

NUTRITIONAL ANALYSIS OF THOMAZEAU, HAITI

An Undergraduate Research Scholars Thesis

By

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ABSTRACT

Nutritional Analysis of Thomazeau, Haiti. (May 2013)

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The long-term health of populations who have suffered through natural or man-made disaster - such as earthquakes, floods, famines, and warfare – is at risk. Yet, once first responders have come and gone, the misconception that order and health has been restored may exist, even though long-term assessment has not taken place. Similarly, nutrition supplement programs, whether short-term or long-term, have lacked the proper process and outcome evaluations needed to understand their effectiveness. Using physical growth and nutrition data gathered by a mobile medical team since the 2010 earthquake in Haiti, an assessment of the current nutrition status of the population of Thomazeau, Haiti, is being conducted. The purpose of this project is to determine if the growth and nutrition status of this population is the same or worse than it was before the 2010 earthquake. De-identified data of medical records of 415 individuals aged 0-18 years (Males: n=180; Females: n=235), including height, weight, age, and gender were analyzed to determine BMI, HFA, WFA, and nutrition status. The results of these analyses demonstrated that a vast majority were underweight (Males: n=151, 83.9%; Females: n=284, 78.3%), suggesting that the nutrition status of this population in Haiti has not improved at all since the earthquake in January of 2010 and, in fact, may be

worse. Continued research in this area is critical in order to fully understand the impact of first-response and nutrition supplement programs in Haiti and other developing countries that face post-disaster challenges. Improvements in birth records would enhance the reliability and validity of future nutrition status analyses.

DEDICATION

This research is dedicated to the wonderful people of Haiti who have proven themselves through the many trials and hardships that they have suffered. Your perseverance is an example to us all.

ACKNOWLEDGMENTS

I would like to thank the doctors, dentists, nurses, assistants, and volunteers from Live Beyond/Mobile Medical Disaster Relief and the countless hours they have spent working in Haiti to improve the lives of the people they love. Finally, I would like to Dr. Christine Tisone and her dedication to overseeing this project.

NOMENCLATURE

BMI	Body Mass Index
HFA	Height for Age
MMDR	Mobile Medical Disaster Relief
WFA	Weight for Age

CHAPTER I

INTRODUCTION

The collection of height and weight measurements, which can be used to calculate Body Mass Index (BMI), height-for-age (HFA), and weight-for-age (WFA), is a simple, low-cost, and effective technique that does not require many resources. The assessment of such data from populations in developing countries leads to identification of nutrition status among adults and potential growth failure among children, and is helpful for monitoring growth changes in a population over time (Frisancho, 1990). Mobile medical units, working to provide relief after natural disaster, may collect such data as part of their normal intake and screening process that can serve for triage-management and be useful in assessing the overall nutrition status of that population. Long-term follow-up does not often occur, however, after disaster-relief operations are carried out. There is concern about long-term health of populations who have suffered through natural or man-made disaster, such as earthquakes, floods, famine, and war-fare (Basch, 1999). Yet, once first responders have come and gone, the misconception that order (and health) has been restored, might resonate through the media and across the world, even though long-term follow-up assessment has not taken place. As time goes by, however, the challenges of effectively utilizing relief aid become clear (Benjamin, 2011; CEPR, 2013; UN OSE, 2012; USAID, 2012). Mobile Medical Disaster Relief (MMDR), a 501(c)(3) organization, took their mobile medical units to Haiti within 48 hours of the earthquake that occurred January, 2010, and have been there ever since. During routine intake and screening of patients in their medical clinics in Thomazeau, Haiti, and surrounding areas, they collect height, weight, age, and sex of each patient, along with information about

dietary habits. They plan to continue serving these populations and collecting the same information over the upcoming academic year. I have been granted access to this database, for the purpose of analyzing the growth and nutritional data. The main objective of this project is to assess the current growth and nutrition status of the population of Thomazeau, Haiti, two years after the earthquake, and compare it to other published growth data on Haitian populations. I hypothesize that growth and nutrition status in Haiti is the same or worse than it was before the 2010 earthquake, despite the billions of dollars of disaster relief funds that have been sent there.

CHAPTER II

METHODS

Approximately 1,200 de-identified medical records were provided for this study, per an agreement with Mobile Medical Disaster Relief (MMDR). The medical records included data that had been collected by MMDR during the latter half of 2012 in Thomazeau, Haiti, and surrounding areas during medical examinations conducted by mobile medical units (see Figure 1). The specific data that were analyzed were: Age, Gender, Height, and Weight. Records with missing or incomplete data were excluded from the analyses, resulting in the analysis of medical records from 415 individuals. Microsoft Excel 2010 was used to organize and manage the data.

