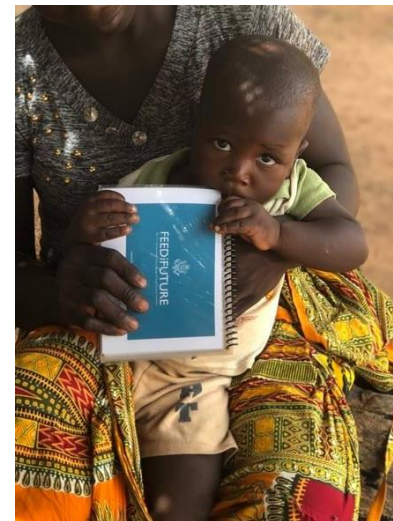




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## Improving Nutrition in Children Under Two Through Increased Egg Consumption in Burkina Faso

Sarah McKune, June 5, 2019

Assistant Professor, Environmental and Global Health, University of Florida, [smckune@ufl.edu](mailto:smckune@ufl.edu)

*Photo Credits: Heather Anderson, Sarah McKune, Anteneh Omer, Christian Oueoraogo, Aida Sanou, Iliasse Tiemtore*



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## RESEARCH TEAM

- **Dr. Sarah McKune – University of Florida**  
Dr. Heather Anderson  
McKune Research Lab
- **Dr. Aissatta N'Diaye Wereme – Institut de l'Environnement et de Recherches Agricoles (INERA)**  
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Mahamoudou Gnabriga - INERA  
Kamboinsé Agricultural Environmental and Training Research Center (CREAF)  
Christian Oueoraogo, Aida Sanou, Iliasse Tiemtore
- **Antoneh Omer – Hawassa University, Ethiopia**





## RESEARCH BACKGROUND & QUESTION

- Ionnatti et al., 2017 study in Ecuador found providing one egg a day to children 6 to 9 months old for a year reduced stunting and underweight by 47 and 74%, respectively, nutritional benefits much greater than those achieved by previous interventions.
- Omer et al., 2016 study in Ethiopia used religious leaders to gift chickens to children, increasing the number of children consuming 3 or more eggs a week from 5% to 70%.
- *Can gifting of chickens to young children (6-12 months) by community champions increase egg consumption and improve nutritional outcomes?*



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## RESEARCH OBJECTIVES

- Increase egg consumption in children under five
- Increase household poultry production
- Improve poultry practices
- Improve knowledge and attitudes about nutrition and ASF consumption

Overarching aim: to improve child nutrition





## METHODS: STUDY DESIGN

- Community intervention trial
- Three study arms: full intervention, partial intervention, and control arms

### Full

- 4 chickens, 3 gifted by community champion
- Monthly training

### Partial

- Monthly training  
*(will receive 2 chickens at end of project)*

### Control

- No intervention  
*(will receive 2 chickens at end of project)*

- Targeted 90 children per arm, n=270 children
- 18 clusters of 15 HH, 6 clusters each study arm



## METHODS: STUDY SITES

- The 18 study villages were randomly selected from all villages (n=70) in the Kaya District, excluding those within Kaya town
- Villages were then randomly assigned to a treatment arm of the study

<b><u>Full Intervention</u></b> (Gifting of chicken and INA trainings)	<b><u>Partial Intervention</u></b> (INA trainings only)	<b><u>Control</u></b> (no intervention)
Basnéré Franka Kokin Ilyalla Nyangado Sian	Dem Kalambaogo Oualga Songodin Tiffou Zandogo	Dashima Bakòuta Gâh Dapologo Légouré Sangro



## METHODS: SAMPLE SELECTION

- Census of all children 6-12 months was taken for the 18 communities
- From all age-eligible mother/child dyads in each village, 15 were randomly selected for participation
- Only one twin was included in each of 3 cases where twins were identified (participating child randomly selected by study team)
- In villages where less than or equal to 15 dyads were available, all dyads were included
- Total of 266 children and mother/child dyads were enrolled, due to low numbers available in three villages
- Final distribution: 86 full intervention, 90 partial intervention, 90 control





