

# Intergenerational Transmission of Mother-to-Child Health:

## Evidence from the Philippines

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  - These data hard to come by in developing countries ⇒ all use data from developed countries

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  - Use Singular Value Analysis (SVA) to strengthen weak instruments

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- Transmission to child height increases with age up to adolescence at which point it falls
  - Not fully explained by birth health or socio-economic mechanisms—only account for 15—30% of transmission
  - Suggestive evidence that transmission affects the endocrinological regulators of pre-pubertal growth and growth velocity

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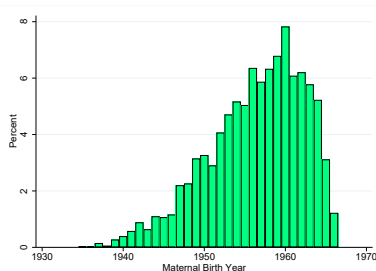
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    - Birth weight (standard measure at birth)
    - HAZ (stock) and WHZ (flow)



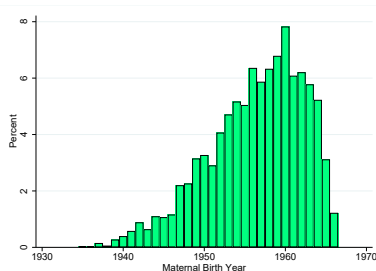
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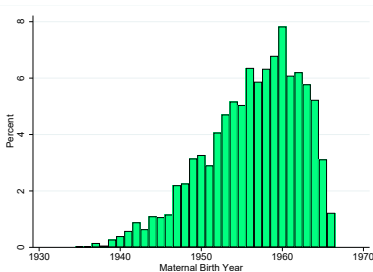
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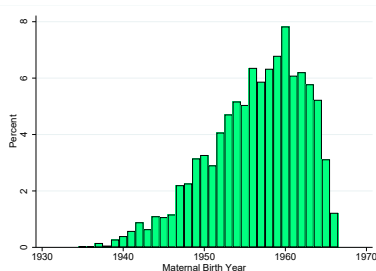
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- Mothers born between 1936 and 1966; most in the 1950s
- Thus, we need climate data from 2-4 decades prior to the birth of sample children in 1983/84



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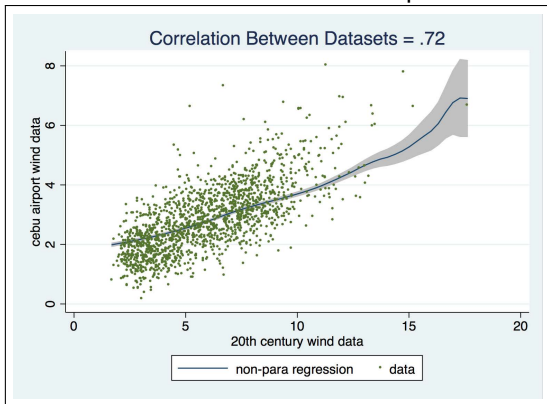
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- Pre-satellite climate data predicted with surface observations of synoptic pressure, sea surface temperature, sea ice distribution — all highly predictive of true temp, rain, and wind patterns



# Correlation between Re-Analysis Predicted Wind Data and Observed Wind Data

Re-analysis wind speed data exhibits high correlation with wind speed data collected at the Cebu Airport



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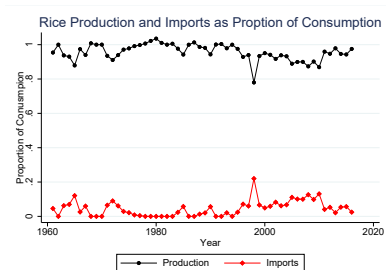
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  - in 1960s, less than 15.5% use any contraceptive practice, less than 4% of which use modern contraceptives (1968, DHS)

