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## Association between bio-fortification and child nutrition among smallholder households in Uganda

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*Feed the Future Innovation Lab for Nutrition*



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## SCOPE

This is a sub-study within the broad framework of the Feed The Future innovation Lab for Nutrition that aimed at Understanding the Linkages between Agriculture, Nutrition and Health among Women and Children in Uganda

The interventions were implemented by the Uganda Community Connector Project (UCCP).



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## PROBLEM

Uganda's problem with undernutrition, and malnutrition including micronutrient malnutrition is well documented.

- UDHS (2016)-3.6 % of under fives wasted, 29 % chronically malnourished (stunted) and below WHA targets
- UBOS (2016)- 53% of children anemic
- NDP II and Draft NDP III and others



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## OBJECTIVE

This particular study aimed at empirically establishing the link between biofortification as a policy instrument (NDP) to address maternal and child malnutrition in Uganda.



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## SAMPLING STRATEGY

- Implemented in 6 (out of 15 UCCP districts) randomly selected districts. Four districts in Northern Uganda (Agago, Dokolo, Kole, Lira) and 2 in Southwestern Uganda (Kisoro and Kamwenge).
- Adopted the 3 UCCP sub-counties per district PLUS one non UCCP sub-county as the Control (RCT design)
- Sample size was statistically derived as 600 per district totaling 3600 households- Panel Survey implemented in 2012, 2014 and 2016. Hence about 10,800 observations for the three panels
- We used population proportional to size (PPS) to determine the number of households to be interviewed within each parish that was then allocated equally across all qualifying villages within the parish.



## SAMPLING STRATEGY CONT'D

- Target respondents were primary mothers of the randomly selected child aged 0 –23 months, or women of child-bearing age.
- Data were captured on Android Tablets using Open Data Kit (ODK) software.
- Data were collection on demographics, diet and health status of mothers, anthropometric and hemoglobin, food security assessment, agriculture (inputs, production, harvest, disposal-consumption and sales, etc), gender, decision-making and time allocation, access to information and infrastructure.



## ANALYSIS

- We focused on **height for age** indicator or stunting (HAZ) as the outcome/dependent variable.
- We then **used panel logistic regression analysis** to assess whether production of bio-fortified crops was associated with the probability of child stunting.
- We based ourselves on WHO cutoffs and a child was considered stunted if HAZ was below -2.0 and severely stunted if HAZ was below -3.0
- We focused on Quality Protein Maize (QPM), Orange Fleshed Sweet Potato (OFS) and Iron Fortified (red) beans as the main biofortified crops but also controlled for other variables hypothesized to influence child stunting.



## RESULTS

- The results confirmed a very strong association between production of bio-fortified crop varieties and child stunting among children aged 0-59 months of age. All else constant, producing at least one biofortified crop significantly (1% level) reduced the probability of stunting by 5.2 percentage points
- The strength of the relationship, was however insensitive to the number of biofortified crop varieties grown by a particular household implying that the intensity of production of biofortified food crops by a household does not seem to be that important for child nutrition.
- What seems important for child nutrition is for a household to produce at least one bio-fortified food crop variety



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## CONCLUSION

- Adoption and production of biofortified crops by households can be associated with preventing stunting among children aged 0-59 months after controlling for all other confounding factors.
- The analysis vindicates current government policy of promoting bio-fortified crop varieties.
- Analysis underscores the need for intensified efforts to promote bio-fortification as a complementary means of addressing long-term child malnutrition in Uganda.



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