in which case you would be provided with plenty of formula to take home. As far as learning how to breastfeed, many of these women reported being taught by their female family members. They reported frustration with the breastfeeding clinic in town because you had to wait in line to register your child in order to receive liquid infant vitamins; this annoyed them because they claimed to already know how to breastfeed, so they felt it was a waste of their time (p. 155).

However, while it might be the case that many women breastfeed, ever breastfeeding does not translate into exclusive breastfeeding: for children that were 0-1 months old, only 12.3% of mothers reported exclusive breastfeeding while 71.5% reported providing breastmilk and other milk. Only 1.2% of mothers were still exclusively breastfeeding their child when it was between 4 and 5 months old (CESDEM & ICF International, 2014, p. 180). The practices that conflict with exclusive breastfeeding, such as premature introduction of complementary foods, will be discussed further in the section on Feeding & Caregiving Practices.

The problem with breastfeeding in the DR, then, is not in its overall prevalence but rather its short duration. The median duration of any breastfeeding was 7 months in 2013 (“Dominican Republic 2013 DHS,” 2015, p. 458). While a small percentage of mothers continued to breastfeed until their child was almost 2 years old, 41.9% of mothers had stopped breastfeeding by the time the child was 4-5 months old. This percentage increased to 55.3% no longer breastfeeding among those with 9-11 month-old children (CESDEM & ICF International, 2014, p. 180). A study by McLennan (2001) examined the reasons for early termination of breastfeeding among 220 women with children under 5 living in a peri-urban district of Santo Domingo. The explanations women gave were separated into the categories of personal reasons and community-perception reasons. For this study, early termination was defined as stopping before the child reached 1 year. The most common personal reasons that women stopped...
breastfeeding early were: the child did not want it, the mother was pregnant again, or the mother had insufficient or no milk. The most common community-perception reasons for stopping breastfeeding early were: that the mother had insufficient or no milk, that the mother was concerned about losing her figure or her breasts changing shape, and that the mother was not eating well, didn’t want to breastfeed, or had to work (p. 364). The authors guessed that the mothers cited these as “community-perception” reasons rather than personal ones because they were perceived as being less acceptable reasons to stop breastfeeding, as they were more focused on the mother’s wants and needs rather than the child’s (McLennan, 2001, p. 365).

Work needs to be done to increase the duration of breastfeeding in the DR, as breastfeeding is associated with a multitude of benefits. Shorter time spent breastfeeding translates into increased morbidity and mortality for young children, especially for those in impoverished communities (McLennan, 2001, p. 362). Accordingly, “it is estimated that the joint effect of the main indicators of child undernutrition and sub-optimum breastfeeding practices accounts for 35% of the deaths of children under 5 years of age worldwide” (Navarro, Sigulem, Ferraro, Polanco, & Barros, 2013, p. 1). Known benefits of breastfeeding include lowering the risk of dying from an infectious disease for children under 2. However, it is also now emerging that breastfeeding may help to prevent overweight and obesity in childhood and can thus lower a child’s chronic disease risk as an adult (WHO, 2014). Therefore, because breastfeeding is so beneficial in preventing both over- and under-nutrition, it is imperative for the health and nutritional status of children under 5 that the overall duration of breastfeeding improves among mothers in the DR.

Nutrient-Rich Foods
The DR used to be an agricultural-dominated economy, but this is no longer the case. As mentioned previously, agriculture has been overtaken by the service industry. These factors, combined with rapid urbanization, seem to have had a detrimental effect on the overall consumption of nutrient-rich foods in the DR, such as fruits and vegetables. For the country as a whole, fruit and vegetable intake as a proportion of total energy decreased from 22% in the mid 1960s to 7% at the turn of the 21st century (Mills et al., 2007, p. 59). In the 2013 DHS, 47.7% of women aged 15-49 reported consuming fruits 2 or less days a week and 53.2% reported consuming vegetables 2 or less days a week. For males aged 15-59, fruit consumption was
slightly better as 39.3% reported eating fruit 2 or less days a week. Vegetable consumption was practically the same as 53.4% reported eating vegetables 2 or less days a week (CESDEM & ICF International, 2014, pp. 206-208).