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## METHODS: PROJECT IMPLEMENTATION JULY 2018-MAY 2019

- Baseline, midline, and end line survey (July, Dec, April)
- Gifting of chickens by community champions (July)
- Three trainings of local community health workers (CHW) and animal extension workers (AEW) by partner INERA
- Monthly Integrated Nutrition and Agriculture (INA) training of mothers by CHW and AEW: WASH, human nutrition, animal management, and child illness (July through May)
- Brief monthly monitoring visits and counseling with all mothers using survey questionnaire and flipbooks (July through May)
- Monitoring and Evaluation visit (Nov/Dec)
- Final Closing Ceremony (May 28, 2019)



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## BEHAVIOR CHANGE COMMUNICATION PACKAGE

- Engagement of community leaders as champions
- Gifting of three chickens to child in local ceremony
- Family contribution of +1 chicken to child flock
- Monthly training of mothers
- Development and distribution of locally appropriate flip books for mothers
- Project jingle, *"One child, one egg, each day"*
- Individual counseling of mothers on target areas not met, monthly during data collection



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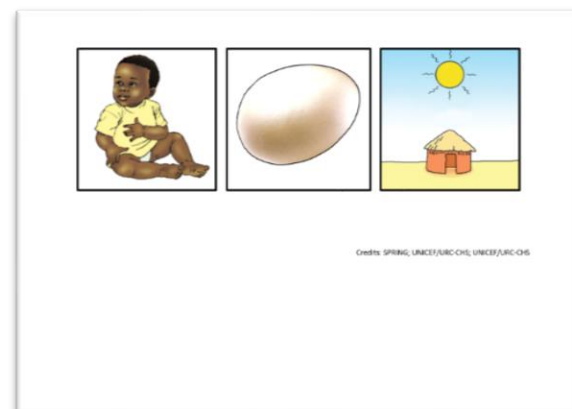
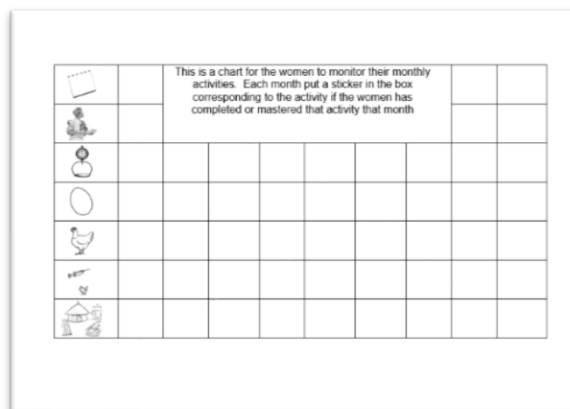


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## BCC: FLIPBOOKS

- Flip books distributed to partial and full intervention groups, to reinforce messages from monthly trainings
- At data collection each month, using the flipbooks the students counseled mothers on target areas not met, identified barriers, and provided feedback to project staff



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## BCC: JINGLE

*Biig a yeyn daar Fãa gell a yeyn*

- Creation of social cohesion through common imagery and jingle that the women would sing together at each gathering



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## ACTIVITIES: GIFTING OF CHICKENS



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## ACTIVITIES: MONTHLY INA TRAININGS



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## ACTIVITIES: DATA COLLECTION AND COUNSELING



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## RESULTS: BASELINE DATA

### Mother's information

- Average mothers age: 27 (16-45)
- Average age at first birth: 18 years
- Average number of live births: 3.5 (1-9)
- Literacy: 82% illiterate
- Religion: 77% Muslim  
20% Catholic  
2% Protestant
- Livelihood: 97% crop production  
58% livestock husbandry



## RESULTS: BASELINE DATA

### Child data

- Sex: 48.3% female, 51.7% male
- Average age: 9.8 months (median 9 m; range 6-18 m)
- Currently breastfeeding: 100% currently
- Exclusively BF: 94.6%
- Child ever hospitalized 33%
- ***No children had consumed eggs in the 24 hours prior to the baseline survey***



