



Children's Diets, Nutrition Knowledge, and Access to Markets

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Summary. — Chronic undernutrition in Ethiopia is widespread and many children consume highly monotonous diets. To improve feeding practices in Ethiopia, a strong focus in nutrition programming has been placed on improving the nutrition knowledge of caregivers. In this paper, we study the impact of caregivers' nutrition knowledge and its complementarity with market access. To test whether the effect of nutrition knowledge on children's dietary diversity depends on market access, we use survey data from an area with a large variation in transportation costs over a relatively short distance. This allows us to carefully assess the impact of nutrition knowledge with varying access to markets, but still within similar agro-climatic conditions. Using an Instrumental Variable approach, we find that better nutrition knowledge leads to considerable improvements in children's dietary diversity, but only in areas with relatively good market access. Our findings suggest that policymakers and program implementers need to ensure that efforts to improve nutrition knowledge are complemented by efforts to improve access to food.

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1. INTRODUCTION

The last ten years has seen a significant increase in interest in policies and interventions that improve the nutritional status—height, weight, and micronutrient intakes—of pre-school children. This interest is based on two considerations. First, improvements in nutritional status are an intrinsically valuable development outcome. Second, the preponderance of evidence shows that the harm caused by undernutrition in early life—both lost physical growth and neurological damage—is not fully recovered, leading to lower levels of height, schooling, cognitive skills, and ultimately income in adulthood (Black *et al.*, 2013; Hoddinott *et al.*, 2013).

This interest has spurred renewed attention on the two factors that directly affect pre-school children's nutritional status, the consumption of a diet that meets their nutritional needs and the absence of infectious diseases that sap child growth (Black *et al.*, 2013). Ensuring that caregivers understand what foods are appropriate for young children is seen as a core component of efforts to improve children's nutritional status (Bhutta *et al.*, 2013; Black *et al.*, 2013). If caregivers do not understand the importance of providing children with certain foods, or if they perceive healthy foods to be harmful, they will not provide these to their children even when they are available in the household. In Ethiopia, the focus of our work, such misperceptions are widespread. One study found that mothers do not feed young children vegetables because these are perceived to be difficult to digest and lead to stomach illnesses (USAID, 2011). A second study, based on focus group discussions and observation, found that Ethiopian mothers did not feed pre-school children meat or other animal source foods because they believed that children cannot digest these (Alive & Thrive, 2010). Abebe, Haki, and Baye (2016) document considerable maternal knowledge gaps about complementary feeding practices, especially regarding meal frequency and dietary diversity in northwestern Ethiopia. In response, Behavioral Change Communication (BCC) interventions that seek to improve caregivers' nutrition knowledge

have gained popularity among policymakers in low income countries (African Union., 2015; USAID, 2014; WHO & UNICEF, 2003). BCC has been found to be effective at improving child feeding practices in a number of randomized control trials in different settings (Dewey & Adu-Afarwuah, 2008), but many of these have taken place in urban localities or areas characterized by high-population density where good access to food markets is likely (e.g., Bhandari, Mazumder, Bahl, Martines, Black, & Bhan, 2004; Penny, Creed-Kanashiro, Robert, Narro, Caulfield, & Black, 2005; Santos *et al.*, 2001; Zaman, Ashraf, & Martines, 2008). But poor access to foods is likely to be a limiting factor on the effectiveness of BCC to improve caregiver understanding of the importance of diet quality (Penny *et al.*, 2005). This points to a second issue, the availability of a diverse set of foods for adults and children to consume. Evidence from Ethiopia suggests that households and children with better access to markets consume more diverse diets (Abay & Hirvonen, 2017; Stifel & Minten, 2017) and their food consumption is less dependent on their own agricultural production (Hirvonen & Hoddinott, 2017; Hoddinott, Headey, & Dereje, 2015).

To this point, however, research into the role of caregiver knowledge and that of market access as determinants of diets, particularly child diets, has proceeded in parallel. In this paper, we bring these strands together using data from Ethiopia. Ethiopia provides a good study area for this topic for many reasons. Its rugged terrain and poor, though improving,

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infrastructure make transportation difficult and expensive. Chronic undernutrition is widespread—38% of children under five are stunted (Central Statistical Agency & ICF International, 2016)—and Ethiopian children consume a diet that is one of the least diversified in sub-Saharan Africa (Hirvonen, 2016).

For our study, we use a novel data set from an area with a large variation in transportation costs over a relatively short distance but with similar agro-climatic conditions. Our survey data contain detailed information on the diets of pre-school children, their mothers' knowledge of good feeding and nutrition practices, and market access. Using instrumental variable techniques to address the endogeneity of household's nutrition knowledge, we find that nutrition knowledge leads to considerable improvements in children's dietary diversity—but only in areas with relatively good market access. Strikingly, we find no evidence that better nutrition knowledge increases the diversity of children's diet in the most remote localities.

