Birth Planning and Women's and Men's Health in Malawi

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Abstract

Despite the frequency with which it occurs, we know little about unintended fertility in sub-Saharan Africa and even less about its implications for the health of the women and men who experience it. We use longitudinal data from southern Malawi to explore how young adults report on the planning of their births and to identify changes in their self-rated health and subjective well-being associated with having more or less planned births. Our data feature a comprehensive scale of pregnancy planning, the London Measure of Unplanned Pregnancy (LMUP), that extends beyond the conventional focus on timing-based pregnancy intentions to incorporate information about contraception, desires, intentions, partner discussion, and preconception preparations. Women and men have similar bimodal distributions on the LMUP, with the majority of births clearly unplanned or planned but a sizeable minority that falls in the middle. Change score models demonstrate that, for women, an unplanned birth is associated with a decline in self-rated health. In contrast, men whose births were ambivalently planned experience a decline in subjective well-being. Our findings highlight the value of considering the full spectrum of birth planning and demonstrate the health consequences of unplanned fertility for both women and men in this sub-Saharan context.

Globally almost one-third of unintended births—that is, births that were not wanted or that came sooner than desired—occur in sub-Saharan Africa (Sedgh et al., 2014). Despite this, research on the health consequences of unintended births in the region is sparse, and has focused almost exclusively on the resulting children's outcomes (Bashchieri et al., 2016; Gipson et al., 2008).

Having a child that was not intended, however, could impact women's own health, as well as that of men who are frequently overlooked despite the fact that they too have fertility intentions and may be susceptible to poor health from unintended childbearing. Of course, identifying potential health consequences of unintended births for women and men hinges on the careful measurement of birth intentions, which are notoriously hard to measure and frequently conflict with individuals' fertility-related desires and behaviors (Mumford et al. 2016; Trussell et al. 1999). Variation in the degree to which births are not just intended, but desired, discussed by the prospective parents, and even explicitly prepared for may be

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informative for identifying those at highest risk of negative outcomes. In this paper, we use a comprehensive measure of pregnancy planning, the London Measure of Unplanned Pregnancy (LMUP), to examine variation in the planning status of young Malawian women's and men's recent births and its association with their subsequent health.

BACKGROUND

Measurement Challenges

Most commonly, researchers categorize births using only a single-item, timing-focused question of fertility intentions. Specifically, the standard approach used in population-based surveys globally (e.g., Demographic and Health Surveys) and in the U.S. (e.g., National Survey of Family Growth) is to ask individuals (almost always women) a variant of the following question: "At the time you became pregnant, did you want to become pregnant then, did you want to wait until later or did you not want to have any (more) children at all?" Researchers then categorize births into those that were intended (wanted then) versus unintended, sometimes differentiating between unintended births that were unwanted and those that were mistimed (Campbell & Mosher, 2000; Gipson et al., 2008).

Despite known limitations of this approach, the measure continues to be used to identify unintended pregnancies, particularly in low-income settings (Gipson et al., 2008). One concern is the focus on extremes fails to reflect the grey area between a fully intended and a fully unintended pregnancy (Bachrach & Newcomer, 1999). The traditional approach to classifying births as intended, mistimed, or unwanted prevents the identification of the ones that women and men had mixed or conflicting intentions towards (Aiken, Borrero, et al., 2016; Kavanaugh & Schwarz, 2009). Identifying these births is important both because they might carry independent health risks (e.g., Mohllajee et al., 2007; Kost and Lindberg 2015) and because doing so helps to identify the least intended births, which may pose the greatest health challenges.

Another concern is that intentions are complex and notoriously hard to measure (Sable 1999). People talk about their intentions using different terminology than do researchers (Barrett and Wellings 2002) and stated intentions are frequently inconsistent with accompanying behaviors, which has led researchers to question the value of narrowly studying intentions as conventionally measured (Trussell et al., 1999; Agadjanian, 2005; Santelli et al., 2003). Furthermore, the standard measure of intention focuses narrowly on the timing of a pregnancy (Aiken, Westhoff, et al., 2016). There are other relevant aspects of individuals' feelings about a pregnancy and his or her desire for it. For instance, the appropriateness of a particular partnership for childbearing, the extent to which the birth was discussed in advance, and feelings of preparedness for parenthood (Barrett et al., 2004) likely correspond with an individuals' reaction to the birth, and its implications for his or her health. Indeed, these elements of pregnancy planning may be more indicative of the consequences of a birth for women's and men's health than the intentionality of it alone (Sable 1999).

The careful measurement of women's and men's fertility planning, not merely their reported intentions, may also have added value in sub-Saharan African contexts where pro-natal

cultural beliefs may discourage women and men from retrospectively reporting that a pregnancy was not intended. In this setting, the benefit of asking about a range of behaviors, intentions, and desires to accurately differentiate pregnancies according to the degree to which they were planned may be even greater. Moreover, a more comprehensive approach, focusing on multiple indicators of planning, enables for clearer identification of the potentially sizeable group of women and men who are engaging in some planning behaviors, but perhaps inconsistently so, or with ambivalence.

