Ethnic Differentials in Risks of Childhood Anemia: Evidence from DHS Nepal

Child undernutrition remains one of most of the most challenging aspects of the nutrition transition in lower and middle-income countries. Among all U.N. and MDG regions, South Asia (classified as South Central Asia or Southern Asia) is the most affected by child undernutrition, even more than Sub-Saharan Africa (United Nations Children's Fund, World Health Organization, and The World Bank 2012). In the last couple of decades other regions, including Africa, have made progress in reducing undernutrition— measured by indicators such as stunting, underweight and wasting. However, parts of South Asia still demonstrate high rates. While several explanations have been proposed, there is no consensus on the specific reasons for the persistence of child undernutrition. This project proposes to investigate how social determinants of child undernutrition can add to our understanding of such persistent rates in places like sub-continental Asia. Specifically it will examine anemic status in children under five in Nepal, using Demographic and Health Survey (DHS) data.

Deaton & Drèze (2009) qualified the effects of economic development on nutrition by showing it had not resulted in improvements in child nutrition status in India. Rising incomes have not led to higher per capita calorie intakes, and regions with higher intake did not see an improvement in undernutrition numbers. Other posited explanations include environmental pollution and the possibility that agricultural improvements, specifically fertilizers, have increased water pollution, with effects in utero that lead to decreased nutritional outcomes in later childhood (Brainerd and Menon 2012; Greenstone and Hanna 2011). Sanitation may also explain poor nutritional outcomes (Spears 2013). However, isolating a risk factor like water quality or sanitation is difficult, as it is often conflated with distal social determinants of health such as inequalities in gender or race-ethnicity. Community factors as well as household socioeconomic and demographic characteristics matter for say, water quality, but so do water sources and behavioral factors (McGarvey, Buszin, and Reed 2008). In some social contexts, socio-economic status (SES) and political context matter more, but less so in others. This project will attempt to show that considering the social context of child undernutrition will help us understand the persistence of such high rates.

Health disparities among different social groups can result from stratification and, in turn, lead to the reproduction of social inequality. This project investigates the presence of ethnic disparities in child health, examining child anemia in Nepal in the early 21st century. It uses childhood anemia as the outcome of interest, due to its well-recognized links to protein energy malnutrition. Child anemia is a good indicator of health status, as it can reflect nutritional deficiencies in important micro-nutrients like iron and vitamin A (Ramakrishnan and Semba 2008; Semba and Bloem 2002) as well as exposure to malaria or parasitic infections (Calis et al. 2008; Dreyfuss and Stoltzfus 2000). Nutritional assessments are particularly important in developing-country contexts due to the synergistic relation between undernutrition and infection on mortality (Schroeder 2008). An infection is much more dangerous to children affected by undernutrition and the combination leads to dangerous increases in risks of mortality. Crucially, mortality risks increase not just with severe undernutrition but also in its mild and moderate forms.

Using DHS data, this study identifies disparities in child anemia among broadly divided ethnic sub-groups in Nepal. Based on hemoglobin levels, the surveys detected moderate anemia (<9.9 g/dl) in 22 (in 2006) and 18 (in 2011) percent of children aged between 6 months and 5 years (below 59 months). Some groups showed higher prevalence than others (Table 1).

Table 1. Anemia rates among ethnic groups for children aged 6-59 months (weights-adjusted): NDHS 2006	
Ethnic group	**Rates**
Hill Brahmin	16.4
Hill Chhetri	20.8
Newar	10.4
Hill Janajati	16.0
Tarai Janajati	38.2
Hill Dalits	19.1
Tarai Dalits	33.8
Muslim	31.3
Other Tarai+	27.9
Other	22.5
Note: Restricted sample to non-missing data for household variables and hemoglobin tests for anemia prevalence.	

In initial results from 2006 data (N=4,421) show that children some groups showed twice the odds of anemia, compared to the reference group, even after taking into account different socio-economic and environmental variables. Adjustments are made for SES measures like household wealth, mother's education and for proximate exposures to parasitic diseases, using the elevation of settlement where the household is located. However, household wealth did not show much of an association with anemia levels, while mother's education showed some effect on anemic status.

Other factors are needed to better model the potential mediators of this association between health and ethnicity. These will include dietary intake measures; access to primary health care; and further information about the household, including involvement of the mother in agricultural activities and her nutritional and maternal history. If these factors are associated with ethnicity and anemic status, and especially if they attenuate the association, then these more concrete results may provide evidence for the effects of cultural and societal contexts on nutrition. Further analysis will thus use information present in the DHS data about nutritional and health behaviors.

The outcomes of this project have important consequences, given the developmental and health impacts linked with undernutrition and infections. The social and economic costs extend from disadvantages during childhood to adulthood, which may contribute to the reproduction of such inequalities. In the demographic literature, child health is established as an important determinant for future outcomes like educational achievement and social class attainment, based on developed country evidence, with implications for stratification (Palloni 2006). This link is being extended to lower and middle-income countries as well. New research on India shows that even after controlling for early-life conditions, child height is associated with cognitive achievement (Spears 2012). The specific effects on short and long-term behavioral and cognitive outcomes are many and, while often nutrient and condition-specific, they are lasting and, for the most part, permanent (Martorell 1999).

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