Children's diets, nutrition knowledge and access to markets

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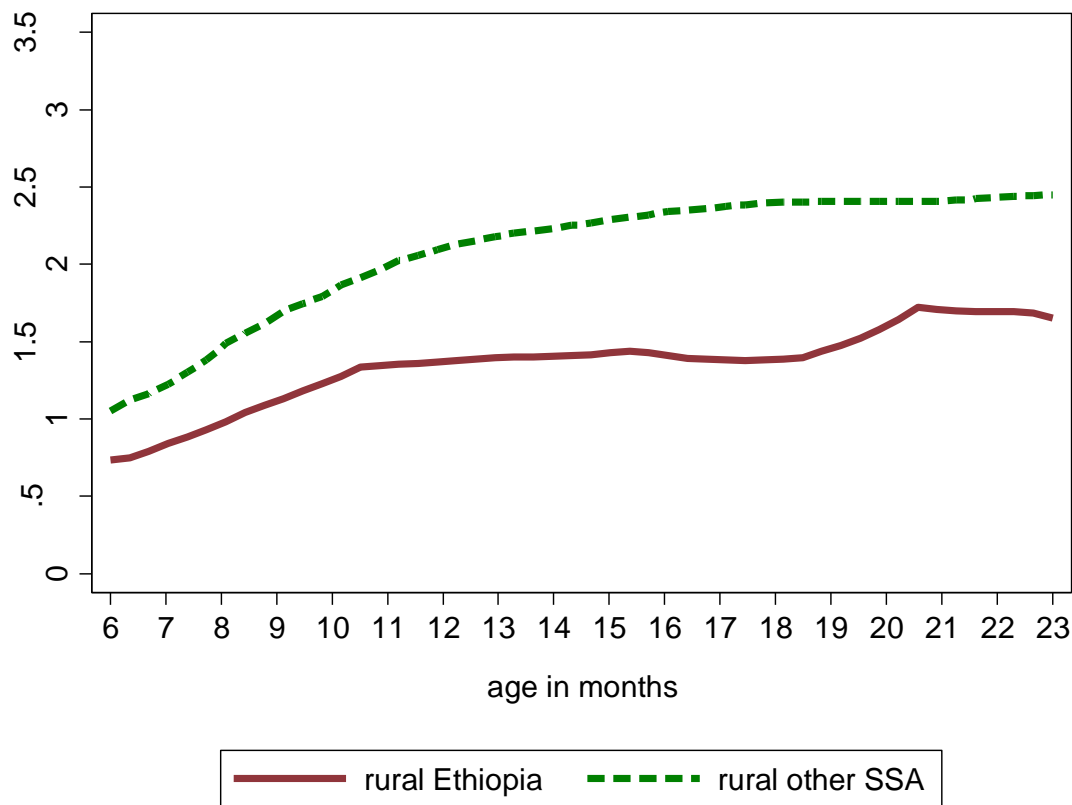Bart Minten (IFPRI – Ethiopia Strategy Support Program)
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Rural Ethiopian children consume one of the most undiversified diets in the sub-Saharan Africa

Source: Demographic and Health Survey data for 20 sub-Saharan African (SSA) countries

Motivation (2/2)

- Low diversity in diets is associated with increased risk of chronic undernutrition and micro-nutrient deficiencies in young children (Arimond and Ruel, 2004; Mallard et al., 2014)

- Considerable political commitment to address this (National Nutrition Strategy Programme, Seqota declaration)

- **But what are the constraints to improving children's diets in Ethiopia?**
  - **Supply – or demand side?**

Supply side constraints…?

- Recent research from different parts of Ethiopia shows how children located closer to markets have more diverse diets (Minten & Stifel, 2015; Abay & Hirvonen 2016)

- Also: For HHs near markets, food consumption is less dependent on their own food production (Hirvonen & Hoddinott 2014; Hoddinott, Headey & Dereje, 2015)

  ➢ **Implications for policy: Improve access to nutritious foods**

...or demand side constraints?

- Anecdotal evidence suggests that poor feeding practices are due to lack of knowledge (Alive & Thrive 2010; USAID 2011).

- Randomized controlled trials (RCTs): Behavioural Communication Change (BCC) effective tool to improve nutrition knowledge and feeding practices

  - In Ethiopia, government uses health extension programme and media outlets to raise awareness

- But RCT evidence comes from countries with high-population density (e.g. Bangladesh) or from urban areas. --> implying good market access.

...or both?

