Mental Health among the Elderly in sub-Saharan Africa—A Neglected Health Dimension?

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Abstract

Elderly individuals are not routinely screened for mental health and psychiatric disorders in resource-constraint settings such as sub-Saharan Africa (SSA), and the levels, age-trajectories, and correlates of mental health are poorly documented on the population level. This paper will investigate how the high-HIV prevalence environment in SSA affects the mental health and well-being of older individuals in SSA. Using a unique longitudinal representative dataset from rural Malawi that provides extensive socioeconomic, social capital and health information—including the SF-12 mental health score, a well validated and standardized instrument commonly used to measure social and emotional functioning—the goals of this paper include analyses of the impact of actual and/or perceived HIV+ status on mental health of older individuals, including the spill-over effects of actual and/or perceived HIV+ status of family/household members, and investigations of the impact of economic and health shocks, including changes in HIV+ status, on the health and well-being of elderly individuals in a low-income high-risk disease environment. The goals of our analysis are therefore twofold: (*a*) First, we document the mental health status of elderly individuals on the *population level* and estimate the impacts of social, behavioral, environmental and biological risk factors on mental health outcomes of elderly individuals living in a poor high-HIV prevalence context; (*b*) Second, we estimate changes in the age trajectory of metal health among the older population as a function of socioeconomic status, exposure to environmental, socioeconomic and health shocks. Documenting these patterns, age trajectories and correlates of mental health and mental health changes in sub-Saharan contexts such as Malawi is important and urgent as researchers attempt to understand the demographic, socioeconomic, health and well-being consequences of the HIV epidemic in SSA.

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***** Extended Abstract *****

1 Introduction

The aging environment in sub-Saharan Africa (SSA) is characterized by high poverty levels and high morbidity and mortality including the world's highest HIV/AIDS prevalence. The relevance of these conditions for aging is heightened by the absence of institutionalized protection systems that can buffer the social, economic, health, and psychological consequences of aging, health and environmental shocks. The elderly in SSA thus represent one of the most vulnerable population groups, and the AIDS epidemic significantly deteriorated their situation through its direct and indirect demographic, socioeconomic and health impacts on individuals and their families (Ankrah 1994; Heuveline 2003, 2004; Merli and Palloni 2006; Palloni and Lee 1992; Wachter et al. 2002; Zagheni 2010). For example, by increasing morbidity and mortality of the prime-aged adult population, the AIDS epidemic affects the ability of families to care for their elderly members and affects existing support networks (Bray 2009; Merli and Palloni 2006). Moreover, the HIV/AIDS epidemic has increased on the other hand the pressure on older generations in sustaining the family through monetary and non-monetary contributions and care-giving responsibilities for sick and dying adult children or orphaned grandchildren (Bray 2009; Floyd et al. 2007; Hosegood and Timaeus 2006; Knodel et al. 2003; Merli and Palloni 2006; Mtika 2001; Naidu and Harris 2005; Nyasani et al. 2009; Peters et al. 2008; Zimmer 2009). Because of the increasing availability of antiretroviral treatments (ART), higher number of HIV+ individuals in sub-Saharan Africa survives to older ages. Consequently, the number of elderly men and women in sub-Saharan Africa who will be HIV+ themselves and/or who will have HIV+ individuals is also expected to increase substantially in near future.

The consequences of the high-HIV prevalence environment in SSA on mental health of elderly individuals have not been documented on population level (Jenkins et al. 2010). Mental health in general and specifically among elderly men and women in sub-Saharan Africa is understudied and poorly understood although mental disorders such as unipolar depression have been identified as one of leading causes of health disability in SSA and worldwide (Lopez et al. 2006; Skeen et al. 2010). About 14% of the global burden of disease is attributed to neuropsychiatric disorders mostly due to the chronically disabling nature of depression and other common mental disorders, alcohol and substance abuse (Prince et al. 2007). While the disease burden due to neuropsychiatric disorders is currently somewhat lower in SSA, it is expected to rise rapidly. It is also very likely to be substantially underestimated in SSA because of the insufficient recognition that mental health and other diseases are interrelated (Prince et al. 2007; World Health Organization 2008). Mental health, remains a low priority in SSA and other less-developed regions (Prince et al. 2007; Saxena et al. 2007). Only scant evidence exists about the mental health status of elderly and HIV+ older individuals in SSA (Lund 2010; Skeen et al. 2010). Almost all of this existing evidence is based on clinical studies or convenient samples rather than population-level studies (Collins et al. 2006).

