*Dying to Work: Effects of Unemployment Insurance on Health**

Alexander Ahammer[a] Analisa Packham[b]

[a]*Department of Economics, Johannes Kepler University Linz*
[b]*Department of Economics, Vanderbilt University and NBER*

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Abstract

Using administrative data for Upper Austrian workers from 2003–2013, we show that an extension in unemployment insurance (UI) duration increases unemployment length and impacts worker physical and mental health. These effects vary by gender. Specifically, we find that women eligible for an additional 9 weeks of UI benefits fill fewer opioid and antidepressant prescriptions and experience a lower likelihood of filing a disability claim, as compared to non-eligible unemployed women. Moreover, estimates indicate within-household spillovers for young children. For men, we find that extending UI benefit duration increases the likelihood of a cardiac event and eventual disability retirement filing.

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1. Introduction

In recent months several countries have passed policies to expand unemployment insurance (UI) benefits. However, one understudied aspect of such policies is the effect of UI benefits on health. For example, although it is well-documented that providing unemployed workers with UI benefits lengthens unemployment duration, less is known about how this change in income and leisure time could alter risky behavior or health care utilization.[1] Additionally, if extending UI benefit length improves future job match, and leads to higher wages for workers in the longer run, then UI could also affect the consumption of healthy foods, and/or complements to risky behavior, like alcohol and drugs.[2]

UI has the potential to positively affect health in a number of ways. First, the replacement of income could allow workers to continue investing in healthy behaviors and preventative care. Second, the increase in leisure time due to the extension in time unemployed could lead to an uptick in health care utilization for workers and their children, resulting in more preventative screenings and greater overall levels of health and well-being. Third, extending the duration of UI benefits could significantly impact mental health by reducing the time pressure of the job search. By allowing workers more flexibility, they may feel less depressed or anxious. Fourth, if workers use short-term opioid therapy or other pain medications due to existing physical stressors of their job, unemployment may provide temporary pain relief, leading to reduced dependence on opioids and a lower likelihood of opioid misuse in the future.

Conversely, for individuals that rely on their job for personal fulfillment and sense of self, more time out of the labor force as a result of longer UI duration may lead to worse mental health outcomes. Additionally, supplemented leisure time may cause individuals to engage in more risky behavior, including smoking, alcohol consumption, and substance abuse. Existing research shows that both job displacement and conditional cash transfers (CCTs) affect health and risky behavior, with women *more* likely to engage in healthier behaviors and men *less* likely to engage in such behaviors (Kohler and Thornton, 2012; Black, Devereux, and Salvanes, 2015; Lindo, Schaller, and Hansen, 2018).[3,4]

[1] For a review of this extensive literature on how UI affects unemployment duration, see Card, Chetty, and Weber (2007b).

[2] We note that extending UI benefit length has not been shown to improve future job match in all instances (e.g., Card, Chetty, and Weber (2007a) and Card, Chetty, and Weber (2007b)), and we expand on this discussion below.

[3] Specifically, in the unemployment literature, Black, Devereux, and Salvanes (2015) analyze workers in Norway and find that job displacement led to a decline in cardiovascular health, driven by increase in smoking behavior. Furthermore, Lindo, Schaller, and Hansen (2018) find that unemployment is linked to adverse health conditions for children. Using data on job layoffs from the Great Recession they find that maltreatment increases when men are unemployed but they find no such effects for female unemployment.

[4] Additionally, in the CCT literature, there are a number of papers showing that transfers to women, and mothers in particular, improve nutrition and health outcomes for their children (Schady and Rosero, 2008; Angelucci and Attanasio, 2013; Armand, Attanasio, Carneiro, and Lechene, 2016). Similarly, when looking at the effect of CCTs on risky behavior, Kohler and Thornton (2012) perform a RCT in Malawi granting individuals financial incentives for one year to abstain from risky sexual behavior. They find that men who received the cash transfer were 9 percentage points more likely and women were 6.7 percentage points less likely to engage in risky sex.

In this paper, we test whether longer UI duration leads to changes in worker labor market outcomes and health using administrative data for a large sample of Upper Austrian workers. To do so, we exploit a policy in Austria that extends UI benefits for workers aged 40 and older from 30 to 39 weeks, but does not change benefit levels. We first replicate findings from Nekoei and Weber (2017) and show that more generous UI time limits lead to increases in unemployment duration. In doing so, we present evidence that employers do not strategically hire or fire employees just before they reach the eligibility threshold, implying that workers just ineligible for the UI extension provide a good comparison group for workers that are just eligible for additional benefits. Then, using linked administrative data on hospitalizations, prescriptions, and disability claims for unemployed workers and their children, we use a regression discontinuity approach to estimate the extent to which more generous UI benefit duration affects physical and mental health and test whether such policies generate spillovers within households.

We present new evidence that extending UI benefits for an additional 9 weeks generates significant health consequences that vary by gender, mirrored by gender differences in time unemployed. In particular, we find that eligible female workers remain unemployed 4.3 days longer than ineligible unemployed female workers, while eligible male workers remain unemployed 1.7 days longer than ineligible males, on average. Moreover, we find that joblessness creates a positive health shock for women and their children. Estimates indicate that female workers just eligible for longer UI benefit duration are 33.3 percent less likely to be prescribed opioids, 8.7 percent less likely to be prescribed antidepressants, and 12.5 percent less likely to eventually claim disability pension as compared to just ineligible unemployed females. We also present evidence of spillovers within the household. In particular, young children under the age of 6 of unemployed, eligible mothers experience reduced outpatient and drug spending.

When analyzing effects for male workers, we find that those marginally eligible for an additional 9 weeks of UI benefits are 41.7 percent more likely to experience a heart attack or stroke in the 9 months following unemployment and are 8.1 percent more likely to eventually file a disability claim as compared to marginally-ineligible unemployed male workers. This corresponds to approximately 700 additional hospitalizations for acute cardiac events following unemployment annually, and 610 more workers eventually filing for disability. Across gender, effects are largest for low-skill workers and workers with children.