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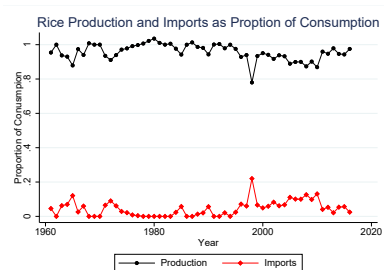
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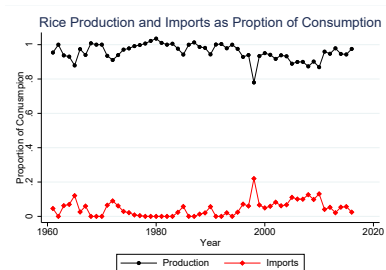
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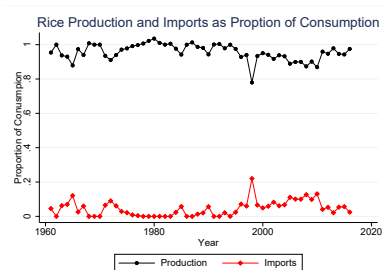
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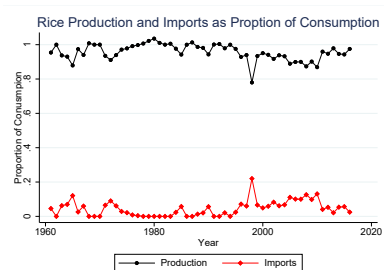
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  - Agriculture highly protected up to 1990s resulting in very low food imports when sample mothers were young



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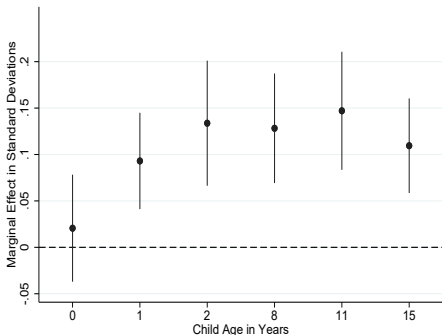
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  - Use cross-validation/sample splitting to choose the “best” SVA-generated linear combination of climate signals that **forecasts** mother’s health
  - Results are similar using LASSO or PCA with LASSO boosting

## Exogenous Right-Hand-Side Variables

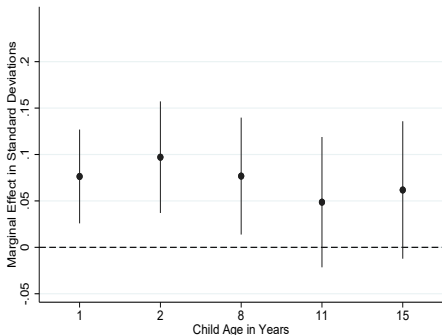
- Mother's age, mother birth cohort dummies (because children born in same year, equivalent to controlling for mother's year of birth)
- Baseline baranagay and child birth month fixed effects
- For birth outcomes only, also include indicator for whether gestational age is in question

# Marginal Effect of Maternal Health on Child Health across Ages

Panel A: Child HAZ



Panel B: Child WHZ or ZBMI



## Results 1

# Mechanisms for Transmission

We suggest 3 potential channels through which this transmission operates

- The influence of maternal health on socio-economic status and parenting ability



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- The influence of maternal health on socio-economic status and parenting ability
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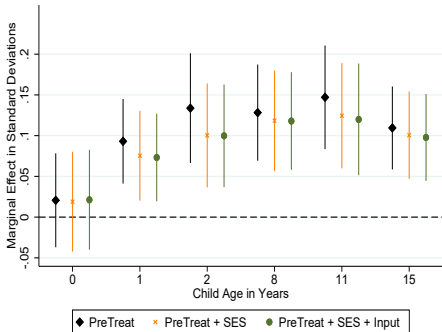
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- The influence of maternal health on socio-economic status and parenting ability
  - Control for a rich set of socio-economic characteristics and parental inputs across ages
  - e.g., per-capita income, maternal education, vaccination status, time allocation, child expenditure, many more...

