

Women's role in agriculture and its effect on child health in Sub-Saharan Africa through intrahousehold resource allocation

Mika Ueyama

Summary

In recent years, studies on poverty in developing countries have progressed remarkably as poverty reduction has emerged as an academic concern as well as an increasingly important issue in development policies. The concept of poverty has been expanded and developed further in the following two ways.

(1) In addition to income (consumption) poverty, non-income dimensions of poverty are now also being emphasized. These aspects include education, health, opportunity, empowerment, and freedom of choice as represented in Amartya Sen's capability approach.

(2) There is a renewed focus on intrahousehold resource allocation. Many economists and policymakers have focused on the question of "who is poor" rather than "which household is classified as poor in terms of household income per capita". This is why intrahousehold issues have become a part of mainstream development economics in recent decades.

This dissertation examines women's roles in agriculture under the "sex-segregated" farming systems in explaining the health conditions of children in Sub-Saharan Africa, and especially seeks the reason why African children are much healthier in terms of anthropometric outcomes than children in South Asia. This study analyzes empirically the determinants of child health, guided by recent theoretical and empirical developments in intrahousehold bargaining models. Recent studies on intrahousehold resource allocation have shown that unitary household models are not applicable in many developing countries. For instance, many studies have shown that farming households, especially in Sub-Saharan Africa, do not operate as a single unit of production and consumption. In such cases, men (husbands) and women (wives) grow different crops and manage budgets separately. In addition, African women have a responsibility for growing food crops and preparing meal for family members.

This study presents substantive empirical evidence that unitary household models are not applicable in Sub-Saharan Africa. In particular, this study reveals the positive effect of

women's bargaining power on child health, through "sex-segregated" gender roles in agriculture. By comparing the main features of poverty in South Asia and Sub-Saharan Africa, this dissertation shows that the distinctive difference in the health conditions of children in the two regions largely stems from the difference in women's roles in agriculture.

This dissertation contributes to the existing literature in the following four ways. First, through comprehensive reviews and international comparisons, regional features of the health conditions of children in Sub-Saharan Africa and South Africa are carefully investigated and new findings are presented. Second, the empirical results of this study provide additional evidence that unitary household models are not applicable in Sub-Saharan African setting. Third, this study proposes the reasons why African children are relatively healthier than their income level would suggest, by focusing on women's role in subsistence farming. There are only a handful of studies investigating the relationship between child health and women's roles in agriculture and this dissertation is the first to identify such role as a key determinant of child health in Sub-Saharan Africa. Last but not the least, this study is the first to empirically examine and differentiate the pathway through which women's farming can affect child health in Sub-Saharan Africa through (1) the pure food security effect, (2) the women's bargaining effect, and (3) their interaction effect (women's bargaining effect realized through household food security), using rich household level data sets.

Summary of Findings

The dissertation is divided into two parts. The first part elucidates the main features of health conditions in Sub-Saharan Africa especially as compared with South Asia. Chapter 2 provides an overview of trends in the health conditions of children in the developing world, and Chapter 3 focuses on gender differences in child health outcomes and the relationship between income growth and gender bias in childhood mortality. In the first part, the following three features of child health conditions are identified as characteristic to Sub-Saharan Africa in relation to South Asia.

- (1) African children face less malnutrition as measured by anthropometric outcomes than children in South Asia, despite the fact that the basic health performance of Sub-Saharan Africa is the worst in the world according to aggregated statistics such as mortality rates.

- (2) There is little anti-female gender bias in measures of child health, such as childhood mortality, anthropometric outcomes, and health-related inputs in Sub-Saharan Africa, whereas such anti-female bias is severe in South Asia.
- (3) In Sub-Saharan Africa, the health conditions of children and the extent of gender bias in health outcomes are much less associated with income growth, while health conditions and gender bias are generally correlated with income levels and economic conditions in other developing regions including South Asia.

The second part of the dissertation seeks to find underlying factors contributing to these distinctive features of child health in Sub-Saharan Africa. The determinants of child health are examined using the framework of intrahousehold resource allocation models, focusing on the effects of women's intrahousehold bargaining power through their contribution to subsistence farming on child health outcomes.

Chapter 4 briefly reviews the recent research on intrahousehold resource allocation, paying attention to empirical studies of the effect of women's bargaining power on child health. Previous studies have found that women's relatively strong bargaining power has a positive effect on child health since women typically invest more on human capital of their children than men do. However, if one assumes unitary models where the household income is pooled, intrahousehold resource allocation is not affected by individuals' bargaining powers. In fact, a number of studies find that incomes are not fully pooled among household members in Sub-Saharan Africa, therefore rejecting unitary household models. One of the reasons is that women not only grow subsistence crops mainly for home consumption, but also have independent authority over disposal/marketing decision-making on their crops. This "sex-segregated" gender role in agriculture, i.e., men and women grow different crops independently on different plots within a household, is a distinctive feature in Sub-Saharan Africa, and this dissertation tests the hypothesis that such agricultural practices lead to better health conditions of African children than those of South Asian children.

