

**Mobile Pediatric Services in Remote Areas of  
Tonpheung, Huixay, and Pha-Udom Districts  
Bokeo Province, Lao PDR  
October, 2011**

**Prime Minister's Office  
National Science Council**

Pediatric services for the mobile clinic were made possible through the generous support of Lao Rehabilitation Foundation and Fred Hollows Foundation. Team members included Dr. Siobhan McNally from Massachusetts, USA, Dr. Chantana Chansouk from Bokeo Province, Laos and medical language interpreter, Souphaphone Phetsavnh.

Pediatric services included a wide range of direct medical and preventive health care interventions, and were delivered in concert with those of obstetric ultrasonography, dental, ophthalmologic, and internal medicine subspecialties.

Based on the more than 700 infants, children, and adolescents seen, the most prevalent pediatric concerns in the region included:

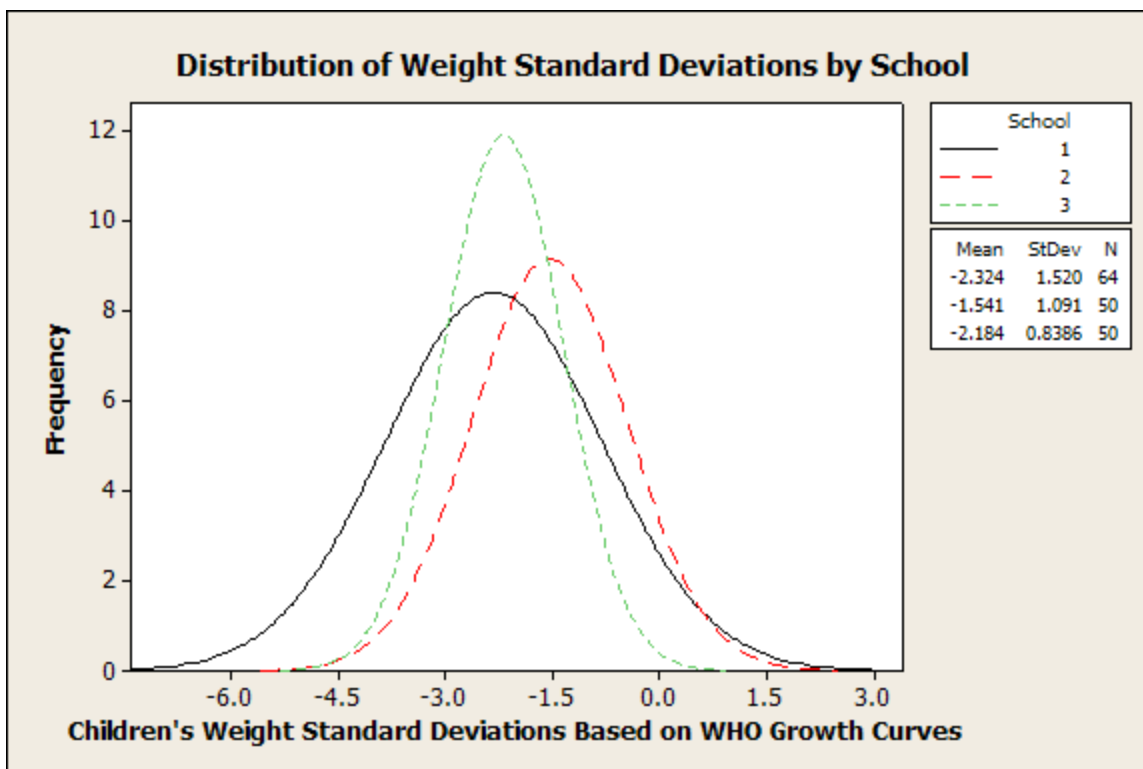
1. Infectious diseases: impetigo and other bacterial soft tissue infections, chronic suppurative otitis media with drainage, pneumonia (with additional concerns about possible tuberculosis), parasitic infections, and Dengue Fever
2. Anemias thought secondary to recurrent parasitic infections, nutrient deficiencies, Thalassemias, and/or Dengue Fever
3. Malnutrition and serious micronutrient deficiencies, including Beriberi
4. Severe dental caries, seen primarily in children who had access to candy and/or sweetened beverages.
5. Spastic and choreo-athetoid paresis thought secondary to Japanese Encephalitis or other types of meningitis/encephalitis.
6. Congenital anomalies including cardiac, cleft palate & lip, limb abnormalities, and Trisomy 21

In addition, a subpopulation of children from each of three elementary schools were measured for height and weight, and underwent brief eye and dental exams, and received fluoride varnish treatments (Total number = 190). Vision screening was done using Snellen chart. Dental exams were qualitative in nature and were graded from 1 to 4 based on the severity of caries, with 1 being normal to 4 being severe caries requiring one or more extractions.