## RESULTS: BASELINE DATA

### Poultry production:

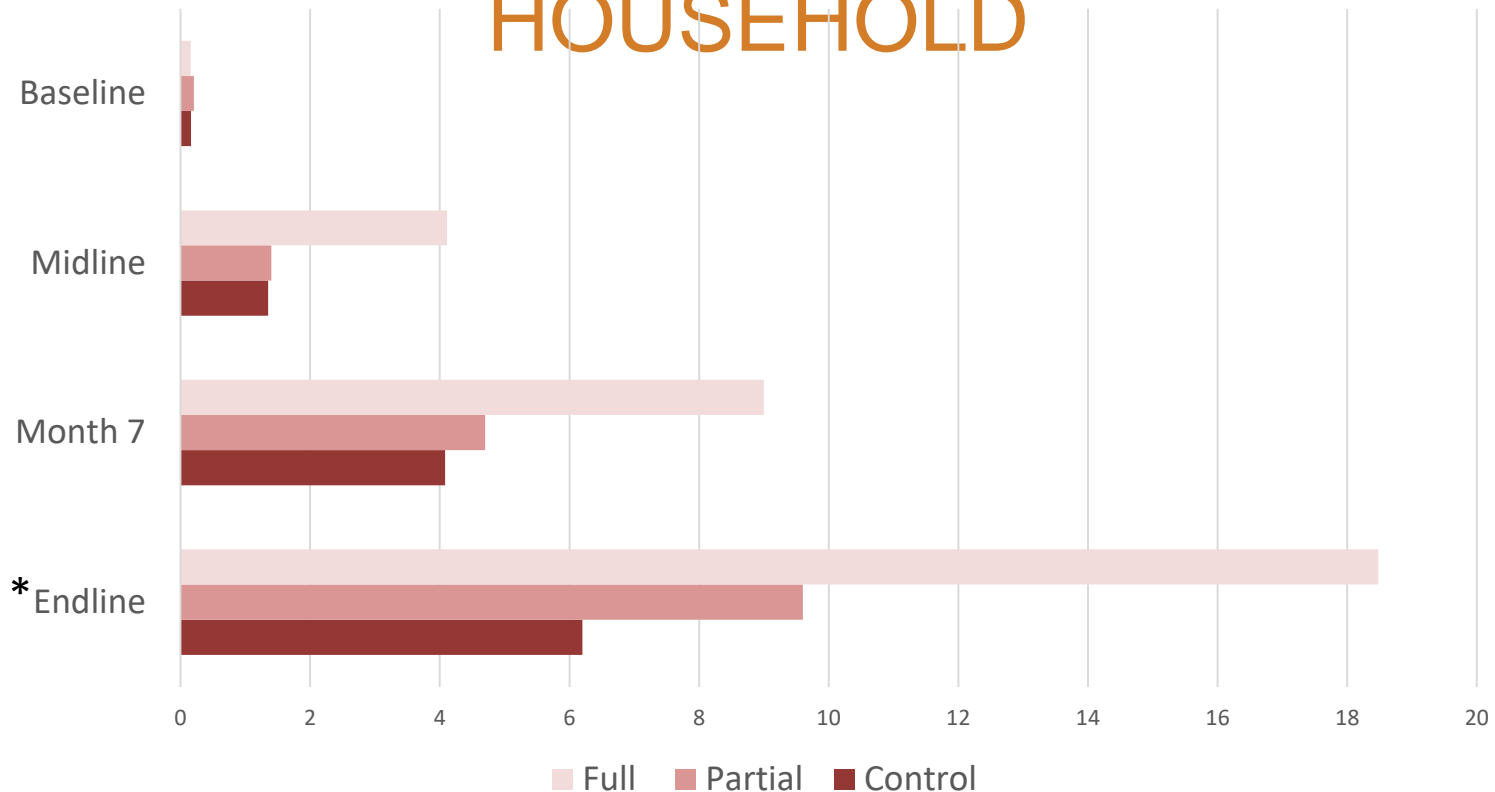
- 97% keep livestock
- 87% keep chickens (average 10.5; median 4; range 1-100)
- 80% report never receiving nutritional education regarding value of eggs
- Average egg production 3.1/day; median 1/day
- 98.4% of eggs are allowed to hatch
- 25% of households have chicken sleep inside the house
- 16.8% of children have their own chickens (mean 1.4; range 1-5)
- **9.7% report ever feeding the child eggs**



