

## **Marital Dissolutions and Changes in Mental Health: Evidence from Rural Malawi**

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### Abstract

Family demographers conducting research in high-income countries have long examined the link between multiple dimensions of marital dissolutions—including discrete events and marital histories—and adverse health outcomes. Research on the relationship between marital dissolutions, marital histories, and health among older adults in sub-Saharan Africa is comparatively limited, and less empirically developed, despite marriage being a paramount cultural and life-course marker on the African continent. Using fixed-effects regressions and 2012 data from the Mature Adults Cohort of the Malawi Longitudinal Study of Families and Health (MLSFH-MAC) linked back to cohort information from 2008 and 2010 available through MLSFH, we test how changes in different dimensions of marital dissolutions are associated with changes in mental health among nearly 1200 respondents, in addition to the potential moderating effects of

household savings and region of residence. For men, spending more of one's life outside of marriage is associated with worse mental health, while more marital dissolutions are surprisingly linked to better mental health for women.

Keywords: divorce, Malawi, marriage, mental health, widowhood

## Introduction

The link between multiple dimensions of marital dissolutions and adverse health outcomes among individuals has long intrigued family demographers, but most of the evidence comes from high-income countries (HICs). The plethora of research has shown a range of possibilities in this relationship. Experiencing a divorce or becoming widowed is often, and unsurprisingly, associated with worse mental and physical health in the short and/or long-term (e.g., Blekesaune 2008; Goldman, Korenman, and Weinstein 1995; Lillard and Panis 1996; Smith and Zick 1996; Stroebe, Schut, and Stroebe 2007; Strohschein et al. 2005; Waldron, Hughes, and Brooks 1996). Emotional strains and the loss of crucial resources are often cited as mechanisms linking divorce and/or widowhood to worse health in the aftermath (Carr 2004; Elwert and Christakis 2006; Pearlin 1989; Pearlin 1999; Sansom and Farnill 1997; Tavares and Aassve 2013).

Scholars have also considered the extent to which the accumulation of years spent in states of marital dissolutions are associated with individual health and might amplify or limit the effects of the number of dissolutions and/or discrete events (e.g., Amato and Previti 2003). The timing of first marriage and number of subsequent marital dissolutions is linked to worse health and greater risk of the onset of disease for women, whereas the duration between divorces, widowhood, and marriage are more consequential for men—in both cases, marital trajectories matter (Dupre and Meadows 2007; Dupre, Beck, and Meadows 2009). Transitions out of, and into, marriages can increase one's chances of death immediately afterwards, and prior marital experiences and the length of previous marriages buffer such effects differently for men and women (Brockmann and Klein 2004). The timing of marital dissolutions in the life course has even been found to be as important as gender differences when it comes to individual health outcomes (Williams and

Umberson 2004). But, as Musick and Bumpass (2012) poignantly note, marriage, itself, is not a “blanket prescription for individual well-being” (p. 14); health selectivity into and out of marriage is difficult to identify (see Rendall et al. 2011).

Evaluating the multidimensionality of marital dissolutions is important in expanding our understanding of the complex, temporal relationship between marriage and health. To do so requires assessing the marital histories and health of individuals who have lived long enough to experience divorce and/or widowhood *and* changes in health. Ideally, these individuals would live in a context where marital transitions are relatively common.

To effectively explore this line of inquiry, we chose a sample of “mature” adults, defined as individuals aged 45 and older, from Malawi for whom we have detailed marital histories—with a high prevalence of dissolutions—and longitudinal observations of mental health. Empirically, mental health is ideal to consider in this highly gendered context when looking into the relationship between marital dissolutions and health outcomes among older individuals: the prevalence of adverse mental health conditions differ for women and men in Malawi as older women have worse mental health across virtually all ages; mental health can change quickly; and mental health outcomes are linked to changes in physical health and other health behaviors (Kohler et al. 2017). But, most importantly, Malawi, like most of SSA, is aging. Those who live to their 45<sup>th</sup> birthdays are likely to live into their 70s (Payne, Mkandawire, and Kohler 2013). Malawi’s population of those 60 years and older will also grow nearly seven-fold by 2060 (UN 2015) and assessing the relationship between social factors and non-communicable diseases such as mental health is ever-important in understanding population health as the HIV/AIDS pandemic slowly recedes.

