Rise and Fall of the Deaths of Despair Burden across European Regions, 2002–2019

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Abstract

Concerns about stagnating life expectancy in the United States (US) have recently focused on the burden of "deaths of despair". While extensively studied in this country, evidence for Europe remains fragmented and mostly national. We present the first systematic regional analysis of despair-related mortality across 20 European countries from 2002–2019, using age-standardized years of life lost (YLL) to capture the burden of premature deaths. We estimate trends by sex, age, and cause, identify statistically significant regional increases or declines, and compare our findings to the US as a benchmark. Our preliminary results suggest that the picture is less alarming for overall Europe than in the US, but worrying sub-patterns are emerging. Acute alcohol mortality has risen sharply in many Northern and Eastern European regions among older adults, while deaths from drugs and toxic substances have increased among younger adults in Germany, the Netherlands, the UK, Sweden, and Spain.

1 Introduction

In recent years, scholars have expressed growing concern about the slowdown in life expectancy improvements observed in high-income countries (Andrade et al., 2025; Dowd et al., 2024; Olshansky et al., 2024; Timonin et al., 2024). National experiences such as those of the United Kingdom and Germany (Jasilionis et al., 2023; Leon et al., 2019), where life expectancy stagnated or even declined during the 2010s, have raised pressing questions about the future of human longevity.

This concern has its roots in the experience of the United States, where life expectancy first diverged from that of other high-income countries before stagnating and ultimately declining during the 2010s. Looking at the epidemiological causes of this "lost decade", the scientific community highlighted most notably the diminishing gains from reductions in cardiovascular mortality (Bramajo-Hemsi and Mehta, 2025; Mehta et al., 2020). At the same time, attention has increasingly focused on what Case and Deaton (2020) labeled "deaths of despair," encompassing alcohol-related diseases, suicides, and drug overdoses, which are on the rise in the US. These causes of death have resonated strongly beyond the scientific community because they disproportionately affect working-age people as well as specific population groups, and are widely viewed as preventable deaths.

To date, the evolution of deaths of despair in Europe has been examined primarily in national contexts (Augarde et al., 2022; Piñeiro et al., 2023), leaving a gap in comprehensive continental analysis. Evidence at a fine-grained geographic scale is particularly lacking, yet such regional analysis is crucial, as national averages may conceal substantial local disparities—especially for categories of despair mortality that disproportionately affect specific populations. A broader European perspective also makes it possible to identify potential transnational clusters that transcend national and administrative boundaries. Finally, because deaths of despair encompass diverse realities, analyses disaggregated by cause, sex, and age group are essential to fully capture their complexity.

In this proposal, we will analyze the evolution of despair mortality since the early 21st century across 20 European countries, at the regional level, using the United States situation as a benchmark. While aggregate results for our panel of countries suggest that the situation is not alarming overall, a more detailed analysis reveals marked increases in recent years for specific causes of death, certain age groups, and distinct regional clusters.

2 Data and methods

We compiled regional mortality data by cause of death (according to the 10th ICD), age, and sex, complemented with population data by age and sex, for a panel of 20 European countries. The dataset covers the period 2002-2019 for all countries of our panel, except Ireland for which the data starts in 2005. We deliberately excluded the pandemic years, as data for this period remain more fragile.

Because the raw data were sometimes available at very fine geographic levels, we aggregated them to at least the NUTS-2 level. This choice ensures that 95% of units included in the analysis represents a population of at least 350,000 inhabitants aged 15+ in 2019, reducing volatility in the observed trends. To further enhance robustness, we grouped the annual data into non-overlapping three-year periods (2002–2004, 2005–2007, and so forth), thereby smoothing short-term fluctuations while preserving longer-term dynamics.

We adopted the classification of "deaths of despair" as defined by the US Senate[1]. Within this framework, we distinguished four main groups of causes: suicides (ICD-10 codes X60-84 and Y10-34), acute alcohol-related deaths (F10 and X45), liver diseases (K70, K73, K74), and drug- and toxic substance-related deaths (F11-16, F18, F19 and X40-44, X46-49).

To analyze the burden of despair mortality, we relied on the Age-Standardised Years of Life Lost (hereinafter Years of Life Lost or simply YLL) metric, widely used in public health to assess the impact of premature mortality (Martinez et al., 2019). YLL quantifies the cumulative years of life lost relative to the expected remaining life expectancy for each death, and applies age-standardization to account for differences in population age structures. This allows for meaningful comparisons across populations and over time. Importantly, the metric is additive across ages, causes, and periods, which facilitates aggregation, while also giving greater weight to deaths occurring at younger ages, since they imply a larger loss of potential life.

