Cash Transfers and Adolescent Nutrition Outcomes: Evidence from the Child Support Grant in South Africa

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Motivation
- Adolescence is a period of high growth characterized by numerous biological and physiological changes.
- However, there is scarce evidence on the impact of interventions such as cash transfers on adolescent nutritional outcomes, especially in the context of a double burden of malnutrition.
- Research Question: To examine the effect of Child Support Grant on the nutrition outcomes of adolescents based on the Body Mass Index (BMI)-for-age z-scores
- The Child Support Grant (CSG), introduced in 1998, is a means tested grant provided to age-eligible poor children in South Africa.
- Grant terminates at the end of the month in which the child crosses the age threshold.
- Increase in age-eligibility criterion in increments of 1 during the study period (2008-2012) extended grant receipt for the same set of cohorts (Table 1).

Data
- Longitudinal data from the National Income Dynamics Study (NIDS) 2008, 2010-11, and 2012 waves.
- Adolescents aged 11-19 in every survey.
- CSG = 1 for CSG grant beneficiary, = 0 non-beneficiary.
- Elig = 1 if age-eligible at the month and year of survey.
- Nutrition Outcomes following WHO 2007 growth standards:
  - Body Mass Index (BMI)-for-age z-score.
  - Nutrition Status:
    - Underweight: BMI z-score < -2 sd
    - Normal: -2 ≤ BMI z-score ≤ 1 sd
    - Overweight: 1 < BMI z-score ≤ 2 sd
    - Obese: BMI z-score > 2 sd

Methodology
- Fuzzy regression discontinuity (RD) design exploiting exogenous cohort variation in grant receipt.
  - First Stage (Linear Probability Model):
    \[ CSG_{it} = \beta_0 + \beta_1 \text{Elig}_{it} + \beta_2 f(X_{it}) + \beta_3 \text{Elig}_{it} \times f(X_{it}) + \beta_4 H_{it} + \lambda_t + u_{it} \] (1)
  - \( X_{it} = \text{Age} - \text{Age eligibility cutoff} \rightarrow \text{centered running variable} \)
  - \( H \) is a matrix of household and community characteristics, \( \lambda_t \) are the time fixed effects.
  - Two Stage Least Squares (for continuous BMI z-score)
    \[ BMI_{it} = \alpha_0 + \alpha_1 CSG_{it} + \alpha_2 f(X_{it}) + \alpha_3 \text{Elig}_{it} \times f(X_{it}) + \alpha_4 H_{it} + \lambda_t + e_{it} \] (2)
  - Control Function Approach: Multinomial Logit model (for nutritional status categories)
    - The probability of an adolescent in nutritional status \( s \) at time \( t \) is given:
      \[ P_{st} = \frac{\exp(V_{st})}{\sum_{s=1}^{4} \exp(V_{st})} \quad s \in \{\text{underweight, normal, overweight, obese}\} \quad \text{where} \]
      \[ V_{st} = \alpha_0 + \alpha_1 CSG_{it} + \alpha_2 f(X_{it}) + \alpha_3 \text{Elig}_{it} \times f(X_{it}) + \alpha_4 H_{it} + \lambda_t + u_{it} + e_{it} \] (3)

Results
- RD identifying assumptions:
  - Covariates smooth around the age-eligibility cutoff.
  - No evidence of sorting into the eligible group.

Robustness Checks:
- Insensitive to different bandwidths.
- Similar results with higher-order polynomials of the running variable.
- Robust to donut-hole approach.
- No effects at arbitrary cutoffs.

Conclusions
- CSG receipt increases BMI z-scores and the probability of being overweight among females beneficiaries associated with health risks.
- However, cash transfers decrease underweight prevalence and obesity among females.
- Improved nutrition has implications for reproductive health of girls.
- Cash transfers can reduce health care costs of extreme under-nutrition and over-nutrition.

<table>
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<th>Reform month</th>
<th>Age-eligibility Threshold</th>
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<tr>
<td>January 2012</td>
<td>18</td>
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</tbody>
</table>

Table 1: Age-eligibility changes since commencement

Figure 1: Age eligibility and grant receipt
Figure 2: Marginal effects of Child Support Grant receipt
Figure 3: Marginal effects of grant receipt: Females
Figure 4: Marginal effects of grant receipt: Males