By exploiting data from the Mature Adults Cohort of the Malawi Longitudinal Study of Families and Health (MLSFH-MAC; Kohler et al. 2020), we have two research questions:

- 1) Are changes in having experienced a **marital dissolution**, one's total **number of dissolutions**, and the percentage of one's **life spent outside of marriage** since first becoming married are associated with rural Malawians' **changes in mental health**?

The former two measures of marital dissolutions are conventional, whereas the latter measure is a new, complementary measure that takes into account the potential negative social consequences of the amount of time one spends out marriage in a setting where one is expected to be married.

- 2) Do **household life savings and region of residence**—both of which have known, different consequences for women and men in Malawi (and many other settings in SSA)—**moderate the relationship** between these aspects of **marital dissolutions and mental health**?

This has been noted as an understudied component of older individuals' livelihoods, even in HICs (Bowen and Jensen 2017).

### Marriage and Health in sub-Saharan Africa

Research on the relationship between marital dissolutions, marital histories, and health among older adults in sub-Saharan Africa (SSA) is comparatively limited, and less empirically developed. Marriage is almost universal (Shapiro and Gebreselassie 2014), although divorce rates are increasing and marriages are being delayed throughout SSA (Clark and Braunner-Otto 2015). The marital household is often a primary source of income, production, and mutual insurance and reifies embedded cultural norms have long been known to encourage, or even mandate, resource exchanges among kin across SSA (Evans-Pritchard 1951; Kuper 1963; Radcliffe-Brown and Ford

1950). In contrast to the declines in the incidence of marriage across HICs (Cherlin 2012; Lesthaeghe 2010; Sobotka 2008), marriage remains a relatively more important, cultural and life-course marker in many SSA nations. Considering the cultural centrality of marriage, the innate complexities of marital dissolutions likely represent status “strains” (Pearlin 1989, Liu and Umberson 2008) with potentially important negative consequences on health in SSA contexts.

Despite an underdeveloped literature in SSA, and empirical issues of selection bias due to limited data availability, a few patterns still emerge. In urban and rural Cameroon, for example, those who are unmarried have lower self-rated health (Kuato-Defo 2006); in rural South Africa, the unmarried frequent health facilities more often than those who are married (Gómez-Olivé et al. 2013); and in rural Malawi, individuals who experience a marital dissolution believe that they have higher chances of dying in the coming years compared to married individuals (Delavande and Kohler 2009). Also, in rural Malawi, those who experienced divorce, separation, or widowhood within the previous two years report worse health than two years before (Myroniuk 2017).

### The Context of Marriage in Malawi

Eighty-five percent of Malawi’s current population of roughly 17 million (UNDP 2015) live in rural areas (Malawi National Statistical Office 2011). Rural Malawians typically engage in subsistence (although some commercial) farming and the sale of goods at local markets. Among mature adults in Malawi, marriage is almost universal (Malawi National Statistical Office 2011): over 98% of individuals aged 45+ in rural Malawi have been married (authors’ calculations; Malawi National Statistical Office 2011), and the median age at first marriage is early (roughly

17-18 years for women, 22-23 years for men [Malawi National Statistical Office and ICF Macro 2011]).

In rural Malawi, the distinction between formal and informal marriages—thus, those recognized legally by the state versus relationships recognized as legitimate marriages by local authorities—is redundant. Mature adults are also likely to have experienced divorce (Bracher, Santow, and Watkins 2003; Reniers 2003). Life-table estimates of experiencing a divorce by a couple's twentieth anniversary in rural Malawi for those born before 1971 range from 28% to 49% depending on the region (Bracher, Santow, and Watkins 2003), indicating significant levels of marital instability and marriage turnover. This is not a new phenomenon in rural Malawi, though, as these patterns reflect historical recordings of the prevalence in divorce (Mitchell 1956) even if older Malawians believe that divorce is more highly prevalent in contemporary times than it was in the past (Kaler 2001).

Regardless of whether a marriage dissolved because of divorce or widowhood, a key feature of the Malawi context is a high, expedient, incidence of re-marriage after a marital dissolution (Reniers 2003), which is in part due to the key economic role of the marital household and strong norms about marriage, as previously mentioned; there is considerable variation in rural Malawians' marital life courses.