We estimate trends separately by sex (total, men, and women), category of deaths of despair (total, acute alcohol, suicides, liver diseases, drugs and toxic substances), and age group (total, 15–64, and 65+). To assess recent developments in despair mortality, we evaluate trends over four alternative subperiods (2003–2018, 2006–2018, 2009–2018, and 2011–2018) by fitting linear regressions to the YLL values within each interval. This floating starting year allows us to capture potential non-monotonic patterns, such as U-shaped or inverted-U-shaped trajectories. For each region and subgroup, we retain only trends that are statistically significant at the 5% level and, among them, select the one with the lowest p-value. This conservative strategy ensures that we do not over-interpret random fluctuations, which can be especially problematic in the smallest regional populations. As a result, a region may display no significant trend, a significantly increasing trend, or a significantly decreasing trend. For each significant trend, the procedure yields three key pieces of information: the starting date, the slope of the regression line (annual change in YLL), and the total variation in burden, computed as the product of the duration and the annual change in YLL.

3 Preliminary results

Figure 1 summarizes our preliminary results. Given the space limitations of this extended abstract, we present findings for the total population (both sexes combined) and for adults aged 65 and above, as this group displays the most concerning increases. Results disaggregated by sex, age group, and specific categories of deaths of despair are also available and will be presented in the full paper.

The first column of Figure 1 displays scatterplots where the x-axis represents the annual change in YLL (i.e., the slope of the regression trend) and the y-axis shows the YLL value observed in the final period of the study (2017–2019). Blue dots indicate regions with declining deaths of despair, with darker shades representing steeper declines, while red dots indicate regions with increasing deaths of despair, with darker shades corresponding to steeper increases. Only regions with statistically significant trends are shown. For comparison, the U.S. situation is also included in each scatterplot and indicated by a black dot. The second column maps the x-axis values from the scatterplots, highlighting the regions identified as increasing (red) or decreasing (blue), while regions in gray are those without significant trends. The third column maps the y-axis values from the scatterplots, that is, the YLL levels in 2017–2019. Each row of the figure corresponds to a specific category of deaths

[1] https://www.jec.senate.gov/public/_cache/files/0f2d3dba-9fdc-41e5-9bd1-9c13f4204e35/jec-report-deaths-of-despair.pdf

of despair, with the first row presenting suicides and the last row drugs and toxic substances.

In these age groups, the most concerning pattern relates to acute alcohol mortality (third row). For this category, we observe a significant increase in many regions, with particularly sharp rises in several Polish, German, and Belgian regions. The map on the right confirms that these areas also had the highest levels in 2017–2019, whereas Southern Europe displayed much lower values. The same applies to the United States, as illustrated by the black dot in the scatterplot.

For drugs and toxic substances—the main driver of the rise in U.S. mortality—the levels reached in Europe remained much lower in 2017–2019. Nevertheless, we find significant recent increases in years of life lost in a number of German, Dutch, British, Swedish, and Spanish regions.

4 Discussion and furthur works

Our proposal will show that, although scholarly and policy attention has focused less on Europe than on the United States in the context of despair mortality, some European situations clearly deserve closer scrutiny. At the aggregate level (results presented during the conference), overall mortality from deaths of despair has increased in only a limited number of regions, notably in Flanders, the Netherlands, England and Wales, as well as in selected Polish and Swedish regions. A more detailed perspective, however, reveals a far broader set of situations of concern. Among older adults (65+), mortality linked to acute alcohol use has risen across many regions of Northern and Eastern Europe. Similarly, mortality from drugs and toxic substances has increased significantly among those aged 15–64 in a wide range of European regions (results presented during the conference). These findings suggest that while the overall European picture may appear less alarming than the U.S. experience, important and heterogeneous dynamics are unfolding below the surface.

Our analytical strategy strengthens confidence in these findings. By (1) aggregating data into large regional units, (2) using non-overlapping three-year periods, and (3) focusing exclusively on upward or downward trends with strong statistical significance, we adopted a deliberately conservative approach. This ensures that the increases we highlight are both robust and reliable, while still allowing us to investigate mortality dynamics at a relatively fine geographic scale, which is particularly important for this type of analysis.

Beyond the analysis of this specific cause of mortality, our results contribute to the broader debate on the slowdown of life expectancy gains in Europe. In earlier work, we showed that this slowdown has gone hand in hand with a divergence in life expectancy between European regions, with lagging regions experiencing stagnation while leading regions continued to improve (Sauerberg et al., 2024). Our preliminary findings suggest that the rise in deaths of despair is partly concentrated in these lagging regions, which may help explain such divergent trends.

