# Field Assessment and the Relationship between Micronutrients and Growth Stunting in Malnourished Children Ages 0-5 in the Hill Tribe Villages of Northern Thailand

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ABSTRACT

The hill tribes of northern Thailand are transitioning from a shifting agriculture economy to a subsistence economy with a stabilized village location. This change has adversely affected household food security and the nutritional status of children ages 0-5. The prevalence of growth stunting, a physical indicator of malnutrition, was extremely high in 2002, with 55% of the hill tribe children growth stunted (Swift, 2002). Micronutrient and protein deficiencies and increased infection are suggested to be major causes of malnutrition. This study focused on evaluating the micronutrient (iron and iodine) status in children ages 0-5 in three hill tribe villages of varying economic status and food security, determining the relationship between the iron deficiency and growth stunting, and the implementation of practical solutions. Predictions included the existence of these micronutrient deficiencies and a positive correlation between growth stunting and iron deficiency. Growth stunting, quantified as Z-scores, was compared to hemoglobin levels using correlation coefficient and consumptive iodine levels were determined. No significant correlation was found between iron deficiency and growth stunting however, all three villages was demonstrated iron deficiency and insufficient iodine consumption, suggesting that the cause of growth stunting is complex and extends beyond micronutrient deficiencies. Iron cooking pots and air-tight salt containers were recommended as solutions.

INTRODUCTION

The hill tribes of northern Thailand have traditionally practiced a subsistence economy with shifting cultivation of upland rice and corn, supplemented by hunting and gathering or growing opium poppy, *Papaver somniferum* (Linn) as a cash crop. Nevertheless, the current Thai government discourages these strategies and alternatively promotes forest conservation, reforestation, stabilizing village locations, and growing substitute cash crops. Due to these pressures, the hill tribe people are transitioning to a completely subsistence economy or to a market economy with alternative cash crops. Subsistence farming allows for little food variety and a market economy is problematic because of its dependency on the success of the cash crop in the market and the field. Consequently, household food security and nutritional status have been adversely affected.

Malnutrition, insufficient consumption of protein and micronutrients exacerbated by frequent disease and infection (WHO, 2003), is a severe and widespread problem. Consistent malnutrition during development results in growth stunting, physically quantified by short stature (Lutter, 2003). This condition introduces metabolic disturbances, mental and physical developmental delay, lowered immunocompetence and is associated with functional limitations and increased morbidity and mortality (Branca and Ferrari, 2002). Growth stunting occurs early in life because of the high nutritional demand at periods of rapid growth. Catch-up growth, the reversal of all symptoms of growth stunting, is possible up to age five (Branca and Ferrari, 2002). Stunted growth is commonly used as a micronutrient deficiency indicator (Demment et. al, 2002).

Today, micronutrient malnutrition is considered the principal global nutritional problem (Allen, 2003) and interventions focused on micronutrients have become the key idea in combating malnutrition in developing countries (Allen, 2003). The main foci of these interventions are iron, iodine, and vitamin A, but micronutrient deficiencies are rarely isolated and usually co-exist (Singh, 2004). In the mid-nineties, Thailand began a campaign targeting these specific micronutrients (Chavasit and Tontisirin, 2002). Since 1994, all table salt in Thailand has been fortified with 50ppm of potassium iodine. Similarly, since 1996 triple fortified (iron, iodine, and vitamin A) noodles have been available for purchase at an affordable price.

Nevertheless, there is strong indication that these public health measures are not reaching the isolated hill tribe villages. In 2002, the prevalence of growth stunting in the hill tribes was extremely high, with a mean of 55% (Swift, 2002). It is estimated that 22% of Thai children under than five years of age suffer from iron deficiency anemia (WHO, 2004) and pica (ingestion of soil due to iron deficiency) has been observed in the hill tribe villages. The most severe iodine deficiencies occur in mountainous terrains far from the ocean, like the geographic location of villages in the hills of the Himalayas, where iodine the soil has been lost due to erosion (WHO, 2004). Visible goiters in the necks of the hill tribe women also suggest iodine deficiency. Vitamin A was not tested for because a reliable field test kit has not been developed and xerophthalmia blindness has not been observed in the villages.

