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The Socioeconomic Status Gradient in Pain: A Cross-Country Analysis

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Chronic pain is a fundamental dimension of well-being and is one of the most common reasons people seek medical care and take medications. Pain also complicates the treatment of other diseases and limits one's ability to work and function in the society. At the individual level, it is associated with a series of negative outcomes, including depression, job loss, reduced quality of life, impairment of function and disability. At the societal level, it imposes considerable costs on the health care system and the economy. Taking into account both the direct costs of medical treatment, and the indirect costs associated to the loss in productivity, the Institute of Medicine has estimated that chronic pain affects approximately 100 million U.S. adults at a cost of $560 - 635 billion every year. These figures are greater than the annual costs of heart disease, cancer, or diabetes (IOM, 2011).

Our current understanding of people's pain experiences has been largely limited by data availability (Case and Deaton, 2015; Kahneman, and Krueger, 2006; Krueger and Stone, 2008). Most research so far has focused on the US, where chronic pain has been deeply intertwined with the opioid crisis (Case and Deaton, 2015, 2017, 2022; Cutler, Meara and Stewart, 2020; Lamba and Moffitt, 2023), but little is still known about pain in Europe.

In this paper, I investigate the extent to which chronic pain is associated with socioeconomic status in mid-life in fourteen European countries (Luxembourg, Switzerland, the Netherlands, Austria, Denmark, Sweden, Germany, Belgium, France, Italy, Spain, Czech Republic, Slovenia, and Estonia) and the United States. Specifically, I exploit newly available

harmonized data from the Survey of Health, Ageing and Retirement in Europe (SHARE) and the Health and Retirement Study (HRS) to study (i) the variability in the rates of pain across the 15 countries, (ii) whether sex-based differences in pain are relatively similar across countries, (iii) which country-specific characteristics matter the most for people in the bottom of the income distribution (Chetty et al., 2016), and (iv) whether greater use of pain medication is associated with lower rates of aggregate pain (Krebs et al., 2018).

The HRS has been asking questions about pain since its first wave, while SHARE started in 2013. Therefore, I use all the available waves of SHARE (starting with the 2013 wave) and the corresponding HRS waves. To measure chronic pain, I rely on two questions. Both surveys ask respondents whether they are troubled with pain, and if they are, the questionnaires then ask how bad the pain is most of the time (and give the options: mild, moderate or severe). I consider respondents answering "yes" to the initial question as individuals experiencing chronic pain and I combine responses to both questions to create a 4-category "pain intensity" variable for each survey: no pain, mild pain, moderate pain, and severe pain.

In the preliminary analysis conducted so far, I find that pain is part of life for two out of five midlife individuals, with wide heterogeneity across countries, from 23% of Swiss to 53% of French (Figure 1). Perhaps surprisingly, given the widespread use of opioids and the "death of despair" narrative in the US, the prevalence of pain in the US (34%) seems to be in line with other European countries (38%).

In every country, more women are bothered by pain than men, but the gender gap differs across countries: in Slovenia and the Mediterranean countries (Italy and Spain) the gender gap is quite large, compared to the US and some other countries (Figure 2). While reporting styles may explain some of these differences, some patterns are consistent across countries and the disparities are fairly large.

That markers of socioeconomic status, such as education and income, are associated to health outcomes is by now quite well established (e.g. Cutler and Lleras-Muney, 2008). The association between socioeconomic status and pain, however, has only been recently receiving attention among researchers, and so far, the focus has been mostly on education in the US (e.g. Atlas and Skinner, 2010; Case and Deaton, 2015, 2017, 2022; Case, Deaton and Stone, 2020; Cutler, Meara and Stewart, 2020). SHARE and HRS allow me to go beyond education and consider additional dimensions of socioeconomic status, such as income and

occupation.

I first document the existence of dramatic differences in the prevalence of pain by educational attainments in Europe as well as in the US. In every country, individuals with less than high school are much more likely to be troubled by pain than those that have completed secondary education, and these two categories are more likely to report pain than those with higher educational attainments (Figure 3).[1] [2] Next, I provide evidence that the reporting of pain shows a strong gradient also according to income quintiles, across all the countries in the sample. Arguably more importantly, I find more country-level variation in the lowest income quintile (Figure 4) as well as in the lowest education group (Figure 3), suggesting that country-specific characteristics matter the most for people at the bottom of the income distribution. This finding is similar to Chetty et al. (2016)'s results for the association between income and life expectancy.