This study:

Does improving nutrition knowledge (NK) lead to improvements in children's diets?

-- Does the effectiveness of NK depend on access to foods (through food markets)?

Data (1/2)

Survey of 775 households in Alefa woreda (north-western Amhara) in December 2014 & January 2015.

Sample area purposefully selected:

1. Area with large variation in transportation costs over a relatively short distance

2. No passable road, land quality & climate similar throughout

Data (2/2)

- Households use the same major market
  - We define remoteness relative to this market town

- Transport costs are measured as the cost of renting a donkey for a round-trip to the market + the cost of farmer's time.

- **Sample in this study 448 HHs with children less than 5 years of age**
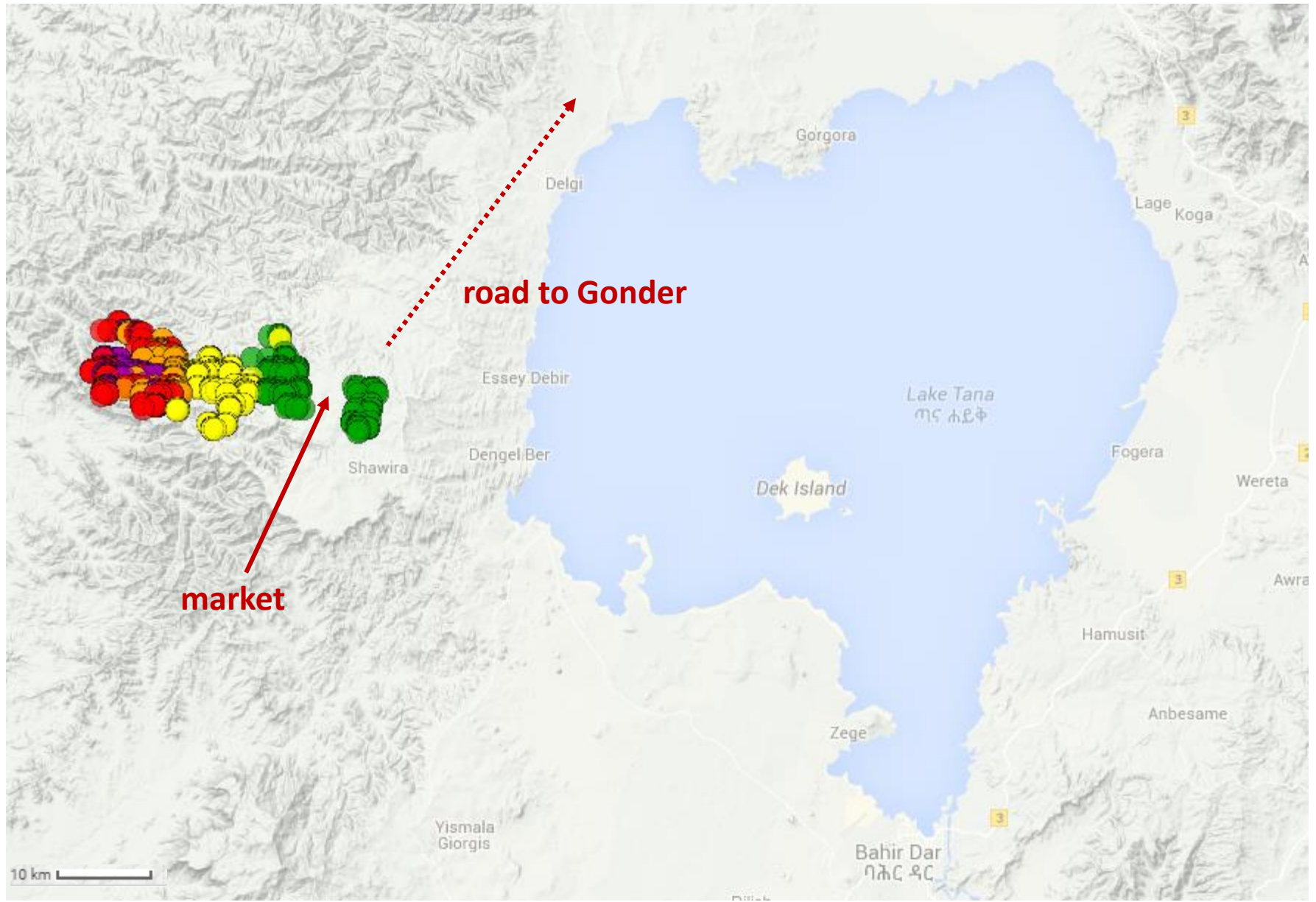
Dietary diversity measure

