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ASSOCIATIONS BETWEEN ECONOMIC VULNERABILITY AND HEALTH AND WELLBEING IN EGYPT

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Working Paper No. 1364

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Abstract

There is a well-established relationship between economic vulnerability and health. The study of this relationship is complicated by reverse causality – poor economic outcomes contribute to poor health and poor health can lead to worse economic outcomes. Yet even descriptive studies of the relationship between economic and health outcomes are lacking in the Middle East and North Africa region. The Egypt Labor Market Panel Survey 2018 includes a range of new health measures, including the UN-Washington Group disability instrument, self-rated health, and the WHO-5 subjective wellbeing scale that allow us for the first time to conduct a detailed examination of the associations between economic vulnerability and health in the Egyptian population. We find a substantial burden of poor health among the working age and older populations in Egypt, particularly along measures of disability and subjective wellbeing. Several groups emerge as particularly vulnerable to poor health across health outcomes, including divorced women, the urban poor and particularly poor urban women, and those in precarious and hazardous forms of employment. Further multivariate studies are needed to disentangle the relationships between multiple forms of economic vulnerability and poor health

Keywords: Economic vulnerability, disability, subjective wellbeing, self-rated health, women's autonomy, Egypt
JEL Classifications: I10, I14, I31

1. Introduction

The link between health and people's social and economic circumstances was clearly established in the 1948 Constitution of the World Health Organization, which defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization 1995). Since that time, there has been a burgeoning field of study on the social determinants of health, or the aspects of our social and economic conditions that affect health, and particularly inequalities in health. Numerous aspects of economic vulnerability, including poverty, income inequality, and employment conditions, are recognized as social determinants of health that impact the distribution of health outcomes across populations (Marmot et al. 2008).

The relationship between human wellbeing and economic, social and environmental vulnerabilities has also received renewed attention through the 2030 Agenda, more commonly known as the Sustainable Development Goals (SDGs). The SDGs *"envisage a world free of poverty, hunger, disease and want, where all life can thrive. We envisage a world free of fear and violence. A world with universal literacy. A world with equitable and universal access to quality education at all levels, to health care and social protection, where physical, mental and social well-being are assured."*[3] The intersectoral nature of the SDGs emphasizes how good health and wellbeing (the focus of Goal 3), are closely related to goals that address economic vulnerability, including reducing poverty (SDG 1) and promoting full employment and decent work for all (Goal 8).

Although there is a well-established relationship between economic vulnerability and a wide range of health outcomes, the study of this relationship is complicated by reverse causality. Poor economic outcomes contribute to poor health, and poor health can also lead to worse economic outcomes, as well as greater vulnerability to the effects of negative economic shocks (UNDP 2014). The relationships between health and economic outcomes are also nuanced and may depend on other sociodemographic factors, such as education or gender. For example, in Egypt unemployment is only a risk factor for poor mental health among young men, and not among young women (Liu, Modrek, and Sieverding 2017). Working conditions also have important impacts on health outcomes among the employed. For instance, while being employed is generally associated with better mental health (van der Noordt et al. 2014), precarious and temporary work is associated with poor mental health globally (Marmot et al. 2008) and among youth in Egypt in particular (Rashad and Sharaf 2018). Hazardous working conditions, high job stress and low control over working conditions can all lead to negative physical and mental health outcomes (Marmot et al. 2008).

Although there is an extensive body of research on economic and especially labor market dynamics in Egypt (Assaad 2009; Assaad and Krafft 2015; Krafft, Assaad, and Keo Forthcoming), very little of this research has addressed the associations between economic vulnerability, employment and health outcomes. These relationships are consequently poorly

[3] UN, Sustainable Developmental Goals, 2015, https://www.un.org/sustainabledevelopment/sustainable-development-goals/

understood in Egypt, reflecting the broader scarcity of studies in the Middle East and North Africa region that have addressed the social determinants of health. The main objective of this paper is thus to provide an overview of variation in the health and wellbeing status of the Egyptian population, focusing in particular on how measures of economic vulnerability are associated with health. We focus on two main research questions: (1) What are the sociodemographic correlates of better health and wellbeing in Egypt?; and (2) How do different measures of economic vulnerability correlate with health and wellbeing for men and women?

2. Methods

2.1 Measures of health and wellbeing

The Egypt Labor Market Panel Survey (ELMPS) 2018[4] includes a range of new health measures that allow us for the first time to conduct a detailed examination of the associations between economic vulnerability and different health outcomes in the Egyptian population. We focus on three health and wellbeing outcomes: disability, self-rated health, and subjective wellbeing. Together, these outcomes capture dimensions of both physical and psychological health, which is central to the WHO definition of health as a state of overall wellbeing.

As with most censuses and household surveys, prior to 2018 the ELMPS collected information on disability through a single question "do you have any kind of mental or physical disability?" This question formulation has been shown to lead to considerable underestimation of disability rates due to the widespread stigmatization of disability, including in the Middle East and North Africa (MENA) region (El-Saadani and Metwally 2019). The definition of disability adopted by the World Health Organization and others has also shifted toward a focus on disability as an interaction between an individual's functional status and her environment; with more accessible physical and social environments, functional limitations may not affect individuals' participation in society (UN-Washington Group on Disability Statistics 2009). To capture this conceptualization of disability, the UN-Washington Group on Disability Statistics (2009) developed a new measurement tool for disability that captures different levels of difficulty in six functional domains: seeing, hearing, walking, cognition, self-care and communication. For each domain the response options are "no difficulty," "some difficulty," "a lot of difficulty," and "cannot do it at all" (see Appendix).

In addition to presenting the detailed prevalence of different forms of functional limitations in the Egyptian population, we construct three measures of disability following the UN-Washington Group (UN-WG) guidance (UN-Washington Group on Disability Statistics 2009). The "broad" definition of disability categorizes as disabled any individual with at least some difficulty in performing tasks in at least one of the six domains. The "narrow" definition categorizes as disabled only individuals who cannot do tasks in at least one of the six domains at all. In between these two definitions, the "medium" definition of disability categorizes as

[4] See Krafft et al. (Forthcoming) for further details on the ELMPS 2018. The ELMPS 2018 microdata are available for public use through the Economic Research Forum's Open Access Micro Data Initiative (OAMDI) www.erfdataportal.com

disabled those who responded that they have a lot of difficulty or cannot do tasks at all in any of the six domains.

We also analyze self-rated health, the only one of our measures that was also captured in the ELMPS 2012 using the same question format. Self-rated health is one of the most widely used measures of general health status in social science and health literature, and has been shown to predict mortality when adjusted for age (Jylhä 2009). The self-rated health measure in the ELMPS asks respondents "how is your health in general?" with response categories of "very good or excellent," "good," "fair," "bad," or "very bad". Due to the small sample size of respondents who gave answers of "bad" or "very bad," we aggregate these two categories with "fair."

Finally, the ELMPS 2018 included the World Health Organization Well-Being Index (WHO-5), a simple and widely used measure of general subjective wellbeing that has also been validated as a screening tool for depression (Topp et al. 2015). The WHO-5 consists of a set of five, positively-phrased statements about the respondent's life over the past two weeks for which the response choices range from 5 (all the time) to 0 (none of the time). The full WHO-5 scale is shown in the Appendix. The total raw score for the index ranges from 0-25, and is then multiplied by 4 to convert to a more easily interpretable scale ranging from 0 (minimal wellbeing) to 100 (maximal wellbeing) (Topp et al. 2015). A cutoff point of 50 is commonly used to indicate low wellbeing (Harsha et al. 2016; Topp et al. 2015), and we follow this convention, presenting in most of our analyses the percentage of individuals who suffered from low subjective wellbeing.

2.2 Operationalization of economic vulnerability

Vulnerability is conceptualized as the "prospect of eroding people's capabilities and choices" (UNDP 2014). While all people may experience unexpected events that lead to greater vulnerability (shocks), the capabilities conceptualization of vulnerability recognizes that certain categories of people tend to be structurally vulnerable and thus face long-term barriers to improving their circumstances (UNDP 2014). People can thus be vulnerable *to* different types of negative outcomes and experiences that can be social or environmental as well as economic. In focusing on economic vulnerability, we are emphasizing factors that are associated with poorer economic outcomes or the risk of experiencing poor economic outcomes, factors that can be operationalized in many ways. Our analysis is not focused on what causes economic vulnerability, but rather on how economic vulnerability may lead to other forms of vulnerability, namely poor health and wellbeing. For instance, poverty is both an indicator of economic vulnerability and a factor that makes people vulnerable to negative health outcomes. Disability and sex are other examples of structural factors that contribute to vulnerability to poor health both directly and through their association with economic vulnerability.

To examine the relationship between economic vulnerability and vulnerability to poor health and wellbeing, we analyze our three health outcomes according to indicators that capture several different dimensions of economic vulnerability. The first dimension is

sociodemographic characteristics that may be associated with structural vulnerability, both in terms of economic and health outcomes. These factors include sex, age, and education, as well as marital status. Marital status is included in particular because women who are divorced or widowed, and thus heading their own households, may face stigma and weakened structures of economic support that make them more vulnerable (Sieverding and Hassan 2016).[5] We also look at several geographic indicators given the uneven development levels within Egypt, namely region of residence (Greater Cairo, Alexandria and the Suez Canal Cities, Urban Lower, Urban Upper, Rural Lower and Rural Upper), and rural versus urban residence. Lastly, we examine the broad measure of disability and a yes/no indicator of whether the individual reports having a chronic illness, both of which are important indicators of structural vulnerability, as correlates of self-rated health and subjective wellbeing.

We then look at several measures related to **poverty.** Our main measure in this category is wealth quintiles derived from the ELMPS asset index (Krafft, Assaad, and Rahman Forthcoming). We also construct a measure that examines poverty by urban versus rural residence. Although rural areas in Egypt are disadvantaged according to many economic and social indicators (Keo, Krafft, and Fedi Forthcoming), urban areas – and particularly informal and poor urban neighborhoods – also suffer from social and economic marginalization (Khalil et al. 2018; Sieverding et al. 2019), which may impact health outcomes. Our measure thus consists of four categories: urban residents in wealth quintiles 1 and 2 (urban poor), urban residents in quintiles 3-5 (urban non-poor), rural residents in quintiles 1 and 2 (rural poor), and rural residents in quintiles 3-5 (rural non-poor). We also construct a variable that compares the poor in Greater Cairo to the non-poor in Greater Cairo, to explore health outcomes in Egypt's capital mega-city. In addition to these measures of poverty, we look at the association between health indicators and household food security, which is closely correlated with poverty (Coates, Swindale, and Bilinsky 2007). We use the Household Food Insecurity Access Scale included in the ELMPS to categorize households as food secure, mildly food insecure, moderately food insecure and severely food insecure following Coates et al. (2007).[6]

We also examine a group of indicators related to **employment vulnerability**. The first of these is labor force status, which is categorized as employed, unemployed or out of the labor force.[7] For those who are employed, we then look at a measure of sector of employment that takes into consideration whether employment is formal (with a contract or social insurance coverage)

[5] Divorce rates have also increased in Egypt from 0.9% in 2006 to 2.2% in 2018 (CAPMAS 2018), making this a growing category of potentially vulnerable women.

[6] Two items in the original HFIAS scale were not included in the ELMPS; these items only affect the categorization of the severely food insecure category, which may therefore be underestimated in our data. According to the HFIAS categorization, a food secure household may experience some worry about food access, but rarely, and does not experience food access restrictions. A mildly food insecure household worries about food access sometimes or often, and/or is unable to eat preferred foods or a diversity of foods, but rarely. A moderately food insecure household experiences these conditions of non-preferred or monotonous diets more regularly and/or has started to cut back on food quantity. A severely food insecure household in the ELMPS data is one that cuts back on food quantity often and/or has no food to eat at times, even if rarely (Coates, Swindale, and Bilinsky 2007).

[7] This measure is based on the market definition of labor force, with search required for unemployment and a one-week reference period.

and/or regular. We follow Assaad et al. (Forthcoming) in using the categorization of public sector employment (almost all of which is formal and regular), formal regular private wage work, informal regular private wage work, irregular wage work, self-employment, employers and unpaid family workers. Irregular wage work is a particularly vulnerable category in Egypt (Assaad, AlSharawy, and Salemi Forthcoming).

For the employed, our indicators of workplace conditions that may be associated with economic and health vulnerability are whether the respondent experienced a workplace-related injury or health issue in the past 12 months (yes/no)[8] and the number of hazards the respondent reported being exposed to in her/his workplace, categorized as no hazards, one hazard, 2-3 hazards, and 4+ hazards.[9] Finally we look at job satisfaction, which may reflect a combination of physical and psychological conditions in the workplace, as well as respondents' aspirations or expectations for employment. Job satisfaction is maintained as in the original question in the ELMPS questionnaire, with the options of "fully satisfied,", "rather satisfied," "neither satisfied nor dissatisfied," "rather dissatisfied," and "fully dissatisfied."

We examine an additional two sets of measures of economic vulnerability only in relation to subjective wellbeing. The first of these is household exposure to **shocks**, or unexpected events, in the twelve months prior to the survey. Whereas poverty is a form of structural vulnerability, shocks of different kinds can affect all households and may lead to direct or indirect health consequences. To operationalize household experience of shocks we follow Helmy and Roushdy (Forthcoming) in categorizing shocks as natural, economic, health or social.[10]

Finally, we include a set of gender-specific measures related to **women's autonomy,** which is associated with positive reproductive and maternal health outcomes for women and their children (Ewerling et al. 2017). The relationship between women's autonomy and their mental health or subjective wellbeing has been less studied. Our measures of women's autonomy include several single-question indicators in the ELMPS that capture women's direct access to financial resources or ability to access financial and social support. These gender-specific dimensions of economic vulnerability are particularly important in a context where the majority of women are not in the labor force (Krafft, Assaad, and Keo Forthcoming), and thus do not have personal wage income, but may have access to financial resources that can reduce vulnerability to negative outcomes. Importantly, some of these measures also capture the dimension of women's economic vulnerability *within* the household, for example if they are

[8] In the 2012 ELMPS questionnaire the reference period for workplace injury was "ever" rather than "in the past 12 months."

[9] The hazards that respondents were asked about included: dust and flames, fire or fuel, loud noise and vibrations, extreme high or low heat, high-risk equipment, working underground, working in a sea/river, working in a dark place, insufficient ventilation, chemicals/pesticides, explosives, bending for a long time and no toilet. This measure is not available in the ELMPS 2012.