It is also critical to understand whether factors like household savings or region of residence mitigate the possible negative health consequences of marital dissolutions, and whether there are particular consequences by gender. Women who experience a marital dissolution are at a disadvantage in terms of partner selection when attempting to re-enter the marriage market in Malawi for most reasons imaginable—such as health, education, age, and other characteristics (Anglewicz and Reniers 2014; Reniers 2008). Yet, some factors might buffer the negative

consequences of marital dissolutions. For instance, savings can buffer the effects of marital dissolutions for unmarried individuals in other SSA settings, with buffering effects being strongest for women (e.g., Cliggett 2005; Ingstad et al. 1992). In matrilineal kinship systems—which are predominant in Malawi’s southern region—men generally do not get access to their deceased, or divorced, wives’ land rights, and must return to their home village, which might hint that marital dissolutions could be less detrimental to women’s health in matrilineal, as compared to patrilineal, contexts. For example, in patrilineal settings (mainly in Malawi’s central and northern regions), female divorcees must return their bride-wealth payment and go back to their family’s village. In contrast, widowed women can retain their husbands’ inheritance rights (see Takane 2008; Berge et al. 2014).

Even with gendered variation in rural Malawians’ marital trajectories and the near universality of marriage, the substantive distinctions (and health implications) between divorce and widowhood are more ambiguous in this high HIV/AIDS prevalence context than in HIC settings. With high—or perceived high—risks of HIV infection, divorce has been postulated as a mechanism in which to avoid widowhood and own infection (Reniers 2003; Watkins 2004), as noted earlier. Further, long spells of being in an unmarried state might be linked to suspicion of a spouse having died of HIV/AIDS, and possibly before the surviving spouse had a chance to divorce their spouse in rural Malawi; divorce even acts as a strategy for women—who suspect their partner has HIV—in order to avoid risk of HIV infection and even widowhood (Watkins 2004).

. Coupled with gendered disparities in re-marriage markets—specifically, older, divorced and/or widowed women needing to re-marry in order to survive, financially—divorce and widowhood are closely linked.

## Data and Methods

Our analysis uses data from the Mature Adults Cohort of the Malawi Longitudinal Study of Families and Health (MLSFH-MAC). MLSFH-MAC is a population-based cohort study of mature adults age 45+ years old living in rural communities in 3 districts in Malawi (Balaka in the south, Mchinji in the central region and Rumphu in the north). MLSFH-MAC was derived from the Malawi Longitudinal Study of Families and Health (MLSFH), an ongoing longitudinal panel study established in 1998 and that is one of very few long-standing publicly available longitudinal cohort studies in SSA for up to 4,000 individuals. The MLSFH documents more than two decades of demographic, socioeconomic and health conditions in one of the world's poorest countries. MLSFH cohorts (and as a result MLSFH-MAC) were selected to represent Malawi's substantial rural population. ("Cohort Profiles" of the MLSFH-MAC and MLSFH, providing detailed discussion of sampling procedures, survey methods, survey instruments, and analyses of attrition have been published and/or are available as a working paper [Kohler et al. 2015; Kohler et al. 2020]).

Our analyses focus on the MLSFH-MAC respondents who were age 45 and older and who participated in the 2012 survey (N = 1,266) that focused on mental health and well-being among older adults who had previously been interviewed in the 2008 and 2010 MLSFH. Including individuals in all these three waves is not only practical for evaluating change in our marital and health variables, but also a key part of the MLSFH-MAC research design. The 2012 sample was conditional on 2008 and 2010 MLSFH survey participation of older individuals: everyone meeting age criteria (e.g., age 45+ years in 2012) was in target sample for 2012. Refusal rates were very low and those who took part in the 2008 and 2010 waves but were not found in 2012 either died or migrated. Accounting for non-response and missing data, our analytic sample includes 1,186

adults aged 45 and over in 2012 (670 women, 516 men) who participated in all three waves (2008, 2010, and 2012). The empirical consequences of these missing data are outlined, and dealt with, later in the paper.

Our dependent variable, the SF-12 mental health scale ranges from 0 to 100 (from worst to best mental health). The twelve-item, self-rated, survey measure has been widely validated as a holistic depiction of individual mental health (Gandek et al. 1998; Ware, Kosinski, and Keller 1996), and is strongly correlated with other depression and anxiety measures in the MLSFH (Kohler et al. 2017).<sup>1</sup> For the SF-12 measure, which was collected for individuals over all three waves of the data in this study, about 40% of women and men have at least one SF-12 score that differs by one standard deviation from the mean. Considering that two standard deviations below the SF-12 mental health scale mean indicates clinical depression (Ware, Keller, and Kosinski 1998) while a score of 45 or less—about one standard deviation below the mean score for women and men in our sample—has been used as a general cut-off for depression screening (Gill et al. 2007), it appears that there is sufficient variation in the SF-12 within individuals, across waves, to capture meaningful changes in mental health. Ideally, mental health would be measured with greater frequency via more waves of data, but this empirical problem is common even in well-established HIC survey research. We also acknowledge that there are important baseline mental health disparities between respondents, but these potential sources of bias in our analyses are ameliorated by the mechanics of fixed-effects regressions that difference these out by only estimating changes in health within individuals.

