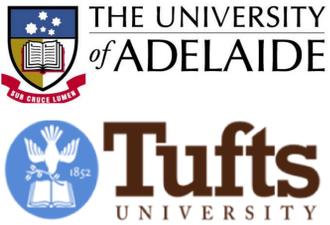


# Dietary diversity in early life: Evidence from 67,241 infants aged 6-24 months in 39 developing countries



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## Background

- Malnutrition in childhood has lifelong consequences for health and productivity, and is most widespread in early life (6-24 months)
- Diet quality is closely linked to the number of food groups consumed, as in the WHO-UNICEF measure of Child Diet Diversity (CDD)
- Surveys of adults have revealed large income elasticities of demand for diversity away from starchy staples into other foods (Bennett's Law)
- Infants' dietary diversity has only recently been measured with sufficient accuracy and sample size to document demand for child nutrition
- We merge data on child diets with household wealth, community characteristics and agroecological conditions to identify the location and timing of early-life malnutrition in 39 low- and middle-income countries

## Research Questions

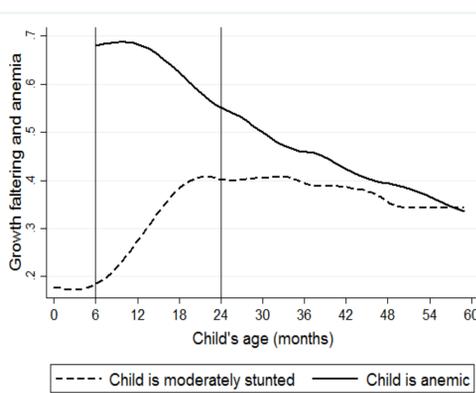
- What determines dietary diversity among young children?
- What are the roles of household wealth, education & health services?
- What are the roles of community infrastructure, climate and agriculture?

## Data and Methods

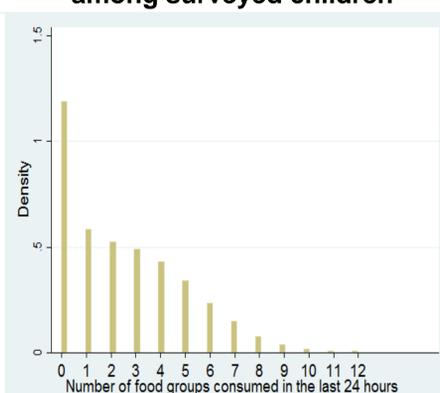
- Since 2005, DHS questionnaires use WHO-UNICEF guidelines to ask whether child was fed each item on a standardized food list in previous 24 hrs, and also document child's anemia status and various household characteristics
- We compile results from 47 surveys in 39 countries, totaling 67,241 children surveyed between 2006 and 2013, merged with administrative data, satellite imagery and climatological information for each household location
- We use non-parametric regression to describe the time path of growth faltering and anemia, and the non-linear relationships between dietary diversity, household wealth and other variables of interest (results below)
- We use OLS to estimate a multilevel model of child dietary diversity by age at 6-23 months, 6-11 months and 12-23 months (pooled results at right)

## Nonparametric Results

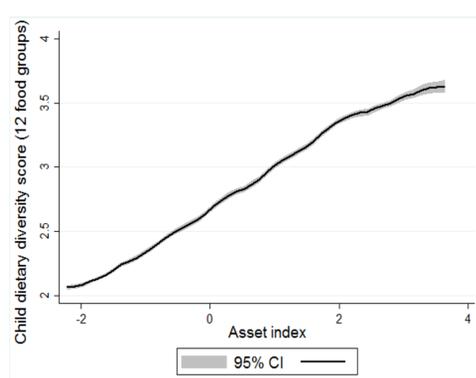
### Stunting accelerates in 6-23 month window and anemia peaks



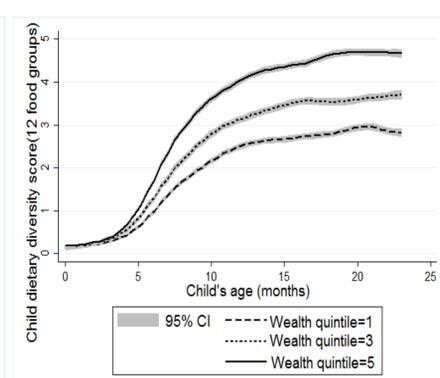
### Diet diversity is low in this sample, but varies widely among surveyed children



