# Fathers' nutrition knowledge is associated with household's, women's, and child's dietary diversity in the Agriculture to Nutrition Study in Ethiopia.

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## Introduction:

**In an effort to address undernutrition and micronutrient deficiencies among women and children in rural areas of developing countries, nutrition-sensitive agriculture (NSA) projects focus on women as a medium to effect positive nutritional outcomes. These projects have focused on women's empowerment through enabling a broader decision-making environment. Women's empowerment, however, cannot be achieved without equitable contribution from men, especially in their role as fathers (Engle, 1997). However, very few studies focus on the impact of paternal factors on household dietary outcomes. In this Agriculture to Nutrition (ATONU) study, we explore the associations between father's knowledge on household's, child's, and women's dietary diversity.**

## Objective:

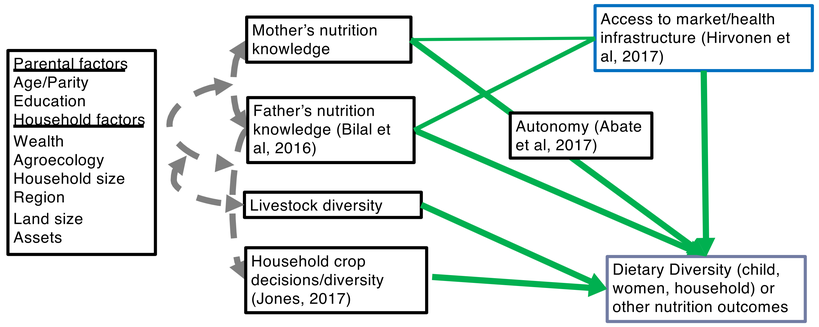
1. **Describe the nutrition knowledge of fathers and mothers from the same household.**
2. **Examine associations on father's and mother's on child's, women's, household's dietary diversity.**

## Study Setting & Methods:

- **ATONU study is a cluster randomized control trial in rural Ethiopia that aimed to evaluate the impact of introducing improved variety of chickens on women's dietary diversity. Study consisted of three arms: 1) control, 2) distribution of improved variety chickens, 3) distribution of improved variety chickens with behavior change communication (BCC).**
- **Small scale chicken farmers from four rural regions of Ethiopia**

- **Nested within the midline evaluation of ATONU study conducted in July 2017.**
- **FAO's nutrition knowledge questionnaire was collected among 2,042 fathers and mothers enrolled in the study. Among these households, 836 households had children under 5 of age who were included in the analysis.**
- **The FAO survey had five main modules:**
  - **Child health and nutrition (exclusive breastfeeding, complementary feeding, growth and diverse diets)**
  - **Water, sanitation, hygiene**
  - **Pregnancy and lactation**
  - **Vitamin A deficiency and vitamin A rich foods**
  - **Iron deficiency and iron rich foods**
- **Main outcome: Dietary Diversity indices for child (CDDS, 1-day recall, 8 food groups), women (WDDS, 1-day recall, 10 food groups group), household (HDDS, 1-month recall, 10 food groups) were constructed.**
- **Main exposure: Father's and mother's knowledge of food groups to improve baby's health.**
- **Analysis: exploratory analysis, agreement between father's and mother's knowledge, and multilevel bivariate and multivariate regressions exploring the association of father's and mother's dietary diversity knowledge on dietary diversity outcomes in the household (adjusting for clustering).**

## Hypothesized pathways:




- **Maternal nutrition knowledge is commonly researched pathway to improve child's nutrition especially in low literacy and resource settings.**
- **Few studies point out that father's knowledge of IYCF practices are positively associated with higher dietary diversity among children but pathways are unknown (Bilal et al, 2016).**
- **Hirvonen et al, 2017 found that distance to market moderated the effect of caregiver's (mother) nutrition knowledge on child's dietary diversity.**
- **Abate et al, 2017 identified women's autonomy (input on big purchases) improved child's anthropometric measures. Father's engagement in childcare and feeding also improved child nutritional status**
- **There are other pathways between mother's and father's knowledge that affect decision making on crop production and livestock management (arrows in gray)**
- **MOST OF THESE PAST LITERATURE FOCUS ON CHILD NUTRITION OUTCOMES**