[10] Natural shocks include drought, flood, erosion, crop pest or a high level of livestock disease. Economic shocks include if the household experienced unusually high costs of agricultural inputs, loss of employment or reduced income. Health shocks include the death of a family member, unusually high rate of illness, or an accident. Social shocks include fire, theft and exposure to conflict or violence (Helmy and Roushdy Forthcoming). The shocks section of the questionnaire is new in the ELMPS 2018, so these measures cannot be constructed for 2012.

dependent on their husbands for financial support. The measures of access to financial and social support are all binary indicators coded 1 if a woman i) has access to money in her hand, ii) personally owns property or another asset, iii) has a family member close enough that she can visit and go back in the same day, iv) has a family member with whom she could spend the night if she had a problem, and v) has a family member who could help her financially if she had a problem.[11] We also include a measure of decision-making, which is commonly used in the literature as an indicator of women's autonomy (Salem, VanderEnde, and Yount 2015; Samari and Pebley 2018). The decision-making variable is constructed from a nine-item sequence about who in the household has primary say over decisions related to daily activities, purchases, and children. Since the answer choices are different for married and unmarried women, we restrict this analysis to married women only, with the categories of: joint decision-making; mostly joint, then husband; mostly joint, then wife; primarily husband; and primarily wife.[12]

2.3 Analysis

Our analysis is descriptive and examines associations between the measures of economic vulnerability discussed above and health outcomes. The results should thus be interpreted with the reverse causality between poor economic outcomes and poor health in mind. Many of the economic vulnerabilities we examine are also overlapping, such that individuals may be vulnerable by multiple measures (e.g. having both low education and insecure or hazardous employment).

In keeping with our focus on economic vulnerability, we conduct most of our analyses for the working age population aged 15 – 64. Although health and wellbeing among older adults and children are important topics, the determinants of health among these populations are likely different than those for general adult population and are thus outside the scope of this paper. An important exception is that we present disability rates for the entire population age five and above to be able to compare with the 2017 Egyptian Census, which also used the UN-Washington Group measure (CAPMAS 2019). For self-rated health, we also descriptively compare patterns for the working age population between the ELMPS 2012 and 2018.

Due to the inherently subjective nature of the WHO-5 and self-rated health questions, individuals for whom responses were given by proxy are removed from the analyses for these questions (N=5,260 (10.3%) total, N=2,833 (7.2%) for those aged 15 and above, and N=2,663 (7.4%) for the working age population 15-64). All analyses are divided by sex both because of our focus on women's economic vulnerability and because the burden of poor health among men and women differs substantially in the region (Mokdad et al. 2014). Disaggregating by

[11] The answer choice "don't know" was coded to "no" for the latter two items.

[12] To construct the aggregated measure, all nine decision-making items were first coded into whether the decision was primarily made by the wife, husband, jointly or by someone else. If seven or more decisions were made jointly, this was coded as joint decision-making. If 3-6 decisions were taken jointly and the husband made more of the remaining decision than the wife, this was coded as "mostly joint, then husband." The converse was coded as "mostly joint, then wife." If two or fewer decisions were made jointly and the husband made more decisions alone than the wife, this was coded as "primarily husband" and conversely for "primarily wife."

sex is also particularly important for a focus on economic vulnerability in a context where there is a strong gendered division of labor within the household (Promundo and UNWomen 2017) and women who do participate in the labor market tend to hold different types of jobs than do men (Assaad, AlSharawy, and Salemi Forthcoming). Men and women are thus exposed to different risk factors for poor health and may be affected differently by the same risk factors due to differences in social and economic structures.

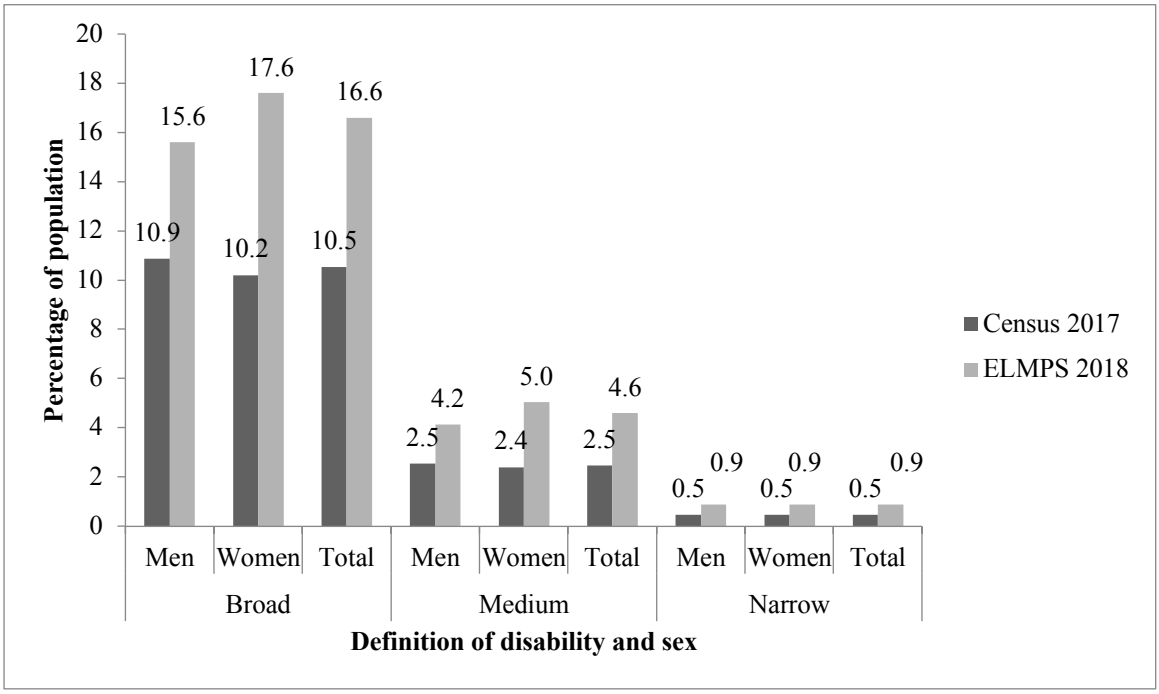
3. Results

3.1 Disability

3.1.1 Prevalence of disability

Whereas the single-question measure of disability in the ELMPS 2012 produced a disability rate of 2.8% for the Egyptian population aged five and above (3.8% for men and 1.8% for women), the expanded UN-WG measure used in ELMPS 2018 produced rates of 16.6% using the broad definition, 4.6% using the medium definition, and 0.9% using the narrow definition. Interestingly, the disability rates found in the ELMPS 2018 were considerably higher than those found in the 2017 Egyptian census, which also used the UN-WG instrument. The Census found rates of 10.5%, 2.5% and 0.5% for the broad, medium, and narrow definitions, respectively (CAPMAS 2019). Figure 1 compares the rates found in the Census and ELMPS by sex and definition of disability. The Census estimates were consistently lower than the ELMPS estimates across definition and sex. However, whereas the Census found very slightly higher rates of disability for men than women under the broad and medium definitions, the ELMPS found higher rates for women under both definitions. Nevertheless, both results confirm those of previous studies that found that the single question measure of disability is a severe underestimate for disability when defined as any level of functional limitation (El-Saadani and Metwally 2019), and appears to have underestimated the disability rate more for women. The single question measure of disability appears to produce a disability rate most comparable to the medium definition using the UN-WG measure.

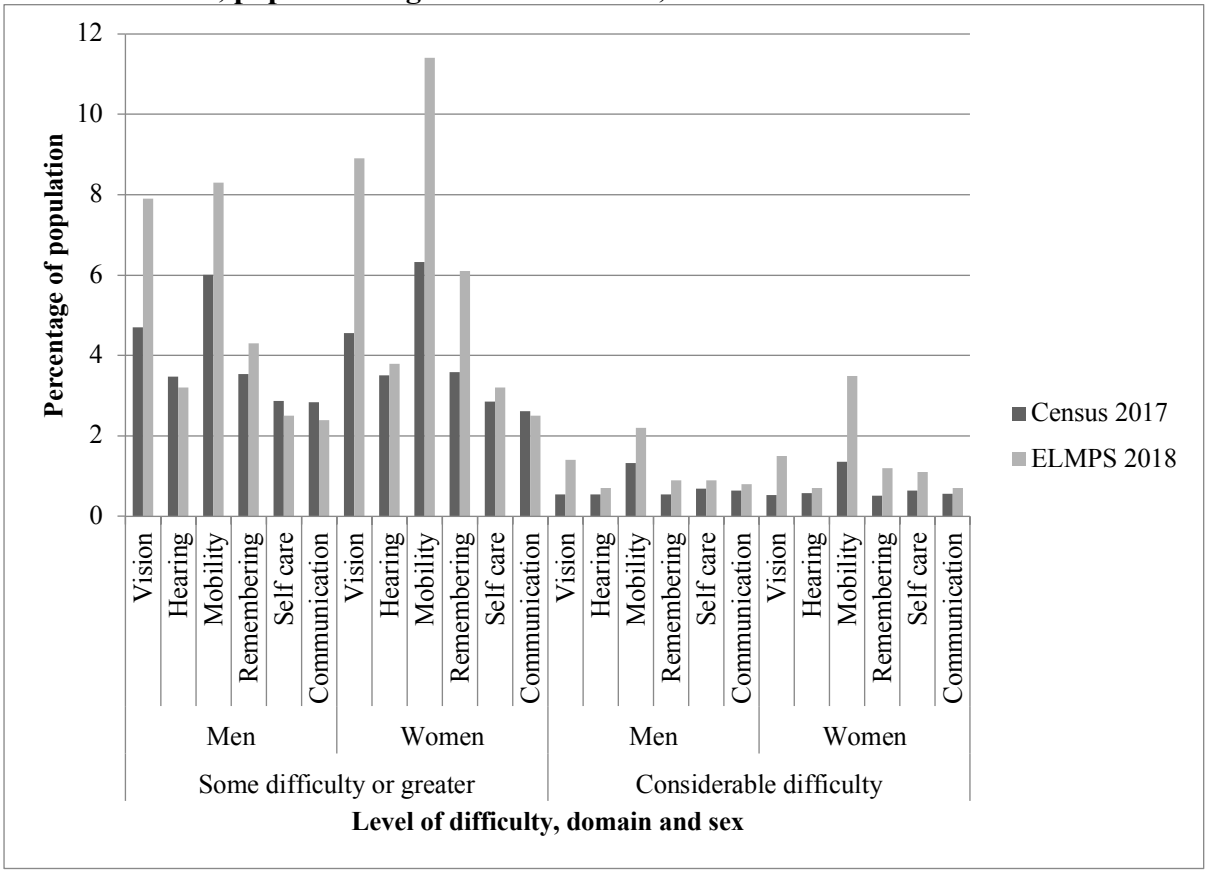
Figure 1. Rates of disability (percentage of population) by definition and sex, population aged five and above, Census 2017 and ELMPS 2018



Source: Census results are authors' calculations from data in CAPMAS (2019, Table 29). ELMPS results are authors' calculations from the ELMPS 2018.

Figure 2 shows the prevalence of any level of limitation (some difficulty or greater; broad definition) or considerable limitation (a lot of difficulty or cannot do at all; medium definition) for each of the six domains captured in the UN-WG instrument, by sex, comparing the Census 2017 and ELMPS 2018. The comparison reveals that the difference in overall disability rates between the two datasets stemmed primarily from several functional domains. In particular, the ELMPS found higher rates of disability in the domains of vision and mobility for both men and women. Mobility was the most common form of disability (by any definition) for both sexes in both datasets, at 4.7% for men in the Census and 7.9% for men in ELMPS, and 6.3% (Census) and 11.4% (ELMPS) for women. The ELMPS also found a higher rate of disability among women in the domain of remembering (6.1% any limitation) as compared to the Census (3.6%). Differences between the Census and ELMPS in other domains were less than one percentage point, and functional limitations in self-care and communication were the least prevalent in both datasets. Why the two datasets found different rates for vision and mobility in particular is unclear.

Figure 2. Rates of functional limitation (percentage of population) by level of limitation, domain and sex, population aged five and above, Census 2017 and ELMPS 2018

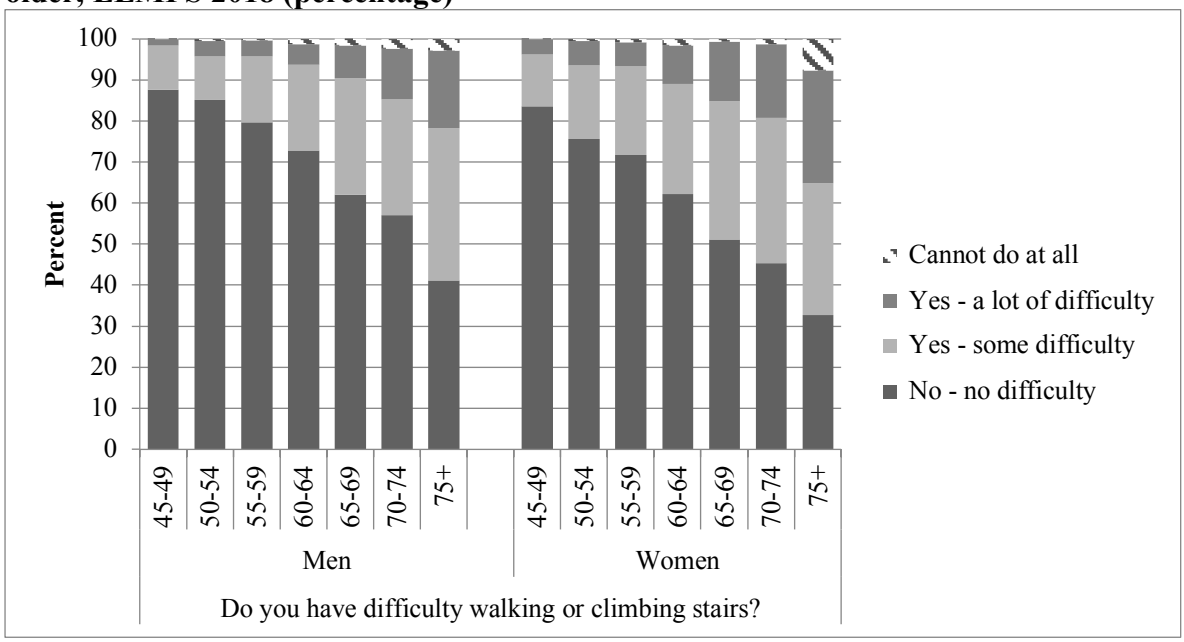


Source: Census results are authors' calculations from data in CAPMAS (2019, Table 29). ELMPS results are authors' calculations from the ELMPS 2018.