If malnutrition, quantifiable by growth stunting, exists in the hill tribe villages of Northern and micronutrient deficiencies are an integral part of malnutrition, then malnourished hill tribe children should be deficient in the micronutrients iodine and iron and furthermore, the degree of the deficiencies should be related to the degree of growth stunting. If this prediction is observed, then solutions promoting the eradication of micronutrient deficiencies can be used as a principal step toward the eradication of growth stunting and malnutrition. Alternatively, if deficiencies of micronutrients are not observed in the growth stunted children or if they existed but are not significantly correlated to growth stunting, they can be discarded as the primary causative agent of growth stunting and malnutrition in this population.

## METHODS AND MATERIALS

Three Akha villages were chosen for this study based on varying economic status and accessibility to the market. Fifteen children from Huay Sahn, fourteen children from Pau Sau, and nineteen children from Thapo participated in the study. All children were in the age range of 0-5. Consent was given by all participating villagers through the Akha Medical Clinic. Name and anthropometric measurements were documented for each child. Age was measured in months and height was measured to the nearest cm using a measuring tape attached to the wall. Recumbent length was used for children less than one year of age.

From the height/age data Z-scores for growth stunting were calculated using the ANTHRO program provided by the NCHS/WHO (Matthews et. al, 2003) based on the NCHS international growth curve. Growth stunting was assigned if a Z-score was less than -2.00 standard deviations from the mean international growth curve (Hendrickx, 1992). The percent of growth stunted children was analyzed by age in years and for the total village. The mean Z-score and standard deviation for growth stunting was calculated for each village.

The HemoPoint H2 Hemoglobin Photometer (Stanbio Laboratory) was used to quantify the levels of hemoglobin from a finger prick bloodspot. The hand of the child was massaged and the ring finger was disinfected using an alcohol wipe. Light pressure was applied to the finger tip and a micropoint lancet was used to puncture its side. The cuvette was held vertically in the middle of a secondary bloodspot until filled. The cuvette was inserted into the photometer and the test was preformed automatically. The hemoglobin and hematocrit (if available) values were recorded. This process was repeated for each child.

Hemoglobin levels for individuals were classified as no anemia (x >110 g/L), mild anemia (100g/L<x<110 g/L), moderate anemia (70g/L<x<100 g/L) and severe anemia (x < 70 g/L) (Kapil et. al, 2002). The cut-off point of 115g/L was used for children five years of age (WHO, 2003). These values have been shown valid for an Indonesian population (Khusun et. al, 1999) and have been used in previous Thai nutritional assessment (Winichagoon, 2002). To provide a population perspective, the degree of the total anemia problem in the villages was determined based on the following World Health Organization cut off points: not a problem (<5% anemic), low magnitude problem (5-14.9% anemic), moderate magnitude problem (15-39.9% anemic), and high magnitude problem (>40%) (WHO, 2003). The significance of the relationship between the individual micronutrient levels and the Z-Score for growth stunting for each village was determined using Pearson correlation coefficient through SPSS. An independent variable t-test was done on hemoglobin values for growth stunted children verses hemoglobin values for non-growth stunted children. Only children with both anthropometric measurements and hemoglobin values were considered in this study. All data was submitted to the Micronutrient Deficiency Information System of the World Health Organization.

The LaMotte Iodine Test Kit (LaMotte Company) was used to quantify the level of iodine in the village water using a direct reading titrator. Water (>25mL) was collected from the village water source in a plastic collector and transported out of the village for analysis. Test tube was filled to the 25mL line with one sample of collected water. Five drops of Iodine Reagent #1 and five drops of Iodine Reagent #2 were added to the test tube. The test tube was caped and mixed until the solution turned blue. The titrator was filled with Iodine Reagent #3 until the large ring on the plunger was opposite the zero (0) line on the scale. Iodine Reagent #3 was slowly added to the test tube, while swirling the test tube, until the blue color disappeared. Results were recorded directly as ppm Iodine. This process was repeated three times for each sample. The entire process was repeated for each village.

The LaMote Iodine Test Kit was also used to quantify the level of iodine in the village salt. One gram of salt collected from a village was dissolved completely in 25mL of distilled water. The same procedure as above was completed and the results were also recorded as ppm Iodine. This process was repeated three times for each sample. The mean result was compared to the labeled content of iodine in the salt (in ppm) as a percentage. The entire process was repeated for each village.

