Semilla Nueva

A cross-sectional study examining the need for nutrition intervention and the presence of malnutrition in a community in rural Guatemala.

Introduction

Guatemala is currently facing a chronic malnutrition problem. Consequences of economic and financial situations along with global climate change are some contributors to the food crisis in the country.

This problem is especially prevelant in rural areas of Guatemala, where the food and nutrition situation has worsened since 2007. Hunger in Guatemala is heavily related to access to food and according the the World Food Programme, rural families acquire 80% of their food on the market and 20% comes from their own production (1). This is affecting the health of children within the nation on a large level. The national child mortality rate stands at 34 per thousand births with more deaths in rural areas thatn urban areas. A stunning 83% percent of these deaths occur in children whose level of malnutrition is considered moderate or mild (2).

The main nutritional problem in Guatemala is chronic malnutrition (height for age). This affects 49.3% of children under 5 years old, a fifth of which (21.1%) are categorized as suffering from severe chronic malnutrition. This puts Guatemala with the third highest rate of chronic malnutrtion in the world (3). Malnutrition statistics vary widely between urban and rural areas. Chronic malnutrition affects 80% of the indigenous population mostly due to extreme poverty and inadequate nutrition practices (4).

Vitamin and mineral deficiencies also impact the nutritional status of children in Guatemala. Of particular concern is iron, vitamin A, and iodine. About 38% of children under five and 22% of pregnant women suffer from iron deficiency anemia. Preschool aged children have shown to be deficient in vitamin A and an estimated 67,000 children annually are born with mental impairments due to iodine deficiency (5). An inadequate diet during the first years of life compromises physical and intellectual development, resuling in low educational achievement and later in low labor productivity(3).

A more recent problem alongside chronic nutrition is a rapid increase in obesity. Trends are showing low-birth weight infants and stunted children to be at greater risk of obesity and diseases such as diabetes and heart disease than children who are well-nourished early in life. Statistics show 67% of Guatemalans aged 15 and above to be overweight, 29% of which are obese. Diets high in refined carbohydrates, saturated fats and sugars are seen as major contributors to the increase in weight and chronic disease (3).

When looking at nutrition practices in rural Guatemala, the foods cultivated in the communities consists mostly of black beans, corn tortillas, rice, coffee, eggs, potatoes, and sugar (4). This limited variety heavily contributes to the high rates of malnutrition in children. Protein and micronutrients appear to be inadquate in quantity and quality.

A study performed by the Benson Institute assessed the nutritional status in rural Guatemala. Height for age and weight for age was used in order to observe growth in children from birth to 7 years. The study reported that at birth the median length of Guatemalan children is at the 16th percentile. By six months, the children were on average less than the 5th percentile, about 5 cm shorter than average. By three years the difference in height increased to 10 cm below the average. Height for age was used in the study in order to determine the nutritional history of a child (6). Malnutrition in early childhood leads to growth retardation. Children who fall below the standard for height for age are considered to be "stunted." Based on these standards, the data collected from the study show that the effects of malnutrition severely effect the health of the children. About 85% of the children showed stunting which effects their motor and cognitive abilities as well as their susceptibility to illness (4). Weight for age was also used in the study to determine which children are "underweight" (those who fall below the standard). Underweight children have two to eight times more of a chance of mortality within a year than those whose weight meets standards for their age(3).

The study also examined the eating habits of families in the communities, revealing that the diets consist primarily of corn and beans with occasional complementary foods depending on the season and their availability in the market. In addition, they also consume processed foods that are available from small stands in the communities (6).

When looking at the study performed by the Benson Institute along with common trends in the nutrition practices in rural Guatemala there is an apparent need for nutritional intervention. It is shown that nutrition and illness act synergistically, effecting the mental and physical well being of this population.

	Malnutrition (height/age)	Malnutrition(weight/age)
Esquintla	27.2 %	13.3 %
Retalhuleu	29.9 %	16.3 %
Suchitepequez	35.4 %	18.4 %

Table 1 shows the malnutrition rates (%) in three coastal regions of rural Guatemala (7)

Objectives

The purpose of this study performed by Semilla Nueva was to assess the nutritional status in small rural communities of Guatemala in order to determine the need for nutritional intervention.

Height and weight for age was used as a measure to observe the growth patterns in children 2 to 12 years of age. Typical eating habits were also observed in order to recognize nutritional inadequacy in the diets of famliies. While the causes of malnutrition vary, Semilla Nueva has attempted to address those that would best allow for a broad understanding of the nutritional status of families in rural Guatemala. The measures chosen also allow for preventative measures to be introduced to the communities in order to improve the situation.

Methods

In order to assess the nutritional status of children in a Guatemalan community, physical examination involving the measurement of height and weight of children ages 2-12 was performed.