The London Measure of Unplanned Pregnancy (LMUP)

The LMUP is a comprehensive tool used to measure pregnancy planning retrospectively and has become the standard approach for studying unplanned pregnancy in Britain (Wellings et al., 2013). The six-item LMUP captures multiple facets of pregnancy planning, not only whether a pregnancy was intended at the specific time, and recognizes that behaviors might reflect underlying latent aspects of intentions that may not be captured in reports (Barrett et al., 2004). Furthermore, it asks respondents to recall their feelings, plans, and behaviors prior to the conception in relative detail, which should aid retrospective recall (Bachrach & Newcomer, 1999).

The LMUP asks about six aspects of pregnancy planning: contraceptive use; personal circumstances/timing; expressed intention; desire; partner discussion and agreement; and pre-conception preparations (Barrett et al., 2004). By measuring behaviors and feelings across these domains, the LMUP reflects a continuum of pregnancy planning that allows researchers to identify births resulting from pregnancies that were neither consistently planned nor entirely unplanned. Although originally developed for an urban UK population, the women's LMUP has been successfully adapted and validated for use in a range of settings, including the United States, India, Iran, and Malawi (Aiken et al., 2015; Hall et al., 2013; Morof et al., 2012; Rocca et al., 2010; Roshanaei et al., 2015). The men's LMUP has received less attention. Our study is the first to implement it in Malawi, but it has previously been used in the UK and Sweden (Bodin et al., 2015; Hall, 2015). To our knowledge, this is also the first study in any context to apply the LMUP in an analysis that examines the relationship between women's and men's birth planning and health.

Health Consequences of Unplanned Childbearing for Women and Men

Research on unintended fertility in high-income countries suggests that unplanned births may have negative implications for women's health. Longitudinal studies from the U.S. and Australia have found that women who had an unwanted birth have worse mental health outcomes than do women with only wanted births (Barber et al., 1999; Herd et al., 2016; Najman et al., 1991). Cross-sectional studies from low- and middle-income settings corroborate these findings, showing correlations between having an unintended birth (relative to an intended one) and women's worse physical and mental health in contexts as diverse as Brazil, Iran and Indonesia (Faisal-Cury et al., 2016; Hardee et al., 2004; Khajehpour et al., 2013).

Evidence that unintended childbearing is associated with poorer antenatal care practices in sub-Saharan Africa suggests that births that are unplanned versus planned could be

especially harmful to women's health in the region (Magadi et al., 2000; Marston & Cleland, 2003). These risks could be particularly acute in settings like Malawi with relatively high maternal morbidity and mortality (Lozano et al., 2011). Unplanned births could also lead to poor health and well-being due to depression over a lack of control over one's life or as the result of stigma when they occur outside of marriage or with insufficient spacing (Levandowski et al. 2012). Furthermore, an unplanned pregnancy could contribute to lower quality relationships, either by encouraging a hasty marriage (Smith-Greenaway and Clark 2018) or causing relationship strain, both of which could lead to declines in health. Growing aspirations for educational and occupational success among young women in Malawi and elsewhere in the region (Frye, 2012; Johnson-Hanks, 2004; Mojola, 2014; Watkins, 2000), may also mean unplanned births generate stress from goals going unrealized.

Given the absence of men from the fertility literature (Greene and Biddlecom 2000), it is unsurprising that we know little about whether unplanned childbearing is associated with changes in fathers' health. The narrow focus on women is not specific to the African context but is reflective of the broader literature's unapologetic focus on women, accounting for only their perspective on births (Gipson et al., 2008; Logan et al., 2007). There are reasons for this primary focus given that women carry pregnancies and are largely responsible for pre- and post-natal health behaviors. Nonetheless, childbearing is dyadic and fathers' perspectives of their fertility can influence their children's health and their partners' health-seeking behaviors (DeRose & Ezeh, 2005; Dodoo, 1998; Richter & Morrell, 2008), suggesting they may also be relevant to their own health. The single study that we are aware of found higher levels of depression among American men who reported mistimed or unwanted births (Bronte-Tinkew et al., 2009).

On the other hand, fertility is highly culturally valued across diverse African contexts (Bawah et al., 2016; Bledsoe et al., 1998; Caldwell & Caldwell, 1987; Preston-Whyte et al., 1990) and even unplanned births may be quickly welcomed, and thus may not be experienced differently than planned ones. This may be especially true for men in Malawi. The gendered nature of childrearing and the extended, non-nuclear structures of family, may mean that men's health and well-being will be less shaped by the extent to which their children were planned.

Of course, it is also possible that the simultaneous social valuing of fertility, combined with young Malawian women's and men's own desires to delay childbearing, could lead them to experience childbearing with considerable ambivalence. That is, these countervailing forces – “benefits and burdens” in Daniel Jordan Smith's lexicon (Smith, 2004) – could also lead to young men and women approaching their fertility with ambivalence. That is, they may have some intention for a birth because of social expectations but only half-heartedly plan for it, or only engage in select planning behavior. Although most family planning and health research focuses on unplanned births, we suspect that these “ambivalently-planned” births may also carry consequences for young women's and men's health.

In this paper, we offer a descriptive overview of birth planning among population-based samples of young women and men in Malawi. We then use longitudinal data to examine how their health and well-being change following a birth that was more or less planned.

Current Study and Setting

Our study is set in the southern Malawian community of Balaka, a growing town and district capital off the main highway connecting Malawi's two largest cities. A number of tribes are represented in and around Balaka, the majority of which are traditionally matrilineal and matrilocal (Berge et al. 2014). Among matrilineal tribes, children tend to belong to their mother's clan and live with their mother or her extended family following divorce (Peters, 1997); however, these practices are more closely adhered to in rural villages than in town.

