Article

Food insecurity and family structure in Nigeria

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ABSTRACT

The article explores a series of questions and hypotheses related to polygynous family structures and both household and individual-level food security outcomes, using the World Bank Living Standards Measurement Survey data from Nigeria, collected in 2011, 2013 and 2015. A Correlated Random Effects (CRE) model is used to examine the relationship between polygyny and household-level food security, and the degree to which it is mediated by household wealth, size, and livelihood. A Household Fixed Effect model is employed to explore whether a mother's status as monogamous versus polygynous relates systematically to her child's health, and also whether child outcomes of senior wives are better than outcomes of junior wives within polygynous households. At the household level, polygynous households are found to have better food security outcomes than monogamous households with differences in household composition and agricultural livelihood as potential explanatory mechanisms. At the individual level, however, children of polygynous mothers have worse nutrition outcomes than children of monogamous mothers in the long run. *Within* polygynous households, children of junior wives appear to have better nutritional outcomes in the long run, compared to children of more senior wives.

Introduction

Progress toward achieving food security is often cited, with focus typically on global progress toward the Millennium Development and World Food Summit goals, that estimate the proportion and numbers (respectively) of the population that is undernourished (State of Food Security and Nutrition-SOFI, 2015). Nonetheless, not only have the *numbers* of the estimates of those globally affected actually increased in some areas, but progress is uneven. Existing indicators mask the underlying distribution, including both regional variation within countries and variation within households (Barrett, 2010). Among the most difficult issues to understand and measure is that food insecurity is an individual concept, and different members of specific households can experience different outcomes—men versus women, adults versus children, and potentially even different children within the same household.

Nigeria is of particular interest given that the numbers of individuals experiencing food insecurity is rising. According to a Food and Agriculture Organization, FAO (2015) report, despite Nigeria having achieved the reduction of undernourishment of the population by more than half, from 19.3% in 1990 to 8.5% in 2010 to 2012, the number of people who are undernourished in Nigeria increased from roughly 10 million to almost 13 million from 2010 to 2012. Additionally, there is regional, rural, urban, and cultural variation in food security across the country. Food insecurity in Nigeria is also likely to vary within the households and as a direct function of intra-household characteristics, such as household structure and decision-making processes. Family structure in Nigeria is complex and varied, with potential implications for resource distribution and bargaining power that are likely to be important determinants of food security at the household and individual levels (Nazli & Hamid, nd).

This paper explores the relationship between polygyny (the still common practice of a man marrying more than one wife) and food security, as measured by both household-level dietary diversity and coping strategies indicators, and individual level child anthropometric outcomes. Polygyny is hypothesized to have a significant relationship with food security outcomes at the household level, after controlling for household structure, wealth and other relevant factors. In turn, children of mothers in polygynous unions have different individual health outcomes than children of mothers in monogamous unions. Finally, the mother's status within a polygynous union can also be important and, in particular, children of senior wife mothers in polygynous settings are likely to have different individual health outcomes from children of junior wives.

The question of how polygyny affects the distribution of power and subsequent household welfare has been explored. Some studies find a positive association between polygyny and household welfare (Anderson, Reynolds, Biscaye, Greenaway & Merfeld, 2016; Akresh, Chen & Moore, 2012). Akresh et al. (2012) use a game theoretic approach and show that there is greater efficiency in agricultural

production in polygamous households in West Africa, compared to monogamous households, largely attributable to co-operation among co-wives in this setting. Co-operative outcomes are not always by choice, however. According to Dauphin (2016), a wife may be forced to cooperate under a husband's threat to take an additional wife if she does not. Dauphin (2016) found a negative correlation between polygyny and efficiency, as measured by agricultural production in Benin, Burkina Faso and Senegal. Other studies also find a negative relationship between polygyny and efficiency. For example, Kazianga and Klonner (2009) point to co-wife rivalry as a driver of inefficient outcomes, namely health disparities between wives in rural Mali. Other studies find that efficiency in polygynous households tends to be context-specific. For instance, Han and Foltz (2015) found that the degree of co-wife competition or cooperation in Mali depends on the cultural characteristics of polygyny. Using ethnic groups as a proxy, the authors found that among the Dogon, Fulani, and Bambara, there were differences in child health outcomes as a result of unobserved characteristics linked to ethnicity. Munro, Kebede, Tarazona-Gomez, and Verschoor (2010), however, found no difference in household efficiency between monogamous and polygynous households in their experimental study conducted in northern Nigeria. Here, the total endowment invested in a common pool by monogamous and polygynous wives did not differ, indicating an absence of efficiency loss from polygyny. Where husbands controlled the allocations however, there was higher investments of household resources under monogamous unions; and polygynous husbands' investments tended to favour first wives. Husbands were the ultimate gainers from the household allocation of resources. All of these findings point to ambiguous effects of polygyny on household level measures of food security.

