The Concentration of Adversity: A Life-Course Analysis of Adverse Life Events in Adulthood

Research question and focus

Adverse life events—such as job loss, divorce, or health shocks—are disruptive experiences that can scar individuals' life trajectories. Adverse life events can cause stress [1], reduce social support [2, 3], and constrain economic resources [4]. In turn, these immediate effects can cascade into long-lasting consequences for individuals' life course [5]. Existing research has thoroughly documented the effects of single adverse life events on various life outcomes (for subjective well-being, see [6, 7, 8]; for mental health, see [9]; for income, see [5]; for job loss, see [4]), but the joint dynamics of adverse life events across the life course remain poorly understood.

Adverse life events may not uniformly occur within individuals' life courses and across social groups. Cumulative disadvantage theory suggests that adverse life events may accumulate over time, leading to widening disparities in life outcomes [10] while resilience theory posits that individuals may adapt to adversity, potentially mitigating its long-term effects [11]. Sparse evidence shows that individuals experiencing one adverse life event are often at higher risk of encountering additional adversities, leading to a cumulative burden that can exacerbate negative outcomes. This dynamic may arise from life events triggering one another through a direct causal link (for instance, experiencing job loss may increase the risk of subsequent financial hardship or divorce [4]), or from shared underlying risk factors (socioeconomic disadvantage may increase the risk of both job loss and health shocks [12]). In cases of multiple adverse events, measures of single events may underestimate the true burden of adversity over the life course. To address this gap, we provide a comprehensive analysis of the clustering and ordering of adverse life events across the life course.

In this study, we investigate the life-course dynamics of major adverse life events and their implications for lifetime income inequality. Using rich longitudinal register data from the Netherlands, we track several adult birth cohorts from age 26 to 52 and describe the timing, ordering, and concentration of eleven major adverse life events: job loss, divorce, disability, health shocks for oneself, parents, siblings or children, and death of a spouse, parent, sibling or child.

We address the following research questions:

1. To what extent do adverse life events cluster together over the life-course? Do individuals experiencing one adverse life event face a higher risk of encountering additional adversities?
2. What are the typical trajectories of adverse life events across the life-course? How do these trajectories vary by socioeconomic background, education, gender, and parental characteristics?
3. How do correlated adverse life events shape lifetime income trajectories and lifetime inequality?

Existing studies have typically focused on single adverse life events in isolation. By examining multiple events and their interactions over time, our study provides a more holistic understanding of life-course adversity. Moreover, relying on high-quality longitudinal register data allows us to capture the timing and sequencing of events with precision, overcoming limitations of retrospective self-reports. The findings will inform theories of cumulative disadvantage and resilience, highlighting the importance of timing, accumulation, and correlation of life events in shaping individuals' life trajectories and economic outcomes.

Theoretical background

Adverse life events act as disruptions into an individual's life trajectory, often leading to stress, income loss, and lower social support [5]. The life-course perspective emphasizes that the temporal ordering and accumulation of such events are crucial for understanding their long-term effects, as individuals' lives are embedded within a broader temporal and social context [13, 14]. For instance, experiencing job loss at a young age may have different implications than at older ages due to differences in labor market attachment and social roles [15]. Similarly, the death of a close family member may have varying impacts depending on the individual's life stage and social support network. It is therefore essential to consider not only the occurrence of adverse life events but also their timing and sequencing within the life course in order to fully understand their implications.

Within this life-course framework, two complementary theories provide insights into the dynamics and consequences of adverse life events: cumulative disadvantage theory and resilience theory. Theories of cumulative disadvantage suggest that early adverse events can set individuals on trajectories of increasing disadvantage, as initial setbacks lead to further challenges and reduced opportunities [10, 14]. For example, the ethnographic work by Marie Jahoda, Paul Lazarsfeld, and William Zeisel [16] on the effects of unemployment in a small Austrian town illustrates how job loss can lead to a cascade of negative outcomes, including financial strain, social isolation, and psychological distress, which may in turn increase vulnerability to further adversities such as divorce or health problems. Conversely, resilience theory highlights the capacity of individuals to adapt and recover from adversity, potentially mitigating its long-term effects [11]. For example, Seery et al. (2010) find that individuals with some prior adversity exhibit better coping mechanisms when facing new adverse events compared to those with no prior adversity, suggesting that exposure to adversity can foster resilience and mitigates negative outcomes [17]. Understanding the interplay between these theories requires a detailed examination of how adverse life events cluster and interact over time, shaping individuals' life trajectories and economic outcomes.