Fertility has been falling in Malawi but remains highest in the country's southern region at 4.6 children per woman. Like its neighbors in eastern and southeastern Africa, Malawi also has high rates of unintended births. Forty one percent of births in Malawi are unintended, and high fertility rates mean that women's lifetime experience of an unintended birth is particularly high (National Statistical Office (NSO) [Malawi] & ICF International, 2016; Sedgh et al., 2014). In such a context, a large proportion of births are likely to occur with minimal planning. The mean age of first marriage is 18 for women and 23 for men. The mean age of first birth is 19 for women; no comparable data exist for men (National Statistical Office (NSO) [Malawi] & ICF International, 2016). Although most births in Malawi occur within the context of marriage, it is relatively common for conceptions to occur before or otherwise outside of marriage (Clark et al., 2017). Divorce and remarriage are common in Malawi and particularly so in the southern region (Bertrand-Dansereau & Clark, 2016; Peters, 1997; Reniers, 2003). Abortion is largely illegal in the country (United Nations 2007), meaning that most unplanned pregnancies result in births.

DATA AND METHODS

Our data come from Tsogolo la Thanzi (TLT), a longitudinal study (2009–2015) of young Malawian adults designed to examine patterns of family formation and reproduction within the course of the HIV epidemic. The TLT sample was drawn in 2009 from a complete household listing of people living within a 7-kilometer radius of Balaka town center. TLT drew a simple random sample of 1,505 women and 574 men aged 15 to 25 years to form the baseline sample (96% response rate). Between May 2009 and December 2011, respondents were interviewed every four months for a total of eight interviews. In early 2012, the women's sample was supplemented with an additional 315 women drawn from the original 2009 sampling frame.

The data for the present analysis come two waves of TLT: the 2015 wave¹ of TLT ("TLT2") during which the LMUP was asked and respondents' last prior interview (hereafter "TLT1"), which we use to measure background traits and health and well-being prior to the pregnancy that results in the index birth. Ninety four percent of the analytic sample was last interviewed in TLT1 in 2011 or early 2012; the remaining 6% were last interviewed in 2009 or 2010 with a mean survey interval of 46 months. Interviews were conducted face-to-face in Chichewa, the most commonly-used local language, in private rooms at the TLT research center.

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¹Eighty percent of female respondents and 71% of the original men's sample were re-interviewed at TLT2.

We restrict the sample to respondents who had a live birth between 2013 and 2015² and were not currently pregnant (or had a partner who was pregnant) at the time of the interview³. The exclusion criteria were necessary because respondents were asked the LMUP questions about their most recent pregnancy since 2013. Our analysis focuses on 645 women and 101 men. The men's analytic sample is substantially smaller both because TLT intentionally oversampled women and because, given men's later age of parenthood, almost half of men interviewed had not yet had a child. TLT additionally recruited the male romantic and sexual partners of the sampled women on an ongoing basis (see Yeatman and Sennott 2014). As a robustness check, we reran all men's analyses on the full sample of men, including the sample of women's partners; the findings were consistent.

LMUP

The LMUP was included in the women's and men's questionnaire in TLT2. The women's LMUP had previously been translated into Chichewa and adapted for the Malawian context (Hall et al., 2013). We adapted and translated the men's LMUP because our study is the first to use the LMUP with Malawian men. Prior to implementation, we conducted a focus group with male interviewers to discuss the LMUP questions and their relevance to local men's experiences. The only item revised to reflect the local context was the pre-conception behaviors men might adopt in preparation for their partner becoming pregnant. We excluded responses considered less relevant to the context (e.g., "I ate more healthily") and added responses considered more appropriate (e.g., "I stopped 'going for' other partners"); other options remained the same (e.g., "sought medical advice", "stopped or cut down drinking alcohol"). The module was then translated and back-translated into Chichewa, pretested, and pilot tested with the full questionnaire⁴. Women who had been pregnant since 2013 were asked the LMUP questions in reference to their most recent pregnancy. Men were asked to recall the last time they got a woman pregnant and were given the LMUP module if the pregnancy occurred in 2013 or later.

The LMUP was scored to generate a 13-point scale spanning from 0 (least planned) to 12 (most planned) (Barrett et al., 2004). We analyze the LMUP two ways. First, we treat women's and men's scores as a continuous variable to reflect the continuum of pregnancy planning (see also Hall et al., 2016). Second, following others (Barrett et al., 2004; Wellings et al. 2013; Aiken, Westhoff, et al., 2016), we divide the LMUP into three categories representing births that were unplanned (0–3), ambivalently-planned⁵ (4–9), and planned (10–12).

²Due to interviewer error, three women were asked the LMUP questions about births that occurred in 2012 and are included in the sample.

³The LMUP has most commonly been used to ask about prevalent pregnancies, but has also been used following births (e.g., Wellings et al. 2013). It was designed to be able to do both, however, and will be substantially less useful to researchers if limited to prevalent pregnancies.

⁴The full men's and women's versions of the LMUP in English and Chichewa are available online at: <https://tsogololathanzi.uchicago.edu>

⁵Other researchers have labeled this category "ambivalent" but we feel ambivalently-planned is more appropriate because a birth itself cannot be ambivalent.

