

Presentation Title : Trends and Inequities in Food, Energy, Protein, Fat and Carbohydrate Intakes in Rural Bangladesh

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Rational and Objectives

- Limited evidence on food consumption patterns and how disparities in food and nutrient intakes have changed
- BDHS does not collect individual-level food intake data.
- Household Income and Expenditure Surveys (HIES) collect data on the quantity, source, and value of food consumption at the household level.
- Household-level food consumption data are relatively accurate at estimating individual-level nutrient intake and adequacy, the predictions are less accurate for certain populations, such as young children.
- Household-level food consumption data cannot be used to estimate varying nutritional demands by age and physical status.
- The Bangladesh Integrated Household Survey (BIHS), nationally representative panel data of households in rural Bangladesh, collected individual-level dietary intake for all household members.
- Examined the trends and adequacies in energy, protein, fat, and carbohydrate intakes between 2011 and 2018 for all household members
- And assessed changes in inequities in nutrient intakes by age group, sex, and expenditure quintile over the 7-year period.

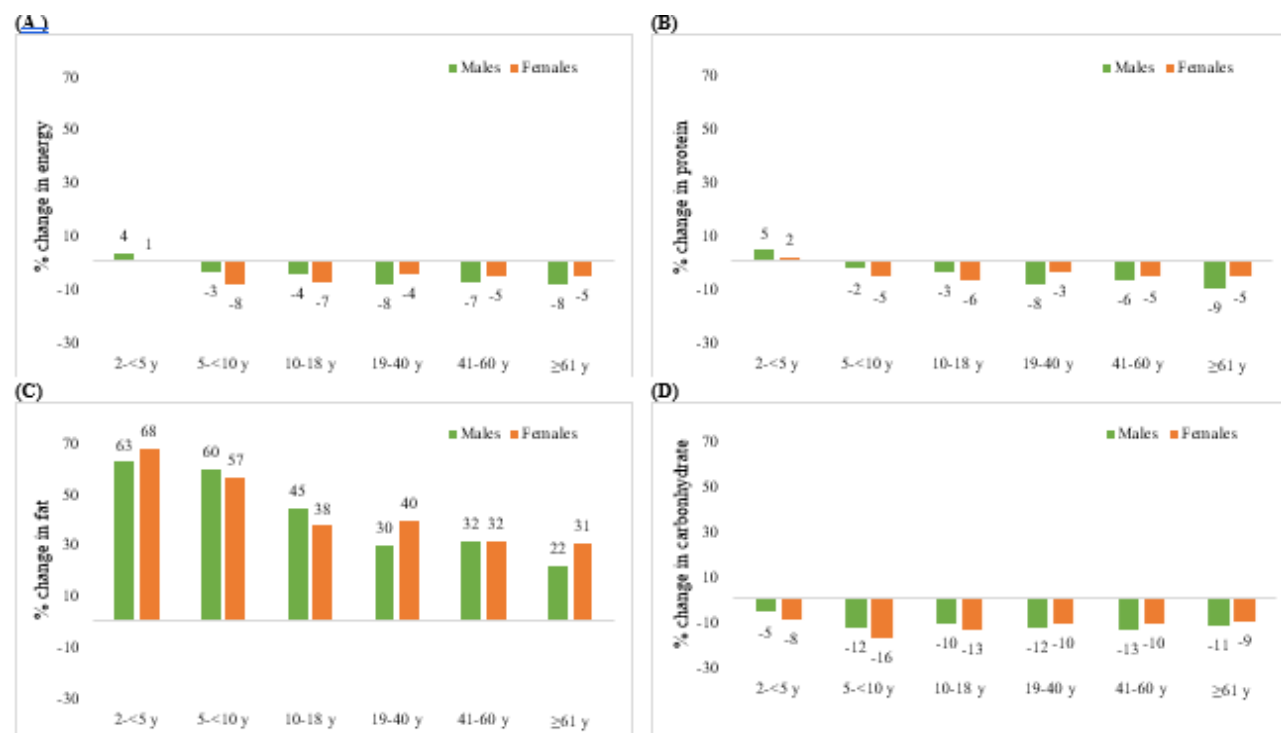
Methods and Analysis

- Data Source: Two rounds of Bangladesh Integrated Household Survey (BIHS) data collected in 2011 and 2018
- Data Collection method: 24-hour recall and food-weighing
- Sample Size:
 - 2011: Households (5503) and Individuals (20,339)
 - 2018: Households (5604) and Individuals (19,818)
- Inclusion: ≥ 2 years old individuals
- Exclusion: Fasting, Sickness, Unwilling, Away from home and Energy Intake Range (<500 kcal and >5000 kcal)
- Food Composition Table (FCT): Bangladesh FCT used to assess macro nutrient intake
- Estimated energy requirements (EERs) were calculated following the FAO/WHO
- The EER is the product of the individual's basal metabolic rate (BMR) and his/her physical activity level (PAL)
- Energy intake was categorized as insufficient if it was $< 85\%$ of EER
- The % of energy from protein, carbohydrate, and fat intakes was compared with the Acceptable Macronutrient Distribution Ranges (AMDRs) for assessing insufficient or excessive intake
- Equity plots were used to visualize the prevalence of insufficient intake, disaggregated by per capita expenditure quintile for each age/sex group.
- Absolute and relative income inequities were examined by age group using the slope index of inequality (SII) and the concentration index (CIX)

