Mental Health: The Role of Health Status and Economic Wellbeing in sub-Saharan Africa

Anna Verjans[1], Elisenda Rentería[1], Jeroen Spijker[2]
[1]Centre d'Estudis Demogràfics-CERCA; [2]Universitat Internacional de Catalunya

Short abstract (250 words)

The burden of common mental health disorders, such as depression and anxiety, has increased over recent years, with countries in sub-Saharan Africa experiencing a higher burden. Simultaneously, the prevalence of chronic conditions is on the rise in the region, with health systems that have limited resources unable to meet the increasing needs. This study aims to uncover the role of health status, economic wellbeing and living arrangements in mental health outcomes in a setting characterized by expectations of intergenerational support, declining household sizes, economic migration and internal displacements due to violence and natural disasters.

Using data from the Demographic and Health Surveys from Lesotho (2023-2024) and Mozambique (2022-2023), we investigate the role of health status, economic wellbeing and living arrangements in symptoms of depression and anxiety, as measured by the PHQ-9 and GAD-7. We implement multilevel logistic regression models including level effects at the cluster (village/city block) and individual level, while accounting for the complex two-stage sampling survey design. We intent to include sex, age, education, employment status, marital status, household composition, migration status, chronic disease status, wealth quintile as individual-level variables and urban residence, average cluster altitude and ecological zone as cluster-level variables.

As shown in previous literature, we expect to find that those with a chronic condition, females and those with lower economic wellbeing have higher odds of experiencing depressive and anxiety symptoms. At the cluster level, we also expect to find variation between urban and rural areas.

Extended abstract (2-4 pages)

Background

The burden of mental health disorders has markedly increased between 1990 and 2019 according to the Global Burden of Disease estimates, as they have risen from the 13th to the 7th leading contributor to disability adjusted life years (GBD 2019 Mental Disorders Collaborators, 2022). Common mental health disorders, such as depression and anxiety, have the highest prevalence and burden. In sub-Saharan Africa (SSA), the prevalence of depressive disorders is estimated at 4500 cases per 100,000, which is higher than the global average of 3400 per 100,000. Besides their significant health burden, mental health disorders also have severe economic consequences, estimated to take up 1.3-6% of GDP in SSA (Arias et al., 2022). In addition, they have been linked to behaviors of self-harm and suicide (Conner et al., 2019; Gili et al., 2019). Moreover, countries in the region struggle with access to mental health care, with few specialized providers available to meet the mental health needs of the population and stigma associated with mental health disorders (Atewologun et al., 2025; Mental Health Atlas 2020, 2021; Zhang et al., 2019).

Previous research from SSA observed associations of common mental health disorders with several social determinants. Women tend to be more likely affected by depression and anxiety, while men are more likely affected by substance use disorders (Bedaso et al., 2022; Dadras, 2025; Kohler et al., 2017; Williams et al., 2008). Poverty (e.g. belonging to the poorest wealth group) and unemployment are correlated with increased symptoms of depression (Antabe et al., 2025; Dadras, 2025; Doyle et al., 2023; Stoop et al., 2019; Thapa et al., 2014), while higher education is linked to increased symptoms of anxiety (Antabe et al., 2025). Those who are widowed, separated or divorced are more likely to experience depressive symptoms than their single and married counterparts (Kohler et al., 2017; Williams et al., 2008). Environmental factors, such as neighborhood deprivation and social capital have been respectively negatively and positively associated with mental health (Tomita et al., 2015; Tomita & Burns, 2013). Living in an urban area seems to negatively affect mental health according to some studies (Edefo, 2025; Harriman et al., 2022; Tomita et al., 2017), while living with family, family cohesion, and social support are potentially protective factors (McKinnon et al., 2013; Bian et al., 2024).

In terms of social and family support, households in SSA are becoming smaller, with generally a lower number of children per household observed and internal migration in search for economic opportunities, which translates into changes in living arrangements (Pohl et al., 2025). These types of support are especially important for people with chronic conditions, who face an increased risk of mental health problems (Arokiasamy et al., 2015; Christian et al., 2020; Clarke & Currie, 2009; Lotfaliany et al., 2018). However, less is known about how family and social support intermediates between chronic conditions and mental health in SSA, and how much these relationships differ by economic conditions and geographical environment.

