Factors Associated with Self-Rated Health: A Multi-Country Longitudinal Study

Philip Anglewicz, Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health.

Carolina Cardona, Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health.

Audrey Yao Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health.

Abstract

Self-rated health is a valuable and compelling indicator, but little is known about patterns of reporting self-rated health in low- and middle-income contexts. This is primarily due to data limitations: few large-scale studies have longitudinal panel data that includes self-rated health, and many prominent surveys in LMICs have not included a question on self-rated health until recently. In this research, we use data from eight LMIC countries (Kenya, the Democratic Republic of Congo, Burkina Faso, Nigeria, Cote d'Ivoire, Uganda, India, and Niger) to understand cross-national patterns of self-rated health. This study is primarily descriptive, capturing the factors that are associated with self-rated health across a range of settings, to better understand how people understand and report their overall health. To do so, we use both cross-sectional and longitudinal panel data to compare how these differently identify the factors that contribute to self-rated health.

Background

Self-rated health is a valuable and compelling indicator. Often phrased as "overall, how would you rate your health?", the question is both general and vague- which has both advantages and disadvantages for measurement of health.

Some have criticized the measure as being difficult to interpret: why capture self-rated health when you could instead measure reports of diseases, symptoms, or actually measure a health item directly from a biomarker test? With these other options, if measured accurately, what's being measured is clear. In contrast, self-rated health is ambiguous: how do I frame my health- compared to the health of others in the community? Compared to my own health last year? Compared to my expectations?

These limitations might lead one to believe that self-rated health is not a worthwhile measure. However, it has been shown to better predict future mortality and other health measures than the other health measures listed above (Benyamini 2011; Idler & Benyamini 1997). Some hypothesize that self-rated health has more predictive utility than more specific measures because it captures a broader range of health features from the respondent's perspective, like their psychological health, resources that contribute to health, and the optimism or pessimism about their health trajectory (Idler & Benyamini 1997).

Despite the value of self-rated health as an indicator, it is not measured as widely as it perhaps should be. In particular, large-scale surveys in low- and middle-income countries (LMICs), like Demographic and Health Surveys (DHS) or the Multiple Indicator Cluster Surveys (MICS) have not included self-rated health. Similarly, many of the surveys that have examined self rated health are focused on aging- and relatively less is known about patterns of self-rated health among younger populations. As stated by Benyamini (2011), "The dearth of psychological research in this area is surprising: 'Self', 'Rating' or 'Assessment', and 'Health' are all concepts of great interest to psychologists in general and to health psychologists in particular. Yet, only in recent years, studies on the nature of SRH have slowly begun to appear in journals in the health psychology area."

In this research, we use data from eight LMIC countries (Kenya, the Democratic Republic of Congo, Burkina Faso, Nigeria, Cote d'Ivoire, Uganda, India, and Niger) to understand cross-national patterns of self-rated health. These settings vary notably in fertility, mortality, socioeconomic characteristics, and economic prosperity, which permits the comparison of reporting patterns across a wide variety of settings. This study is primarily descriptive, capturing the factors that are associated with self-rated health across a range of settings, to better understand how people understand and report their overall health. To do so, we use both cross-sectional and longitudinal panel data to compare how these differently identify the factors that contribute to self-rated health.

Methods

Data

We used data from the Performance Monitoring for Action Project (PMA). Since 2013, PMA (known from 2013 to 2019 as "PMA2020") has collected representative data on family planning and contraceptive use in eleven geographies in Africa and Asia. To do so, PMA used multi-stage stratified cluster design to draw a probability sample of households and women of childbearing age. Datasets can be obtained. and a description of the study design and other features are available at the PMA website: www.pmadata.org.

Data collection begins with mapping and listing of all households and health facilities in selected enumeration areas (EAs), after which approximately 35 households are randomly selected. For selected households, the interviewers (which PMA calls "Resident Enumerators", or REs) first administers a household survey that measures household assets, followed by a survey to all women aged 15–49 within the household that captures family planning-related behaviors. Data are collected on smartphones using Open Data Kit (ODK) as the program for data collection. After the interview is completed, the RE submits the data to a cloud server; these data are aggregated and downloaded by the PMA data management team for regular checks of data quality. Survey instruments are available on the PMA website (at https://www.pmadata.org/data/survey-methodology).

