

Peripartum timing, agricultural productivity, food security and child health in Africa

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Extended abstract

The majority of the population in LICs depend on rain-fed agriculture for livelihoods, which means the timing of most activities is dependent on the rainfall calendar and pattern. This has implications on the timing of other events that reduce labour supply or make it hard to carry out heavy agricultural workloads. One such event is pregnancy, especially in the third trimester and a few months after giving birth which period we refer to as peripartum (loosely used here to refer to the first three months before and after delivery). Women provide an estimated 24–50% of the total labour force in agriculture in Africa (Palacios–Lopez et al., 2017) and produce a substantial share of all food globally (Doss et al., 2018). Therefore, the demand for their labour at critical points in the agricultural calendar cannot be overemphasized. Anecdotal evidence (Mulungu & Kilimani, 2023) confirms that pregnancy or birth are adverse idiosyncratic shocks that affect livelihood outcomes such as food security, and asset accumulation. However, there is no robust evidence on the effect of the timing of pregnancy on both the household (through the mother) and the child. There is literature that estimates the timing of pregnancy and birth and child outcomes, for example, the famous “monsoon babies” shows that an increase in rainfall increases weight for height but that the effect is transitory and dissipates by age five (Tiwari et al., 2017). There is also evidence that the timing of pregnancy, and the coincidence of second and third trimesters have an impact on child outcomes such as weight at birth (Ahmed et al., 2020).

No similar studies exist in rural Africa where such a study is more crucial for three reasons. First, unlike in urban areas or in places with irrigated agriculture, rural Africa depends on rain-fed agriculture, meaning ‘work’ cannot be moved to fit the pregnancy or birth schedule. Second, there is a clear link between production and food security. If a household has reduced labour in the current year when the baby is born, then they will be food insecure the following year, impacting the health of the mother and the child. Pre- and post-natal health of the mother has significant effects on child health outcomes. Thirdly, because of the seasonality of rainfed agriculture, the food lean season also coincides with the growing season when the labour demands are high, this means the effect of pregnancy and birth for food insecure households is compounded.

In this project, we seek to ask:

How does peripartum timing affect agricultural productivity, food security, and child health outcomes? Does the effect vary by gender of the household head and family size? How long does the impact persist for children? This study will use panel data econometrics to answer the afore mentioned questions. We will use the LSMS–ISA datasets for five African countries to obtain the date of birth for children under five. From these data, we will map out when ‘peripartum’ happened. This household data will then be linked to rainfall patterns for that area from different sources. A determination of whether peripartum coincided with the agricultural season when there is demand for labour and seasonality of food availability will then be determined. Since the data has children up to age 5, we will determine how long the effect lasts on children. We will also use latest advances in causal machine learning to determine if the effect varies by different household characteristics such as household size,

gender of the household head, education level, and others. To understand impact mechanisms, we will determine if a household that has an adult female with peripartum in the growing season has significantly reduced labour supply to agriculture. We will also determine if the impact of peripartum on agricultural productivity is more pronounced on female-managed plots compared to male-managed plots.

This analysis will contribute to literature in several ways. Several studies have examined the impact of adverse shocks on rural livelihoods in Africa. Though no conclusive studies exist on the categorization of pregnancy and childbirth as a negative shock, anecdotal evidence shows that these events reduce households' welfare (Mulungu & Kilimani, 2023). Further evidence shows that timing of pregnancy has implications for the health of the fetus (Ahmed et al., 2020). Babies born in the growing season in some studies have been found to have low birth weight (Ahmed et al., 2020). However, there is a lack of research specifically examining the impact of pregnancy and birth timing on rural livelihoods in Africa. This research will address this gap in the literature by providing empirical evidence on the topic. We will also contribute to the public health literature that has come up recently estimating the timing of certain events such as school calendars and child health outcome by providing a causal impact of pregnancy timing on both household and children's health. This study will also contribute to the literature on human capital accumulation by estimating the long-term impact of pregnancy timing on child health outcomes.

In addition, the proposed research also aims to examine whether the effect of pregnancy and birth timing varies by gender of the household head and family size. This is important as gender and household size are known to be key factors in determining household strategies and coping mechanisms in rural Africa (Mehtar et al., 2016; Paumgarten, 2005). Furthermore, this research will be the first to estimate the effect of peripartum timing on agricultural and livelihood outcomes in Africa. Because we will use nationally representative data (LSMS-ISA) from four sub-Saharan countries, we provide nationally representative statistics on birth timing by season and provide a regional picture of the topic unlike previous studies that mostly used case-studies or single countries.

The findings from this research have several policy implications. First, they are expected to inform policies that support pregnant women and new mothers in rural areas and help farmers and households plan their activities around pregnancy and birth. Second, for policymakers, the research will provide valuable information on how peripartum timing can affect agricultural productivity, food security, and child health outcomes. Such information can be used to design policies and programmes that address these issues, including social support. Overall, the findings have the potential to improve the well-being of many rural communities in sub-Saharan Africa.