

Original Article

Marital Dissolutions and the Health of Older Individuals in a Rural African Context

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Abstract

Objectives: Research from high-income countries has often found a negative relationship between marital dissolutions and health. This paper assesses that relationship among older sub-Saharan Africans, on a now-aging continent. Such individuals are likely to be at risk of a dissolution, or have already experienced one, due to high rates of marriage.

Methods: Data from over 1,200 rural Malawians, age 45+, are employed from the 2008 and 2010 waves of the Malawi Longitudinal Study of Families and Health. Cross-sectional and lagged dependent variable regressions examine the relationship between marital dissolutions and 4 measures of self-reported health: retrospective health, relative health (compared with others in one's village), and age-standardized SF-12 mental and physical health scales.

Results: Worse relative, mental, and physical health are associated with being currently divorced/widowed compared with being married. However, worse retrospective health is linked to becoming divorced/widowed between 2008 and 2010. Those divorced/widowed prior to 2008, and who remained so through 2010, are in worse relative and physical health.

Discussion: The findings question the relative hardship of marital dissolutions for those who have managed to survive into old age, and call for the collection of more detailed longitudinal data on older Africans on this topic.

Keywords: Divorce—Malawi—Self-reported health—Widowhood

Sub-Saharan African (SSA) nations are now aging (United Nations, Department of Economic and Social Affairs, Population Division, 2015). The burden of noncommunicable diseases, disability, and lower quality of life will increasingly threaten the lives of SSAs (Gómez-Olivé, Thorogood, Clark, Kahn, & Tollman, 2010; Gómez-Olivé et al., 2014). Throughout SSA, a variety of social and economic factors, such as wealth, education, and residence are related to old age health in markedly different ways (Nyirenda et al., 2013). Despite a need to understand the health determinants of aging populations in SSA (Cohen & Menken, 2006), little research has examined how social or economic factors are associated with the health of older individuals.

Research in high-income countries (HICs) has shown that marital dissolutions are associated with worse individual

health, as well as higher risks of mortality (i.e., Dupre, Beck, & Meadows, 2009; Stroebe, Schut, & Stroebe, 2007; Strohschein, McDonough, Monette, & Shao, 2005). This relationship extends into old age too (Goldman, Korenman, & Weinstein, 1995; Sullivan & Fenelon, 2014). In many SSA nations, marriage is highly prevalent and nearly universal in some places. Even with slight declines and delays in its onset over the past several decades (Shapiro & Gebreselassie, 2014), marriage remains an important aspect of most cultures. Transitioning out of marriage, whether through divorce or widowhood, will likely disrupt kinship networks, deplete one's access to the former spouse's resources, and strain an individual in a setting where marriage is normative. In a given SSA country where most people get married at some point in their lives, a substantial portion of older

individuals will be at risk of experiencing a marital dissolution and potentially the corresponding adverse health effects. But for older individuals, it is possible that marital dissolutions might not be strongly associated with health by virtue of surviving the worst of the HIV/AIDS pandemic, often in impoverished communities.

This paper examines the degree to which marital dissolutions are associated with self-reported health outcomes among 1,290 older, rural Malawians (age 45+) between 2008 and 2010. The data come from the Malawi Longitudinal Study of Families and Health (MLSFH) which is one of the highest quality demographic panel studies in SSA. Although Malawi is one of the least developed countries in the world, with low life expectancies at birth, healthy women and men who have managed to reach their 45th birthday are projected to live into their early 70s. This population is also expected to account for around 80% of additional person-years lived among adults in the coming decades (Payne, Mkandawire, & Kohler, 2013), and there will be nearly seven times more individuals 60 years and older in 2060 than in 2015 (United Nations, Department of Economic and Social Affairs, Population Division, 2015). Malawi is, not surprisingly, aging.

Only 2% of Malawian men and 1% of women have not married by age 50 (Malawi National Statistical Office, 2011). In rural areas (where this study takes place and where about 85% of Malawians live [Malawi National Statistical Office, 2011]), an estimated 40% to 65% of these marriages end in divorce (Reniers, 2003). As in other SSA nations, the prevalence of divorce in Malawi has actually declined in the past several decades (Clark & Brauner-Otto, 2015). The presence of both patrilineal (predominantly in the north and central regions) and matrilineal systems (almost exclusively in the southern region) further complicates the role of marriage and gender dynamics within marriage in Malawi. Regardless of the system, marriage is a critical component of kin risk pooling and an important cultural goal for Malawians.

Changing survival rates into old age and different kinship and inheritance systems inevitably lead to gendered livelihood consequences for widows and divorcees in Malawi. Through the 1990s and early 2000s, men and women were equally less likely to marry a widower than a divorcee (Reniers, 2008). Further, after age nineteen, a woman's chance of remarrying steadily declines whereas age does not influence a man's chance (Reniers, 2008). Still, nearly every Malawian widow or divorcee gets remarried at some point (Reniers, 2003).

Unfortunately, the small sample size of older Malawians in the MLSFH prohibits empirical analyses by gender. Divorce and widowhood must also be combined in order to disaggregate the timing of marital dissolutions between 2008 and 2010. These analytic sacrifices are nonetheless necessary in efforts to build upon the small extant body of literature on the social determinants of old age health in SSA via the MLSFH data.