Generally, we find that these health outcomes last during the months unemployed, before returning to pre-period levels. However, some health effects, including declining opioid and antidepressant use for women and prescription expenses for children, persist even 18 months after the unemployment spell.

We present new evidence suggesting that these effects may be driven by an improvement in wages and job match for female workers. We find no evidence that male workers match to a higher paying job as a result of the UI extension.

Our findings contribute to the existing literature in a number of ways. First, we note that while many studies have analyzed the effects of unemployment on health more broadly, these findings often rely either on widespread macroeconomic shocks (Ruhm, 2000, 2015; Hollingsworth, Ruhm, and Simon, 2017), or shocks common to small, local areas, like plant closures, to identify effects (Ruhm, 1991; Elison and Storrie, 2006; Sullivan and Wachter, 2009; Browning and Heinesen, 2012; Venkataramani, Bair, O'Brien, and Tsa, 2020).[5] Furthermore, US data on health outcomes and well-being is often self-reported, drawing concerns over whether employees systematically report poorer health when they temporarily lose health insurance coverage.[6] Additionally, many of the existing estimates of job loss and health are cross-sectional, implying that they may not represent true casual effects if recently laid off workers are different than their peers in both observable and unobservable characteristics. For example, many studies do not control for firm-level worker characteristics, which could bias the estimate of health and mortality effects upwards.[7]

To overcome these limitations, we use exogenous sources of variation across individuals using a large sample of workers and objective measures of health in the months following job loss in a setting in which workers cannot manipulate their UI eligibility, do not lose health insurance, and are not granted more generous benefits due to a recession.[8] Importantly, these data track individuals over time, allowing us to observe trends in health conditions, hospitalization, disability, and prescription take-up prior to and following unemployment. By comparing unemployed workers that are similar on all observed

[5]In particular, while Ruhm (2000) shows that unfavorable health conditions follow macroeconomic growth, Ruhm (2015) suggests that total mortality has shifted away from being strongly pro-cyclical to being unrelated to macroeconomic shocks, with the exception of some conditions, like deaths from cardiovascular events. However, Hollingsworth, Ruhm, and Simon (2017) show that rising unemployment rates increase opioid-related deaths, primarily among White individuals, which is consistent with Case and Deaton (2015), who show that deterioration in economic conditions corresponds to increases in "deaths of despair".

[6]For example, Kuka (2018) finds that more generous UI increases health insurance coverage and health care utilization, and leads to higher self-reported health. Cylus, Glymour, and Avendano (2015) find that higher maximum UI benefit payments improves self-reported health outcomes 2 years after job loss. Schaller and Stevens (2015) use data from the Medical Expenditure Panel Survey (MEPS) and find that job loss leads to worse self-reported health and mental health. Fu and Liu (2019) use data from the 1995–2011 Current Population Survey-Tobacco Use Supplement data and find that more generous UI benefits lead to smoking cessation. Deb, Gallo, Ayyagari, Fletcher, and Sindelar (2011) analyze responses to the Health and Retirement Study and find that unemployment exacerbates unhealthy behavior for workers already at risk prior to job loss.

[7]See Bloemen, Hochguertel, and Zweerink (2015) for a discussion of controlling for firm-level worker characteristics in the context of the existing literature on job loss.

[8]This latter point is especially important, given the relative stickiness of wages that has been well-documented in the Austrian labor market (Dickens, Goette, Groshen, Holden, Messina, Schweitzer, Turunen, and Ward, 2007). For example, Jäger, Schoefer, and Zweimüller (2019) exploit changes in UI benefit levels in Austria in the 1980s and 1990s and find that wages are relatively unresponsive to UI generosity. This insensitivity holds even among low-wage earners, frequent job switchers, and those with high predicted unemployment duration (Jäger, Schoefer, Young, and Zweimüller, 2019).

characteristics but vary by UI duration eligiblity, these data allow us to improve on existing work and get a better sense of how UI duration affects an individual's physical and mental health.

Our findings build on recent work documenting the adverse health consequences of job loss on men, and extend these findings beyond mortality, self-reported health, and mental health effects (Sullivan and Wachter, 2009; Elison and Storrie, 2006; Kuhn, Lalive, and Zweimüller, 2009). Furthermore, unlike many existing studies which focus only on men, we measure effects for female workers during a period when female labor force participation is at an all-time high and in an era where Austrian women report spending more time on childcare and housework.[9, 10]

Our analysis focuses on unemployment in a European context, which has previously been shown to have mixed results (Elison and Storrie, 2006; Kuhn, Lalive, and Zweimüller, 2009; Browning, Dano, and Heinesen, 2006; Browning and Heinesen, 2012; Bloemen, Hochguertel, and Zweerink, 2015). However, we note that Austria is more similar to the US than Scandinavia in terms of work hours and views of traditional gender roles, implying that our findings can inform policy in many different settings and countries (EVS, 2017).[11] Moreover, we are able to isolate health effects for a set of workers whose health insurance coverage is unaffected by job loss.[12] We note that any findings on adverse health consequences of unemployment will appear in *spite* of Austria's universal health care system, yielding important policy implications for discussions on optimal UI determination in the presence of relatively generous safety net programs.

Finally, because we test the effects of prescription drug use prior to and after job loss, our findings can speak to programs that may affect opioid misuse in the wake of the opioid crisis. This is especially important, given both the magnitude of the crisis, and also the unclear causal channel between unemployment and drug use. For example, Krueger (2017) finds that the increase in opioid prescriptions spanning 1999–2015 could account for up to 43 percent of the decline in US labor force participation for men

[9] In particular, Austrian women's total paid and unpaid working time exceeds men's total work by 21 minutes per day, on average. This average is identical to the difference in men and women's reported time usage in the US. For information on time spent in paid and unpaid work, by county and by sex, see https://stats.oecd.org/index.aspx?queryid=54757.

[10] Unlike some European countries, Austria does not offer free public childcare for children under the age of 6, and there exists considerable excess demand for subsidized childcare. Less than 20 percent of Austrian children under the age of 3 participated in center-based early childhood education and care (ECEC) in 2017, below the EU average of 33 percent (European Commission, 2019).

