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Beyond access to basic services

Perspectives on the social determinants of health in Mozambique

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Abstract: The social determinants of health have not been studied extensively in low-income contexts, where most studies focus on access to medical care. We undertake a retrospective cross-sectional analysis of the social determinants of health in Mozambique for the 2002–14 period, covering 258,431 observations. The results consistently show that neither better access to health care nor material conditions are related to better health outcomes. Rather, we find that macro factors, proxied by place of residence, are the predominant predictor of health inequalities. A policy implication is that a narrow focus of health policy on selected services is not sufficient to address the current health equity gap.

Keywords: health equity, Mozambique, self-assessed health, social determinants of health
JEL classification: I14, I15

Tables and figures: at the end of the paper.

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1 Introduction

In common with many low-income countries, a pillar of Mozambique's health policy over the past 20 years has been to improve access to medical care. This has principally involved expanding the network of primary health facilities (i.e. health posts) throughout the country. In many ways, this has represented a natural response to the stark health challenges facing the country after prolonged armed conflict which ended in the mid-1990s, at which point Mozambique was one of the poorest countries in the world. Consistent with the Millennium Development Goals, expanding access to health facilities has been aiming to address high rates of child and maternal mortality, as well as the prevalence of specific communicable diseases such as HIV/AIDS, tuberculosis, and malaria. Indeed, in 1995, infant mortality was 151.2 per 1,000 live births (World Bank 2018).

Significant gains have been achieved since the mid-1990s, both in reducing mortality from specific diseases and tackling infant mortality in general. Despite this, little attention has been paid to how gains in health are distributed across population sub-groups. Looking across a range of countries, Wagstaff et al. (2014) point to different rates of progress between richer and poorer households, meaning that relative health inequalities have been increasing in a non-negligible fraction of developing countries. Similarly, the United Nations (2015) argues that health inequalities are widening in sub-Saharan Africa (SSA), implying that widened access to basic services may not be sufficient to sustain improvements in health outcomes.

In Mozambique, the focus of health policy has been on curative care (WHO 2013). This is a concern since actions to treat specific diseases rarely address their root causes. Poor health is often explained with reference to a wide range of economic and social determinants. As Marmot et al. (2008) put it: '… structural determinants and conditions of daily life constitute the social determinants of health and cause much of the health inequity between and within countries' (2008: 1,661). Consequently, both integral and social views of the determinants of health are vital (CSDH 2008).

The purpose of this paper is to apply the lens of the social determinants of health (SDH) to the case of Mozambique. In contrast to a conventional focus on investigating specific diseases or health events (e.g. infant mortality), we consider progress in overall health status. We ask three main questions: (a) how has self-reported health status evolved in Mozambique over the past decade? (b) what are the differences in health status across population sub-groups? and (c) what are the key determinants of variation in health status, such as access to basic services? These questions are relevant for three reasons. First, self-reported health status provides a general and inclusive picture of life quality (health), which goes beyond the effects of specific diseases or conditions (Au and Johnston 2014). While reductions in the latter are expected to raise overall health status, their contribution to general health may be small at the population level. Second, the relationship between improved access to curative care and health status is generally considered to be weak. Take the example of water-borne disease—better access to treatment may lead to temporary improvements, but it does not address the source of the disease. And even though some resistance may emerge, other complications or lower-level symptoms may remain, implying that overall health status does not significantly improve. Third, a fuller understanding of systematic patterns in health and how they may have changed over time can provide guidance to policy makers wishing to take an integrated approach to addressing poor health, as well as to narrow within-country health inequalities.

The remainder of the paper is structured as follows. Section 2 provides a brief overview of SDH and how this has been applied in previous research. Section 3 introduces the Mozambican case

and describes three rounds of household survey data used in the empirical analysis as well as the variables employed to operationalize the SDH approach. Section 4 presents our results, starting with descriptive statistics and ending with a set of multivariate regressions. These seek to isolate relevant groups of factors that explain variation in health status within the country, both on average and for specific sub-groups (such as men and women). Section 5 discusses these findings, and Section 6 concludes.

A main finding is that overall health status in Mozambique has improved over time. But there is no evidence of a systematic relationship between access to medical care and overall health status, conditional on other factors. Furthermore, we find persistent and substantial structural differences in health status—such as between geographical regions and between men and women, and in some cases these differences appear to be widening. This suggests a need to widen the focus of health policy beyond access to care and to engage more comprehensively with the deeper (structural) social determinants. This also demands engagement beyond the institutional confines of public health care systems.

2 SDH in low-income contexts

As Irwin and Scali (2007) indicate, prevailing approaches to health policy in developing countries have changed over time, often moving in tandem with broader development models. Following the Second World War, primary health was increasingly understood in comprehensive terms and as being inseparable from the wider set of factors affecting the socio-economic development of communities. Echoing this view, the Alma-Ata declaration of 1978 framed health policy explicitly in terms of multi- or intersectoral approaches. However, following the neoliberal turn that gained traction in developing countries from the mid-1980s, a more selective and disease-oriented view took precedence. The implication was a preference for high-impact technical health interventions aimed at treating specific conditions that are amenable to quantitative evaluations, such as the GOBI (growth charts, oral rehydration, breastfeeding, immunization) approach to reduce infant mortality. More generally, the emphasis has been on access to basic services and adopting western health technology and models of care. Unsurprisingly, the majority of social science health research in low-income contexts has focused on access to services (e.g. Wabiri et al. 2016; Mezmur et al. 2017; Mtowa et al. 2017).

General medical interventions to combat diseases are of great importance. Nonetheless, a wide range of evidence shows how health outcomes are systematically related to people's social and economic positions in society. As the World Health Organization (WHO) Commission on the Social Determinants of Health (CSDH 2008) elaborates, various mechanisms act to stratify populations (between and within each country), such as according to their gender, ethnicity, location, income, or education (Braveman and Gottlieb 2014; Pedrana et al. 2016). In turn, these give rise to concrete associations between material circumstances and other intermediate factors that affect health outcomes. Put simply, there is a social gradient to poor health that reflects structural differences or inequities between population sub-groups. It follows that while access to curative health services may be a pertinent *proximate* cause of health outcomes, it is unlikely to be the *only* material determinant. Moreover, differences in access to health services tend to reflect (are symptomatic of) deeper inequalities across the population.