Marital Status and Health in HICs and SSA

Widows and divorcees in HICs are more susceptible to health risks than those who are married. This is attributed to the stress and diminishment of financial, emotional, and social resources—health buffering mechanisms—associated with losing a spouse (Pearlin, 1989). For example, psychological distress after a divorce is exacerbated or mitigated based on the availability of other individuals willing to provide support (Sansom & Farnill, 1997; Tavares & Aassve, 2013). Higher levels of religious participation and assistance from children in the aftermath of a widowhood for African Americans are associated with lower levels of anger relative to Whites (Carr, 2004). Social activities and groups have similar effects with regards to post-widowhood mortality (Elwert & Christakis, 2006). In a Durkheimian manner (Durkheim [1897] 1951), the health consequences experienced after a marital dissolution are often closely linked to the social structure an individual is part of (Aneshensel, 1992). Nevertheless, debates regarding the health selection effects surrounding marriage have not been resolved (see Land & Yang, 2006; Lillard & Panis, 1996; Schoenborn, 2004; Waldron, Hughes, & Brooks, 1996).

Important temporal differences in the relationship between marriage and health have been uncovered. Depending on a number of circumstances, some individuals face short-term health crises whereas others face chronic health strains in the aftermath of divorce (see Amato, 2000). A change in one's union status can be an immediate stressor (Strohschein et al., 2005). For instance, divorcees have a high risk of mortality if they have been divorced for less than 5 years (Dupre, Beck, & Meadows, 2009). The effects of widowhood compared with marriage are typically linked to higher rates of mortality, long-lasting deteriorated physical health, and spells of worse mental health (Goldman, Korenman, & Weinstein, 1995; Stroebe, Schut, & Stroebe, 2007). This relationship becomes severe among older adults (Goldman, Korenman, & Weinstein, 1995). Widowhood—compared with remaining married—comes with a nearly 50% increase in the chance of death (Sullivan & Fenelon, 2014). Divorce leads to slightly higher risks of mortality than widowhood for older individuals (Manzoli, Villari, Pirone, & Boccia, 2007). Although the circumstances leading to a dissolution might differ, immediate mental health shocks like depression, and subsequent responses, do not vary by gender (Sasson & Umberson, 2014).

The available research in SSA, although limited, has found analogous results. While the causal direction and antecedent factors are unclear, those who are not married have lower self-reported health—but not functional limitations (Kuate-Defo, 2006). Although not explicitly tested, the separate effects of marital status and age suggest that older, unmarried individuals have relatively high expectations of dying in the coming years

(Delavande & Kohler, 2009). Older, single individuals also use local health facilities more frequently than married individuals (Gómez-Olivé, Thorogood, Clark, Kahn, & Tollman, 2013), supporting the idea that unmarried older individuals are susceptible to worse health than those who are older and married. Like the analyses in this paper, health research in SSA has not distinguished between divorce and widowhood. This is most likely due to sample size issues, and possibly because any marital dissolution would represent a shock and departure from what is culturally accepted, in addition to the possible loss of kin support and resources.

Other scholarship posits that older, widowed women are particularly susceptible to declines in health (Ingstad, Bruun, Sandberg, & Tlou, 1992), especially if left without strong ties to her spouse's family (Schatz, Madhavan, & Williams, 2011)—or even with other women and men in the community (Cliggett, 2005). Such women are often burdened with the need to take care of younger family members (Schatz, 2007) as a consequence of HIV/AIDS mortality, which could deteriorate their own health as a result (for a comprehensive review, see Schatz & Seeley, 2015). The available research only implies that divorced and widowed men—whether due to inheritance rights or high rates of remarriage (i.e., Bongaarts & Zimmer, 2002; Oppong, 2006)—have livelihood advantages over women, which might translate into better health outcomes.

This paper is first guided by the hypothesis that those currently in a state of marital dissolution (divorced or widowed) will have significantly worse health outcomes than those who are married. Virtually none of the research in SSA has tested whether the relationship between marital dissolutions and subsequent health outcomes endures, or is only temporary. Thus, a second hypothesis also guides this paper's analyses: those who recently experienced a marital dissolution (whether a divorce or becoming widowed) will have significantly worse health outcomes than those who have been in a state of marital dissolution for a longer period of time; those who remain married will be in the best health.

Data and Sample

For the ensuing analyses, I use the 2008 and 2010 waves of the MLSFH, which contains a representative sample of rural households (HHs) in Malawi's three regions: North, Central, and South. Roughly 1,300 individuals in each region were interviewed in each of the 2008 and 2010 waves. About 75% of those respondents participated in both waves (see Kohler et al., 2015 for complete details of the project). Respondents were asked about their marital histories, health, HH composition, sexual behaviors and attitudes, and other social, economic, and demographic topics. The analytic sample is restricted to a maximum of 1,290 individuals 45 years and older (see Payne, Mkandawire, & Kohler, 2013, for age justification) in 2010, who participated in both the 2008 and 2010

waves. Differences between the analytic sample and those lost to attrition between 2008 and 2010 can be found in Supplementary Table 1.