[11] Specifically, Elison and Storrie (2006) look at plant closures in Sweden in the late 1980s and find negative effects on mortality for men, whereas Browning, Dano, and Heinesen (2006) use Danish data and find no stress-related health effects of unemployment. However, for Danish men with strong labor attachment, Browning and Heinesen (2012) find that job loss increases overall mortality, alcohol-related diseases, and mental illness. Bloemen, Hochguertel, and Zweerink (2015) analyze Dutch plant closures and find a 0.60 percentage point increase in mortality in the following five years. Kuhn, Lalive, and Zweimüller (2009) study the effects of plant closures in Austria from 1998–2002 and find that job loss reduces the mental health of men.

[12] Although supplementary private health insurance is available in Austria, we find no evidence of job loss leading to reductions in public insurance coverage.

during that time.[13] Alternatively, for workers that need pain medication to perform the daily functions of their jobs, unemployment may lessen opioid prescriptions and the probability of misuse.

Our findings have several implications for policy. First, the magnitudes of the estimates indicate that extending UI benefit duration by 9 weeks increases unemployment length by 7 days, on average, and that this corresponds to changes in prescription drug use and hospitalization. Since these effects vary both in sign and magnitude depending on gender, our findings suggest differential health costs of work on men and women and have important implications for addressing gaps in labor force participation. Second, we find suggestive evidence to support the conclusions of Krueger (2017) and Savych, Neumark, and Lea (2018) implying that men engage in more risky behavior after job loss, and are more likely to remain out of the labor force and claim disability in the longer run. Because our estimates are largest for workers with children, our findings reinforce the notion that gender-specific economic shocks have important effects on within-household bargaining and have the potential to affect children's outcomes (Lindo, Schaller, and Hansen, 2018).[14] Moreover, we find that women are able to increase their earnings when eligible for additional weeks of UI benefits. Our findings support the idea that this income boost allows women to take better care of their health and the health of their children. Taken together, our results suggest that there is scope for government to do more to help workers face pain in their day-to-day jobs, while mitigating incentives for risky behavior. In doing so, targeted policies could reduce direct and external costs to taxpayers and communities.

Lastly, we note that these health effects are driven by parents, low-skill workers, and workers in physically strenuous jobs, which sheds some light on the relationships between economic circumstances, occupational demands, and worker health, and the role that pain medication takes in everyday life. These findings are especially relevant as countries continue to address the ongoing pandemic and/or face new declines in life expectancy for young men as a result of the opioid crisis.

2. Unemployment Insurance in Austria

Austria's unemployment insurance program is compulsory, with workers paying a 6 percent payroll tax. UI benefits are related to previous after-tax earnings, with a 55 percent minimum replacement rate and

[13] Relatedly, Rege, Telle, and Votruba (2009) find that both men and women are likely to receive disability insurance following a plant closing, while Savych, Neumark, and Lea (2018) documents that longer-term opioid prescribing for lower back pain increases the duration of temporary disability.

[14] Unfortunately, we are unable to see whether workers are married or single; therefore, we focus on parenthood.

baseline eligibility of 20 weeks.[15,16] Similar to the UI system in the US, applicants for UI benefits must be willing to accept reasonable employment or undergo retraining.

Benefits for laid-off workers are payable immediately upon entry into unemployment; for job quitters there is a one-month waiting period.[17] Although baseline UI duration is 20 weeks, the total duration for UI benefits increases discontinuously with age. For workers up to 39 years old, the maximum baseline UI benefit period is 30 weeks, for workers aged 40–49 years old, benefits are extended to 39 weeks, conditional on a sufficient contribution period. To qualify, workers must meet an experience requirement of having worked at least 6 out of the last 10 years. After age 50, benefits are extended up to a year.[18]

Although there are other discontinuities present in the Austrian UI system, in this analysis, we focus on the jump in UI benefit duration from 30 to 39 weeks at age 40.[19] We do so for two main reasons. First, this age group gives us a large sample of workers with a high density around the age cutoff. Second, the other UI duration extension in Austria (from 20 to 30 weeks) is not binding at a particular age, limiting our ability to compare workers in a causal framework. Below, we further discuss the extent to which focusing on this cutoff affects both internal and external validity.

3. Data

To analyze the effects of increasing UI benefit duration on health, we use administrative data on all workers in Upper Austria spanning 2003–2013.[20] These data include information on an employee's age, which is critical to the research design, as well as their gender, migrant status, and residence location. Because of the existence of other UI cutoffs at ages 30 and 50, described above, we include only workers that are between 30–50 years old upon entering unemployment, and meet the experience criterion of having worked at least 6 of the last 10 years.

For information on past fertility, prescriptions, and hospitalizations, we use data containing information on both workers and nonworkers from the Upper Austrian Health Insurance Fund (UAHIF) database

[15]Replacement wages are calculated using the last six months' income. Maximum and minimum benefit levels are adjusted annually. Total UI replacement rates cannot exceed 60 percent for single claimants without dependents, or 80 percent for a claimant with dependents. See http://www.oecd.org/els/soc/29725351.PDF for more information.

[16]To qualify for baseline benefits, workers must have contributed at least one out of the last two years.

[17]In our sample, only 9.4% of workers are job quitters. We note that including these workers yields very similar, but more conservative, baseline estimates.

[18]Specifically, for workers up to age 39, UI benefits can span 30 weeks only after 156 weeks (3 years) of work in 5 years. For those over 40, workers must have contributed for 6 of the last 10 years to have UI benefits for 39 weeks. UI benefit duration is 52 weeks for workers over the age of 50 with a 9 out of 15 years contribution record, although older workers may also qualify for a special benefit scheme to top up benefits by up to 25 percentage points.

[19]See Figure A11 for a visual representation of why cutoffs at age 30 and 50 are not ideal to study in this context, as these thresholds are not a true binding constraint for workers receiving UI benefits.

