

# **Healthy and Unhealthy Working Life Expectancy Across Emerging Welfare States: How Micro- and Macro-level Factors Shape Who Works Longer in Poorer Health**

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## **Short abstract**

Population aging and longer working lives makes it crucial to understand the relationship between health and employment across various contexts. These issues are particularly relevant for emerging welfare states that are balancing expanding social protection systems with high informal employment. Additionally, they sit at the nexus of demographic and health transitions, managing old-age employment amidst rising chronic disease burden and limited social protection. Healthy and unhealthy working life expectancy are valuable indicators for assessing the work-health relationship, especially within and between populations. Therefore, using a discrete-time multistate modelling approach, this study examines how micro- and macro-level factors shape healthy and unhealthy working life expectancy at age 50 across these emerging welfare states: China, Costa Rica, Mexico, South Africa, and South Korea. Expectancies are estimated by gender, education, place of residence, marital status, public pension receipt, and private health insurance coverage. Preliminary analyses based on nine waves (2006–2022) of the Korean Longitudinal Study of Aging show that men and women spend 26% and 14% of their remaining life expectancy working in poor health, respectively. Differences are more pronounced by urban/rural residence and private health insurance coverage. Individuals from rural areas and with private health coverage work longer in poorer health than those from urban areas and without private health coverage. These findings suggest that micro- and macro-level factors jointly structure late-life work and health. Future analysis will examine the other countries and compare how healthy and unhealthy working life expectancies differ and which factors may have larger influences.

## **Extended abstract**

### **Introduction**

As population compositions shift, so does the age structure of who participates in the labor force. The working age population is declining and older adults are working more and longer than ever before. These changes are especially consequential for countries with less developed welfare regimes, where the growing population of older adults are expected to place increasing strain on health and social security systems. While many European countries have advanced welfare systems that are better equipped to handle this increasing burden, other (mainly middle-income) countries are still in the growing process. These emerging welfare states are characterized by their more recent economic growth and expansion towards universal social protection (Dorlach, 2021; Huber & Niedzwiecki, 2015). They also tend to have higher levels of informal employment, which has been linked to poorer health outcomes (Aronsson & Soysa, 2025).

Many of these emerging welfare states are also situated at the nexus of demographic and health transitions, grappling with population aging and a rising prevalence of non-communicable diseases atop existing burdens of infectious diseases, maternal and child health, and external mortality. When this is combined with longer working lives, it raises concerns about whether people are actually working longer in good or poor health. Existing evidence largely shows that people with poor health exit the labor market early (Gurgel do Amaral et al., 2022; Lee et al., 2018), but differences in job type, financial need, and welfare context add uncertainty into how long and under what conditions people continue working despite poor health (Baxter et al., 2021; Di Gessa et al., 2018; Madero-Cabib et al., 2020).

Healthy and unhealthy working life expectancy (HWLE and UHWLE) are estimates of how long people are expected to work in healthy or unhealthy states, respectively (Lievre et al., 2007). These indicators are useful for assessing the relationship between work and health, especially in light of recent policies promoting healthy aging and extended working lives. While these policies have mainly been implemented in rapidly aging high-income countries, it may be even more timely to estimate HWLE and UHWLE in emerging welfare states to understand current conditions before these challenges become more pressing. Existing evidence shows that men consistently have higher HWLE and UHWLE than women (Boissonneault & Rios, 2021; Feraldi & Dudel, 2025). In the US, the high educated have higher HWLE (Feraldi & Dudel, 2025), but in China and South Korea, the low educated have higher HWLE and UHWLE (Huang et al., 2025; Yang et al., 2025). However, inconsistencies in how health and work are defined (Feraldi & Dudel, 2025), as well as social and structural differences between countries, complicate comparisons across studies, making it difficult to identify key determinants of HWLE and UHWLE outside of gender and education. A more comprehensive and cohesive approach is needed to understand how various social and structural factors influence HWLE and UHWLE across countries.

Therefore, this paper aims to examine how micro- and macro-level factors shape HWLE and UHWLE across the following emerging welfare states: China, Costa Rica, Mexico, South Africa, and South Korea. Using harmonized data and definitions, we aim to answer the following research questions:

1. How does HWLE and UHWLE differ across these countries?
2. How does HWLE and UHWLE differ by micro-level factors within countries? Are there larger between-country differences for some of these factors compared to others?
3. How does HWLE and UHWLE differ by macro-level factors?