PMA weighted the data to be representative of each geography. The weighting procedures started with adjusting for sampling and non-response in the baseline phase 1 survey. Then, to account for differences in sample composition for women who participate in follow-up surveys and those who don't, PMA used inverse probability weights. PMA also weighted to adjust for the likelihood of responding to the phone survey. More details on these weighting procedures are available on the PMA website.

Starting in 2019, PMA started a new phase of the project that involved a change in study design from repeated cross-sectional to a longitudinal panel. PMA initiated data collection under this phase in the fall of 2019, starting with baseline data collection in Kenya (nationally-representative), Burkina Faso (nationally-representative), the Democratic Republic of Congo (Kinshasa and Kongo Central provinces), and Nigeria (Kano and Lagos states); followed by baseline data collection in Uganda, Cote d'Ivoire, India (Rajasthan province), and Niger in the fall of 2020. In addition to information on family planning and contraceptive dynamics, the baseline survey instrument also asked women to consent to follow-up interviews and, if they did, asked for their phone number to facilitate relocation and re-interviews. Some of the differences across these settings is shown in Table 1, for fertility, family planning, and contraceptive use characteristics.

Since the baseline survey, PMA has conducted two follow up surveys in each geography, which took place in 2021, 2022, and 2023. PMA has experienced exceptionally low attrition, obtaining over 70 percent of the baseline sample in all geographies (as documented in Anglewicz et al. 2023). PMA also had high response rates to the baseline survey, with less than 2% refusing the survey in each geography.

Measures

Our main measure of interest is self-rated health, which is phrased as "In general, would you say your health is, very good, good, moderate, bad, or very bad?" This is the dependent variable in our analyses.

As covariates, we also include measures to adjust for socioeconomic characteristics that may differ between women who own a phone compared with those who don't, including age (15–24 years; 25–34 years; 35+ years), parity (0 children; 1–2 children; 3–4 children; 5+ children), highest schooling level (none/primary; secondary +), household wealth tertile (lowest; middle; highest), rural/urban residence, and type of partnership (currently married/living with partner or not married but with a partner/boyfriend; not married, no partner/boyfriend). Household wealth was measured using a constructed wealth index based on ownership of 25 household durable assets, house and roof material, livestock ownership and water source, a standard approach in surveys like PMA (Filmer & Pritchett 2001).

Analytic Methods

We conduct our analysis in three steps. First we present simple tabulations of self-rated health in each PMA context. With this analysis, we can first identify basic reporting patterns in self-rated health: how frequently do women report being in "bad" or "very bad" health? How does the frequency of reporting "very good" or "good" compare across settings?

Second, we conduct regression analysis of self-rated health. Our regressions have two different approaches. We begin with simple cross-sectional ordered logistic regressions in which self-rated health is the dependent variable, with independent variables as age, education, marital status, household wealth, urban/rural residence, number of children, and modern contraceptive use. We then use the longitudinal panel data from PMA and employ a lagged dependent variable approach, where self rated health is measured at time $t+1$, and the independent variables are measured at time t, thereby identifying which measures predict self-rated health in the future. To address the potential differential impact of attrition on reporting patterns of self-rated health, we use inverse probability weights in our longitudinal analysis.

Preliminary Results

Figure 1 shows the distribution of self-rated health across settings in PMA. Some common patterns are evident in this figure. First, the percentages are highest for the "very good" and "good" categories across countries; and the lowest for "bad" and "very bad". Second, the frequency of "very good" and "good" differs considerably across settings: in Nigeria-Lagos, the

percentage reporting “very good” health is highest among the five categories- but this is the only setting where this is the case. The percentages reporting “very good” and “good” is similar in Nigeria-Kano and Burkina Faso; while in all other settings, the percentage of women reporting “good” health is much higher than those reporting “very good”: for example, only 19% of women in Uganda report being in “very good” health, compared to 50% of women reporting “good”.

Results from our cross-sectional analysis are shown in Table 2. There are several evident patterns in these results. First, not surprisingly, age is consistently associated with self-rated health across most contexts. However, age is not associated with self-rated health in the two urban settings, Nigeria-Lagos or DRC-Kinshasa; and not strongly associated in Nigeria-Kano. Aside from age, the measures associated with self-rated health generally vary across settings. Marital status is infrequently associated with self-rated health overall, but is a relatively important factor in Uganda and India-Rajasthan. Similarly with number of children, with an association only in DRC-Kinshasa and Uganda. Wealth is a more common correlate of self-rated health, with significant associations in India-Rajasthan, Niger, Kenya, Nigeria-Kano, DRC-Kinshasa, and DRC-Kongo Central- but the direction of the association varies across contexts. Finally, use of modern contraceptive methods is associated with health in several settings, like Kenya, India-Rajasthan, and Niger.

