Socio-economic disparities in the dual burden of malnutrition in Thailand: analysis from the Kanchanaburi Demographic Surveillance System

Rebecca Firestone, Harvard School of Public Health
Sureeporn Punping, Institute for Population and Social Research, Mahidol University

Extended Abstract

Background and introduction

The increasing prevalence of overweight and obesity in many lower and middle income countries along with the persistence of several forms of undernutrition provides evidence for what the Food and Agriculture Organization terms a dual burden of malnutrition, with both undernutrition and overnutrition occurring simultaneously within a population (Kennedy et al. 2004). This dual burden is a feature of health and nutrition transitions and a growing concern for international policy-makers, because of the challenge in designing and targeting nutritional interventions that address insufficient energy consumption as well as energy imbalances (Gillespie and Haddad 2001; FAO 2006). The paper argues that the dual burden in low and middle income countries such as Thailand is to a large part socially determined. The risk of being in any one of the extremes of the distribution of child growth is a function of socio-economic disparities related to household wealth and area of residence. The aim of this paper is to establish the magnitude of socio-economic gradients in child growth outcomes among children ages 2-9 in Kanchanaburi, Thailand. It is critical to understand the distribution of risks of poor growth outcomes in childhood because of the long term health and economic consequences of both over and undernutrition.

The nutrition transition describes the process in which large shifts in diet and physical activity patterns occur over time, marked by changes in nutritional outcomes such as body composition and stature (Popkin 2006). Frenk et al. suggest that one possible trajectory of this transition is a 'protracted and polarized' model, in which stages of the transition overlap over a period of time and the "social distribution of changes is very heterogeneous among social groups" (Frenk et al. 1991: 34) . The protracted and polarized model implies that different socio-economic groups within a country will experience the nutrition transition at varying rates. While some groups in society, such as urban populations, may be more directly exposed to the economic and social forces that promote overnutrition, other groups may still need be able to attain a sufficient diet to prevent underweight and stunting, thus giving rise to a dual burden. Because socio-economic conditions play a major role in determining child growth (Bradley and Corwyn 2002), we can expect to see marked socio-economic gradients in key measures of child growth in the Thai population as the country experiences the nutrition transition.

Different segments of society experience the risk implied by the nutrition transition in different ways, because their control over resources and services determines who receives insufficient energy and who experience energy imbalances that contributed to overnutrition. The very forces that engender the nutrition transition – economic growth and urbanization – also shape the particular groups in society that will be at risk of poor

nutritional outcomes. We are particularly likely to see these inequalities when considering children since their nutritional status is shaped by parental and household dynamics.

Data and methods

This paper uses data from the 2004 Round of the Kanchanaburi Demographic Surveillance System in Kanchanaburi, Thailand to assess the growth status of 6008 children ages 2 to 9 resident in the study area. Underweight is defined as below the 5th percentile for BMI-for-age on the 2000 CDC reference growth curves, while overweight is assessed as above the 85th percentile. Short stature is assessed as being below -2 standard deviations of height-for-age. Household wealth is measured using an asset index derived from principal components analysis following the procedure recommended by Filmer and Pritchett (2001). Households are then categorized into wealth quintiles according to their index scores, with the first quintile representing the poorest 20% of households and the fifth quintile representing the wealthiest quintile of households. Area of residence is a five-category variable determined by location of the child's village within the study area: urban, rice village, plantation, upland or mixed economy. Descriptive statistics for the sample are shown, and bivariate analysis is used to describe the shape of socio-economic gradients across areas of residence within the study area. Multivariable logistic regression analysis accounting for survey design is then used to assess the persistence of the wealth gradient, accounting for other child, maternal and household characteristics. All analyses are conduced in SAS 9.1.

Expected findings

Socio-economic disparities describe the distribution of the risk of poor growth outcomes among Thai children. The children of families and households that have greater access to resources and services will be more likely to experience overweight, while the children of families that have not been able to tap into the changes wrought by economic growth will be more likely to be underweight and/or stunted. Characteristics of the sample are shown in Table 1, demonstrating substantial variations in children's socio-economic conditions across areas. Figure 1 provides evidence of a dual burden of malnutrition in the population of children in Kanachanaburi, with almost 20% of children being of short stature and 15% being overweight. Household wealth is expected to be an important determinant of children's growth status, associated with an increased risk of being overweight and a reduced risk of being underweight or with short stature. Figures 2-4 demonstrate evidence of a wealth gradient in the expected direction across area of residence. In multivariable analysis, area of residence is expected to remain significant for overweight, after accounting for household wealth and other covariates, but the magnitude of the effect of household wealth is thought to be greater. The effect of area of residence on short stature and overweight is expected to be marginal after accounting for household wealth and other covariates. As a result, whether a child is in a poor or wealthy household greatly influences of risks of various growth outcomes. The effect of area of residence cannot be discounted, and indeed, living in an urban is an important risk for overweight. However, household wealth is expected to remain a major determinant of poor child growth after accounting for other factors, thus contributing to socio-economic disparities in child health risks.