[20]Upper Austria is a state in northern Austria. The population is approximately 1.5 million, or 17 percent of the total inhabitants of Austria. The largest city is Linz.

linked to social security records from the Austrian Social Security Database (ASSD).[21] The UAHIF is the main statutory health insurance provider in Upper Austria, covering 75 percent of the total population. Importantly, unemployed workers continue to be insured with the UAHIF, irrespective of their former employment. We additionally link workers to their children, using birth certificate information, to analyze effects of an additional 9 weeks of benefit eligibility on child health to address the potential for within-household spillovers.[22]

Prescription data include the names and doses of every medication which requires a prescription in Austria. Specifically, we analyze diagnoses using ATC code N medications ("nervous system") and ICD-10 code F diagnoses ("mental and behavioral disorders").[23] Diagnoses are only available if an individual has either an inpatient hospital stay or a sick leave, which excludes regular doctor's visits where no sick leave is certified. Therefore, we will not be able to measure outpatient diagnoses. Moreover, the data do not contain information on over-the-counter drugs, implying that any estimates on drug use may be understated. However, we note that many drugs typically sold over-the-counter in the US, like Acetaminophen, are commonly prescribed by a physician in Austria.[24] Importantly, there are no prescription refills in Austria, which allows us to capture all possible prescriptions during our sample period.

Hospitalization data from the UAHIF contains individual-level information on inpatient and outpatient visits, including information on total physician visits and fees paid, and occurrence of acute cardiac events, such as heart attacks or strokes. These data will allow us to track whether unemployed workers experience more serious health conditions or spend more on physician visits after job loss. Hospital data do not include information on emergency department visits.

Additionally, these linked data contain information on individual-level disability claims. These data allow us to track whether a worker files a disability claim prior to or following job loss. We consider a disability claim to be active if a worker has filed for disability prior to December 31, 2018, which is the latest sample date we can observe labor market status. Importantly, filing a disability claim in Austria is a form of retirement, we therefore refer to disability claims as "disability retirement" throughout.[25]

[21] Zweimüller, Winter-Ebmer, Lalive, Kuhn, Wuellrich, Ruf, and Büchi (2009) provide a detailed description of these data.

[22] In the following analyses we focus primarily on mother-child linkages, as we do not have full matching information on fathers if they are not present for the birth, which may lead to selection bias.

[23] N02A are opioid analgesics, including fentanyl, N05 contain benzodiazepines and other sleeping and antianxiety pills, N06 contain antidepressants, and N07BC are medications used for opioid dependence like methadone, morphine, and buprenorphine. For reference on ATC codes, see https://www.whocc.no/atc_ddd_index.

[24] This limitation in the data allow us to focus on more serious forms of pain treatment. In Austria it is common to prescribe more mild pain drugs, such as tramadol and codeine, which are substitutes to Tylenol. Therefore we also consider effects on prescriptions for "weak" opioids below.

[25] Workers bear the burden of proof of inability to work. In Austria, disability pension is paid for an assessed loss of more than 50 percent of earning capacity for workers with at least 60 months of paid contributions. Although the claimant has

Summary statistics for Upper Austrian workers are shown in Table 1. We present descriptive statistics for the pooled set of workers (Columns 1–2) and also present these means by gender (Columns 3–4). In Column 5 we present estimates from a t-test showing whether the means for female and male workers are statistically different for each outcome.

Notably, unemployed workers aged 30–50 in Austria are more likely to be male and have 17 years of job experience, on average. Splitting these descriptive statistics by gender, female workers are more likely than males to visit a physician and are more likely to have an opioid and/or antidepressant prescription. Male workers, on the other hand, earn approximately 26.5 Euros more per day, and become employed again 18 days earlier than female workers.

4. Methodology

Our empirical strategy exploits the discontinuous jump in UI benefit duration from 30 to 39 weeks at age 40. This regression discontinuity design is motivated by the idea that characteristics of unemployed workers related to behaviors and outcomes of interest are likely to vary smoothly through the age threshold; that is, any discontinuity in prescription drug use, health care utilization, or disability claims can be reasonably attributed to the change in benefit length. We operationalize this identification strategy by estimating:

$$y_i = \beta_0 + \beta_1 UIextend + f(age_i) + \eta_i, \tag{1}$$

where y_i represents the main outcome variables of interest such as individual-level prescriptions for opioids and other painkillers, antidepressants, and benzodiazepines, as well as hospitalizations and cardiac events, and whether a worker i ever claimed disability retirement. f represents some smooth function of our running variable, worker age. $UIextend$ is a binary indicator variable for whether a worker is at least 40 years old at the time of layoff. To construct our preferred estimates we adopt a quadratic specification for the function of our running variable and allow the slope term to be flexible on each side of the UI eligibility threshold, although we additionally fit models where the running variable enters the equation linearly and cubically. In our preferred specifications we also include quarter-year fixed effects to control for any cylicality or economic trends in unemployment over time.[26] We highlight

the burden of proving inability to work due to a physical or mental impairment, there need not be direct medical evidence of subjective events like chronic pain (Federal Ministry Republic of Austria, 2018). See https://www.ssa.gov/policy/docs/progdesc/ssptw/2008-2009/europe/austria.html for more information on the interworkings of the disability pension system.

[26]This is especially important in light of the fact that our data from 2003–2013 span the years of the global financial crisis. We note that omitting 2007–2009 from our analysis to account for the Great Recession yields estimates that are statistically similar to our baseline estimates at the 1 percent level.

estimates from a specification that uses a one-sided bandwidth of 10 years, following Nekoei and Weber (2017), although we additionally present results from a wide range of bandwidths, including a MSE-optimal bandwidth, as suggested by Calonico, Cattaneo, Farrell, and Titiunik (2016). Standard errors are clustered on the running variable, worker age bin.

In all specifications, we estimate effects using information for unemployed workers only. Our approach therefore compares unemployed workers that are just-ineligible for the 9-week UI benefit extension to those that become unemployed just after turning 40.[27] The identification assumption underlying this model is that no other income transfers, employment shocks, or other related events occur concurrently at the benefit extension eligibility threshold. The fact that individuals have no control over their age alleviates potential selection concerns. However, hiring and firing powers are held with the firm, which may be aware of an individual's birth date and may be incentivized to discharge workers just before (or just after) this UI extension cutoff.