## RESULTS

Table I. Percent of growth stunting and anemia by age in all three villages.

| Ages | Growth Stunting | | | | | | Anemia | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (mo) | Thapo | | Hauy San | | Pau Sau | | Thapo | | Hauy San | | Pau Sau | |
| | #* | Percent Stunted | #* | Percent Stunted | #* | Percent Stunted | #* | Percent Anemic | #* | Percent Anemic | #* | Percent Anemic |
| 0-11 | 1 | 0% | 1 | 0% | 0 | 0% | 1 | 100% | 1 | 100% | 0 | 0% |
| 12-23 | 4 | 75% | 2 | 0% | 4 | 75% | 4 | 50% | 2 | 50% | 4 | 100% |
| 24-35 | 2 | 0% | 4 | 0% | 2 | 100% | 2 | 100% | 4 | 25% | 2 | 100% |
| 36-47 | 3 | 66.6% | 7 | 0% | 5 | 20% | 3 | 33.3% | 7 | 0% | 5 | 20% |
| 48-59 | 3 | 33.3% | 1 | 33.3% | 2 | 50% | 3 | 0% | 1 | 0% | 2 | 50% |
| 60-71 | 2 | 50% | 1 | 50% | 1 | 0% | 2 | 50% | 1 | 0% | 1 | 100% |
| All | 15 | 46.6% | 19 | 10.5% | 14 | 57.1% | 15 | 46.8% | 19 | 15.8% | 14 | 62.4% |

#* Total Number of Village Children in Age Group

Table II. Correlation significance of stunting Z-scores and hemoglobin values in all three villages.

| Village | N | P-value | Significance |
|---|---|---|---|
| Thapo | 13 | 0.143 | Not significant |
| Hauy Sahn | 19 | 0.866 | Not significant |
| Pau Sau | 14 | 0.993 | Not significant |

Table III. T-test significance for hemoglobin levels of growth stunted children verses hemoglobin levels of non-growth stunted children in all three villages.

| Village | DF | P-value | Significance |
|---|---|---|---|
| Thapo | 13 | 0.469 | Not significant |
| Hauy Sahn | 19 | 0.291 | Not significant |
| Pau Sau | 14 | 0.486 | Not significant |