The present analysis makes an important contribution to the emerging literature on mental health in sub-Saharan Africa by drawing on innovative and rich new data collection from rural Malawi that includes extensive longitudinal information on health, specifically mental health, as

well as demographic, socioeconomic and family characteristics of elderly men and women living in a context characterized by high poverty, and high morbidity and mortality. Specifically, the goal of our analysis is twofold: (*c*) First, we document the mental health status of elderly individuals on the *population level* and estimate the impacts of social, behavioral, environmental and biological risk factors on mental health outcomes of elderly individuals living in a poor high-HIV prevalence context; (*d*) Second, we estimate changes in the age trajectory of metal health among the older population as a function of socioeconomic status, exposure to environmental, socioeconomic and health shocks. Both aspects of this analysis have not been investigated in this context and thus the paper will provide important knowledge about a neglected health dimension in sub-Saharan Africa.

The remainder of this extended abstract is organized as following. In the next section, we present the Malawi Longitudinal Study of Families and Health (MLSFH) and discuss the methodology we will use in the final version of the paper. In section 3 we present preliminary results on the determinants of mental health based on the 2008 data. In the last section, we present a short summary and outlook for the final analysis.

2 Data and Methods

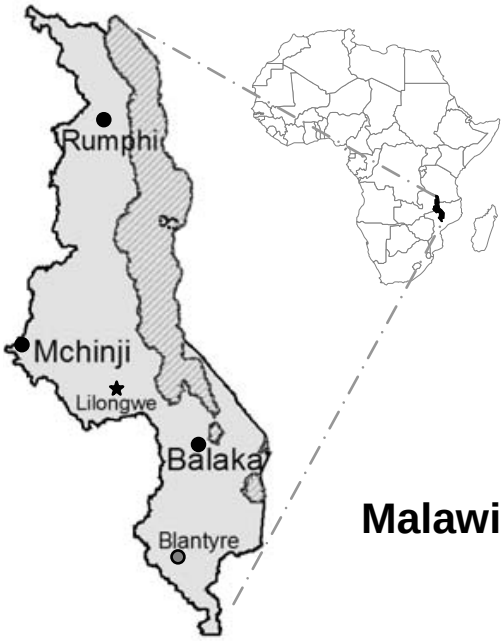
2.1 The Malawi Longitudinal Study of Families and Health (MLSFH)

Data used in this analysis comes from the Malawi Longitudinal Study of Families and Health (MLSFH; formerly, Malawi Diffusion and Ideational Change Project), a longitudinal panel study with survey waves in 1998, 2001, 2004, 2006, 2008 and 2010 that is implemented in three sites in rural Malawi: Rumphi (in the northern region), Mchinji (in the central region), and Balaka (in the southern region) (see Figure 1. The primary goals of the MLSFH are to study the role of social interactions on attitudes related to sexual behavior in a high risk HIV/AIDS environment, contraceptive use and family planning, and to identify mechanisms used by Malawian households in rural areas to cope with multiple shocks such as HIV/AIDS infections or mortality.