In this study, we focus on Lesotho and Mozambique, the only two SSA countries so far with recently released Demographic and Health Survey (DHS) data, including both a mental health and chronic disease module. Lesotho, a small land-locked country in Southern Africa, is estimated to have the highest suicide rate worldwide (World Health Organization, 2024, 2025). The country faces several socioeconomic challenges, with a high unemployment rate, climate change challenges causing food insecurity and people having to leave their families to neighboring South Africa for employment opportunities (Bureau of Statistics, n.d.; Matarira et al., 2013; Verschuur et al., 2021). Mozambique also experiences more frequent and severe natural disasters, alongside extreme violence in the north of the country, leading to high levels of internal displacement (Zoni, 2025). Both countries are also burdened by a rising prevalence of chronic illnesses, such as hypertension and diabetes (González Fernández et al., 2024; Silva-Matos & Beran, 2012).

Accordingly, this paper aims to investigate the role of economic wellbeing, health status, and living arrangements in relation to symptoms of depression and anxiety in Lesotho and Mozambique. To achieve this, the key objectives of this study are fourfold. First, to explore if having a chronic condition affects depressive and anxiety symptoms in Lesotho and Mozambique and, if so, whether the effect is the same across types of chronic conditions. Second, to analyze if and how living arrangements, in terms of marital status, the number of adults, children and older individuals in the household affect depressive and anxiety symptoms in both countries. Third, to examine how economic wellbeing (e.g. education, employment and household wealth) could be protective for those symptoms. Fourth, to investigate how symptoms of depression and anxiety vary at the cluster level and which cluster variables could (partially) explain this difference.

Data

We use the most recent release of the Demographic and Health Surveys (DHS) for Lesotho (2023-2024) and Mozambique (2022-2023). Both datasets are nationally representative and contain both a mental health and chronic disease module, as well as a household roster with all the members of the household listed along with their age, sex and education. In Mozambique, the mental health module screened all eligible women in every selected household and all eligible men in every second household for depression and anxiety, whereas in Lesotho it screened for depression only, covering all eligible women and men in every second household. Women and men were eligible if they were between the ages of 15-49 and 15-59 respectively and were usual residents or stayed in the household the night before. Depression and anxiety were, respectively assessed with the 9 item Patient Health Questionnaire (PHQ-9) and the 7-item General Anxiety Disorder (GAD-7). In addition, participants were also asked if they have ever been diagnosed with depression/anxiety and if they are currently on treatment for either of the conditions. The chronic disease module, administered in both countries to eligible men and women in every second household, asks participants whether they have ever been diagnosed by a healthcare provider and whether they are receiving treatment for hypertension, diabetes, heart disease, lung disease, and, for Lesotho only, cancer, arthritis or other chronic conditions. The datasets also contain valuable information on socioeconomic status, educational attainment, and employment status. We can also identify in which district the person is living and if the area is urban or rural, as well as previous residence and the amount of time the person has lived in the current place of residence.

Methods

We aim to develop multilevel logistic regression models including level effects at the cluster and individual level, taking into account the complex survey design and sampling weights at each level. Analyses are planned to be run separately for each country. We include women and men aged 15-49 who are categorized as usual residents, or who are reported as being the head of the household. We exclude usual residents whose relationship to the head of the household is classified as ‘Domestic employee’, ‘Herd boy’, or ‘Don’t know’. The outcomes of analysis are symptoms of depression and anxiety, defined as having a score higher or equal to 10 or 6 respectively on the PHQ-9 and GAD-7. Living arrangements are assessed through the household size, and the proportion of children, adults and elderly (>=65) in the household, as well as if someone with a high level of education (completed secondary or higher) is living in the household. For Lesotho, we also include whether someone from the household is living abroad. Health status is measured through the presence of a chronic condition. We will also include socioeconomic factors at the individual level such as sex, age, employment status, education level, marital status, migrant status and religion and wealth status at the household level. At the cluster level, the model will assess whether the cluster is in an urban or rural area as well as the ecological zone and average altitude of the cluster. Analyses are performed in Stata and R software.

