

## Wimpfheimer-Guggenheim Essays Competition

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*Winning essay from 2013*

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### **Mobile Health Education Kits in Rural Nicaragua**

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How do you teach nutrition to a population that does not have a word for nutrition in their language? How do you provide resources to the health care professionals when they are not able to read? How do you get materials to communities that are only accessible by boat? These were the challenges we faced when [AMC](#) and Lifetime Nutrition decided to provide basic nutrition education to midwives and teachers in the very rural river communities of eastern Nicaragua. The Nicaraguan non-profit organization AMC has been promoting health in this region for over 20 years. Due to the region's inaccessibility, very few resources from other non-profits or even from the federal government reach this region. We decided to create mobile health education kits to provide tools for teaching basic health concepts to this needy population. We were supported by a small I-CATCH grant from the [American Academy of Pediatrics](#) which paid for AMC staff time and transportation expenses within the region.

The region along the Prinzapolka River in eastern Nicaragua was selected because of a perceived need by AMC for improvements the public health through better nutrition, hygiene, dental care, and personal and community sanitation. These communities are inhabited by the Miskitu indigenous people, who speak primarily the Miskitu language. [Save the Children](#) has just refurbished schools in 5 communities, making access to teachers and school children more practical than in communities where schools may not be functional. A nutrition survey conducted by [Church World Services](#) in 2010 showed a high incidence of malnutrition in the region. Although hard data is not available, malaria and diarrheal diseases are still causing illness and there was a serious cholera outbreak only 20 years ago. There has been no preventative dental care there and medical care is provided by occasional Health department staff for vaccinations and medications.

Nutrition concerns revolve around a limited diet and poor sanitation with no clear understanding of either nutrition or sanitation issues by the residents. People live by subsistence farming and produce beans supplemented by corn, yucca, multiple types of cooking and eating bananas, some breadfruit, some wild fruit, a few tomatoes, avocados, mangoes and watermelon. There are almost no small scale vegetable farms and seeds are not available for planting desired vegetables such as: cabbage, squash, melon, tomatoes and peppers of various kinds. Interestingly, due to 350 years of influence from British and Caribbean culture, rice and

homemade wheat bread are staples. Although the wheat flour is enriched as in the US, the rice is Nicaraguan and does not indicate that it is enriched in any way. This is a concern in a diet where it is a nutritional staple often served three times a day. A typical meal consists of rice and beans and at least one other starchy food item such as bread or plantain. The school lunches consist of rice with a few beans, a big piece of white bread and a grain drink that may or may not have been enriched with soymilk from the government. A number of families have cows that can be milked once a day. Milk is drunk as a beverage or added to grain drinks according to a number of women. We were served oatmeal with milk as a drink. Soft cheeses are homemade and often served to accompany beans. Chicken, eggs, fish and wild animals provide protein to supplement that provided by beans.

In March, 2013, the nutritional needs of this population were addressed using The Mobile Health Education Kits. These were developed by Lifetime Nutrition in the US and based on information provided through email from field workers at AMC, as well as a 2000 anthropological study, [\*The Miskitu People of Awastara\*](#). They consisted of large plastic boxes filled with educational aids. Each had two felt boards, one with an empty plate divided into three portions on it. Dairy Council food models of available foods were supplemented with internet pictures of yucca, guayabana, coconut and other local foods. These were all coded for use by low literacy or illiterate midwives and teachers. Stickers were made to categorize foods into one of four categories: protein/building block foods, starchy/energy foods, fruits and vegetables/rainbow foods and junk/unhappy face foods. These were represented by a stack of building blocks, a child running, a rainbow with a happy face in it and a frowny face. Some additional stickers indicated iron by a finger with a drop of blood coming off it and calcium by a cute skeleton. A picture of an eye and some lungs helped to indicate vitamin A and a developing fetus sticker indicated folic acid. These stickers were put onto the back of each food model and the food models were then laminated so that they would survive a lot of handling in a humid and dirty environment. Comparison cards of key food group foods as well as sugar, soda and candy were available and the midwives kit also contained graphs of the best local sources for iron, protein, calcium, vitamin A, vitamin C and folic acid. All these were laminated for durability after adding Spanish names and photographs of the foods. Some visuals included plastic test tubes with "weak" and "strong" blood and some dried chicken leg bones, half of which had been treated with vinegar to make them rubbery, to demonstrate strong and weak bones. The teachers' kit contained two books to read in the classroom, one on the body and its different systems and another on cultivating vegetable soup. Both are in Spanish and thus can be used by the Spanish-speaking teachers and are appropriate for the bilingual schools as well as the general culture. Both kits contained a large laminated poster with vivid pictures of Hispanic food groups coded as above. Teachers also received a large poster of the body with many body parts named in Spanish and space for their names in Miskitu. Finally, each kit contained scripts, puppets, props and a curtain for performing one of four puppet shows. These can also be performed as a story using the felt puppets and props attached to the felt board, or read as a radio show or recounted as an oral story once learned. The stories taught key nutrition concepts: Rainbow foods make families feel well, food affects how good you feel and how well you function, pregnant women will have healthy babies if they eat the right foods, and sugar tastes good but

can do bad things to your teeth and body. Each kit has an instructional manual with eleven Big Ideas on Nutrition written in Spanish with space for translation into Miskitu.