The availability of detailed marital histories for MLSFH respondents are essential for the present analyses. Although marital histories among MLSFH participants are not always consistent with one another across waves (Chae 2016), we address this issue, as much as possible, by starting

with data from the 2010 marriage history roster for individuals who participated in the 2008, 2010, and 2012 waves. The 2010 roster captures 2008 and 2010 marriage histories. The 2012 wave explicitly recorded updates to one's marriage history since 2010 (linked to spouses from 2010), and these changes are reflected in the 2012 measure of marital status in our analyses. Although imperfect, this method allows for internal consistency in measuring marital status. Attrition due to different reasons is typical for longitudinal studies such as MLSFH and MLSFH-MAC. Of course, individuals are inevitably lost to attrition, but prior MLSFH research has indicated that, while attrition is selective, it does not appear to bias the estimation of key health-related relationships in the MLSFH data (Kohler et al. 2015).

Most importantly, among eligible individuals for our sample who were alive in 2008, slightly more than 3% died by 2010. For those eligible to be in the mature adult sample in 2012 (and thus participated in 2008 and 2010), slightly under 3% died by 2012. Since few eligible individuals for these mature adult analyses died in-between waves, bias due to mortality in our analyses is minimized (Kohler et al. 2020). About 10% of the 2012 mature adult sample is excluded due to missing values on age at first marriage, or implausible values).

To more effectively test how changes in our three primary independent variables—ever divorced/widowed, number of marital dissolutions, and the percentage of one's life spent divorced and/or widowed (thus outside of marriage) since first being married—predict changes in older Malawians' mental health, we utilize fixed-effects regression analyses combining health outcomes from the 2008, 2010, and 2012 waves and time-varying marital indicators. For conceptual reasons, noted above, and issues of statistical power (due to data limitations), we do not distinguish between divorce and widowhood, but rather combine these as being in an unmarried state.

Our third independent variable is a newly-proposed continuous measure that innovatively allows us to aggregate complicated marital histories in a SSA context—and to potentially capture nuance in the social consequences of spending more time of one’s life outside of marriage, compared to the other two measures. It was calculated from the MLSFH’s marriage history roster whereby details on each respondent’s marriage (beginning with the first) were recorded. With this information, we could determine the year the first marriage took place, the duration of marriage, and the duration between marriages or since the dissolution of the previous marriage. Ultimately, we summed the time spent between and after marriages (combining years spent divorced and widowed), and divided these person-years lived outside marriage by the number of years that had passed since first marriage. We multiplied this ratio by 100 (to produce a percentage value). Given high re-marriage rates, and short durations between dissolutions and higher-order marriages (Bracher, Santow, and Watkins 2003; Reniers 2003), an increase in even several percentage points of life spent outside of marriage is substantively meaningful (e.g., 1.5 more years out of thirty years since first becoming married corresponds to a 5 percentage point higher fraction of adult life spent married). This variable effectively captures variation in the portion of individuals’ lives spent outside of marriage, and provides an additional marital dissolution dimension to test in conjunction with having experienced a marital dissolution and one’s number of dissolutions. Approximately 5% of eligible respondents were deemed to be in polygamous/concurrent marriages primarily concentrated in the south (Balaka). Because polygamous marriages are distinct and marital transitions in polygamous marriages have distinct patterns compared to dissolutions of non-polygamous marriages, these values of exposure to divorce/widowhood—and, therefore, women and men who are currently or were previously in polygamous marriages—are excluded from this variable and our analyses.