- Following World Health Organization (2008) recommendations:
    - 7 food groups
    - Good proxy for diet quality

- Mean: 3.1 food groups
- < 7.5 % consumed from 4 or more food groups
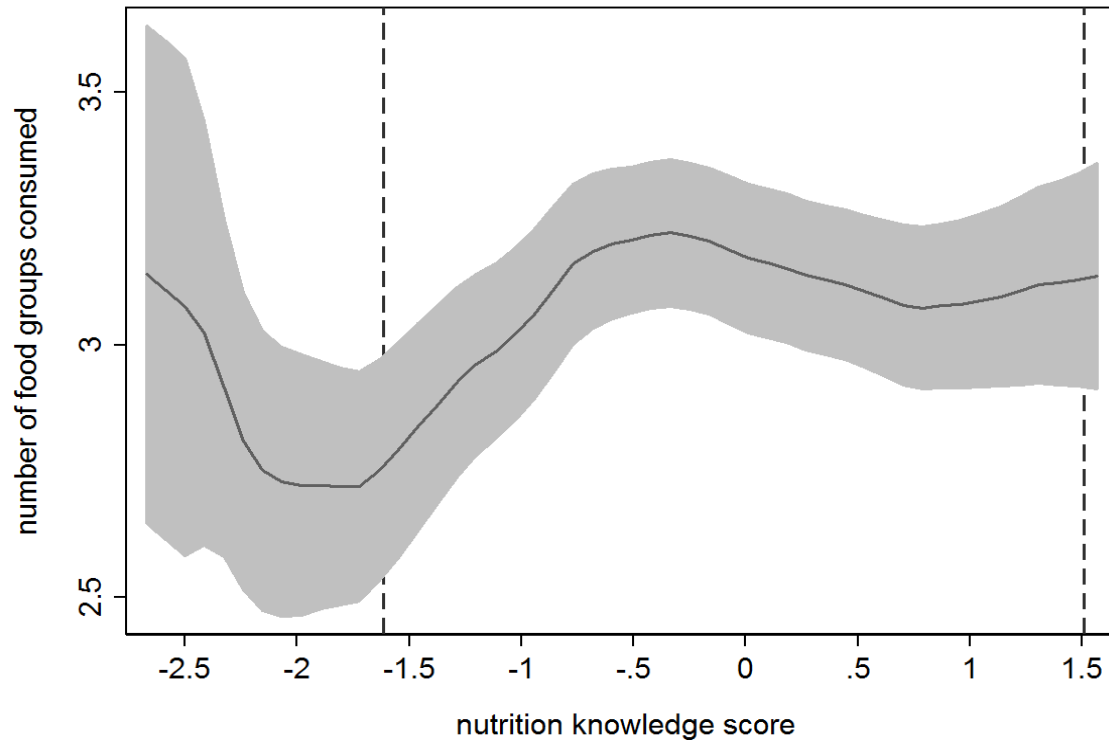
Measuring nutrition knowledge

- Seven statements about nutrition & feeding practices

- Based on "7 Excellent Feeding Actions" by Alive & Thrive

- Using statistical techniques to construct a measure of household nutrition knowledge

Nutrition knowledge associated with higher dietary diversity

Note: Local polynomial regression. Shaded area refers to 95%-confidence interval. Dashed lines represent the bottom and top 5% of the nutrition knowledge distribution.

Methodology

- Research question: what is the impact of improving nutrition knowledge on children's dietary diversity

- We use multivariate regression techniques together with instrumental variable methods

  - Allows statements about causality

  - We predict nutrition knowledge using information about Radio ownership and Health Extension Worker (or a health volunteer) visit.

  - Standard diagnostic tests suggest that these are good predictors of Nutrition Knowledge

Findings (1/2)

1) Nutrition knowledge leads to considerable improvements in children's diets

- A one standard deviation increase in household's nutrition knowledge score leads to 0.7 food group increase in children's diets, *on average*

- Children in the average household would now consume from 4 food groups (WHO recommendation)