The most recent DHS in 2013 asked mothers with children under 2 about the specific foods that were eaten the day or night before the interview took place (CESDEM & ICF International, 2014, p. 183). Although there is no data on children under 5, the data for Dominican children under 2, presented in Table 1, is still helpful in understanding the trends related to the consumption of nutrient-rich foods:

**Table 1: Food Consumption Patterns in the Dominican Republic for Children Under 2 Currently Breastfeeding and Children Under 2 Not Currently Breastfeeding**

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Fortified Infant Cereals</th>
<th>Grain-based Products</th>
<th>Fruits &amp; Vegetables Rich in Vitamin A</th>
<th>Other Fruits &amp; Vegetables</th>
<th>Foods Made from Roots &amp; Tubers</th>
<th>Foods Made from Legumes &amp; Nuts</th>
<th>Meat, Fish, &amp; Poultry</th>
<th>Eggs</th>
<th>Cheese, Yogurt, &amp; Other Dairy Products</th>
<th>Whatever Other Solid or Semi-Solid Food</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children under 2, breastfeeding</strong></td>
<td>11.7%</td>
<td>46.3%</td>
<td>29%</td>
<td>21.2%</td>
<td>31.3%</td>
<td>36.4%</td>
<td>32.7%</td>
<td>19.7%</td>
<td>11.5%</td>
<td>62.7%</td>
</tr>
<tr>
<td><strong>Children under 2, not breastfeeding</strong></td>
<td>25.5%</td>
<td>75%</td>
<td>43%</td>
<td>37.8%</td>
<td>49.6%</td>
<td>51.2%</td>
<td>48.7%</td>
<td>34.6%</td>
<td>19.8%</td>
<td>88.3%</td>
</tr>
</tbody>
</table>

Data extracted from CESDEM & ICF International, p. 183

The DHS also examined how many total children under 2 had consumed foods rich in certain micronutrients within the last 24 hours. It found that 75.6% of children under 2 had a food item rich in vitamin A and 66.4% a food item rich in iron. Finally, although there was no information in the DHS on consumption of nutrient-rich foods for children under 5, it did survey how many children under 5 were receiving vitamin A and iron supplements. Among children aged 6-59 months, 34.2% had received vitamin A supplements in the previous 6 months and 33.8% had received an iron supplement in the last 7 days (CESDEM & ICF International, 2014, p. 188).

These statistics demonstrate a couple of important things. First, there may be some over-reporting of consumption in the overarching categories of vitamin A-rich and iron-rich foods. It would seem by these results that three-quarters of children and two-thirds of children under 2 were consuming foods rich in vitamin A and iron, respectively. However, when broken down into more specific food groups, the percent of children actually consuming foods in the categories that contain foods high in vitamin A or iron were much lower. For instance, only about half of non-breastfeeding children under 2 were consuming meat, fish, or poultry and 43%
were consuming vitamin A-rich fruits and vegetables. Second, if all categories, with the exception of the final one, represent nutrient-rich foods, it is concerning that by far the highest consumption levels are in that final category of “whatever other solid or semi-solid foods.” Although it is hard to tell from the available information, this may mean that many caregivers are providing their young children with processed foods, high in sugar and/or fat, that do not fall into any of the more nutritious food categories. Finally, it seems that it may be more common for children to consume iron supplements than vitamin A supplements, since a third of children had taken an iron supplement in the past week versus the a third in the past 6 months for vitamin A supplements.

**Eating Routine**

The eating routine in the DR is influenced by many of the factors outlined in the above section entitled *Food Security – Availability, Economic Access, & Use of Food.* These factors converge to form a routine that includes: daily shopping and cooking for the women in the family, and eating of the main meal, *la comida*, as a family around noon (Weisberg-Shapiro & Devine, 2015). The dietary pattern normally includes something small for breakfast, such as oatmeal, bread with coffee, or mangú (boiled, mashed plantains), followed by *la comida*, which generally consists of rice and beans and a salad. Depending on a family’s socioeconomic status, *la comida* may or may not include fish, meat, or chicken on a daily or weekly basis. Sometimes carrots or other vegetables are incorporated into the rice and beans or meat portion of *la comida*, but generally small in portions. Finally, dinner is usually also small in the DR and is less structured, potentially consisting of rice and eggs, plantains, salty cheese, fruit, or even a warm chocolate milk drink with sweet bread (Babington, 2006, p. 156; Weisberg-Shapiro & Devine, p. 295).