Table A1 in the Appendix shows the detailed rates of different levels of functional limitation in the six domains by age group from the ELMPS 2018. As expected, rates of disability increased considerably with age and were highest for the age group 65 and above. Among the youngest age groups, disabilities in the domains of seeing and remembering or concentrating were the most common, but less than 3% of the age group in all cases.

Since the prevalence of disability increases with age, which is an important concern for overall population health and services provision in the context of aging populations such as that of Egypt, Figures 3 and 4 illustrate the increase in different levels of functional limitation, by age, for men and women aged 45 and older, using mobility and remembering or concentrating as examples. By the 60-64 age group about a quarter of men and nearly 40% of women had at least some difficulty walking or climbing stairs (Figure 3). Rates of mobility limitation rose rapidly for each age group after age 60, reaching around two-thirds of women and 60% of men by the 75+ age group. In the oldest age group, 7.5% of women and 2.9% of men said they could not walk or climb stairs at all.

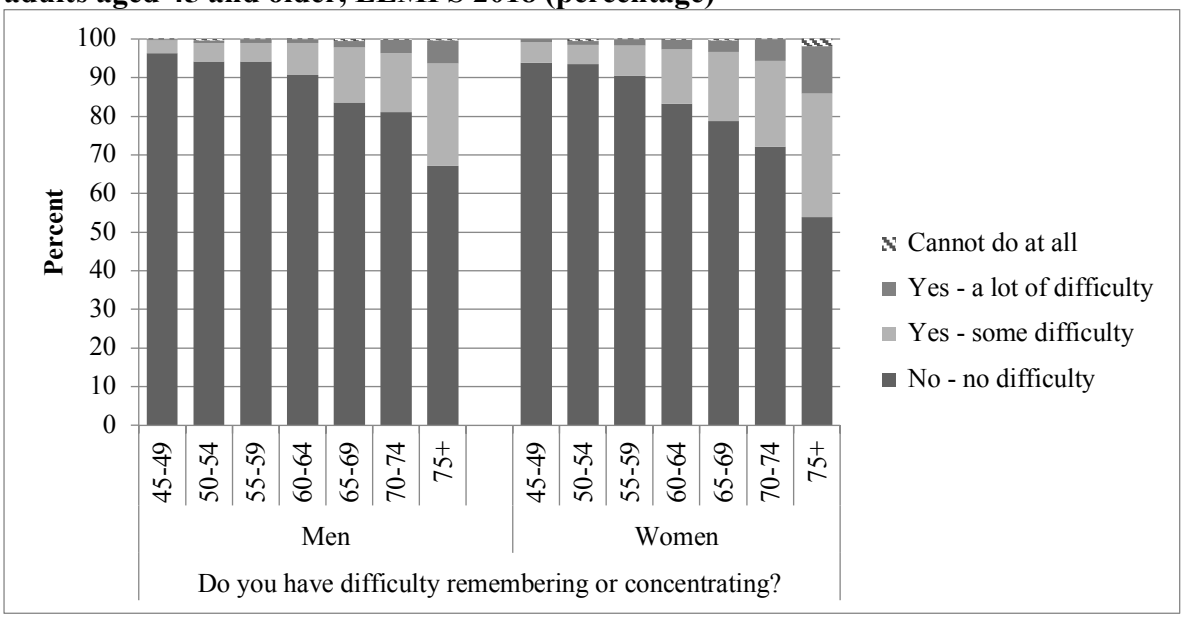
Figure 3. Functional limitations in mobility by sex and age group, adults aged 45 and older, ELMPS 2018 (percentage)



Source: Authors' calculations from the ELMPS 2018.

Figure 4 shows the results for remembering/concentrating, which was one of the domains with the widest gender gap in terms of disability rates. Although the disability rate in this domain was lower than with mobility, by age 75+, just over 30% of men and nearly half of women experienced at least some difficulty remembering or concentrating. The consistently higher rates of disability among older women as compared to men may be due in part to differential mortality, which means that, particularly in the oldest age groups, there will be more women at the higher end of the age group than men. However, the differential rates of onset of disability appear to begin as early as the 40s and 50s for some domains, so this may also be related to factors such as physical activity, overall rates of physical health or differences in risk factors for disability onset.

Figure 4. Functional limitations in remembering/concentrating, by sex and age group, adults aged 45 and older, ELMPS 2018 (percentage)



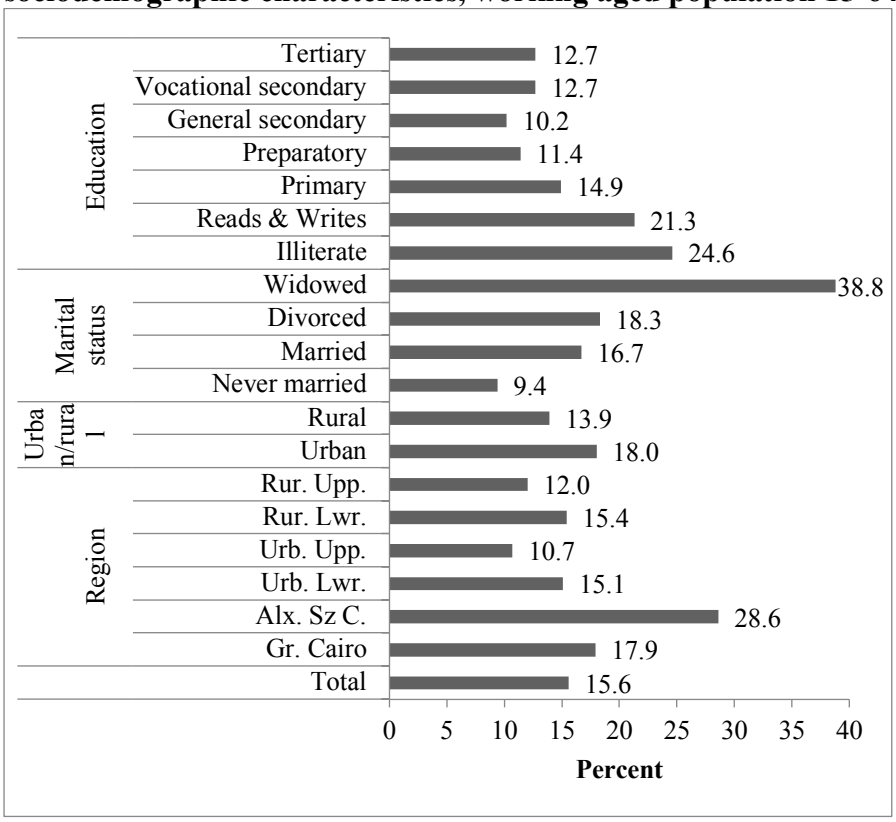
Source: Authors' calculations from the ELMPS 2018.

3.1.2 Disability rates by sociodemographic characteristics and poverty indicators

Figure 5 shows the broad disability rate among the working age population by sociodemographic characteristics (medium and narrow definition disability rates by these characteristics can be found in Appendix Table A2). The total broad disability rate for the working age population was 15.6%, much higher than the 2.3% obtained in the ELMPS 2012 using the single question measure. The much higher rate of different forms of disability among the working age population detected using the UN-WG measure has wide-ranging implications for the economic activity of the working aged population, ranging from the need for medical devices or services, to accommodations that individuals should be granted in education and workplaces, to potential impacts on labor force participation.

The prevalence of any form of disability was considerably higher for the least educated, particularly the illiterate and those who could only read and write. This is likely due in part to the strong barriers that children and youth face in accessing schooling when they have a disability at a young age (El-Saadani and Metwally 2019), as well as the fact that older individuals are over-represented among the lowest education categories. It is also possible that low-educated individuals were more exposed to the risk of becoming disabled, for example through engagement in hazardous work, but since we do not know when individuals acquired a disability this is not possible to determine. Turning to marital status, disability was most common among the widowed, which is expected as this population is generally older, and lowest among the never married who were likely to be younger than the married. Disability rates were also higher in urban areas than rural ones, which is likely due to the older age profile of urban populations (Krafft, Assaad, and Keo Forthcoming). However, when looking at the results by region, it becomes clear that the higher rate of disability in urban areas is driven by Greater Cairo and Alexandria and the Suez Canal cities. Disability rates in urban Lower and Upper Egypt were not higher than in the rural areas of these regions.

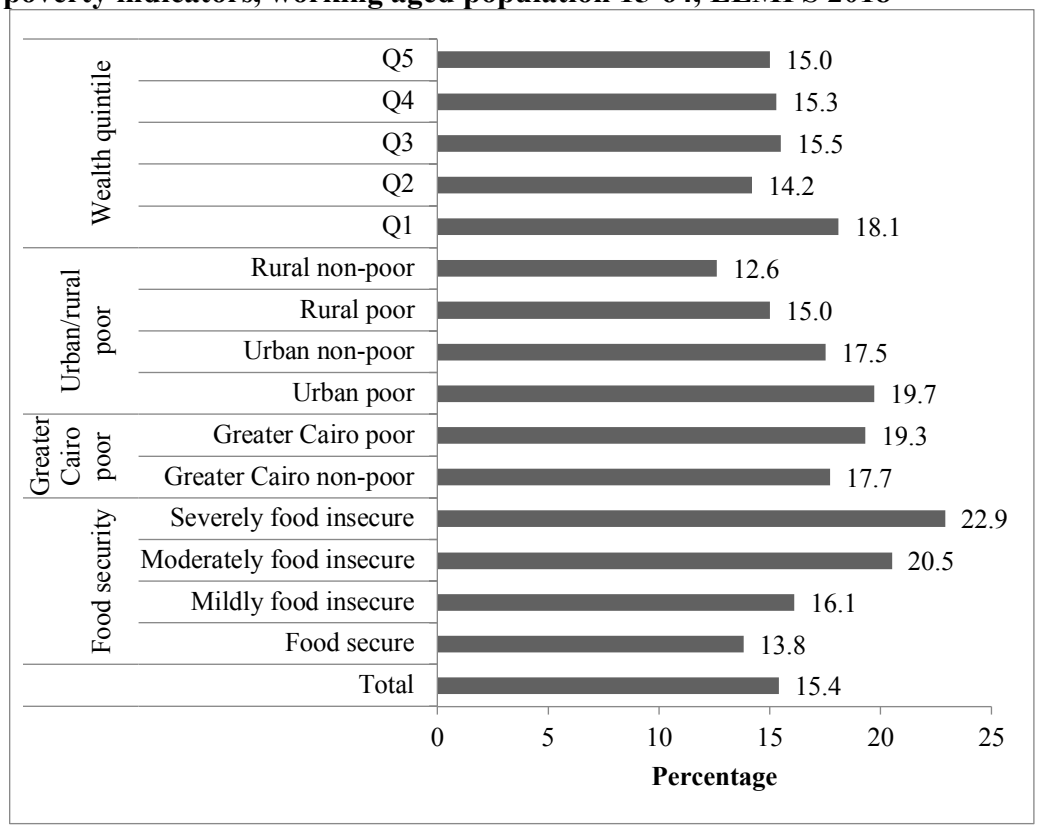
Figure 5: Percentage of the population with a disability, using the broad definition, by sociodemographic characteristics, working aged population 15-64, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

In Figure 6 we examine the prevalence of disability, using the broad definition, by our set of poverty indicators. The disability rate was higher among the poorest wealth quintile (18.1%) as compared to wealth quintiles 2-5, for which disability rates ranged from 14.8-15.7% and did not decrease consistently by quintile. The high rates of disability in the lowest quintile may reflect the disadvantage that disabled individuals face in terms of earning a livelihood. A similar pattern was seen using the medium definition; the disability rate was 4.7% among individuals in Q1 compared to 3.2-2.7% among those in Q2 through Q5 (data not shown). By urban/rural and poverty status, disability rates were highest among the urban poor and lowest among the rural non-poor. This reflects a combination of the older profile of urban residents and the association of disability with poverty. Disability rates were high in Greater Cairo overall, at 17.7% among the non-poor and 19.7% among the poor in Greater Cairo. Finally, disability rates increased progressively with greater levels of food insecurity. This is expected given the association of poverty with both disability and food security, but is greatly concerning in terms of the double burden of poorer health and food insecurity among those who were disabled. Patterns for men and women were similar across all of the indicators (data not shown), but one notable difference was that disability rates among women in Cairo were quite a bit higher for both the non-poor (19.3% compared to 15.9% for men) and the poor (20.9% compared to 17.7% for men).

Figure 6. Percentage of the population with a disability using the broad definition by poverty indicators, working aged population 15-64, ELMPS 2018

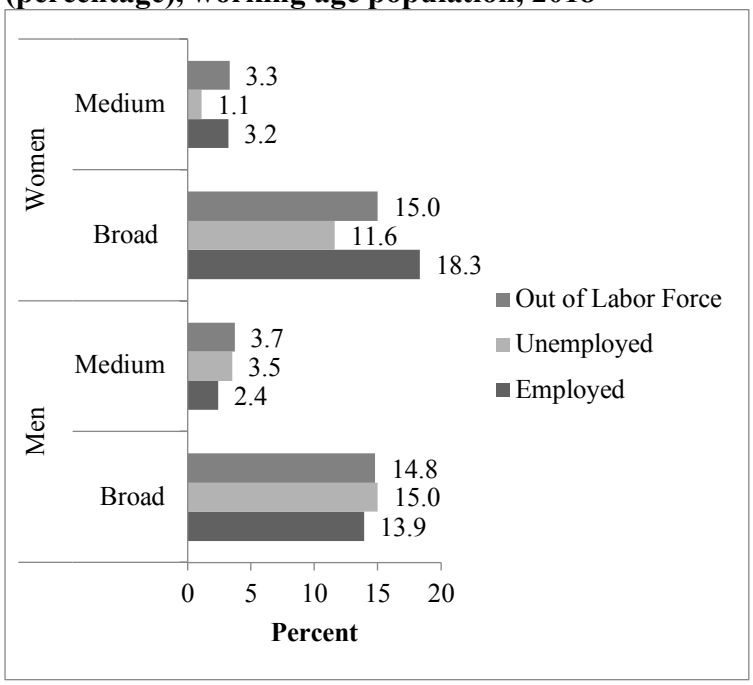


Source: Authors' calculations from the ELMPS 2018.