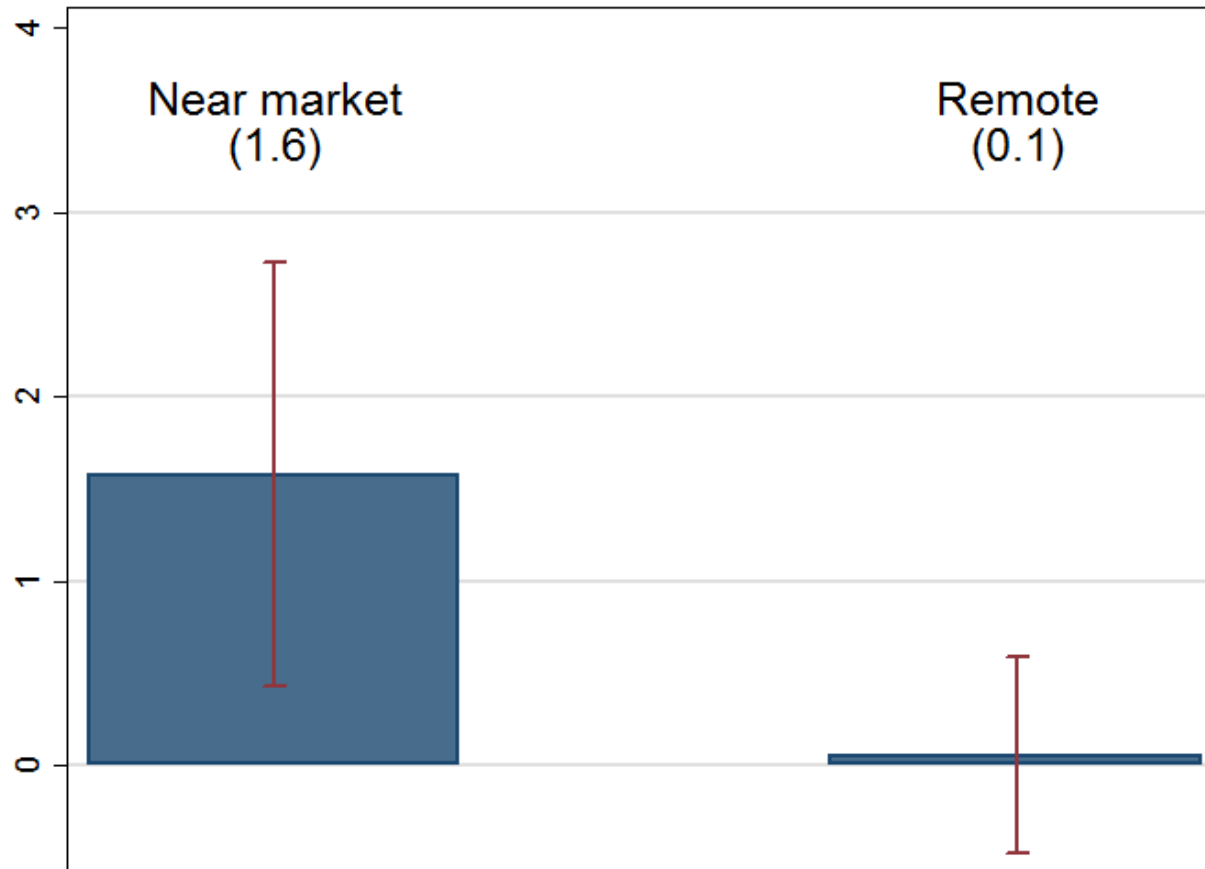# Findings (2/2)

2) But this only holds for areas that have a relatively good market access! (next slide)

Impact of improving nutrition knowledge, by market access

Take-aways for policy (1/2)

- To improve diets in Ethiopia policymakers need to focus on solving both supply and demand side constraints.

1. Behavioral Change Communication seems to work for the demand (knowledge) constraints.

Take-aways for policy (2/2)

2. Ensuring access to foods is a 'tougher nut to crack'

- **In the long run:** access to foods should be mediated through markets.

- **In the short run:** more remote households may have to produce the foods they want to consume by themselves. But this may not be possible everywhere.

  - Considerable agro-ecological constraints!
  - Undermines benefits from production based on comparative advantage

Appendix

Dietary diversity measure

- Series of yes/no questions on children's diets (24 recall, HH level)
- Grouped into 7 food groups (WHO 2008)
- Good proxy for diet quality.
- Mean: 3.1 food groups
- < 7.5 % consumed from 4 or more food groups