In 1998, when the project started data collection, a sample of 1,541 ever-married women aged 15-49 and 1,065 of their spouses were interviewed. In 2001, respondents were re-interviewed, along with any new spouses since 1998. In 2004, the study added two new components to the data collection: an additional sample of approximately 1,500 adolescents, and free HIV testing and voluntary counseling for the HIV test results to all respondents. The MLSFH returned for a fourth wave of survey data collection and a second round of HIV testing in 2006, and it followed-up in 2008 with a fifth round of extensive survey data, including the collection of the extensive transfer data that are used in the present analysis, and a 3rd round of HIV testing and counseling. In 2006 and 2008 about 4,000 individuals were interviewed by the MLSFH. Elderly men and women in MLSFH are overrepresented because of the aging of the longitudinal sample and the addition of a *parent sample* in 2008 that includes all respondents' living parents. These data are linked between respondents and parents/children.

Since 2006, MLSFH collected repeated measures of mental health using the SF12-scale, a widely-used measure of social and emotional well-being and functioning that has been implemented

Figure 1: Study sites in the Malawi Longitudinal Study of Families and Health (MLSFH)



and validated in many contexts (Fischer and Corcoran 2007; Fleishman et al. 2006; Macran et al. 2003; Ware et al. 2001; Ware Jr et al. 1996). In addition, the data contains detailed longitudinal information on subjective well-being (e.g., self-reported health), subjective expectations of life expectancy (Delavande and Kohler forthcoming), and detailed measures of HIV risk perceptions since 1998 (Delavande and Kohler 2009, forthcoming). Beginning 2004, MLSFH conducted repeated biomarker-based HIV tests (Obare 2010; Obare et al. 2009), identifying 314 HIV+ individuals and collected also information on access to and utilization of antiretroviral treatment (ART).

This longitudinal and exceptionally rich information on mental health and well-being of the elderly population in rural Malawi is accompanied by detailed demographic and socioeconomic data on the respondents, including (*e*) marital history and sexual-partnership histories; (*f*) detailed measures of economic and social shocks experienced by respondents and their households, including mortality of family members, crop failures/income losses, changes in health of individuals and their family members (since 1998); and (*g*) extensive information on social networks and social capital, including participation in social groups (since 1998) and unique information about family networks, intergenerational transfers and resource sharing in extended family networks (since 2006) (Behrman et al. 2002, 2009; Kohler et al. 2007, 2011). This combination of longitudinal mental health data among elderly respondents and their family/household members, along with detailed data on actual/perceived HIV status, risk behaviors and social/economic/demographic contexts provide an exceptional opportunity to investigate the patterns of mental health in a high risk disease environment such as rural sub-Saharan Africa.

2.2 Measures and Analytic Methods

The dependent variable in all analysis is mental health measured with the SF12-scale, a widely used measure of social/emotional functioning, subjective well-being and overall health-related

quality of life that has been implemented and validated in many different contexts. The SF12-scale is a multipurpose short form survey with 12 questions selected from the SF36 Health Survey. Higher SF12 scores reflect better mental health.

Given the lack of knowledge about mental well-being in poor high HIV-prevalence contexts and specifically in rural Malawi, we will first estimate the impacts of social, behavioral, environmental, and biological risk factors that predict mental health outcomes of older individuals on population level using standard descriptive statistics, OLS and/or logistic regressions with adjustments for clustering of respondents in households. We will specifically address differences in mental health outcomes between HIV+ and HIV- elderly men and women.

A second focus of the present analysis is to estimate the age trajectories of mental health and their changes among the older population in rural Malawi as a function of socioeconomic status, access to family resource networks and exposure to environmental and health shocks on individual and/or family level.

