Contribution ID: **42** Type: **Poster**

Trends and Inequity in the Double Burden of Malnutrition in India between 2006-2016: Insights from Nationally Representative Surveys

Introduction: India is experiencing an emerging burden of overweight/obesity and other diet-related non-communicable diseases (NCD) alongside high burden of undernutrition in the context of multiple forms of inequities within the country. This paper aims to: 1) examine trends in underweight and overweight/obesity between 2006 and 2016; 2) assess the changes in socioeconomic (SES) inequalities in these outcomes by gender and urban/rural residence; 3) identify factors associated with overweight/obesity, hypertension and high blood sugar in 2016; and 4) examine drivers of changes in overweight/obesity over time.

Methods: Data were from the 2005-06 National Family Health Survey (NFHS-3) and the 2015-16 NFHS-4 (n~ 767,000 women and 177,000 men). The main outcome measures were 1) underweight (body mass index [BMI in kg/m2] <18.5), 2) overweight/obesity (BMI ≥23 –cut-off based on the high risk for NCDs among Asian population), 3) hypertension (≥140 [systolic] or ≥90 [diastolic] or taking medication or prior diagnosis by physicians), and 4) high blood glucose (fasting plasma glucose ≥ 100 mg/dL or taking medication). Data for hypertension and high blood glucose were available only in 2016. We used t-test to examine changes in underweight, overweight/obesity over time. We constructed SES quintiles (Q) and assessed inequalities in these outcomes using concentration and slope indices. We used logistic regression to examine factors associated with all outcomes, and regression-based decomposition to estimate predicted changes in overweight/obesity over time.

Results: Between 2006 and 2016, the prevalence of underweight reduced significantly for women (36 to 23%) and men (34 to 20%), but overweight/obesity increased in both groups (21 to 33% and 20 to 35%, respectively). Hypertension and high blood glucose were slightly higher among men than women in 2016 (17 vs.12% and 15 vs.12%, respectively. On average, 45% women and 49% men had 1 or more of these conditions. Overweight/obesity increased rapidly with SES quintile at almost the same pace in both men and women and in rural and urban areas. Equity gaps between highest and lowest SES quintiles (Q5-Q1) for underweight (19-26%) and overweight (28-32%) were large in both rural and urban areas in 2006; these gaps became narrower for underweight, but were unchanged for overweight in 2016. The equity gap (Q5-Q1) was small for hypertension (2-3% in women and 5-9% in men), and almost unobservable for high blood glucose. Compared to adults in Q1, those in Q5 were 2.6 times more likely to be overweight/obese and 1.2 times higher hypertension. Being overweight/obese was associated with higher odds of hypertension (OR:2.16; 95% CI: 2.03-2.30) and high blood glucose (OR:1.43; 95% CI: 1.36-1.51). Improvement in SES explained 30% of the changes in overweight/obesity in the last decade.

Conclusions: The growing double burden of malnutrition across the SES strata and in both rural and urban areas in India is alarming. Due to its high population, the country will soon have staggering numbers of people and households experiencing the dual burden. It is therefore imperative for India to develop a strong nutrition strategy that simultaneously addresses multiple forms of malnutrition and socioeconomic inequalities.

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Session Classification: Poster session 1

Track Classification: Epidemiology