Although this traditional eating routine remains highly prevalent throughout the DR, the recent additions to or deviations from this pattern must also be acknowledged. Even if someone eats this “traditional” way most of the time, they may also be consuming sugary snack foods, sugar-sweetened beverages, and fast food.

In summary, the overall eating pattern in the DR appears to consist of an abundance of starches, such as rice and root vegetables, beans, and some animal-source foods, while it is generally lacking in a variety of fruits and vegetables. Furthermore, with the recent shift in dietary pattern
corresponding to the nutrition transition, children are likely consuming many energy-dense and sugary snacks on a regular basis. These assumptions are confirmed by the dietary data for children under 2 outlined in the *Nutrient-Rich Foods* section. Therefore, although not entirely devoid of beneficial nutrients, it is readily apparent that there are certain aspects of the dietary pattern that contribute to the prevalence of malnutrition in Dominican children under 5.

*Feeding & Caregiving Practices*

Feeding and caregiving practices, most often the role of the mother or other female relative in the DR, are very much informed by the availability of various human, economical, and organizational resources that have already been discussed. Certain feeding and caregiving practices were also already addressed in this paper. For instance, the section on *Nutrient-Rich Foods* outlined types of foods that are given to a young child and the *Breastfeeding* section discussed common breastfeeding practices in the DR. Statistics regarding caregiving practices, as they relate to the knowledge for treatment of diarrhea, were described in the *Infectious Disease Burden* section. Finally, the *Religious & Health Beliefs* section detailed some of the more non-traditional health beliefs held by Dominican families that impact caregiving, such as seeking out a healer or providing amulets to children for protection. To finish off this discussion, then, this section will start with an overview of the complementary feeding practices in the DR and the beliefs that inform those practices. It will finish with a brief analysis of certain cultural expectations that inform childrearing practices and how these relate to child nutritional status.

Complementary feeding, or the introduction of food and drinks other than breast milk, begins early on in the DR. The DR-DG recommend breast milk between 0-6 months, after which point solid foods from the *pilón* should be slowly incorporated (Fuster, 2016, p. 611). However, in the DR, 11.8% of mothers reported providing breast milk and complementary foods when their child was 2-3 months old. This percent increased to 22.6% for children 4-5 months old and peaked at 41.8% for children 6-8 months old (CESDEM & ICF International, 2014, p. 180). This number likely decreases after 6-8 months not because children are receiving less complementary foods, but because they are no longer receiving breast milk and complementary foods. Next, 82% of mothers reported introducing solid, semi-solid, or soft foods to children aged 6-8 months (CESDEM & ICF International, 2014, p. 181). Although this last statistic represents appropriate
timing, it definitely is concerning that complementary foods are being introduced as early as 2-3 months.

The qualitative descriptive study by Babington (2006) provides information on cultural beliefs pertaining to complementary feeding. As a reminder, these women were relatively poor and uneducated, residing in a rural region in the DR, so their viewpoints may not pertain to all Dominican mothers. Nevertheless, what they described provides valuable insight. The respondents reported that giving 6-month-olds weak tea or the water that beans are cooked in using a bottle that had been cleaned in hot water, but not sterilized. They then stated that if there was enough money to purchase cereal, they would provide it to infants around 5-6 months. Otherwise, it was typical to feed infants rice that has been mashed with bean juice. Next, they would introduce bananas mixed together with milk and subsequently watermelon and mangoes. These women believed that meat is a “greasy” food and also that children should not eat greasy or fatty foods until they are at least 3 years old. Foods that they would provide included vegetables like yucca and eggplant. If cake was served at a party, they would give the child a piece if they were around 2-4 years old (p. 156). The study then posited that once a child turns three, they could typically be found eating the same diet as the other members of their family. This dietary pattern, previously described in the Eating Routine section, might consist of hot cereal for breakfast; la comida with rice, beans, and stewed vegetables, with meat fried in cooking oil two to three times a week; and finally salty cheese, fruit, or tea for dinner. Children less than ten may have one glass of milk per day (Babington, 2006, p. 156).