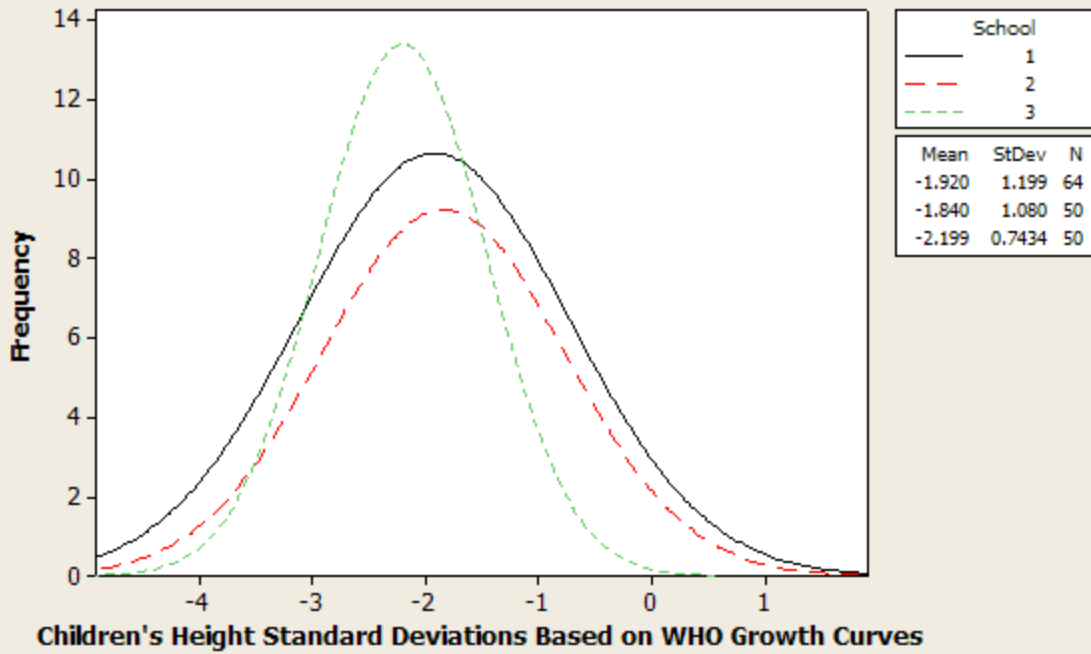


Findings were as follows:

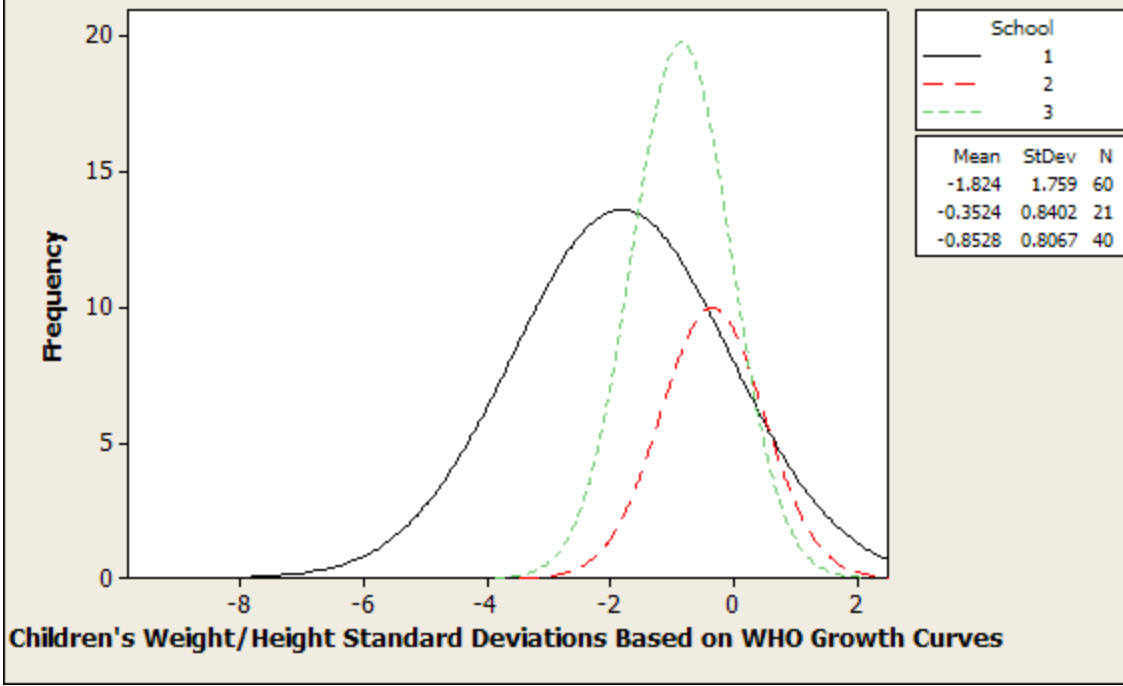
1. All children had normal vision acuity exams.
2. The majority of school children, regardless of which school they came from, had very low weights, heights, weight/height ratios, and BMIs compared with global averages based on most recent World Health Organization growth curve data.