Figures and Tables

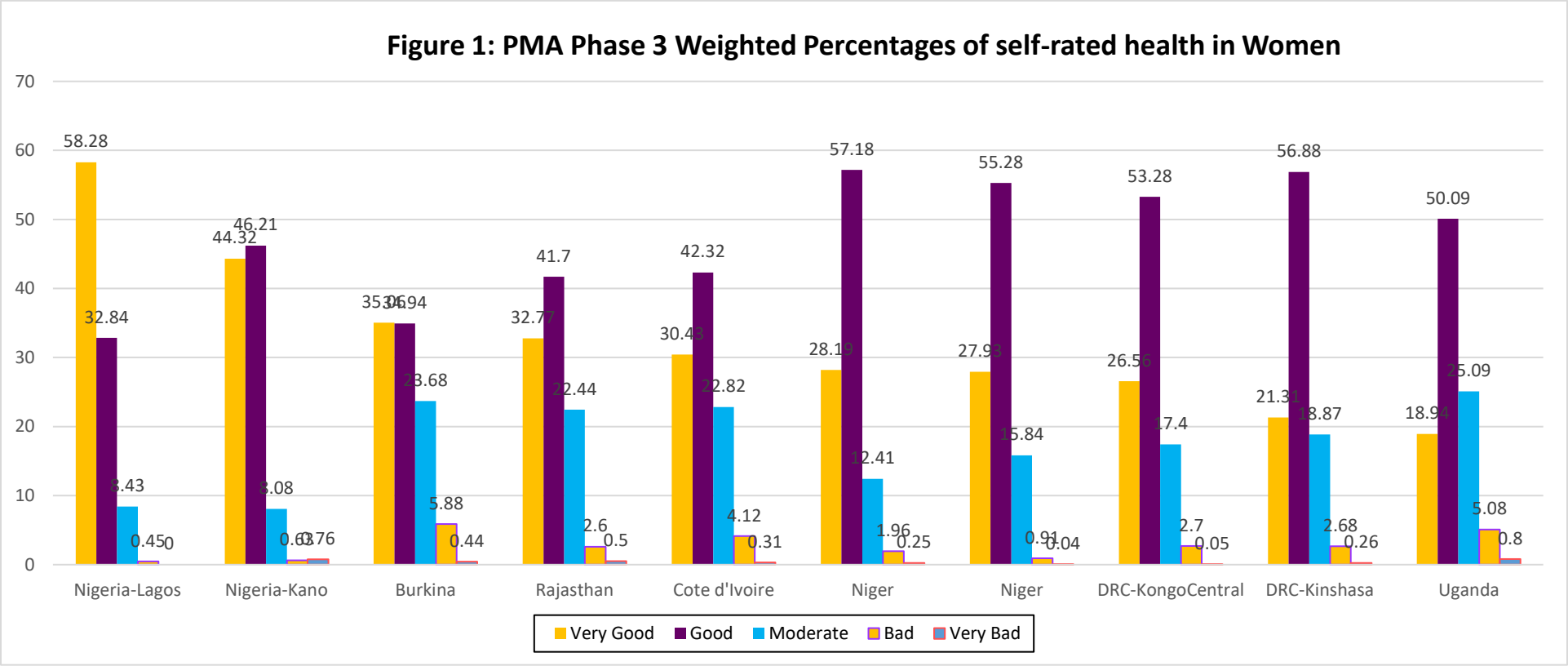

Table 1: Family Planning Characteristics from Baseline PMA Data, 2019-2020

Country	Sample Size	CPR	mCPR	LARC	Most common method	TFR	Unmet need
DRC- Kongo Central	1950	36.1	22.8	9.0	Traditional	5.96	23.5
DRC- Kinshasa	2611	43.6	24.5	7.3	Traditional		10.7
Nigeria- Lagos	1469	38.2	25.6	7.0	Condom	5.42	10.8
Nigeria- Kano	1122	9.4	8.1	3.0	Injectable		21.6
Burkina Faso	6590	27.4	25.5	13.1	Implant	5.23	21.1
Kenya	9477	45.7	43.0	20.2	Implant	3.52	12.1
Uganda	3939	34.9	29.4	12.0	Injectable	5.01	17.0
Niger	1391	15.9	15.2	2.9	Pill	6.95	17.6
India	5405	50.0	44.2	31.0	Female sterilization	2.24	7.5
Cote d'Ivoire	2864	26.0	21.8	2.6	Condom	4.68	25.1