UI benefits in Austria are not experience-rated, implying that there is no strategic advantage to the firm to either delay or speed up layoffs, based on the UI system. Moreover, firms report the date of layoff, so workers cannot delay claims to UI benefits just after they turn 40. Nonetheless, below we provide formal evidence that there are no discontinuities in worker unemployment at age 40, and provide support that gender, education, urbanicity, migrant status, and job experience do not drive the discontinuities we observe in unemployment duration or health outcomes.

Moreover, with any age-based design, it is critical to consider any other treatments at age 40 that may also affect the outcomes of interest. One such example is if health providers recommend certain preventative care treatments at the age of 40 and we believe that individuals schedule these appointments near or on their birthdays, leading to an increase in diagnoses or prescriptions. Another such example is birthday celebrations. If an individual decides to engage in risky behaviors, like opioid use, on their 40^{th} birthday, our estimates will be biased upward.[28] We can address this issue primarily by estimating a "donut RD" which omits observations near the age cutoff, as suggested by Barreca, Guldi, Lindo, and Waddell (2011). Additionally, by analyzing subgroups more prone to opioid use, we can get a better sense of which types of short-lived behaviors are more likely to be age-related and thus related to turning a year older (i.e., celebratory events or actions due to a "midlife crisis") and which are likely to be sustained as a result of job loss.

We primarily focus on effects within 9 months of unemployment, which corresponds to the maximum

[27] Below, we additionally consider comparisons restricting our sample to just female workers on either side of this cutoff and just male workers on either side of this cutoff separately.

[28] We note that no other Austrian policies use this same age threshold.

benefit duration of 39 weeks, noting that only 2.36 percent of female workers and 2.06 percent of male workers fully exhaust their benefits.[29] Therefore, our below analysis investigates to what extent the *opportunity* to receive benefits for an additional 9 weeks affects the ability of workers to match to a higher-paying job or alters their health. We note that health effects during the period right after unemployment and those occurring once a majority of workers are back to work may vary. To track individual outcomes over time, we additionally estimate the above equation for months prior to and after unemployment ($t = -1, 0...12$) separately. This allows us to check whether the discontinuities we observe in health after job loss are attributed to the timing of unemployment or preexisting anomalies of the data and whether health effects persist after workers have matched to a new job. Finally, using a rolling 3-month window, we show how worker health evolves within the 3, 6, 9, and 12 months following job loss.

5. Effects of Longer UI Duration on Unemployment Length and Wages

Before presenting our estimated effects on health, we first analyze how the discrete 9-week increase in UI benefit duration for workers aged 40 and older affects the length of UI benefit duration, and display this evidence in Figure 1. We plot means of individual-level UI duration, using 3-month age bins, for workers meeting the experience criterion unemployed near the age 40 cutoff. We display quadratic fits for the individual-level UI benefit duration, in days. Workers above the age of 40, shown to the right of the vertical line, are eligible for the 39-week UI benefit duration, while those to the left of the vertical line are ineligible and receive benefits lasting a maximum of 30 weeks. In the bottom right corner, we display the coefficient on the main variable of interest from Equation (1) and the corresponding standard error.

Figure 1 shows the first-stage effect of eligibility of prolonged UI benefits on benefit duration for all workers. Overall, we estimate a statistically significant increase in unemployment duration by approximately 2 days for those just over the age threshold, suggesting that an extension in UI incentivizes workers to take up the program and/or remain jobless longer.[30]

These findings are generally consistent with previous work suggesting that longer UI duration causes

[29] We find no discontinuity in share of workers who exhaust benefits at the eligible cutoff. For a distribution of an individual's unemployment spell, in days, see Figure A1. Importantly, a large majority of workers return to work within the first quarter of unemployment.

[30] Similarly, in Figure A2, we present effects on unemployment duration and duration until next employment. Unemployment duration includes the total number of days unemployed for all laid-off workers, until they enter the labor force again or enter any other labor market status (i.e., retirement, disability, other welfare schemes). Duration until next employment includes only those that continue to participate in the labor force. Mirroring our main estimates, we find increases in both nonemployment duration and duration until next employment, with duration increasing sharply for workers over the age of 40.

longer unemployment (Nekoei and Weber, 2017; Card, Lee, Pei, and Weber, 2015). However, these average effects may mask important heterogeneity by gender. Although we are unable to observe which households have dual earners or whether a particular unemployed worker is married, we do observe whether individuals are in the labor force. In our sample, males are much more likely than females to be employed, and in survey data are more likely to report being the primary household earner (EVS, 2017). In Figure 2, we also address the notion that the impact of UI benefit duration on unemployment is likely to vary by gender. Indeed, the figure displays visual evidence that male workers eligible for an additional 9 weeks of benefits take up UI benefits for a longer period of time than noneligible male workers. In particular, eligible male workers claim UI benefits for nearly 2 additional days, on average. However, the jump in UI benefit duration for female workers is even larger, accounting for approximately 4 additional UI benefit days.

Table 2 formalizes these estimates based on the model described in Equation (1). The results include both average effects for all workers as well as results by gender separately. Estimates in Columns 1 and 2 largely reinforce the conclusions that can be drawn from the figures – longer UI benefits eligibility leads to longer UI benefits duration, and these effects are larger for female workers. Specifically, estimates in Column 1 indicate a statistically significant and economically meaningful increase in UI duration by 4.1 days, with average effects of 2.7 days for male workers and 8.0 days for female workers.

Moreover, in Table 2 Column 2, we estimate the number of days a worker takes to find a new job, conditional on reentering the labor force. When we estimate effects of job search time separately by gender (Column 2), we find that female workers eligible for longer UI benefit duration take an additional 35 days, while male workers take an additional 14 days to become re-employed.