Adverse life events may also be more prevalent among socioeconomically disadvantaged groups, exacerbating existing inequalities. For instance, individuals with lower educational attainment may face higher risks of job loss and financial hardship due to limited labor market opportunities and weaker social safety nets [4]. Loi et al. (2024) find that immigrants are both more likely to experience job loss and divorce and to suffer more severe consequences from them, highlighting the intersection of social disadvantage and life-course adversity [18]. Such disparities underscore the importance of examining how adverse life events cluster within different social groups and contribute to lifetime inequality.

Data and methods

We use longitudinal register data from the Netherlands, tracking several birth cohorts in their adult ages from age 26 to 52 (n = 163,228). The data include detailed records of individuals' life events, socioeconomic characteristics, and income trajectories. We identify the occurrence and timing of eleven major adverse life events: job loss, divorce, disability, health shocks for oneself, parents, siblings or children, death of a spouse, parent, sibling or child. Observations are recorded annually, allowing us to construct detailed life-course sequences of adverse events.

Methods

To analyze the clustering and sequencing of adverse life events, we employ a combination of descriptive and inferential methods:

- **Concentration index**: We develop a novel concentration index to quantify the extent to

which adverse life events cluster within individuals' life courses. This index captures the degree of overlap in event occurrences, allowing us to assess whether certain individuals are disproportionately affected by multiple adversities.

- **Heterogeneity analysis**: We stratify our analyses by socioeconomic background, gender, and foreign background to explore how the clustering and sequencing of adverse life events vary across social groups.
- **Sequence analysis**: We use sequence analysis to map typical trajectories of adverse life events across the life course. We use optimal matching techniques to compute distances between sequences and hierarchical clustering to identify six distinct trajectory groups.

Preliminary findings

Preliminary analyses focus on (1) the overall incidence of adverse life events across the life course, (2) the socioeconomic gradient in event incidence, (3) the concentration of adverse life events within individuals, and (4) the identification of typical life-course trajectories through sequence analysis and clustering.

Incidence of events We begin by examining the incidence of adverse life event over the life course. Figure 1 displays the distribution of the number of adverse life events experienced from age 26 to 52 in the observed birth cohort. The results indicate that adverse life events are widespread, with more than 90% of individuals experiencing at least one adverse life event during this period. The prevalence of adverse life events roughly follows a Poisson distribution with a mean of 3.74 events per individual. The distribution is right-skewed, with most individuals experiencing 0–3 events. However, a third of individuals experience 5 or more adverse life events, indicating a substantial burden of adversity for a subset of the population.

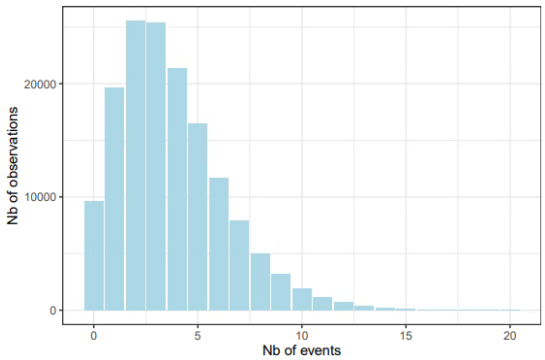

Figure 1: Distribution of the count of adverse life events.