3.1.3 Disability and employment

In this section, we turn to the association between disability and our employment-related measures of economic vulnerability. It is important to remember in this analysis that disability can affect individuals' employment opportunities, and that hazardous forms of employment could lead to increased disability rates, for example due to workplace injuries. Beginning with labor force participation, Figure 7 shows different patterns by sex. Whereas employed men were somewhat less likely to have a disability, by either the broad or medium definitions, as compared to those who are unemployed or out of the labor force, for women the opposite was true. The higher rates of disability among women who were employed may be due to the fact that employed women were older than those who were out of the labor force or unemployed (Krafft, Assaad, and Keo Forthcoming). Unemployed women in particular tend to be younger (Krafft, Assaad, and Keo Forthcoming), likely explaining the low rates of disability, although the number of unemployed women with a disability using the medium definition is small and the result should be interpreted with caution.

Figure 7. Disability rates (broad and medium definitions) by labor force status and sex (percentage), working age population, 2018



Source: Authors' calculations from the ELMPS 2018.

For men, in contrast, who tend to work across the age distribution (Krafft, Assaad, and Keo Forthcoming), having a disability of some form may lead to a disadvantage in finding employment. This interpretation is supported by looking at the results a different way, in terms of the composition of men who do and do not have a disability by labor force status. Whereas a similar percentage of men with and without disability by the broad definition were employed (71.0% with and 72.6% without disability), unemployed (4.8% with and 4.4% without disability) and out of the labor force (24.2% with and 23.0% without a disability,) this was not the case when we look by the medium definition of disability. Using the medium definition, employment rates for men with a disability (63.1%) were considerably lower than for those without a disability (72.6%), and they were more likely to be out of the labor force (31.2% compared to 22.9% among men who do not have a disability). Men with a disability under the medium definition were also somewhat more likely to be unemployed (5.7%) than those who do not have a disability (4.5%). This suggests that men with higher levels of functional limitations faced considerable barriers to employment.

For those who were employed, Table 1 shows the percentage of men and women in each type of employment who have a disability, and the composition of the employed who are disabled, using the broad definition of disability.[13] Cell sizes are small for some categories, particularly for women, and should be interpreted with caution. For both men and women, the results indicate that the disabled were somewhat more concentrated in the public sector, and men with a disability were somewhat more concentrated in self-employment than those who do not have any form of disability. The public sector result in particular is likely driven by the older age

[13] Sample sizes are not sufficient to conduct this analysis by the medium definition of disability.

profile of public sector workers. Men with a disability were less likely to be employed in informal private regular wage work and irregular wage work. This may be related to the age profile of men in those less secure forms of employment, or barriers to men with disabilities engaging in the types of jobs that are more common in the informal and irregular wage sectors.

Table 1. Percentage in each type of employment who have a disability and composition of the employed disabled (broad definition), by sex, working age population, ELMPS 2018

	Men			Women		
	No disability	Disability	Total	No disability	Disability	Total
Public sector						
Percent of workers in the sector	83.2	16.9	100.0	81.2	18.9	100.0
Percent of working non/disabled employed in the sector	20.1	24.8	20.8	21.4	24.2	21.8
N	*2,290*	*464*	*2,754*	*1,099*	*255*	*1,354*
Formal private wage						
Percent of workers in the sector	85.1	14.9	100.0	80.0	20.0	100.0
Percent of working non/disabled employed in the sector	11.4	12.2	11.5	4.4	5.4	4.6
N	*1,299*	*227*	*1,526*	*228*	*57*	*285*
Informal private regular wage						
Percent of workers in the sector	88.7	11.3	100.0	86.7	13.3	100.0
Percent of working non/disabled employed in the sector	28.2	21.7	27.3	6.8	5.1	6.5
N	*3,203*	*407*	*3,610*	*349*	*54*	*402*
Irregular wage						
Percent of workers in the sector	88.1	11.9	100.0	80.2	19.8	100.0
Percent of working non/disabled employed in the sector	18.6	15.3	18.1	2.6	3.1	2.7
N	*2,117*	*286*	*2,403*	*132*	*33*	*165*
Employer						
Percent of workers in the sector	83.6	16.4	100.0	73.6	26.4	100.0
Percent of working non/disabled employed in the sector	7.7	9.2	7.9	1.1	2.0	1.3
N	*875*	*172*	*1,047*	*58*	*21*	*78*
Self-employed						
Percent of workers in the sector	81.2	18.8	100.0	79.2	20.8	100.0
Percent of working non/disabled employed in the sector	9.6	13.5	10.1	6.2	7.9	6.4
N	*1,090*	*252*	*1,342*	*316*	*83*	*399*
Unpaid family worker						
Percent of workers in the sector	88.9	11.1	100.0	84.3	15.7	100.0
Percent of working non/disabled employed in the sector	4.4	3.3	4.3	57.6	52.4	56.7
N	*500*	*62*	*562*	*2,961*	*552*	*3,513*
Total						
Percent of workers in the sector	85.9	14.1	100.0	83.0	17.0	100.0
Percent of working non/disabled employed in the sector	100.0	100.0	100.0	100.0	100.0	100.0
N	*11,375*	*1,870*	*13,245*	*5,143*	*1,054*	*6,197*

Source: Authors' calculations from the ELMPS 2018.

Other results indicate that exposure to work hazards is associated with the prevalence of disability. The percentage of men with a disability increased from 10.9% among those who were exposed to no hazards at work, to 14.0% among those exposed to one hazard, 14.2% among those exposed to 2-3 hazards and 19.2% among those exposed to 4+ hazards. For women, the corresponding disability rates increased from 14.6% to 19.4%, 21.6%, and 27.6%, respectively. Exposure to hazards was more common in more vulnerable forms of work, and particularly irregular wage and unpaid family work (data not shown), yet the disability rate in these categories was lower. This indicates that disentangling the relationship between disability and employment type requires multivariate analysis that takes into account the age profiles of the different categories of employment.

3.2 Self-rated health

3.2.1 Self-rated health by demographic characteristics

As with disability, self-rated health is strongly associated with age. The percentage of people who rated their health as a very good was highest in 2018 among the youngest age group (15-24) at 56.1% for men (Figure 8A) and 55.6% for women (Figure 8B). By the oldest age group of those aged 65 and above, these percentages decreated to 8.7% for men and 5.7% for women. A similar pattern by age was observed in 2012, but comparing between the ELMPS 2012 and ELMPS 2018 data, Figures 8A and 8B shows that the percentage of people who rated their health fair, bad or very bad declined substantially in 2018 compared to 2012 (13.9% in 2018 versus 20.6% in 2012 for men, and 15.7% in 2018 versus 22.9% in 2012 for women). Correspondingly, the percentage of both men and women who rated their health as very good increased from 2012 to 2018. Increases in self-rated health were seen across the age distribution but particularly among the youngest aged 15-24. Women had somewhat lower levels of self-rated health than men in both years.

Figure 8A. Self-rated health by age group, men aged 15 and older, ELMPS 2012 and 2018 (percentage)

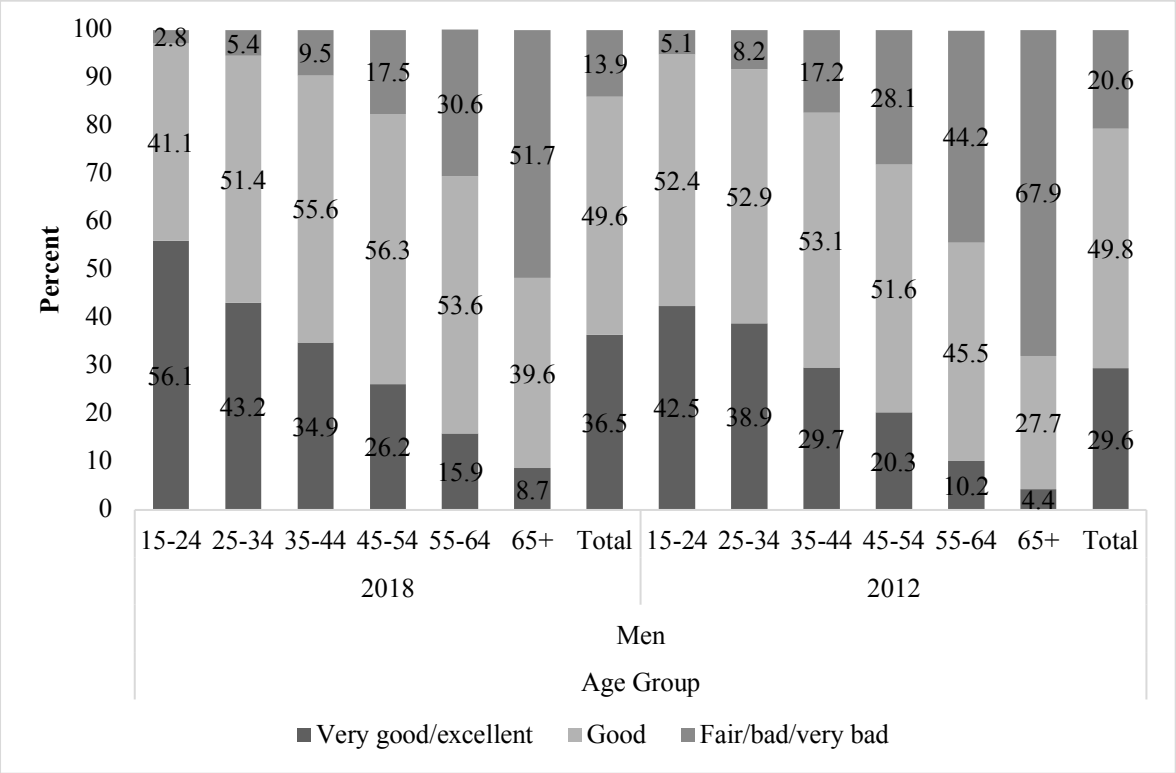
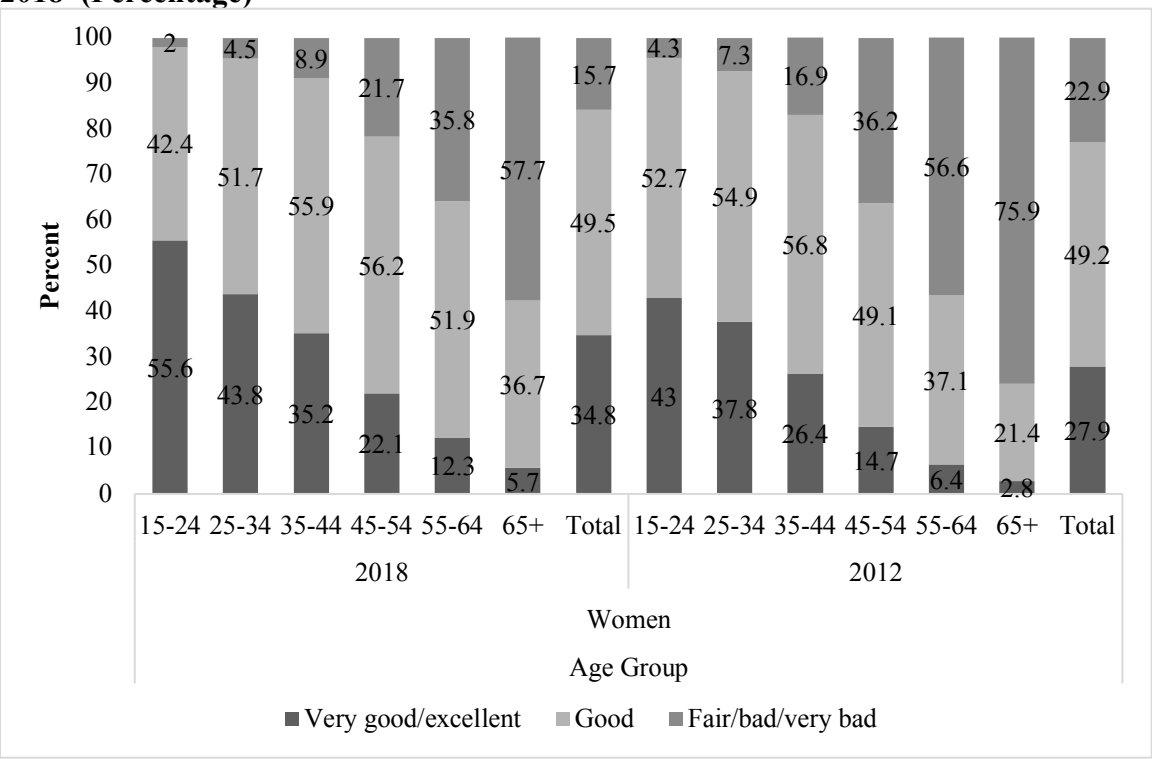


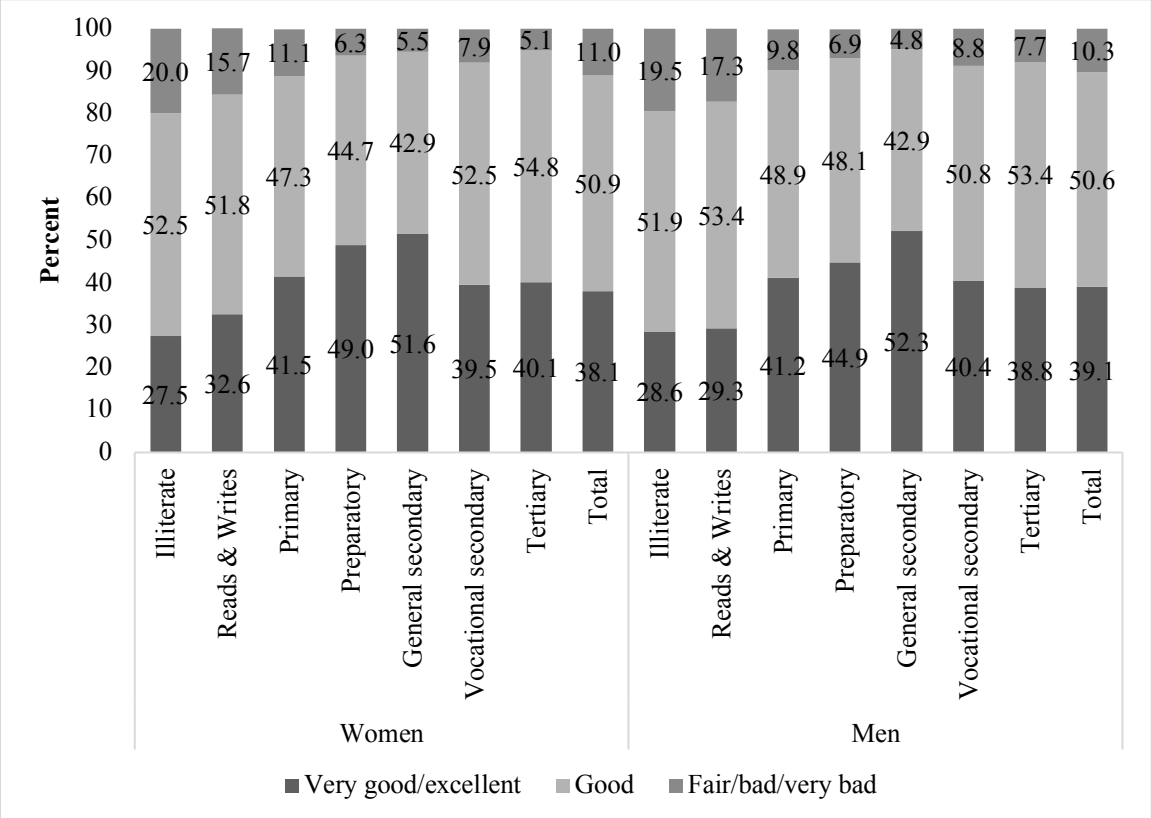
Figure 8B. Self-rated health by age group, women aged 15 and older, ELMPS 2012 and 2018 (Percentage)



Source: Authors' calculations from the ELMPS 2012 and 2018.