Preliminary descriptive findings

For this abstract, the preliminary descriptive findings will focus on the outcome of depressive symptoms, as this variable is present for both countries. Table 1 shows the distribution of some of the weighted variables that we aim to use in the models for Mozambique and Lesotho for the total sample and for those who are categorized as having depressive symptoms. The weighted survey sample consists of 11,622 and 5,658 individuals in Mozambique and Lesotho, respectively. Most individuals are aged between 20-29 in both countries (35.3% and 30.6%), while females are slightly more represented in Mozambique (52.9% compared to 50% in Lesotho). Among those with depressive symptoms, women are more represented in Mozambique and Lesotho (82.3% and 60.4%, respectively), while the distribution of age follows a similar pattern as in the total sample. In Lesotho, individuals tend to be more highly educated, with a completed secondary degree or higher, than in Mozambique (32.1% vs. 11.5%), but fewer people report having consistent employment (34.1% vs 38.2%). While the distribution of education follows a similar distribution among those with depressive symptoms, a smaller proportion in this group seems to have consistent employment. A higher proportion of people are married or living with a partner in Mozambique (61.8 % vs 47.8%). In both countries, being divorced, widowed or separated is more prevalent among those with depressive symptoms as compared to the total sample. In Mozambique, prevalence of depressive symptoms is highest in the poorest wealth quintile, while the poorer and richest quintile have the highest prevalence in Lesotho. In line with higher individual educational levels, the proportion of households with someone who has high education is higher in Lesotho (43.9 % vs. 23.5%). About 10% of households in Lesotho have a member who lives abroad. Both countries have a higher proportion of rural population and in Lesotho there are more internal migrants (40.9% vs. 20.4%). However, among those with depressive symptoms, we observe a higher proportion of urban residents in Lesotho. Lesotho has higher self-reported prevalences of every chronic condition measured in the survey. The proportion of individuals with chronic conditions among those with depressive symptoms is higher in both countries compared to the total sample.

As previous literature has found, we expect our multilevel logistic models to show that those with a chronic condition, being female, those with lower economic wellbeing and those living in urban areas will have higher odds to experience symptoms of depression and anxiety. In line with the healthy migrant paradigm, we expect that migrants will have lower depressive symptoms. For symptoms of anxiety, we additionally expect that those with higher education will be more likely to experience anxiety.