Table 1. Socio-economic and demographic characteristics of children ages 2-9 (n=6008)

	N	%	Urban	Rice	Plantation	Upland	Mixed
Sample size	6008		943	956	934	2040	2235
Child characteristics							
Sex							
Male	3059	50.92	52.07	50.84	51.18	51.18	49.34
Female	2949	49.08	47.03	49.16	48.42	48.82	50.66
Age							
2-4 years	1901	31.64	29.59	31.07	28.59	36.08	28.37
5-6 years	1527	25.42	22.91	25.21	25.48	26.47	25.73
7-9 years	2580	42.94	47.51	43.72	45.93	37.45	45.90
Maternal characteristics							
Maternal education							
None	1016	19.93	1.38	4.31	11.53	44.44	19.93
Primary	2939	57.64	46.37	74.54	70.60	45.23	57.64
Secondary	1144	22.44	52.26	21.16	17.88	10.33	22.44
Missing	909						
Maternal BMI							
Mean		23.14	23.26	23.41	23.78	22.53	23.44
Standard deviation		4.31	4.43	3.95	5.00	4.10	4.18
Missing	1396						
Maternal height							
Mean		154.69	156.45	156.05	155.48	152.42	156.75
Standard deviation		6.16	5.88	5.53	6.13	6.09	575
Missing	1395						
Household characteristics							
Household wealth							
Poorest	1468	24.43	2.23	5.75	11.46	58.19	8.63
Poor	1117	18.59	6.04	22.07	29.66	18.43	17.27
Middle	1117	19.49	14.00	28.45	27.09	11.76	24.14
Wealthy	1112	18.51	23.54	26.88	21.52	7.01	25.46
Wealthiest	1140	18.97	54.19	16.84	10.28	4.61	24.49
Household size							
Mean		5.65	5.77	5.46	5.43	5.78	5.69
Standard deviation		2.32	2.60	2.14	2.10	2.17	2.62
Household head occupation							
Unemployed	825	13.73	20.57	14.85	12.42	9.75	15.33
Manual	4045	67.33	39.98	72.07	70.99	77.65	64.49
Non-manual	1138	18.94	39.45	13.08	16.60	12.60	20.18

Figure 1.

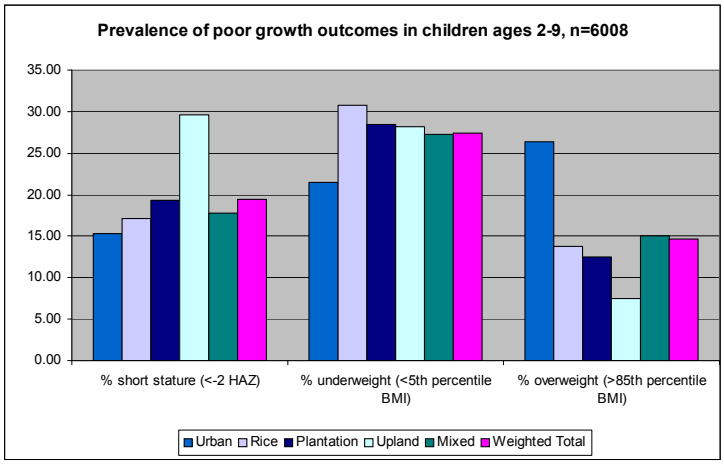

Figure 2.

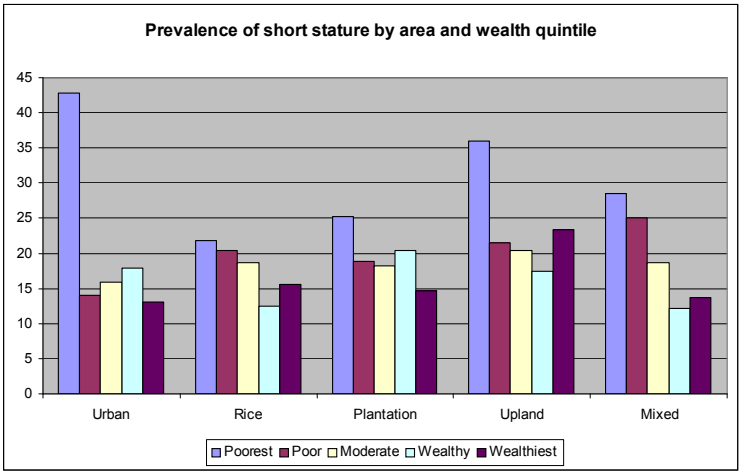

Figure 3.

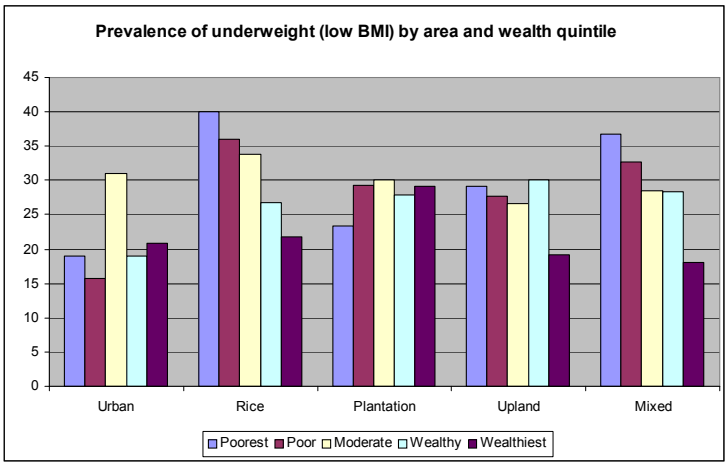

Figure 4.