Figure 1. Map of Haiti; Red star shows location of Thomazeau.



With the height, weight, and age data we calculated Body Mass Index (BMI), Height-for-Age (HFA) and Weight-for-Age (WFA) as described in Frisancho (1990). Ultimately, however, we only used the BMI indices to categorize nutrition status. The reason for this

is that there is question about the accuracy of self-reported ages among this population, where birth certificates are not available and birthdays are not commonly celebrated. Consequently, calculations of HFA and WFA would not be likely to produce valid results. Since BMI relies only on height and weight data, we believe this is the most effective way to assess nutrition status using this particular data set. The English BMI formula was utilized, as follows: $BMI = [weight \text{ in pounds} / (height \text{ in inches} \times height \text{ in inches})] \times 703$. The BMI categories that were utilized to categorize each subject's nutrition status are shown in Table 1.

Table 1. Nutrition classifications based on BMI.

Underweight	<18.5
Normal	18.5-24.9
Overweight	>25.0

This research has been reviewed and approved as Protocol #2012-0545 by the Human Subject Protection program in the Office of Research Compliance & Biosafety of Texas A&M University.

CHAPTER III

RESULTS

As can be seen in Table 2, we found that the vast majority of the participants are underweight. All of the children in this study ages range from 0-18 years. 235 females were examined in this study, and we found that 184, or 78.3%, of the females are underweight, 43, or 18.3%, are considered normal, and 8, or 3.4%, are to be considered overweight. Of the 180 males examined, we found that 151, or 83.9%, are underweight, 21, or 11.7%, are normal, and 8, or 4.4% are overweight.

Table 2. Results: Nutrition Status Category Based on BMI

Body Mass Index: BMI	Females: Age 0-18	Males: Age 0-18
Underweight: <18.5	78.3% (n=184)	83.9% (n=151)
Normal: 18.5-24.9	18.3 (n=43)	11.7% (n=21)
Overweight: >25.0	3.4% (n=8)	4.4% (n=8)

Based on available BMI data from Haiti prior to the earthquake, our results suggest that this particular sample of the population is suffering from a higher degree of underweight status than has been recorded in other parts of the country, or from country-wide samples. UNICEF, for example, reports 22% of children were suffering from extreme or moderate underweight during the time period of 2006-2010, which is considerably less than the roughly 80% of our sample that were categorized as underweight (UNICEF, 2013).

There are many factors that could prevent the generalizability of these results to the general population of Haiti, but there are compelling reasons to believe that the majority of the Haitian population suffers from a similar state of undernourishment. The first

concern about generalizability might be that our data came from medical records of those being treated by medical mobile units, which would suggest that a characteristic of the sample is that they are ill and in need of medical treatment and, therefore, worse off than the general population. But, since MMDR also provides food supplementations to anyone they treat, it is known that many people seek a consult with them for that reason alone. Additionally, the undernourishment of the Haitian population in both rural and urban areas has been well documented, both before and after the earthquake, and there is compelling evidence that conditions are similar throughout the entire country (Bassett, 2010; Blossner, 2005). Therefore, we feel comfortable in speculating that similar results would be found in other rural populations of Haiti, and that further investigation is warranted to confirm this. A major limitation of this study is that birth date data were not available. Interpretation of BMI for children is more effective when birth date is known, yet in this study we relied on self-reported (or caretaker-reported) age, as birthdates are not known among this population. It should also be noted that BMI does not account for body composition (fat mass vs. lean mass, or pregnancy), so the interpretation of results is limited by this factor.

CHAPTER IV

CONCLUSIONS

After analyzing the data set, we can conclude that the individuals in this sample, age 18 and below, suffer from malnutrition and are moderately to severely underweight.

Further, since the conditions in which this sample lives are similar to most of Haiti's population, it is likely that a great deal of underweight status is prevalent throughout the country. Furthermore, our results suggest that the nutrition status of the children and adolescents in Haiti is worse now than it was before the Earthquake of 2010, despite two years of disaster relief assistance. Further research is needed in order to better understand the exact nutrition situation of this population, with the hope of improving it in the future. Improvements in birth records would enhance the reliability and validity of future nutrition status analyses.

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