The dissertation explores the following three mechanisms through which women's subsistence farming under the "sex-segregated" gender roles in Sub-Saharan Africa could improve health conditions of the children: (1) an increase in household food supply from women's contribution to subsistence crop production (the "pure food security effect"), (2) the changes in intrahousehold resource allocation attributable to the changes in relative bargaining power in the household (the "pure bargaining effect"), and (3) the interaction effect between (1) the "pure food security effect" and (2) the "pure bargaining effect" (the bargaining effect

through household food security). Using this conceptual framework, Chapters 5 to 7 empirically investigate how exactly the health conditions of children are influenced by household food security and women's bargaining power under this farming system in Sub-Saharan Africa.

As a base-line analysis, Chapter 5 quantitatively examines the relationship between women's engagement in agriculture and the health outcomes of children without attempting to distinguish the above three mechanisms, using the Demographic and Health Surveys from various developing countries. The regression results show that mothers' agricultural work has a much greater impact on child health relative to fathers' agricultural work in Sub-Saharan Africa, whereas fathers' farming is more important in South Asia. The result suggests the possibility of a positive effect of women's farming on child health in Sub-Saharan Africa, but this regression analysis does not specify the channels through which women's participation in agriculture affects child health.

Chapters 6 and 7 examine the pathway through which women's roles in subsistence crop production can affect the health conditions of children in Malawi and South Africa, differentiating among the food security effect, women's bargaining effect, and their interaction effect. Following table summarizes the regression results. Women's contribution to food production for home consumption has a positive and significant effect on child health through enhancing women's bargaining power and household food security in both countries. In South Africa, ensuring household food security is fairly important for child health. Women's strong bargaining power positively influences child health through an increase in the self-sufficiency of food, which is assured by women's contribution to subsistence farming. Also, cultivating food crops for home consumption may directly contribute to the improvement and stability of household food security. This effect, called the pure food security effect, has a positive and significant effect on child health in South Africa, but insignificant in Malawi. In contrast, women's strong bargaining power plays a significant role in Malawi. The pure bargaining effect is more important than women's bargaining effect through household food security in Malawi. Moreover, the actual impact of women's bargaining power differs by the gender of children. Women's relatively strong bargaining power has a positive and significant effect on girls' health, but not on boys'. In both countries, the weight-for-age is more likely to correlate with the household food self-sufficiency and intrahousehold bargaining power than the height-for-age. This result is reasonable because the determinants of the height-for-age and those of the weight-for-age are different. The weight-for-age reflects current health conditions such as acute malnutrition and diseases and is easily influenced by changes in economic

circumstances and intrahousehold resource allocation. In contrast, the height-for-age is a result of cumulative health conditions since the conception, highly influenced by the health condition of mothers during pregnancies and sanitary conditions during the early childhood. In short, women’s contribution to subsistence crop production is a powerful tool to prevent acute malnutrition of children so that it is an effective mechanism to reduce the ill effects of poverty and economic shock.

Table Summary of Empirical results

	Malawi		South Africa	
	weight-for-age	height-for-age	weight-for-age	height-for-age
pure food security effect	-	-	positive	positive, but weak
pure bargaining effect (mothers' relatively strong bargaining)	significantly positive for girls' health, but insignificant for boys' health	-	significantly negative for girls' health, but insignificant for boys' health	significantly negative for girls' health, but insignificant for boys' health
bargaining effect through food security	positive	positive (especially for land and plot ownership by women)	positive (especially for girls' health)	-

Note: " - " means that the effect was statistically insignificant

Limitations of the Study and the Remaining Issues for Future Research

There are several limitations and unanswered questions in this study. First, the micro datasets used in this study are not ideal. For instance, detailed information on agricultural production is not available. The analyses would be considerably enriched if we could compare the intensity of agricultural labor inputs of men and women by crops (plots). The concept of “sex-segregated” gender roles in agriculture and the definition of men’s and women’s crops are complicated, e.g., persons who spend much time for growing crops are sometimes different from those who have decision-making authority on crops. The lack of data on the amount of labor inputs by crops and intrahousehold time allocation makes it difficult to clarify what the

“sex-segregated” gender roles are. Moreover, measurement errors in the anthropometric variables make it impossible to use panel data analyses. Panel analyses are preferable in the investigation of the fluctuation of individuals’ health conditions. Also, limited information on cultural aspects and community level information prevents us from finding appropriate instrumental variables to rigorously control for the endogeneity bias.

Second, this dissertation analyzed case studies of Malawi and South Africa only, both of which are in maize cultivating areas. Existing studies show that the “sex-segregated” gender role is more pronounced in plantain cultivating areas such as West Africa. Therefore, further research is needed to carefully examine how the effect of women’s roles in agriculture on child health is different by areas or countries within Sub-Saharan Africa. This study has found that women’s subsistence farming has a positive effect on child health even in maize cultivating areas. We expect such effect to be stronger in West Africa, but this expectation needs to be empirically examined.

Finally, this dissertation identified the women’s particular role in agriculture as a main determinant of their relative bargaining powers within a household. However, other social, cultural, and environmental factors, such as inheritance systems, paternal or maternal society, and polygamy, may influence the intrahousehold bargaining power and gender roles in societies. We can certainly benefit from future research by incorporating these factors and refining the measurement of women’s bargaining power. The investigation of the definition of a household and its dynamic formation is also worth more research. These issues are left for further research.