As the patterns of self-rated health were generally similar across 2012 and 2018, apart from the higher overall levels of self-rated health in 2018, for the remainder of this section we focus on the results for 2018. Figure 9 shows that there was some education gradient in self-rated health for both men and women. In particular, the least educated had the highest percentages of reported fair, bad or very bad health, at 20.0% for illiterate women and 19.5% for illiterate men. The percentage of both men and women with very good or excellent health increased through general secondary education, although few adults have general secondary as a terminal education level so many of these individuals may be continuing students and thus younger than other education groups. Around 40% of those with vocational secondary and tertiary education reported very good or excellent health for both men and women. Throughout the educational distribution, about half of respondents reported having good health so much of the variation is produced by reports of poor health versus very good health.

Figure 9. Self-rated health by education and sex (percentage), working age population 15-64, ELMPS 2018

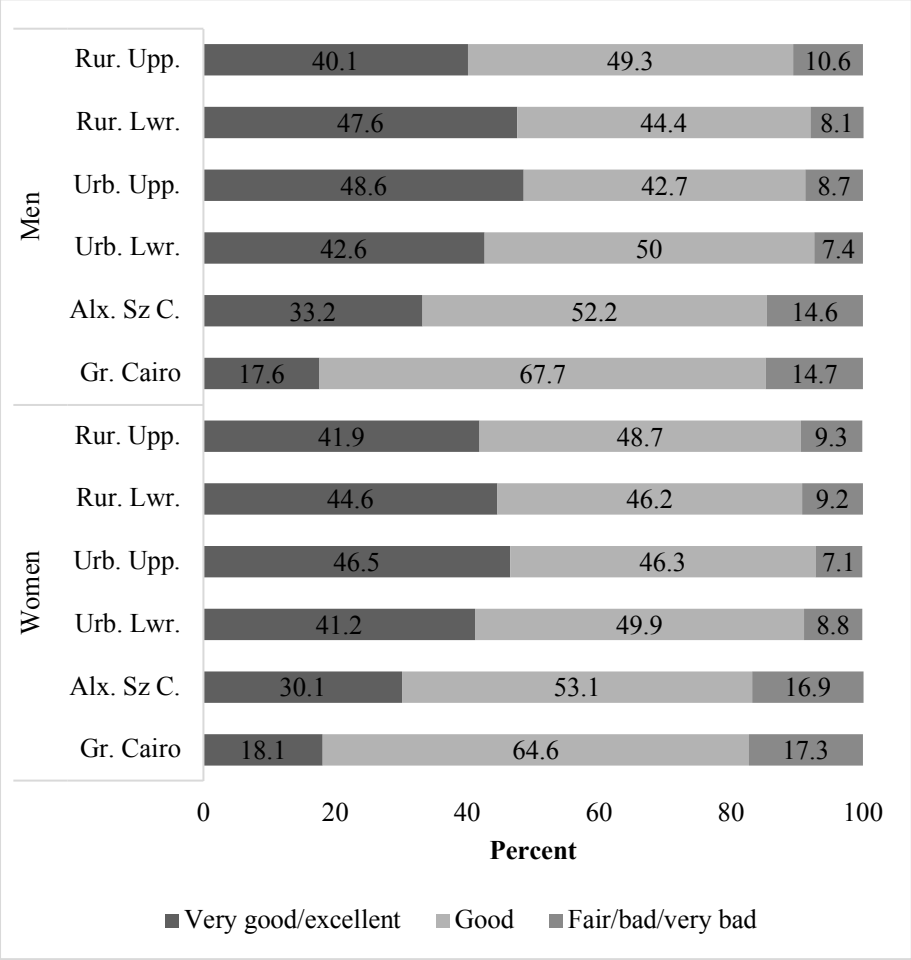


Source: Authors' calculations from the ELMPS 2018.

Marital status was associated with self-rated health in a manner that is consistent with the age gradient in self-rated health. Widowed men (21.5%) and women (33.4%), who were likely to be older, were most likely to report poor health, whereas among the never married, who were likely to be younger, few men (4.3%) or women (3.0%) reported poor health. Among both married and divorced men, about 13% reported poor health. For women, in contrast, 10.3% of married women reported poor health whereas 21.2% of divorced women reported poor health.

There was also substantial regional variation in self-rated health. Overall, rural residents had an advantage in self-rated health as compared to urban residents, with 44.5% of rural men reporting very good or excellent health compared to 31.6% of urban men. Among women, the gap was 43.4% among rural residents and 30.6% among urban residents. This urban disadvantage in self-rated health was likely due in part to the older age structure of urban areas, but is a pattern we see repeated in subjective wellbeing (see below) and may also be due to factors related to living conditions in urban areas. As seen in Figure 10, the urban disadvantage in self-rated health seems to be driven by major urban areas, and particularly Greater Cairo, where only 17.6% of men and 18.1% of women reported that their health was very good or excellent. The gap in self-rated health between Urban and Rural Lower Egypt was smaller, and self-rated health in Urban Upper Egypt was somewhat better than in Rural Upper Egypt for both men and women.

Figure 10. Self-rated health by region and sex (percentage), working age population 15-64, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

Finally, as expected, both self-rated chronic illness and disability were highly correlated with self-rated health. Only 7.8% of working-age men with a chronic illness reported that they had very good or excellent health, compared to 44.2% of those without a chronic illness. Among women, the comparable figures were 9.4% for those with a chronic illness and 44.2%, for those without a chronic illness. The percentage of people reporting very good health was also lower

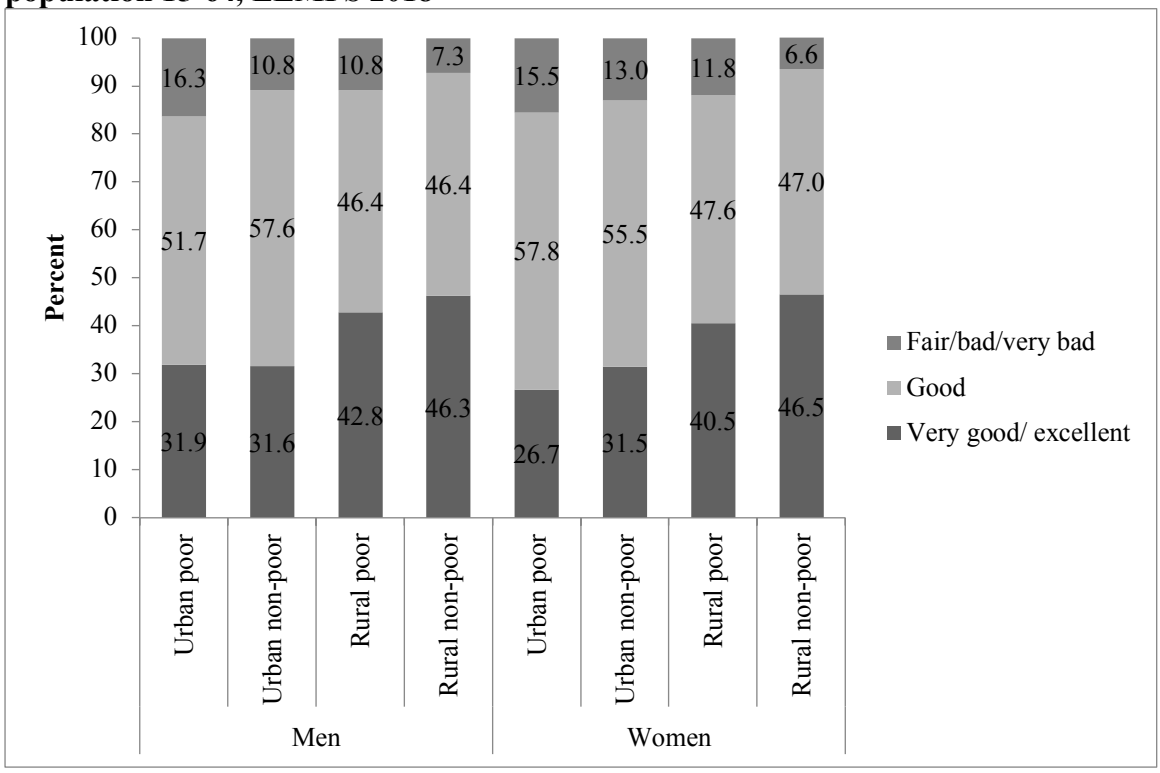
for those with a disability by the narrow definition (11.8% of men and 5.8% of women) as compared to those with a disability by the broad definition (15.1% of men and 14.7% of women; see Appendix Table A3 for full data).

3.2.3 Self-rated health by economic vulnerability

There was not a strong gradient in self-rated health by wealth quintile for either men or women. For men, 36-40% consistently reported themselves as having very good or excellent health across wealth quintiles, and for women 37-41%. The main difference in self-rated health by wealth was that somewhat higher percentages of men (15.0%) and women (14.2%) reported themselves as having poor health as compared to the other quintiles (see Appendix Table A4 for full data).

A stronger gradient was seen when examining the overlap of urbanity with poverty (Figure 11). Among men, the percentage with very good health was nearly the same for the urban poor and non-poor, but poor urban men suffered higher rates of poor health (16.3% versus 10.8%). Non-poor rural men had a small advantage in self-rated health over poor rural men, but both had higher levels of very good health than urban men. Among women, a consistent gradient in self-rated health can be seen in which the urban poor were the least healthy, and the rural non-poor the healthiest, according to their own assessments.

Figure 11. Self-rated health by urban/rural poverty and sex (percentage), working age population 15-64, ELMPS 2018



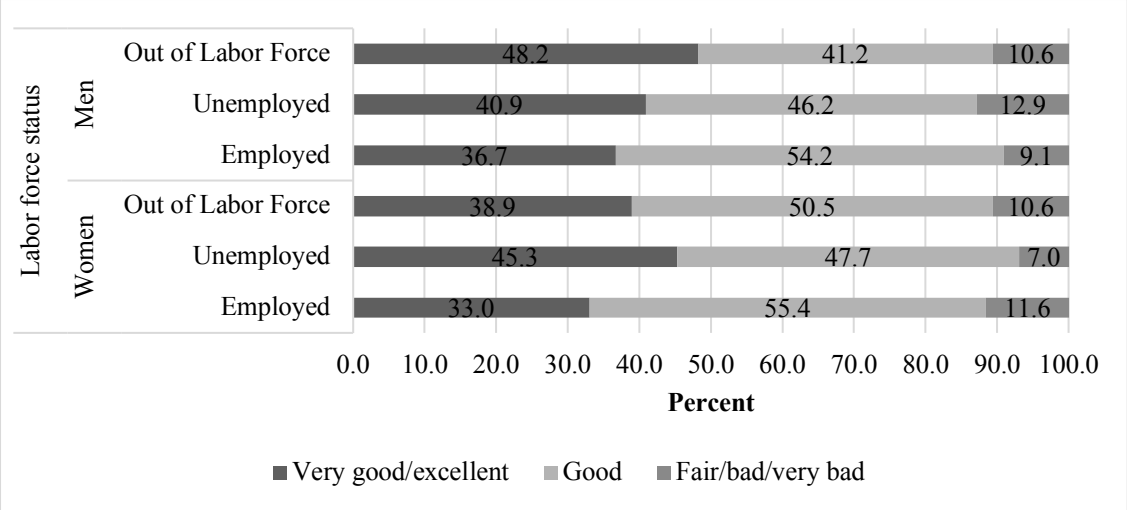
Source: Authors' calculations from the ELMPS 2018.

Turning to employment indicators, Figure 12 shows that there were differences by sex in the associations between self-rated health and labor force status. Among men, those who were out

of the labor force were most likely to rate their health as very good (48.2%), followed by the unemployed (40.9%) and then the employed (36.7%). The unemployed, however, were more likely to rate their health as poor (12.9%) than men in the other two categories. Among women the pattern was quite different with the unemployed most likely to rate their health as very good (45.3%), which may be due to the young age profile of this relatively small group. As with men, women who were employed were least likely to rate their health as very good (33.0%) and those who were out of the labor force lay in the middle (38.9%).[14]

There was insufficient sample size to examine the relationship between other employment characteristics and self-rated health for women, but among men, those who had experienced a workplace injury in the past month were unsurprisingly considerably more likely to rate their health as poor (30.2%) than those who had not experienced an injury (8.2%). Those who were dissatisfied with their employment were also slightly more likely to report their health as poor compared to those who were satisfied with their jobs, which may be related to the relationship between subjective wellbeing and job satisfaction discussed in the next section.