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## NUMBER OF CHICKENS PER HOUSEHOLD



\* ANOVA  $p = 0.00$



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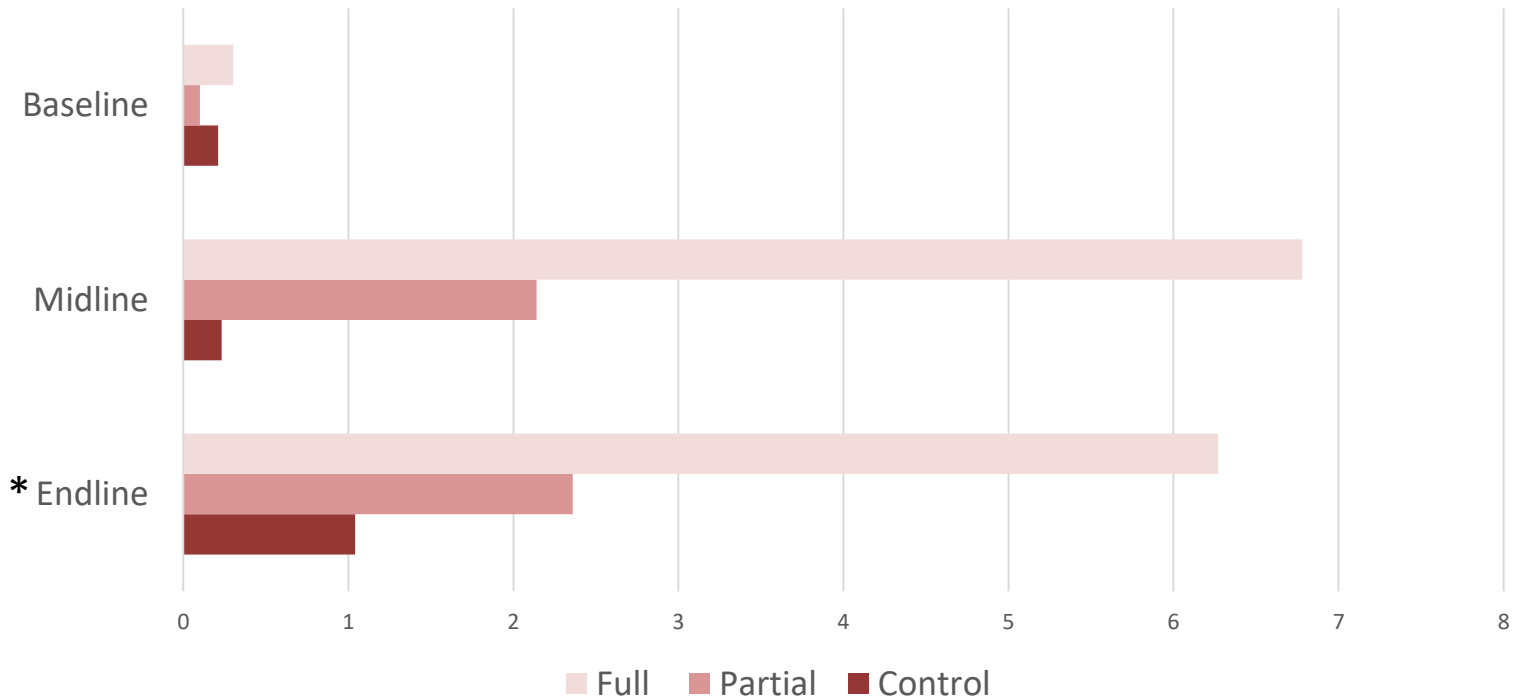
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## CHILD WEEKLY EGG CONSUMPTION