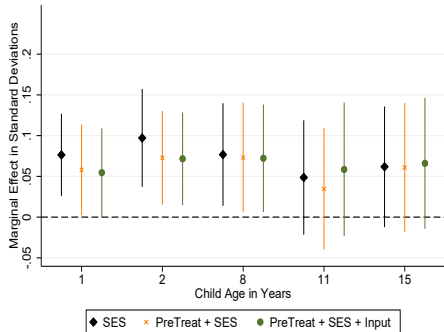
	Socio-Economic Controls 1	Parental Input Controls 2
Birth	Per capita household income, Household size, Mother's education, Baseline asset value; Access to piped water, Flushable toilet, Electricity; Garbage taken away after disposal; Uses clean cooking fuel, Food area kept clean; Excreta visible around HH	Took prenatal vitamins; Received prenatal care; Baby delivered by doctor; Baby delivered in hospital
Age 1	Per capita household income, Household size, Mother's education, Year 1 asset value; Access to piped water, Flushable toilet, Electricity; Garbage taken away after disposal; Household uses clean cooking fuel, Food area kept clean; Excreta visible around HH; Animals kept inside HH	In last year child given vitamins or minerals, vaccinations, or non-treated water; Child breastfed for full first year
Age 2	Per capita household income, Household size, Mother's education, Baseline asset value; Access to piped water, Flushable toilet, Electricity; Garbage is taken away after disposal; Uses clean cooking fuel, Food area kept clean; Excreta visible around HH; Animals kept inside HH	In last year child given vitamins or minerals, vaccinations, or non-treated water
Age 8	Per capita household income, Household size, Mother's education; Access to piped water, Flushable toilet, Electricity; Garbage taken away after disposal; Uses clean cooking fuel, Food area kept clean; Excreta visible around HH	Since last survey child given vitamins or minerals or vaccinations; Child given worm medication; Child's food consumption score for average week; Extended family in HH
Age 11	Per capita household income, Household size, Mother's education; Access to piped water, Flushable toilet, Electricity; Garbage taken away after disposal; Uses clean cooking fuel, Food area kept clean; Excreta visible around HH	Parent usually helps child with homework; Hours spend on chores in avg week; Child's food consumption score for average week; Extended family in HH; Per capita expenditure on food, child allowances, and school fees
Age 15	Per capita household income, Household size, Mother's education; Access to piped water, Flushable toilet, Electricity; Garbage taken away after disposal; Uses clean cooking fuel, Food area kept clean; Excreta visible around HH	Child's food consumption score for average week; Extended family in HH; Per capita expenditure on food, child allowances, and school fees

# Socio-economic channel?

Panel A: Child HAZ



Panel A: Child WHZ/ZBMI



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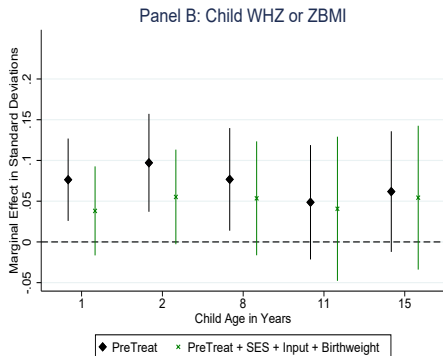
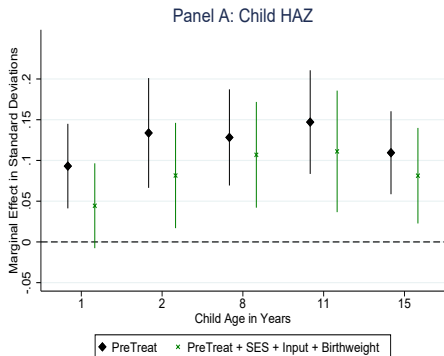
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  - Control for birthweight as proxy for birth health, in addition to SES and parental input variables

# Marginal Effect of Maternal Health on Child Health across Ages—Controlling for Birthweight



## Results 2

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  - **Exploit variation in sex-specific growth transitions**

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  - Could explain increasing height advantage of having healthier mother

