The path to childbearing is paved with mixed intentions: a longitudinal examination of how fertility intentions and contraceptive use relate to pregnancy and childbearing in rural Malawi

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Short Abstract

Despite rapidly increasing contraceptive use, unintended pregnancies have remained quite stable in Malawi over several decades. However, measures of unmet need may overestimate a latent demand for contraception by ignoring the strength of fertility motivations in determining behaviors. This study uses three rounds of data from the Malawi Longitudinal Study of Families and Health to assess how fertility intentions and contraceptive use relate to childbearing in rural Malawi over a six-year period. We use a multivariate logistic regression model to describe the relative odds of experiencing a birth within two-years of the previous interview based on respondents' contraceptive use, fertility intentions, and various sociodemographic characteristics. We hypothesize that an interaction between fertility intentions and contraceptive use will better predict subsequent birth outcomes within the study sample by capturing both the strength of the contraceptive intention and the degree of proactive contraceptive behavior undertaken to implement stated intentions.

Background

Unintended pregnancy, defined as either mistimed (wanted later) or unwanted pregnancy, is associated with many adverse outcomes for women, couples, and newborns, including recourse to unsafe abortion and maternal mortality.[1] As such, reducing unintended pregnancies and unmet need for family planning is a core objective on the global family planning and reproductive health agenda, particularly through improving access to and use of modern contraception. Increased contraceptive use has been credited with reducing maternal deaths in developing countries by 40% over the past 20 years, simply by averting unintended pregnancies and recourse to unsafe abortion.[1,2] The burden of maternal mortality is high in Sub-Saharan Africa[3] and Malawi, in particular, has a maternal mortality ratio estimated at 439 maternal deaths per 100,000 live births.[4] The Guttmacher Institute estimates that over half of pregnancies in Malawi are unintended and nearly one-third of unintended pregnancies end in abortion, resulting in an estimated 141,044 abortions in 2015.[5] This is particularly concerning in Malawi as abortion is legal only in cases where the procedure is required to save the mother's life; attempting to procure an abortion for any other reason is punishable by 7-14 years in prison.[6] This restrictive legal context pushes most abortion cases underground into unsafe conditions; with up to 18% of maternal deaths due to unsafe abortion, unintended pregnancy and recourse to unsafe abortion presents a substantial risk to maternal health and survival.[5]

Addressing this problem requires that good measures exist to identify women who are at risk of unintended pregnancy and that there is broad understanding of the factors associated with a pregnancy being wanted or unwanted. Current measures rely primarily on retrospective reporting of a current or previous pregnancy as wanted then, later, or not at all. Population surveys such as the Demographic and Health Survey ask the question of currently pregnant women or women who have given birth within the past two years: "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?"[7] Responses to this question then reclassify pregnant and post-partum amenorrheic women who report a mistimed or unwanted pregnancy or birth as having an unmet need for family planning.[8] While unmet need for family planning is relatively stable at the population level, at the individual level, need for family planning tends to fluctuate frequently due to the fluidity of individual fertility desires and frequent stopping and restarting of contraceptive use over one's reproductive life. A slightly more nuanced way of assessing intention is to look at future pregnancy intentions and how this corresponds to use of contraceptives and subsequent pregnancy outcomes. This conceptualization has been applied in other studies using the Measurement, Learning and Evaluation data from urban areas in Nigeria, Kenya, Senegal, and Uttar Pradesh within a two-year follow-up period.[9,10] This paper will use this approach to conduct a longitudinal assessment of the role of fertility desires and contraceptive use on pregnancy and birth experiences over a longer period of time in rural Malawi.