Notably, longer unemployment duration and/or job search time may improve efficiency if workers eventually find a better job match.[31] While there is some evidence to suggest this is indeed the case (see Nekoei and Weber, 2017), studies to date focus on workers as a whole, without considering differential effects by gender. In Figure 3 we present evidence to support the notion that UI duration does affect job match, as measured by wages, and note that this is driven primarily by female workers. Specifically, we find no changes in job quality for male workers, on average, as measured by log wages of the first new job after an unemployment spell. Female workers receive slightly higher wages, although the magnitudes imply only an additional 1 Euro per day, or 371 Euros per year.[32]

[31] In the US context, there is less evidence to support the notion that longer benefit duration leads to improved job match (Card, Chetty, and Weber, 2007a).

[32] These magnitudes are consistent with Nekoei and Weber (2017) who use a search model to show that the discontinuity in UI benefit duration induces Austrian workers to seek higher-wage jobs, but reduces wages by lengthening time unemployed.

Because few workers use the full 39 weeks to search, and there is heterogeneity in how long workers take to reenter the labor force, in Table 3, we investigate these wage effects further by estimating effects by quartiles of nonemployed days. We find that for unemployed females who match to a job within the first 93 days, wages increase slightly, by 0.5–0.8 percent. For female workers that take near the entire 39 weeks, there is no statistically significant change in wages. In contrast, male workers do not experience an increase in wages for spending fewer days unemployed, but face a small wage penalty for claiming UI past the 14-week window.

Importantly, these findings imply that granting workers an additional 9 weeks to look for their next job allows some female workers the ability to place in a higher-paying position than they would otherwise, even if they do not use the full UI allowance. While many workers choose not to spend a full 39 weeks claiming UI benefits, the opportunity to do so increases unemployment duration and affects worker wages, as compared to unemployed workers with only 30 weeks of benefit eligibility. These findings are consistent with recent work suggesting that some workers overestimate their ability to find a new and/or higher paying job, and allowing additional search time can yield better outcomes (Mueller, Spinnewijn, and Topa, 2020). Next, we analyze whether this time extension also affects the physical and mental health of unemployed workers and their children.

6. Effects of Longer UI Duration on Worker Health

In this section, we test to what extent prolonged UI benefit duration affects prescription drug use, health care utilization, and disability retirement.[33] We first present results for all workers, then further explore how these effects vary by gender, family status, and occupation.

6.1. Opioid Prescriptions

We first estimate the effects of workers receiving an additional 9 weeks of UI benefits on opioid prescriptions, a proxy for opioid use, using the universe of prescription data for Upper Austria from 2003–2013. We do so given the expansive and growing literature suggesting that opioid prescriptions and/or opioid misuse is related to, or causes, unemployment.[34] Moreover, there is existing evidence that income shocks affect consumption of prescription pain relievers and hallucinogens (Carpenter, McClellan, and Rees, 2017) and illicit drugs and alcohol (Dobkin and Puller, 2007).[35]

[33] We have also analyzed effects on the most serious health outcome – mortality. We find no evidence of effects of longer UI duration on mortality for either gender ($p > 0.61$). See Figure A3.

[34] See, for example, Krueger (2017) and Hollingsworth, Ruhm, and Simon (2017).

[35] Carpenter, McClellan, and Rees (2017) analyze the use of prescription pain relievers and hallucinogens increases when people face substantial shocks during economic downturns, while Dobkin and Puller (2007) focus on effects from a cash transfer

In our context, average daily per capita opioid use in Austria ranks among the top five countries in the world, and Austria leads the world in per capita morphine consumption.[36] On average, 1.2 percent of our full sample has a prescription for opioid analgesics. Importantly, female workers are prescribed opioids at 1.3 times the rate for males.

First, Figure 4 shows the probability of being prescribed an opioid for workers just above the UI extension eligibility cutoff for all years in our sample period (2003–2013). In particular, we include prescribing data for the 9 months (i.e., 39 weeks) following an unemployment event for all workers between ages 30 and 50. Given that a majority of Austrian workers are male, and that we find a differential effect in UI benefit duration by gender, we separately display binned means and quadratic fits for male and female workers. Figure 4 presents suggestive evidence that both male and female workers are less likely to use opioids when benefits are extended from 30 to 39 weeks, with larger effects for female workers.[37]

In Table 4 Column 1, we present the regression discontinuity estimates from Equation (1) for the pooled sample (Panel A) as well as separate estimates for male and female workers (Panels B and C, respectively), which mirrors our estimates from Figure 4. Specifically, estimates indicate that female workers are 0.5 percentage points, or 33.3 percent, less likely to use opioids within 9 months of being unemployed, and these estimates drive the decrease in the overall sample.[38] Estimates for male workers are statistically insignificant and are precise enough to rule out more than a 11.6 percent decrease in the likelihood of being prescribed opioids.

We also consider how these effects evolve within different time windows after unemployment, which may be important for several reasons. First, the nature of some health outcomes, like opioid misuse or acute illness may take time to develop, suggesting that these effects may become more apparent and/or grow after job loss. Second, given that a majority of individuals find new jobs within 6 months, looking at the development of short-lived effects and their persistence can more directly speak to the changes in health behavior associated with the stress of unemployment and/or the relief of finding a new job. Third,

program.

[36]The top four countries, in order of per capita opioid use, are the US, Canada, Germany, and Denmark, with average days of opioid use per resident per year spanning 8.3–17.4 (United Nations, 2018).

[37]We note that, based on this figure, there are apparent increases in average opioid prescription take up for women aged 38–40. This may imply that unemployed women just under age 40 may differ in an important, unobserved way as compared to unemployed women just over the age of 40. However, in Figure A4, we replicate this graph using 1-month, instead of 3-month age bins, implying that the perceived "jump" in opioid prescriptions just to the left of the cutoff is spurious. We also note that all regressions are based on the underlying individual-level data, not the age bins themselves, which should provide more reassurance that these observations are not driving the reported decline in opioid prescriptions. Below we provide more sensitivity checks to support the notion that our estimated reduction is not reliant on functional form and holds even when omitting observations close to the cutoff.