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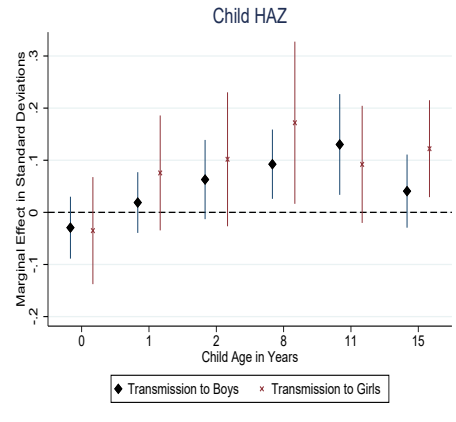
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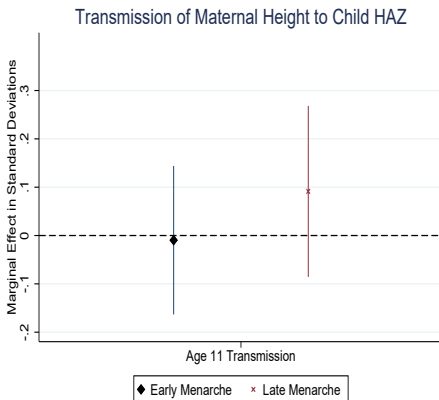
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  - Interact mother's height with best proxies for timing of pubertal development

# Marginal Effect of Maternal Height on Boy vs Girl Height

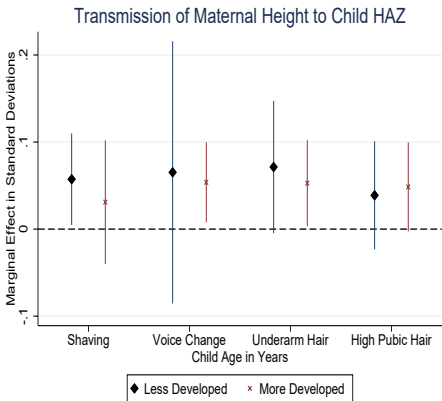




# Marginal Effect of Maternal Height on Girls based on Menarche Timing



# Marginal Effect of Maternal Height on Boys Based on Developmental Indicators at Age 15



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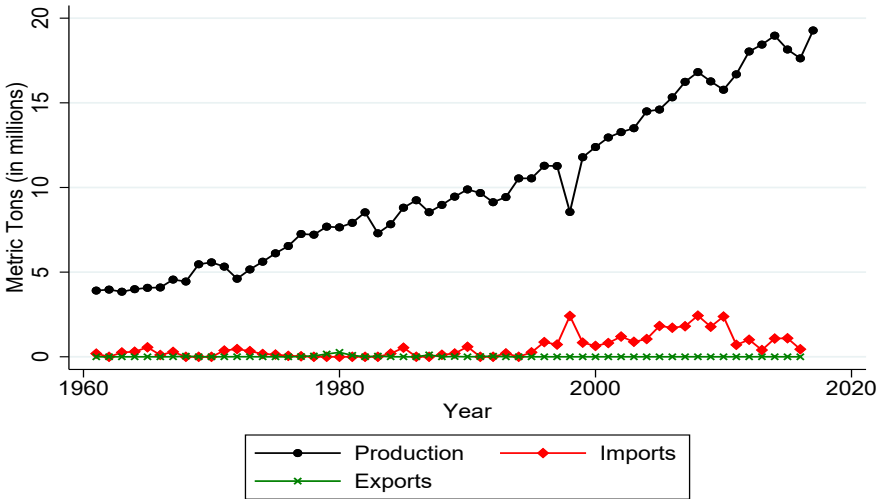


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- SVA a promising way of dealing with many weak instruments

Thank you!

# Rice Production and Trade



Back

## Contraception Use in the Philippines

- Concern that mother's month of birth may correlate with grandparent socio-economic status due to reproductive control
- The Philippines predominately Roman Catholic country with low contraceptive use
- 1968 DHS (earliest available) found that only 15.5% used any contraceptive practice (Laing, 1984)
  - Over 70% of those used traditional methods such as withdrawal or rhythm methods
  - Less than 4% of those used modern contraception such as pills, IUD, sterilization, or condoms
- Regardless, our IV does not predict grade parent grade attainment or occupation type.