Table 1: Description of the total sample and those with depressive symptoms

Country	Mozambique		Lesotho	
	Total	Depressive symptoms	Total	Depressive symptoms
Variable	**N = 11,622[1]**	**N = 719[1]**	**N = 5,658[1]**	**N = 348[1]**
Sex				
Male	5,476 (47.1%)	128 (17.7%)	2,829 (50.0%)	138 (39.6%)
Female	6,146 (52.9%)	592 (82.3%)	2,829 (50.0%)	210 (60.4%)
Age groups				
15-19	2,958 (25.5%)	156 (21.7%)	1,167 (20.6%)	68 (19.4%)
20-29	4,101 (35.3%)	264 (36.6%)	1,729 (30.6%)	118 (34.0%)
30-39	2,667 (22.9%)	194 (26.9%)	1,516 (26.8%)	98 (28.2%)
40-49	1,896 (16.3%)	106 (14.8%)	1,246 (22.0%)	64 (18.4%)
Education				
No education or some primary	6,251 (53.8%)	433 (60.3%)	1,024 (18.1%)	50 (14.5%)
Complete primary or some secondary	4,029 (34.7%)	230 (31.9%)	2,820 (49.8%)	175 (50.4%)
Complete secondary or higher	1,342 (11.5%)	56 (7.8%)	1,814 (32.1%)	122 (35.2%)
Consistent employment	4,444 (38.2%)	139 (19.4%)	1,932 (34.1%)	107 (30.7%)
Marital status				
Married or living with partner	7,043 (60.6%)	468 (65.1%)	2,628 (46.5%)	137 (39.4%)
Never in union	3,489 (30.0%)	153 (21.2%)	2,450 (43.3%)	157 (45.1%)
Divorced/Widowed/Separated	1,089 (9.4%)	99 (13.7%)	580 (10.3%)	54 (15.5%)
Wealth quintiles				
Poorest	2,014 (17.3%)	174 (24.2%)	1,067 (18.9%)	68 (19.7%)
Poorer	2,243 (19.3%)	156 (21.7%)	1,127 (19.9%)	82 (23.4%)
Middle	2,344 (20.2%)	134 (18.7%)	1,084 (19.2%)	59 (17.1%)
Richer	2,398 (20.6%)	141 (19.6%)	1,156 (20.4%)	53 (15.3%)
Richest	2,623 (22.6%)	114 (15.8%)	1,225 (21.6%)	85 (24.5%)
Proportion of adults in the household	0.43 (0.33; 0.60)	0.40 (0.29; 0.50)	0.57 (0.43; 0.80)	0.57 (0.43; 0.80)
Proportion of children in the household	0.50 (0.33; 0.63)	0.57 (0.40; 0.67)	0.33 (0.00; 0.50)	0.33 (0.00; 0.50)
Proportion of elderly in the household	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
Someone in household completed secondary educ or higher	2,735 (23.5%)	158 (21.9%)	2,483 (43.9%)	166 (47.5%)
Someone in household lives abroad	-	-	591 (10.4%)	44 (12.6%)
Urban/rural				
Urban	4,687 (40.3%)	321 (44.6%)	2,430 (42.9%)	198 (56.9%)
Rural	6,935 (59.7%)	399 (55.4%)	3,228 (57.1%)	150 (43.1%)
Ecological zone				
Lowlands	-	-	3,992 (70.6%)	262 (75.1%)
Foothills	-	-	431 (7.6%)	18 (5.3%)
Mountains	-	-	873 (15.4%)	35 (10.1%)
Senqu River Valley	-	-	362 (6.4%)	33 (9.5%)
Migrant				
No	9,108 (78.4%)	605 (84.1%)	3,281 (58.2%)	193 (55.3%)
Internal migrant	2,372 (20.4%)	111 (15.4%)	2,308 (40.9%)	150 (43.1%)
External migrant	142 (1.2%)	3 (0.5%)	51 (0.9%)	5 (1.5%)
Unknown	0	0	18	0
Ever been diagnosed by a healthcare worker with				
Hypertension	743 (6.4%)	72 (10.0%)	524 (9.8%)	41 (12.1%)
unknown (hypertension)	0	0	279	12
Diabetes	84 (0.7%)	8 (1.1%)	88 (1.6%)	8 (2.4%)
Heart disease	112 (1.0%)	9 (1.3%)	284 (5.0%)	46 (13.1%)
Lung disease	154 (1.3%)	16 (2.3%)	133 (2.3%)	13 (3.8%)
Arthritis	-	-	123 (2.2%)	16 (4.7%)
Cancer	-	-	48 (0.8%)	8 (2.3%)
Another chronic condition	-	-	107 (1.9%)	5 (1.3%)
Any chronic condition	965 (8.3%)	91 (12.6%)	1,042 (18.4%)	102 (29.2%)

[1]n (%); Median (Q1-Q3)

References

Antabe, R., Antabe, G., Sano, Y., & Batung, E. (2025). Prevalence and socio-demographic correlates of probable depression and anxiety symptoms in Mozambique: A secondary data analysis. *PLOS Mental Health*, *2*(1), e0000169. https://doi.org/10.1371/journal.pmen.0000169

Arias, D., Saxena, S., & Verguet, S. (2022). Quantifying the global burden of mental disorders and their economic value. *eClinicalMedicine*, *54*, 101675. https://doi.org/10.1016/j.eclinm.2022.101675

Arokiasamy, P, Uttamacharya, U, Jain, K., et al 2015). The impact of multimorbidity on adult physical and mental health in low- and middle-income countries:What does the study on global ageing and adult health (SAGE) reveal? *BMC Medicine*,*13*(1),178. https://doi.org/10.1186/s12916-015-0402-8