[38]In Section 9 we additionally conduct sensitivity analyses and discuss how these estimates vary across bandwidths and functional form.

by presenting estimates of effects in the 1 and 2 months prior to unemployment, we can test whether any estimated health effects represent existing trends in behaviors of laid-off workers. In Table 5 Column 1 we present estimates of extended UI benefit duration on opioid prescriptions within 3, 6, 9, 12, 15, and 18 months after job loss, respectively.[39]

Overall, these differential effects by gender motivate the idea that male and female workers face different demands on the job and in the household. Two potential explanations uphold these findings: (i) female workers use opioids while employed due to existing physical stressors and/or (ii) unemployment may provide temporary pain relief. Alternatively, if extending UI duration allows women needed time to match to a less painful job, starting a new position itself may reduce reliance on opioids. As shown in Table 6, estimates are driven by a decrease of "weak" opioids prescribed to female workers, including opioids in ATC categories N02AX, like tramadol, or codeine and dihydrocodeine, versus "strong" opioids, like morphine or oxycodone.[40] Therefore, these findings support the idea that some female workers may take weak opioids to perform at their jobs, and joblessness allows for a reduction in the use of such drugs.

To test these possible explanations further, in the first column of Table 7 we investigate additional heterogeneous effects of UI extensions on opioid prescriptions across female worker subgroups.[41] First, we consider the idea that female workers may face more pain while unemployed due to a combination of physical work demands and within-household stressors. These challenges may be even greater for households with children. To explore this possibility, we create an indicator for whether a female worker gave birth before the age of 44 or whether a male worker has been registered as a father in the birth register before the age of 44, and analyze whether effects are stronger for this subgroup.[42,43]

In Table 7 Panel (a) we present evidence that female workers with children drive our main results. Estimates indicate that women with children experience a up to a 60.0 percent reduction in opioid

[39]To better understand what is driving these trends in opioid use, in Figures A5 and A6 we analyze dynamic effects of longer UI duration on health outcomes, including opioid prescriptions, separately by gender. In particular, for each outcome of interest, we display RD coefficients from Equation (1) separately by month for the 1–12 months following the start of UI benefits on the x-axis, and coefficients on the y-axis. Estimates indicate that opioid prescriptions decline in the months following unemployment for both women and men, with larger temporary reductions for female workers and later effects for males.

[40]We have also analyzed whether these effects may also be explained by substitution to other less-addictive pain medication, and present evidence supporting this hypothesis in Figure A8. Specifically, we find weak evidence that women substitute to non-opioid analgesics in the 1–3 months following unemployment. When pooling months together, and/or observing quarterly data, we find a large and statistically significant positive effect of non-opioid pain prescriptions for female workers in the first quarter (e.g. first 3 months) after unemployment.

[41]For male workers, subgroup estimates are presented in Table A1 for completeness.

[42]Importantly, fathers are only recorded if the child is born in wedlock, which may bias our estimates for male workers.

[43]For mothers, we define motherhood by age 44 due to data restrictions. Birth register information is available only until 2007. Thus, females who are 50 years old (the maximum age in our baseline sample) in 2013 (the last year of our sample) were only 44 years of age in 2007. Therefore, we can only observe completed fertility up to age 44 for every mother in our main sample.

prescriptions when eligible for an additional 9 weeks of UI benefits.[44] While this reduction is relatively large, we note that only 1.5 percent of female workers fill an opioid prescription each year.

Next, in in the first column of Table 7 Panels (b)-(e) we present estimates by occupation type and education to explore whether low-skill, low-educated, or low-income female workers are more likely to experience large gains in health when UI benefits are extended. In particular, we consider effects based on whether a female worker works in a designated "low-skill" occupation, works in a job that is physically taxing, works part-time, and/or has less than a college education, respectively.[45] Estimates indicate that female workers in physically demanding jobs, low-skill jobs, and workers with lower education levels are more likely to reduce opioid use in the 9 months following unemployment.

Overall, these findings have stark implications for the adverse health conditions that many workers face. Female workers, especially mothers, are less likely to use opioids when they experience a longer period of unemployment, and these effects are concentrated for low-skilled workers in industries imposing a large physical toll. Low-skilled male workers, on the other hand, experience no change in the probability of being prescribed opioids following unemployment, which is consistent with previous findings suggesting a strong complementary between leisure and opioid use for men but not women (Krueger, 2017; Serdarevic, Striley, and Cottler, 2018). Our findings therefore speak to distinct differences in worker behavior across gender, especially during a time when women are facing high rates of labor force participation but also report engaging in more housework and childcare than their partners. In the next section, we further discuss prescription drug usage to analyze effects of unemployment insurance on mental health and/or drug and alcohol dependence.

6.2. Mental Health and Addiction

Unemployment is often associated with increased stress, depression, and deteriorated mental health (Kuhn, Lalive, and Zweimüller, 2009; Classen and Dunn, 2012). This could be due to financial insecurity, changed plans or expectations, perceived loss of purpose, and/or, in the case of workers with employer-sponsored health care, concerns over health insurance coverage. Extending UI benefits duration could lead to improved mental health if employees take more time to relax and rest or find a job with better wages. On the other hand, if prolonged joblessness compounds this mental stress, or results in consumption

[44] We have also analyzed whether workers that fully exhaust benefits before returning to work are driving our results. Overall, our results are concentrated in female and male workers that return to work before the end of the 39-week eligibility period, although we note that the sample of workers that fully exhaust benefits represent a smaller sample, and these estimates may be underpowered.

[45] Because not all variables are recorded for all workers in all years, sample sizes vary across panels, although remain relatively similar in size, with no notable systematic non-reporting.

of goods like drugs, alcohol, or other risky behaviors, anxiety or depression may worsen. Similarly, if there is societal or family pressure to remain unemployed longer due to the extension in UI benefits, workers that do feel a sense of meaning when employed may experience more adverse mental health consequences.

