Household Food Insecurity and Maternal and Child Undernutrition: The Case of Maharashtra, India

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Food insecurity is believed to be one of the underlying determinants of undernutrition. However, the evidence on this link is not conclusive in the extant literature (Ali et al. 2015; Saha et al. 2009; Hackett et al. 2009; Baig–Ansari et al. 2006; Osei et al. 2007; Motbainor et al. 2015; Haddad et a;. 2014). A case in point is Maharashtra ─ one of the wealthier states in India.

Maharashtra's nutrition scenario has been paradoxical. One of the puzzles is the apparent dissociation of economic growth and nutrition and food security. Between 1994 and 2008, Maharashtra's per capita income increased more than one-and-a-half times while its nutrition status remained nearly stagnant according to several measures (Pitre et al. 2009). Until recently Maharashtra had one of the largest child (0-23 months) stunting rates in India — 39% (NFHS 2007). Simultaneously, the nutrition scenario is characterized by high rates of maternal underweight, the percentage of underweight women being just above the all-India rate of 35.6 per cent in 2008. The food security scenario has been equally grim with the state experiencing one of the highest rates of calorie deficiency among Indian states in 2004-05. In 2008, the state ranked 10 out of 17 Indian states by Global Hunger Index (von Grebmer 2008), listed in the

category of “alarming hunger”. The global comparison of the Hunger Index Rank reveals that Maharashtra is behind Rwanda, Cambodia and Burkina Faso, which are low income countries.

The second aspect of the puzzle is, since 2006 nutritional status of children has improved significantly, primarily with prevalence of child stunting declining significantly between 2006 and 2012; however food security continues to be a major concern (Haddad et al. 2014). The paradox signals an apparent lack of correspondence between the two phenomena, notwithstanding the fact that some other contributors to undernutrition such as drinking water and sanitation have not improved much in the context of Maharashtra. The apparent disconnect raises some doubt on the validity of the assertion that food insecurity is an underlying determinant of undernutrition. In this paper, we raise the question: to what extent household food insecurity contributes to undernutrition of maternal and child undernutrition in the Maharashtrian setting. The answer to the question is important not just in the Indian context but in the context of broader literature as well. If the answer is positive there are prospects to achieve progress in reduction of undernutrition by ameliorating food security provided other major drivers of undernutrition are taken care of.

Given the above, we test the following hypothesis in this study: household food security status is a predictor of nutritional status of women and children. The access to a rich micro database coming from Comprehensive Nutrition Survey Maharashtra (CNSM) 2012 (IIPS-UNICEF 2012) provides us the opportunity to rigorously test our hypothesis using state-of-the-art techniques in food security measurement. Primarily as a response to Maharashtra’s alarmingly rising stunting rates, the Maharashtra Nutrition Mission was launched in March 2005 with a focus to universalize coverage of proven nutrition interventions during the 1,000-day window of opportunity. To assess the impact of Mission the Government of Maharashtra conducted the CNSM in 2012 on a representative sample more than two thousand children aged 0-23 months and their mothers. The survey collected information on various nutritional behaviours, anthropometry and service access, including food security which is assessed using FANTA Household Food Security Access Scale (HFIAS).

The few studies that examine the above relationship in the Indian context (Mukhopadhya and Biswas 2011; Gupta et al. 2013) as well as in the broader extant literature (Ali et al. 2015; Saha et a. 2009; Hackett et al. 2009; Baig–Ansari et al. 2006; Osei et al. 2007; Haddad et al. 2014) have certain limitations, to the extent they do not address the concerns regarding the presence of unobserved confounders in determining the causal effect of household food insecurity on nutritional status of children and women in the households. Failure to adhere to the latter often tends to bias the true measured impact of food security status on indicators of undernutrition, especially in cross section data. Our study is an attempt to address the above gaps.

First, we apply a recent development in measuring household food security – the HFIAS. Household Food Insecurity Access Scale is an experiential food security scale developed by the FANTA (Coates et al. 2007). The scale captures household food insecurity (HFI) experiences reported by adults in the family on their inability to access food owing to income constraints and ranks them based on affirmative answers to nine items with four frequency responses (Coates et al. 2007). HFIAS has been applied in other Indian settings as well (Chinnakali et al. 2014; Chatterjee et al, 2012; MSF 2008; Pasricha et al., 2009; IFPRI 2015), however, in different contexts. Second, we use simultaneous probit models to address the concerns regarding

unobserved confounders in estimating the causal effect of household food security on maternal and child nutritional status.