Food group	Value
Grains, roots and tubers	0.94
Legumes and nuts	0.87
Dairy products	0.33
Poultry, fish, meat	0.10
Eggs	0.06
Vitamin A rich fruits and vegetables	0.07
Other fruits and vegetables	0.73
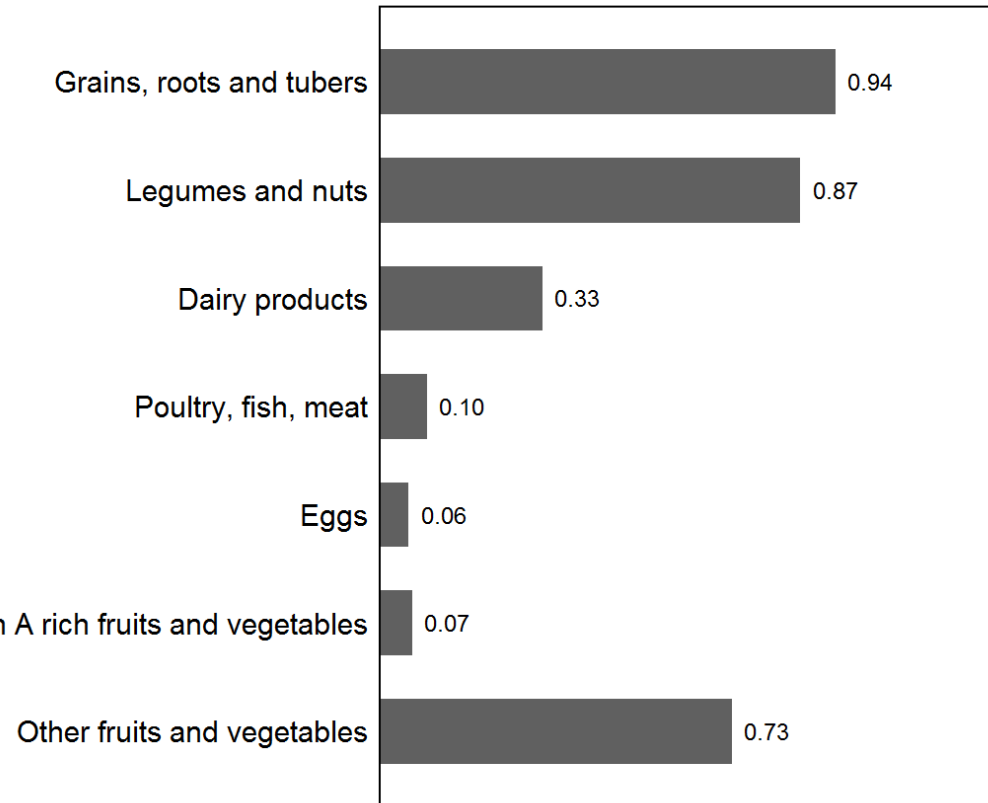
Measuring nutrition knowledge

**Based on "7 Excellent Feeding Actions" by Alive & Thrive**

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Colostrum should be given to the baby	15.4	22.4	19.6	26.7	15.9
Give only breast milk for the first six months of life	2.2	4.1	13.3	46.3	34.1
Babies should eat thick porridge once they stop breastfeeding	2.7	6.2	18.7	43.1	29.3
Very young children (6-24 months) should eat eggs and meat	2.7	6.5	17.3	43.5	30.1
Porridge should be made by adding vegetables, eggs, milk	1.4	2.1	14.3	49.4	32.8
Give a variety of foods to very young children (6-24 months)	1.8	3.5	13.9	43.6	37.2
Give your sick children (6-24 months) more food than usual	2.8	9.6	18.8	43.2	25.6

--> Collapsed into one variable using principal components analysis (PCA)