Health Outcomes

We use two indicators of women's and men's health and well-being that were measured identically at TLT1 and TLT2, allowing us to track changes in each before/after the focal birth. One is a measure of overall self-rated health, in which respondents were asked, "In general, would you say your health now is....," and could answer "excellent", "very good", "good", "fair", or "poor". Previous work shows this measure correlates with other indicators of physical, mental, and functional health and is highly predictive of mortality across diverse contexts (Idler & Benyamini, 1997). It has been used in Malawi (Smith-Greenaway, 2015) and elsewhere in Africa (Dageid & Grønlie, 2013; Williams et al., 2008).

The second outcome, subjective well-being, measures general satisfaction with life and is associated with marriage quality, income, social standing, and caregiving demands (Bookwalter & Dalenberg, 2010; Della Giusta et al., 2011; Kahneman et al., 2003), and has been used in Malawi (Baranov et al., 2015). Interviewers prompted respondents by stating, "I am interested in your general level of well-being or satisfaction with life" before asking "How satisfied are you with your life, all things considered?" Responses were recorded using a 5-point scale ranging from very unsatisfied (1) to very satisfied (5).

Control Variables

Marital status is measured at each TLT survey and dichotomized into currently married or not. Additionally, the TLT2 survey included a complete marital history, which allows us to estimate marital status at time of birth. Socioeconomic status is estimated separately by gender using a principal-components analysis of structural assets and durable household goods owned⁶. Age is measured by subtracting year of birth from survey year. Parity is measured at TLT1. Interviewers asked women about children ever born and asked men a question on living children, although we have data on children's vital status born during the study⁷. HIV status is measured using a biomarker for HIV at both TLT1 and TLT2. Six percent of respondents (N=47) are of unknown HIV status at one or both periods.

Analytic Strategy

Our analyses proceed in two stages. First, we describe the sample and respondents' responses to the six LMUP items and to the composite scale, paying attention to differences by gender. We then examine the scale's basic psychometric properties for women and men, using Cronbach's alpha to assess reliability and a principal components analysis to assess validity. We further assess the scale's construct validity in our sample by examining whether LMUP responses are patterned by marital status for women and men. Marital status is the most consistent predictor of pregnancy intention found in studies from low-income settings (Hall et al. 2016). Although we know less about the determinants of unplanned childbearing, particularly for men, the vast majority of childbearing occurs within marriage in Malawi

⁶This approach to measuring socioeconomic status—something difficult to accurately estimate in low-income countries—has been validated by previous researchers (Filmer and Pritchett 2001; Howe, Hargreaves, and Huttly 2008). The linear asset index comprises nine durable household goods, six personal goods, housing material, water and toilet access. A principal-components analysis calculates weights following the same procedure used to construct the Demographic Health Survey wealth index. The resulting index places households on a continuous scale relative to the sample.

⁷In order for parity to proxy birth order for the index child, we adjusted parity for the three men whose child died to 1+ living children.

(NSO [Malawi] & ICF International, 2016) supporting our hypothesis that both women and men who are unmarried at the index birth will have lower LMUP scores than married respondents. We test for differences in the LMUP using the Wilcoxon Rank-Sum test to account for the scale's non-parametric distribution.

Second, we examine the relationship between birth planning and men's and women's health outcomes. Past studies suggest sociodemographic factors that influence both the likelihood of having an unplanned birth and poor parental or child health may drive a spurious relationship between the two (Carson et al., 2011; de La Rochebrochard & Joshi, 2013; Joyce et al., 2000; Kost & Lindberg, 2015; Herd et al., 2016). For example, there is evidence that a history of depression is predictive of low scores on the LMUP among pregnant Malawian women (Hall et al. 2016). Without controlling for prior health, any relationship between current health and an unplanned birth could merely be an artefact of previous health problems rather than a change following the birth.

We therefore leverage the TLT panel data to examine *changes* in men's and women's health and well-being between TLT1 (before birth) and TLT2 (after birth). We adopt two complementary modeling strategies: change score models and lagged dependent variable models that serve as a robustness test. A change score approach (also called first-difference) models the relationship between the planning status of a birth and *changes* in adult health and well-being. We prefer these models because they account for time invariant measured and unmeasured characteristics that may otherwise drive a spurious relationship between an unplanned birth and health (Allison, 1990; Johnson, 2005; Liker et al., 1985). To create the dependent variables, we subtract values of self-rated health and subjective well-being at TLT1 from those at TLT2 such that a positive value indicates an improvement in the outcome over time. Because we study a relatively short period (fewer than four years), and are focusing on a generally healthy young adult population, this allows us to measure *any* change in health over time. We use linear regression for our change score models and include controls that capture changes in the following time-varying predictors: marital status, SES, HIV status, parity (to account for respondents who have more than one birth between surveys), and change in age to reflect variation in the inter-survey interval.

As a robustness check, we estimate lagged dependent variable models that address two potential weaknesses of the change score models in our case. First, because little is known about the relationship between unplanned childbearing and adult health, it is possible that time-varying indicators included in the change score models could be mediators rather than exogenous controls (Barber and East 2011). Because lagged dependent variables only include controls from TLT1 that precede the birth, they are less susceptible to this possibility. Second, the lagged dependent variable models are less vulnerable to regression to the mean among the health indicators (Allison 1990). These models maintain our focus on change in health and well-being between TLT1 and TLT2 by including the comparable TLT1 health indicator alongside other controls variables measured at TLT1 (age, SES, parity, marital status, and HIV status). We use ordinal logistic regression to account for our polytomous dependent variables.