Children's nutritional status is assessed using stunting, wasting and underweight, while women's nutritional status is examined using BMI-status – underweight or overweight (Table 1). Results (Table 2) indicate household food security status is significantly associated with child wasting, child underweight but not with stunting. Household food security status is also a strong predictor of women's underweight but not overweight. These findings have important policy implications since they direct towards the need to ameliorate household food access for the purpose of addressing short term nutritional deprivation of mothers and children. However, long term deprivation captured by stunting requires further investigation. It is important that future research directs its attention to explore the pathway linking lack of food access to nutritional outcomes so that remedial actions can be prompt and effective.

References

Ali, Disha, Kuntal K. Saha, Phuong H. Nguyen,Michael T. Diressie, Marie T. Ruel, Purnima Menon, and Rahul Rawat. Household Food Insecurity Is Associated with Higher Child Undernutrition in Bangladesh, Ethiopia, and Vietnam, but the Effect Is Not Mediated by Child Dietary Diversity.

Baig-Ansari N, Rahbar MH, Bhutta ZA, Badruddin SH. Child's gender and household food insecurity are associated with stunting among . young Pakistani children residing in urban squatter settlements. Food Nutr Bull. 2006;27:114–27.

Chatterjee, N., G. Fernandes, and M. Hernandez, Food insecurity in urban poor households in Mumbai, India. Food Security, 2012. 4(4): p. 619-632.

Chinnakali, P., R.P. Upadhyay, D. Shokeen, K. Singh, M. Kaur, A.K. Singh, A. Goswami, K. Yadav, and C.S. Pandav, Prevalence of Household-level Food Insecurity and Its Determinants in an Urban Resettlement Colony in North India. Journal of Health, Population, and Nutrition, 2014. 32(2): p. 227-236.

Coates, J., A. Swindale, and P. Bilinsky, *Household Food Insecurity Access Scale (HFIAS) for measurement of household food access: indicator guide (v. 3).* 2007, Food and Nutrition Technical Assistance Project, Academy.

Hackett M, Melgar-Quin˜onez H, Alvarez M. Household food insecurity associated with stunting and underweight among preschool children in Antioquia, Colombia. Rev Panam Salud Publica. 2009; 25:506–10.

Haddad, L., N. Nisbett, I. Barnett, and E. Valli. 2014. Maharashtra's Child Stunting Declines: What Is Driving Them? Findings of a Multidisciplinary Analysis. Brighton, UK: Institute of Development Studies.

International Institute of Population Sciences (IIPS) (2007) National Report: National Family Health Survey (NFHS-3) 2005–06. IIPS: Mumbai, India.

IIPS-UNICEF, *Comprehensive Nutrition Survey of Maharashtra Report*. 2012, Available at : http://iipsindia.org/cnsm_report.htm.

Motbainor*, A., AlemayehuWorku, AberaKumie.Stunting Is Associated with Food Diversity while Wasting with Food Insecurity among Underfive Children in East and West Gojjam Zones of Amhara Region, Ethiopia.PLoS One. 2015 Aug 18; 10(8):e0133542. doi: 10.1371/journal.pone.0133542. eCollection 2015.

Osei A, Pandey P, Spiro D, Nielson J, Shrestha R, Talukder Z, Quinn V,Haselow N. Household food insecurity and nutritional status of children aged 6 to 23 months in Kailali District of Nepal. Food Nutr Bull. 2010;4:483–94.

Pitre, A., Hari, L., Kamble, M., Sardeshpande, N., Padhye, R and S. Mishra (2009). Nutritional Crisis in Maharashtra. Pune, India, Report prepared by SATHI (Support for Advocacy and Training to Health Initiatives) for Maharashtra Health Equity and Rights Watch.

Saha KK, Frongillo EA, Alam DS, Arifeen SE, Persson LA, Rasmussen KM. Household food security is associated with growth of infants and young children in rural Bangladesh. Public Health Nutr. 2009;12:1556–62.

von Grebmer, K., Fritschel, H., Nestorova, B., Olofinbiyi, T., Pandya-Lorch, R., & Yohannes, Y. (2008). The Global Hunger Index – The Challenge of Hunger 2008. Bonn, Washington DC, Dublin.