Longitudinal SF12-mental health scores across three rounds are available for 1,768 MLSFH respondents. Age-trajectories of mental health will be estimated using growth curve analyses (Curran and Hussong 2002; Karney and Bradbury 1995), a statistical method for measuring change over time in developmental outcome using a latent variable approach. In the simplest form, these growth models represent mental health H_{it} of individual i who is age A_{it} at time t as $H_{it} = \eta_{i0} + \eta_{i1}A_{it} + \varepsilon_{it}$, where η_{i0} the (latent) initial value of the mental health status score at baseline and η_{i1} is the (latent) slope of change in mental health with age for individual i. ε_{it} includes measurement errors and other shocks to mental health. Our analyses will in particular focus on *conditional growth models* that extend the above framework to allow for the possibility that age-trajectories of mental health are affected by individual and household-levels economic and health shocks, including for instance own/spouses' HIV infection, increased own/spouses' HIV risk perceptions, or sickness of household members. Because the intercept η_{i0} and slope η_{i1} parameters of the equation vary across individuals, they can be treated as dependent variables in auxiliary equations that predict the initial value and slope of mental health status (Bollen and Curran 2006). For example, to test the hypothesis that both baseline level and/or the age-trajectory of mental health are affected by social support networks and actual/perceived HIV status (own or that of a family member), the model can be specified as $\eta_{i0} = \pi_{00} + \pi_{10}HIV + \pi_{20}Network + \nu_{i0}$ and $\eta_{01} = \pi_{01} + \pi_{11}HIV + \pi_{21}Network + \nu_{i1}$ (For recent examples of such models, see Hennessy et al. 2009; Murphy et al. 2009).

For MLSFH respondents added to the sample in 2008 ($N \approx 600$), mental health scores are only available from two waves, and we will use fixed-effect regression models to identify changes in mental health and its determinants (Behrman et al. 2002; Kohler et al. 2007). Given the large sample size, all analyses are well-powered to detect important differences in levels and age-trajectories of mental health.

3 Preliminary Results

Table 1 shows the longitudinal trends in the SF12 mental health scores and selected mental health differentials for MLSFH respondents aged 40+ years. Mental health in rural Malawi has continu-

Table 1: SF12 mental health scores and selected mental health differentials for MLSFH respondents aged 40+

	2006	2008	2010
# of respondents aged 40+	1,129	1,637	1,838
SF12 mental health: mean	54.77	52.97	51.26
std. deviation	(8.57)	(9.44)	(10.15)
Difference: female vs. male	-2.26**	-4.15**	-2.74**
HIV+ vs. HIV–	-2.39*	-0.52	-2.23†
above vs. below age 50	-0.70	-2.06**	-2.73**
married vs. not marr.	3.81**	4.45**	3.93**

p-values: † $p < .10$; * $p < .05$; ** $p < .01$.
2008 and 2010 MLSFH data include *parent sample.*

ously declined since 2006, from a mean of 55 in 2006 to a mean score of 51 in 2010. Women above age 40 have lower SF12 scores compared to men, and this difference in mental health is statistically significant is all 3 years considered in this analysis. In all years, HIV+ elderly individuals reported lower mental health compared to HIV- individuals, but this difference between the two groups was not statistically significant in 2008. Elderly individuals above age 50 have worse mental health compared to men and women aged 40 to 50 years. In addition, married men and women report better mental health compared to the non-married, a trend that is observed since 2006.

Next, we report preliminary results on the determinants of mental health outcomes based on data from 2008. Table 2 presents summary statistics for the MLSFH repsondents aged 40+ in 2008. The mean age of the respondents in 2008 was about 55 years. Almost all men age 40 and above were married in contrast to only 70% of women who were married. Male respondents are on average better educated than female elderly respondents. About 4% of women and 5% of men were HIV+ in 2008. Men and women experienced equal number of recent socioeconomic shocks (1.6). About 22% of men but almost 30% of women experienced a recent death of an adult household member. Economic shocks such as cross loss are fairly common in this context, and about 60% of all respondents reported crop loss in the period 2006-2008.

Table 3 summarizes the results from multivariate regression models, in which we investigated the correlation between sociodemographic characteristics of the respondents and their mental health status. In all five OLS models, we estimated a robust statistically significant association between sex of the respondent and mental health: men report better mental health compared to women, and this association remains when controlling for different sociodemographic characteristics such as marital status, wealth, education, totla number of alive children, number of alive adult daughters, number of co-resident adult children. Among the socioedemographic characteristics, higher number of alive children in 2008 (model 2) and higher number of alive adult daughters (models 3 to 5) are associated with better mental health outcomes. In contrast, higher number of co-resident adult children is associated with lower SF12 scores. Neither education, marital status or wealth predict mental health among respondents in 2008.