RESULTS

Table 1 presents the descriptive characteristics of the 645 young women and 101 young men in the analytic sample. The mean age for both women and men is 26 years. Mean education is just below completed primary school (eight years) for women and at eight years for men. Sixty five percent of women are married at TLT1 while only 31% of similarly-aged men are married. By TLT2, however, 80% of men are married, as are 85% of women (not shown). More than a quarter of women and almost two-thirds of men have no children at TLT1. For the vast majority of these respondents, the focal birth is their firstborn child, although some have more than one birth in the inter-survey period.

At TLT2 mean self-rated health for women and men was 3.8 (between good and very good) and mean subjective well-being was 4.4 and 4.3, respectively (between somewhat and very satisfied.) Overall, women's health and well-being increase slightly on average over the inter-survey period, whereas, in general, men's decline.

Figure 1 shows the distribution of responses to the six LMUP questions as scored for inclusion in the full-scale by gender. Men's and women's responses follow broadly similar patterns and are not statistically different with the exception of preparatory steps, which was the only question that differed across men and women because of their distinct reproductive roles. There is substantial variation in responses to all questions except the first (contraception) and the sixth (preparatory steps). Very few women become pregnant while using contraception in Malawi because of the dominance of highly effective methods such as injectables and implants, which together make up 87% of modern contraceptive use among 25–29 year olds (National Statistical Office (NSO) [Malawi] & ICF International, 2016). Additionally, relatively few individuals engage in preparatory behaviors for births as has been found in other applications of the LMUP in low-income settings (Rocca et al. 2010; Hall et al. 2013). Both women and men commonly report responses across the distribution of the other four questions (i.e., timing, intention, desire and partner discussion).

When the LMUP questions are combined to create the full scale, both men's and women's responses span the full 13-point range. The shape of the women's and men's LMUP follow pronounced bimodal distributions (see Figure 2), which corresponds with past research on Malawian women (Hall et al., 2016) and the original UK sample (Barrett et al., 2004). The LMUP demonstrates good internal consistency among women ($\alpha=0.86$) and excellent among men ($\alpha=0.91$) in the TLT sample (Cronbach 1990). Principal components analysis finds that all six items loaded onto only one component with an eigenvalue exceeding one for both women (eigenvalue: 3.58) and men (eigenvalue: 4.11). Item-rest correlations are all above an acceptable cutoff of 0.20 (Streiner and Norman 2008) with the lowest among contraception and preparation for both sexes, consistent with and somewhat higher than those reported among the other Chichewa women's LMUP sample (Hall et al. 2013) (Table 2).

As a simple test of the scale's construct validity, we tested the hypothesis that women and men who are unmarried at the time of birth will have lower LMUP scores than their married counterparts. We find support for this hypothesis among both women and men (Table 2).

When the LMUP scale is used to categorize births as unplanned (0–3), ambivalently planned (4–9), or planned (10–12), the LMUP measure classified 29% of women’s and 34% of men’s births as unplanned, and 43% and 47% respectively as planned (Table 2). The remaining 28% of women’s and 20% of men’s births are categorized as ambivalent. There are no statistically significant differences in men’s and women’s mean LMUP score or categorization.

Appendix A shows that both women and men categorized as having “planned” births almost universally give the most planned response to each of the first five items of the LMUP (i.e., contraception, timing, intention, desire, partner discussion); however, half of the women and men coded as having a planned birth took no preparatory steps before conception, which is consistent with the low level of preparatory behavior in this population. Respondents with “unplanned” births have responses concentrated in the least planned category for all questions except partner discussion and contraception. As many as 45% of women and 32% of men with unplanned births had discussed getting pregnant with their partner (representing the middle response), but reported no clear agreement.

Respondents whose births are categorized as ambivalently planned either are inconsistent in their behaviors, intentions, and desires or report middle responses. In terms of the former, respondents frequently offer responses that demonstrate inconsistent underlying motivations (e.g., a desire or intention to get pregnant but no partner discussion). In terms of the latter, it is also common for respondents to report in the middle category consistently for the individual items (i.e., timing (“okay, but not quite right time”), intent (“my intentions kept changing”), desire (“I had mixed feelings”) or partner discussion (discussed but report no clear agreement)). The most common combination of responses in the ambivalently-planned category is: not using contraception, “okay, but not quite the right” time to get pregnant, did not intend to get pregnant, did not want to have a baby, discussed becoming pregnant with partner but had not agreed, and had not engaged in any preparatory behavior.

Moving to the relationships between fertility planning and women’s and men’s health and well-being, Figure 3 shows trajectories of self-rated health and subjective well-being for women and men by the degree to which their most recent birth was planned, tracking changes from before (TLT1) to after the index birth (TLT2). In general, women with unplanned, ambivalently-planned, and planned births report similar self-rated health before the birth but diverge following it. Indeed, women with planned births experience **improvements** in self-rated health, whereas women with unplanned or ambivalently-planned births experience a slight decline. All women—regardless of the degree to which their birth was planned—experience modest increases in subjective well-being over the study period.

