

# Translating Adoption of Biofortified Varieties into Nutritional Impact - Quality Protein Maize in Ethiopia



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Paper presented at the 2017 East Africa Evidence Summit  
Agricultural Technology Adoption Initiative (ATAI)

Addis Ababa, July 18, 2017

# Undernutrition in Ethiopia



- Undernutrition and stunting are serious problems in Ethiopia,
  - In the country: 2/5 of children are stunted
  - in Amhara region: > 50% are stunted
- As livelihoods in rural areas mostly depend on agriculture, there is increasing focus on integrating nutrition into agricultural interventions
- Maize increasingly important food source household consumption (particularly for the poor), but has poor balance of essential amino acids
- High amount of maize in diets of infants/young toddlers (combined with morbidity and sanitation) puts them at risk of inadequate protein intake
- CIMMYT has developed Quality Protein Maize (QPM)—biofortified with limiting amino acids lysine and tryptophan
- Through the NuME (Nutritious Maize for Africa), QPM is being promoted and disseminated throughout Ethiopia



# Impact for target population

- There is evidence of nutritional benefits when QPM is provided with some control over children's consumption
- However, in natural settings, people make their own decisions
  - Will QPM have an impact?
  - Are additional interventions needed?



# RCT – 1<sup>st</sup> Intervention

## Adoption Encouragement (AE)



- Population: Rural households with children aged 6-35 months
  - A household member has attended QPM field demonstrations
- First intervention: Adoption encouragement
  - Target household head, visit at home
  - Reiterate agronomic and nutrition information
  - Offer free seed in smaller quantities: 2 kg bags, up to 6 kg
    - Originally intended to sell seed with subsidy
    - Variety choice (AMH760Q or BHQPY545)

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# RCT – Intervention 2

## Consumption Encouragement

- Second intervention randomized among adopters:  
Consumption encouragement
  - Target female caregiver of target child
  - Two visits at home and one group meeting
- Provide information on:
  - Nutritional benefit
  - Methods to separate QPM grain and flour from other maize
  - Methods to earmark and allocate QPM foods for young child
  - QPM for feeding young children



# Consumption Encouragement



- Women were provided:
  - Bags for QPM grain storage
  - Bag for QPM flour transport and storage
  - Bowl and spoon for feeding child
  - Poster encouraging feeding of children with QPM

# Study Design and Execution

Farmers With Young Children  
Attending QPM Field Demonstrations (End 2014)  
Random Selection of 1779 Households

## Individual Random Assignment

**QPM Adoption  
Encouragement and Seed  
Distribution**

1192 randomized  
1024 met initial criteria

**No QPM Adoption  
Encouragement**

587 randomized  
267 enrolled

Early 2015

March-April 2015 (AE)

Baseline (< harvest):  
July-August 2015

## Cluster Random Assignment

**QPM Consumption  
Encouragement  
(Earmarking, Targeting QPM  
to Children)**

513 randomized  
299 enrolled

**No QPM  
Consumption  
Encouragement**

511 randomized  
323 enrolled

Consumption Encouragement

- 1) July-August 2015 - Data
- 2) November 2015 - Group
- 3) Feb-March 2016 - Data

Midline: Fe-Mar 2016

Endline: Jun-Jul 2016

# Research Questions

- What are the effects of adoption encouragement (**adoption**) and consumption encouragement (**consumption**) on:

## Adoption

- Agricultural questionnaires
- Grain sampling



## Child diets and consumption of QPM

- 24-hour dietary recalls (→nutrient intakes)
- Questionnaires on cooking/time use, intra-household food allocation, child feeding, and gender



## Child protein status

- Venous blood:
  - Prealbumin
  - insulin-like growth factor 1 (IGF-1)
  - Markers of inflammation
  - Serum amino acids



## Child nutrition and health status

- Anthropometry
- Others:
  - Malaria (RDT)
  - Other morbidities (2-week recalls)
  - Anemia (HemoCue)
  - Helminth infestation (stool)



# Results

- Analysis is ongoing
- Preliminary results were shared at the 2017 East Africa Evidence Summit and will be posted publicly soon
- Please direct any questions to the authors



# Acknowledgements



We like to thank:

- our sponsor, ATAI (BMGF, UKAID)
- Our partners, Ministries of Health and Agriculture, cooperatives
- The farmers for planting QPM
- The participating mothers and children for given us their time and considerable effort



**Thank You!**