Research on SDH has been primarily undertaken in western contexts (Cash-Gibson et al. 2018). In SSA, studies of the social determinants of general population health, rather than of individual diseases or particular population groups, are scarce. Several studies point to socio-economic gradients in health, but their scope has been in selected populations—mainly, children (Macassa

et al. 2003; Zere and McIntyre 2003; Adewuyi et al. 2017; Hangoma et al. 2017) or HIV-positive groups (Pons-Duran et al. 2016; Sia et al. 2016). Other studies link health outcomes to specific factors such as housing conditions, access to basic services, or access to a safe water source (Herrin et al. 2013; Ntouda et al. 2013; Dos Santos et al. 2015; Batiro et al. 2017). However, with the exception of Ataguba et al. (2015) for South Africa, no studies take a comprehensive view of SDH outcomes. Recognizing that the effect of specific determinants of health outcomes may vary from one country to another, as well as within countries (Eshetu and Woldesenbet 2011), we address this gap for the case of Mozambique.

3 Materials and methods

3.1 Context

Mozambique is a low-income country in East Africa. Since the mid-1990s, it has achieved rapid growth in real gross domestic product (GDP), averaging around 7 per cent per year. Economic growth has brought reductions in poverty levels, but not at the same pace as in aggregate GDP—e.g. the official poverty rate fell from 68 per cent in 1996/97 to 53 per cent in 2002/03, but up to 2014/15 it only declined to 46 per cent (MEF 2016). Multidimensional poverty—which, arguably, better takes account of the provision of public goods and services—has fallen somewhat more consistently (from 77 per cent in 1996/96 to 45 per cent in 2014/15). At the same time, regional disparities in socio-economic conditions are large and persistent. As of 2014/15, multidimensional poverty rates were as high as 57 per cent for the population in the north of the country, versus just 14 per cent in the south (MEF 2016).

Social and economic gains over recent years have been echoed in population-average health outcomes. For instance, life expectancy at birth rose from 45 years in 1995 to 58 years in 2016 (World Bank 2018). Even so, it is clear that average health outcomes in present-day Mozambique rank poorly on a global perspective, reflecting low average incomes and weak provision of public services. The country still has one of the highest maternal and infant mortality rates in the world (Instituto Nacional de Estatística 2015) and continues to be a major recipient of health aid (IHME 2016). Currently, communicable diseases are the leading causes of death in Mozambique: malaria (29 per cent of all deaths), HIV/AIDS (27 per cent), perinatal conditions (6 per cent), diarrhoeal diseases (4 per cent), and lower respiratory infections (4 per cent) (WHO 2016). Large differences in mortality also exist across urban and rural locations. Malaria was the leading cause of death in rural zones, and HIV/AIDS is the leading cause of death in urban zones (Instituto Nacional de Estatística 2015). Moreover, chronic malnutrition remains a common health condition, affecting 43 per cent of under-fives.

3.2 Data and outcomes

To answer our research questions, we use data from the set of household budget surveys (HBS) undertaken in Mozambique for the years 2002/03, 2008/09, and 2014/15. The HBS provide consistent and homogeneous information over time of a sample of the Mozambican population which is representative at national and provincial levels. The surveys apply probability sampling following a three-level multistage stratified sampling technique: selection of strata (provinces), selection of enumeration areas within each stratum, and selection of the households within each enumeration area. The designated person for responding to the survey in each unit was the head of the household. The final samples of households included in the analyses consist of n= 43,869 (HBS 2002/3), n= 51,114 (HBS 2008/9), and n=163,448 (HBS 2014/15). The HBS 2014/15 has

a larger size because the same households were visited on three different occasions between 2014 and 2015.

The HBS covers a wide variety of information on socio-economic characteristics of individuals and households, such as home consumption, durable assets, and housing quality. It also includes information on access to a safe water source, energy, and distance to public services (e.g. distance to health facility or primary schools). Compared to the demographic and health survey (DHS), the HBS provides a better description of household expenditures on goods and services, thus shedding light on the Mozambican population's living conditions. Additionally, the DHS does not have measures of comprehensive health outcomes.

The main outcome variable of interest is self-assessed health, which is a dichotomous variable that takes a value of one if somebody had a perceived health need in the two weeks before the survey (and zero otherwise). We refer to this as being 'unwell' hereafter. In addition, the surveys verified the severity of illness, which ranges from zero to four. These values capture the number of days ill (its severity) and where the lowest value coincides with not being unwell on any of the previous 14 days, and the maximum value indicates having been unwell for at least four of the days (this cut-off reflects the underlying questionnaires). Self-assessed health has been found to be a strong predictor of morbidity and mortality across different populations (Appels et al. 1996), including in SSA (Olgiati et al. 2012). Self-assessed health is a comprehensive measure of health status that is able to capture elements (e.g. mental health conditions) that more guided questions cannot. However, because of its nature, self-assessed health provides little guidance on components of health that are being affected (Au and Johnston 2014). Days ill, which has also been tested in the SSA context and found to be valid (Herrin et al. 2013), provides complementary insights into the severity of unwellness.

To answer our first research question, Figure 1 shows the average unwellness in Mozambique, in total and across population sub-groups. In general, during the years of the study, the population that reported being unwell in the previous two weeks decreased from 16 per cent in 2002 to 11 per cent in 2014. However, systematic and persistent (relative) differences appear when analysing the different population sub-groups; that is, despite the overall decreasing trend, a higher proportion of women and individuals living in rural areas reported being unwell. For example, in 2014, 12 per cent of women and 10 per cent of men reported being unwell in the previous two weeks, and the number of individuals who reported being unwell in the previous two weeks in rural areas (13 per cent) was almost twice as high as the number of individuals in urban areas (7 per cent). Individuals aged under 5 and older than 45 years old were also groups that reported greater levels of unwellness on average—in 2014, they reported 15 per cent and 18 per cent, respectively.