Turning to the results for men, those with ambivalently-planned and unplanned births experience some decline in self-rated health, whereas men with planned births experience consistent self-rated health, on average. With regards to subjective well-being, men whose births fall in the ambivalently-planned category experience a sizeable decline while the other men stay relatively stable over the period.

Building on these descriptive findings, Table 3 presents the results from the change score models, which account for controls and analyze whether birth planning corresponds with changes in women's and men's health before and after the index birth. In the top panel of Table 3, we show model results using the continuous indicator of birth planning that reflects the full continuum of planning. The bottom panel shows the results of models that make use of the 3-category LMUP measure, which treat the births that score in the middle of the LMUP range as a distinct group rather than simply on the continuum between planned and unplanned.

Women's models of self-rated health reveal a clear relationship between higher LMUP score—indicating the birth was more planned—and better health (Model I). The same pattern is revealed in the 3-category LMUP models where women with unplanned births experience reductions in self-rated health relative to women with planned births (Model II).

Women's birth planning is not associated with women's subjective well-being when using either the continuous indicator of birth planning (Model III) or the categorical version (Model IV). The key findings are replicated in the lagged dependent variable models (Appendix B).

Table 4 examines the relationship between men's birth planning and their health and well-being. As with the presentation of women's results, the top panel presents results using the continuous specification of the LMUP. Under this specification, there is no relationship between men's birth planning and lower self-rated health (Model I). The lower panel broadly supports the absence of a relationship between birth planning and self-rated health for men; however, there is a sizeable, although not statistically significant, negative relationship with health for men whose births were ambivalently planned (Model II).

Moving to relationships with men's subjective well-being, when birth planning is treated continuously, there appears to be no relationship between men's birth planning and subjective well-being (Model III). When we use the 3-category LMUP measure that identifies the middle category of ambivalently planned, a new relationship emerges. Model IV reveals a large negative relationship between having an ambivalently-planned birth (versus a planned one) and reduced subjective well-being for men. These relationships are identical to the ones we document in the lagged dependent variable models (Appendix B).

As an additional robustness check, we reran all men's analyses using a larger sample of men that included women's partners who were interviewed at both TLT1 and TLT2 (N=233). We found the same relationship with an ambivalently-planned birth and reduced subjective well-being (not shown but findings available upon request).

DISCUSSION

The high levels of unintended fertility in some of the poorest regions of the world, including sub-Saharan Africa, have garnered fertility scholars' attention for several decades. Nevertheless, we know surprisingly little about the implications of this childbearing experience for the women—and especially the men—who go through it. In an effort to identify the full spectrum of women's and men's pre-pregnancy planning, not only timing-

focused intentions, we use the LMUP to differentiate births according to the degree to which they were planned. This approach enables us to both recognize and directly measure that individuals' desires, intentions, and behaviors preceding a pregnancy can conflict with one another. Doing so allows us to identify births that are at the opposite ends of the planning spectrum, and also directly study the under-theorized and empirically overlooked births that fall somewhere in the middle.

In addition to our measurement approach, another notable aspect of our study is that we bring African men into the conversation on unplanned childbearing. Demographers have long recognized the importance of men in the study of fertility in Africa (Dodoo, 1998), yet we rarely incorporate them into our research, let alone consider them as individuals with their own reproductive histories rather than simply as partners of focal women (Greene & Biddlecom 2000). Our findings show that, similar to women's, Malawian men's fertility planning is multi-faceted and varied. Indeed, among our population-based sample of women and men not in partnership with each other, responses to the six-item LMUP were remarkably similar by gender. This is intriguing given the distinct reproductive roles and socialization of men and women in the study context.

Our results demonstrate that fewer than half of children reported by both women and men in our sample were planned. Our estimate that 43% of births to women in Balaka were planned is substantially lower than the 64% classified as intended among 20–29 years olds nationwide using the standard timing-focused measure in the 2015–2016 Malawi DHS (National Statistical Office (NSO) [Malawi] & ICF International, 2016). In this context, unplanned births were rarely the result of contraceptive failure (likely due to the use of highly-effective contraception), but rather occurred while women and men were not using contraception despite reporting that the pregnancy was not desired, not intended, poorly timed, and occurred without partner discussion or preparatory behaviors.

Importantly, our findings document that the other approximately half of births could not uniformly be labeled as “unplanned”. Instead, a sizeable minority of births was ambivalently planned—neither unplanned nor planned but instead only partially or inconsistently planned. Our findings highlight that identifying this group is important for understanding the health consequences of fertility planning.

Whereas young women in Balaka who have planned births actually experience a slight increase in health over the study period, young women with unplanned births experience a slight reduction in self-rated health. Although women's ambivalence in planning is common, it was not linked with poor health relative to having a more fully planned birth. Admittedly, the reduction in self-rated health following an unplanned birth is small, but it is still of concern given these are young women who are likely to have multiple additional births over their reproductive career—many of which may similarly be unplanned. Thus, if the influence of unplanned childbearing is cumulative or even compounds with each additional unplanned birth, the small reduction in self-rated health that we document here may translate to a more sizeable disadvantage over their reproductive life course. Moreover, it is possible that the health costs associated with unplanned fertility increase over time as women endure the maternal work associated with caring for the child. Furthermore, even small declines in

health may be important given that these women are the primary caregivers for their children and mother's health may be a mechanism through which birth planning influences children's well-being. More research is needed to examine the health consequences of unplanned childbearing for women across time horizons and multiple births.