### **Data and Methods**

For this abstract, data come from nine waves (2006-2022) of the Gateway to Global Aging harmonized version of the Korean Longitudinal Study of Aging (KLoSA) (De La O et al., 2025; Korea Employment Information Service, 2023). The original sample includes 10,254 individuals, with a refreshment sample of 920 participants in wave five (N=11,174). After excluding participants younger

than 50 years, who were only present in one wave (because we need to observe at least one transition), and who were missing information on education, financial transfers, and private health insurance, I end up with  $n=10,338$  individuals ( $n=58,538$  observations). Future analysis will include data from the China Health and Retirement Longitudinal Study (CHARLS), the Costa Rican Longevity and Healthy Aging Study (CRELES), the Mexican Health and Aging Study (MHAS), and the South African National Income Dynamics Study (NIDS) to provide cross-national comparisons across different emerging welfare states.

All data is based on self-report. Working status is defined by whether an individual reports “working or pay” or “not working for pay”. Health is defined using a count of nine chronic conditions: arthritis, cancer, chronic lung disease, diabetes, heart disease, hypertension, liver disease, psychiatric problems, and stroke. Participants were asked if they were ever told by a doctor or healthcare professional that they were diagnosed with one of these conditions, and if they answered “yes”, they were not asked again in subsequent waves, indicating the chronic nature of these conditions. Multimorbidity is present if the individual has two or more of the aforementioned conditions. Future analysis may include other commonly used indicators of health, such as disability status or an indicator of whether the participant’s health limits their ability to work.

Participants are categorized into one of the following states: “Working, no disease”, “Working, one disease”, “Working, multimorbidity”, “Not working, no disease”, “Not working, one disease”, or “Not working, multimorbidity”, and “Death”. They can then remain in the same state or transition to another state across waves. Death is an absorbing state, and individuals can transition between working statuses but not between health statuses because of the chronic nature of the included conditions.

Independent variables include: continuous age, gender (man/woman), education (middle school or less/at least secondary school), residence (urban/rural), marital status (married/not married, where not married includes being single, divorced, separated, or widowed), co-residence (residing with children/not residing with children), financial transfers (receiving financial transfers from children/not receiving financial transfers from children), public pension (receiving/not receiving), and health insurance (public/private/public and private). Gender, education, residence, and marital status represent the micro-level factors we are interested in examining. Macro-level factors include receiving public pension and having private health insurance coverage, which in the Korean case indicates having private insurance on top of the universal health coverage provided by the state.

Multinomial logit models are used to predict the probability of transitioning between the different work-health states and death for combinations of gender and education, residence, marital status, public pension, and health insurance. These transition probabilities are then input into discrete-time multistate Markov models to estimate HWLE and UHWLE at age 50, separately for each of the stratification variables, with 95% confidence intervals computed based on asymptotic theory and the delta method (Schneider, 2023). For brevity, HWLE is the time spent working with no disease and UHWLE is the time spent working with one disease or multimorbidity.