Research Question and Significance

Using three waves of survey data over a six-year follow-up period, the study will investigate the longitudinal association between women's reported fertility desires and contraceptive use at baseline (1998) and midterm (2001) with pregnancy and birth outcomes at midterm (2001) and endline (2004). This overarching research question will be broken into three aims. The first will examine how women's fertility desires and contraceptive use behaviors change over time. Using three waves of the survey, we can assess change in reported fertility desires and contraceptive use behaviors over time and the factors associated with this change. Second, the paper will examine whether fertility intentions and contraceptive use status at baseline are predictive of having a birth or not within the same individuals over time – both in terms of changes as respondents age and changes over the time-period included in the study. The family planning environment in Malawi changed drastically in the study period in terms of availability and use of contraceptives. According to the Malawi Demographic and Health Surveys, only 7.4% of married women in 1992 were using a modern method of contraception. By 2004, the last year included in this analysis, 28.1% of married women were using a method of contraception. Today, modern contraceptive prevalence has reached 58.1% of married women.[4]

The third aim will pull in more recent rounds of data from the same longitudinal study to examine the factors associated with more or less successful achievement of ideal family size, as reported earlier in women's

reproductive lives. The extended duration of the Malawi Longitudinal Study of Families and Health provides an opportunity to study the evolution of women's reproductive lives and changing family dynamics over a nearly 20-year time period. Understanding how marriage histories, child survival, and a variety of other health and demographic indicators may influence childbearing and family size over the long term would capitalize on the strength of this rich data source and make a significant contribution to the literature.

Current measures of unmet need for family planning are important in driving appropriate resource allocation, but they may also over simplify fertility intentions and thus inflate estimates of latent demand for contraception. By providing a means of evaluating current measures of demand for family planning, the proposed study will begin to shed light on the inadequacy of existing measures of unmet need, particularly for spacing. Previous studies suggest that "wanting" vs "not wanting" a pregnancy is a false dichotomy and many women likely fall somewhere in between.[9–11] This paper will examine how changing fertility intentions are related to contraceptive use and pregnancy experience over a longer period of time than previous studies with similar objectives. By allowing more time to examine how life experiences affect fertility desires and more time for women to experience a pregnancy during the study, this paper will provide more robust evidence of the longitudinal association between fertility desires and contraceptive use on the risk of pregnancy. Prior research has suggested that fertility intentions fall on a continuum[9,12,13] and this study may contribute to further studies that aim to better measure and understand this continuum. Adding to this evidence base, this study may shed further light on possible refinements that are needed to a core family planning indicator.

Malawi is an appropriate context for this work, as contraceptive prevalence has increased drastically over the past couple of decades without a corresponding drop in unintended births and unmet need, particularly for births wanted later (See Figure 1) and unmet need for spacing.[4] A more nuanced understanding of fertility intentions and how they relate to the consistency of contraceptive use and the intendedness of pregnancies is needed in this context.

Literature review

Existing research suggests that unmet need, as an indicator driving population and reproductive health policy interventions, may be more or less useful, depending on the context. A study conducted by Jain in 1999 in Peru found that contraceptive users accounted for more unwanted births during a two-year observation period than did women with an unmet need for family planning.[14] As a result, the author suggested that an emphasis on unmet need may be misplaced and more emphasis should be placed on ensuring that current contraceptive users (i.e., women with a met need for contraception) are supported in continuing their contraceptive use and using the most effective methods. In contrast, another study with similar objectives in Upper Egypt found that women who had an unmet need for family planning contributed the largest share of unintended pregnancy.[12] Thus, the authors came to the opposite conclusion and recommendation, at least for settings where contraceptive use is low and unmet need is relatively high. They suggest that addressing unmet need is the most effective way of averting unintended pregnancies in this context. It is important to note two key differences between the contexts of these two studies, namely the level of contraceptive use and the predominant method mix in these two settings. In Peru at this time, contraceptive prevalence was much higher at 50%[14] of women using a method of contraception compared to 24% in Upper Egypt according to the DHS.[15] However, participants in the Peruvian study were also using less effective methods of contraception than in the Egyptian context, with 21% reporting using a traditional method compared to only 5% of respondents in Upper Egypt.[14] These findings may have significance for current global family planning initiatives. The Family Planning 2020 Initiative, launched out of the 2012 London Summit on Family Planning, has set a goal of reducing unmet need for family planning by reaching an additional 120 million additional contraceptive users by the year 2020. In support of this goal, Track20 has created innovative modeling tools to provide real-time tracking of additional users based on both survey data and routine data sources.[16] These studies suggest that this focus on unmet need and recruitment of additional contraceptive users may cause national population and reproductive health policies to overlook current users who are motivated to prevent pregnancy but may need access to more effective methods in order to successfully meet that goal.