Figure 12. Self-rated health by labor force status and sex (percentage), working age population 15-64, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

3.3 Subjective wellbeing

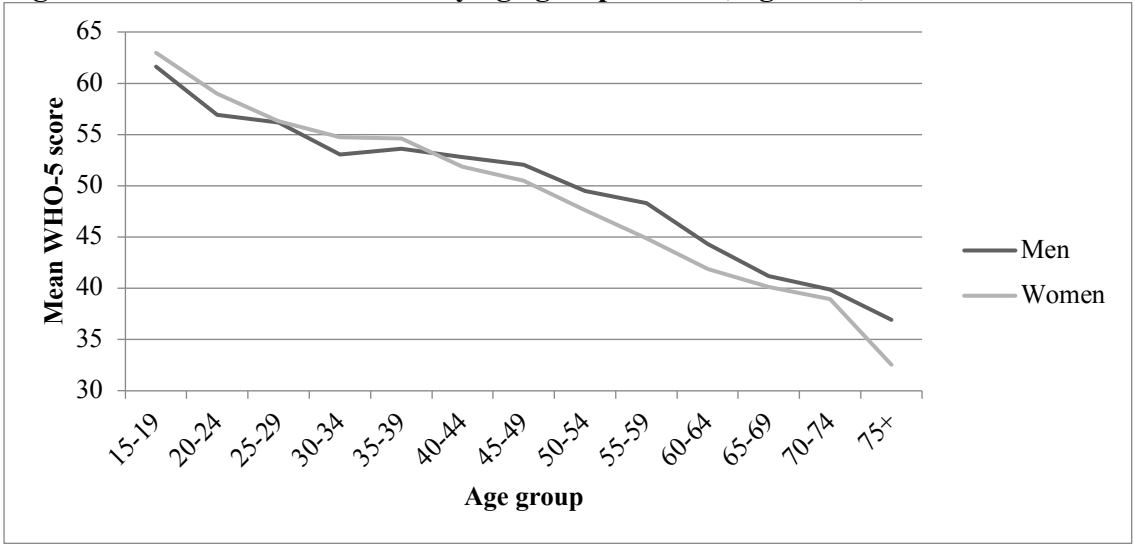
3.3.1 Subjective wellbeing by sociodemographic characteristics

The mean WHO-5 score for the 36,321 individuals aged 15 and above in the ELMPS 2018 who completed the WHO-5 scale was 52.6, with no difference in the mean wellbeing score for men (52.8) and women (52.4). Using the cutoff score of less than 50 for low wellbeing, 44.5% of men and 45.2% of women had low wellbeing. This is higher than the population rate of 33.8% low wellbeing found in Palestine (sex-disaggregated data was not reported; mean WHO-5 score for the population was 58.0) (Harsha et al. 2016). This is the only other national-level data on the WHO-5 that we are aware of in the region, so it is unclear how Egypt compares to other countries in MENA on subjective wellbeing.

[14] The relationship between type of employment and self-rated health was inconsistent and therefore is not discussed here.

Figure 13 shows that there was a strong age gradient in wellbeing for both men and women. Whereas the mean WHO-5 scores for the youngest age group (15-19) were above 60, among the oldest age groups aged 70 and above the mean scores declined to below 40. Whereas women had a slight advantage in wellbeing scores at younger ages, this reversed around age 40 to a slight disadvantage.

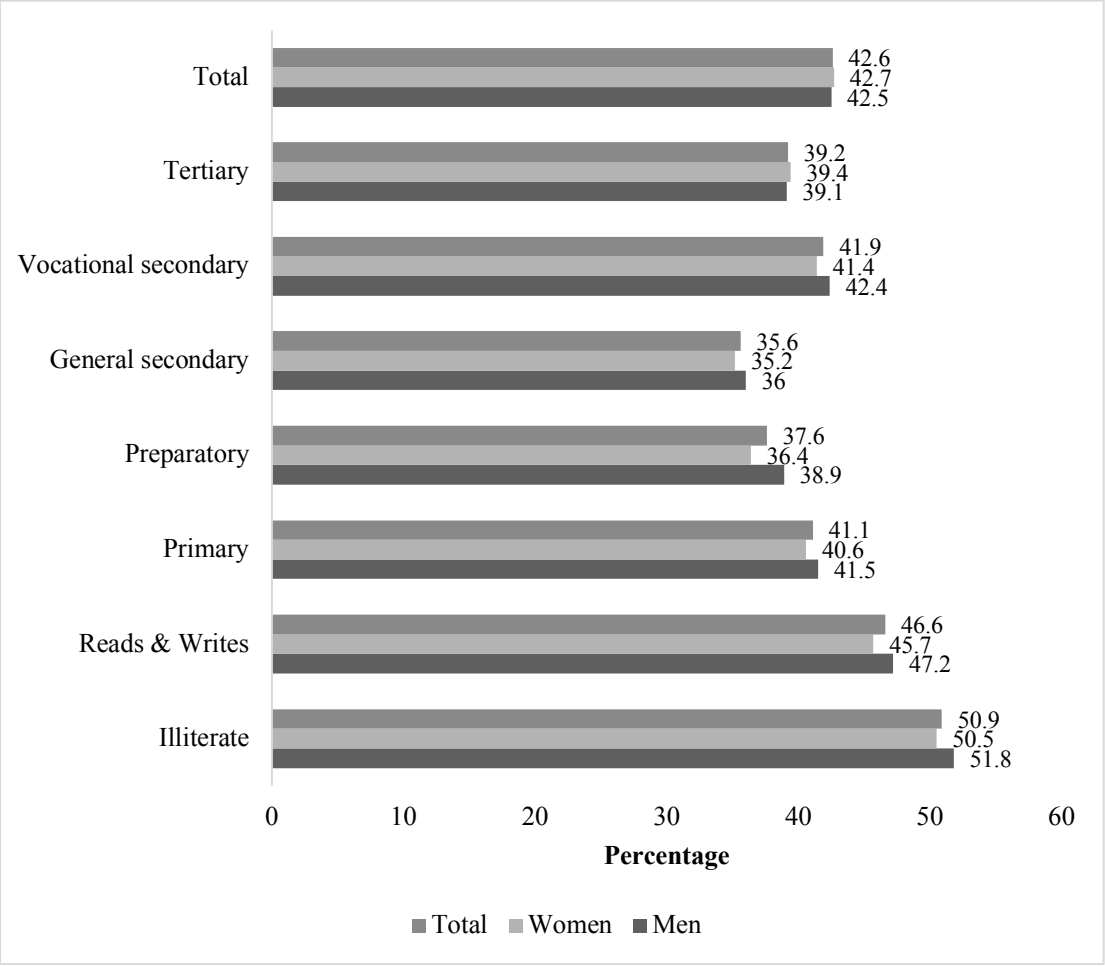
Figure 13. Mean WHO-5 Score by age group and sex, ages 15+, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

The prevalence of low wellbeing was considerably higher for the least educated, particularly the illiterate and those who could only read and write. Figure 14 shows that 50.9% of illiterate men and women suffered from low wellbeing, with a slightly higher rate among men. The percentage suffering from low subjective wellbeing decreased through those with general secondary education (a small group) before increasing again for those with vocational secondary or tertiary education. Among the most educated (tertiary education), the percentage experiencing low wellbeing was 39.2%. These patterns are similar to those that we saw for self-rated health.

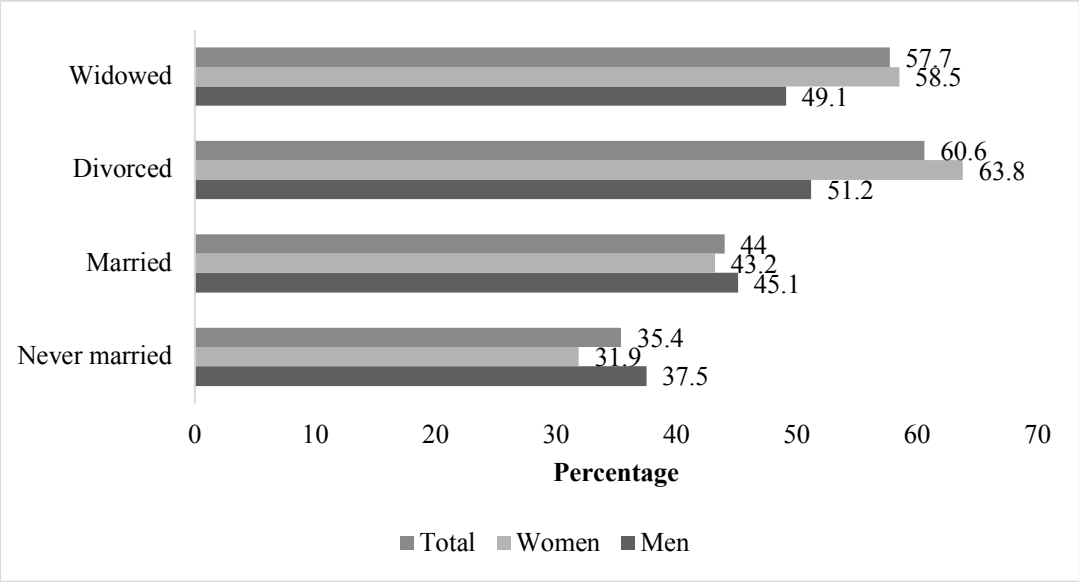
Figure 14. Low wellbeing (percentage) by education and sex, working age population 15-64, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

Marital status is another sociodemographic characteristic that shows a clear relationship with low wellbeing (Figure 15). Low wellbeing was most prevalent among divorced women, with 63.8% experiencing low wellbeing compared to 51.2% of divorced men. Likewise, widowed women had high rates of experiencing low wellbeing (58.5%) compared to widowed men (49.1%). In contrast, unmarried women were the least likely to experience low wellbeing (31.9%) along with unmarried men (37.5%). The wellbeing of the married lay in between, with 53.8% of married women experiencing low wellbeing and 52.1% of married men. The gender gap in wellbeing for those who were married or never married was thus much smaller than for the divorced and widowed.

Figure 15. Low wellbeing (percentage) by marital status and sex, working age population 15-64, ELMPS 2018

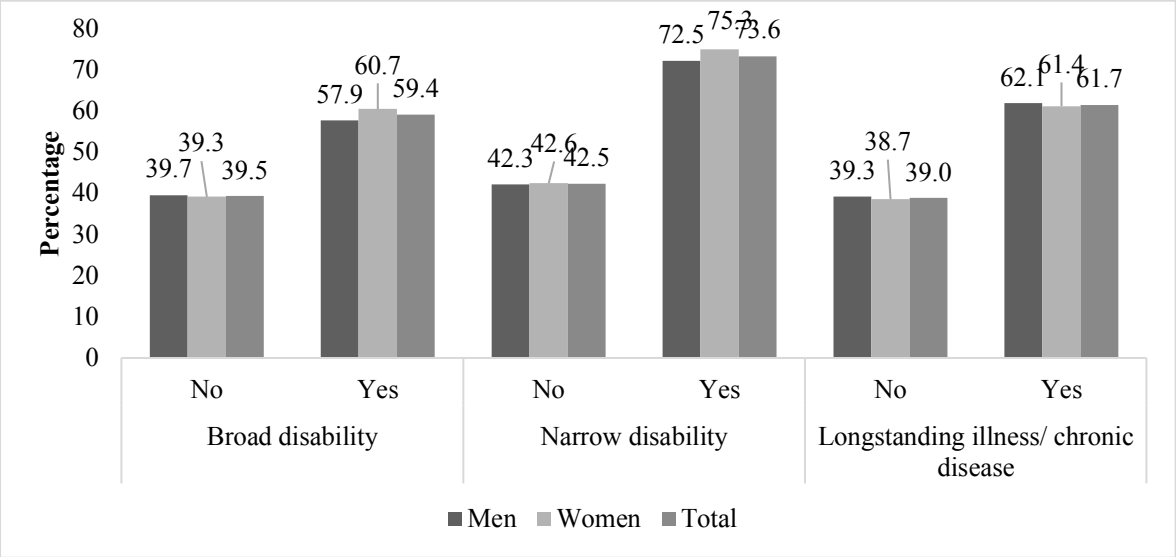


Source: Authors' calculations from the ELMPS 2018.

In terms of residence, the percentage of people suffering from low wellbeing was higher among those living in urban areas than those living in rural areas (47.5% urban and 39.1% rural). Corresponding to this division, the data shows that the low wellbeing was considerably more prevalent in Greater Cairo (58.8%) as compared to other regions in the country (37-41%; data not shown).

In Figure 16 we examine the correlation between subjective wellbeing and other measures of health, using chronic illness and the broad and narrow definitions of disability. Low wellbeing was highest among people with a disability according to the narrow definition (73.6%), which indicates the greatest degree of functional limitation, whereas the percentage was lower among people with a disability according to the broad definition (59.4%). There was also a strong correlation between low wellbeing and longstanding illness and chronic diseases; people who reported that they had a chronic illness were more likely to experience low wellbeing (61.7%) compared to those who reported that they did not have any type of illness or chronic disease (39.0%).