What can explain this strong association between pain and socioeconomic status and the observed disparities? A possible explanation for these differences is that people with lower socioeconomic status are more likely to have worked in manual jobs, or to suffer from poor health. In the multivariate analysis, I estimate probit regressions (for the prevalence of pain) and ordered probits (for the intensity of pain) to assess the importance of occupation, industry, and health status in explaining cross-country differences.

The preliminary findings emphasize the need for public policy intervention promoting pain prevention and management strategies addressing the most vulnerable groups of the population.

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[1] The only exception is the Netherland.

[2] For every country, there is also a strong gradient in the intensity of pain according to individuals' educational attainments. Not only the less educated are more likely to be in pain, they are also more likely to experience more severe pain levels than the rest of the population (Figure 5).

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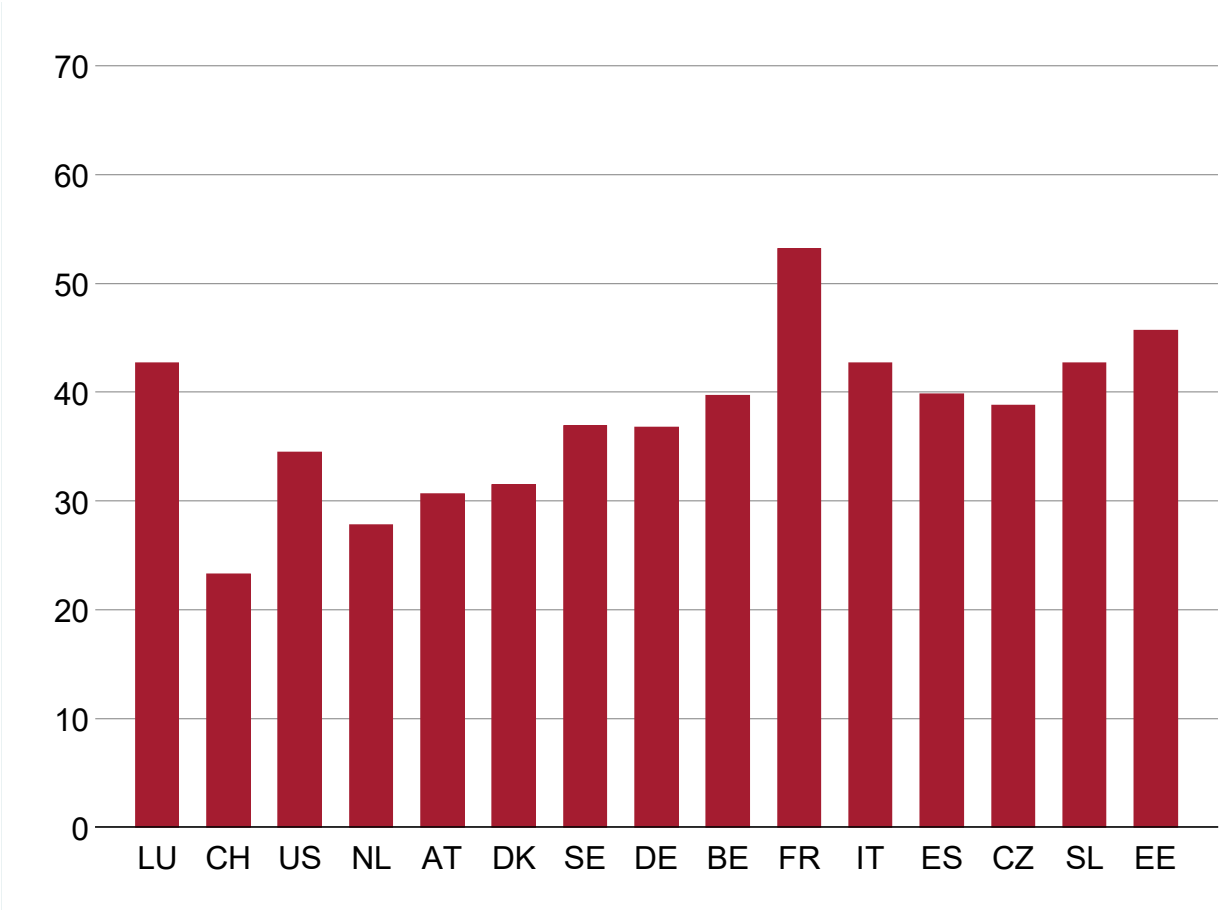
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Disclosure Statement