Analytic Methods

Four self-reported health outcomes are employed to test the aforementioned hypotheses. The first two outcomes are single-item measures: "Retrospective Health" and "Relative Health," with responses dichotomized into the outcomes of Much Worse/Worse/Same (=0) and Better/Much Better (=1) for logistic regression. These stem from the respective questions: (a) "How would you compare your health today to your health two years ago?" and (b) "How would you compare your health to other people in the village who are of about the same age and sex?" The other two measures are the robust SF-12 physical and mental health scales (Gandek et al., 1998; Ware, Kosinski, & Keller, 1996), which are transformed into age-standardized scores to improve the interpretation of scores across all age groups (for this and other types of SF-12 standardizations, see Hurst, Ruta, & Kind, 1998; Mols, Pelle, & Kupper, 2009). Twelve self-reported health questions (separate from the questions above) are weighted differently to construct the mental and physical health scales (although the weighting process is not publicly available due to registered trademark issues).

The four measures represent distinct aspects of self-reported health and test the consistency of the relationship between marital dissolutions and health. Retrospective Health captures a temporal aspect of one's health and could be linked to whether one's marital status changed or stayed the same over the 2-year period covered by the question. Relative Health measures one's perceived health compared with others in a particular village, which accounts for a between-village differences in health. The SF-12 explicitly measures mental and physical health (whereas the other two do not) and has a high degree of external validity.

Regression estimates for a four-category ordinal variable (only collapsing worse/much worse categories) and unstandardized SF-12 scores can be found in Supplementary Tables 2 and 3. Since some estimates stem from less than 20, and even less than 15, observations, the conservative approach with dichotomized health outcomes is presented in the main text. The coefficients in both estimating procedures do not substantively differ.

Logistic and ordinary least squares (OLS) regressions are conducted with only the 2010 data. Then, lagged dependent variable regressions are employed to assess the influence of marital status and marital transitions between 2008 and 2010 on health in 2010, and include controls from 2008.

For both sets of analyses, multiple imputation (MI) techniques account for missing values. Each health variable in 2008 contains about 20% missing cases. In 2008, the MLSFH administered a separate health survey, often on a different day by a different team of interviewers, after

respondents completed the main HH survey. This process was, to a large extent, random as the second team of interviewers were unable to track respondents on the particular day that the survey team returned to a village for the health survey. Sensitivity analyses on observable characteristics (not presented) supports this notion. The data are treated as “missing at random.” Listwise deletion (LD) estimates only would suffice in the unlikely scenario that the data were “missing completely at random.” Some values for control variables were missing as well. MI techniques generated ten additional datasets to estimate missing values (LD regression estimates can be found in Supplementary Tables 4 and 5). Missing data for the 2010 health outcomes are not imputed because they are dependent variables.

The control variables in these models include demographic characteristics commonly associated with health such as gender, age, and ethnicity. Ethnicity is dichotomized into respondents either belonging to the Yao tribe (who almost exclusively live in the southern region and are embedded in matrilineal kinship systems with traditionally higher rates of divorce) or non-Yao tribes. These models also control for potentially health-biasing factors, such as educational attainment, a modified HH dependency ratio (number of HH members 45 years and older, and under 15 years, relative to those between 15 and 44), one’s number of marriages (including the present, categorized as 1, 2, and 3+), and the perceived chance of being HIV-positive (HIV status cannot be utilized since testing was conducted in 2008 but not 2010). Due to previously noted data limitations, gender acts only as a control. HH wealth and region are not included in these models because of serial correlation issues with educational attainment and ethnicity.

Lastly, in the lagged dependent variable models, the respective health outcome of the previous wave (2008) is controlled for. The only health control in 2008 that is not identical to the 2010 outcome is labeled “General Health 2008,” which is similarly dichotomized into Poor/Fair/Good (=0) and Very Good/Excellent (=1) so that there is a baseline health metric in 2008 when assessing 2010 retrospective health.

The independent variable in the cross-sectional analyses is the respondent’s marital status in 2010, dichotomized as either being married or divorced/widowed. There are insufficient cases to warrant separating these marital dissolutions (for reasons explained in the next paragraph). While separation exists as a unique marital state within the MLSFH, only 1.4% of the analytic sample claimed they were separated in 2008 and only 0.7% in 2010. Separation is the functional equivalent of divorce in rural Malawi and is treated as such in the analyses. By 2010, all of the respondents had been married.

For the lagged dependent variable models, the independent variable depicts a respondent’s marital status and transitions over the two waves of data (between 2008 and 2010): stayed married/became married, stayed divorced/widowed, and became divorced/widowed. This coding distinguishes

potential health differences with respect to the duration of a marital dissolution, as has been noted in the HIC literature. Here, combining divorce and widowhood is necessary (and also conventional in existing SSA research) because, between the two waves, only 2.3% ($N = 29$) of respondents experienced a divorce and 3.1% ($N = 39$) became widowed.