\* ANOVA  $p = 0.00$



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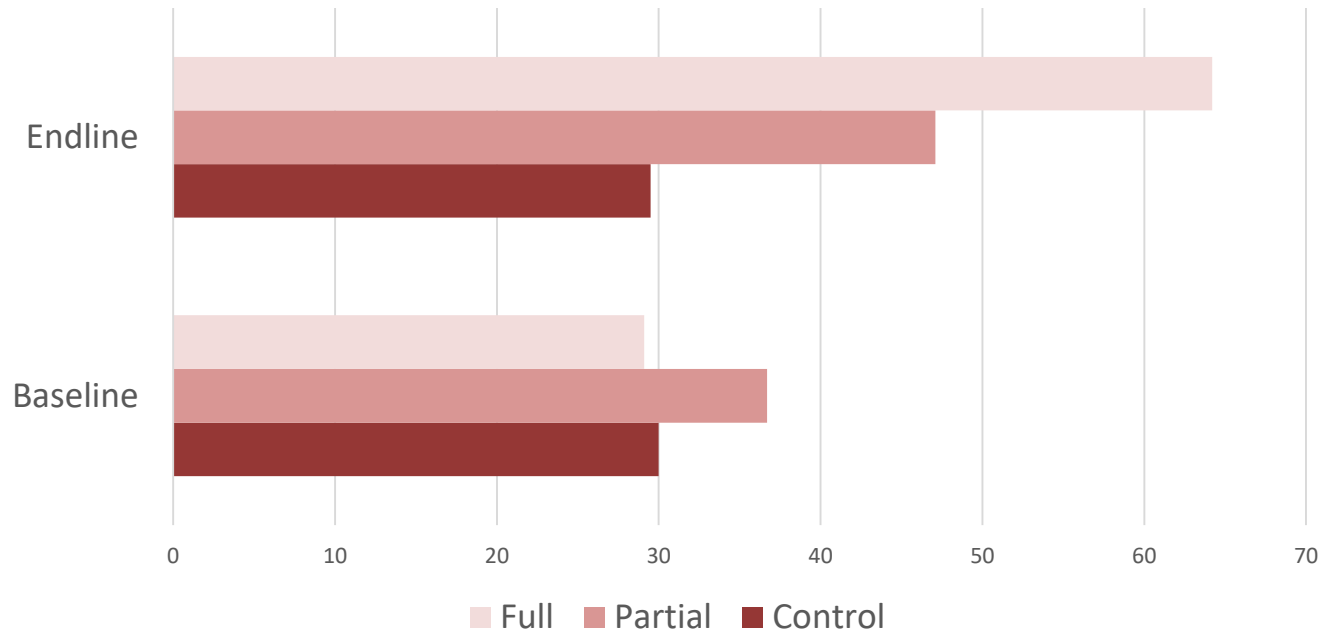


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## DECISION MAKING AROUND POULTRY