Table 2a: Ordered logistic regression results for factors associated with self-rated health, PMA data

	Kenya			Nigeria- Kano			Nigeria- Lagos			DRC- Kinshasa			DRC- Kongo Central		
	Odds	95% CIs		Odds	95% CIs		Odds	95% CIs		Odds	95% CIs		Odds	95% CIs	
Age															
15-19 (ref)															
20-24	**1.24**	**1.07**	**1.43**	1.31	0.87	1.96	0.90	0.61	1.35	1.14	0.89	1.47	**1.63**	**1.18**	**2.25**
25-29	**1.31**	**1.09**	**1.57**	**2.07**	**1.25**	**3.41**	1.19	0.77	1.86	0.97	0.73	1.29	*1.53*	*1.05*	*2.21*
30-34	**1.35**	**1.11**	**1.65**	1.64	0.94	2.87	0.91	0.55	1.51	1.05	0.75	1.47	**1.74**	**1.15**	**2.63**
35-39	**1.43**	**1.16**	**1.76**	*1.86*	*1.03*	*3.37*	0.91	0.54	1.54	0.89	0.61	1.28	**2.33**	**1.52**	**3.58**
40-44	**1.96**	**1.57**	**2.44**	**2.40**	**1.28**	**4.49**	1.05	0.61	1.83	0.92	0.61	1.38	**2.40**	**1.48**	**3.88**
45-49	**2.23**	**1.77**	**2.81**	1.51	0.75	3.03	*1.80*	*1.02*	*3.21*	1.05	0.68	1.64	**2.84**	**1.73**	**4.67**
Marital status															
Currently married (ref)															
Divorced/widowed	*1.20*	*1.04*	*1.39*	1.50	0.85	2.64	0.87	0.57	1.33	1.02	0.74	1.40	1.07	0.81	1.43
Never married	0.96	0.83	1.11	0.92	0.50	1.72	0.89	0.54	1.47	0.90	0.70	1.18	1.18	0.87	1.62
Number of children															
None (ref)															
1-2	0.96	0.82	1.12	0.88	0.47	1.65	0.97	0.60	1.57	1.26	0.98	1.63	0.92	0.65	1.28
3-5	0.97	0.80	1.19	0.78	0.41	1.51	1.14	0.67	1.93	1.40	0.98	1.99	0.83	0.54	1.27
6+	1.02	0.81	1.27	0.97	0.50	1.88	1.12	0.59	2.14	**1.97**	**1.31**	**2.95**	0.86	0.54	1.38
Level of education															
None (ref)															
Primary	**1.45**	**1.17**	**1.81**	0.77	0.54	1.10	0.92	0.37	2.32	0.30	0.06	1.41	0.74	0.51	1.10
Secondary or higher	1.19	0.95	1.50	*0.67*	*0.46*	*0.97*	1.04	0.44	2.46	0.33	0.07	1.50	*0.65*	*0.45*	*0.95*
Rural residence	1.00	0.91	1.10	1.21	0.89	1.63									
Wealth tertile															
Lowest (ref)															
Middle	0.95	0.86	1.05	**1.53**	**1.11**	**2.09**	0.92	0.71	1.19	0.83	0.68	1.01	**1.45**	**1.13**	**1.87**
Highest	**0.83**	**0.74**	**0.94**	**1.79**	**1.21**	**2.64**	0.79	0.60	1.04	**0.59**	**0.48**	**0.73**	**1.64**	**1.27**	**2.10**
Modern contraceptive use	**0.89**	**0.81**	**0.97**	0.81	0.57	1.15	1.07	0.84	1.37	0.89	0.73	1.07	1.03	0.84	1.26

Notes:

Table 2b: Ordered logistic regression results for factors associated with self-rated health, PMA data

