Changing Perceptions of Climate-Related Risk and Fertility Intentions in Malawi: Longitudinal Narratives of Uncertainty

Monica Grant and Katherine Curtis

The inter-annual variation in rainfall in southern Africa has increased since the 1960s—droughts have become more intense and widespread, while rainy periods have become shorter and with increased rainfall (Fauchereau et al. 2003; Shongwe et al. 2009; Williams, Kniveton, and Layberry 2010). Countries in the region are seen as particularly vulnerable to climate variability, given the paucity of resources and infrastructural constraints that exist even in the absence of extreme rainfall events (World Meteorological Organization 2020). Malawi has had one of the most erratic rainfall patterns in Africa, with high spatial variability in monthly and annual rainfall across districts by topography and location (Kumbuyo et al. 2014; Ngongondo et al. 2011). The number and severity of climate-related disasters has increased in recent decades, including 16 major flooding events between 2010 and 2022 (World Bank 2022). In the absence of development intervention, climate change is projected to reduce Malawi's GDP per capita by 6-20 percent in 2040 (World Bank 2022).

In this study, we use longitudinal in-depth interviews to explore how repeated exposure to extreme weather events shape perceptions of climate-related risk and the consequences of these perceptions for fertility intentions and behaviors in rural Malawi. Our data were collected in the months following Cyclone Idai (2019) and Cyclone Freddy (2023), allowing us to compare how respondents incorporate these experiences into their narratives of the future and how these narratives change over time. Preliminary analyses indicate an increasing focus on uncertain climate conditions over time, with an emphasis on concerns about food security and maintaining the health of existing children. These pervasive concerns motivate desires for birth intervals of five months or longer. Our findings have implications for theories of fertility decline, with an emphasis on how climate fluctuations may shape fertility trends.

Background

By examining parents' fertility intentions in the periods following Cyclone Idai and Cyclone Freddy, we use the framework of imagined futures (Vignoli et al. 2020) to integrate the schemas parents invoke to understand and make sense of environmental forces as they envision their family's future composition and wellbeing. This framework is distinct from earlier research linking fertility intentions and the environment, which have focused on the consequences of

long-run environmental degradation (e.g., Biddlecom, Axinn, and Barber 2005; Carr 2005; Ghimire and Mohai 2005; Rosero-Bixby and Palloni 1998; Sasson and Weinreb 2017) and short-run deviations in climate or food security (Brooks et al. 2023; Eissler, Thiede, and Strube 2019; Grace et al. 2017; Simon 2017; Somefun and Banougnin n.d.). The former body of research often approaches fertility as a household risk diversification strategy to insure against declining environmental conditions, while the latter analyzes isolated disruptions in reproductive decision-making. Within the imagined futures framework, the immediate context of environmental instability generates an anticipated future characterized by uncertainty, which in turn informs reproductive actions and intentions in the present. Of particular interest are the time horizons over which parents are jointly evaluating their environmental and reproductive futures.

Theories of fertility postponement in sub-Saharan Africa have centered the uncertainty of everyday life as a motivation for couples to delay their next birth. Current material difficulties and perceived insecurity lead couples to decide that they want no additional children in the present moment; the decision to have additional children can be revisited at some time in the future as conditions and priorities change (Timæus and Moultrie 2020). In this framework, fertility preferences are recognized as uncertain and flexible (Morgan 1981; Trinitapoli and Yeatman 2018)), shifting and taking shape in response to evolving life circumstances. Empirical studies of fertility intentions in sub-Saharan Africa suggest that even when respondents are clear that the present is a bad time to have a child, when the right moment will come is often ambiguously framed (Agadjanian 2005). As climate fluctuations increase, we hypothesize that this dynamic of increased uncertainty will motivate birth postponement.