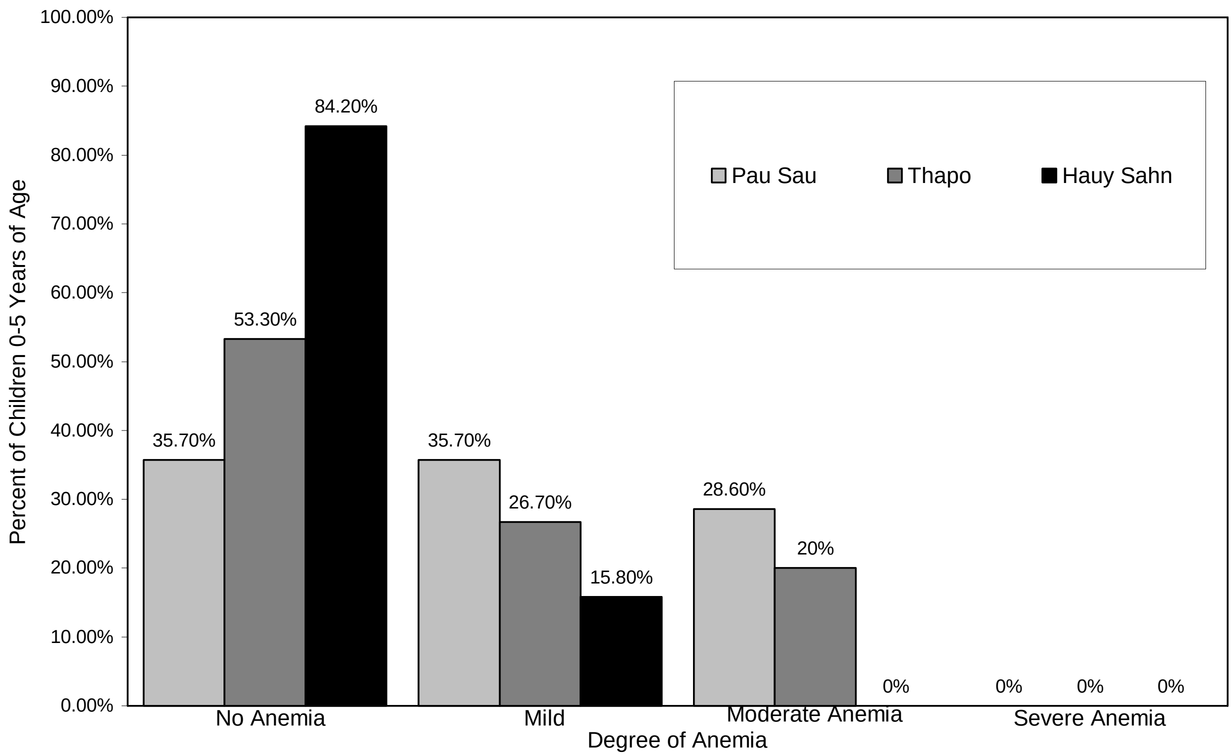


Figure 1. Varying degrees of anemia in all three villages**.**

Table IV. Z-score and hemoglobin descriptive statistics for all three villages.

| Village | Mean Z-Score | Z-score Standard Deviation | Median Hemoglobin |
|---|---|---|---|
| Thapo | -2.39 | 1.19 | 108.5 |
| Hauy Sahn | -0.77 | 1.19 | 121.5 |
| Pau Sau | -2.49 | 1.91 | 106.5 |

Table V. Salt iodine content for all three villages.

| Sample | Stated Iodine Amount (ppm) | Mean Actual Iodine Amount (ppm) | Percent Iodine Lost |
|---|---|---|---|
| Store Package | 50 | 16.67 | 66.67% |
| Hau San | 50 | 10.33 | 79.34% |
| Thapo | 50 | 7.33 | 85.4% |
| Pau Sau | 50 | 8.66 | 82.7% |

All villages exhibit some degree of an iron deficiency anemia problem. There is a moderate problem in Hauy Sahn with 15.8% of the children anemic. There are severe problems in Thapo and Pau Sau with 46.8% and 62.4% of children anemic respectively. No child in any village is severely anemic. There are no moderately anemic children in Hauy Sahn and 15.8% of the children are mildly anemic. 20.0% and 26.7% of the children in Thapo are moderately and mildly anemic respectively. 28.6% and 35.7% of the children in Pau Sau are moderately and mildly anemic respectively.

Thapo village had a median hemoglobin value of 108.5 g/L and a mean Z-score value of -2.39. Hauy Sahn village had a median hemoglobin value of 121.5 g/L and a mean Z-score value of -0.77. Pau Sau village had a median hemoglobin value of 106.5 g/L and a mean Z-score value of -2.49. Data from the correlations and t-tests indicate that there is no significant relationship between growth stunting and micronutrient deficiency in any of the three villages or between the hemoglobin values for growth stunted children and non-growth stunted children.

No iodine was found present in the water of any of the three villages. Values of iodine in salt were much lower than the stated value of 50ppm. The store package, Hau San sample, Thapo sample, Thapo sample, and Pau Sau sample had mean iodine values of 16.67ppm, 10.33ppm, 7.33ppm, and 8.66ppm respectively.

## DISCUSSION

Results from this study demonstrate no relationship between stunted growth and iron deficiency any village however, high prevalence of both conditions independently exist in all villages. This supports the premise that iron deficiency is not the exclusive cause of growth stunting and that both growth stunting and malnutrition are complex issues with many variables. Micronutrient deficiencies, more specifically iron deficiency, may still be a significant contributing factor to childhood malnutrition in the hill tribes and a cause of growth stunting, but the confounding variables of protein deficiency and infection may play larger role. Nevertheless, trends in overall growth stunting and anemia prevalence in the three villages suggest that both are influenced by similar sociological factors.

Hauy Sahn is a model nutritional hill tribe village demonstrated by growth stunting and anemia rates significantly below those for children in the general Thai population (15% and 22% respectively). Hauy Sahn village's nutritional success is representative of many positive factors including access to a local market by motorbike or community van and daily consumption of protein rich foods including poultry, eggs, and pork. Additionally, soy patties and peanuts are regularly integrated into meals. Children, beginning at approximately age two, attend a government funded school located in the village where they are provided with a nutritious school lunch including soy milk. Toilets in every house, electricity allowing for refrigeration, and boiled drinking water have considerably reduced the incidence of infection in the village. Overall, data indicates the great strides this village has made with respect to its overall health, but also suggests improvements still can be made with daily iron intake.