Figure 2 illustrates the incidence of adverse life events by decile of parental wealth. The results reveal a clear socioeconomic gradient in the experience of adverse life events. Panel A shows that individuals from the lowest parental wealth decile experience an average of 4.85 adverse life events, compared to 3.26 events for those from the highest decile. This gradient suggests that socioeconomic disadvantage in childhood is associated with a higher risk of encountering multiple adversities in adulthood. Panel B and C further detail the incidence of adverse life events into the share of never-affected individuals and the share of individuals experiencing 10 or more events. The share of never-affected individuals increases from 2.9% in the lowest wealth decile to 8.5% in the highest decile, while the share of individuals experiencing 5 or more events decreases from 7.9% to 1.7% across the same gradient. These findings highlight the role of early-life socioeconomic conditions in shaping exposure to adversity over the life course.

Concentration of adverse life events To quantify the clustering of adverse life events, we measure the extent to which events co-occur within individuals' life courses. Preliminary results on job loss and divorce indicate that adverse life events tend to cluster, with individuals experiencing one event being more likely to encounter others.

Table 1 presents the joint distribution of job loss and divorce incidence from age 26 to 52. The results show that individuals experiencing divorce are more likely to have also experienced job loss, and vice-versa. 32.7% of the birth cohort experienced at least one job loss. Among the

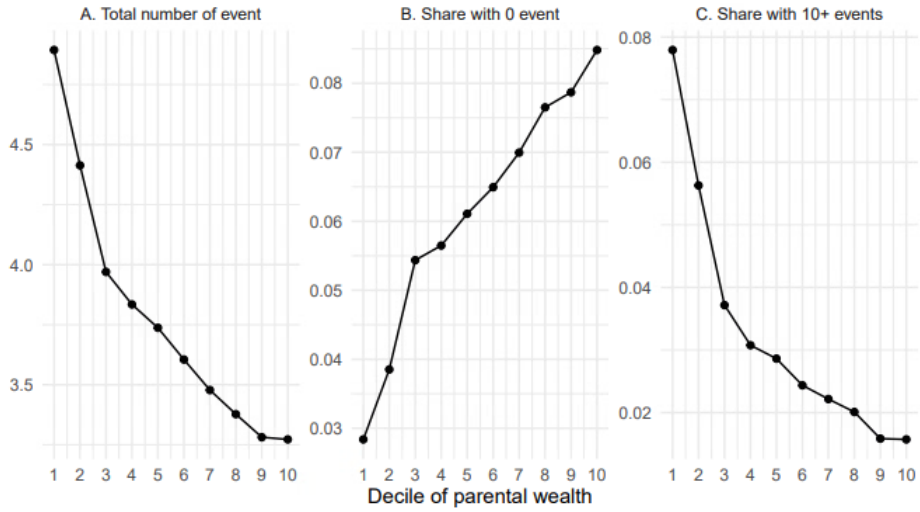

Figure 2: Incidence of adverse life events by decile of parental wealth.

never-divorced, this share drops to 29.8%. Among the one-time divorced, the share rises to 46.5%, and among the repeatedly divorced, it is 50.5%. This early result suggests a strong positive association between repeated adverse life events.

		Job loss			
		0	1	2+	Total
Divorce	0	70.2	19.4	10.4	100
	1	53.5	27.5	19.0	100
	2+	49.5	27.5	23.0	100
	Pop.	67.3	20.1	12.6	100

Table 1: Joint distribution of job loss and divorce incidence from age 26 to 52.

Sequence analysis and clustering Using sequence analysis, we identify typical trajectories of adverse life events across the life course. Figure 3 presents the six clusters derived from hierarchical clustering of life-course sequences. Events are coded cumulatively, such that once an individual experiences an event, they remain in the affected state for the remainder of the observation period.

We performed preliminary analyses on job loss, divorce and disability, using optimal matching to compute distances between sequences on a random subsample of 5,000 individuals who experienced at least one adverse life event. Each panel displays the proportion of individuals in a given state (no event, job loss, divorce, disability, or a combination thereof) at each age from 26 to 52 for each cluster. The clusters reveal distinct patterns of adversity:

- **Cluster 1** (Late job loss, $n = 764$, 15.28%): Individuals in this cluster primarily experience job loss in their late 30s and early 40s, with relatively low incidence of divorce or disability.
- **Cluster 2** (Early disability, $n = 1{,}114$, 22.28%): This group faces disability primarily in their late 20s and early 30s, mostly without concurrent job loss or divorce.
- **Cluster 3** (Early job loss, $n = 823$, 16.46%): Individuals in this cluster experience job loss predominantly in their late 20s and early 30s, with no incidence of divorce or disability.
- **Cluster 4** (Multiple adversity, $n = 413$, 8.26%): This group encounters are very likely to experience all three adverse events (job loss, divorce, and disability) throughout the life course.
- **Cluster 5** (Job loss and disability, $n = 1{,}044$, 20.88%): Individuals in this cluster primarily experience both job loss and disability, with low incidence of divorce.