Characteristics of respondents can be found in [Table 1](#) following. The first column contains information for complete cases, which are quite similar to the MI estimates found in the second column (from the fifth imputed data set which was arbitrarily chosen out of 10 possible imputed data sets). There are no scores reported for age-standardized SF-12 measures because these are centered on a mean of zero with a normal distribution and standard deviation of about 1.

Multivariate Results

The regression models in [Table 2](#) (following) show that being divorced/widowed in 2010 is negatively and significantly associated with relative health compared with others ($p < .05$), SF-12 mental health scores ($p < .05$), and SF-12 physical health scores ($p < .05$). While the coefficients for retrospective health are not statistically significant, the direction of the coefficients is negative.

Men appear to have significant health advantages over women across all outcomes, and becoming a year older is significantly and negatively associated with health. Being a member of the Yao ethnic group is negatively associated with retrospective health ($p < .10$). Educational attainment is mostly not significantly associated with health, but if an individual has attended primary school ($p < .05$) or secondary school ($p < .01$) they have higher age-standardized SF-12 physical health scores. Being in a HH with a higher dependency ratio is not associated with health for these older Malawians. One’s number of previous marriages is not associated with health. Lastly, believing oneself to have a chance of being HIV-positive is negatively associated with one’s mental health ($p < .01$) and physical health ($p < .05$).

The regressions in [Table 3](#) build upon the foundation set in [Table 2](#). Staying divorced/widowed between 2008 and 2010 (experiencing a marital dissolution prior to 2008)—compared with staying or becoming married—predicts lower log odds of being in better health relative to others ($p < .05$) and SF-12 physical health scores ($p < .10$) for Malawians in 2010. Moreover, becoming divorced/widowed between 2008 and 2010 only predicts comparatively worse retrospective health ($p < .10$) relative to married individuals or those who stayed divorced or widowed between 2008 and 2010.

The association between the control variables and health outcomes are similar to the cross-sectional approach in [Table 2](#). But, in these models, three or more marriages as of 2008 are associated with worse relative and physical health. Even having experienced two marriages as of 2008 is associated with worse physical health. Perceiving oneself to have a chance of being HIV-positive is, inexplicably,

Table 1. Sample Descriptive Statistics (Percentages and Means with Standard Deviations)

		Complete cases	MI (Fifth)
Gender	Female	56.9	56.9
	Male	43.1	43.1
Ethnicity	Non-Yao	72.8	72.6
	Yao	27.2	27.4
Education	None	38.0	38.3
	Primary	57.2	57.0
	Secondary	4.8	4.7
# Marriages as of 2008	1	50.9	50.5
	2	31.4	31.6
	3+	17.7	17.8
# Marriages as of 2010	1	53.6	54.0
	2	29.2	28.9
	3+	17.2	17.1
Perceived chance HIV+ 2008	None	58.4	58.5
	Some	41.6	41.5
Perceived chance HIV+ 2010	None	69.1	69.2
	Some	30.9	30.8
Age 2010		59.6 (11.2)	59.6 (11.2)
HH dependency ratio 2008		1.5 (1.5)	1.5 (1.5)
HH dependency ratio 2010		1.3 (1.3)	1.3 (1.3)
Marital status 2010	Married	74.3	74.3
	Divorced/widowed	25.7	25.7
Marital status 2008–2010	Stayed/became married	76.0	75.5
	Stayed divorced/widowed	18.4	18.8
	Became divorced/widowed	5.6	5.7
General health 2008	Poor/fair/good	48.4	49.7
	Very good/excellent	51.6	50.3
Retrospective health 2010	Much worse/worse/same	51.7	50.2
	Better/much better	48.3	46.9
Relative health 2008	Much worse/worse/same	48.2	50.2
	Better/much better	51.8	49.8
Relative health 2010	Much worse/worse/same	45.4	43.9
	Better/much better	54.6	52.8
N		1,290 (max)	1,290

Notes: Non-imputed variables in the right-hand column may not add up to 100% due to the inclusion of missing values in these descriptive statistics. HH = household; MI = multiple imputation.

positively linked to better physical health in 2010. Each lagged health outcome is positively and significantly associated with the corresponding health outcome in 2010; being in good health in the past predicts good health in the future.

Discussion

The analyses indicate that currently being divorced/widowed is associated with lower log odds of being in better relative, mental, and physical health—but not retrospective health—for older, rural Malawians. Those who became divorced/widowed prior to 2008 and who remained so through 2010 reported worse relative and physical health. Worse retrospective health is only linked to becoming divorced/widowed between 2008 and 2010. When examining these relationships more closely, greater nuance in the relationship between marital dissolutions and health comes to light.

The magnitude of the marital status coefficients on the health scores are relatively small, or non-existent. For example, in [Table 3](#), the effect of staying divorced/widowed relative to staying (or becoming) married results in less than one-sixth of a standard deviation lower physical health score. It could be that marital dissolutions are not that strongly associated with worse health outcomes, despite the literature from HICs suggesting otherwise.