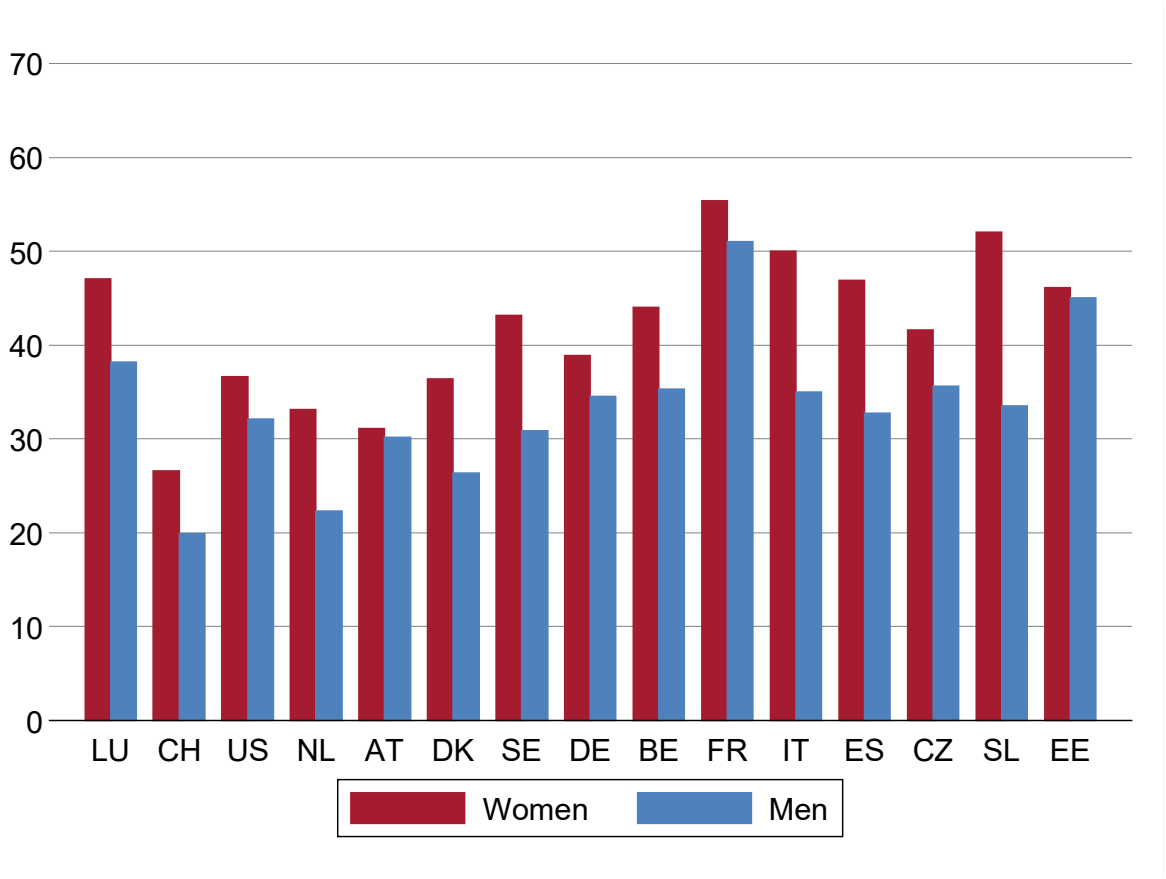
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Figure 1. Prevalence of Pain by Country