Results : Energy, Protein, fat and Carbohydrate Intake

- Minimum dietary diversity significantly improved in both males and females for all age groups
- But the total quantity of food consumed decreased by 6%, from 930 to 873 g/d (lower than the Desirable Dietary Intake (DD) of 1240 g/d)
- Energy consumption decreased for all age groups (Except 2-5 years)
- Protein consumption decreased for all age groups (Except 2-5 years)
- Carbohydrate consumption decreased for all age groups.
- But fat consumption increased for all age groups

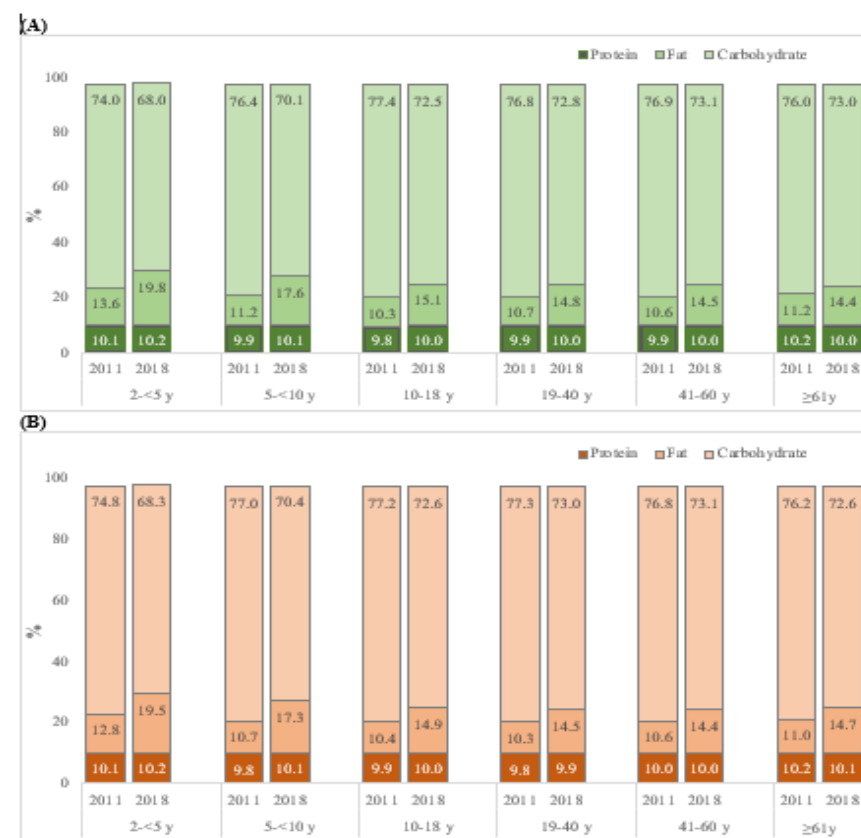
Figure 1: Changes in energy and macronutrient intakes between 2011 and 2018, by age group and sex



Insufficiency and Balance diet

- Insufficient energy intake (<85% EER) was high in children aged <5y (~40%) and did not change over time
- Insufficient energy intake was lower in other age groups and increased over time.
- Approximately 20% of children aged <5 years and over >50% of older children and adults (52-62%) did not meet protein requirements
- In 2011, >90% did not meet the fat intake requirements. Insufficient fat intake decreased in all age groups (5-13 pp)
- Carbohydrate intakes exceeded the upper bound of the AMDRs for most of the population, and decreased for all age groups over time, with a higher reduction among children aged 2-9 y (17-18 pp) than adults (5-8 pp).
- In 2011, more than three-quarters of energy contributions came from carbohydrate, 10-14% from fat, and ~10% from protein.
- The contribution of protein to total energy did not change over time,
- But the contribution of fat to total energy slightly increased (by 3-7% for different age groups)