Education levels are low and education does not predict nutrition knowledge
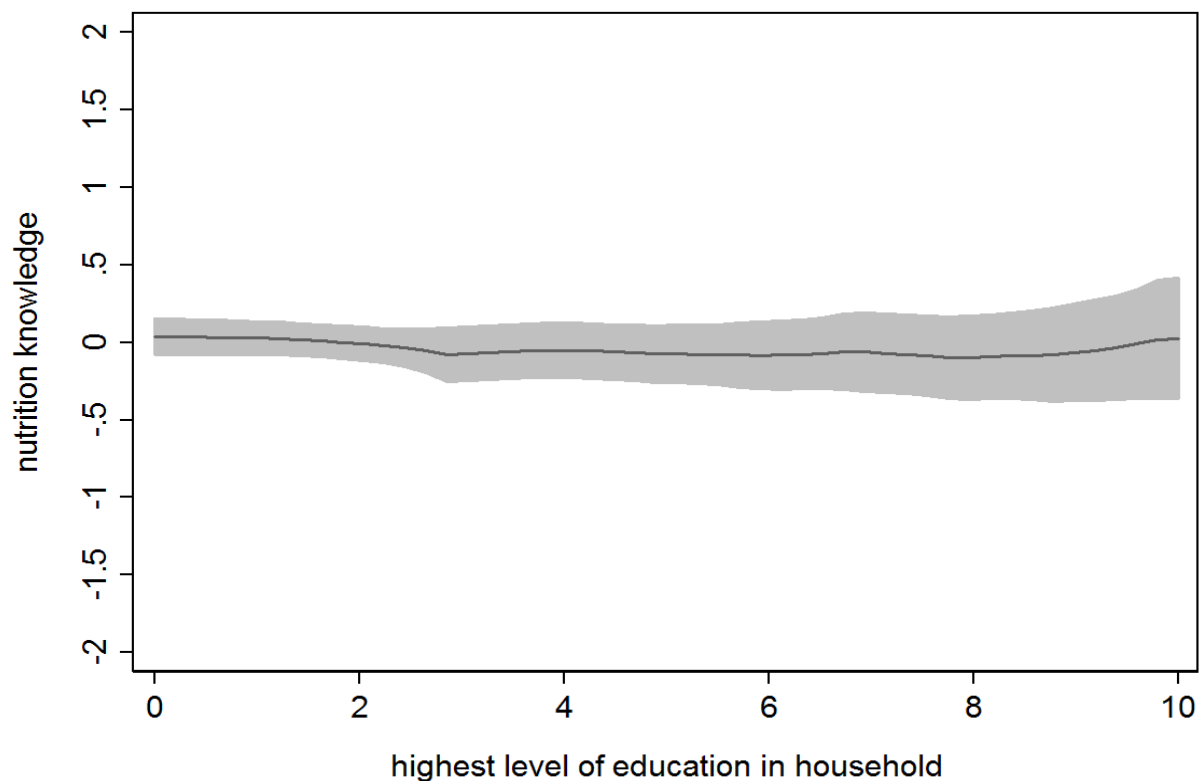
Note: Local polynomial regression. Shaded area refers to 95%-confidence interval.

First stage regression results

Outcome variable: nutrition knowledge	(1)
Household owns a radio	0.389***
	(0.105)
Household was visited by a health worker	0.296**
	(0.129)
Included instruments? [a]	Yes
Weak Identification tests:	
Cragg-Donald Wald F statistic	10.21
Kleibergen-Paap rk Wald F statistic	10.58
Angrist-Pischke F-test – p-value	0.000***
Over-identification test:	
Hansen/Sargan test	1.324
p-value	0.250
Number of observations:	448

Robust standard errors in parentheses.
Statistical significance denoted at *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Results

Dependent variable: number of food groups consumed	OLS (1)	IV (2)
Nutrition knowledge score	0.096**	0.724***
	(0.047)	(0.268)
Remoteness dummy	0.002	-0.183
	(0.104)	(0.148)
R^2	0.151	-
Weak Identification tests:		
Cragg-Donald Wald F statistic	-	10.21
Angrist-Pischke F-test	-	10.58
p-value	-	0.000***
Over-identification test:		
Hansen/Sargan test	-	1.324
p-value	-	0.250
Number of observations	448	448

Robust standard errors in parentheses.
Statistical significance denoted at *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Results robust to:

1. Re-defining nutrition knowledge

   - Use only 1 statement: "Give a variety of foods to very young children"

2. Dropping the health extension worker visit instrument

3. Poisson regressions

4. Using larger data – FtF (2015): 4,107 children

Results by market access

Dependent variable: number of food groups consumed	OLS (1)	IV (2)
nutrition knowledge (A)	0.106*	1.523***
	(0.062)	(0.553)
nutrition knowledge X remoteness (B)	-0.028	-1.468**
	(0.095)	(0.644)
remoteness dummy	0.005	-0.134
	(0.104)	(0.149)
Other controls? [a]	Yes	Yes
Sub-kebele dummies? [a]	Yes	Yes
$\chi2$-test: joint significance: (A)+(B) = 0	p = 0.284	p = 0.841
R^2	0.193	-
Weak Identification tests:		
Angrist-Pischke F-test: (A)	-	2.96
p-value	-	0.032*
Angrist-Pischke F-test: (B)	-	4.17
p-value	-	0.006***
Over-identification test:		
Hansen/Sargan test	-	1.573
p-value	-	0.455
Number of observations	448	448