The Effects of Hot Weather on Rural Indian Diet Quality: A Focus on Iron

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Introduction

- Over 50% of rural Indian households rely on agriculture as their main source of income.
- Hot weather decreases agricultural yields and income.
- In 2016, 59% of Indian children were anemic, a consequence of iron deficiency.
- Iron deficiency decreases energy levels, learning in children, and labor productivity in adults.

Purpose

- Quantify the causal relationship between extreme temperatures and household-level iron consumption.

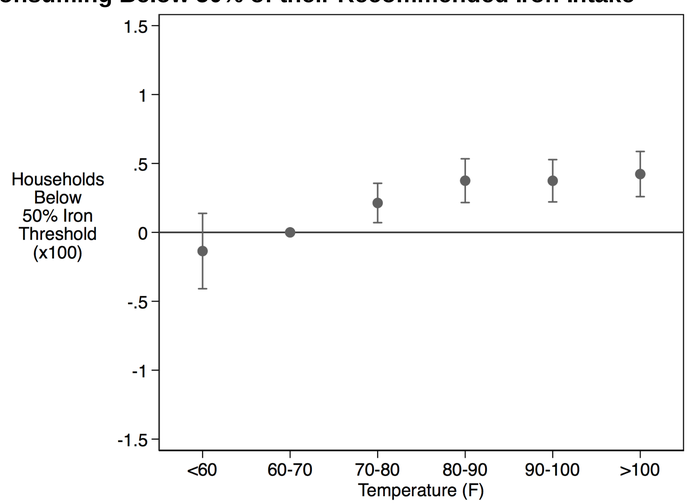
Methods

- Use survey data from India's National Sample Survey, including responses from over 300,000 households over a 10-year period.
- Use detailed food consumption responses and household compositions to calculate the level of iron intake relative to need.
- Link responses to district-level temperature and rainfall data from ERA5, a weather reanalysis dataset.
- Using a fixed effects regression model to control for average district-level, yearly, and seasonal characteristics, estimate the causal impact of hot weather on iron intake.

Results

One day above 100F during the previous growing season increases the fraction of households consuming less than 50% of their recommended iron intake by 0.4 percentage points (from a mean of 17.2%) relative to a day between 60 and 70F.

Figure 1: Effect of Temperature (F) on the Percentage of Households Consuming Below 50% of their Recommended Iron Intake



Discussion

Focusing primarily on calories and other macro nutrients misses an important element of diet quality and how it is affected by hot weather. A mere 10 extra days above 100F during the 7-month growing season are enough to increase the risk of being below 50% iron adequacy by 23%. Next, we will be focusing on potential reasons for this relationship, including a decrease in agricultural income.

Implications

Climate change will increase the frequency of hot weather, thus threatening food security in rural Indian households.

Literature Cited

Google Doc of References

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