2. DATA

This study focuses on Alefa woreda (district) in the rugged terrain of northwestern Ethiopia. This area was chosen because the large variation in transportation costs over relatively short distances in the woreda allows us to carefully assess the impact of these varying costs by comparing it with a situation of similar physical and climatic conditions. The authors administered a household panel survey in this district to study the consequences of physical remoteness on agricultural productivity, technology adoption, and nutrition. The

first round of the survey took place shortly after the main cropping season (meher) harvest over a five-week period in November and December 2011. The second round, which is used in this analysis, was conducted over a similar period in 2014, interviewing 775 of the original 850 households. The study site is an isolated area with little to no electricity or mobile phone access, and without any development or humanitarian assistance programs provided by non-governmental organizations. As it is common in rural Ethiopia, agriculture forms the main source of income in this area and that is also the case for all the households in our sample. The anthropometric data collected as a part of the first survey (but not as a part of the second survey) showed that 36% of the children were stunted (their height for age z-score was below 2 standard deviation). In this paper, we use the second round of the survey that included detailed questions about households' nutrition knowledge.¹

The starting point for the study area is the market town of Atsedemariam, which is connected to a major metropolitan area (Gonder) to the northeast by a gravel road that is passable year round. Atsedemariam is illustrated by the solid arrow in Figure 1 that provides the map of the survey area.

Trucks regularly ply the road between Atsedemariam and the product markets in Gonder (dotted line in Figure 1) and beyond with goods originating from and destined for Atsedemariam. To the west of Atsedemariam there exist communities whose access to the outside markets is available for the most part only through Atsedemariam because of the difficult terrain. Further, access to Atsedemariam (and onward to Gonder) is limited to paths along the route that are mainly accessible only by foot, although motorcycles can pass along

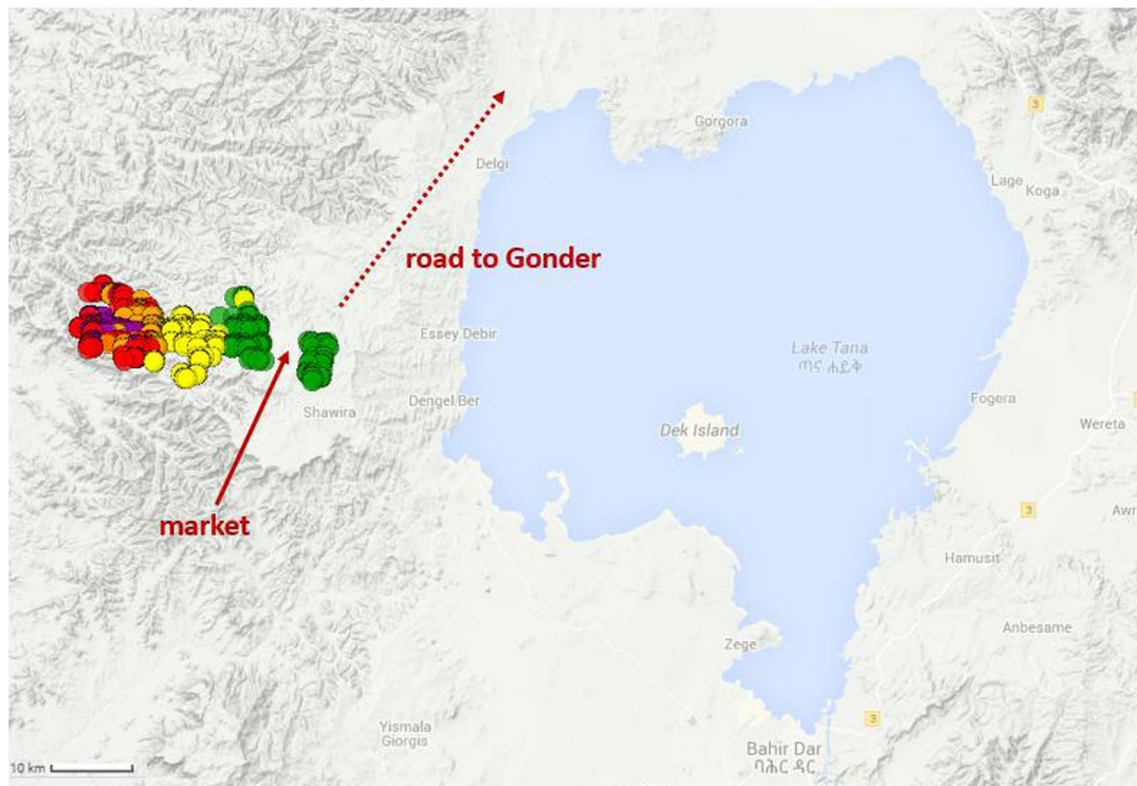


Figure 1. Map of the survey area. Note: The solid line points to the Atsedemariam market and the dotted line points toward Gonder (the second largest city in the Amhara region, after Bahir Dar). Circles represent households. The colors capture households' transportation costs to the Atsedemariam market divided into five quintiles: green (1st quintile, lowest transportation costs), yellow (2nd quintile), orange (3rd quintile), red (4th quintile) and purple (5th quintile, highest transportation costs). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

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