	Burkina Faso			Niger			Cote d'Ivoire			Uganda			India- Rajasthan		
	Odds	95% CIs		Odds	95% CIs		Odds	95% CIs		Odds	95% CIs		Odds	95% CIs	
Age															
15-19 (ref)															
20-24	**1.65**	**1.39**	**1.96**	*1.30*	*1.04*	*1.61*	**1.64**	**1.33**	**2.02**	*1.24*	*1.00*	*1.53*	1.15	0.95	1.40
25-29	**2.05**	**1.68**	**2.50**	**1.43**	**1.10**	**1.85**	**1.86**	**1.46**	**2.36**	1.13	0.88	1.44	**1.41**	**1.12**	**1.78**
30-34	**2.34**	**1.88**	**2.92**	**1.95**	**1.45**	**2.63**	**1.53**	**1.18**	**1.99**	*1.38*	*1.04*	*1.82*	**1.46**	**1.13**	**1.88**
35-39	**3.35**	**2.65**	**4.25**	**1.70**	**1.23**	**2.35**	**2.12**	**1.61**	**2.80**	**1.55**	**1.14**	**2.12**	**1.72**	**1.32**	**2.25**
40-44	**3.44**	**2.67**	**4.42**	**2.20**	**1.56**	**3.09**	**2.70**	**2.01**	**3.62**	**1.57**	**1.13**	**2.20**	**1.77**	**1.34**	**2.34**
45-49	**4.41**	**3.34**	**5.83**	**3.48**	**2.36**	**5.14**	**3.83**	**2.74**	**5.36**	**1.76**	**1.24**	**2.50**	**2.08**	**1.55**	**2.79**
Marital status															
Currently married (ref)															
Divorced/widowed	1.09	0.86	1.36	0.97	0.74	1.29	1.31	0.97	1.77	**1.32**	**1.13**	**1.55**	1.17	0.87	1.58
Never married	0.83	0.68	1.02	*0.75*	*0.57*	*0.99*	0.94	0.78	1.13	0.87	0.69	1.11	**0.74**	**0.59**	**0.92**
Number of children															
None (ref)															
1-2	*0.81*	*0.66*	*0.99*	1.15	0.86	1.53	0.98	0.80	1.19	1.06	0.83	1.34	0.88	0.71	1.08
3-5	*0.74*	*0.58*	*0.94*	1.11	0.81	1.52	0.96	0.74	1.23	*1.41*	*1.05*	*1.89*	0.85	0.67	1.08
6+	*0.76*	*0.58*	*0.98*	0.92	0.66	1.29	1.17	0.88	1.55	**1.99**	**1.44**	**2.74**	0.95	0.70	1.29
Level of education															
None (ref)															
Primary	1.09	0.95	1.25	0.98	0.82	1.17	0.88	0.75	1.02	0.89	0.69	1.14	**0.77**	**0.66**	**0.89**
Secondary or higher	1.01	0.88	1.16	0.84	0.70	1.01	**0.77**	**0.66**	**0.91**	0.89	0.68	1.18	**0.64**	**0.55**	**0.75**
Rural residence	1.10	0.97	1.26	**0.53**	**0.44**	**0.64**	1.10	0.94	1.29	0.98	0.85	1.12	0.90	0.80	1.02
Wealth tertile															
Lowest (ref)															
Middle	1.13	0.97	1.31	0.89	0.73	1.09	0.86	0.73	1.01	1.14	0.99	1.31	**0.81**	**0.71**	**0.92**
Highest	1.03	0.88	1.21	**0.61**	**0.49**	**0.76**	0.94	0.78	1.14	1.09	0.92	1.29	**0.73**	**0.63**	**0.84**
Modern contraceptive use	**0.84**	**0.76**	**0.93**	**0.73**	**0.60**	**0.89**	*0.86*	*0.75*	*0.99*	0.96	0.85	1.09	*0.88*	*0.78*	*1.00*

Notes:

References

Benyamini, Y. (2011). Why does self-rated health predict mortality? An update on current knowledge and a research agenda for psychologists. Psychology & health, 26(11), 1407-1413.

Filmer, D., & Pritchett, L. H. (2001). Estimating wealth effects without expenditure data—or tears: an application to educational enrollments in states of India. Demography, 38(1), 115-132.

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. Journal of health and social behavior, 21-37.

Performance Monitoring for Action. 2023. "Survey Results Summaries, Phase 1 Data Collection." Available at: https://www.pmadata.org/data/survey-results-summaries. Accessed September 27, 2023.