Explanatory variables

To understand what lies behind self-reported health, we apply a SDH lens. The motivation is to take account of a broad range of factors that may affect health status, including immediate physical/material determinants (such as access to services) and broader structural factors. Inspired by the WHO's conceptual framework (CSDH 2008; Solar and Irwin 2010), we classify variables into four main groups: (1) access to basic services, (2) material conditions, (3) social position, and (4) macro context. The first two groups capture proximate determinants of health, distinguishing between public services and private material conditions. The remaining two groups refer to deeper structural factors associated with differences in 'power, prestige and access to resources' (Solar and Irwin 2010) and which, in turn, produce social stratification. Concretely, 'social position' captures structural differences *between* individuals and/or households in terms of such resources (e.g. driven by gender relations). The 'macro context' group of variables captures how power and resources vary more broadly over space (e.g. between geographical regions) and over time. These latter

dynamics are not directly observed and therefore are proxied by a combination of region, year, and season fixed effects.

A detailed list of the variables we use to capture the effects in each group is found in Table 1. Note that while the outcome variables and certain characteristics vary at the individual level (i.e. within households) all members of each household share the same material conditions and per capita consumption levels. Access to medical care and education services also vary at the household level, as they are based on self-reported distances to relevant facilities. Safe water and access to clean energy are based on reported household conditions. Seasonal conditions refer to the main annual differences in the Mozambican climate, which is conventionally divided between a hotter wet season and a cooler dry season (Abellana et al. 2008).

Table 2 provides summary statistics of the explanatory variables. As already hinted at, access to services has increased substantially over time. For example, since 2002, access to medical care has doubled. In 2014, 68 per cent of the population were able to access medical care in less than 30 minutes. Another example is access to a safe water source, which increased from 41 per cent in 2002 to 53 per cent in 2014. Additionally, over the same period, an improvement in the material conditions is observed—e.g. the proportion of the population dwelling in a residence with a quality roof covering increased from 29 per cent in 2002 to 43 per cent in 2014. A similar pattern is observed for transportation means ownership, which increased from 34 per cent in 2002 to 44 per cent in 2014 (Table 2).

Statistical analysis

The classification of variables into different types of factors is not only useful for presentational purposes. Under the SDH model, a working hypothesis is that proximate variables can (largely) be traced back to structural factors. The statistical implication is that the explanatory power of structural factors (groups 3 and 4) should exceed that of the proximate factors (groups 1 and 2). Put another way, the relevance (statistical significance) of the latter variables should decline when structural factors are introduced into the model.

We investigate this hypothesis through sets of multivariate regressions of health outcomes on the different sets of factors, considered separately (one by one) and jointly. Although the first outcome (unwell) is a binary measure, we use ordinary least squares (OLS) estimators throughout. In this case, the specification is a linear probability model, which has the advantage of dealing appropriately with unobserved fixed effects (i.e. the macro context factors) and coefficients can be interpreted directly. All regression estimates apply survey weights and use robust standard errors, clustered at the level of the enumeration area. The models are estimated using Stata v14.1.

The aggregate regressions are run for the two outcomes (unwell and days ill), pooling the three sets of household surveys. By definition, this restricts the coefficients of interest to be the same for all groups and time periods. Later, we relax this assumption by running stratified models by age, gender, and survey year. This helps provide additional insights into the extent of heterogeneity in the determinants of self-reported health.

4 Results

4.1 Aggregate results

Tables 3 and 4 show the aggregate results from the regression models for being unwell and days ill, respectively. In columns 1 through 4, the four different groups of factors associated with different aspects of the SDH framework are introduced separately, and then, in column 5, they are introduced jointly. For columns 1 to 3 an intercept is shown, which gives the mean health status for the reference group (e.g. in column 1, those with no access to any services). In columns 4 and 5, the intercept is partitioned across the regional dummy variables, allowing each location to have a different mean health status.

Column 1 in both tables considers the relationship between health status and access to basic services. Neither column indicates any clear relation between access to medical care or access to education and health outcomes. Column 2 considers material conditions. On a standalone basis these variables appear important—e.g. being unwell is significantly less likely in those individuals living in houses with quality walls and roof coverings (ß=-0.01, $p<0.05$ and ß=-0.02 $p<0.001$, respectively); it is also consistent with days ill. However, the same variables become almost irrelevant when they are jointly considered alongside the full set of structural factors (see column 5). For example, quality walls and roof coverings are no longer statistically significant either for unwellness or for days ill.

Consistent with existing literature (Hosseinpoor et al. 2012), column 3 shows that gender and age are relevant factors—namely, women and the population over 45 years old are more likely to be unwell and suffer more days ill compared to men and younger age groups (column 3). Consumption shows a counter-intuitive relation with being unwell (Table 3), and, while the wealthier population also report more illness, its severity appears to be lower (Table 4). This result may reflect a pattern of premature deaths in less-advantaged populations (for example, due to uncontrolled health conditions), as well as growing chronic conditions (diabetes, obesity-related illness, high blood pressure, and cancer) in wealthier population that are maintained over time through access to health care. Similar results are reported in other studies (Antignac et al. 2018).

Critically, the coefficients for the macro context factors are large in magnitude and generally highly significant (columns 4 and 5). For example, moving from the capital city (Maputo) in the urban south to a village in the rural north increases the probability of being unwell by 4 percentage points in 2014. Additionally, time is very relevant—e.g. the urban north shows large improvements between 2002 and 2014 both in being unwell and days ill. Based on the results shown in column 5 of Table 3, Figure 2 visually plots the results for place of residence and year for being unwell, confirms the described improvements for urban north, and shows that rural zones are left behind (grey dashed line) compared to urban zones (blue dashed line). These results support our hypothesis that the relevance of the proximate factors (access to basic services and material conditions) declines when structural factors are introduced into the model.

4.2 Stratified results

Table 5 shows the models stratified by age and sex for unwellness. Consistent with previous aggregate results, the relation between access to basic services and health is weak. For the population under 20 years old, access to medical care is weakly correlated to being unwell, which may relate to receiving care in under-resourced health systems (lack of infrastructure, equipment, and/or skilled health personnel). As before, we find that material conditions are insignificant for the age groups under 20 years old; however, the two sets of structural factors remain important

and, in particular, we see that older women show a worse health status on average. Also, as shown in the previous models, consumption continues to be positively correlated with being unwell. Note how large the macro context factors are, especially for women and the population under 5 and older than 45 years. The R-squared also shows that the models for the age groups under 5 (18 per cent) and older than 45 years (22 per cent) explain more of the variability for being unwell than the age group between 6 and 20 years old (8 per cent). Additionally, the R-squared for women indicates that the model explains 17 per cent of the variance in being unwell and social determinants, while for men the model explains 14 per cent.