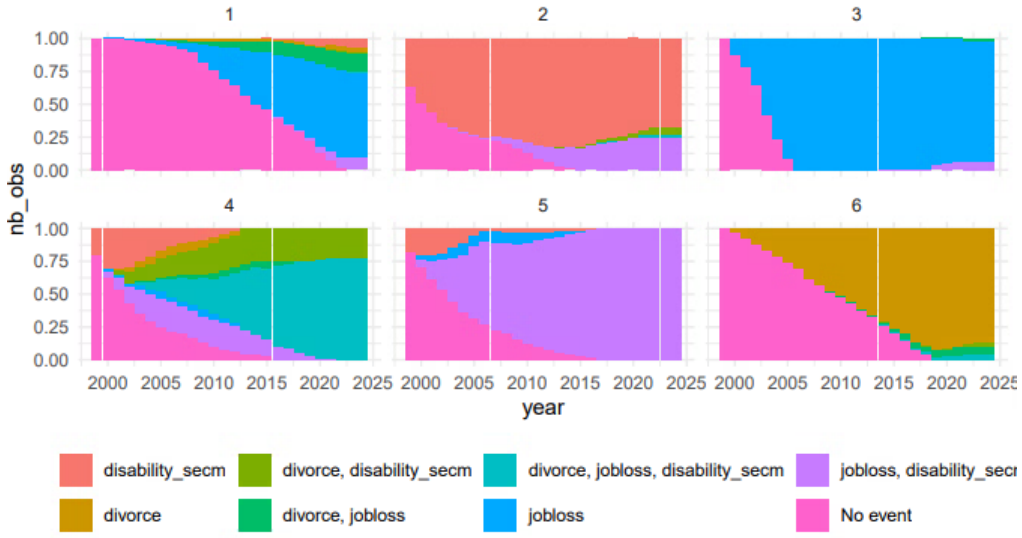

Figure 3: Life events trajectories by cluster.

- **Cluster 6** (Divorce, $n = 842$, 16.84%): This group is characterized by a high incidence of divorce, with relatively low occurrence of job loss or disability.

Keywords

life-course, adverse life events, sequence analysis, earnings dynamics, lifetime inequality, dynamic panel data

References

[1] Sheldon Cohen and Thomas A. Wills. "Stress, Social Support, and the Buffering Hypothesis". In: *Psychological Bulletin* 98.2 (1985), pp. 310–357. ISSN: 1939-1455. DOI: 10.1037/0033-2909.98.2.310.

[2] M. E. Duffy. "Social Networks and Social Support of Recently Divorced Women". In: *Public Health Nursing (Boston, Mass.)* 10.1 (Mar. 1993), pp. 19–24. ISSN: 0737-1209. DOI: 10.1111/j.1525-1446.1993.tb00015.x. PMID: 8516253.

[3] Susanne Buecker, Jaap J. A. Denissen, and Maike Luhmann. "A Propensity-Score Matched Study of Changes in Loneliness Surrounding Major Life Events". In: *Journal of Personality and Social Psychology* 121.3 (Sept. 2021), pp. 669–690. ISSN: 1939-1315. DOI: 10.1037/pspp0000373. PMID: 33119390.

[4] Jennie E. Brand. "The Far-Reaching Impact of Job Loss and Unemployment". In: *Annual Review of Sociology* 41.1 (2015), pp. 359–375. DOI: 10.1146/annurev-soc-071913-043237.

[5] Simon Rabaté et al. "The Effect of Adverse Life-Events on Income Trajectories". Version CPB discussion paper, 460. In: (2025). DOI: 10.34932/74D0-F494.