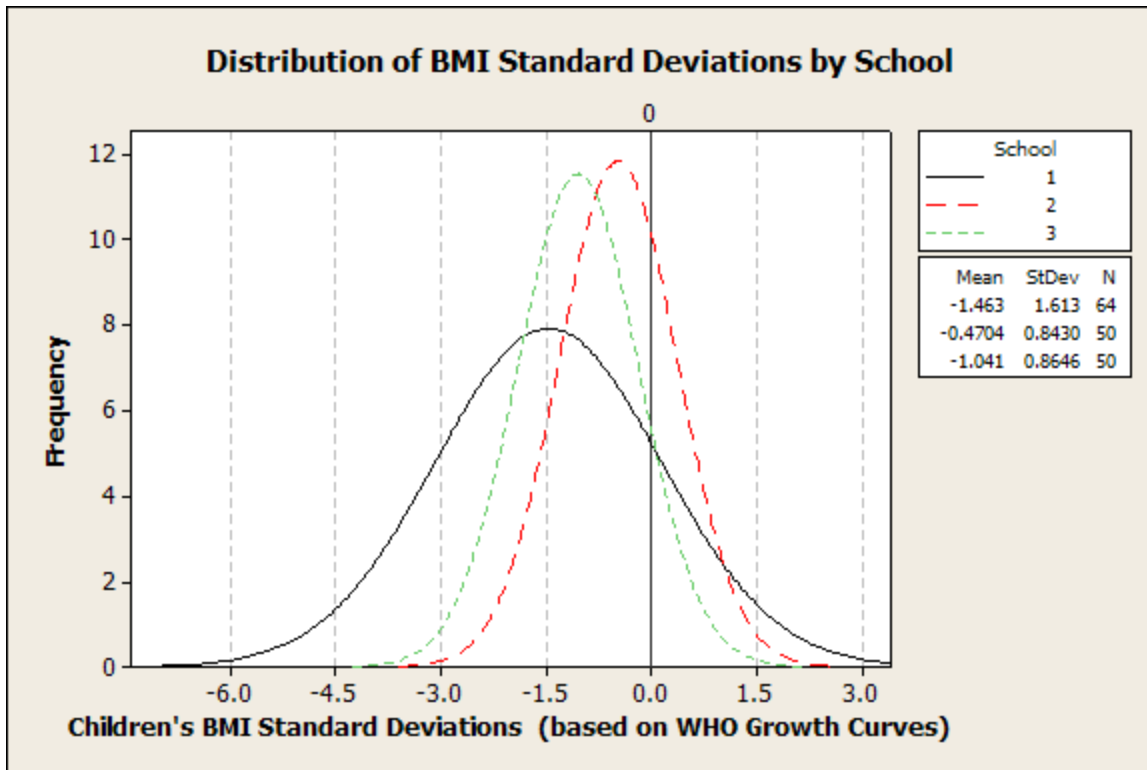


### Distribution of Height Standard Deviations by School



### Distribution of