Our findings reveal no relationship between women's birth planning and subjective well-being. It is possible that women's subjective well-being was simply not impacted or that the positive benefits that accrue with the status of motherhood (or being a mother to more children) countered other potential negative impacts. The different findings across health outcomes may point to the physical demands that childbearing places on women (i.e., pregnancy, delivery, and extended breastfeeding), and the possibility that these are more arduous for unplanned births, which tend to come at times that may be particularly ripe for physical consequences (e.g., too soon after an earlier birth).

In contrast to women, men's birth planning was not closely connected with their self-rated health. This may be because men in Malawi are not primary caregivers and thus their health is not as closely tied to birth planning. On the other hand, men who had ambivalently-planned births experienced a clear decline in their subjective well-being over the study period. Although we cannot speak confidently about the mechanisms driving this relationship, it is possible that these births are occurring in relationship contexts that are stressful for men. Indeed, these men are the least likely to live with their children. Whereas most men live with their children resulting from a planned birth (93%), only 68% live with their children resulting from an ambivalently-planned birth—even fewer than those residing with their children resulting from an unplanned birth (73%) (p-value=0.02). Although in some African settings, non-resident fathers have been shown to be highly involved in their children's lives (Clark et al., 2015; Madhavan et al., 2014), the fact that these men reported some planning may indicate that they had envisioned a different, more involved family arrangement. And, in the generally matrilineal context that we study, these men may have more constraints on their ability to achieve their desired family arrangement given the shared cultural understanding that children belong to mothers and her lineage. Recent research from the same Malawian setting found that childbearing ambivalence was common among young men and patterned by life circumstances rather than the characteristics of individual men (Blinded for review, In press).

Our study is subject to certain limitations. First, our sample of women and men in Balaka is relatively young and does not represent the tails of the reproductive age range. It is possible that the consequences of birth planning differ for younger adolescents or older adults seeking to limit childbearing. Second, as in all studies of men's fertility, the men in our sample were reporting on the births they knew about, and there will be a set of pregnancies that men not only did not plan but also did not know about and we cannot make any inferences about these. On the other hand, births men do not know about are unlikely to impact their health.

Third, despite its many strengths, the LMUP is a retrospective measure, and as such is vulnerable to *ex post* rationalization and social desirability and recall biases (Bongaarts, 1990; Koenig et al., 2006; Rosenzweig & Wolpin, 1993). The detailed nature of the

questions in the LMUP, however, lead us to believe that the risk of bias is less than exists with standard measures of intention, which are also retrospective.

A related limitation of the LMUP and all retrospective measures is their specification to births that already occurred—overlooking the theoretically-interesting group of young women and men who were engaging in similar behaviors and held comparable intentions and desires to avoid a birth and succeeded in doing so. It is possible that a comparison of these young women and men with the young women and men in our study who had unplanned births would reveal important differences. Unfortunately, such a comparison would require either prospective data on fertility planning, or a tailored construct that could be asked of all women and men—not just those whose births were recent. Either approach, however, has its own limitations and challenges, which may explain why past studies have failed to make it; nonetheless, such an approach could advance understanding of the consequences of unplanned fertility in important ways.

Even with our study's focus on comparing only those adults who had births, our inclusion of men and our use of a more detailed and comprehensive scale of birth plannedness are major advancements. Although, these innovations require more time and financial resources in data collection endeavors, which could prohibit their wider application, they also better reflect the complexity of lived fertility.

Our study empirically demonstrates the importance of women and men having control over their reproduction for their health and well-being. In so doing, we offer additional evidence to the already large literature documenting the continued need to scale up and improve upon contraceptive access in resource-poor contexts like Malawi. Perhaps unsurprisingly, unplanned births were more common among unmarried women and men who have a harder time accessing contraception in many sub-Saharan settings, including Malawi (Chandra-Mouli et al., 2014; Thatte et al., 2016). Improving access to contraception, and offering a diverse range of contraceptive options, for young and unmarried women and men would acknowledge the reality that contraception is needed not just to space or stop having births but also to delay the start of childbearing. More generally, efforts to convince young women and men of the importance and safety of contraception, alongside efforts to encourage them to discuss and recognize the risk of pregnancy with their sexual partners, may reduce the discordance between their fertility desires, intentions, and behaviors that we see here, and show is consequential for their broader health and well-being.

APPENDIX

Women:

Men:

APPENDIX A.

Distribution of scoring on the individual survey items that constitute the LMUP by gender and LMUP category, TLT2

APPENDIX

APPENDIX B

Results from supplementary ordinal regression lagged dependent variable models of the relationship between planning status of most recent birth and two indicators of health, TLT1 & TLT2

		Women (N=645)			Men (N=101)		
		Self-rated health (TLT2)	Subjective well-being (TLT2)	Self-rated health (TLT2)	Subjective well-being (TLT2)	β	(SE)
		β	(SE)	β	(SE)		
LMUP Scale (0 least planned - 12 most planned)		0.058 **	(0.020)	0.033	(0.023)	-0.011	(0.052)
						0.047	(0.055)
LMUP categories	Unplanned	-0.504 **	(0.180)	-0.2850	(0.202)	0.143	(0.462)
	Ambivalently-planned	-0.342 ^a	(0.179)	-0.202	(0.201)	-0.735	(0.533)
	Planned	ref		ref		ref	

*
p<0.05;
**
p<0.01

Note: The table presents coefficients from eight supplementary lagged dependent variable models using ordinal regression. Similar to Tables 3 and 4, these models examine the relationship between the planning status of women's and men's births (measured with LMUP scale or LUMP categories) and changes in self-rated health and subjective well-being. All models include the TLT1 measure of the dependent variable in addition to the following controls measured at TLT1: age, SES, currently married, party (0, 1(ref), 2+), HIV status, and education category.