**Photo 1: Father taking care of a young child while mother went to the market. Amhara, Ethiopia. July 2017.**

## Results :

**Table 1: Demographics and main variables of interest from the ATONU study, Ethiopia**

| Key characteristics | Median (IQR) or Percentages |
|---|---|
| Household Dietary Diversity Score (1 month recall) | 4 (3,6) (n=2042) |
| Woman's Dietary Diversity Score (1 day recall) | 3 (2,4) (n=2042) |
| Child's Dietary Diversity Score (1 day recall) | 4 (2, 5) (n=836) |
| Father's knowledge of food groups | 2 (1,2) (n=1912) |
| Mother's knowledge of food groups | 2 (1,3) (n=1912) |
| Women's age | 35 (28, 40) |
| Household size | 6 (5,8) |
| Women headed household | 12 |
| No schooling (~1 year)* | 55 |
| Primary 1 (2-5 years) | 19 |
| Primary 2 (6-9 years) | 14 |
| Secondary | 4 |
| Religious school | 8 |
| Access to electricity* | 21 |
| Access to improved sanitation* | 31 |
| Access to improved water* | 83 |
| Size of land owned (Timads) | 3 (2,6) |
| Food access security (Household Food Insecurity Access Scale)<br>Food Secure<br>Mildly Food Insecure<br>Moderate Food Insecure<br>Severely Food Insecure | <br>50.8<br>9.7<br>20.7<br>18.8 |

* From Baseline SES survey collected in November 2016

**Figure 1: Have you heard of exclusive breastfeeding?**

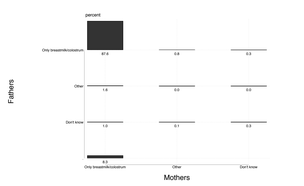



**Figure 2: Have you heard of iron-deficiency anemia?**

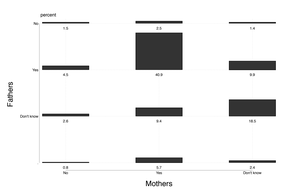



**Figure 3: Have you heard of vitamin A deficiency?**

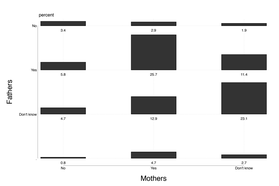



**Figure 4:Household's Dietary Diversity Score by father's and mother's knowledge of food groups**

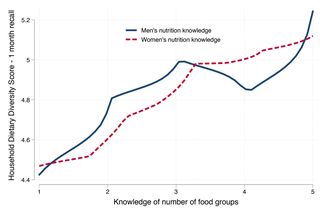



**Figure 5: Women's Dietary Diversity Score by father's and mother's knowledge of food groups**

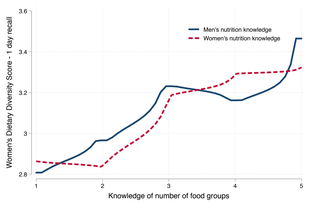



**Figure 6: Child's Dietary Diversity Score by father's and mother's knowledge of food groups**

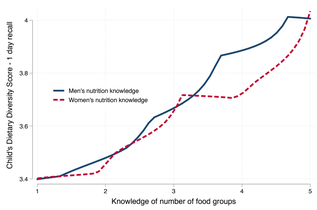



**Table 2: Agreement between maternal and paternal knowledge of IYCF, pregnancy, WASH, selected other questions**

| Selected questions from the KAP survey on fathers and mothers | Mothers (%)[A] | Fathers(%) [A] | Kappa (Agreement within household)[B] |
|---|---|---|---|
| What is the first food a newborn baby should receive? "Only breastmilk/colostrum, Other, Don't know" | 96.6 | 98.4 | 95.8% |
| Have you heard about exclusive breastfeeding? "Yes" "No" | 95.1 | 90.5 | 88.6% |
| At what age should babies start eating foods in addition to breastmilk? "At six months, Other, Don't know" | 97.1 | 94.5 | 92.9% |
| Have you ever heard of iron-deficiency anemia? "Yes" "No" "I don't know" | 58.5 | 60.6 | 66.8% |
| Have you ever heard of lack of vitamin A or vitamin A deficiency? "Yes" "No" "I don't know" | 46.2 | 46.7 | 76.8 % |
| Please tell me some ways to make porridge more nutritious or better for your baby's health.<br>Animal-source foods (meat, poultry, fish, liver/organ meat, eggs, etc.)<br>Pulses and nuts | 53.0 | 49.1 | 73.3 % |
| | 49.7 | 45.3 | 75.5% |
| Vitamin A rich foods | 27.0 | 25.8 | 76.8% |
| Green leafy vegetables | 23.2 | 19.5 | 77.6% |
| Energy rich foods (oil, butter) | 40.0 | 38.3 | 74.6% |