Weight/Height Standard Deviations by School

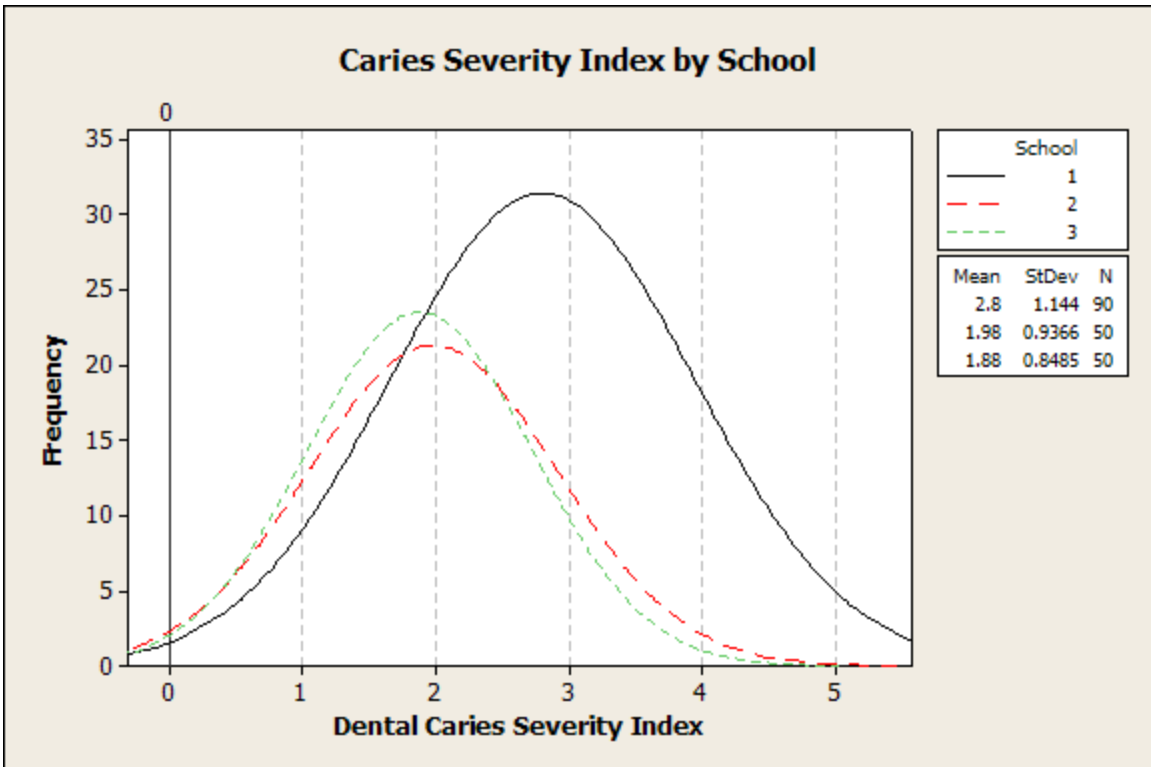
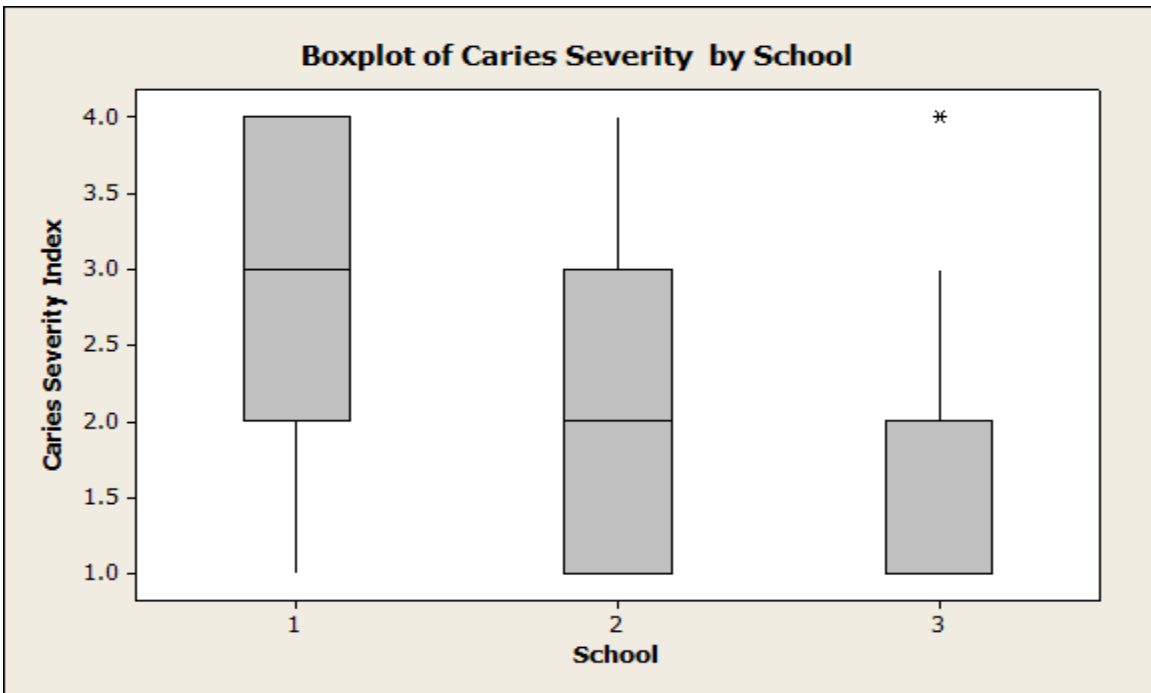