Training consisted of using the above visual aides to introduce the participants to the Big Ideas:

1. The food you eat affects how healthy you are and how good you feel. Good food helps you grow and develop well. Good food and a good diet can help to prevent illness and disease.
2. Food contains things that help your body to function well. These things are called nutrients.
3. The three main functions of nutrients are: Fuel, building blocks, helpers and protectors (rainbow foods).
4. Foods vary in kinds and amounts of nutrients they contain. It is good to eat a variety of foods to get all the nutrients you need.
5. At different times of our lives our needs for nutrients change.
6. Growing children need to eat more often than other people to get the extra fuel and nutrients they need. Pregnant and nursing women also need to eat more often.
7. There are three main types of food we should be eating every meal to make a Healthy Plate: Building Block foods that contain protein, Fuel foods that contain starches/carbohydrates, Rainbow foods that contain helpers and protectors/vitamins & minerals
8. Junk foods do not contain many nutrients and may hurt your body. Eat them less often.
9. Some special nutrients that pregnant and nursing women and growing children need include: iron for blood and muscles, calcium for bones, vitamin A for healthy eyes and respiratory system, vitamin C for absorbing iron and fighting against disease, and folic acid for growth and the nervous system.

Although these concepts may seem elementary and universally understood in the US, they are novel in developing and minimally educated communities.

The kits will remain at the AMC field office in the region and be mobilized at least twice by the nurse to reinforce the Big Ideas and to support the teachers and midwives as they teach others. The kit will then be left at individual schools for 1-2 weeks in the care of the principals or teachers so that the contents can be used for more extensive projects with the kids. An example of a likely exercise would be to have kids use the food models and felt boards to classify foods by category, identifying junk foods as well. Then kids can do a coloring project with the themed coloring pages and work on performing the Superkid or Mr. Sugar Comes to Town puppet show for their parents and other students. The AMC nurse also has access to the radio station, the only electronic media available in the area. She will offer programs using the Big Ideas, read the stories or answer questions about nutrition. Two of the songs in the kits have already been translated into Miskitu and put to music by local teens, and will be played on the radio.

The kits proved to be very convenient for taking our nutrition trainings to the river communities. The kits first had to be flown on a 12 person commercial plane to the region, where they were transferred to truck for a three-hour bumpy ride on rough dirt roads to the AMC field office. There they were used for training the AMC nurse who will be in charge of the kits and further community trainings over the next year. Then the kits were loaded onto a panga, the name for the riverboats there, and taken to 6 river communities over the course of five days. At each community, the kits were carried by local boys, local men or by us to a school, church or the home of one of the midwives for trainings. Sometimes the boat had to go up or down river to pick up some of the midwives for training. Trainings often took place in a yard, with kids, chickens, puppies, pigs, and cows wandering past. Ultimately, the AMC staff, 17 teachers, 15 midwives, two national health service nurses and about 160 school children were trained or educated using the kits.

In the process of traveling to these communities, important information was gathered for modifying or supplementing the nutrition kits and for creating the education kits for the next two years of the grant. It was determined that individual midwives need to have their own plastic notebooks with some of the key visuals so that they can use them as they meet with pregnant women in their own communities. Sanitation issues to be addressed in the future include the drinking river water without sterilization and the subsequent diarrheal diseases. Gray water mud puddles create sanitation issues but can be converted into vegetable gardens to improve food choices and nutritional status. Photographs of positive and negative behaviors observed during this trip will be used for teaching tools in subsequent kits. Dental issues include a lack of understanding of the relationship between sugar and dental decay and the availability of lots of candies. Fortunately, although available, sodas are not widely consumed in these communities. However, sugar in coffee, Tang or in low protein grain beverages are offered in bottles to infants, with resultant concomitant dental and nutritional problems. The opportunity to be in a community for three years enables us to target learning materials most appropriately.

In addition to developing and implementing these kits, instructions for assembling them have been created with resource lists and instructional photographs of kit contents and implementation ideas. Within a week of returning, a request came through the American Academy of Pediatrics for help creating a nutrition education kit for a group going to work with a Mestizo population in Guatemala where similar nutritional issues have been identified. A flash drive with puppet patterns, graphics for food model coding, resource lists, songs and nutrient graphs, etc. was sent across country within days, enabling a health care team to easily create a similar but culturally adapted kit for themselves. Sharing concepts for nutrition and subsequent kits with other non-profit and health groups can help the international aid community to be more effective. To this end, information on the kits will be posted on the [Rotary International Health Fair](#) website, made available through the [American Academy of Pediatrics international division](#), and hopefully through Academy of Nutrition and Dietetics Foundation's website. The material is available to anyone who agrees not to charge for its use.

The concept of mobile health kits with simple, clear and basic health messages worked well in the rural river communities in Nicaragua and is adaptable for wherever remote health

educational resources are desired. Having some simple tools and guidance for health educational greatly empowers a community that has dedicated health and teaching staff but virtually no resources for teaching.