Women Reporting "Self" as Decision Maker about  
Chickens in the Household

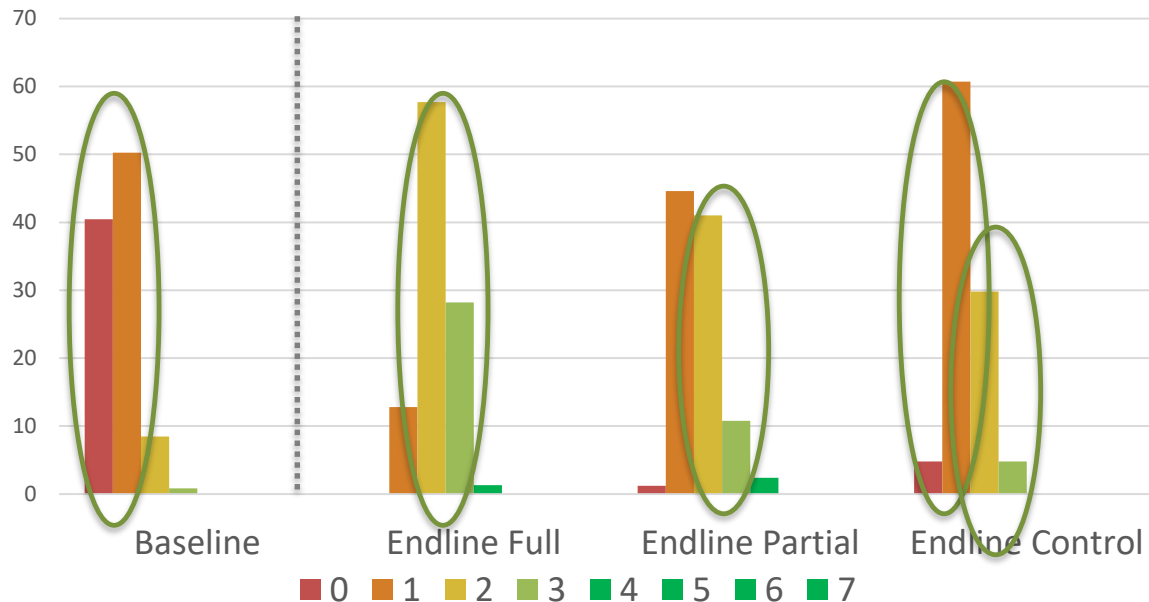






## DIETARY DIVERSITY

- Minimum Dietary Diversity not met by most, pre or post intervention
- 3 children (full and partial intervention arms) met MDD (4 or more of 7 food groups) by endline



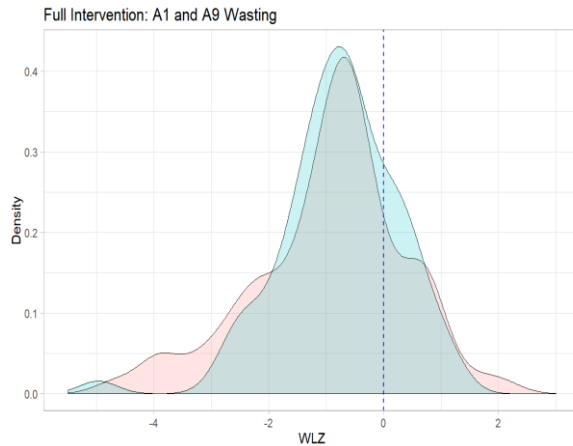


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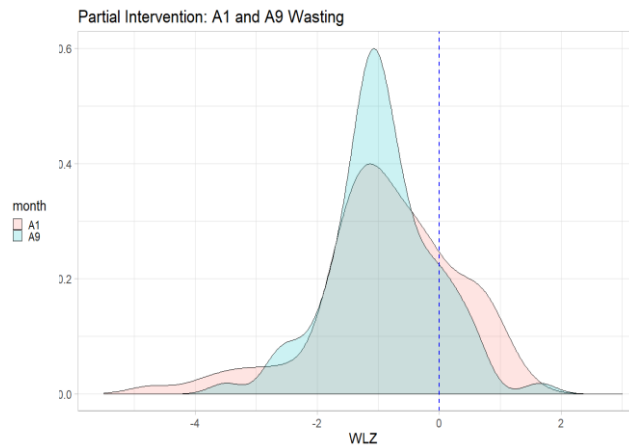
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## WASTING (WLZ)