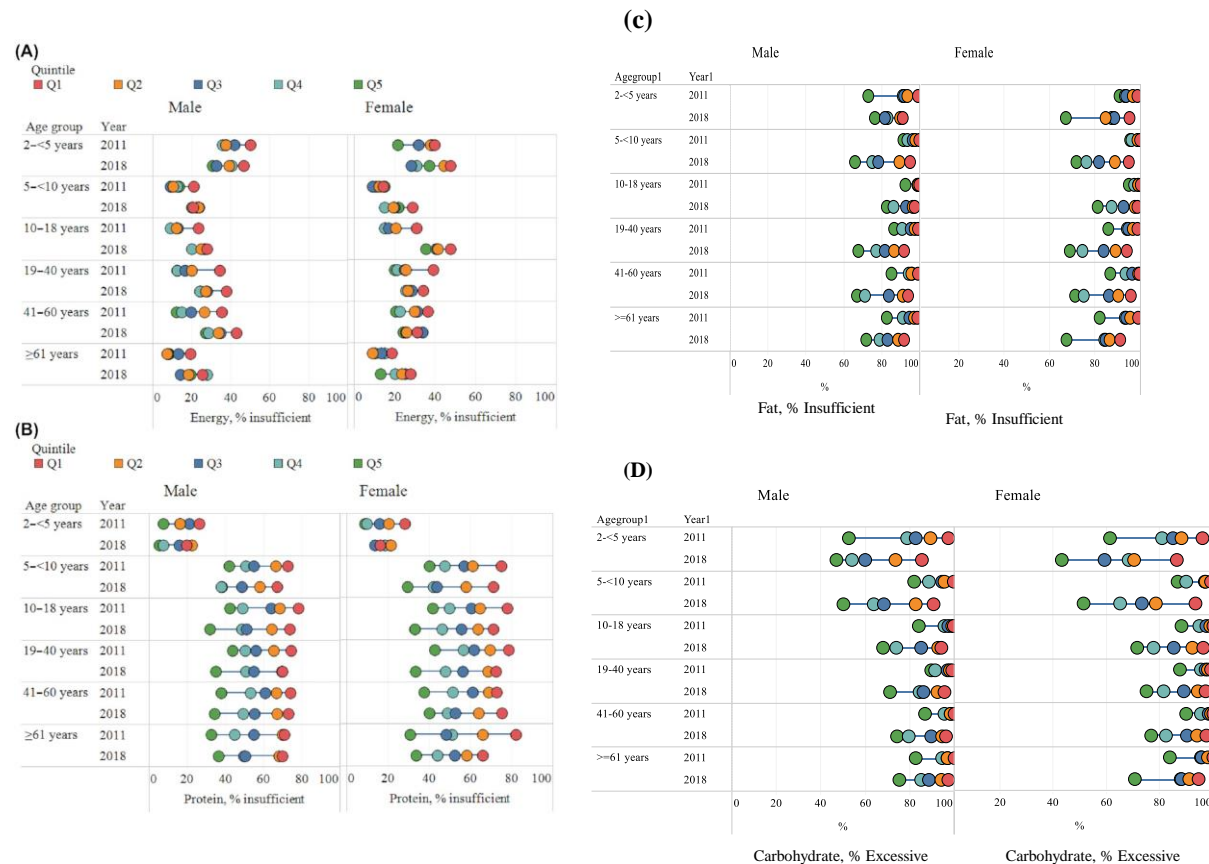
Figure 2: Contribution (%) of energy from protein, fat, and carbohydrate, by age group, sex, and survey rounds



Inequities in Energy and Macronutrient intakes

- Insufficient energy, Protein and fat intake was higher among poorer
- Poorer individuals were more likely to have excessive carbohydrate intakes
- The inequity gaps in energy intake decreased between 2011 and 2018 among boys 5–10 y old and men aged 19–60 y,
- But did not change for children <5 y old and men aged ≥61 y. The wealth gaps also decreased among women aged 19–60 y
- The wealth gaps in protein intake did not change across age groups, except among girls aged <5 y whose wealth gap decreased over time.
- For fat, the differences between income groups were medium in all age groups (in 2011–SII: –8 to –24 pp for males and –5 to –19 pp for females),
- But the difference for fat increased between 2011 and 2018 in both males (SII: –19 to –36 pp) and females (SII: –19 to –32 pp), except among children aged <5 y and the elderly aged ≥61 years
- The wealth gaps in terms of excessive carbohydrate intakes grew over time for all age groups except for the elderly aged ≥61 y.

Figure 3: Inequity in energy and macronutrient intake, by age group, sex and survey rounds



Policy Implications

- In Bangladesh, agricultural diversity is associated with dietary diversity. But, rice is overwhelmingly dominant in Bangladesh's crop patterns and diets.
- The growth in the production of non-rice crop and non-crop agricultural commodities (livestock and fish) must be augmented to improve the dietary diversity.
- Year-to-year price fluctuations are much larger for non-rice crops than for rice, Developing value chains to link producers to food processing industries and food supermarkets can help to mitigate the this
- Trainings that combined production of diverse, high-value, nutrient-rich foods and nutrition behavior change communication (BCC) are effective in improving production diversity and diet quality among rural farm households in Bangladesh
- Develop efficient and effective food systems for enhanced production of nutrient-rich food, as well as processing, marketing, preparation, and consumption of these foods.
- Women are key actors within the food system, and that their empowerment improves dietary diversity as well as household food security

Thank You all

The article published in the *Journal of Nutrition* is available in the following link: <https://academic.oup.com/jn/advance-article/doi/10.1093/jn/nxac198/6679108#supplementary-data>