The results stratified by year for unwellness are shown in Table 6. The first group of variables (access to basic services) show that in 2002 access to clean energy is correlated with being less unwell but is no longer significant in the following years. We also note that access to medical care is positively correlated with unwellness in 2014. Material conditions are almost irrelevant, as in 2014. Unwellness shows a decreasing trend for age, sex, and place of residence, which is consistent with the previous descriptive analysis.

5 Discussion and conclusion

This study contributes to a small but growing body of evidence on the importance of social determinants for overall population health. We analysed the case of Mozambique using data over a 12-year period. Based on a general SDH conceptual model, we confirmed that the explanatory importance of structural factors exceeds that of proximate factors, including access to health services and private material conditions.

Confirming the importance of broader macro factors, the results consistently showed that health differences between places of residence are large and persistent over time. This suggests that access to basic services or material conditions, although crucial, are unlikely to be a main *cause* of differences in health outcomes in Mozambique. In other words, the root causes of poor health lie beyond the question of access to curative care. For example, there is evidence that general welfare policies have contributed to a concentration of services and assets in urban zones and a progressive underinvestment in infrastructure, access to land, and agricultural technology in rural ones (Cunguara and Moder 2011; Peters 2013). Additionally, the World Bank's last report on poverty alleviation for Mozambique concludes that growth has mostly benefited the non-poor (World Bank 2016), suggesting that (socio-)economic progress has not been inclusive and both vulnerability and poor living conditions remain widespread.

We recognize that fully disentangling the effects of place of residence on health is complicated. Even so, the persistent and fundamental role of spatial differences is consistent with Macassa et al. (2003) who also find no association between socio-economic factors and child mortality in Mozambique using multivariate models controlling for place of residence. Recently, similar results have been presented for Nigeria (Adewuyi et al. 2017). Other studies in Ghana and Uganda also provide evidence of the importance of place of residence over income (Herrin et al. 2013; Atuoye and Luginaah 2017).

Our results are relevant for progression in the eradication of diseases such as malaria. In 2016, an estimated 216 million cases of malaria occurred worldwide, but about 80 per cent of the global malaria burden is in SSA (WHO 2017). Global efforts towards eradication of malaria have placed the focus on specific measures directed at vector control and preventive and curative drug therapy. However, as WHO's World Malaria Report shows, less than half of the countries with ongoing transmission are on track to reach the targets for mortality and morbidity reduction (WHO 2017).

This study shows that access to basic services does not have a critical effect on overall (general) health outcomes. The point is that even though medical care is important given the high burden of disease, its contribution to the reduction of the number of people vulnerable to malaria lies to a great extent beyond the health sector, being due instead to urban planning, agriculture, transport, and mining (CSDH 2008). Indeed, these connections were revealed by the historical experiences of European countries where broad-based socio-economic improvements such as wealth, life expectancy, and urbanization were strongly correlated with the decline and elimination of malaria in the region (Zhao et al. 2016).

Additionally, in SSA most of the attention as regards health interventions has been on specific periods of life such as those relating to new-borns, children, and women of childbearing age (e.g. see Irwin and Scali 2007; UN 2015). These studies show that health inequalities not only worsen with age but also that women over 45 years old display the greatest health inequalities. Moreover, women from deprived areas and the older population are particularly vulnerable to suffering deprivation and exclusion, which inherently create vulnerability to poor health and negative health outcomes, and these get cumulatively worse in old age (WHO 2015). An appropriate policy response should be to establish populational health interventions targeting those in a disadvantaged position rather than for specific populations per se (children and women of childbearing age). The recently designed national strategy for social protection (MMAS 2016) may be an opportunity to address health inequalities in a broader fashion.

A core strength of this paper is the use of three nationally representative surveys. A downside is that, given the reliance on observational data, we cannot make strong inferences about causation. A second contribution of this paper is the use of a general measure of health, that is self-reported by the respondents. However, while self-reported health is a strong predictor of mortality and morbidity, caution is needed in its interpretation and cross-cultural validity. In this regard, more objective and harmonized measures of health are needed, for example using vignettes or increasing the efforts for a cross-cultural equivalence translation of the questions (Burgard and Chen 2014). Moreover, use of a secondary source of data limits the range of determinants considered here. For example, it was not possible to include ethnicity or race, which may be a relevant axis of social inequalities. Future studies should incorporate other structural factors in order to identify relevant pathways and causal mechanisms.

In sum, the identification of social determinants that significantly influence health inequalities are crucial for the design of appropriate evidence-based policy responses and actions. This study has highlighted the relevance of the SDH lens for thinking about health in low-income contexts. Indeed, to date, the deeper socio-economic causes of poor health, in particular those related to structural factors, have not been given sufficient attention. While disease-oriented health care programmes and policies do offer important palliative responses to extant health challenges, longer-run and integrated public health interventions are needed to address the current health equity gap in Mozambique.

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Tables and figures

Table 1: Variables of the study

Social determinants of health	Factors	Variables
Health outcomes	Self-assessed health	Had or had not a perceived health need in the two weeks before the survey
	Days ill	Number of days reported sick
Access to basic services	Medical care	Effective access is considered when the distance to a health facility from the household is less or equal to 30 minutes
	Education	Effective access is considered when the distance to a primary school from the household is less or equal to 30 minutes
	Safe water source	Households with water from a protected well water or spring water, water tank or bottled water
	Clean energy	Households with electricity supply
Material conditions	Housing conditions	- Quality wall coverings: cement or brick - Quality roof coverings: slab, tile, or sheet metal - Furniture possession: bed, fridge or freezer
	Transportation means ownership	Car, motorbike, or bicycle
	Access to information	Communication technology ownership: television, radio, phone, or pc
Social position	Gender	Proxied by sex
	Age	Number of years
	Income	Per capita expenditure
	Literacy	Literacy of the head of the household
	Household size	Number of members living in the household
Macro context	Socio-economic and political context	Fixed effects of place of residence (northern, central, southern area, and for each urban and rural area), year, and season

Source: Authors' elaboration.