Our fixed-effects regressions also control for time-varying observable characteristics within respondents over the three waves. These regressions subsume time-invariant unobserved heterogeneity stemming from fixed individual or contextual factors in the individual fixed effects. This aspect is important since unobserved factors that jointly influence health and marital transitions (such as fixed personality characteristics, fixed local socioeconomic contexts, persistent differences in local HIV prevalence, and local cultural/religious norms, such as those regarding alcohol use, gender norms potentially affecting both marriage and health) might otherwise bias the analyses. Fixed-effect analyses also control for measurement error pre-dating marital events prior to 2008 too (e.g., measurement error in the age of first marriage, if prior to 2008, is differenced out). By controlling for time-invariant characteristics through fixed-effects analyses found in Equation 1 (full regression models; stepwise models are shown within analytic tables), our approach accounts for a considerable amount of health and marriage selectivity among older Malawians.

$$SF12Mental_{it} = M_{it}\beta_1 + X_{it}\beta_2 + \alpha_i + \varepsilon_{it} \quad (1)$$

Changes in  $SF12Mental_{it}$ , the outcome, are measured by the SF-12 mental health score of individual  $i$  at time  $t$ ;  $\mathbf{M}_{it}$  is the set of time-varying marital dissolution predictors—the multiple dimensions—that we test in this paper. As noted above, these measures are: ever divorced/widowed, number of marital dissolutions, and the percentage of one’s life spent divorced and/or widowed since first being married. To allow a discontinuity for one marital dissolution, we include a time-varying dummy variable for being divorced/widowed at least once, and each additional separation. The former captures the effect of being ever experiencing and the latter

captures the marginal effect of subsequent dissolutions. Consequently, a value of one is subtracted from the number of marital dissolutions one experienced (except for those who have not been divorced or widowed), to empirically adjust for this discontinuity.  $\mathbf{X}_{it}$  represents time-varying control variables—current marital status and overall household savings (ln) in Malawi Kwacha (in 2010, for instance, 150 Kwacha were equal to approximately one US dollar). Age is excluded from these equations, as it is functionally a fixed characteristic, along with other time-invariant factors in the term  $\alpha_i$ . Time-varying error is captured by  $\varepsilon_{it}$ .

Since we are also interested in potential moderating effects between exposure to marital dissolutions and health, we test whether the following two factors act as buffers—via interactions with our marital dissolution predictors—relevant to rural Malawi and SSA more generally: 1) between-wave changes in overall savings (ln), and 2) fixed region effects (to proxy for kinship system and gendered inequalities within kinship systems).

There are widely known effects that the presence of an HIV-positive individual in a union has on the likelihood of divorce and/or widowhood. But, HIV status is not an ideal time-varying characteristic to include from an empirical perspective in these fixed-effects models: 1) it can only change once (becoming HIV-positive), and 2) the MLSFH did not conduct HIV testing in all waves, and respondents who were eligible to be tested could refuse (although refusal rates have typically been less than 10% [see Kohler et al. 2015]). Although we exclude HIV status in our models, we conducted additional analyses (available upon request) that exclude individuals who are HIV-positive, and then individuals and/or their matched spouses who have ever been diagnosed as HIV-positive, to address these concerns; the results are nearly identical to those in the main text. Lastly, the scaling-up of anti-retroviral treatment availability for rural, HIV-positive Malawians in the MLSFH took place in the latter part of 2007 and early part of 2008, and since our analyses take

place from 2008 onward, this change in accessibility does not affect subsequent changes in marital status.

### Descriptive Results

The SF-12 mental health score means are marginally higher than the standard of 50, but nonetheless are distributed among rural Malawians as one would expect compared to populations in a number of different countries. Over half of the women, and slightly less than half of men, in our sample have been divorced or widowed at least once. By 2012, over 20% of women and men experienced multiple marital dissolutions. Also, by 2012, women spent an average of 13% of their lives outside of marriage since first becoming married (approximately six years for a 65-year old who first married at 18 years old), while men averaged 7% (approximately three years for a 65-year old who first married at 18 years old); the large standard deviations indicate wide variation in this key predictor among women and men our sample.

To further convey this variation and complexity in marital experiences, by 2012, 23% of our respondents aged 45+ had been married 3 or more times, while 45% had been married only once; 8% had been divorced or widowed 3 or more times, and 46% had never been divorced or widowed; a quarter of our respondents spent 68% or more of their adult life married, while another quarter spent 48% or less in marriage. More-detailed descriptive statistics of our outcomes, time-varying independent variables, and key time-invariant variables employed in interaction effects are found in Table 1. These differences in the marital life course of mature adults may potentially

contribute to our understanding of their substantial health differences (Myroniuk 2017; Payne, Mkandawire, and Kohler 2013).