Additional studies in Burkina Faso, Ghana, and Kenya found that underlying fertility motivations are an important factor in determining pregnancy outcomes but these motivational factors are poorly measured with existing indicators. In one study, 25**%** of women in Burkina Faso & Ghana and 40**%** of women in Kenya who said they wanted to delay or limit childbearing also reported ambivalence about becoming pregnant, saying that it would be "no problem" or a "small problem." In this same paper, 16-31% of women in Burkina Faso and Ghana and 30-56% of women in Kenya who were classified as having an unmet need for family planning reported that it would be no problem or a small problem if they were to get pregnant in the next few weeks.[11]

Two studies undertaken by the Measurement Learning and Evaluation team at the University of North Carolina and their study teams in Nigeria, Kenya, Senegal, and Uttar Pradesh found that women who wanted to limit pregnancy (i.e., they reported they wanted no more children at all when asked about future fertility intentions), and who were using contraception were the least likely to experience a pregnancy.[9,10] These studies also found that a desire to merely delay pregnancy did not predict future pregnancy outcomes, suggesting an ambivalence about the timing of pregnancies among women who had not yet completed their families. The study in Nigeria, Kenya, and Senegal found that contraceptive use predicted fertility outcomes only among users of long-acting and permanent methods (e.g., intra-uterine devices, contraceptive implants, and sterilization) and short-acting method users had similar rates of subsequent pregnancy to non-users.[9] This literature supports the concept that family planning reduces but does not eliminate unintended pregnancy risk and the strength of women's motivation for fertility control is an important factor in determining subsequent pregnancy and birth experiences. Considering historical fertility trends and evidence for fertility control prior to the existence of modern contraceptive methods[17,18], the importance of individual motivation also makes intuitive sense.

Few studies have used longer than a two-year observation period to assess the relationship between fertility desires, contraceptive use and subsequent pregnancy and birth experiences. The long follow up period in the proposed study will provide robust evidence of the longer-term influence of these factors on fertility and unmet need. The overarching goal of this study will be to contribute to the evidence for a more nuanced measure of fertility intentions and motivations that helps illuminate latent family planning needs and possible ambivalence of fertility desires.

Data and Methods:

