

A Child’s Well-Being: Food Insecurity and Antenatal Care (Nepal)

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Presented by: Yeshanew Belayneh, Jose Ruiz, Julieth Saenz, and José B. Santiago



INTRODUCTION

Preliminary studies on antenatal care have been performed and analyzed in Nepal in order to gauge the overall health of newborns and their families. Studies also show that malnutrition has no significant effect on children’s BMI’s in Nepal. We plan on analyzing whether factors like antenatal care and undernutrition have any affect on a child’s BMI and weight.

LITERATURE REVIEW

Gilberto and Michael (2012) used a sample of children 0–60 months of age (n=3,433) in Brazil to examine the association between Household Food Insecurity (HFI), weight for height z-score (WHZ) and Body Mass Index for age z-score (BMI-Z). They estimated a multiple linear regression model, which took into account the complex sampling design. The main finding of this study is an insignificant relationship between HFI and children’s BMI-Z for age or WHZ. A study by **Akoto Osei, Pooja Pandey et al** (2010) used a sample of 368 children 6 to 23 months of age to assess the relationship between household food insecurity and malnutrition among children aged 6 to 23 months in Kailali District of Nepal using multivariate logistic regression models. They found that there is no significant associations between household food insecurity and stunting, underweight, or anemia. **Nafisa Halim, Alok K Bohara and Xiaomin Ruan** (2010) used a sample of 8429 women aged 15–49 who have been married to examine the social determinants of the use of routine antenatal care in Nepal and estimate the value to child health of a safe and healthy motherhood. They measure antenatal care with (a) a binary outcome: 1 when a mother utilizes professional antenatal care, and 0 otherwise, and (b) a continuous variable: the frequency of visits during pregnancy. They found that education increases routine antenatal care utilization and that child health improves as a result.

RESEARCH QUESTION

How is child undernutrition in Nepal affected by food insecurity and antenatal care?



HYPOTHESES

Hypothesis 1: Antenatal care is negatively correlated with child undernutrition.
Hypothesis 2: Food-insecurity is positively correlated with child undernutrition.

DESCRIPTIVE STATS

Dataset used: DHS in Nepal.

Data restrictions: Rural areas, households with children under five years old, pregnancy duration of 9 months.

Sample Size: 1464 (from 0-60 months)
1294 (from 6-60 months)

8.15% of undernourished children.
11.2% of households report food insecurity.

We decided to run two models that have the same dependent and independent variables, but differ in the observations used for each model. Model 1 uses all children aged 0-60 months.

METHODOLOGY

We recognize that infants can be breastfeed for many months or years before they start consuming whole foods. With this recognition in mind, Model 2 uses all children aged 6-60 months in order to better capture the effects of undernutrition on a child’s health. Undernutrition is measured through a food index.

MODEL

$BMI = f(\text{antenatal care, food insecurity, } z) + u$

BMI: Standard deviations away from median body mass index by age.

Antenatal Care: Number of antenatal visits.

Food Insecurity: High score in a ten dichotomous questions survey about food security.

Z: Mother’s age, number of young children in the household, birth order, ecological belt, Brahmin/Chhetri ethnicity.

2SLS IV: $\text{Antenatal Care} = f(\text{Wealth Index, Mother’s education, Access to health facilities})$

RESULTS

Results for Sample 1 (0-60 months)

Variable	Model 1	Model 2	2SLS (Model 2)
# Antenatal Visits	2.380 (1.24)	1.769 (1.341)	18.177*** (3.913)
Severe Food Insecurity	-22.6959* (9.531)	-21.243* (9.532)	-13.636 (10.125)
Mother over 30 years old	-	12.678 (10.798)	18.850 (11.426)
# young children	-	-14.809 (4.427)	-10.112* (4.378)
Birth order	-	-3.857 (2.303)	2.182 (2.760)
Not Hill or Mountain	-	-16.610 (6.423)	-23.594*** (6.8864)
Brahmin / Chhetri	-	-12.004 (6.336)	-22.853 (7.051)
Intercept	-65.751*** (-5.315)	-21.617 (10.575)	-94.870 (19.677)
Diagnostics			
AIC	18031.46	18014.22	-
N (Observations)	1464	-	-
Adj. R-Squared	0.007	0.026	0.273
White's Test		P-value = 0.23	
Wu-Hausman F(1,1455)		P-value = 0.0000	
Basmann chi2(2)		P-value = 0.6118	
Min Eigenvalue Statistic		F = 71.7937	

Results for Sample 2 (6-60 months)

Variable	Model 1	Model 2	2SLS (Model 2)
# Antenatal Visits	1.735 (1.275)	1.331 (1.383)	18.758*** (4.079)
Severe Food Insecurity	-30.296** (10.036)	-28.549** (10.049)	-22.140* (10.710)
Mother over 30 years old	-	9.822 (11.375)	17.676 (12.142)
# young children	-	-14.269** (4.794)	-9.885 (5.155)
Birth order	-	-3.418 (2.41)	3.071 (2.915)
Not Hill or Mountain	-	-19.023** (6.769)	-26.963*** (7.36)
Brahmin / Chhetri	-	-13.466* (6.659)	-25.188*** (7.488)
Intercept	-59.899*** (5.497)	-17.537 (11.092)	-94.832*** (20.559)
Diagnostics			
AIC	15907.11	15893.15	-
N (Observations)	1294	-	-
Adj. R-Squared	0.008	0.022	-
White's Test		P-value = 0.143	
Wu-Hausman F(1,1455)		P-value = 0.0000	
Basmann chi2(2)		P-value = 0.494	
Min Eigenvalue Statistic		F = 63.0000	

Instruments: Wealth, Mother's education, and Access to health facilities.

Legend: β / (se), * p<.05; ** p<.01; *** p<.001

CONCLUSION

Based on our results for Model 1, we found that antenatal visits have a very significant impact on BMI and severe food insecurity has no significant impact on BMI. Model 2 shows a strong significance on severe food insecurity. These results also confirm the impact of antenatal visits and mother’s education on a child’s overall health from previous studies.

Using these results, we provide evidence indicating that food insecurity programs should focus on infants older than 6 months in order to properly combat problems of food insecurity. Undernutrition become prevalent after a mother stops breastfeeding her child. Recognizing habits and preferences of mothers’ care toward their children will also help reduce Nepal’s instances of child undernutrition.

REFERENCES

Halim, Nafisa, Alok K Bohara, and Xiaomin Ruan. 2010. “Healthy Mothers, Healthy Children: Does Maternal Demand for Antenatal Care Matter for Child Health in Nepal?” *Health Policy and Planning*, September.

Kac, Gilberto, Michael M. Schlüssel, Rafael Pérez-Escamilla, Gustavo Velásquez-Melendez, and Antônio Augusto Moura da Silva. 2012. “Household Food Insecurity Is Not Associated with BMI for Age or Weight for Height among Brazilian Children Aged 0–60 Months.” Edited by Yolanda Sanz. *PLoS ONE* 7 (9): e45747. doi:10.1371/journal.pone.0045747.

Keino, Susan, Guy Plasqui, and Bart van den Borne. 2014. “Household Food Insecurity Access: A Predictor of Overweight and Underweight among Kenyan Women.” *Agriculture & Food Security* 3 (1): 2. doi:10.1186/2048-7010-3-2.

Osei, Akoto Osei, Pooja Pandey,et al. "Food and Nutrition Bulletin, vol. 31, no. 4 © 2010, The United Nations University. 483 Household food insecurity and nutritional status of children aged 6 to 23 months in Kailali District of Nepal." *Food and Nutrition Bulletin* 31. (accessed July 20, 2014).

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