-Insert Table 1 about here-

### Multivariate Results

For mature Malawian women (Table 2), each additional marital dissolution—after the first—is associated with up to a 4.25 points *increase* in SF-12 mental health scores (models 2, 4, and 6). This change is about half of a standard deviation difference in these scores. Although having ever experienced a divorce or becoming widowed is consistently negatively associated with changes in mental health, these effects are not significantly different from zero. Further, changes in the percentage of one’s life spent outside of marriage, since first becoming married, current marital status, and savings, are not significantly associated with changes in mental health.

-Insert Table 2 about here-

For mature Malawian men (Table 3), in contrast to the above findings for women, changes in the percentage of years that men have spent divorced and/or widowed, since first becoming married, are significantly and negatively associated with SF-12 mental health scores ( $p < .05$ , models 3, 5, and 6). Nevertheless, changes in one’s number of marital dissolutions, or experiencing a first divorce/becoming widowed for the first time are not significantly associated with changes in mental health. The same goes for one’s current marital status. However, increases in household savings are linked to increases in SF-12 mental health scores, even if these effects are modest ( $p < .05$ , models 1-6).

-Insert Table 3 about here-

Table 4 tests whether savings or region of residence (proxying for kinship systems) moderate the effects of changes in significant main effects of the dimensions of marital dissolutions for women and men.

For mature women (Table 4, model 1), the main effects of changes in one's number of marital dissolutions are still associated with increases in mental health. Savings do not moderate this relationship. Further, the main effects of changes in one's number of marital dissolutions are nullified when testing whether living in Malawi's southern region (where women could have health advantages given the predominant matrilineal kinship system)—which does not influence changes in mental health, either (Table 4, model 2).

For mature men (Table 4, model 3), the interaction between the percentage of one's life spent outside of marriage, since the onset of first marriage, and savings is significant only at the 90% level ( $p=0.053$ , not identified within Table 4). Based on post-regression estimates (not presented), these results indicate that savings increasingly moderate the relationship between this dimension of marital dissolutions and health as the percentage of one's life outside of marriage reaches beyond 10%. Changes in mental health have a significantly steeper slope for those who have spent 10% or 15% of their lives outside of marriage, as savings increase, compared to those who have spent smaller percentages of their lives outside of marriage. Still, changes in mental health among these individuals are small, given even substantial increases in savings. Finally, living in the southern region, does not exacerbate any mental health disadvantages associated with changes in the percent of their lives that men spend outside of marriage (Table 4, model 4).

-Insert Tables 4 about here-

## Discussion

After accounting for fixed individual characteristics and key time-varying factors, changes in the number of marital dissolutions one has experienced, and lifetime exposure to being divorced and/or widowed, are still modestly linked to changes in mental health—albeit, in opposite directions—for women and men, respectively. The discrete effect of becoming divorced or widowed for the first time, is not linked to changes in mental health for women or men.

For men, these results could lend credence to the beliefs that in rural Malawi, larger portions of one's life spent unmarried are associated with a type of role strain (Pearlin 1989; Pearlin 1999)—in a cultural context where one is expected to be married once reaching adulthood—even after factoring in whether someone has been divorced or widowed and the number of times one has experienced divorce and/or widowhood. Household savings—albeit an imperfect measure affected to some extent by types of marital dissolutions and shared wealth of spouses—offer a small buffering effect, and since changes in savings do not moderate this relationship more, there is additional evidence to support the role-strain explanation. Although the causal mechanisms are not clear, men might face new emotional and physical stresses since they must take-up new tasks that were previously under the domain of their wives in order to survive. It is also possible that men are not reaping the health and other protective effects of marriage, as men have been often found to benefit from in HICs (e.g., Murray 2000; Rendall et al. 2011). However, in a setting with near universality of marriage, it is unclear if the marriage premium would even exist.

For Malawian women, the results seem counter-intuitive: increases in the number of marital dissolutions are associated with *increases* in mental health scores. Considering that this relationship is not moderated by residence in the southern region, the remaining explanation lies in the selectivity of those who experience dissolutions. We believe that there are two plausible, yet empirically indistinguishable explanations: 1) enough women in the MLSFH have gotten out of

“bad” marriages which otherwise would have been detrimental to their mental health, and/or 2) those in good mental health are the ones able to re-marry and thus have experienced multiple marriages. Conversely, there are undoubtedly women who have never left their marriage for a plethora of reasons, and their mental health could suffer; given the lack of change in marital status, their effects within our regressions would not be as obvious. Another explanation in this context is that divorce is a health empowering mechanism for women, often to avoid real or perceived HIV infection (Reniers 2003; Reniers 2008; Smith and Watkins 2005; Watkins 2004). If this is the case among this sample of mature Malawians—then it is likely that there would be no, or little, detrimental effect of marital dissolutions on women’s mental health.