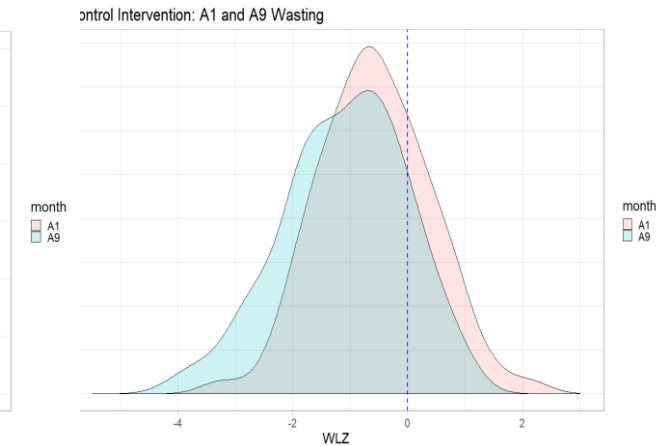
FULL



PARTIAL



CONTROL



Baseline  
Endline

ANOVA:  $p = 0.00014^*$

Tukey HSD: partial-full  $p=0.23$

control-full  $p=0.00^*$

control-partial  $p=0.02^*$



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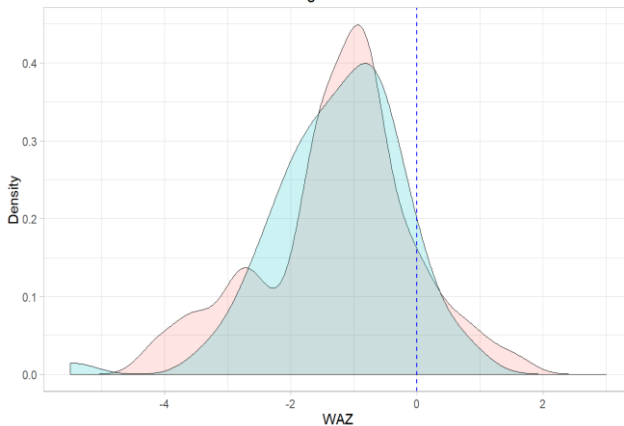
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## UNDERWEIGHT (WAZ)

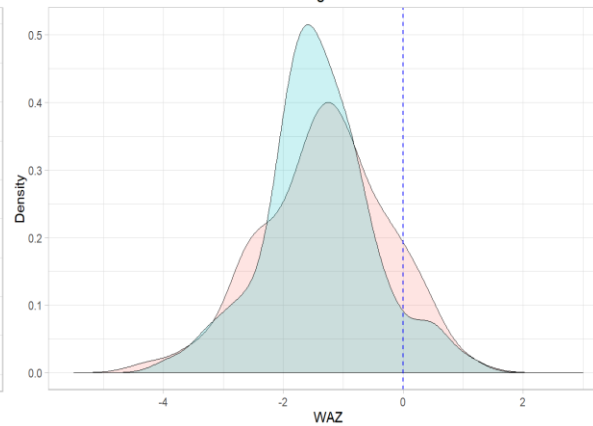
FULL

Full Intervention: A1 and A9 Underweight



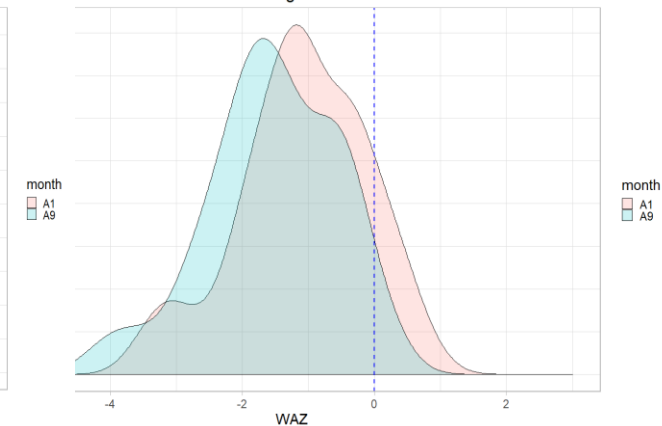
PARTIAL

Partial Intervention: A1 and A9 Underweight



CONTROL

Control: A1 and A9 Underweight



Baseline  
Endline

ANOVA:  $p = 0.00015$  \*

Tukey HSD: partial-full  $p=0.52$

control-full  $p=0.00$ \*

control-partial  $p=0.01$ \*



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## STUNTING (LAZ)