Selection into surviving to advanced ages (45+) in Malawi might be at the root of this issue. If rural Malawians have been able to survive in a subsistence agricultural society, with little access to medical facilities or practitioners through most of their lives, and through the HIV/AIDS pandemic, then marital dissolutions might be inconsequential. Most individuals in HICs are not likely to have faced comparable hardships prior to a marital dissolution. Limited evidence from the U.S. supports the idea that those who have faced marked disadvantages throughout

Table 2. Cross-Sectional Regressions Predicting Health Outcomes in 2010

Regression type	Logit	Logit	OLS	OLS
Health outcome	Retro health	Relative health	SF-12 mental	SF-12 physical
Marital status (married)				
Divorced/widowed	-0.11 (0.15)	-0.31 (0.15)**	-0.17 (0.07)**	-0.17 (0.07)**
Male	0.34 (0.13)**	0.48 (0.14)***	0.21 (0.06)***	0.19 (0.07)***
Age 2010	-0.03 (0.01)***	-0.02 (0.01)***	N/A	N/A
Yao (non-Yao)	0.25 (0.15)*	0.13 (0.15)	0.05 (0.07)	0.04 (0.07)
Education (none)				
Some primary	0.12 (0.14)	0.00 (0.14)	0.07 (0.07)	0.18 (0.07)**
Some secondary	0.13 (0.31)	0.18 (0.32)	0.09 (0.14)	0.49 (0.13)***
HH dependency ratio 2010	0.05 (0.04)	0.07 (0.04)	0.03 (0.02)	0.02 (0.02)
# Marriages as of 2010 (1)				
2	0.02 (0.13)	-0.05 (0.13)	0.08 (0.06)	-0.06 (0.06)
3+	-0.11 (0.17)	-0.06 (0.17)	0.08 (0.08)	-0.03 (0.08)
Some chance HIV+ 2010	-0.05 (0.13)	0.08 (0.13)	-0.22 (0.06)***	-0.15 (0.06)**
Constant	1.20***	1.28***	-0.11	-0.14*
N	1,252	1,247	1,220	1,220

Notes: “Retro health” is short for retrospective health. SF-12 mental and physical health outcomes are age-standardized and thus, age is excluded in the respective models. Robust standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

HH = household; OLS = ordinary least squares.

Table 3. Lagged Dependent Variable Regressions Predicting Health Outcomes in 2010

Regression type	Logit	Logit	OLS	OLS
Health outcome 2010	Retro health	Relative health	SF-12 mental	SF-12 physical
Marital status 2008–2010 (stayed/became married)				
Stayed divorced/widowed	0.09 (0.17)	-0.35 (0.17)**	-0.12 (0.08)	-0.15* (0.08)
Became divorced/widowed	-0.54 (0.28)*	-0.28 (0.27)	-0.17 (0.15)	0.02 (0.12)
Male	0.35 (0.14)**	0.46 (0.14)***	0.21 (0.07)***	0.20 (0.06)***
Age 2008	-0.02 (0.01)***	-0.02 (0.01)***	N/A	N/A
Yao (non-Yao)	0.29 (0.15)**	0.19 (0.15)	0.06 (0.07)	0.10 (0.07)
Education (none)				
Some primary	0.13 (0.14)	0.01 (0.15)	0.06 (0.07)	0.16 (0.07)**
Some secondary	0.07 (0.31)	0.19 (0.32)	0.01 (0.15)	0.45 (0.12)***
HH dependency ratio 2008	0.02 (0.04)	-0.04 (0.04)	-0.01 (0.02)	0.00 (0.02)
# Marriages as of 2008 (1)				
2	0.01 (0.14)	0.03 (0.14)	0.09 (0.06)	-0.12 (0.06)*
3+	-0.12 (0.17)	-0.32 (0.18)*	-0.09 (0.08)	-0.29 (0.08)***
Some chance HIV+ 2008	0.05 (0.13)	0.12 (0.13)	0.03 (0.06)	0.11 (0.06)*
General health 2008 (poor/fair/good)				
Very good/excellent	0.31 (0.14)**			
Relative health 2008 (same or worse)				
Better/much better		0.37 (0.13)***		
SF-12 Mental 2008			0.13 (0.03)***	
SF-12 Physical 2008				0.20 (0.03)***
Constant	0.80*	1.11***	-0.11	-0.15*
N	1,252	1,247	1,220	1,220

Notes: “Retro health” is short for retrospective health. SF-12 Mental and Physical health outcomes are age-standardized and thus, age is excluded in the respective models. Robust standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

HH = household; OLS = ordinary least squares.

their lives manage to deal with the loss of a spouse better than other groups, in large part due to social support and having survived through great adversity already (Elwert & Christakis, 2006). But, it is possible that when marital status measures (in Tables 2 and 3) are negatively but insignificantly associated with health, a Type II error is witnessed. This could be a consequence of the relatively small sample size and portion of rural Malawians who are not married (coinciding with relatively large standard errors for some estimates), along with issues of unobserved heterogeneity in the chosen regression methods. Thus, the conventional theoretical framework would be supported in this rural Malawian research as in earlier studies situated in SSA (Delavande & Kohler, 2009; Kuate-Defo, 2006; Gómez-Olivé et al., 2013).