Table 2: Population weighted distribution of the explanatory variables by year, 2002–14

		2002 (n= 43,869)		2008 (n= 51,114)		2014 (n= 163,488)	
		Mean	(SE)	Mean	(SE)	Mean	(SE)
Access to basic services							
Access to medical care		0.33	(0.002)	0.58	(0.002)	0.68	(0.001)
Access to education		0.73	(0.002)	0.80	(0.002)	0.73	(0.001)
Access to safe water source		0.41	(0.002)	0.42	(0.002)	0.53	(0.001)
Access to clean energy		0.09	(0.001)	0.15	(0.002)	0.28	(0.001)
Material conditions							
Quality wall coverings		0.17	(0.002)	0.20	(0.002)	0.29	(0.001)
Quality roof coverings		0.29	(0.002)	0.33	(0.002)	0.43	(0.001)
Furniture possession		0.40	(0.002)	0.42	(0.002)	0.55	(0.001)
Owns transportation means		0.34	(0.002)	0.45	(0.002)	0.44	(0.001)
Owns communication technology		0.57	(0.002)	0.63	(0.002)	0.76	(0.001)
Social position							
Female		0.52	(0.002)	0.53	(0.002)	0.52	(0.001)
Age	<=5	0.21	(0.002)	0.22	(0.002)	0.21	(0.001)
	6–20	0.37	(0.002)	0.38	(0.002)	0.40	(0.001)
	21–45	0.29	(0.002)	0.28	(0.002)	0.27	(0.001)
	>45	0.12	(0.001)	0.12	(0.001)	0.12	(0.001)
Log consumption		1.32	(0.010)	1.33	(0.008)	1.61	(0.008)
Literacy		0.54	(0.002)	0.55	(0.002)	0.59	(0.001)
Household size		6.20	(0.015)	5.96	(0.012)	6.33	(0.007)
Place of residence							
Northern area	Urban	0.11	(0.001)	0.09	(0.001)	0.09	(0.001)
	Rural	0.22	(0.002)	0.24	(0.002)	0.24	(0.001)
Central area	Urban	0.09	(0.001)	0.09	(0.001)	0.10	(0.001)
	Rural	0.33	(0.002)	0.34	(0.002)	0.33	(0.001)
Southern area	Urban	0.13	(0.001)	0.13	(0.001)	0.13	(0.001)
	Rural	0.13	(0.001)	0.11	(0.001)	0.11	(0.001)
Season							
Wet season		0.49	(0.002)	0.50	(0.002)	0.70	(0.001)

Note: SE: standard error (in parenthesis).

Source: Authors' calculations.

Table 3: Social determinants of health inequalities using ordinary least squares and self-assessed health as outcome variable, 2002–14

		Model 1	Model 2	Model 3	Model 4	Model 5
Intercept		0.14***	0.16***	0.16***		
		(28.00)	(37.56)	(35.29)		
Access to basic services						
Access to medical care		0.00				0.01
		(-0.47)				(1.79)
Access to education		0.00				0.00
		(0.71)				(0.40)
Access to safe water source		-0.01*				0.00
		(-2.52)				(-1.04)
Access to clean energy		-0.04***				-0.01*
		(-10.52)				(-2.06)
Material conditions						
Quality wall coverings			-0.01*			0.00
			(-2.57)			(-0.79)
Quality roof coverings			-0.02***			0.00
			(-3.82)			(-0.52)
Furniture possession			-0.01*			0.00
			(-2.07)			(0.07)
Owns transportation means			-0.01			-0.01
			(-1.79)			(-1.90)
Owns communication technology			-0.02***			-0.01**
			(-5.98)			(-2.95)
Social position						
Age	6–20			-0.10***		-0.10***
				(-30.04)		(-29.80)
	21–45			-0.04***		-0.03***
				(-10.42)		(-9.61)
	>45			0.02***		0.03***
				(4.12)		(4.81)
Female				0.02***		0.02***
				(10.99)		(11.10)
Literacy				-0.01***		0.00
				(-4.35)		(0.75)
Household size				0.00		0.00
				(-9.18)		(-8.45)
Log consumption				0.01***		0.01***
				(3.89)		(4.60)
Macro context						
Northern area						
Urban	2002				0.16***	0.20***
					(9.13)	(9.87)
	2008				0.16***	0.20***
					(12.34)	(13.72)
	2014				0.04***	0.09***
					(9.44)	(10.71)
Rural	2002				0.19***	0.23***
					(15.21)	(17.08)
	2008				0.20***	0.23***
					(10.17)	(11.71)
	2014				0.12***	0.16***
					(15.96)	(16.20)
Central area						
Urban	2002				0.14***	0.18***

					(15.65)	(16.65)
	2008				0.10***	0.15***
					(11.09)	(13.38)
	2014				0.09***	0.14***
					(16.12)	(15.07)
Rural	2002				0.17***	0.20***
					(25.05)	(24.13)
	2008				0.11***	0.15***
					(11.53)	(13.28)
	2014				0.11***	0.15***
					(20.02)	(19.33)
Southern area						
Urban	2002				0.10***	0.15***
					(21.07)	(16.51)
	2008				0.10***	0.15***
					(15.94)	(14.34)
	2014				0.07***	0.12***
					(18.58)	(12.87)
Rural	2002				0.12***	0.15***
					(17.58)	(17.78)
	2008				0.17***	0.20***
					(7.94)	(9.21)
	2014				0.12***	0.17***
					(15.19)	(16.18)
Season						
Wet season					0.01**	0.01**
					(3.21)	(2.77)
R^2		0.13	0.13	0.15	0.13	0.16
n		234,191	234,191	234,191	234,191	234,191

Note: T-statistics (in parenthesis); P value: * p<0.05, ** p<0.01, *** p<0.001. Model 1 includes only the variables for access to basic services; Model 2 includes only material conditions; Model 3 contains only social position variables; Model 4 includes only the macro context; and, Model 5 incorporates all the previous variables.

Source: Authors' calculations.