This study took place in a rural village in coastal Guatemala called Willywood. An announcement was made for every family in the village to come to the community center, where the measuring took place. Based on discussion with the village leader, we believe that mostly every child in the village attended the weighing/measuring.

The height and weight of each child in the sample group was taken using a standing scale and a tape measure. The age and measurements of each child were recorded. During this visit, Semilla Nueva personnel stayed with a family in the community and were able to observe eating habits as well as interview the mothers about dietary habits. Typical breakfast, lunch and dinner was observed.

After collecting data, height for age and weight for age were plotted on growth charts from the CDC. Using age, weight, and height data, the team was able to obtain a broad understanding of the children's current and historical nutritional state.

A young monther and her son walk through their corn field in the community of Nuevos Bracitos.

Results

Figure 1: % Height for Age

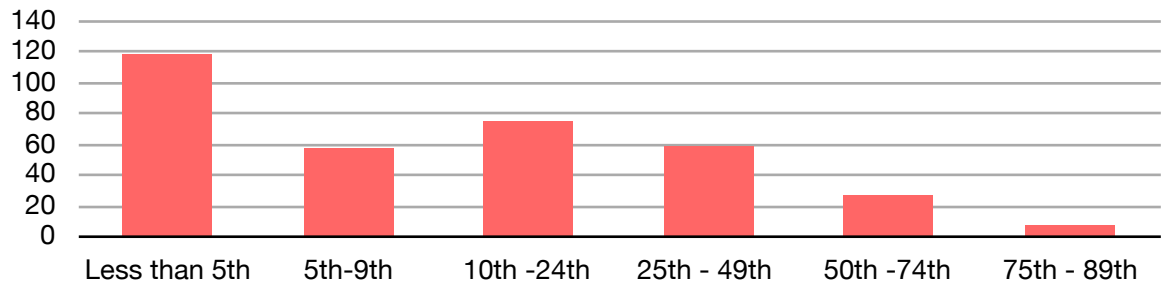

Figure 1 shows how many children fall into each percentile category after plotting their height for age on CDC growth charts.

Figure 2: % Weight for Age

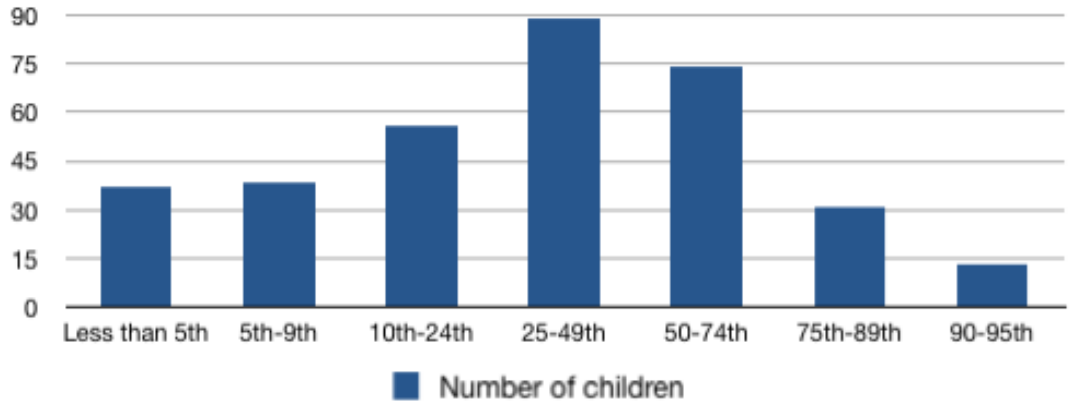

Figure 2 shows how many children fall into each percentile category after plotting their weight for age on CDC growth charts.

Figure 3: Weight for Age

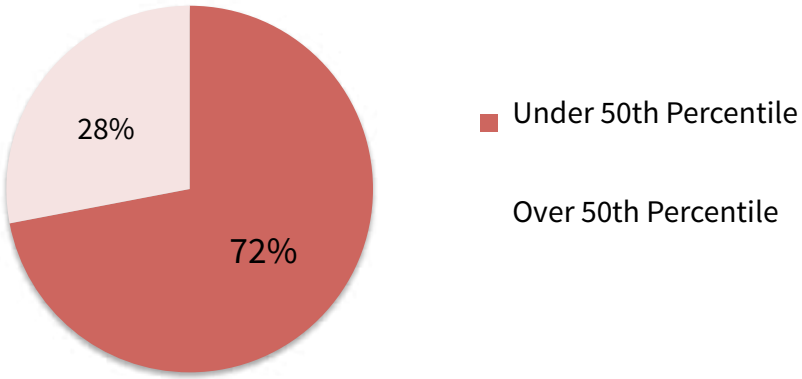

Figure 3 shows how many of the children's weight for age are under the 50th percentile as compared to those over the 50th percentile