Figure 16. Low wellbeing (percentage) by disability and health status, by sex, working age population 15-64, ELMPS 2018



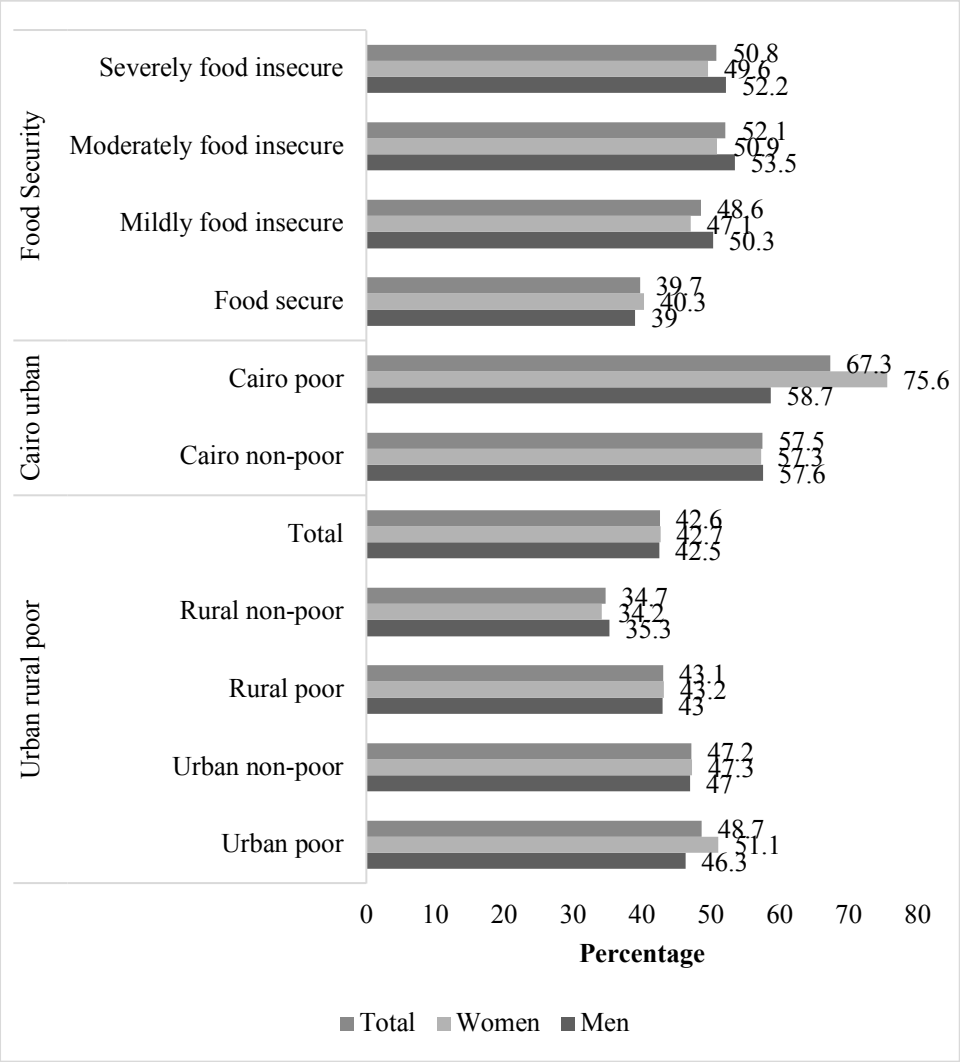
Source: Authors' calculations from the ELMPS 2018.

3.3.2 Subjective wellbeing by poverty indicators and exposure to shocks

Turning to our measures of poverty and exposure to shocks, the poorest (Q1) were the most likely to experience low wellbeing (46.6%), followed by those in Q3 (44.6%), Q2 (42.4%), Q4 (41.3%) and then Q5 (38.5%; data not shown). The higher level of low wellbeing among Q3 was driven by men, whereas among women the percentage with low wellbeing declined across quintiles, but not by large amounts.

Figure 17 shows the association between low wellbeing and our other measures of poverty. Poor women in urban areas were the most likely to experience low wellbeing (51.1%) compared to poor urban men (46.3%) and men and women in other areas. As with self-rated health there was a gradient by wealth and residency in which the urban poor experienced the worst subjective wellbeing and the rural non-poor the best. The 'urban penalty' was very clear among poor women in Greater Cairo, among whom 75.6% reported low wellbeing, compared to 58.7% of men and 57.3% of non-poor women in Cairo. In addition, people whose households were food secure – which is likely to be correlated with wealth – were considerably less likely to suffer from low wellbeing than people whose households suffered from even mild food insecurity.

Figure 17. Low wellbeing (percentage) by poverty indicators and sex, working age population 15-64, ELMPS 2018

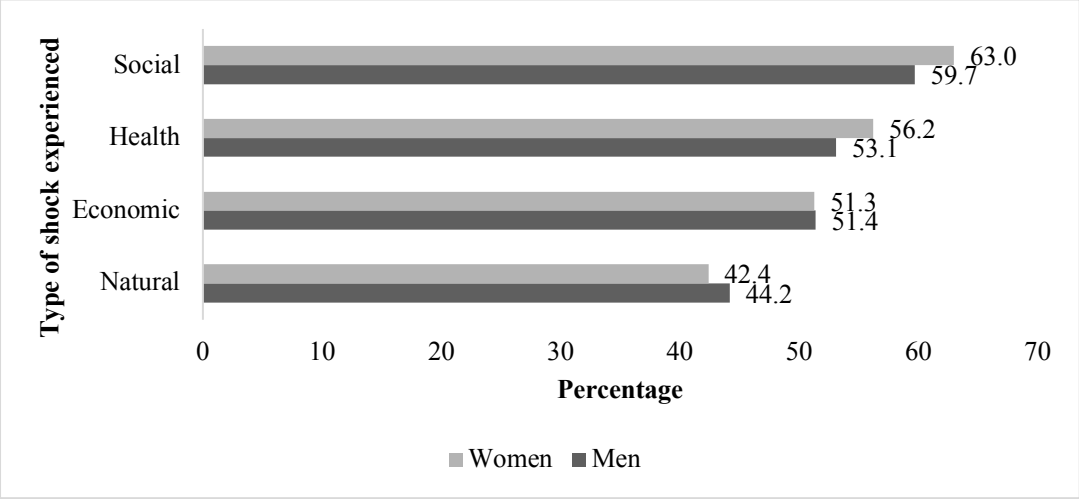


Source: Authors' calculations from the ELMPS 2018.

The results also indicate that household exposure to most types of shocks was associated with low wellbeing. Figure 18 demonstrates that both men and women whose households experienced social shocks were the most likely to experience low wellbeing (59.7% and 63.0%), followed by people whose households experienced health shocks (53.1% among men and 56.2% among women). Among those whose households experienced natural shocks, in contrast, the percentage of men and women experiencing low wellbeing was similar to that of the population overall.[15]

[15] The categories of shocks are not mutually exclusive and some households may have experienced multiple shocks.

Figure 18. Low wellbeing (percentage) among respondents whose households experienced a shock in the 12 months prior to the survey, by type of shock and sex, working age population 15-64, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

3.3.3 Subjective wellbeing and employment

In this section, we turn to the relationships between labor force participation, employment and wellbeing. Figure 19 again shows that patterns differ by sex; whereas unemployed men were the most likely to experience low wellbeing (48.2%) compared to men who were employed (43.0%) or out of labor force (37.8%), among women there was no relationship between labor force status and wellbeing. This is consistent with other studies showing that employment is associated with mental health among men in Egypt but not women (Liu, Modrek, and Sieverding 2017).

Among the employed, there was also variation in low wellbeing based on type of employment and sex. Men engaged in irregular wage labor, which is a particularly vulnerable form of employment, were the most likely to suffer from low wellbeing (49.3%). Male unpaid family workers, employers and public sector employees had the lowest rates of low wellbeing. Among women, in contrast, by far the highest percentage suffering from low wellbeing was among those engaged in private formal wage work (62.3%), although this was a small percentage of working women. Formal private employment is generally seen as a more secure and advantageous form of employment in Egypt, but women in Egypt carry a substantial domestic burden even when they work (Assaad, Krafft, and Selwaness 2017). It is thus possible that women engaged in the formal private sector, where hours are typically longer than in the public sector, face additional stresses that affect their wellbeing. As with men, women unpaid family workers, public sector workers and employers, although the latter group was very small, had the lowest rates of low wellbeing.

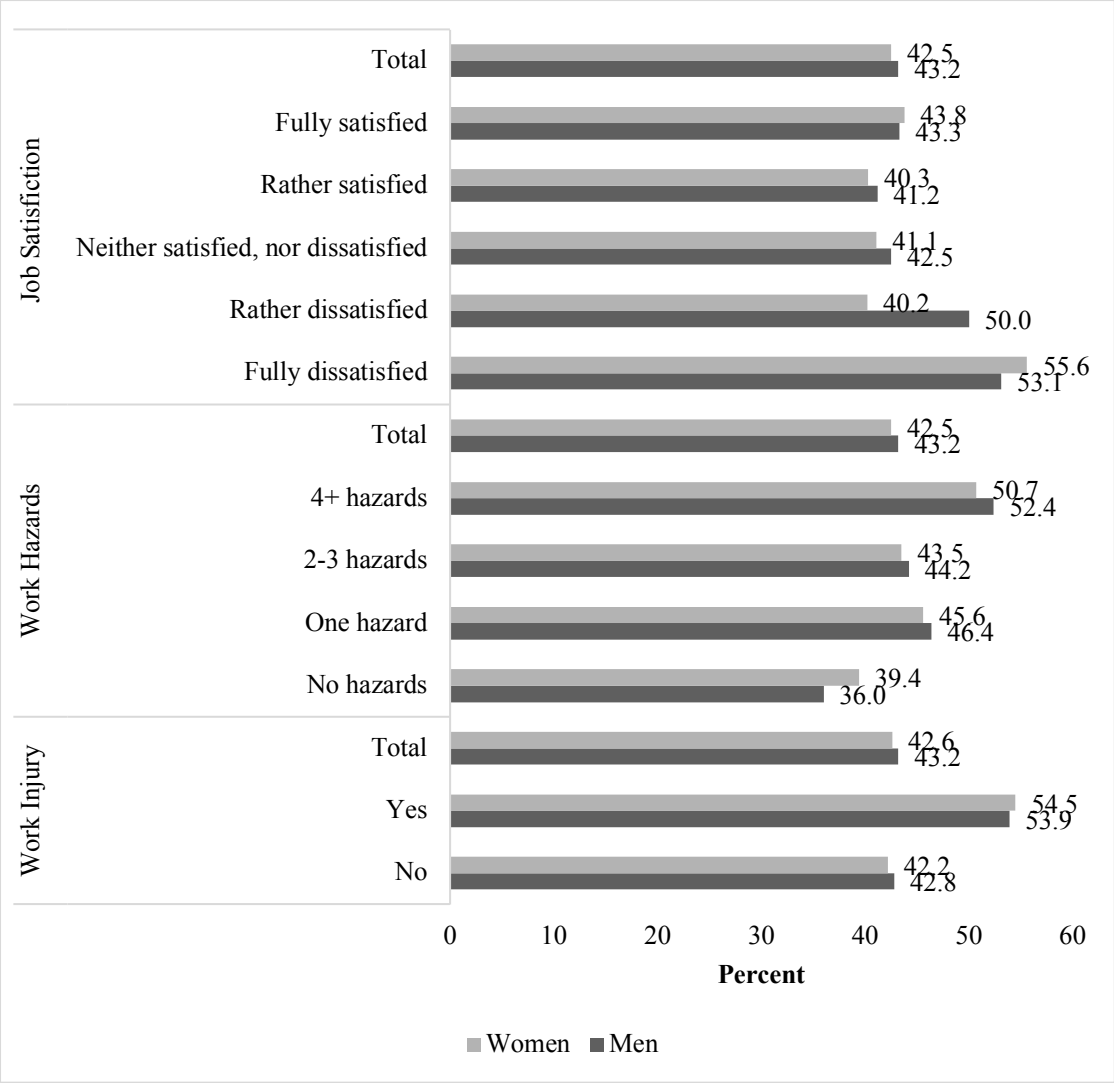
Figure 19. Low wellbeing (percentage) by labor force status and type of employment (among the employed), by sex, working age population 15-64, ELMPS 2018

Source: Authors' calculations from the ELMPS 2018.

Working conditions were also strongly associated with low wellbeing (Figure 20). Low wellbeing was more prevalent among those who had been injured at work (53.9% among men and 54.5% among women), compared to who had not experienced a work injury in the last 12 months (42.8% among men and 42.2% among women). Among women, very few had experienced a workplace injury so the result should be interpreted with caution. In addition, people who were exposed to 4+ hazards at work had the highest rates of experiencing low wellbeing, and those who were not exposed to any hazards at work the lowest rates of low wellbeing. This result may be driven by hazards leading to health problems or injuries that affect wellbeing, or by the association of hazards with job satisfaction. As also shown in Figure 20, those who were fully dissatisfied with their jobs, as well as men who were rather

dissatisfied, were considerably more likely to report low wellbeing than those who expressed neutral or positive job satisfaction.

Figure 20. Low wellbeing (percentage) by employment characteristics, working age population 15-64, ELMPS 2018



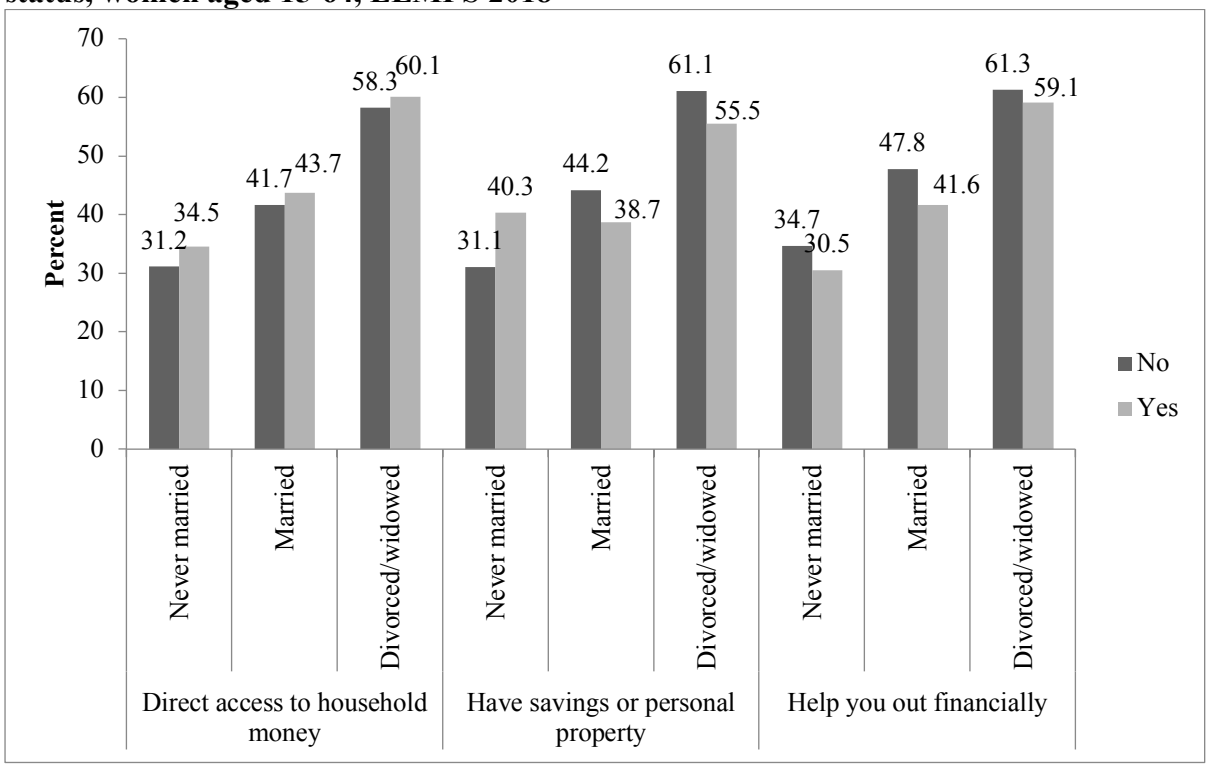
Source: Authors' calculations from the ELMPS 2018.