Data and Methods

This paper draws on 65 in-depth interviews collected in rural Malawi in July 2019 and 77 in-depth interviews collected in June 2023. In 2019, respondents were purposively selected from past participants of the Malawi Schooling and Adolescent Study (MSAS), a longitudinal survey that followed a cohort of youth from 2007 to 2013 in Balaka and Machinga districts (Hewett and Mensch 2015). First, we selected MSAS clusters based on two criteria: the cluster must have had at least ten female respondents and ten male respondents in residence at the time of the 2013 survey round; and the cluster must have experienced extremely high rainfall in March 2019 when Cyclone Idai hit the region. Second, we contacted MSAS respondents until three men and three women had been interviewed within each selected cluster; once the quota was achieved, no

attempts to contact other respondents were made. For two clusters that had been particularly hard-hit by Cyclone Idai, we sampled six women and six men. Due to high levels of out-migration, the interview team contacted all male respondents who were living in most clusters in 2013 to complete three interviews. In contrast, the majority of female respondents were still living in the same area as they had lived in 2013. These efforts yielded a sample of 35 women and 30 men ages 26-29 years old at the time of the 2019 interviews.

In 2023, we returned to the same clusters and attempted to reinterview the respondents from 2019. If respondents moved outside the study area or could not be located, they were replaced with other MSAS respondents from the same cluster. Thirty women and 17 men were reinterviewed in 2023 (longitudinal sample). Five women and 14 men interviewed in 2019 had migrated or were not located by the study team in 2023 (2019 only). In addition to these respondents, 12 women and 21 men not interviewed in 2019 were successfully interviewed in 2023 (2023 only). The final 2023 sample included 39 women and 38 men aged 30-34 years old.

All interviews were conducted in Chichewa by experienced local interviewers of the same sex as the respondent. The interview guides included questions about the respondent's background, recent experiences with extreme rainfall and drought, livelihoods, fertility plans, and fertility outcomes, and interviewers were encouraged to probe beyond these prompts. The authors of this paper met with the interviewers daily to discuss the content of the interviews and revised the interview guide in response to emerging themes as the study progressed.

Recordings of the transcripts were transcribed and translated into English by local transcribers immediately following the interviews. The authors read all transcripts as soon as they were translated to clarify the content with the interviewers and transcribers. The interviews were analyzed using a flexible coding strategy (Deterding and Waters 2018). First, the interviews were coded by a research assistant in NVivo with categories that corresponded to the major themes of the interview guide. Second, the authors re-read the coded units focused on fertility intentions and preferences and inductively generated more detailed codes based on the themes that emerged from the interview data.

Preliminary Findings

Four months after the extreme rainfall associated with Cyclone Idai (2019), our interviews revealed continued evidence of the physical devastation resulting from the storm. Almost 40 percent of respondents reported that at least part of their home had collapsed during

the heavy rains and winds associated with the cyclone and all respondents who engaged in subsistence agriculture reported extensive crop losses. The average female respondent had 2.5 children and the average male respondent had 1.4 children, including two women and six men who were childless. Twenty-seven women and 24 men were married at the time of the interview, seven women and two men were separated or divorced, and one woman and four men had never married. All never married respondents were nulliparous and unable to describe intended birth intervals beyond describing ideals. Therefore, this analysis will focus exclusively on the fertility intentions of ever-married respondents.

In the period following Cyclone Idai, three motivational narratives emerged. First, a minority of respondents described their fertility intentions as undisrupted by recent extreme environmental events. The motivations of the remaining and majority of respondents were more consistent with the intention to postpone their next birth. Although these respondents named a time to wait until their next birth, these answers were framed by contingency and uncertainty. We identify two forms of postponement intentions differentiated by the domain of uncertainty. First, some respondents planned to postpone their next birth because of *uncertain conditions*. For many respondents, these intentions were grounded in the economic uncertainties created by Cyclone Idai and other environmental fluctuations. Second, respondents described *uncertain intentions*. These respondents were not only postponing their next birth, but also the decision about whether to have additional children given uncertainties about the future.

We are in the process of analyzing the 2023 interview data. Preliminary observations suggest a shift in narratives relative to 2019. In 2023, the uncertain conditions narrative was pervasive across respondents, suggesting the normalization of climate uncertainty in the everyday lives of rural Malawians. Rainfall fluctuated between 2019 and 2023, with drought years occurring between the two cyclones. Respondents emphasized ongoing concerns about food security and the health of their existing children as the primary motivation for the postponement of future childbearing. To a lesser extent, respondents also discussed the increased labor demands on women in the aftermath of a climate-related disaster as a threat to health during pregnancy. The final paper will explore the links between climate-related uncertainty, concerns about maternal and child health, and intentions for birth postponement. We will discuss the implications of our findings for theories of fertility decline, with an emphasis on how climate fluctuations may shape fertility trends.

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