Table 4: Social determinants of health inequalities using ordinary least squares and number of days ill as outcome variable, 2002–14

		Model 1	Model 2	Model 3	Model 4	Model 5
Intercept		0.40***	0.43***	0.43***		
		(32.33)	(40.12)	(35.64)		
Access to basic services						
Access to medical care		0.01				0.01
		(1.30)				(1.18)
Access to education		-0.01				0.00
		(-0.87)				(-0.09)
Access to safe water source		-0.03**				-0.01
		(-2.71)				(-1.06)
Access to clean energy		-0.07***				0.02
		(-6.38)				(1.40)
Material conditions						
Quality wall coverings			-0.03**			0.00
			(-2.65)			(-0.19)
Quality roof coverings			-0.04**			0.01
			(-3.27)			(0.51)
Furniture possession			0.01			0.04**
			(0.65)			(2.97)
Owns transportation means			-0.02*			-0.02*
			(-2.37)			(-2.06)
Owns communication technology			-0.05***			-0.02
			(-4.21)			(-1.95)
Social position						
Age	6–20			-0.17***		-0.17***
				(-18.27)		(-18.06)
	21–45			-0.04***		-0.03***
				(-4.48)		(-3.57)
	>45			0.18***		0.19***
				(10.77)		(11.13)
Female				0.03***		0.03***
				(4.70)		(4.87)
Literacy				-0.03**		0.00
				(-3.09)		(0.15)
Household size				-0.01***		-0.01***
				(-4.84)		(-5.18)
Log consumption				-0.03***		-0.04***
				(-4.66)		(-5.68)
Macro context						
Northern area						
Urban	2002				0.34***	0.37***
					(12.25)	(10.65)
	2008				0.28***	0.32***
					(9.35)	(8.80)
	2014				0.20***	0.21***
					(13.01)	(8.18)
Rural	2002				0.38***	0.42***
					(12.70)	(12.82)
	2008				0.44***	0.48***
					(6.83)	(7.29)
	2014				0.30***	0.33***
					(16.65)	(13.28)

Central area						
Urban	2002				0.28***	0.32***
					(10.94)	(9.85)
	2008				0.17***	0.22***
					(6.89)	(6.75)
	2014				0.25***	0.28***
					(16.91)	(10.25)
Rural	2002				0.34***	0.38***
					(19.30)	(16.82)
	2008				0.19***	0.25***
					(6.72)	(7.29)
	2014				0.30***	0.34***
					(20.96)	(15.53)
Southern area						
Urban	2002				0.19***	0.20***
					(14.27)	(7.62)
	2008				0.15***	0.16***
					(9.54)	(5.45)
	2014				0.19***	0.19***
					(18.88)	(7.00)
Rural	2002				0.21***	0.22***
					(9.56)	(7.82)
	2008				0.31***	0.33***
					(6.86)	(6.32)
	2014				0.33***	0.34***
					(19.24)	(13.23)
Season						
Wet season					0.15***	0.15***
					(17.49)	(17.58)
R^2		0.12	0.12	0.13	0.13	0.14
n		240,614	240,614	240,614	240,614	240,614

Note: T-statistics (in parenthesis); P value: * p<0.05, ** p<0.01, *** p<0.001. Model 1 includes only the variables for access to basic services; Model 2 includes only material conditions; Model 3 contains only social position variables; Model 4 includes only the macro context; and, Model 5 incorporates all the previous variables.

Source: Authors' calculations.

Table 5: Social determinants of health inequalities stratified by sex and age and self-assessed health as outcome variable, 2002–14

		5 years old and younger	Between 6 and 20 years old	45 years old and older	Female	Male
Access to basic services						
Access to medical care		0.01*	0.01*	0.00	0.01	0.01
		(2.06)	(2.17)	(0.47)	(1.55)	(1.62)
Access to education		0.00	0.00	0.00	0.00	0.00
		(-0.40)	(0.82)	(0.04)	(0.26)	(0.44)
Access to safe water source		-0.01	0.00	-0.01	0.00	0.00
		(-1.01)	(-0.88)	(-0.83)	(-0.93)	(-1.02)
Access to clean energy		-0.02*	-0.01	-0.01	-0.01	-0.01**
		(-2.24)	(-1.42)	(-0.85)	(-1.16)	(-2.72)
Material conditions						
Quality wall coverings		0.01	0.00	0.00	0.00	0.00
		(0.96)	(-0.13)	(-0.27)	(-0.83)	(-0.54)
Quality roof coverings		-0.01	0.00	-0.02	-0.01	0.00
		(-1.49)	(0.91)	(-1.64)	(-1.23)	(0.40)
Furniture possession		0.00	0.00	0.03**	0.00	0.00
		(-0.52)	(-1.18)	(2.84)	(-0.06)	(0.25)
Owns transportation means		-0.01	0.00	-0.01	-0.01**	0.00
		(-1.18)	(-0.73)	(-1.81)	(-2.67)	(-0.14)
Owns communication technology		-0.01	0.00	-0.04***	-0.01*	-0.01*
		(-0.74)	(-1.20)	(-4.21)	(-2.09)	(-2.57)
Social position						
Age	6–20	-	-	-	-0.09***	-0.10***
					(-21.67)	(-23.86)
	21–45	-	-	-	-0.01**	-0.05***
					(-2.83)	(-11.29)
	>45	-	-	-	0.05***	0.00
					(7.69)	(-0.36)
Female		0.00	0.01***	0.05***	-	-
		(-0.17)	(4.40)	(8.28)		
Literacy		0.01*	0.00	0.00	0.00	0.00
		(2.23)	(0.71)	(0.11)	(0.83)	(0.98)
Household size		-0.01***	0.00	-0.01***	0.00	0.00
		(-6.21)	(-6.26)	(-4.50)	(-7.53)	(-6.79)
Log consumption		0.02***	0.01***	0.02**	0.01***	0.01***
		(3.80)	(4.32)	(3.04)	(3.40)	(4.79)
Macro context						
Northern area						
Urban	2002	0.29***	0.11***	0.22***	0.24***	0.22***
		(9.77)	(6.08)	(3.31)	(7.03)	(15.41)
	2008	0.29***	0.10***	0.27***	0.25***	0.22***
		(10.79)	(8.18)	(7.81)	(13.85)	(15.10)
	2014	0.12***	0.04***	0.12***	0.13***	0.13***
		(8.33)	(5.79)	(6.30)	(12.87)	(14.24)
Rural	2002	0.26***	0.13***	0.29***	0.27***	0.24***
		(13.62)	(9.34)	(10.61)	(16.59)	(16.51)
	2008	0.32***	0.12***	0.25***	0.28***	0.25***
		(10.33)	(6.93)	(8.42)	(12.06)	(12.32)