This paper will use data from the first three waves of the Malawi Longitudinal Study of Families and Health in 1998, 2001, and 2004. The sample will be restricted to women of reproductive age (15-49) who were interviewed at all three time points (N=1136). The paper will employ univariate, bivariate, and multivariate longitudinal analyses of contraceptive use, fertility intentions, and pregnancy/birth outcomes. The multivariate logistic regression will use current pregnancy at follow up or live births in the six-year study period as the key dependent variable. The key independent variables will be contraceptive use (any method and modern method use), baseline fertility intentions (wants another child now/soon, wants to wait >2 years, and wants no more children), as well as an interaction term between contraceptive use and fertility intentions. Since all women will have been interviewed at three time points, we can also include their transitioning fertility desires over the course of the study. Separate analyses will be run for all women and women who are married or in union to determine whether these should be analyzed separately. The MLSFH data include complex marital histories and a considerable amount of change in marital status over the course of the study, which will be an interesting contextual variable to consider in this analysis. The analyses will also control for key demographic factors such as region of residence (to account for cultural/geographic differences across the three regions in the study), number of children ever born, number of living children, employment, age group, religion, education level, wealth and marital status (in the all women model).
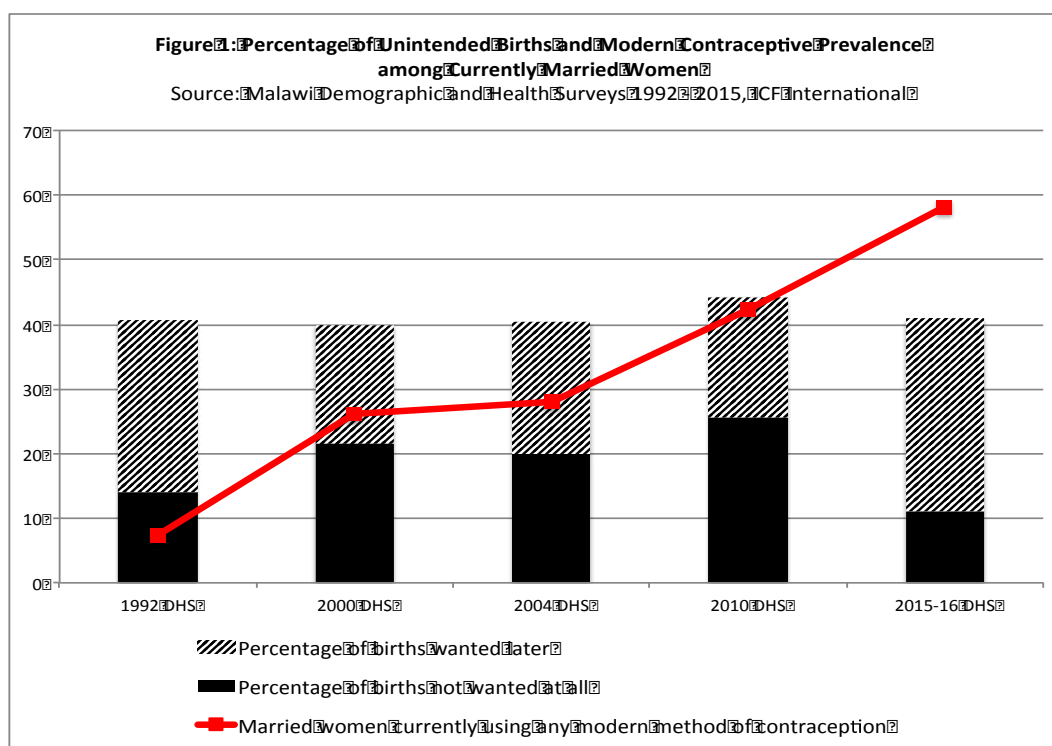
To address aim #3 regarding the long-term fertility outcomes of women in the study and how these comport with earlier stated fertility desires, the paper will pull in data on children ever born from the latest rounds of the survey and compare women who have met or exceeded their stated fertility desires to determine factors associated with successful achievement of ideal family size. Further exploratory analysis of later waves of data are

needed to inform the construction of this model and final variable selection, but key independent variables will likely be similar to those included in previous models. The significance of HIV in this context may warrant inclusion of changes in HIV status or awareness, both in the examination of long-term fertility outcomes and in the stability of fertility intentions over time.