Atewologun, F., Adigun, O. A., Okesanya, O. J., et al (2025). A comprehensive review of mental health services across selected countries in sub-Saharan Africa: Assessing progress, challenges, and future direction. *Discover Mental Health*, *5*(1), 49. https://doi.org/10.1007/s44192-025-00177-7

Bian, Y., Jin, K., & Zhang, Y. (2024). The association between family cohesion and depression: A systematic review and meta-analysis. *Journal of Affective Disorders*, *355*, 220–230. https://doi.org/10.1016/j.jad.2024.03.138

Bedaso, A., Mekonnen, N., & Duko, B. (2022). Estimate of the prevalence of depression among older people in Africa: A systematic review and meta-analysis. *Aging & Mental Health*, *26*(6), 1095–1105. https://doi.org/10.1080/13607863.2021.1932740

Bureau of Statistics. (n.d.). *2024 Labour Force Survey Key Indicators Updated*. http://www.bos.gov.ls/New%20Folder/Copy%20of%20Demography/Lesotho_Labour_Force_Survey_2024_Indicators.pdf

Christian, A. K., Sanuade, O. A., et al (2020). Social capital is associated with improved subjective well-being of older adults with chronic non-communicable disease in six low- and middle-income countries. *Globalization and Health*, *16*(1), 2. https://doi.org/10.1186/s12992-019-0538-y

Clarke, D. M., & Currie, K. C. (2009). Depression, anxiety and their relationship with chronic diseases: A review of the epidemiology, risk and treatment evidence. *The Medical Journal of Australia*, *190*(S7), S54-60. https://doi.org/10.5694/j.1326-5377.2009.tb02471.x

Conner, K. R., Bridge, J. A., Davidson, et al (2019). Metaanalysis of Mood and Substance Use Disorders in Proximal Risk for Suicide Deaths. *Suicide and Life-Threatening Behavior*, *49*(1), 278–292. https://doi.org/10.1111/sltb.12422

Dadras, O. (2025). Mental health and help-seeking behaviors among Mozambican youth: Insights from a post-pandemic National Survey Amidst Internal Conflict. *Social Psychiatry and Psychiatric Epidemiology*. https://doi.org/10.1007/s00127-025-02817-3

Doyle, A. M., Bandason, T., Dauya, E., et al (2023). *Common mental health and emotional and behavioural disorders among adolescents and young adults in Harare and Mashonaland East, Zimbabwe: A population-based prevalence study*. https://doi.org/10.1136/bmjopen-2022-065276

Edefo, J. W. (2025). Do self-reported well-being and residence predict depression and anxiety in Mozambican women? A national survey analysis. *Mental Health & Prevention*, *38*, 200426. https://doi.org/10.1016/j.mhp.2025.200426

GBD 2019 Mental Disorders Collaborators. (2022). Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Psychiatry*, *9*(2), 137–150. https://doi.org/10.1016/S2215-0366(21)00395-3

Gili, M., Castellví, P., Vives, et al (2019). Mental disorders as risk factors for suicidal behavior in young people: A meta-analysis and systematic review of longitudinal studies. *Journal of Affective Disorders*, *245*, 152–162. https://doi.org/10.1016/j.jad.2018.10.115

González Fernández, L., Firima, E., Gupta, R et al (2024). Prevalence and determinants of cardiovascular risk factors in Lesotho: A population-based survey. *International Health*, *16*(3), 313–324. https://doi.org/10.1093/inthealth/ihad058

Harriman, N. W., Williams, D. R., Morgan, et al (2022). Racial disparities in psychological distress in post-apartheid South Africa: Results from the SANHANES-1 survey. *Social Psychiatry and Psychiatric Epidemiology*, *57*(4), 843–857. https://doi.org/10.1007/s00127-021-02175-w

Kohler, I. V., Payne, C. F., Bandawe, C. et al (2017). The Demography of Mental Health Among Mature Adults in a Low-Income, High-HIV-Prevalence Context. *Demography*, *54*(4), 1529–1558. https://doi.org/10.1007/s13524-017-0596-9

Lotfaliany, M., Bowe, S. J., Kowal, P., et al (2018). Depression and chronic diseases: Co-occurrence and communality of risk factors. *Journal of Affective Disorders*, *241*, 461–468. https://doi.org/10.1016/j.jad.2018.08.011