	2014	0.21***	0.08***	0.21***	0.20***	0.20***
		(13.48)	(10.51)	(10.93)	(17.23)	(17.51)
Central area						
Urban	2002	0.26***	0.09***	0.24***	0.23***	0.21***
		(11.52)	(9.30)	(9.43)	(17.65)	(17.10)
	2008	0.19***	0.08***	0.20***	0.19***	0.18***
		(9.13)	(7.43)	(9.14)	(15.31)	(14.65)
	2014	0.19***	0.07***	0.19***	0.18***	0.17***
		(11.44)	(8.61)	(9.81)	(15.90)	(17.71)
Rural	2002	0.28***	0.11***	0.26***	0.26***	0.22***
		(15.19)	(13.47)	(12.80)	(20.33)	(23.19)
	2008	0.18***	0.06***	0.29***	0.19***	0.17***
		(8.37)	(5.28)	(3.99)	(14.27)	(15.19)
	2014	0.19***	0.07***	0.22***	0.20***	0.18***
		(14.13)	(10.94)	(13.25)	(20.14)	(19.70)
Southern area						
Urban	2002	0.20***	0.09***	0.19***	0.20***	0.19***
		(11.52)	(10.33)	(9.18)	(16.75)	(18.49)
	2008	0.19***	0.08***	0.17***	0.19***	0.17***
		(11.13)	(8.97)	(8.21)	(15.52)	(16.15)
	2014	0.16***	0.05***	0.15***	0.16***	0.15***
		(9.93)	(6.99)	(7.77)	(14.08)	(15.38)
Rural	2002	0.21***	0.08***	0.21***	0.20***	0.20***
		(12.99)	(9.74)	(10.02)	(16.79)	(18.65)
	2008	0.24***	0.11***	0.31***	0.24***	0.24***
		(8.45)	(7.34)	(7.48)	(10.04)	(11.22)
	2014	0.22***	0.09***	0.21***	0.21***	0.19***
		(12.99)	(9.77)	(10.39)	(16.57)	(18.12)
Season						
Wet season		0.00	0.00	0.03***	0.01	0.01**
		(0.62)	(1.50)	(3.53)	(1.82)	(3.16)
R^2		0.18	0.08	0.22	0.17	0.14
n		45,759	92,314	30,563	122,439	111,752

Note: T-statistics (in parenthesis); P value: * p<0.05, ** p<0.01, *** p<0.001. Each model includes the variables for access to basic services, material conditions, social position (without age or sex, accordingly) and macro context.

Source: Authors' calculations.

Table 6: Social determinants of health inequalities stratified by year and self-assessed health as outcome variable, 2002–14

		2002	2008	2014
Access to basic services				
Access to medical care		0.00	0.00	0.01*
		(-0.20)	(0.40)	(2.27)
Access to education		0.00	-0.01	0.00
		(-0.78)	(-0.93)	(1.13)
Access to safe water source		0.00	0.00	0.00
		(-0.91)	(-0.22)	(-0.70)
Access to clean energy		-0.03*	-0.02	-0.01
		(-2.48)	(-1.76)	(-0.98)
Material conditions				
Quality wall coverings		0.00	-0.02*	0.00
		(0.42)	(-2.18)	(-0.51)
Quality roof coverings		-0.02	0.00	0.00
		(-1.81)	(-0.34)	(0.05)
Furniture possession		0.00	0.01	0.00
		(0.07)	(0.59)	(0.00)
Owns transportation means		-0.01	-0.02*	0.00
		(-1.95)	(-2.56)	(-0.39)
Owns communication technology		0.00	-0.02*	-0.01**
		(0.22)	(-2.37)	(-2.88)
Social position				
Age	6–20	-0.12***	-0.11***	-0.09***
		(-13.93)	(-14.30)	(-23.27)
	21–45	-0.04***	-0.05***	-0.03***
		(-4.51)	(-5.39)	(-7.08)
	>45	0.01	0.04	0.03***
		(0.80)	(1.45)	(5.43)
Female		0.03***	0.03***	0.02***
		(5.44)	(6.27)	(8.23)
Literacy		0.01	0.00	0.00
		(0.86)	(-0.14)	(0.62)
Household size		-0.01***	0.00	0.00
		(-5.04)	(-1.88)	(-6.89)
Log consumption		0.01**	0.03***	0.01**
		(2.78)	(4.12)	(2.73)
Northern area	Urban	0.25***	0.26***	0.11***
		(11.37)	(11.27)	(10.67)
	Rural	0.26***	0.29***	0.18***
		(15.50)	(11.34)	(15.90)

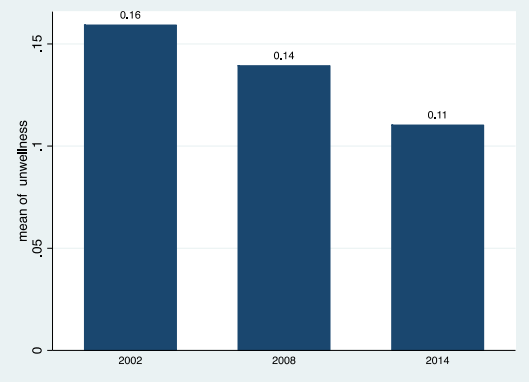
Central area	Urban	0.24***	0.22***	0.15***
		(13.57)	(10.52)	(13.99)
	Rural	0.24***	0.21***	0.17***
		(16.70)	(10.36)	(17.84)
Southern area	Urban	0.21***	0.21***	0.13***
		(12.54)	(9.90)	(11.68)
	Rural	0.21***	0.26***	0.18***
		(13.89)	(9.76)	(15.75)
Season				
Wet season		0.03**	-0.02	0.01**
		(3.07)	(-1.53)	(2.59)
R^2		0.19	0.18	0.14
n		43,749	33,448	156,994

Note: T-statistics (in parenthesis); P value: * p<0.05, ** p<0.01, *** p<0.001. Each model for each year includes the variables for access to basic services, material conditions, social position (including place of residence) and season.