Hypotheses 1 and 2 are only partially supported. Both the significant and insignificant negative associations between marital dissolutions and health outcomes offer an avenue forward in theoretical and methodological development. The effects of less-recent marital dissolutions are more consistently linked to worse health than more-recent dissolutions, which suggests that such dissolutions could have a long(er)-term influence on the health of older Malawians.

However, when examining marital dissolutions and health for older individuals in SSA, it is necessary to understand what survival into old age substantively means in a particular setting and whether a marital dissolution is indeed a distinct livelihood shock. The high prevalence of remarriage in Malawi (Reniers, 2003) suggests it is normative, like a first marriage. Those remaining in a state of marital dissolution for long periods might have a difficult time adapting to such circumstances if they remain unmarried. Perhaps the lack of a negative significant relationship between recent marital dissolutions and relative, physical, and mental health is a result of the perceived, or even realistic, chance of remarriage in the near future. The importance of marriage for one's social standing likely moderates the relationship between marital dissolutions and health much more strongly in Malawi than in HICs, even if the mechanisms remain unclear.

In the future, researchers must attain larger samples of older SSAs—perhaps even oversampling older individuals who are not married to improve the ability to disaggregate gender differences. Larger samples would also permit more effective analyses, reducing underlying time-invariant unobserved health selection issues in a longitudinal framework (such as fixed effects modeling). More importantly, larger sample sizes would allow the effects of marital status to be disaggregated in longitudinal regression analyses into: stayed married, became married, stayed divorced, became divorce, stayed widowed, and became widowed. This was not possible with these data. For example, among the 29 individuals who became divorced between 2008 and 2010, 58.6% ($N = 17$) indicated they were in much worse, worse, or the same health. Of the 39 individuals who became widowed between 2008 and 2010, 74.4% ($N = 29$) indicated they were in much worse, worse, or the same health. Such

a small number of cases per health outcome could not be reliably extrapolated as representative of the larger populations in the rural Malawian sample sites.

Qualitative data would allow for a better understanding of the mechanisms driving the relationship between marital dissolutions and health. Complete network studies on older Malawians and their support networks would enlighten our understanding of available social support. Additionally, while the MLSFH data allow for some spousal matching (where available), there are not enough cases to warrant inclusion of spousal characteristics in these analyses. Examining couples' (and former couples') characteristics in future research would further reduce the uncertainty in health outcome estimates for older individuals. Spousal selection, especially for higher-order marriages, on the basis of either HIV status or perceived HIV status, is an important consideration for rural Malawians (Reniers, 2008; Watkins, 2004). Although an individual's number of prior marriages are accounted for in the regression models, these analyses cannot address the possibility of health-selection into first and subsequent marriages.

Lastly, missing data are not uncommon in SSA surveys when considering the time-burdens placed on respondents, limited training of fieldworkers, and difficulties in finding respondents to reconcile missing data. While MI techniques are widely accepted in social science research when randomly missing data are involved, analyses involving fewer missing cases are still preferred.

Conclusion

Little research has explicitly examined the overall health of those who are often left keeping the fabric of SSA communities together—older individuals. The primary goal of this paper was to examine whether experiencing a marital dissolution and the timing of a dissolution in a rural SSA context are associated with worse health outcomes compared with being married, as is found in many HIC settings. While the analyses cannot determine any causal paths, and include only a relatively small sample of rural Malawians, the results suggest that marital dissolutions might not be as influential on the health of individuals as expected.

Selection into surviving to advanced ages in Malawi could outweigh the detrimental effects of a marital dissolution. The observed relationship between marital status and health in Malawi, and high union instability more generally in SSA, might inform future analyses in HICs. Researchers in HICs have not yet had the opportunity to examine how the health of relatively newer cohorts of individuals who “will have spent less of their lives in married-couple households and more of their lives living alone, in single-parent or complex households” (Hughes & Waite, 2007, p. 196 in Schaie and Uhlenberg) will be affected by union dissolutions when they enter into old age. A more practical way of examining this relationship in SSA and HICs might be to consider relative years of exposure to being in a state

of marital dissolution, rather than the timing of discrete events such as separation, divorce, and widowhood.

Understanding the social determinants of health among older individuals in aging countries like Malawi or more generally, SSA, will also become increasingly necessary because considerably more individuals—in terms of both magnitude and portion—are projected to survive into old age (United Nations, Department of Economic and Social Affairs, Population Division, 2015). It will also be critical to understand how marriage, divorce, and remarriage are associated with remaining life expectancy in an era where the incidence and prevalence of marriage and divorce are changing (Clark & Brauner-Otto, 2015; Shapiro & Gebreselassie, 2014). Recognizing the role of a significant cultural goal in many SSA settings—marriage—and how it relates to population aging is paramount for future discussions on aging to determine, more broadly, whether marriage is beneficial or dissolutions are disadvantageous to health. Could the protective effects of marriage even outweigh the negative effects of HIV/AIDS on life expectancy of those who are coming into old age in SSA countries? Investing in longitudinal research targeted at older populations will only contribute to a better understanding of how SSA countries are aging and the factors hindering this demographic process.