3.3.3 Low wellbeing and women's agency

In this section we examine the correlation between different indicators of women's agency and their subjective wellbeing. Given the importance of women's household structure for the theoretical linkages between agency and wellbeing, we divide this analysis by marital status. However, divorced and widowed women are combined into one category due to sample size. Figure 21 illustrates the results for three of our indicators, not all of which support classic hypotheses about the role of financial independence for women. Regardless of marital status, the results show that women who did have direct access to household money had somewhat higher rates of low wellbeing than those who did not have direct access to money. The ELMPS data also do not show a consistent relationship between personal property or savings and wellbeing. Whereas unmarried women with personal property or savings had higher wellbeing, among the married and divorced or widowed the opposite was true.

The one indicator where we did consistently find the expected relationship between financial autonomy and higher wellbeing was whether women had a family member who could help them financially if needed. Across marital statuses, women who said they had a family member they could turn to had somewhat lower rates of poor wellbeing. Our results also did not find a consistent association among the other measures of family support and low wellbeing (data not shown). The lack of association between these factors and subjective wellbeing may be related to the simplicity of the single-item measures, or may be driven by other factors, such as poverty or employment, that affect both agency and wellbeing.

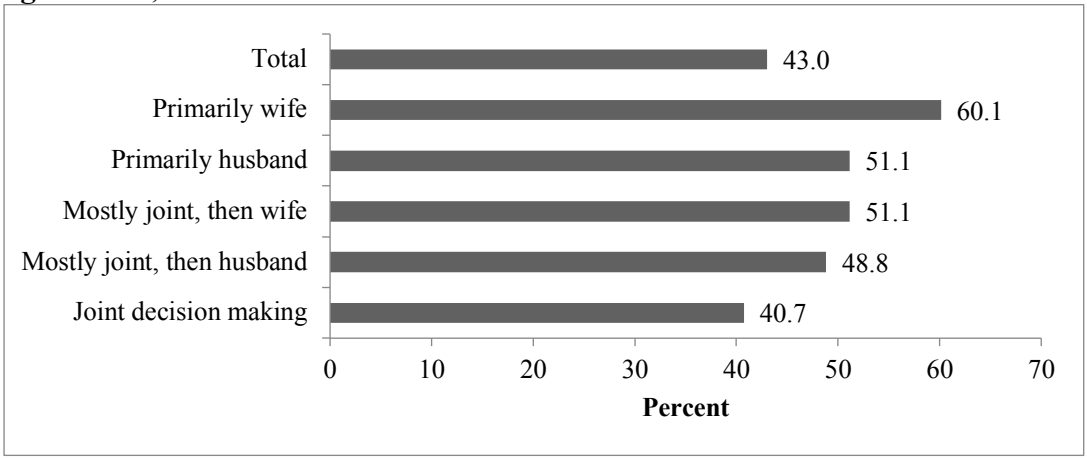
Figure 21. Low wellbeing (percentage) by access to financial resources and marital status, women aged 15-64, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

Finally, turning to household decision-making, which we examine for married women only, we find that women who reported that they were the primary decision maker were most likely to experience low wellbeing (60.1%), whereas women who reported that they make decisions jointly with their husbands had the lowest rates of low wellbeing (40.7%). These results need to be examined in a multivariate context, as decision-making within the household may be correlated with sociodemographic characteristics, but call into question whether women's independent decision making – which is often used as an indicator of agency – is better for their wellbeing more broadly speaking.

Figure 22. Low wellbeing (percentage) by household decision-making, married women aged 15-64, ELMPS 2018



Source: Authors' calculations from the ELMPS 2018.

4. Conclusion

Using the new measures available in the ELMPS 2018, our results demonstrate the relationship between different indicators of economic vulnerability and poor health in Egypt, as well as the substantial burden of poor health among the working age population that may in turn affect economic indicators. According to the ELMPS data, around one in six working-age individuals in Egypt has some level of disability in one of the six UN-WG domains. This is higher than the rate found in the 2017 Census and should be further explored. The implications of these figures for the accommodations and environmental changes that are needed to help people with disabilities integrate into and remain in the labor market, as well as have equal access to schooling among the young (see also El-Saadani and Metwally 2019) are of critical importance at the social, economic and personal levels. The fact that disability was strongly associated with low levels of subjective wellbeing may be one indication of the degree to which such conducive environments do not currently exist.

Our results also found a high rate of low subjective wellbeing in the Egyptian population. The only available national comparator in the MENA region is Palestine, where the percentage of the population suffering from low wellbeing on the WHO-5 scale was around 10 percentage points lower (Harsha et al. 2016) than we find in Egypt with the ELMPS. To the best of our knowledge, there is no validated cutoff point for the WHO-5 scale to be used as an indicator for clinical depression in Egypt. Given the simplicity of the scale and its clear sensitivity to different socioeconomic characteristics of the population, this would be a useful area for future research into vulnerability and health, particularly mental health, in the country.

Across our health measures, there were several groups that appear to be particularly vulnerable to poor outcomes. Key among these were divorced, and to a somewhat lesser degree widowed, women. The burden of poor health among divorced women was likely related to the social stigma attached to divorce in Egypt, as well as greater economic vulnerability among this group. The poor health indicators among widowed women were likely due to poorer health among the elderly population in general, across measures of disability, self-rated health and subjective wellbeing. Poor health and economic vulnerability among the elderly may also be

self-reinforcing, particularly if they do not have social and/or health insurance coverage. With the ageing of the Egyptian population and populations in MENA in general (Hussein and Ismail 2017), the elderly are thus a key population for whom further research is needed on mechanisms of economic support and means to address both economic vulnerability and the deterioration of health indicators after the age of 60.

Finally, it is likely that many of our results were driven by overlapping vulnerabilities. These overlapping vulnerabilities may explain why the wealth gradient in most of our health indicators is not as stark as when we examine more nuanced indicators of employment, or poverty and urbanity. For example, one particularly vulnerable group that emerges from our analysis is the urban poor, and particularly poor urban women. The nature of the social and economic stressors of urban life in Egypt that appear to be negatively impacting health deserve further exploration, as well as how these stressors act on the poor (especially poor women).

Another important example is related to our finding that poorer working conditions were associated with poorer health, and particularly low subjective wellbeing. These results may be driven by direct relationships between working environments and health, as well as accumulated forms of disadvantage. For instance, the least educated were more likely to be engaged in less secure forms of employment that may also expose them to greater hazards at work. All of these factors may influence health outcomes directly, or via the association with other forms of vulnerability. Similarly, the effect of women's agency on subjective wellbeing may be conditional on age, education or household structure. For these reasons, further multivariate studies are needed in order to disentangle the relationships between health and economic vulnerability in Egypt and to determine where interventions to improve health may be most successful.

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Appendix

UN-Washington Group on Disability Statistics Instrument

Do you have difficulty seeing, even if wearing glasses?	1. No - no difficulty 2. Yes - some difficulty 3. Yes - a lot of difficulty 4. Cannot do at all
Do you have difficulty hearing, even if using a hearing aid?	
Do you have difficulty walking or climbing stairs?	
Do you have difficulty remembering or concentrating?	
Do you have difficulty (with self-care such as) washing all over or dressing?	
Using your usual (customary) language, do you have difficulty communicating, for example understanding or being understood?	

WHO-5 Wellbeing Scale

Over the past two weeks….						
..I have felt cheerful and in good spirits	**All of the time (5)**	**Most of the time (4)**	**More than half the time (3)**	**Less than half the time (2)**	**Some of the time (1)**	**None of the time (0)**
..I have felt calm and relaxed						
..I have felt active and vigorous						
..I woke up feeling fresh and rested						
..my daily life has been filled with things that interest me						

Table A1. Detailed disability rates by age group (percentage) using the UN-WG instrument, ELMPS 2018

	Age Group							
	5-14	**15-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65+**	**Total**
Do you have difficulty seeing, even if wearing glasses?								
No - no difficulty	97.7	96.9	96.4	93.1	86.1	79.7	63.2	91.6
Yes - some difficulty	2.0	2.8	2.9	6.2	12.0	17.5	27.4	7.0
Yes - a lot of difficulty	0.3	0.3	0.5	0.6	1.7	2.5	8.3	1.2
Cannot do at all	0.0	0.0	0.1	0.1	0.2	0.2	1.1	0.2
Do you have difficulty hearing, even if using a hearing aid?								
No - no difficulty	99.1	99.1	98.8	98.5	96.6	92.0	75.0	96.5
Yes - some difficulty	0.6	0.6	0.8	1.3	2.9	6.7	20.4	2.9
Yes - a lot of difficulty	0.1	0.1	0.2	0.1	0.2	1.1	4.1	0.5
Cannot do at all	0.1	0.2	0.2	0.1	0.3	0.1	0.6	0.2
Do you have difficulty walking or climbing stairs?								
No - no difficulty	99.0	98.3	96.1	92.5	83.1	71.6	48.6	90.1
Yes - some difficulty	0.7	1.1	3.0	5.9	12.9	21.4	32.5	7.1
Yes - a lot of difficulty	0.1	0.5	0.7	1.3	3.6	6.1	16.3	2.4
Cannot do at all	0.1	0.2	0.1	0.2	0.3	0.9	2.6	0.4
Do you have difficulty remembering or concentrating?								
No - no difficulty	97.8	97.8	97.2	96.4	94.6	89.6	73.1	94.8
Yes - some difficulty	1.7	1.6	2.3	3.0	4.5	8.7	21.1	4.2
Yes - a lot of difficulty	0.3	0.4	0.4	0.4	0.7	1.5	5.2	0.8
Cannot do at all	0.2	0.2	0.2	0.3	0.2	0.1	0.6	0.2
Do you have difficulty (with self-care such as) washing or dressing?								
No - no difficulty	98.5	99.0	99.2	98.6	97.5	94.8	81.9	97.2
Yes - some difficulty	1.1	0.5	0.5	0.8	1.8	3.7	11.6	1.9
Yes - a lot of difficulty	0.2	0.3	0.2	0.3	0.6	1.1	4.3	0.6
Cannot do at all	0.2	0.2	0.1	0.3	0.2	0.4	2.2	0.3
Using your usual (customary) language, do you have difficulty communication?								
No - no difficulty	98.2	98.7	98.7	98.5	97.3	96.7	88.6	97.5
Yes - some difficulty	1.3	0.7	0.9	0.9	1.7	2.7	8.5	1.7
Yes - a lot of difficulty	0.3	0.4	0.2	0.3	0.6	0.4	2.4	0.5
Cannot do at all	0.2	0.2	0.2	0.3	0.4	0.2	0.6	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	11,505	9,857	10,457	7,152	4,646	3,744	3,273	50,634

Source: Authors' calculations from the ELMPS 2018.

Table A2. Percentage of population with a disability using broad, medium and narrow definitions, by sociodemographic characteristics, working aged population 15-64, ELMPS 2018

	Definition		
	Broad	**Medium**	**Narrow**
Education			
Illiterate	24.6	7.5	1.9
Reads & Writes	21.3	4.2	0.4
Primary	14.9	3.3	0.7
Preparatory	11.4	2.7	0.5
General secondary	10.2	2.2	0.5
Vocational secondary	12.7	2.2	0.2
Tertiary	12.7	2.4	0.3
Marital status			
Never married	9.4	3.1	1.2
Married	16.7	3.4	0.4
Divorced	18.3	3.4	0.6
Widowed	38.8	11.3	1.3
Region			
Gr. Cairo	17.9	4.5	0.8
Alx. Sz C.	28.6	6.3	0.5
Urb. Lwr.	15.1	3.4	0.8
Urb. Upp.	10.7	2.2	0.7
Rur. Lwr.	15.4	3.6	0.7
Rur. Upp.	12.0	2.9	0.6
Urban/Rural			
Urban	18.0	4.2	0.7
Rural	13.9	3.3	0.7
Total	**15.6**	**3.7**	**0.7**

Source: Authors' calculations from the ELMPS 2018.

Table A3. Self-rated health by sex, disability and chronic illness status, working aged population 15-64, ELMPS 2018

			Very good/ excellent	Good	Fair/bad/very bad	Total
Women	**Broad disability**	No	42.4	51.9	5.7	100.0
		Yes	14.7	45.7	39.6	100.0
	Narrow disability	No	38.2	51.0	10.8	100.0
		Yes	5.8	16.3	77.9	100.0
	Chronic illness	No	44.2	51.6	4.1	100.0
		Yes	9.4	47.6	43.0	100.0
Men	**Broad disability**	No	43.4	51.0	5.6	100.0
		Yes	15.1	47.8	37.0	100.0
	Narrow disability	No	39.3	50.7	10.0	100.0
		Yes	11.8	22.9	65.3	100.0
	Chronic illness	No	44.2	51.3	4.5	100.0
		Yes	7.8	46.2	46.0	100.0

Source: Authors' calculations from the ELMPS 2018.

Table A4. Self-rated health by wealth quintile and sex (percentage), working aged population 15-64, ELMPS 2018

		Very good/ excellent	Good	Fair/bad/very bad	Total
Men	Q1	36.3	48.7	15.0	100.0
	Q2	38.6	50.9	10.4	100.0
	Q3	38.9	51.4	9.8	100.0
	Q4	40.1	48.8	11.2	100.0
	Q5	36.4	54.4	9.2	100.0
	Total	38.1	50.9	11.0	100.0
Women	Q1	40.9	44.8	14.2	100.0
	Q2	39.7	50.1	10.2	100.0
	Q3	37.3	52.3	10.4	100.0
	Q4	40.3	51.5	8.2	100.0
	Q5	37.5	53.5	9.0	100.0
	Total	39.1	50.6	10.3	100.0

Source: Authors' calculations from the ELMPS 2018.