Food security is best considered individually, since different members of the same households can experience different outcomes based on gender, age, or other factors. Different children within the same household may have different food security outcomes (Sellen, 1999; Wagner and Rieger, 2015). The relationship between polygyny and individual children's health outcomes most likely operates through efficiency channels, while at the same time depending on characteristics of the child's mother. Polygyny is generally negatively correlated with female bargaining power; co-wives in polygynous households wield less bargaining power than their monogamous counterparts because the value of individual wives' assets in the latter, on which bargaining power may be based, is smaller, given that multiple wives contribute to household welfare (Anderson et al., 2016).

These relationships are examined using the nationally-representative Nigeria General Household Survey, collected as part of the Living Standards Measurement Survey – Integrated Surveys on Agriculture (LSMS-ISA) project of the World Bank. Three waves of the data are used to run correlated random effects (CRE) and Household fixed effects (FE) estimators, in order to convincingly examine relationships and mechanisms. The present research contributes to the existing literature in the following ways. First, appropriate and nationally representative data is employed in carrying out micro-level analyses of food security in Nigeria. Second, the study builds on literature on both intra-household bargaining and the nature and implications of the practice of polygyny, with the specific application of its implications for food security in Nigeria.

Materials and methods

The study employs nationally-representative data from the Nigerian General Household Survey (GHS), containing information collected from 5000 households. The data consists of three waves, 2010/2011, 2012/2013 and 2014/15, and each wave consists of two seasons, post-planting and post-harvest. Post-harvest data is primarily relied on, only updating missing information using the post-planting rounds, as the data in this season included information on both household-level food security and child anthropometric outcomes that were necessary for the analysis.

The survey defines a household as a social unit consisting of one or more people who are or are not related, and who live in the same household unit; that is, live under the same roof, and who eat together; that is "eat from the same pot". This definition and its application in practice have implications for the nature of the responses to food security questions, in particular for polygynous households. First, while in principle a respondent is to be a knowledgeable person answering on behalf of all household members, a potential limitation lies in that it is difficult to be certain that a respondent in a polygynous setting is in fact answering for all co-wives and children, as opposed to for his or her specific family unit within the household. The child-level analysis, however, overcomes this limitation, as it addresses specific children of a certain age regardless of their mothers' status. Second, this definition of a household also has implications for how polygyny is handled in this paper; some polygynous households may have wives who would not be considered as family members if they live in different locations and therefore do not "eat from the safe pot". Households are classified as being polygynous if co-wives are listed in the household roster, therefore, and just by the husband reporting that he is married to multiple women.

For household-level outcome variables, two indices of food security are constructed, in order to reflect different aspects of the availability of and access to food. First, dietary diversity is examined through the Food Consumption Score (FCS), following the World Food Programme approach put forward by Weismann, Bassett, Benson & Hoddinott (2009). The FCS uses information on the frequency of consumption in the week prior of cereals, tubers, pulses, vegetables, fruits, meats and fish, milk, sugar and oil. Higher scores are indicative of better food security. To reflect other dimensions of food security, such as economic and social access to food, the Reduced Coping Strategies Index (RCSI) is constructed, following Maxwell, Vaitla, Tesfay and Abadi (2013). The RCSI provides information on household behaviour or coping strategies in the presence of food deficits. It is constructed from self-reported practices, including relying on less preferred foods, limiting portion sizes and the number of meals eaten, and reducing meals so as to give priority to children.

For child-level food security, child anthropometric measures are used. The height-for-age z-score (HAZ) compares children's height against global averages for that age (in months). Children's skeletal (linear) growth may be compromised due to constraints to nutrition or health, making HAZ a good indicator of stunting, resulting from long-term or chronic nutritional deprivation. The weight-for-height z-score (WHZ) is also considered. As children suffer thinness resulting from energy deficit and disease-induced poor appetite, or loss of nutrients, the WHZ is a fitting indicator for wasting, or more transitory nutritional deprivation.

Summary statistics

Summary statistics of variables from wave 1 (2010/2011) are provided in the table below. It is noted in the descriptions where averages differ greatly between waves. About 23% of households in the data were in polygynous unions. While the rate of polygyny has been on the decline in recent years, it remains a defining feature of household structure in the Nigerian context (Fenske, 2011). Polygynous and monogamous households differ significantly with respect to participation in formal education and the highest education level attained by any household member, with education levels higher in monogamous households. While only 12% of household members in monogamous households report having no formal education, 21% of members in polygynous households had no education. Additionally, in 33% of monogamous households, the highest educational qualification among members was a secondary school education, compared to only 20% in polygynous households. Across all households, roughly 89% of heads in the sample are employed.