FIgure 4: Percentage of Children Below the 5th Percentile for Height and Weight

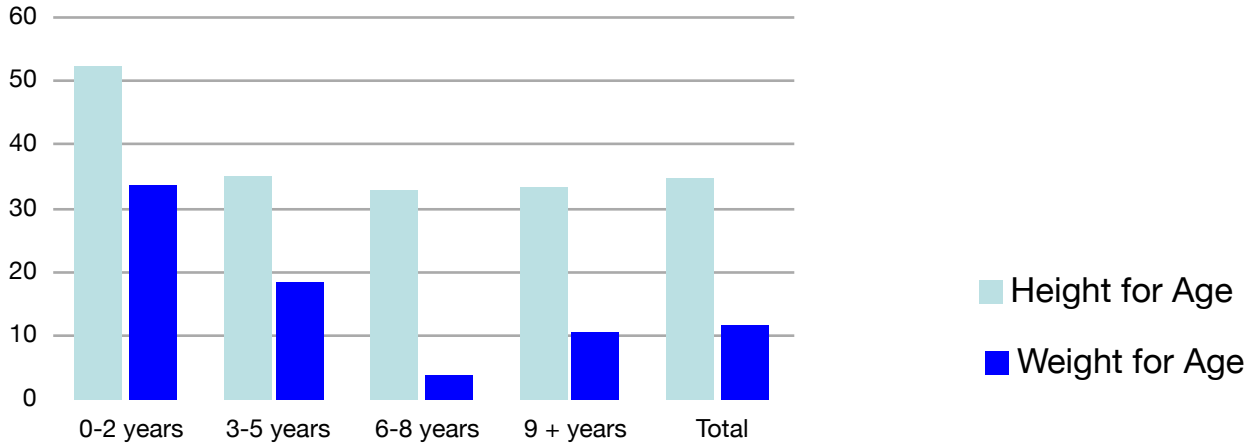

Figure 4 shows the percentage of children whose height and weight for age falls under the 5th percentile

Discussion

The height and weight of each child were examined on CDC growth charts. The majority of the children, 60 girls and 57 boys, fall under the 5th percentile for height for age(Figure 1). This puts them in the "high risk" category. Very few children (31) are above the 50th percentile, which is considered to be the standard for height for age. The rest of the children fall between the 5th and 49th percentile (Figure 1).

When examining weight for age, the majority of children fall between the 25th and 49th percentile. A large amount (74) fall between the 50th and 74th percentile as well (Figure 2).

A lesser count of 37 children fall under the 5th percentile for weight for age, but this number still represents a good percentage of the sample.

Woman leader, Refugio, partakes in a women's cooking group in the community of Nuevos

An overwhelming majority (90.2%) of the children in the sample fall below the standard for height for age (Figure 3). A smaller percentage but still representing the majority (72%) of the children fell below the standard for weight for age (Figure 4).

When looking at the children whose height and weight fell below the 5th percentile separated by age, most of the children are in the 0-2 year age category (Figure 5) . The percentage of children falling below the 5th percentile remains fairly consistent among all other age groups. Height for age falls under the 5th percentile more often than weight for age consistently throughout all age groups.

The majority of the children examined in this study appear to have stunted growth. This is most commonly due to undernourishment early in life. The diets observed in the communities are representative of typical rural Guatemalan eating habits. While it is hard to classify the specific type of manutrition in the sample, the stunted growth can likely be attributed to poor quality of diet and nutrition status.

Conclusion

Nutrition intervention has been introduced in regions of Guatemala with a fair amount of success in improving cognitive and social development. Community-based programs have shown to accelerate nutritional improvements the fastest. Programs can be very effective while costing only $2-10 per person per year. Addressing undernutrition is cost effective with average costs as low as US$0.05–8.46 per person annually and returns on investment are as high as 6–30 times the costs.

The study performed by Semilla Nueva supports the need for nutrition intervention in the communities observed in rural Guatemala. Overall, the majority of children measured in the community showed stunted growth, revealing history of malnutrition from birth. Based on research of typical Guatemalan diets as well as observations of eating habits in the community, the need for more variety in the diet exists. Other forms of protein besides black beans should be introduced to this population. Animal sources of protein as well as various legumes, nuts, and seeds can improve their nutrition state. The addition of various vegetables and grain sources will also incorporate necessary micronutrients into the diets.

Semilla Nueva will start a community-based program introducing a legume, called pigeon pea, also known as gaundul, in order to add variety to the diets of the families. Along with the introduction of gaundul, the Semillla Nueva team will share recipes of how to prepare the pea with various vegetables. This will allow for a large amount of micronutrients to be included in the diets within the community.

A young girl smiles from the community of Los Encuentros.

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