The focus of table 4 is on the health correlates of mental health in 2008. The OLS regression models 1 and 2 show that HIV+ status does not predict mental health. In contrast, the subjective perception of being HIV+ is statistically significant and respondents who state higher likelihood

Table 2

Summary statistics for MLSFH respondents aged 40+ in 2008

	Females	Males	Total
N	657	530	1187
SF-12 mental score mean (std. deviation)	51.41 (9.57)	55.54 (8.62)	53.26 (9.38)
Age mean (std. deviation)	54.54 (11.69)	55.26 (11.32)	54.86 (11.53)
Married (%)	70.02	97.17	82.14
Formal schooling (%)			
no formal schooling	45.36	20.38	34.20
primary schooling	51.75	69.81	59.81
secondary schooling	2.89	9.81	5.98
Total number of alive children mean (std. deviation)	5.30 (2.24)	6.26 (2.43)	5.73 (2.36)
HIV+ (%)	3.96	4.72	4.30
Likelihood of being HIV+ (%)			
not likely	55.56	58.87	57.03
low	27.70	28.30	27.97
medium	10.50	8.68	9.69
high	6.24	4.15	5.31
Experience of socioeconomic shocks in the household			
Number of recent shocks mean (std.deviation)	1.69 (0.93)	1.62 (0.96)	1.66 (0.95)
Recent adult death in HH (%)	29.07	22.64	26.20
Recent crop loss (%)	61.64	57.36	59.73

Table 3

Sociodemographic correlates of mental health (SF12) in 2008: multivariate regressions

	(1)	(2)	(3)	(4)	(5)
Respondent's age	0.208	0.174	0.129	0.138	0.135
	(0.98)	(0.81)	(0.58)	(0.62)	(0.61)
Age squared	-0.003	-0.002	-0.002	-0.002	-0.002
	(1.51)	(1.32)	(1.18)	(1.21)	(1.20)
Male	4.170**	3.847**	4.080**	3.973**	4.085**
	(7.91)	(6.63)	(7.23)	(6.81)	(6.97)
Number alive children in 2008		0.192^			
		(1.64)			
Married		0.512	0.551	0.513	0.472
		(0.61)	(0.65)	(0.61)	(0.55)
Number alive adults daugthers			0.373^	0.485*	0.365^
			(1.74)	(2.18)	(1.69)
Number alive adult sons			-0.040	0.099	-0.050
			(0.19)	(0.44)	(0.24)
Number co-resident adult children				-0.425^	
				(1.75)	
Schooling (0=none, 1= primary, 2=secondary)				0.007	0.012
				(0.01)	(0.02)
2008 wealth quantile					0.079
					(0.39)
Constant	48.459**	47.939**	50.195**	50.075**	49.798**
	(7.90)	(7.84)	(7.76)	(7.73)	(7.66)
Observations	*1187*	*1187*	*1187*	*1187*	*1187*
R-squared	0.07	0.07	0.07	0.08	0.07

Notes: Robust t-statistics in parentheses. *P-values*: ^p<.10; * p<.05; **p<.01.

Table 4

Health correlates of mental health (SF12) in 2008: multivariate regressions

	(1)	(2)	(3)
Respondent's age	0.206	0.178	0.243
	(0.96)	(0.84)	(1.22)
Age squared	-0.003	-0.003	-0.003
	(1.51)	(1.45)	(1.54)
Male	4.184**	4.123**	3.05**
	(7.94)	(7.81)	(5.74)
HIV+	-1.465	-0.808	
	(1.07)	(0.58)	
Likelihood of HIV infection		-0.701*	
(0=none; 1=low; 2=medium; 3=high)		(2.29)	
Current health status 2008			-2.127**
(1=excellent; 2=very good; 3=good; 4=poor, very poor)			(5.80)
Health compared to 2 yrs ago			0.246
(1=much better; 2=better; 3=same; 4=worse, much worse)			(0.69)
Health compared to others in village			-1.397**
(1=much better; 2=better; 3=same; 4=worse, much worse)			(3.43)
Constant	48.672**	50.202**	54.566**
	(7.93)	(8.23)	(9.31)
Observations	*1187*	*1187*	*1187*
R-squared	0.07	0.07	0.13

Notes: Robust t-statistics in parentheses. *P-values*: ^p<.10; * p<.05; **p<.01.

of being infected with HIV are characterized by lower mental health (model 2). In addition, worse self-reported general health status as well as rating own health status as being worse compared to others in the village are also associated with lower mental health (model 3).