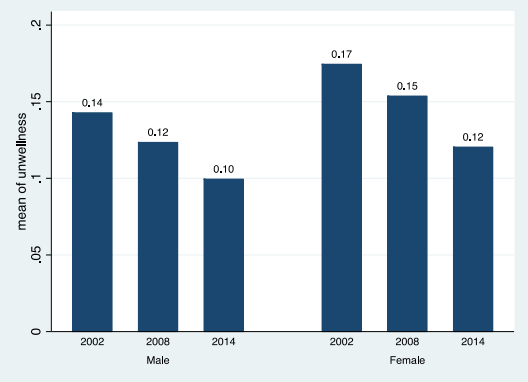
Source: Authors' calculations.

Figure 1: Average unwellness, in total and across population sub-groups in Mozambique, 2002–14

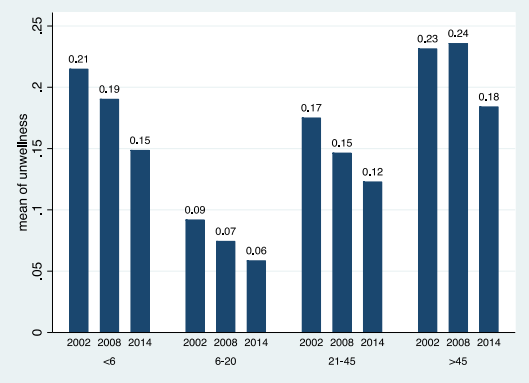
a) Total unwellness



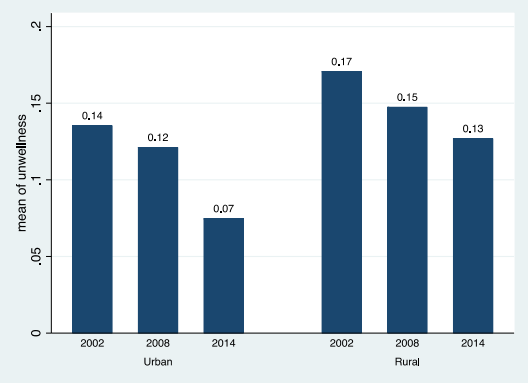
b) Sex



c) Age

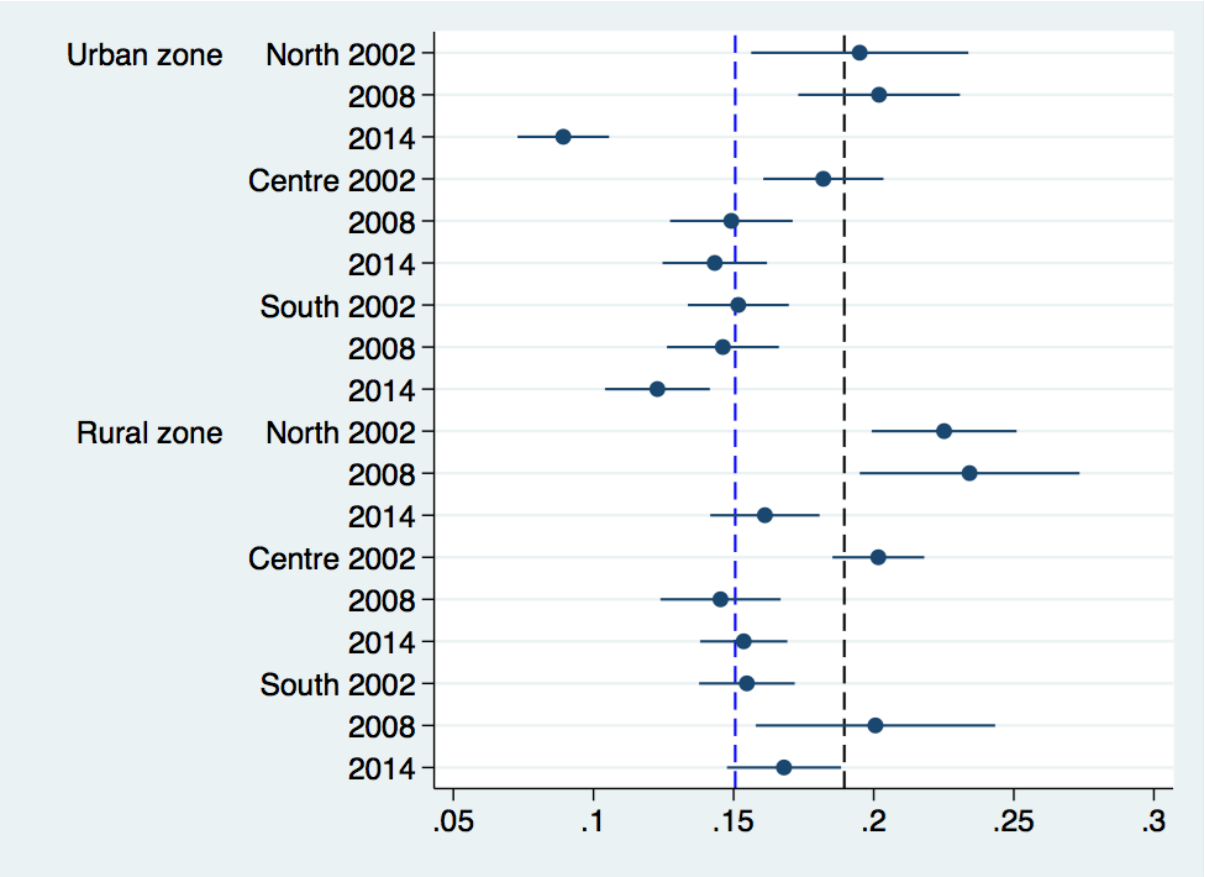


d) Place of residence



Source: Authors' calculations.

Figure 2: OLS coefficients for place of residence and year and self-assessed health as outcome variable, 2002–14



Note: The mean for urban areas is represented by the blue dashed line, and for rural areas it is shown i.

Source: Authors' calculations.