Tests indicate that Thapo village has a severe iron deficiency anemia problem and a high degree of growth stunting with both mean growth-stunting value and median hemoglobin levels significantly below the normal range for a healthy population. Nevertheless, the degree of growth stunting has decreased considerably since January 2004 when it was 53.6% (Swift, 2004). Contributing factors to Thapo's nutritional problems include: no government kindergarten program; close proximity of the rice fields to the homes, preventing poultry raising; and very limited access to the local market during the rainy season (June-September). When access to the market is available, villagers, plagued by land debt and no monetary income, do not have money to buy goods. Alternatively, successful efforts responsible for the decrease in growth stunting include drinking boiled water, increasing the use and availability of toilets, and increased protection from parasitic infection by wearing sandals. Attempts to increase protein consumption are in progress.

The village has recently begun growing peanuts and incorporating them into their daily diets. Soy has been discarded as a possible crop since it does not grow well on the mountain.

Pau Sau village also demonstrates considerable nutritional problems with both mean growth-stunting and median hemoglobin levels below the normal range for a healthy population. The growth stunting in this village had decreased over the last year and a half, from 67.6% to 62.4% but was still very high. Like Thapo, Pau Sau has no access to a local market and relies singularly on its subsistence farming. There is no government kindergarten program in the village, few houses have toilets, the drinking water is not boiled, and the children are not wearing sandals to protest themselves from infection. Increased protein consumption has been promoted and although they are getting good peanut crops, soybeans appear to be growing well and are regularly consumed.

Although anemia is present in high amounts in all three villages in the first three years of life but there is a notably low prevalence of growth-stunting in children ages 0-3. This data suggests that infants are receiving the appropriate nutrition for growth but not adequate amounts of iron. Village mothers have been encouraged to breastfeed as long as possible, into the second year of life. Nevertheless, based on this data, it is suspected that village mothers are relying solely on breast milk and no additional foods during this time. Breast milk has a high nutritional value but does not contain large amounts of iron. Since healthy full-term babies have enough iron supplies for only the first six months of life, after this point iron consumption from external sources but begin (Nestel and Nalubola, 2003). Village healthcare promoters were made aware of this problem and have increased education of the issue to the villagers.

Even though iron deficiency is not shown in this study to influence growth stunting, the high prevalence of anemia in the villages maybe be detrimental to the health of the children. It is likely that data for the prevalence of iron deficiency may be an underestimate; negative effects of anemia have been shown to begin before detectable by using hemoglobin values (Khusun et. al, 1999). Accordingly, is recommended that all three villages take measures to decrease the prevalence of iron deficiency and prevent future deficiencies. Three main accepted solutions to micronutrient deficiency problems include: supplementation, fortification, and dietary improvement. Supplementation has been discarded as an appropriate solution because of its high cost and creation of village dependency on outside resources. Compliance with this type of practice can also be poor (Allen, 2003).

The most suitable solution recommended to increase iron consumption for all three villages is the use of iron cooking pots when preparing meals. Iron from these pots has been shown to leach out into the food, increasing an individual’s daily intake. Studies have shown that iron pots are effective in increasing hemoglobin levels and enhancing growth in children (Adish et. al, 1999). Iron pots are socially acceptable and have been traditionally been used in developing countries. However, since they are more expensive than aluminum pots, few households use them. Iron cooking pots cost approximately 150 batt (3.75 U.S. dollars) and can be afforded by many villagers in Hauy Sahn making education the primary focus in that village. However, many of the villagers in Thapo and Pau Sau cannot afford these pots and consequently outside funds are being used for their purchase. Although they are not buying the pots themselves, once the villagers have the pots, this iron fortifying solution will be very much self-sustaining.