Supplementary Material

Supplementary data is available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

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References

- Amato, P. R. (2000). The consequences of divorce for adults and children. *Journal of Marriage and Family*, *62*, 1269–1287. doi:10.1111/j.1741-3737.2000.01269.x
- Aneshensel, C. S. (1992). Social stress: Theory and research. *Annual Review of Sociology*, *18*, 15–38. doi:10.1146/annurev.so.18.080192.000311
- Bongaarts, J., & Zimmer, Z. (2002). Living arrangements of older adults in the developing world: an analysis of demographic and health survey household surveys. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *57*, S145–S157. doi:10.1093/geronb/57.3.S145
- Carr, D. S. (2004). Black/White differences in psychological adjustment to spousal loss among older adults. *Research on Aging*, *26*, 591–622. doi:10.1177/0164027504268495
- Clark, S., & Brauner-Otto, S. (2015). Divorce in sub-Saharan Africa: Are unions becoming less stable? *Population and Development Review*, *41*, 583–605. doi:10.1111/j.1728-4457.2015.00086.x
- Cliggett, L. (2005). *Grains from grass: Aging, gender, and famine in rural Africa*. Ithaca, NY: Cornell University Press.
- Cohen, B. & Menken, J. (Eds.). (2006). *Aging in Sub-Saharan Africa: Recommendations for furthering research*. Washington, DC: National Academies Press.
- Delavande, A., & Kohler, H. P. (2009). Subjective expectations in the context of HIV/AIDS in Malawi. *Demographic Research*, *20*, 817–874. doi:10.4054/DemRes.2009.20.31
- Dupre, M. E., Beck, A. N., & Meadows, S. O. (2009). Marital trajectories and mortality among US adults. *American Journal of Epidemiology*, *170*, 546–555. doi:10.1093/aje/kwp194
- Durkheim, E. (1951). *Suicide: a study in sociology [1897]*. Translated by J. A. Spaulding and G. Simpson. Glencoe, IL: The Free Press.
- Elwert, F., & Christakis, N. A. (2006). Widowhood and race. *American Sociological Review*, *71*, 16–41. doi:10.1177/000312240607100102
- Gandek, B., Ware, J. E., Aaronson, N. K., Apolone, G., Bjorner, J. B., Brazier, J. E., ... Sullivan, M. (1998). Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. *Journal of Clinical Epidemiology*, *51*, 1171–1178. doi:10.1016/S0895-4356(98)00109-7
- Goldman, N., Korenman, S., & Weinstein, R. (1995). Marital status and health among the elderly. *Social Science & Medicine*, *40*, 1717–1730. doi:10.1016/0277-9536(94)00281-W
- Gómez-Olivé, F. X., Thorogood, M., Bocquier, P., Mee, P., Kahn, K., Berkman, L., & Tollman, S. (2014). Social conditions and disability related to the mortality of older people in rural South Africa. *International Journal of Epidemiology*, *43*, 1531–1541. doi:10.1093/ije/dyu093
- Gómez-Olivé, F. X., Thorogood, M., Clark, B. D., Kahn, K., & Tollman, S. M. (2010). Assessing health and well-being among older people in rural South Africa. *Global Health Action*, *3*(Suppl 2), 23–35. doi:10.3402/gha.v3i0.2126