In Table 5 we estimated the association of social and economic shocks with mental health outcomes in 2008. The results from the OLS regression models show that higher number of recent shocks (experienced between 2006 and 2008), recent death of an adult household member and recent crop loss are negatively associated with mental health outcomes and mental well-being of the respondents.

4 Summary

The NIH and other institutes have correctly identified the study of aging and well-being of elderly people in SSA as a research priority. Through the spreading use of antiretroviral treatments (ART), higher number of HIV+ individuals in sub-Saharan African survives to older ages and the number of elderly who will have HIV+ individuals in their households and immediate families will increase significantly in the near future. As a result, those infected persons will be living longer. Mental health disorders—specifically depression—often accompany HIV/AIDS infections and both pathophysiological and adverse behavioral mechanisms may lead to poorer outcomes in

Table 5

Shocks correlates of mental health (SF12-MC) in 2008: multivariat

	(1)	(2)	(3)
Respondent's age	0.222	0.226	0.219
	(1.06)	(1.06)	(1.04)
Age sqaured	-0.003	-0.003	-0.003
	(1.61)	(1.61)	(1.58)
Male	4.119**	4.055**	4.116**
	(7.82)	(7.62)	(7.82)
Total number of recent shocks	-0.692*		
	(2.44)		
Recent adult death in HH		-1.766**	
		(2.80)	
Recent crop loss			-1.249*
			(2.37)
Constant	49.273**	48.503**	48.942**
	(8.14)	(7.95)	(8.07)
Observations	1187	1187	1187
R-squared	0.08	0.08	0.07

Notes: Robust t-statistics in parentheses. *P-values*: ^p<.10; * p<.05; **p<.01.

individuals and families living with HIV/AIDS. Understanding the determinants of mental health and its interaction with HIV is a critical component that can importantly affect health policies for the elderly population and international aid efforts in SSA.

The above analyses of the determinants of mental health among elderly men and women in rural Malawi are very preliminary and represent a first step in our attempt to describe mental health patterns in this context. Nevertheless, this preliminary analysis is promising and shows that mental health is associated with multiple dimensions of the environment in which elderly men and women live. Specifically, the uncertainty and fear of being HIV+ (as measured by estimating the subjective likelihood of being HIV+) is associated with worse mental health status. This preliminary result suggests an important interaction between HIV and mental health outcomes in sub-Saharan Africa. Moreover, the experience of socioeconomic and environmental shocks such as death of adult household member or crop loss is also an important determinant of mental health outcomes among respondents. For example, sociodemographic, health and economic characteristics clearly predict mental health among elderly men and women in rural Malawi, but the relationships are distinct from that in developed or other developing countries. Moreover, the preliminary results suggest that mental health among elderly is associated with the family composition and the exposure to serious social and economic shocks that affect the household of the elderly in rural Malawi.

Our final analyses for the PAA2012 will substantially extend beyond the preliminary analyses presented in this extended abstract. In particular, in our final analysis we will exploit the longitudinal structure—and specifically the longitudinal data on mental health—and our proposed

additional analyses using growth curve models will provide us with a much better understanding of the determinants of mental health in a high-risk HIV/AIDS environment. Given the current state of the literature that provides only a very poor understanding of the prevalence, patterns and determinants of poor mental health outcomes in sub-Saharan context, our analyses will make an important contribution to the emerging literature on mental health in high-HIV prevalence contexts in sub-Saharan Africa.

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