Matarira, C. H., Pullanikkatil, D., Kaseke, T.et al (2013). Socio-economic impacts of climate change on subsistence communities: Some observations from Lesotho. *International Journal of Climate Change Strategies and Management*, *5*(4), 404–417. https://doi.org/10.1108/IJCCSM-06-2012-0034

McKinnon, B., Harper, S., & Moore, S. (2013). The relationship of living arrangements and depressive symptoms among older adults in sub-Saharan Africa. *BMC Public Health*, *13*, 682. https://doi.org/10.1186/1471-2458-13-682

Mental Health atlas 2020. (2021). World Health Organization. https://www.who.int/publications/i/item/9789240036703

Pohl, M., Esteve, A., & Galeano, J. (2025). African households: National and subnational trends from censuses and surveys. *Population Studies*, 1–21. https://doi.org/10.1080/00324728.2024.2427580

Silva-Matos, C., & Beran, D. (2012). Non-communicable diseases in Mozambique: Risk factors, burden, response and outcomes to date. *Globalization and Health*, *8*(1), 37. https://doi.org/10.1186/1744-8603-8-37

Stoop, N., Leibbrandt, M., & Zizzamia, R. (2019). *Exploring psychological well-being and poverty dynamics in South-Africa: Evidence from NIDS waves 1-5* [Working Paper]. http://localhost:8080/handle/11090/955

Thapa, S. B., Martinez, P., & Clausen, T. (2014). Depression and its correlates in South Africa and Ghana among people aged 50 and above: Findings from the WHO Study on global AGEing and adult health. *Journal of Psychiatry*, *17*(6), 1000167. https://doi.org/10.4172/1994-8220.1000167

Tomita, A., & Burns, J. K. (2013). A multilevel analysis of association between neighborhood social capital and depression: Evidence from the first South African National Income Dynamics Study. *Journal of Affective Disorders*, *144*(1), 101–105. https://doi.org/10.1016/j.jad.2012.05.066

Tomita, A., Labys, C. A., & Burns, J. K. (2015). A multilevel analysis of the relationship between neighborhood social disorder and depressive symptoms: Evidence from the South African National Income Dynamics Study. *The American Journal of Orthopsychiatry*, *85*(1), 56–62. https://doi.org/10.1037/ort0000049

Tomita, A., Vandormael, A. M., Cuadros, et al (2017). Green environment and incident depression in South Africa: A geospatial analysis and mental health implications in a resource-limited setting. *The Lancet Planetary Health*, *1*(4), e152–e162. https://doi.org/10.1016/S2542-5196(17)30063-3

Verschuur, J., Li, S., Wolski, P., & Otto, F. E. L. (2021). Climate change as a driver of food insecurity in the 2007 Lesotho-South Africa drought. *Scientific Reports*, *11*(1), 3852. https://doi.org/10.1038/s41598-021-83375-x

Williams, D. R., Herman, A., Stein, D. J. et al (2008). Twelve-month mental disorders in South Africa: Prevalence, service use and demographic correlates in the population-based South African Stress and Health Study. *Psychological Medicine*, *38*(2), 211–220. https://doi.org/10.1017/S0033291707001420

World Health Organization. (2024, January 8). *Suicide mortality rate (per 100,000 population)*. https://data.who.int/indicators/i/F08B4FD/16BBF41

World Health Organization. (2025). *Suicide worldwide in 2021: Global health estimates*. World Health Organization. https://www.who.int/publications/i/item/9789240110069

Zhang, Y., Augusto, O., Ásbjörnsdóttir, K., et al (2019). Geographic distribution and determinants of mental health stigma in central Mozambique. *Social Psychiatry and Psychiatric Epidemiology*, *54*(11), 1391–1410. https://doi.org/10.1007/s00127-019-01708-8

Zoni, I. (2025, January 17). *Climate change, conflict and political unrest: Mozambique's triple crisis explained*. UNHCR. https://www.unhcr.org/news/stories/climate-change-conflict-and-political-unrest-mozambique-s-triple-crisis-explained