Looking ahead, and in preparation for the EPC conference, we plan to incorporate regional cause-of-death data for England and Wales. This addition is particularly important given the recent stagnation of life expectancy in the United Kingdom and our preliminary evidence suggesting a notable rise in deaths of despair there. We also intend to test the robustness of our results using alternative metrics, such as standardized death rates (SDRs) or losses in life expectancy. Finally, we will seek to extend our dataset to more recent years to provide a first assessment of the COVID-19 period and beyond, thereby examining whether the worrying trends we identified have been disrupted by the pandemic or, on the contrary, have worsened.

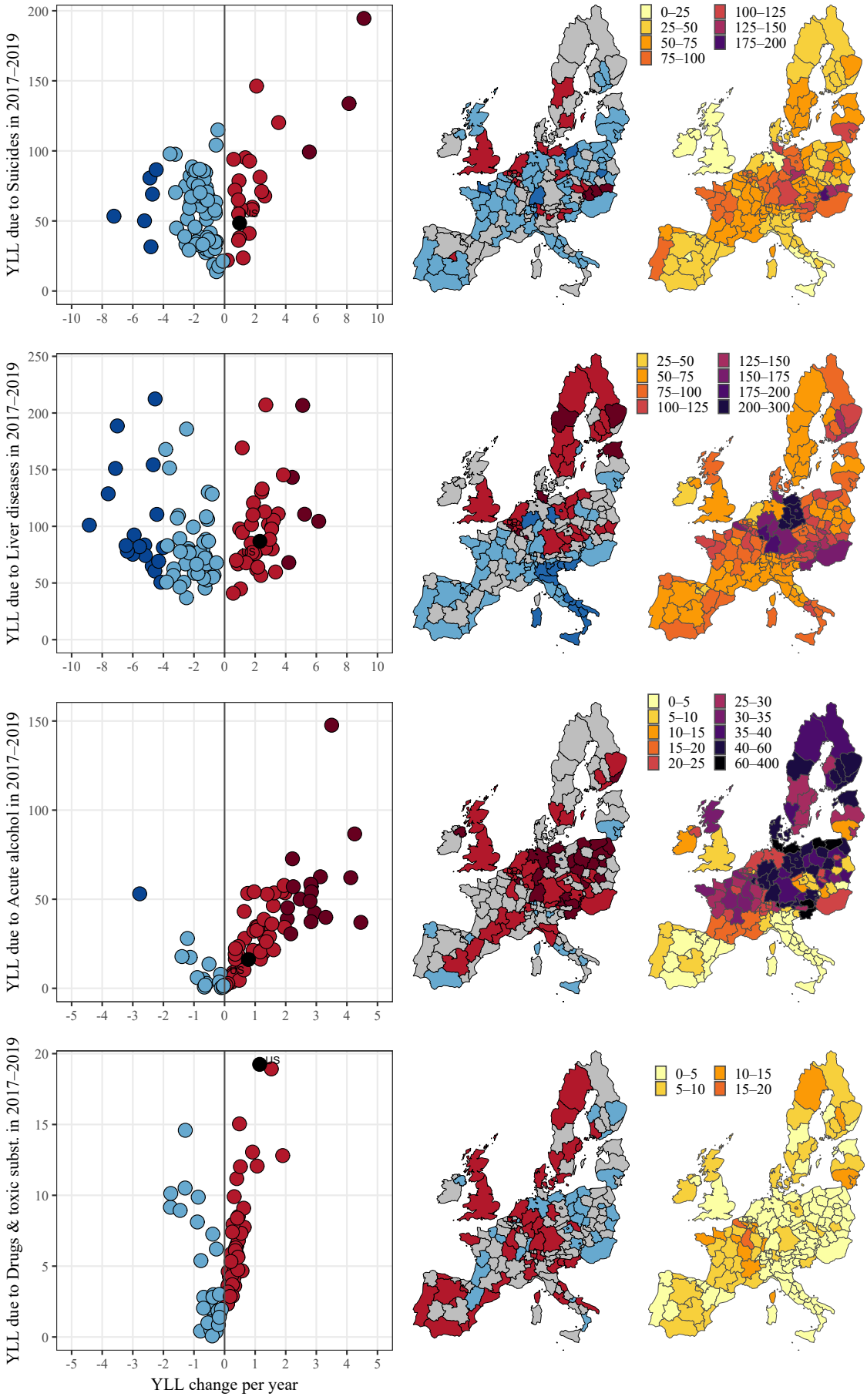

Figure 1. Trends in YLL (left and middle columns) and YLL in 2017-2019 (left and right columns) due to sub-category of deaths of despair in European regions, both sexes combined, aged 65 and plus.

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