Preliminary findings

Preliminary cross-tabulations of the data from 1998-2004 show a substantial number of births occurring in the six-year study period. During this period, 75% of respondents experienced at least one birth and a substantial number of births occurred to women stating a desire to delay or limit births at baseline. Similarly, a substantial number of women who were using contraceptives at baseline also experienced a birth or pregnancy in the follow up period. Table 1 details the percentage of women experiencing a birth within two years of the 1998 interview (as reported in 2001) and within two years of the 2001 interview (as reported in 2004). Overall 59.2% of women experienced a birth within 2 years of the 1998 interview and 39.8% of women within two years of the 2001 interview. Among contraceptive users, the birth rate is even higher, suggesting perhaps a higher fecundability among contraceptive users. Fecundity is likely also a factor in the comparatively lower percentage of births to women who report wanting another child now or soon, as these women may have been trying to get pregnant for some time. The most significant finding from these preliminary analyses is the comparatively lower rate of birth experiences (though still quite high) among women who report wanting no more children at all (around 30% at both time points) compared to women who report wanting to delay childbirth for two or more years. This finding may support the claim that motivation in fertility desires is predictive of subsequent fertility outcomes. This pattern is even more evident among women who want to limit fertility and are using a contraceptive method at baseline. Across all contraceptive use status groups, women who want to limit births are less likely to experience a birth than women who want to delay childbearing 2 or more years. This is displayed clearly in Figures 2 and 3. Figure 2 shows the percentage of women who want to delay or limit births who experience a birth within two years of the 1998 interview, by contraceptive use status (i.e., no use, any use, or modern method use). Figure 3 shows the same of women following the 2001 interview. While the pattern is the same between these two time periods, the overall level of births experienced is lower in the later group, which is in line with the changing family planning context and overall reductions in fertility in Malawi at the time. Preliminary findings suggest that motivation for pregnancy prevention may be a key factor in predicting later pregnancy outcomes and the proposed analysis plan will likely provide useful evidence for explaining variation in pregnancy and birth experiences by contraceptive use status and stated fertility desires.

Tables and Figures

Figure 1: Percentage of Unintended Births and Modern Contraceptive Prevalence among Currently Married Women
Source: Malawi Demographic and Health Surveys 1992 - 2015, ICF International

Table 1: Percentage of Women having a birth within two-years after interview, by contraceptive use status and fertility intentions at the time of the preceding interview

	% giving birth 1998-2000	% giving birth 2001-2003
Contraceptive Use Status at time of preceding interview		
Not using any contraception	42.6	44.4
Using contraception (any method)	57.4	55.6
Using modern contraception	32.7	36.8
Fertility intentions at time of preceding interview		
Wants a child now/soon	24.0	17.6
Want to delay birth >2yrs	45.8	50.9
Does not want any(more) children	30.3	31.5
Contraceptive Use * Fertility Intentions		
No method & wants no more children	51.2	37.5
No method & wants to delay childbearing >2 years	67.3	44.8
Any method & wants no more children	38.6	35.3
Any method & wants to delay childbearing >2 years	71.6	52.0
Modern method & wants no more children	34.5	32.7
Modern method & wants to delay childbearing >2 years	66.7	58.7
Total (n=1,136)	**59.2**	**39.8**