**A: Percentage represents the correct answers or mentioned answers; B: includes agreement on all possible answers**

**Table 3: Preliminary results from multilevel model on exploring father's and mother's dietary diversity knowledge on dietary diversity measures in the household (adjusted for clustering).**

| Key exposures of interest | Household Dietary Diversity | Women's Dietary Diversity | Child's Dietary Diversity |
|---|---|---|---|
| Father's knowledge of food groups | 0.074 (0.002 - 0.149) * | 0.073 (0.024 – 0.122)** | 0.112 (0.013 – 0.211)* |
| Mother's knowledge of food groups | 0.086 (0.10 – 0.162) * | 0.067 ( 0.015 – 0.118)* | 0.028 (-0.077 - 0.133) |
| Crop diversity (Meher season) | 0.292 (0.192 -0.392) *** | 0.078 (0.112 -0.146) * | 0.135 ( -0.008 -0.278) * |
| Amhara region (compared to Tigray) | 1.032 (0.604 -1.460) *** | 0.087 (-0.194 – 0.368) | 0.066 (-0.403 – 0.536) |
| Oromia region | 0.770 (0.376 -1.165) *** | 0.632 (0.372 – 0.891)*** | 0.637 (0.196 – 1.077) ** |
| SNNPR region | 0.553 (0.123-0.984) * | -0.184 (-0.437-0.098) | -0.442 (-0.920 -0.35) * |
| Lowland agroecological zone (compared to highland) | -0.252 (-0.732 – 0.226) | 0.142 (-0.171 -0.457) | -0.204 (-0.684 - 0.275) |
| Midland agroecological zone | 0.050 (-0.341 - 0.442) | 0.189 (-0.737 -0.441) | 0.005 (-0.379 -0.389) |
| Livestock diversity | 0.167 (0.104 – 0.230) *** | 0.078 ( 0.035 – 0.120)*** | 0.151 (0.058 – 0.244)** |
| Women's education – primary 1 (compared to no education) | 0.228 (0.370 – 0.420) ** | 0.529 (-0.076 -0.182) | -0.031 (-0.306 – 0.242) |
| Women's education – primary 2 | 0.442 (0.224 – 0.659) ** | 0.186 (0.038 -0.333) * | 0.539 (-0.248 – 0.356) |
| Women's education – Secondary 1 | 0.320 (-0.041 – 0.682) * | 0.212 (-0.038 - 0.333) * | 0.333 (-0.188 -0.849) |

* P<0.10; *p<0.05; ** p<.01 ; ***p<.001; Other variables included in the model were wealth quintiles, child age/breastfeeding (for child's dietary diversity model), other education categories, treatment arms (not significant). Bivariate associations adjusted for clustering are not shown.

**Photo 2: Father taking care of young child during focus group discussion of male engagement in nutrition & caregiving. Amhara, Ethiopia. July 2017**

## Conclusions:

- **Poor dietary quality among vulnerable members of the household.**
- **High parental knowledge and agreement on exclusive breastfeeding and early IYCF practices in the first six months of child's life.**
- **Low parental knowledge and agreement on complimentary feeding, food groups, iron-deficiency anemia, WASH, and vitamin A deficiency.**
- **Father's knowledge had strong and positive association on household's dietary diversity, child's dietary diversity, and women's dietary diversity**
- **In the case of child's dietary diversity, the association between father's knowledge was stronger and positive while mother's knowledge and education associations attenuate and become non-significant.**
- **<u>While previous NSA and programmatic work predominantly focus on uptake among women, large gap and potential remains with father's engagement in household nutrition.</u>**
- **<u>Interventions that expand the role of fathers can synergistically improve women's empowerment and household nutritional outcomes</u>.**

## Next steps:

- **Examine the role of women's empowerment dimensions (autonomy and participation) on moderating the effect of maternal knowledge on dietary quality.**
- **Evaluate moderation by access (distance) to market and market diversity.**
- **Evaluate access to village level services such as access to primary health infrastructure or availability of primary schools and agricultural services**
- **Examine within household correlation of nutrition knowledge over time at endline data collection of the ATONU project (May 2018).**
- **Incorporate findings from qualitative study that interviewed men and women on men's engagement in nutrition and caregiving.**

**Photo 3: Father playing with the child and encouraging the child to eat injera with cottage cheese. Direct observations, Amhara, Ethiopia. July 2017.**

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