- Gómez-Olivé, F. X., Thorogood, M., Clark, B., Kahn, K., & Tollman, S. (2013). Self-reported health and health care use in an ageing population in the Agincourt sub-district of rural South Africa. *Global Health Action*, 6, 19305. doi:10.3402/gha.v6i0.19305
- Hughes, M. E., & Waite, L. J. (2007). The aging of the Second Demographic Transition. In K. W. Schaie and P. Uhlenberg (Eds.), *Social structures: The impact of demographic changes on the well-being of older persons* (pp. 179–211). New York, NY: Springer.
- Hurst, N. P., Ruta, D. A., & Kind, P. (1998). Comparison of the MOS short form-12 (SF12) health status questionnaire with the SF36 in patients with rheumatoid arthritis. *Rheumatology*, 37, 862–869. doi:10.1093/rheumatology/37.8.862
- Ingstad, B., Bruun, F., Sandberg, E., & Tlou, S. (1992). Care for the elderly, care by the elderly: The role of elderly women in a changing Tswana society. *Journal of Cross-Cultural Gerontology*, 7, 379–398. doi:10.1007/BF01848700
- Kohler, H. P., Watkins, S. C., Behrman, J. R., Anglewicz, P., Kohler, I. V., Thornton, R. L., ... Kalilani-Phiri, L. (2015). Cohort profile: The Malawi Longitudinal Study of Families and Health (MLSFH). *International Journal of Epidemiology*, 44, 394–404.
- Kuate-Defo, B. (2006). Interactions between socioeconomic status and living arrangements in predicting gender-specific health status among the elderly in Cameroon. In B. Cohen & J. Menken (Eds.), *Aging in Sub-Saharan Africa: Recommendations for furthering research. Panel on policy research and data needs to meet the challenge of aging in Africa* (pp. 276–313). Washington, DC: The National Academies Press.
- Land, K. C., & Yang, Y. (2006). Morbidity, disability, and mortality. In R. Binstock and L. K. George (Eds.), *Handbook of aging and the social sciences* (pp. 41–58). New York, NY: Academic Press/Elsevier.
- Lillard, L. A., & Panis, C. W. (1996). Marital status and mortality: the role of health. *Demography*, 33, 313–327. doi:10.2307/2061764
- Malawi National Statistical Office. (2011). *2008 population and housing census*. Zomba, Malawi: NSO.
- Manzoli, L., Villari, P., Pirone, G.M., & Boccia, A. (2007). Marital status and mortality in the elderly: a systematic review and meta-analysis. *Social Science & Medicine*, 64, 77–94. doi:10.1016/j.socscimed.2006.08.031
- Mols, F., Pelle, A. J., & Kupper, N. (2009). Normative data of the SF-12 health survey with validation using postmyocardial infarction patients in the Dutch population. *Quality of Life Research*, 18, 403–414. doi:10.1007/s11136-009-9455-5
- Nyirenda, M., Newell, M. L., Mugisha, J., Mutevedzi, P. C., Seeley, J., Scholten, F., & Kowal, P. (2013). Health, wellbeing, and disability among older people infected or affected by HIV in Uganda and South Africa. *Global Health Action*, 6, 19201. doi:10.3402/gha.v6i0.19201
- Opping, C. (2006). Familial roles and social transformations older men and women in sub-Saharan Africa. *Research on Aging*, 28, 654–668. doi:10.1177/0164027506291744
- Payne, C. F., Mkandawire, J., & Kohler, H. P. (2013). Disability transitions and health expectancies among adults 45 years and older in Malawi: a cohort-based model. *PLoS Medicine*, 10, e1001435. doi:10.1371/journal.pmed.1001435
- Pearlin, L. I. (1989). The sociological study of stress. *Journal of Health and Social Behavior*, 30, 241–256. doi:10.2307/2136956
- Reniers, G. (2003). Divorce and remarriage in rural Malawi. *Demographic Research, Special Collection*, 1, 175–206. doi:10.4054/DemRes.2003.S1.6
- Reniers, G. (2008). Marital strategies for regulating exposure to HIV. *Demography*, 45, 417–438.
- Sansom, D., & Farnill, D. (1997). Stress following marriage breakdown: Does social support play a role? *Journal of Divorce & Remarriage*, 26, 39–49. doi:10.1300/J087v26n03_03
- Sasson, I., & Umberson, D. J. (2014). Widowhood and depression: new light on gender differences, selection, and psychological adjustment. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 69, 135–145. doi:10.1093/geronb/gbt058
- Schatz, E. J. (2007). “Taking care of my own blood”: Older women’s relationships to their households in rural South Africa. *Scandinavian Journal of Public Health*, 35(Suppl 69), 147–154. doi:10.1080/14034950701355676
- Schatz, E., Madhavan, S., & Williams, J. (2011). Female-headed households contending with AIDS-related hardship in rural South Africa. *Health & Place*, 17, 598–605. doi:10.1016/j.healthplace.2010.12.017
- Schatz, E., & Seeley, J. (2015). Gender, ageing and carework in East and Southern Africa: A review. *Global Public Health*, 10, 1185–1200. doi:10.1080/17441692.2015.1035664
- Schoenborn, C. A. (2004). *Marital status and health, United States 1999–2002*. Hyattsville, MD: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics.
- Shapiro, D., & Gebreselassie, T. (2014). Marriage in sub-Saharan Africa: Trends, determinants, and consequences. *Population Research and Policy Review*, 33, 229–255. doi:10.1007/s11113-013-9287-4
- Stroebe, M., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. *The Lancet*, 370, 1960–1973. doi:10.1016/S0140-6736(07)61816-9
- Strohschein, L., McDonough, P., Monette, G., & Shao, Q. (2005). Marital transitions and mental health: Are there gender differences in the short-term effects of marital status change? *Social Science & Medicine*, 61, 2293–2303. doi:10.1016/j.socscimed.2005.07.020
- Sullivan, A. R., & Fenelon, A. (2014). Patterns of widowhood mortality. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 69, 53–62. doi:10.1093/geronb/gbt079
- Tavares, L. P., & Aassve, A. (2013). Psychological distress of marital and cohabitation breakups. *Social Science Research*, 42, 1599–1611. doi:10.1016/j.ssresearch.2013.07.008
- United Nations, Department of Economic and Social Affairs, Population Division. (2015). *World population prospects: The 2015 revision*. New York, NY: United Nations.
- Waldron, I., Hughes, M. E., & Brooks, T. L. (1996). Marriage protection and marriage selection—prospective evidence for reciprocal effects of marital status and health. *Social Science & Medicine*, 43, 113–123. doi:10.1016/0277-9536(95)00347-9
- Watkins, S. C. (2004). Navigating the AIDS epidemic in rural Malawi. *Population and Development Review*, 30, 673–705. doi:10.1111/j.1728-4457.2004.00037.x
- Ware, J. Jr., Kosinski, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*, 34, 220–233. doi:10.1097/00005650-199603000-00003