3. Children from the Tonpheung School had a much higher prevalence of severe dental caries: 33.8 % with Grade 4 disease compared with 4% in those attending the Khmong Pha-Udom School and 6% attending the Khmou Pha-Udom School.

**Table 1**

School	Grade 1 = No Cavities seen	Grade 2= Mild	Grade 3= Moderate	Grade 4= Severe
School #1 Tonpheung	20.0 %	21.5 %	24.6 %	33.8 %
School #2 Pha-Udom-Khmong	40.0 %	26.0 %	30.0 %	4.0 %
School #3 Pha-Udom-Khmou	36.0 %	46.0 %	12.0 %	6.0 %



4. Tonpheung School was also the only school that had a store located on school grounds. Children were seen purchasing candy and sweetened drinks from this store through out the school day. We also noticed that candy wrappers and empty drink containers littered the schoolyard, in contrast to the other school campuses that were relatively free of litter.





5. There was an association between the caries severity index and a child's growth, with children from the Tonpheung Elementary School having not only the highest prevalence of severe caries, but also the poorest growth indicators, as measured by Wt/Ht ratio SDs, BMI SDs, and Wt. SDs.

**Table 2**

School	Mean Age (years)	Mean Weight SD	Mean Height SD	Mean BMI SD	Mean Wt/Ht Ratio SD	Caries Severity Index Mean
School #1 Tonpheung	6.64	-2.32	-1.92	-1.46	-1.82	2.80
School #2 Pha-Udom - Khmong	9.12	-1.54	-1.84	-0.47	-0.35	1.98
School #3 Pha-Udom - Khmou	8.08	-2.18	-2.20	-1.04	-0.85	1.88

### **Recommendations**

Government and Public Health officials have made great strides in preventing illness and fostering the optimal growth and health of children who live in remote regions of Bokeo Province, Lao PDR. Efforts that have clearly made a difference include the promotion of breastfeeding, the assurance that all children are vaccinated and attend school, and improved household access to potable water.

Based on data gleaned from October 2011's Pediatric Mobile Clinic, we would like to offer some additional recommendations on ways to prevent illness and decrease overall childhood morbidity and mortality.

1. Increase distribution of prenatal vitamins to all women of childbearing age, including adolescents, with special priority given to women who are already pregnant or nursing. Many of the children we saw suffered from malnutrition and micronutrient deficiencies, the most serious of which was thiamine (Vitamin B1) deficiency (Beriberi). Ensuring that mothers are protected from micronutrient deficiencies during pregnancy and lactation is the easiest way to ensure that infants are protected also. Educating families on the types of foods that can be eaten to avoid the most common micronutrient deficiencies would also be helpful, eg. whole brown rice vs. milled white rice.

2. Educate families about the importance of protecting children from dust and smoke, e.g. promoting the wearing of masks while riding on motorbikes. Promoting the wearing of helmets is also important.
3. Explore ways to make both the Japanese Encephalitis vaccine and PCV-13 (Pneumococcal) vaccine part of the routine childhood vaccination schedule. The Japanese Encephalitis vaccine would help decrease the number of children suffering from neurologic sequelae of the disease. The PVV-13 vaccine will help decrease the prevalence of otitis media and pneumonias.
4. Explore ways to decrease dental caries among children. When children have severe tooth decay, they often have difficulty eating nutritious foods that require chewing. This makes them more vulnerable to malnourishment and micronutrient deficiencies. Caries also cause pain, which may interfere with their ability to pay attention in school
  - a. Education about the importance of dental hygiene
  - b. Availability of tooth paste and tooth brushes
  - c. Routine fluoride varnish application, integrated with the vaccination schedule and/or made available in school on a regular basis.
  - d. Minimize children's access to candy and sweetened beverages by not allowing stores on school grounds.

We also want to thank government officials for giving us the opportunity to work side by side with Lao physicians, nurses, and language interpreters. It was very inspiring, and we look forward to your suggestions about additional ways we can help.