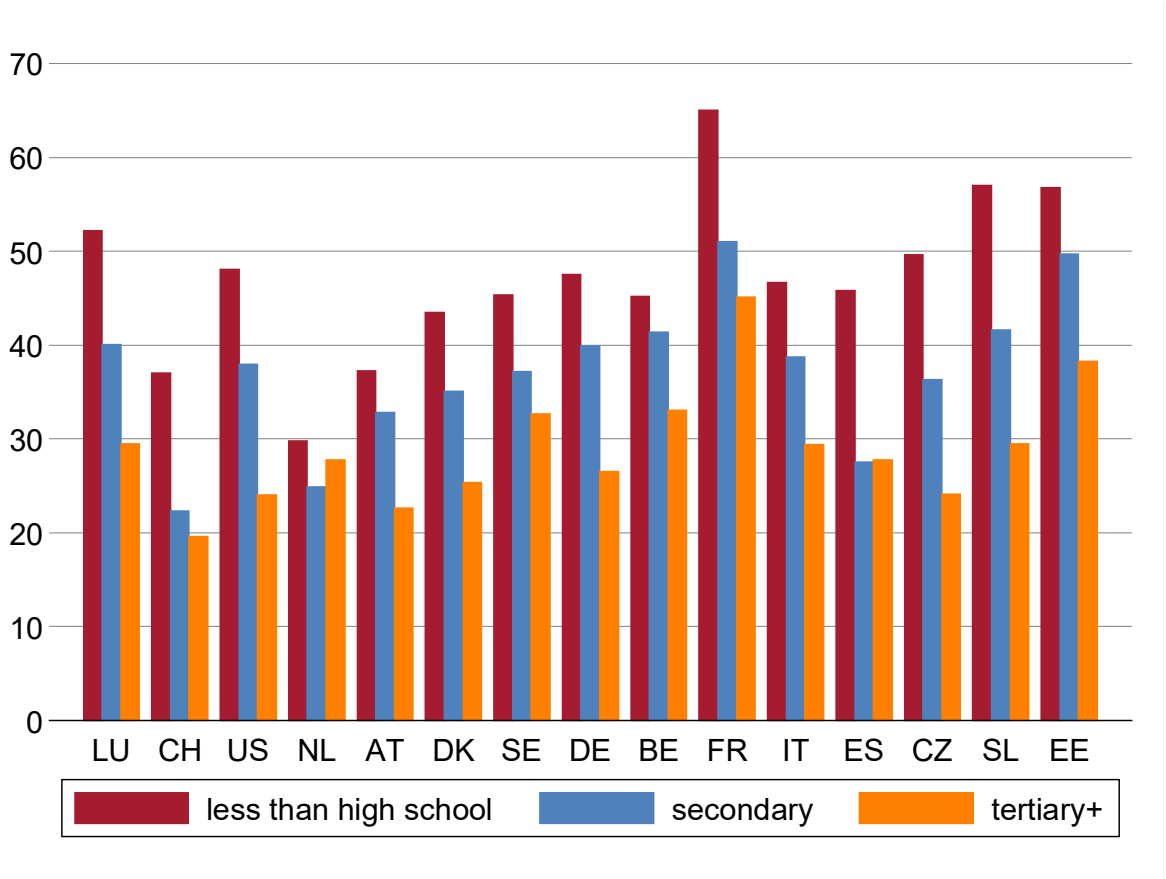
Notes: Percentages. Countries ordered according to per capita GDP ranking.
Source: SHARE wave 5 and HRS 2012. Age 50-64. Weighted.