Our study has its empirical and conceptual limitations. First, while our fixed-effects estimation procedure eliminates time-invariant confounders, it is still possible that unobserved time-varying characteristics that simultaneously affect changes in health and marital status bias the analyses. We cannot claim a causal relationship between lifetime exposure to these multiple dimensions of marital dissolutions and mental health. Second, missing data could bias our regression estimates, although several sets of sensitivity analyses—including a complete case analysis (see Appendix Table 1) and multiple imputation (results not presented, and only appropriate based on female missing data due to the percentage of missing observations) do not substantively change our conclusions. The vast majority of missing data stemmed from interviewer prompting issues on the SF-12 items in 2008 fieldwork as noted in previous research (author, 2017). Third, there are reliability issues regarding retrospective marital histories among rural Malawian women and men (Chae 2016) even after we ameliorated this concern as much as possible by considering the 2010 wave as the “true” marital history for an individual and creating

values for our marriage variables in 2008 and 2012 based on 2010 reporting. Fourth, our sample consists of those who survived the worst of Malawi's HIV/AIDS epidemic.

In the end, our sample of mature Malawian adults still serves to proxy for the social and demographic lives of a very sizable population in rural low-income countries in SSA. These results can inform what will be increasingly important research on the relationship between marital dissolutions and mental health in other African nations as non-communicable diseases play a continually more important role in older individuals' lives. Going forward, research testing the link between marriage, marital dissolutions, and mental health in SSA ought to consider the order and timing of life events more explicitly via sequence analyses (Billari 2001); marital events rarely happen in a vacuum and the order and timing are gendered. In Malawi, scholars have identified how specific life course events relate to the likelihood of HIV infection (Boileau et al. 2009). Applying these methods in understanding the risks of non-communicable diseases and other health conditions, like mental health, is a logical next step in this line of scholarship.

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#### Footnotes

1) The SF-12 was modified for the rural Malawian context. Self-rated health questions pertaining to an individual’s general health, physical limitations, and emotional well-being are scored and weighted to derive a mental health score. A different weighting and scoring scheme are applied for a physical health score (not employed here).

Table 1: Descriptive Statistics for Respondents in 2008, 2010, and 2012  
(Means, Percentages, and Standard Deviations where Appropriate)

	<i>Women</i> 2008	<i>Women</i> 2010	<i>Women</i> 2012	<i>Men</i> 2008	<i>Men</i> 2010	<i>Men</i> 2012
SF-12 Mental Health (0-100)	51.5 (9.6)	50.0 (10.6)	52.0 (10.3)	55.1 (8.4)	53.3 (9.0)	54.4 (9.1)
Age	53.8 (11.9)	55.8 (11.9)	57.8 (11.9)	55.7 (10.8)	57.7 (10.8)	59.7 (10.8)
Ever Divorced/Widowed	50.5	56.1	59.1	43.6	45.7	46.9
# Marital Dissolutions						
0	49.6	43.9	40.9	56.4	54.3	53.1
1	33.9	34.5	35.5	26.6	26.7	26.0
2	12.2	14.9	15.5	11.6	12.2	13.6
3+	4.3	6.7	8.1	2.7	6.8	7.4
% Years Outside Marriage	10.5 (16.9)	11.4 (17.4)	13.2 (18.9)	6.8 (15.7)	7.4 (16.1)	7.7 (16.5)
Currently Married	72.0	68.8	64.2	96.7	94.5	95.4
Savings MWK (ln)	3.6 (2.7)	4.5 (3.3)	4.6 (3.2)	4.5 (3.4)	5.3 (3.6)	5.5 (3.8)
Southern Region	39.0	-	-	32.2	-	-
N (max)	670			516		

Table 2: Mature Women, Fixed-Effects Regressions Predicting Changes in Mental Health, 2008-2010-2012