### **Preliminary results**

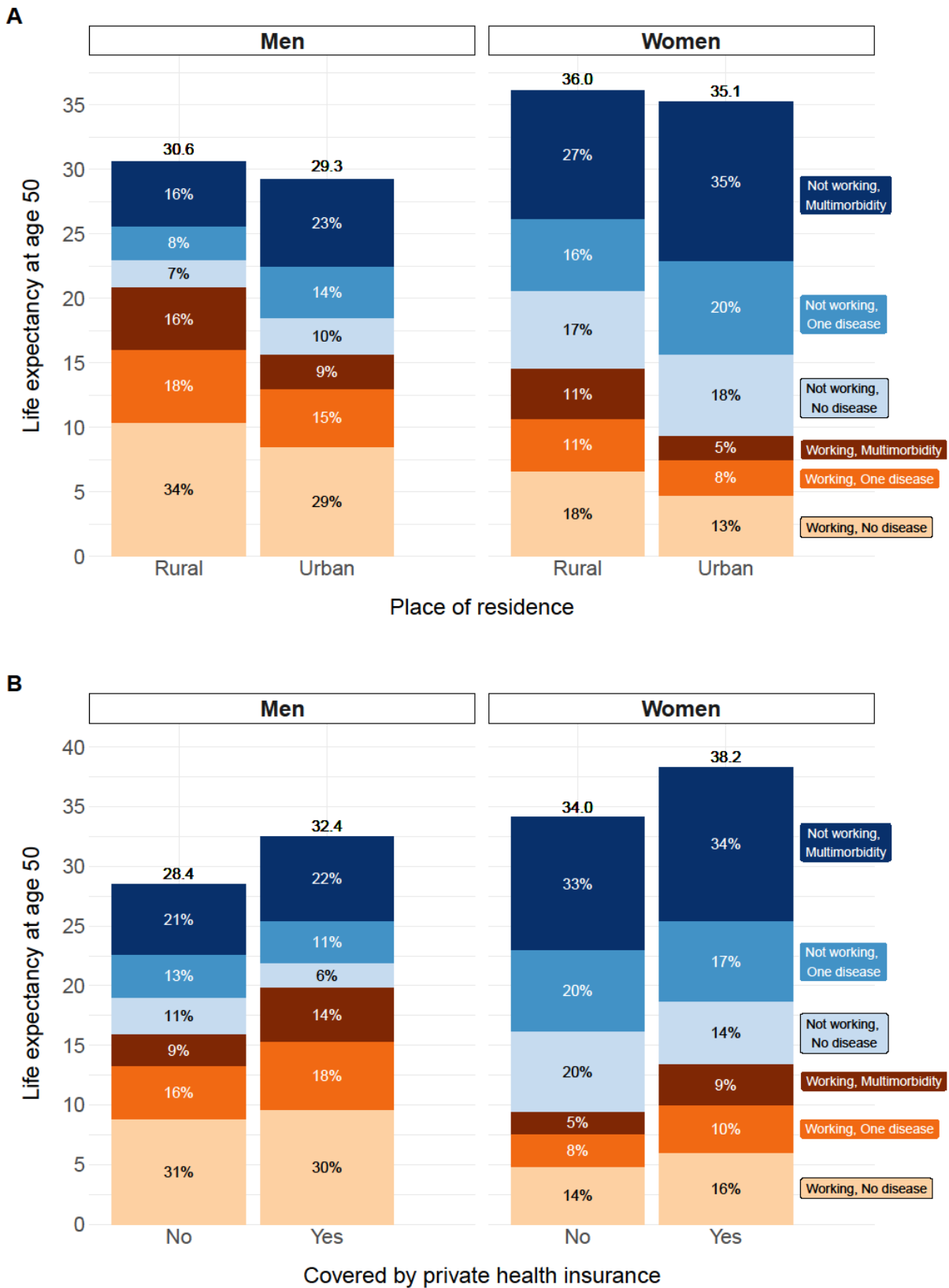
Preliminary results show that men in Korea spend 26% of their remaining life expectancy at age 50 working in an unhealthy state, while women spend 14% (not shown). These estimates are similar regardless of marital status, education level, or receiving a public pension. However, there are larger differences comparing urban/rural residence and private health insurance coverage (Figure 1, panel A and B). Men and women from rural areas work substantially longer than their urban counterparts. Men and women in rural areas spend 34% and 22% of their remaining life expectancy at age 50 working with poor health compared to 24% and 13% of men and women in urban areas, respectively. Men and women with private health insurance coverage work longer in poorer health (32% and 19% of remaining life expectancy at age 50, respectively) compared to those who do not have private health insurance (25% and 13% for men and women, respectively).

These findings demonstrate how micro- and macro-level factors shape work and health in Korea, both individually and jointly. The gender gap in HWLE and UHWLE likely reflects the gendered division of labor that plays a prominent role in Korean society. The urban/rural difference could indicate occupational differences in access to social security or desires to work. Lastly, individuals having additional private health insurance but higher UHWLE could suggest that they may have either a greater need for health services or more resources to obtain additional coverage, but at the same time are able to manage their conditions.

Once analyses are complete for the other countries, this study should provide a useful overview of how micro- and macro-level factors contribute to differences in unhealthy working life expectancy within and between emerging welfare states. Future analysis will also investigate whether disease onset occurs earlier or retirement occurs later for certain groups compared to others to better disentangle the mechanisms driving the work and health trajectories of older adults.

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**Figure 1.** Life expectancy at age 50, split into time spent in different work and health states, separately for men and women and by A) place of residence or B) private health insurance coverage