FULL

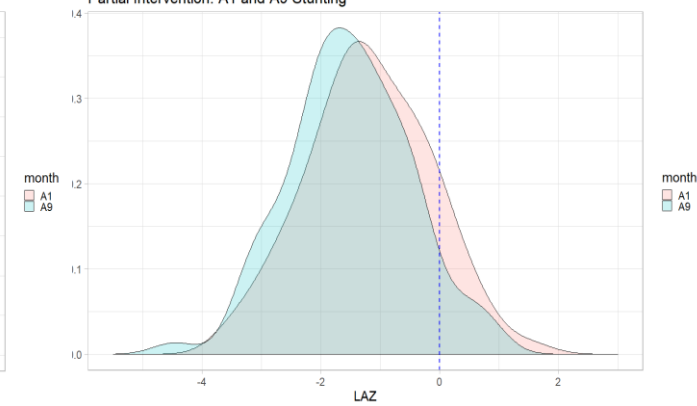
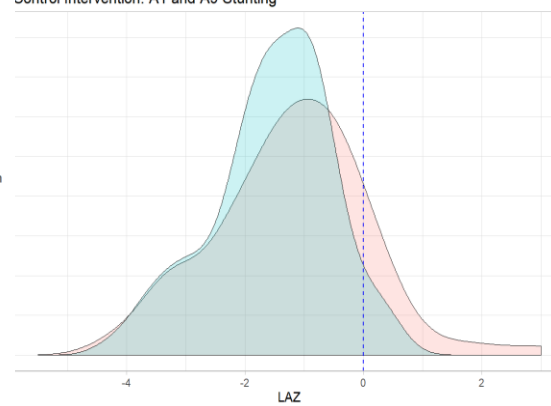
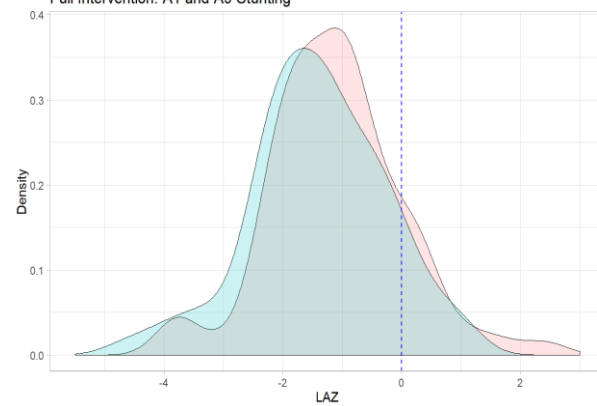
PARTIAL

CONTROL

Full Intervention: A1 and A9 Stunting

Control Intervention: A1 and A9 Stunting

Partial Intervention: A1 and A9 Stunting



Baseline

Endline

ANOVA:  $p = .66$



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## KEY FINDINGS

- Behavior change communication package increased household chicken flock size, with and without distribution of livestock asset
- Behavior change communication package increased egg consumption in targeted child with and without distribution of livestock asset
- Acute malnutrition (wasting) was reduced significantly in both full and partial intervention groups
- Underweight was reduced significantly in both full and partial intervention groups
- Chronic malnutrition was not significantly reduced in any group
- Significantly greater behavior change occurred when chickens were gifted to the child than with education alone



## IMPLICATIONS AND NEXT STEPS

- In areas where acute malnutrition is high and resources are limited, findings hold significant implications for low cost improvements in child health and reductions in child mortality
- Continued analysis of quantitative data, including models to explore women's empowerment, analysis of poultry management practices and potential relationship with stunting
- Analysis of qualitative data, including focus groups with 9 communities conducted at the end of the project
- Investigating possibilities for post hoc assessment of cognitive impact
- Next step – does gifting of the chicken improve behavior change beyond that of livestock asset alone?
- ENHANCE project launched May 1, 2019







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