[6] Chiara L. Comolli et al. "Concentration of Critical Events over the Life Course and Life Satisfaction Later in Life". In: *Advances in Life Course Research* 61 (Sept. 1, 2024), p. 100616. ISSN: 1569-4909. DOI: 10.1016/j.alcr.2024.100616.

[7] Paul Frijters, Christian Krekel, and Aydogan Ulker. "Should Bads Be Inflicted All at Once, like Machiavelli Said? Evidence from Life-Satisfaction Data". In: *Journal of Economic Behavior & Organization* 205 (Jan. 1, 2023), pp. 1–27. ISSN: 0167-2681. DOI: 10.1016/j.jebo.2022.10.047.

[8] Nathan Kettlewell et al. "The Differential Impact of Major Life Events on Cognitive and Affective Wellbeing". In: *SSM - Population Health* 10 (Apr. 1, 2020), p. 100533. ISSN: 2352-8273. DOI: 10.1016/j.ssmph.2019.100533.

[9] Jornt Mandemakers and Matthijs Kalmijn. "From Bad to Worse? Effects of Multiple Adverse Life Course Transitions on Mental Health". In: *Longitudinal and Life Course Studies* 9.3 (2018), pp. 299–311. URL: https://www.llcsjournal.org/index.php/llcs/article/view/484 (visited on 10/22/2025).

[10] Thomas A. DiPrete and Gregory M. Eirich. "Cumulative Advantage as a Mechanism for Inequality: A Review of Theoretical and Empirical Developments". In: *Annual Review of Sociology* 32.1 (2006), pp. 271–297. DOI: 10.1146/annurev.soc.32.061604.123127.

[11] Ann S. Masten, Karin M. Best, and Norman Garmezy. "Resilience and Development: Contributions from the Study of Children Who Overcome Adversity". In: *Development and psychopathology* 2.4 (1990), pp. 425–444. URL: https://www.cambridge.org/core/journals/development-and-psychopathology/article/resilience-and-developmet-contributions-from-the-study-of-children-who-overcome-adversity/9D84A6A2339F9B66E7B0B0D910F841CC (visited on 10/29/2025).

[12] Emile Cammeraat et al. "Predictability and (Co-)Incidence of Labor and Health Shocks". In: *CPB Discussion paper* (2024).

[13] Glen H. Jr. Elder. "Age Differentiation and the Life Course". In: *Annual review of sociology* 1 (1975), pp. 165–190. JSTOR: 2946043. URL: https://www.jstor.org/stable/2946043 (visited on 01/22/2025).

[14] Andrea E. Willson, Kim M. Shuey, and Jr. Elder Glen H. "Cumulative Advantage Processes as Mechanisms of Inequality in Life Course Health". In: *American Journal of Sociology* 112.6 (May 2007), pp. 1886–1924. ISSN: 0002-9602. DOI: 10.1086/512712.

[15] Sewin Chan and Ann Huff Stevens. "Job Loss and Employment Patterns of Older Workers". In: *Journal of Labor Economics* 19.2 (Apr. 2001), pp. 484–521. ISSN: 0734-306X. DOI: 10.1086/319568.

[16] Marie Jahoda, Paul F. Lazarsfeld, and Hans Zeisel. *Marienthal: The Sociography of an Unemployed Community*. New York: Routledge, 1971. 176 pp. ISBN: 978-0-203-78633-8. DOI: 10.4324/9780203786338.

[17] Mark D. Seery, E. Alison Holman, and Roxane Cohen Silver. "Whatever Does Not Kill Us: Cumulative Lifetime Adversity, Vulnerability, and Resilience". In: *Journal of Personality and Social Psychology* 99.6 (2010), pp. 1025–1041. ISSN: 1939-1315. DOI: 10.1037/a0021344.

[18] Silvia Loi, Peng Li, and Mikko Myrskylä. "At the Intersection of Adverse Life Course Pathways: The Effects on Health by Migration Status". In: *Demography* 61.3 (June 1, 2024), pp. 665–686. ISSN: 0070-3370. DOI: 10.1215/00703370-11314758.