Some of the insight gained from these mothers includes a better understanding of why young children aren’t eating many animal-source foods: if the cultural view is that this food is greasy, and children less than three shouldn’t consume greasy foods, this would explain why the 2013 DHS found that less than half of children under 2 were consuming meat, poultry, and fish (CESDEM & ICF International, 2014, p. 183). Furthermore, sweets are introduced at a young age, although this is not necessarily unique to the DR. Next, if the first foods that are being introduced are rice with bean juice, these children may not be receiving enough iron and other micronutrients at a critical point during their development, especially when considering that the 2013 DHS found that only a quarter of children under 2 no longer being breastfed were
consuming fortified infant cereals (CESDEM & ICF International, 2014, p. 183). Finally, if these are the general complementary feeding practices of mothers in the DR, much work remains to be done to inform mothers as to which foods a child needs for optimum growth and development.

Similar to feeding practices, caregiving customs in the DR are shaped considerably by cultural beliefs. A paper by Vazquez (2005) on Dominican Families outlines many of these cultural influences. First, the concept of simpatia depicts the expectation for a child to conform, have good manners, and display common courtesy. This may encompass, “expecting a child, particularly a girl, not to assert herself, or a boy not to defend himself against abusive or disrespectful adults in the family or in the outside world” (p. 223). In line with this is the belief of Dominican parents that children should obey advice without requiring much explanation or asking questions. Different expectations are normally placed on male versus female children as more traditional Dominican values define specific gender roles. Furthermore, parents tend to be more protective of their children, not encouraging independence as is often seen in the United States (Vazquez, 2005). These data demonstrate how important caregiving and feeding practices are in determining the nutritional status of a child. If children are expected to conform to the customs of their household, and independence is discouraged, then children are at the mercy of their parents to provide them with the type of food and care necessary to develop into healthy, well-nourished individuals. Interventions should therefore be aimed at providing education to the parents, particularly the mothers, on beneficial caregiving practices. That way, even if these culturally-ingrained values cannot be changed, at least what is being taught to and expected of children will serve to encourage healthy growth and development.

**Interventions**

Analyzing and summarizing all of the ongoing nutrition-related programs and interventions in the DR is beyond the scope of this paper. This is in part because there are a multitude of national and international agencies responsible for implementing policies and programs in the DR, making it especially difficult to track down all existing interventions. Furthermore, it is likely that not all interventions are monitored, evaluated, and updated in the literature on a regular basis; in fact, certain NGOs may not even publish the work encompassed by their programs, making this information hard to obtain. Therefore, this paper will limit its analysis to the national
policies and programs captured by the WHO’s Global Database on the Implementation of Nutrition Action (GINA) (WHO, 2016c). GINA is a digital platform used to share standardized information about what commitments have been made globally towards improving nutrition. GINA has two types of data, policy and action. The former tracks any policy, strategy, action plan, or legislation in a country that helps to promote good nutrition, including both nutrition-specific documents as well as those that are more broad but still nutritionally-relevant. The latter monitors what actions have been taken, through programs and interventions, to improve the nutritional status of the population (WHO, 2016c).

Table 2 outlines the relevant nutrition policies currently in place in the DR, drawing from GINA policy data. Following the table there will be a brief analysis of one of the more pertinent laws, as this law helps to depict which interventions are currently being prioritized on a national level.