	(1)	(2)	(3)	(4)	(5)	(6)
Ever Divorced/Widowed (ref. never)	-2.66 (1.95)			-2.92 (1.92)	-4.01 (2.86)	-3.58 (2.85)
# Marital Dissolutions		2.11 (1.09)		2.28* (1.12)		4.25** (1.31)
% Years Outside Marriage			0.07 (0.09)		0.09 (0.09)	0.03 (0.09)
Currently Married (ref. not married)	-0.16 (1.57)	-1.58 (1.42)	-0.16 (1.69)	-0.72 (1.58)	0.90 (2.01)	0.27 (2.00)
Savings MWK (ln)	0.13 (0.10)	0.13 (0.10)	0.14 (0.11)	0.13 (0.10)	0.14 (0.11)	0.14 (0.11)
Constant	52.11*** (1.01)	50.47*** (0.64)	50.21*** (1.11)	51.77*** (1.02)	51.88*** (1.59)	51.43*** (1.59)
Observations	1844	1844	1464	1844	1464	1464

\* p<.05, \*\* p<.01, \*\*\* p<.001. Standard errors, adjusted for individual clustering, in parentheses.

Table 3: Mature Men, Fixed-Effects Regressions Predicting Changes in Mental Health, 2008-2010-2012

	(1)	(2)	(3)	(4)	(5)	(6)
Ever Divorced/Widowed (ref. never)	-2.78 (2.87)			-2.80 (2.87)	-2.15 (3.20)	-2.13 (3.24)
# Marital Dissolutions		-0.35 (1.53)		-0.41 (1.53)		0.84 (1.41)
% Years Outside Marriage			-0.25* (0.10)		-0.25* (0.10)	-0.26* (0.11)
Currently Married (ref. not married)	-0.29 (2.44)	-0.71 (2.45)	0.92 (2.62)	-0.18 (2.48)	1.22 (2.64)	1.09 (2.67)
Savings MWK (ln)	0.17* (0.08)	0.16* (0.08)	0.19* (0.08)	0.17* (0.08)	0.19* (0.08)	0.19* (0.08)
Constant	54.59*** (1.32)	53.49*** (0.65)	55.10*** (0.76)	54.74*** (1.44)	55.98*** (1.56)	55.78*** (1.62)
Observations	1405	1405	1311	1405	1311	1311

\* p<.05, \*\* p<.01, \*\*\* p<.001. Standard errors, adjusted for individual clustering, in parentheses.

Table 4: Mature Women and Men Fixed-Effects Regressions, with Main Effects and Key Interactions, Predicting Changes in SF-12 Mental Health, 2008-2010-2012 (Significant Results Only)

	Women		Men	
	(1)	(2)	(3)	(4)
# Marital Dissolutions	4.59** (1.59)	2.88 (2.11)		
Savings MWK (ln)	0.16 (0.11)	0.14 (0.11)		
# Marital Dissolutions * Savings MWK (ln)	-0.07 (0.20)			
# Marital Dissolutions * Southern Region		2.36 (2.57)		
% Years Outside Marriage			-0.32* (0.12)	-0.31** (0.12)
Savings MWK (ln)			0.09 (0.09)	0.19* (0.08)
% Years Outside Marriage * Savings MWK (ln)			0.01 (0.01)	
% Years Outside Marriage * Southern Region				0.24 (0.18)
Observations	1464	1464	1311	1311

\* p<.05, \*\* p<.01, \*\*\* p<.001. Standard errors, adjusted for individual clustering, in parentheses. Other time-varying predictors in full expressions of models in Tables 2 and 3 are included, but not presented, in these regressions.

Table A1: Mature Women Fixed-Effects Regressions Predicting Changes in Mental Health, 2008-2010-2012, Identical Observations

	(1)	(2)	(3)	(4)	(5)	(6)
Ever Divorced/Widowed (ref. never)	-3.80 (2.87)			-3.50 (2.85)	-4.01 (2.86)	-3.58 (2.85)
# Marital Dissolutions		4.49*** (1.25)		4.37*** (1.25)		4.25** (1.31)
% Years Outside Marriage			0.07 (0.09)		0.09 (0.09)	0.03 (0.09)
Currently Married (ref. not married)	1.24 (1.94)	-0.66 (1.58)	-0.16 (1.69)	0.37 (1.94)	0.90 (2.01)	0.27 (2.00)
Savings MWK (ln)	0.15 (0.11)	0.14 (0.11)	0.14 (0.11)	0.14 (0.11)	0.14 (0.11)	0.14 (0.11)
Constant	52.70*** (1.34)	50.03*** (0.70)	50.21*** (1.11)	51.68*** (1.37)	51.88*** (1.59)	51.43*** (1.59)
Observations	1464	1464	1464	1464	1464	1464

\* p<.05, \*\* p<.01, \*\*\* p<.001. Standard errors, adjusted for individual clustering, in parentheses.