Malnutrition in rural Guatemala: a Health Priority
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Introduction:
In 2001 I spent 6 weeks in Guatemala, and I was able to return in 2007 for 4 additional weeks. The town I was in, San Lucas Tolimán, has 20,000 residents and only 3 doctors. Two of those doctors are private; over 90% of the locals cannot afford their services. The other doctor works for a hospital that is operated by the Catholic Diocese of St. Paul, Minnesota. I volunteered there in September, 2007.

I would often see a child, estimate that she was 7 years old, and then learn she was 11 or 12. Adding data to growth charts, I soon saw that underweight was very topical, and short stature abounded. I undertook a chart review, and looked for prospective studies on malnutrition.

Discussion:
- Major prospective trials have been performed in Guatemala, demonstrating dramatic benefits of nutritional support. But roughly 30% of rural Guatemalan children remain malnourished. Despite strong evidence that early nutritional support improves cognitive and social development, and even increases future wages, malnutrition is higher in Guatemala than in any other American country.
- U.N. studies of nutrition programs show that gains of 1-2 percentage points in malnutrition rates per year are achievable: such strides have been made in Thailand, Indonesia, Tanzania, and Zimbabwe. Other programs initiated in India, Egypt, and Pakistan have yielded poor results. There are some obvious differences between the programs that produced improvements and the ones that haven’t.
  - Regardless of the program, economic growth helps lower malnutrition rates.
  - Decreases in the fertility rate are strongly correlated to decreases in child malnutrition.
  - Feeding programs are the most expensive, and tend to be fraught with more corruption.
  - Community-based programs accelerate nutritional improvements the fastest.
  - Programs can be very effective while costing only $2-10 per person per year.
- Such a program in Guatemala needs to address several areas:
  - Growth charts must be maintained for every child, and the importance of these charts must be shared with parents. A warning system needs to be in place to alert health care workers when a child is underweight.
  - Rural and poor areas need to be prioritized. Historically, the rural areas are underserved in virtually all government programs, particularly health.
  - Programs need to be community-based, with little central administration.
  - Nutritional supplements should be made available for those who remain malnourished after health care workers have provided special care.

Methods:
- Growth charts from the clinic were reviewed for 322 patients age 15 or younger.
- PubMed literature searches were conducted to find studies, particularly randomized trials, about nutritional interventions among children in rural areas in Latin America.
- PubMed literature searches were conducted to find correlatives between childhood malnutrition and mortality, morbidity, development, and educational achievement.

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Findings:
- World Health Organization data show 23% of Guatemalan children age 0-5 are malnourished.
- In the rural Guatemalan clinic where I worked, charts of children aged 12 and under showed that 25.5% of these patients were under weight, and 61.2% were under expected height.
- 48% of Guatemalan children have iron-deficiency anemia. Infants with iron-deficiency anemia have poorer cognitive, motor and neurophysiologic development.
- Between 1969 and 1977, four Guatemalan villages were randomized: children and pregnant and nursing mothers received one of two nutritional supplements. One supplement, called Fresco, was a fruit-flavored drink with sugar, water, flavoring and 6 essential vitamins, and contained no protein. The other supplement, called Atole, was made from milk and vegetable proteins, and had the same vitamins as Fresco. Some of the findings from this study:
  - The girls who received Atole achieved 1.2 years more education.
  - As adults, men who received Atole before 36 months of age earned 46% higher hourly wages.
  - In a trial to evaluate frequent diarrhea in children, three rural Guatemalan villages were randomized: one received interventions of sanitation and health care workers, another received Atole nutritional supplementation alone; one served as a control with no interventions:
    - The village with medical treatment and sanitation intervention did not have reduced morbidity; in fact, the rate of diarrhea increased.
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    - The village that received nutritional supplementation alone had statistically significant reductions in mortality and mortality, and had increased rates of growth and development.
- In Guatemala, malnourishment contributes toward 54% of all child mortality.
- Poor infant growth has been associated with increased risk for disease in adulthood, including Type 2 Diabetes, Ischemic Heart Disease, Hypertension and Hypertension.
- Malnutrition at the time of diagnosis is associated with higher rates of childhood cancer in Guatemala, for non-lymphoblastic leukemias and myelodysplasia, over 90% of children are moderately or severely malnourished at the time of diagnosis.

References:

Malnutrition Trends in Central America, 1990-2000

- Malnutrition affects 30%-40% of Guatemala’s population, with 18% exhibiting moderate to severe underweight.
- In 1990, Guatemala had the highest malnutrition rate in Central America, with 38% of children underweight. By 2000, the rate had decreased to 20%.
- Guatemala has made significant progress in reducing malnutrition rates, but the problem still persists.

A Guatemalan child receiving Atole.