Table 2: Dominican Republic Nutrition-Related Policies

<table>
<thead>
<tr>
<th>Policy</th>
<th>Start Date – End Date</th>
<th>Nutrition-Related Policy Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Operating Plan</td>
<td>2014 – N/A</td>
<td>Food safety, Food security, Agriculture</td>
</tr>
<tr>
<td>Resolution No. 000022 – Instructs how to Implement the Food-Based Dietary Guidelines in the Dominican Republic</td>
<td>2012 – N/A</td>
<td>Food-based dietary guidelines</td>
</tr>
<tr>
<td>United Nations Development Assistance Framework</td>
<td>2011 – 2012</td>
<td>Stunting in children 0-5 years, Breastfeeding, Overweight and obesity in school-age children and adolescents, Diet-related NCDs, Growth monitoring and promotion, Nutrition counseling on healthy diets, Micronutrients, HIV/AIDS and nutrition, Food security, Agriculture, Family planning, Vaccination, Vulnerable groups, Right to health</td>
</tr>
<tr>
<td>Constitution of the Dominican Republic</td>
<td>2010 – N/A</td>
<td>Food security, Water resources, Protection of minors, Right to health, Right to education, Right to physical education</td>
</tr>
<tr>
<td>Decree No. 243-08, by which the Council for Food Security of the Dominican Republic was created</td>
<td>2008 – N/A</td>
<td>Food security, Agriculture</td>
</tr>
</tbody>
</table>
The most recent, most nutritionally-relevant policy captured by GINA is the *National Nutrition Strategic Plan 2013-2016* (Ministerio de Salud Pública, Viceminstro de Salud Colectiva, & Dirección de Nutrición, 2013). This document, released by the Nutrition Department of the Dominican Ministry of Public Health, outlines the organizational structure of nutrition management within the Dominican government, which programs are to be developed by this national plan, and a framework for the specific tasks and activities required to implement each program. The priority areas encompassed by the programs within this strategic plan include: food and nutrition education, hospital food and nutrition, nutrition and food security in local development processes, nutrition in emergencies, the Codex Alimentarius, nutrition monitoring and surveillance, nutritional research, micronutrient supplementation, and micronutrient food fortification (Ministerio de Salud Pública et al., 2013).

As noted previously, it is important to acknowledge the specific programs outlined by the *National Nutrition Strategic Plan* because they reveal the most recent nutrition-related national priorities in the DR. However, it is difficult to determine how well these programs were implemented because GINA does not have any action data for the DR. This hinders further analysis of what actions have taken place as a result of various policies described by Table 2. Furthermore, it is important to note that the information that is available from GINA, although helpful and quite likely the most comprehensive listing of all nutrition-related national policies in the DR, is arguably incomplete. There is no mention of the Zero-Tolerance strategy or the Ten Year National Health Plan 2006-2015, both of which have nutritional dimensions and were
described in the section on Healthcare System & Reform. These shortcomings in data collection and reporting point to some of the most central issues faced by the DR in its attempts to combat child malnutrition. The discussion of these issues and their consequences will be the focus of the following section.

**Implications for Policy**

The DR has quite obviously made improving the overall health of its population and the nutritional status of vulnerable groups a top priority. This is evidenced by the recent health reform laws and programs outlined by nutritionally-relevant policies. However, the task at hand is far from simple, as the dual-burden of disease in the DR means that malnutrition takes several different forms. Furthermore, the many determinants of malnutrition, including urbanization and the nutrition transition, income inequalities, educational attainment, racism, religious beliefs, poor sanitation, dietary patterns, place of residence, breastfeeding duration, and proper complementary feeding practices, add another layer of complexity when it comes to finding a solution. As such, the intricate nature of the problem demands a multidimensional response. The DR, though, seems to be fully aware of the range of issues they face, both in what determinants need to be addressed and which specific aspects of malnutrition need to be prioritized. One must look no further than the country’s first dietary guidelines, which focus on over- and undernutrition, reduction of poverty, improvement of food security, and lactation and complementary feeding, to see evidence of this (Fuster, 2016). As additional proof, the policy topics covered by the laws in Table 2 address all three forms of malnutrition in children in the DR: underweight, overweight, and micronutrient deficiencies. And, while the GINA policy topics don’t necessarily encompass all of the determinants outlined in this paper, they either directly or indirectly address a sizeable proportion of them. What is the disconnect, then? In other words, why, if the Dominican government is seemingly making all of the right efforts, does the country still have widespread poverty, malnutrition, and significant health disparities? This discrepancy may largely stem from the low quality and enforcement of existing programs in the DR, fueled further by poor monitoring of the implementation of nutrition-related policies and programs.
In the process of collecting and analyzing data for this paper, it became readily apparent that many well-intentioned Dominican programs fall short in the areas of execution and quality control. For example, the iodination of salt, briefly mentioned in the section on Food Security – Availability, Economic Access, & Use of Food, depicts the country’s challenges in implementing new laws. As mentioned previously, salt iodination was mandated in 1994 and soon thereafter non-iodinated salt was supposedly removed from the food supply (Fuster, 2016, p. 613; Malasanos, et al., 2007, p. 214). Yet, only 11% of the population was consuming sufficiently iodinated salt in 2007 and only 27% of Dominican households used iodized salt in their homes according to a recent WHO report (WHO, 2013, p. 13; WHO, 2016d). In fact, Malasanos et al. (2007) concluded that, “the lack of monitoring and enforcement has apparently hindered the success of this program” (p. 215). This shows that, in this case, the proper intentions by the Dominican government did not translate into an effective law.

