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).

Reform month	Age-eligibility Threshold
April 1998	7
April 2003	9
April 2004	11
April 2005	14
January 2009	15
January 2010	16
January 2011	17
January 2012	18

Table 1: Age-eligibility changes since commencement

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 $\leq$ BMI z-score $\leq$ 1 sd
  Overweight: 1 $<$ BMI z-score $\leq$ 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):

$$CSG_{it} = \beta_0 + \beta_1 Elig_{it} + \beta_2 f(X_{it}) + \beta_3 Elig_{it} * f(X_{it}) + \beta_4 H_{it} + \lambda_t + u_{it} \quad (1)$$

$X_{it} = Age - Age\ eligibility\ cutoff \rightarrow$ centered running variable
H is a matrix of household and community characteristics, λ_t are the time fixed effects

- **Two Stage Least Squares** (for continuous BMI z-score)

$$BMIz_{it} = \alpha_0 + \alpha_1 \hat{CSG}_{it} + \alpha_2 f(X_{it}) + \alpha_3 Elig_{it} * f(X_{it}) + \alpha_4 H_{it} + \lambda_t + e_{it} \quad (2)$$

- **Control Function Approach: Multinomial Logit model** (for nutritional status categories)

The probability of an adolescent i in nutritional status s at time t is given:

$P_{it}^s = \frac{e^{V_{it}^s}}{\sum_{s=1}^{4}(e^{V_{it}^s})}, \quad s \in (underweight, normal, overweight, obese)$ where

$$V_{it}^s = \alpha_0 + \alpha_1 CSG_{it} + \alpha_2 f(X_{it}) + \alpha_3 Elig_{it} * f(X_{it}) + \alpha_4 H_{it} + \lambda_t + \hat{u_{it}} + e_{it} \quad (3)$$

Results

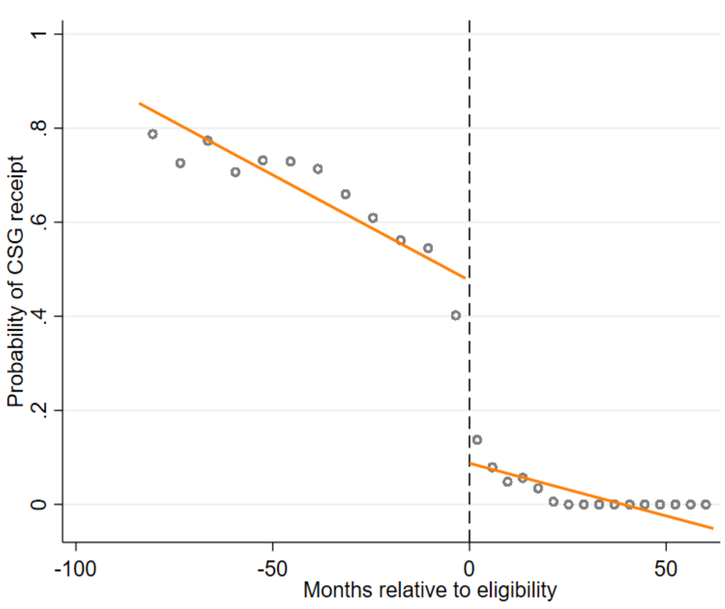

Figure 1: Age eligibility and grant receipt

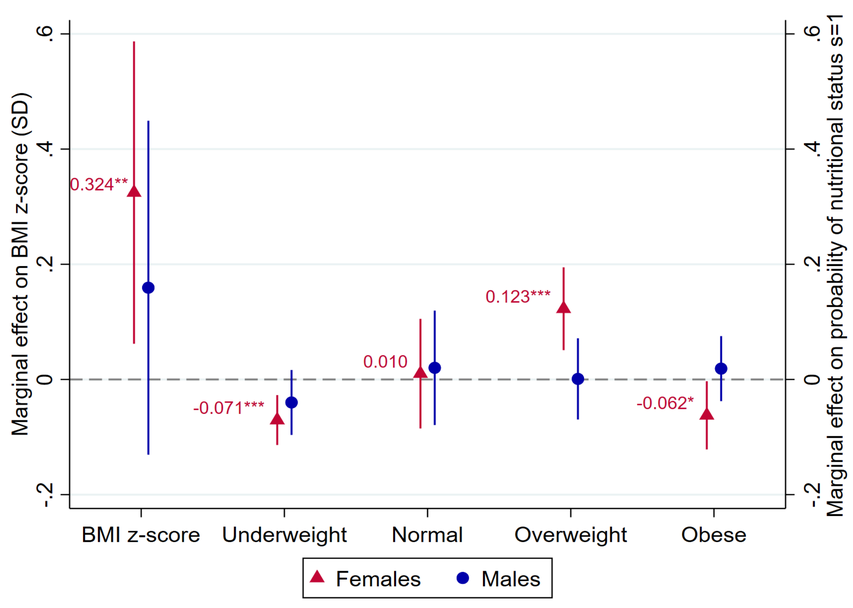

Figure 2: Marginal effects of Child Support Grant receipt

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

Quantile regression results

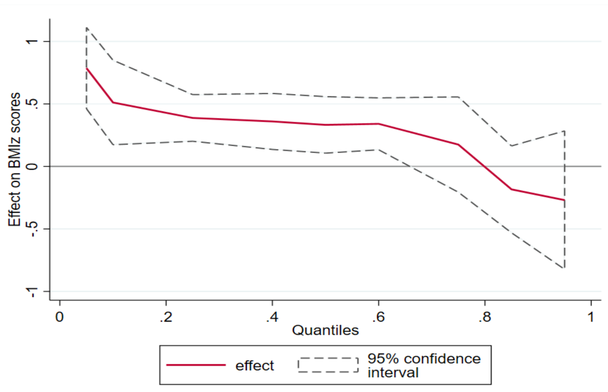

Figure 3: Marginal effects of grant receipt: Females

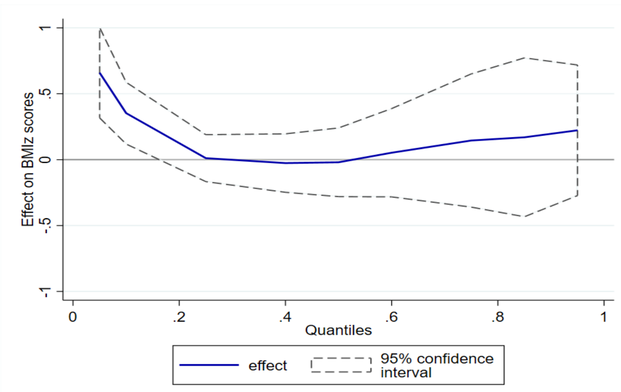

Figure 4: Marginal effects of grant receipt: Males

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