^a
p=0.057

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FIGURE 1.
Distribution of scoring on the individual survey items that constitute the LMUP by gender,
TLT2

FIGURE 2. Distribution of LMUP scores by gender, TLT2

Note: The dashed vertical lines indicate the cut points for the LMUP categorical measure: unplanned (0–3), ambivalently planned (4–9), and planned (10–12).

FIGURE 3.
Changes in women's and men's self-rated health and subjective well-being by LMUP category, TLT1-TLT2

Table 1

Descriptive statistics of the analytic sample by gender, TLT1 & TLT2

	Women			Men		
	TLT1	TLT2	Change	TLT1	TLT2	Change
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Health outcomes						
Self-rated health	3.77 (0.87)	3.81 (0.87)	0.03 (1.16)	4.03 (0.84)	3.78 (0.82)	−0.25 (0.95)
Subjective well-being	4.32 (0.86)	4.43 (0.93)	0.11 (1.14)	4.42 (0.71)	4.27 (0.96)	−0.15 (1.02)
	TLT1	Change		TLT1	Change	
	Mean (SD)/%	Mean (SD)		Mean (SD)/%	Mean (SD)	
Time-varying covariates						
Age	21.70 (3.33)	3.91 (0.55)		22.10 (2.96)	4.07 (0.29)	
Parity		1.35 (0.59)			1.34 (0.64)	
0	27.1			65.4		
1	30.1			23.8		
2	26.4			9.9		
3+	16.5			1.0		
Married	64.5	0.21 (0.52)		30.7	0.50 (0.54)	
HIV positive	7.6	0.05 (0.21)		3.0	0.03 (0.17)	
SES index-centered	0.00 (2.20)	0.00 (1.13)		0.00 (2.15)	0.00 (1.14)	
Time invariant covariates						
Education						
Some primary	47.3			41.6		
Some secondary	41.1			32.7		
Completed secondary+	11.6			25.7		
N	645			101		

TABLE 2

LMUP responses, psychometric properties, and construct validity hypothesis testing by gender, TLT2

	Women	Men
Continuous LMUP scale mean(SD)	6.93(3.66)	7.13(3.99)
[min, max]	[0,12]	[0,12]
LMUP categories,%		
Unplanned:0-3	29.0	33.7
Ambivalent:4-9	27.8	19.8
Planned:10-12	43.3	46.5
<u>Psychometric properties</u>		
Cronbach's α	0.86	0.91
Item-rest correlations		
Contraception	0.28	0.37
Timing	0.81	0.89
Intention	0.89	0.94
Desire	0.86	0.93
Partner discussion	0.73	0.84
Preparation	0.34	0.46
<u>Construct validity hypothesis testing</u>	Mean(SD)	Mean(SD)
Marital status at birth		
Not married	5.09(3.39) ***	4.78(3.69) **
Married	7.13(3.64) ***	7.64(3.89) **
N	645	101

**
p<0.01;***
p<0.001

TABLE 3

Relationship between planning status of women's most recent birth and two indicators of women's health (N=645)

		Change in Self-rated health		Change in Subjective well-being	
		β	(SE)	β	(SE)
		Model I		Model III	
LMUP Scale (0 least planned - 12 most planned)		0.034 **	(0.012)	0.010	(0.124)
		Model II		Model IV	
LMUP categories	Unplanned	-0.295 **	(0.110)	-0.097	(0.109)
	Ambivalently-planned	-0.143	(0.110)	-0.075	(0.109)
	Planned	ref		ref	

**
p<0.01

Note: The table presents coefficients from four OLS change scores models of the relationship between women' birth planning (measured with LMUP scale or LMUP categories) and changes in women's self-rated health and subjective well-being between TLT1 and TLT2. Models control for changes in age, SES, marital status, parity, and HIV status over the inter-survey period.

TABLE 4

Relationship between planning status of men's most recent birth and two indicators of men's health (N=101)

		Change in self-rated health		Change in subjective well-being	
		β	(SE)	β	(SE)
LMUP scale		Model I		Model III	
0 least planned-12 most planned)		0.027	(0.024)	0.033	(0.026)
		Model II		Model IV	
LMUP categories	Unplanned	-0.173	(0.220)	-0.287	(0.221)
	Ambivalently-planned	-0.425	(0.259)	-0.978 ***	(0.261)
	Planned	ref		ref	

***
p<0.001

Note: The table presents coefficients from four OLS change scores models of the relationship between men's birth planning (measured with LMUP scale or LMUP categories) and changes in men's self-rated health and subjective well-being between TLT1 and TLT2. Models control for changes in age, SES, marital status, parity, and HIV status over the inter-survey period.