Two additional examples of poor quality come from the areas of health and education reform. The section on Access to & Use of Health Services describes increased enrollment in health insurance, a growing healthcare workforce, and adequate numbers of hospitals and medical care facilities in the aftermath of the Dominican health reform laws. However, PAHO (2012) reports that, despite these developments, there were no significant improvements in basic health indicators over the same time period, reflecting low or no progress in quality of care (p. 281). Next, education appeared time and time again in this analysis, namely in the Education, Access to & Use of Health Services, Feeding & Caregiving Resources, and Infectious Disease Burden sections, revealing itself to be one of the most important causes of disparities in child nutritional status in the DR. Similar to the mismatch between intention and outcomes for nutrition-related programs, the recent education reforms, reflected by increased GDP spending and the transition from a half-day to a full-day school schedule, have not necessarily led to improved educational quality (CIA 2016; Manning, 2014; UNDP, 2015). A recent report describes a student-teacher ratio of 78:1 in the majority of public schools. As a solution, the DR is planning to build thousands of new classrooms, even while there aren’t enough teachers to fill the existing ones (Manning, 2014). And, although the DR has a lofty goal of transitioning 80% of its schools to the full-day schedule by the end of 2016, it seems that this change is happening without a concurrent investment in a new, longer curriculum and teacher training. Students can often be found
sleeping in the schools that have extended hours because the teachers don’t yet know how to fill the additional time (Manning, 2014). This is a great example of what happens when a law is enacted quickly without the proper infrastructure to support it.

Iodination ordinances, healthcare reform, and education reform are just three examples of a much more pervasive issue in the DR. That is, the tendency of the Dominican government to implement policies without the proper resources and systems in place to support those policies, which results in poor quality and less than ideal outcomes. Compounding this issue is the DR’s failure to adequately track and evaluate how well its policies are carried out. A perfect illustration of this is the complete lack of action data for the DR in GINA (WHO, 2016c). Even if GINA captures the majority of nutrition-related policies in the DR, without knowing what steps were taken to execute these policies, no analysis can occur of what went well and what went poorly during implementation. Another example comes from the 2015 Nutrition Country Profile report by IFPRI. As of 2014, there was no data for the “Availability and Stage of Implementation of Guidelines/Protocols/Standards for the Management of NCDs,” namely diabetes and hypertension. There was also no information for the “Scaling Up Nutrition (SUN) Country Institutional Transformations” (IFPRI, 2015, p. 2). Finally, data was missing for the following interventions: geographic coverage of severe acute malnutrition, full coverage of vitamin A supplementation, and the consumption of iodized salt (IFPRI, 2015, p. 2). The DR does a decent job in documenting child nutritional status and other health indicators. However, without the proper monitoring and evaluating of the programs aimed at improving those indicators, the DR can only hope to get so far in advancing the health of its most vulnerable populations.

In conclusion, the DR’s primary focus moving forward should be on quality improvement rather than the passing of new policies. Fortunately, the DR has already made some attempts to shift its focus towards quality. For instance, the Quality Assurance branch of the Ministry of Public Health was established as recently as 2008 (PAHO, 2012, p. 280). Additionally, the National Nutrition Strategic Plan 2013-2016 outlines the need to establish a monitoring and evaluation system for nutrition programs and calls for an analysis of the impact of national food and nutrition programs (Ministerio de Salud Pública et al., 2013). It is quite possible that there simply has not been enough time since the inception of these changes since they both took place within
the last decade, the latter within the last three years. Regardless, these are just the first of many necessary transformations that will need to occur in the areas of quality assurance, monitoring, and evaluation in order for the DR to see a significantly reduced burden of malnutrition in children under 5.
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