Secondary solutions have also been proposed for Hauy Sahn and Pau Sau villages. As a result of its access to money and a market, education on the benefits of consumption of fortified instant noodles is recommended for Hauy Sahn village. Fortified instant noodles are sold in ready-to-prepare packets, are popular processed food in Thailand, and are already regularly consumed by some villagers. The government certified fortified instant noodles contain one third of the recommended daily allowance of iron (5mg), iodine (50mg), and vitamin A (267mg retinal equivalents) (Winichagoon, 2002). The noodles are affordable (5 batt), can bought in bulk, and have a shelf life of at least six months at room temperature (Chavasit and Tontisirin, 2002). Pau Sau has been encouraged to take advantage of its large soybean crop. Soybeans have recently been promoted in this village as a food with high nutritional value yet, more education on the benefits of soy beans may be helping in increasing iron intake. Soybeans contain a high amount of iron; one half cup of soy beans provides individuals with 4.42 mg of iron, approximately twenty-five percent of the daily recommended allowance (Branca and Ferrari, 2002).

Even though direct iodine consumption (measured through urine specimens) was not able to be collected in this study, iodine consumption was inferred from examining nutritional sources, namely water and salt. Iodine does not occur naturally in crops but can be introduced if found in the soil. Since there was no iodine found in the soil it is highly unlikely that there is iodine in any of the crops being consumed by the villagers. Nevertheless, all villages are consuming government regulated iodized salt (50ppm). Yet, analysis suggests that much of the iodine in the salt, on average 78.5%, is being lost between the site of manufacturing and the household due to environmental conditions such as humid air and porous packaging. This observation is consistent with other studies (WHO, 2004). To prevent this loss village health promoters have been trained to educate villagers to store their salt in air-tight containers preventing iodine loss in humid conditions.

This study was limited by the necessity to develop methods appropriate for use in the field, cultural barriers, and time constraints when testing the children. Future studies should include follow-up studies on hemoglobin values after the introduction of iron pots into the villages and direct measurement of iodine consumption (if a field method becomes available). Also tests should be done on how much iron is being released into food from the purchased iron pots and how much more iodine is being retained by storing salt in air-tight containers.


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APENDIX

Table AI. Name, Sex, Age, Height, Weight, Hemoglobin, Hematocrit, Stunting and Wasting for Huay Sahn Village.

| Name | Sex | Age* (mon) | Ht.* (cm) | Wt* (kg) | Hemoglobin (g/L) | Hematocrit (%) | Stunting Z-score | Wasting Z-score |
|---|---|---|---|---|---|---|---|---|
| Montita | F | 11 | 71 | 7.5 | 109 | n/a | -0.74 | -1.41 |
| Camin | M | 13 | 77 | 11 | 124 | 36% | -0.09 | 0.78 |
| Somchai Mayer | M | 22 | 81.5 | 22 | 105 | n/a | -1.17 | 0.78 |
| Sutipont Muirae | M | 24 | 87.5 | 12.5 | 107 | n/a | 0.60 | -0.16 |
| Tida Cherlui | F | 24 | 86 | 11 | 129 | 38% | 0.47 | -0.97 |
| Piyatpon | M | 30 | 90.5 | 12 | 120 | 35% | 0.02 | -1.17 |
| Casapon | M | 31 | 98 | 15 | 119 | n/a | -1.90 | -0.17 |
| Anan Ubor | M | 36 | 98 | 15 | 137 | 37% | 0.81 | -0.17 |
| Sumale | F | 39 | 92 | 14 | 111 | n/a | -1.04 | 0.41 |
| Isaya Yeru | M | 41 | 96.5 | 14 | 120 | 35% | -0.48 | -0.65 |
| Ampai Ayi | M | 43 | 96 | 14 | 124 | 36% | -0.92 | -0.55 |
| Sasriya Yaelor | F | 45 | 99 | 14 | 125 | n/a | -0.21 | -0.83 |
| Apirud Cherumi | M | 46 | 96.5 | 14 | 127 | 37% | -1.24 | -0.65 |
| Ratana | F | 47 | 99.5 | 14 | 124 | 36% | -0.38 | -0.92 |
| Jantila | F | 48 | 102 | 15 | 136 | 40% | 0.09 | -0.64 |
| Sumkit | M | 54 | 103 | 15 | 119 | n/a | -0.80 | -1.09 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Nitipum Yubor | M | 58 | 89.5 | 14 | 121 | 36% | -4.25 | 0.59 |
| Anut Chermui | F | 60 | 97 | 14 | 139 | 39% | -2.58 | -0.47 |
| Gepisa | M | 66 | 109.5 | 18 | 122 | n/a | -0.76 | -0.31 |