Figure 2: Percent of women who experienced a birth within 2 years of the 1998 interview, by contraceptive use status and fertility intentions in 1998
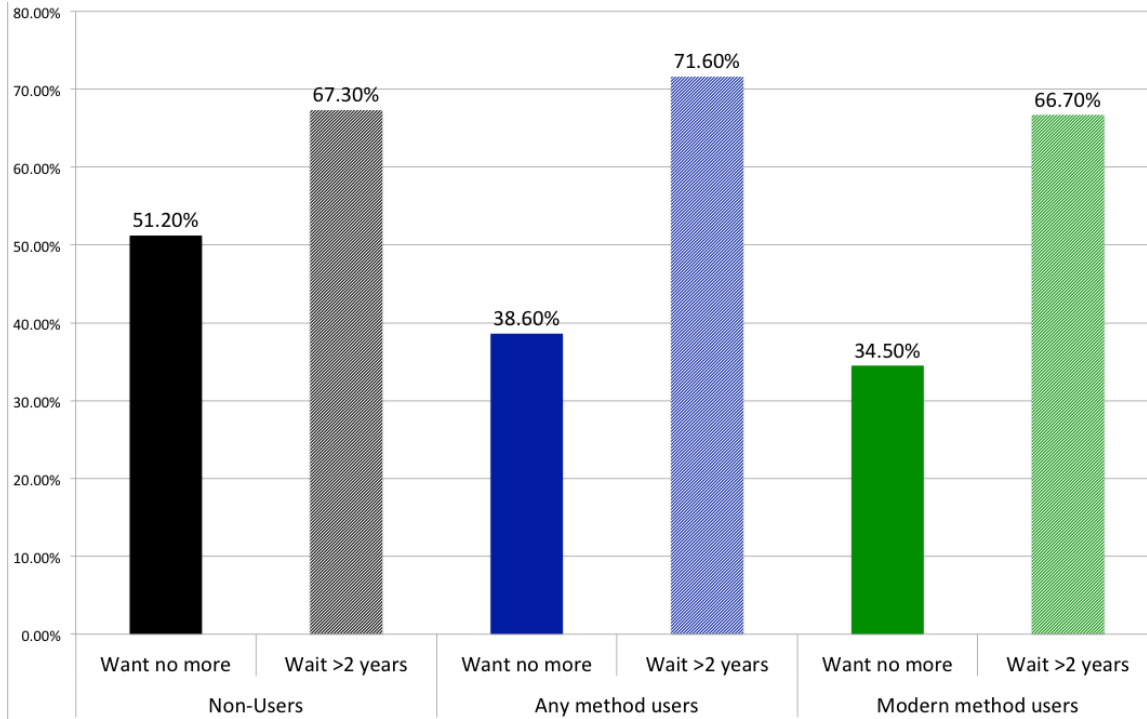
Figure 3: Percent of women who experienced a birth within 2 years of the 2001 interview, by contraceptive use status and fertility intentions in 2001
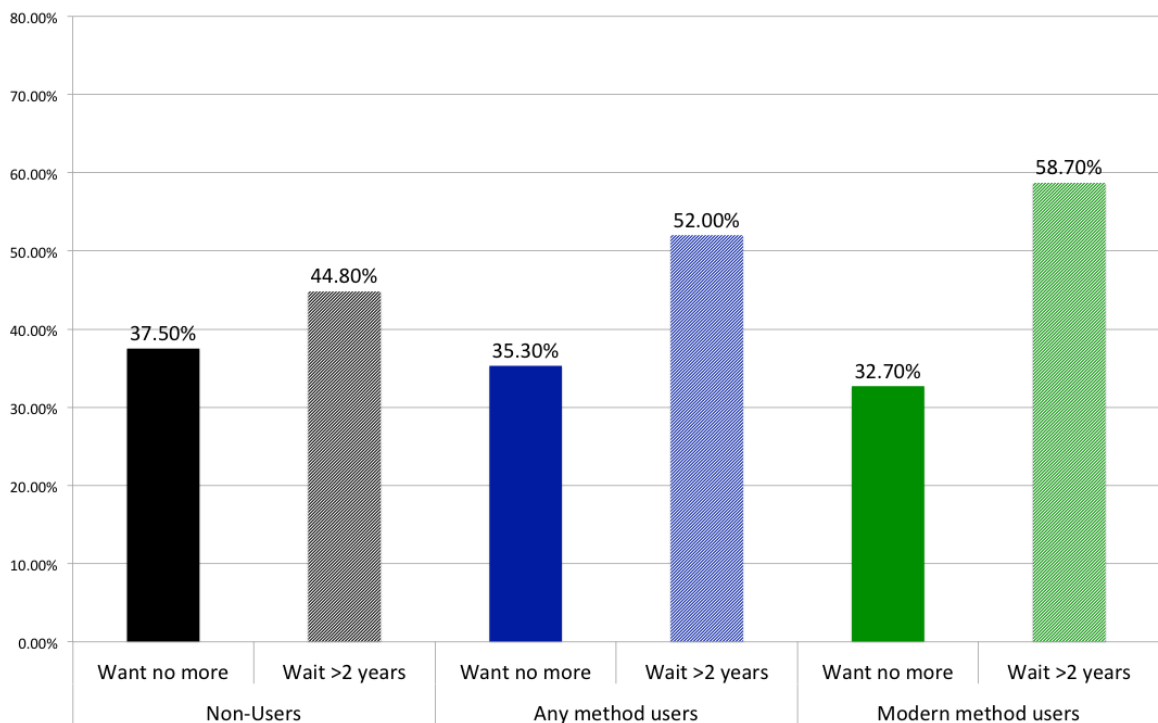
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