### Wealthier households reveal a clear preference for greater child diet diversity at all levels of wealth

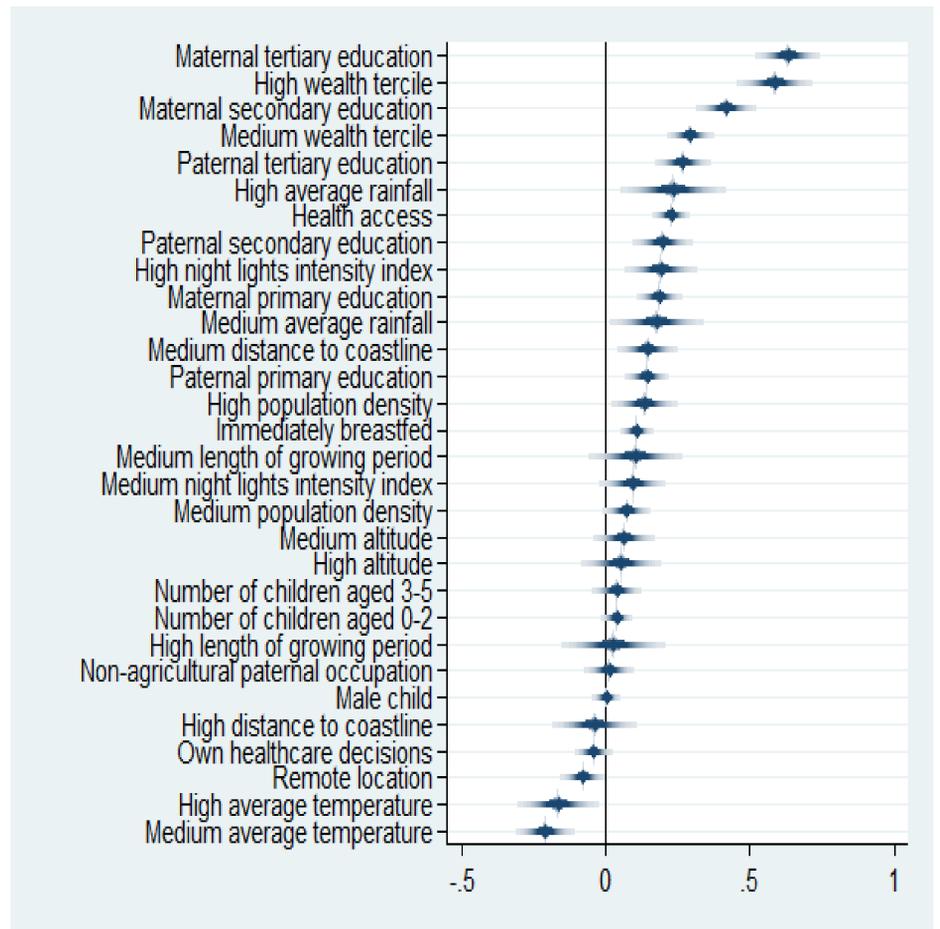


### Diet diversity differences across wealth quintiles begin to emerge at around 6 months



## Multilevel Model Results

### Household and community factors in child diet diversity



Note: Dependent variable is number of food groups consumed in past 24 hrs; results shown are OLS estimates for all children aged 6-23 months (n=67,241) with additional controls for child age country and year fixed effects with standard errors clustered at level of DHS enumeration area (villages).

## Effect Modifiers

- Child diets follow Bennett's law, with an additional 0.29-0.59 food groups consumed with each increase in household wealth tertile.
- Household access to markets (travel time to town, night lights, population density) is associated with higher CDD only at older ages (12-23 months). In contrast, maternal access to health services (antenatal care, facility birth and vaccinations) is associated with improved child feeding practices in early infancy (6-11 months) as well.

## Conclusions

- Malnutrition occurs very early in life, requiring large household surveys to obtain data on a sufficient number of infants at each age
- Recent DHS surveys, merged with other information, provide novel evidence on economic behavior regarding infant and young child feeding
- Household wealth alone can account for some but not all of the observed variation in child diet diversity and early-life malnutrition
- Also important are parental education and maternal & child health services, while market conditions primarily affect diets at older ages
- Climate change could influence malnutrition: shifts towards hotter and drier conditions expected to reduce dietary diversity for infants

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