Table AII. Name, Sex, Age, Height, Weight, Hemoglobin, Hematocrit, Stunting and Wasting for Pau Sau Village.

| Name | Sex | Age* (mon) | Ht.* (cm) | Wt* (kg) | Hemoglobin (g/L) | Hematocrit (%) | Stunting Z-score | Wasting Z-score |
|---|---|---|---|---|---|---|---|---|
| Matira | F | 13 | 75 | 9 | 98 | n/a | -0.17 | -0.70 |
| Surin | M | 13 | 65 | 10 | 98 | n/a | -4.47 | 3.75 |
| Atchara | F | 14 | 68 | 10 | 105 | n/a | -2.97 | 2.88 |
| Pitshidon | M | 20 | 76 | 8 | 97 | n/a | -2.60 | -2.52 |
| Gampon | M | 25 | 82 | 10 | 105 | n/a | -2.75 | -1.38 |
| Siri Rat | F | 35 | 69 | 7 | 106 | n/a | -6.70 | -1.55 |
| Tartini | F | 37 | 89 | 11 | 107 | n/a | -1.50 | -1.52 |
| Desada | M | 37 | 89 | 13 | 123 | 36 | -1.72 | -0.3 |
| Dagree | M | 40 | 86 | 11 | 114 | n/a | -2.95 | -1.22 |
| Weelachad | M | 40 | 88 | 12 | 115 | n/a | -2.45 | -0.71 |
| Chonachad | M | 44 | 102 | 15 | 112 | n/a | 0.39 | -0.91 |
| Noparat | M | 48 | 82 | 12 | 110 | n/a | -4.92 | 0.38 |
| Garoona | F | 53 | 99 | 11 | 90 | n/a | -1.32 | -3.08 |
| Daruni | M | 71 | 112 | 21 | 107 | n/a | -0.75 | 0.90 |

Table AIII. Name, Sex, Age, Height, Weight, Hemoglobin, Hematocrit, Stunting and Wasting for Thapo Village.

| Name | | Sex | Age* (mon) | Ht (cm) | Wt* (kg) | Hemoglobin (g/L) | Hematocrit (%) | Stunting Z-score | Wasting Z-score |
|---|---|---|---|---|---|---|---|---|---|
| David Churmu | 16 | M | 6 | 63 | 7 | 91 | n/a | -1.79 | 0.64 |
| Santipon Chermu | 9 | M | 20 | 78 | 10 | 113 | n/a | -1.97 | -0.58 |
| Tanonasak Chermu | 13 | F | 20 | 68 | 9 | 95 | n/a | -5.13 | 1.25 |
| Glaison Chermu | 14 | M | 22 | 75 | 9 | 118 | n/a | -3.35 | -1.02 |
| Saipha Chermu | 11 | M | 23 | 73 | 8 | 94 | n/a | -4.15 | -1.71 |
| Yago Chermu | 8 | M | 27 | 83 | 11 | 107 | n/a | -1.51 | -0.63 |
| Nalong Meyer | 15 | M | 33 | 90 | 12 | 106 | n/a | -0.74 | -1.08 |
| Tomchai Chermu | 12 | M | 41 | 92 | 15 | 110 | n/a | -1.60 | 0.86 |
| Buta Chermu | 4 | F | 41 | 89 | 12 | 111 | n/a | -2.15 | -0.63 |
| Conded Chermu | 7 | M | 41 | 88 | 12 | 107 | n/a | -2.59 | -0.71 |
| Saitipe Chermu | 3 | M | 53 | 99 | 13.5 | 112 | n/a | -1.58 | -1.47 |
| Apo Chermu | 5 | F | 53 | 93 | 13.5 | 128 | n/a | -2.75 | -0.10 |
| Wala Nut Chermu | 2 | F | 56 | 100 | 14 | 138 | 41 | -1.45 | -1.01 |
| Amiya Chermu | 6 | M | 65 | 96 | 15 | 102 | n/a | -3.52 | 0.19 |
| Dusipt Chermu | 10 | M | 65 | 105 | 18 | 127 | n/a | -1.61 | 0.53 |