Figure 2. Prevalence of Pain by Gender and Country



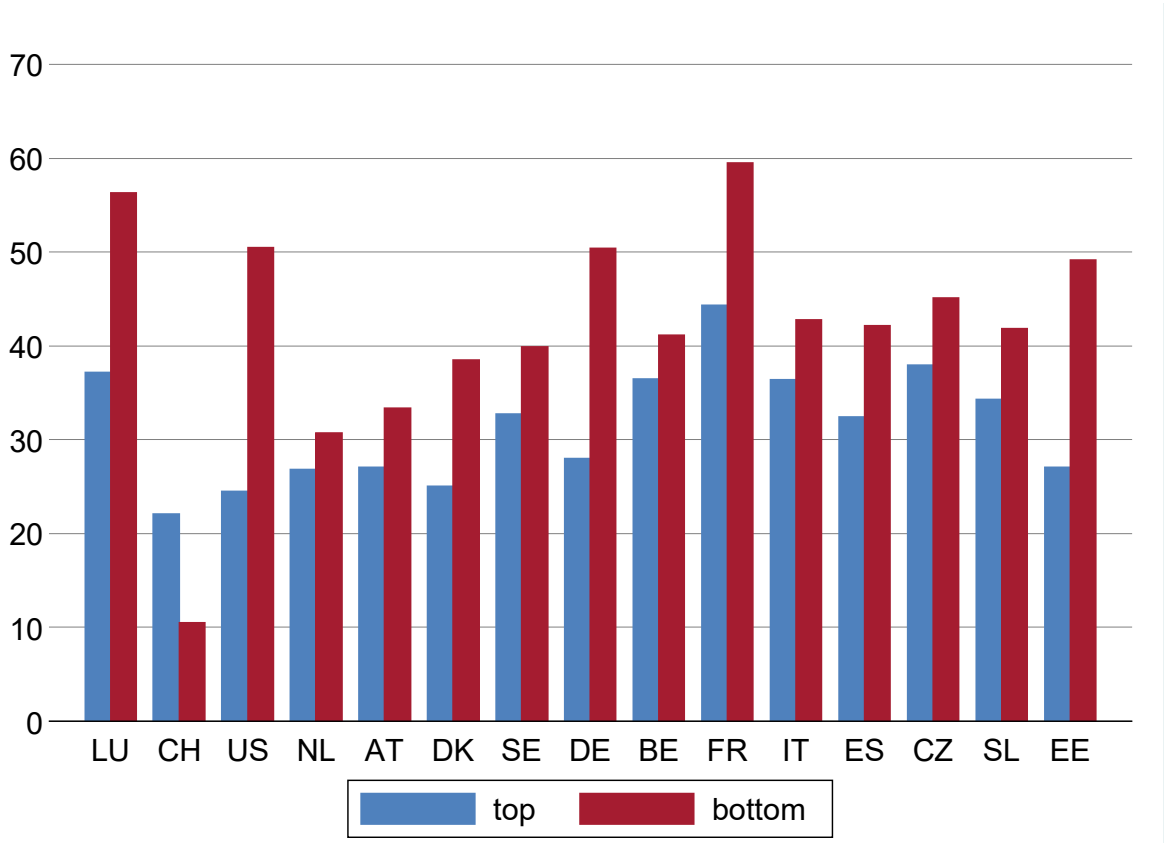
Notes: Percentages. Source: SHARE wave 5 and HRS 2012. Age 50-64. Weighted.

Figure 3. Prevalence of Pain and Education



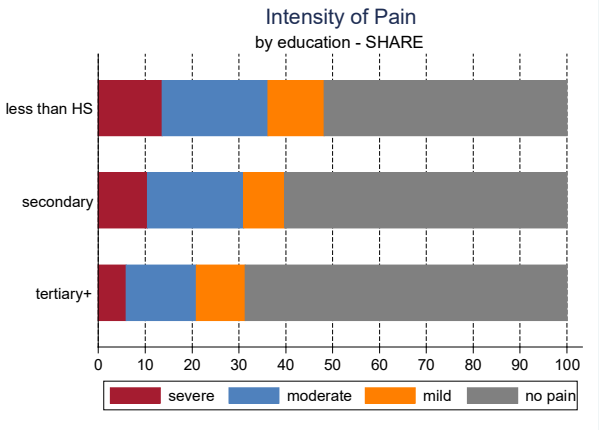
Notes: Percentages. Source: SHARE wave 5 and HRS 2012. Age 50-64. Weighted.

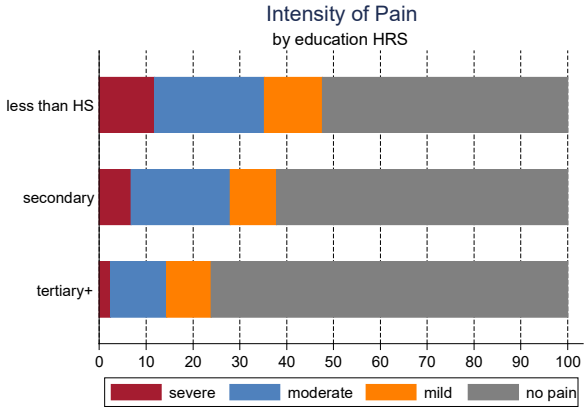
Figure 4. Prevalence of Pain by Country
Top and bottom equivalent income quintile



Notes: Percentages. Source: SHARE wave 5 and HRS 2012. Age 50-64. Weighted.

Figure 5. Intensity of Pain and Education





Notes: Percentages. Source: SHARE wave 5 and HRS 2012. Age 50-64. Weighted.