In Figure 5 we analyze the effects of unemployment duration on the uptake of prescription drugs for stress, anxiety, and depression. In particular, we present estimates of the take-up of benzodiazepines, a class of psychoactive drugs primarily used for treating anxiety (top panel), as well as take-up of antidepressants (bottom panel).[46]

We present our formal RD estimates for these health outcomes in Table 4. Overall, we find that female workers experience decreases in antidepressant prescriptions following unemployment.[47] In particular, estimates indicate that extending UI benefits by 9 weeks reduces antidepressant prescription take-up by 8.7 percent for female workers. Effects are largest for full-time workers, parents, and female workers in low-skill occupations (Table 7 Column 4). Moreover, as shown in Column 4 of Table 4, we estimate a statistically significant 25 percent increase in benzodiazepine prescriptions for female workers after unemployment. Effects for both types of prescriptions persist even up to 18 months after job loss (Table 5).

There are two potential explanations for these findings. While results for benzodiazepines suggest that female workers seek drugs to help reduce stress and anxiety while unemployed, results for antidepressants at the same time provide support for the idea that relaxing the job search time constraint may improve workers' mental health. One possibility consistent with our results is that when female workers are eligible for longer UI duration they find higher paying, albeit more demanding, jobs leading to more stress. However, these jobs also pay more, which may lead to decreases in depression.

Nevertheless, given that these prescription drugs are often seen as substitutes, these effects may seem surprising. Therefore, in Table 8 we further investigate which types of female workers may be more likely to increase their take-up of benzodiazepines when eligible for 9 additional weeks of UI benefits. Specifically, we test whether these prescriptions vary for the population or workers that receives psychotherapy treatments, as these patients may be more likely to experience reported stress and anxiety just after job loss.

Despite the fact that less than 2 percent of our total sample of female workers receives psychotherapy, increases in the probability of receiving a benzodiazepine prescription are entirely concentrated in this

[46]For a list of commonly prescribed benzodiazepines in Upper Austria and their targeted treatment purposes, see Table A2.

[47]We find some evidence that male workers increase use of antidepressants when eligible for longer UI duration. However, this effect is not statistically significant or consistent across bandwidths.

subgroup, and these effects are large enough to drive the overall increase for the full sample. These effects are consistent with evidence in Table 6 indicating that the increase in benzodiazepine prescriptions is largest for the more "potent" drugs, which are potentially more likely to be taken by existing psychotherapy patients, due to potential side effects and withdrawal symptoms of the drugs (Susman and Klee, 2005).

Furthermore, we find that this is not the case for antidepressant prescriptions. For female workers not enrolled in psychotherapy, estimates indicate a 8.8 percent decline in the probability of receiving an antidepressant prescription when eligible for a UI benefit extension. We find no statistically significant effects on benzodiazepine prescriptions for this group. Moreover, we estimate no changes in psychotherapy take up just before or after job loss, indicating that this is not driven by changes in patient composition at the benefit cutoff (e.g., Figure A7.)

One remaining question is whether for these types of prescriptions, prescribing behavior is changing most for those with existing prescriptions or for those who previously did not have a prescription for benzodiazepines or antidepressants. In Tables 9 and 10, we investigate the effects of longer UI duration on changes in the level of prescriptions. Table 9 reports results for the total number of packages prescribed, including zeroes, while Table 10 provides estimates for the number of packages prescribed, conditional on receiving a prescription. These estimates are largely insignificant, implying that longer UI duration affects patients' decisions to start or stop taking a prescription drug.[48]

Additionally, in Figure A8 we show that female workers are more likely to be prescribed non-opioid analgesics in the months immediately following unemployment, which may represent a substitution effect that offsets the previously discussed decrease in opioids for this group. These estimates, mirrored in Table 4, are relatively noisy, but weakly suggest that when female workers are in-between jobs, they may experience less physical pain, especially those in physically demanding jobs.[49]

6.3. Health Care Utilization

In this section, we test the relationship between unemployment duration and health care utilization. To the extent that unemployment affects risky behaviors, we may observe changes in the number of and/or the intensity of interactions with the health care system. Importantly, Austrian workers do not lose health care coverage after job loss, implying no effects on the intensive or extensive margins of health care

[48] Additionally, for opioid prescriptions, estimates indicate that changes in the extensive margin drives our main result; that is, having access to a longer period of unemployment benefits greatly reduces the probability that more female workers start taking opioids.

[49] We have also tested whether an employee eligible for 9 additional weeks of UI benefits is more likely to seek treatment for alcohol or opioid dependence. However, these occurrences are relatively rare. Estimates for alcohol addiction and opioid addiction treatment are statistically insignificant and we can only rule out up to a 39 percent decrease in opioid- and alcohol-dependence prescriptions overall.

utilization due to changes in out-of-pocket costs. Therefore, any observed effects on hospitalizations, doctor's visits, or prescriptions are likely due to changes in worker health.[50,51]

In Figure 6 and Table 11 we consider the average effects of extending unemployment insurance benefits by 9 weeks on in-patient hospital stays within 9 months after job loss. Overall, we find no consistent effects on physicians visits or hospitalizations.[52,53] However, we find that extending UI benefit duration reduces inpatient days for male workers by 12 percent. Below, we further investigate what types of acute illnesses may be driving these results and focus our attention primarily on cardiac events.

6.4. Cardiac Events

In this section, we present estimated effects of unemployment duration on the prevalence of heart attack or stroke, using individual-level data on hospitalizations from the UAHIF. Despite the fact that cardiac events are relatively rare, we focus on these outcomes due to the existing evidence suggesting that unemployment leads to negative effects on cardiovascular health, due to increases in adverse health behaviors, like smoking (Black, Devereux, and Salvanes, 2015; Vogli and Santinello, 2005) and/or increases in stress due to job search.[54] While we cannot focus on smoking behavior directly, this possible explanation is especially plausible and important for Austria, which maintains the highest smoking rate for teenagers and ranks 4th for adults in OECD countries (OECD, 2019).

Figure 7 shows the mean counts of heart attack or stroke within 9 months after job loss for male and female workers separately just above the UI extension eligibility cutoff. We present our main regression-based estimates in Table 12. Estimates indicate that women are no more or less likely to experience a cardiac event in the months following unemployment, while males are 41.7 percent more likely to experience such an event within 9 months, driven by an increase in the likelihood of a stroke (30.0 percent).[55]

[50]Unemployment may also affect a worker's leisure time, leading to more doctor's visits and/or prescriptions for previously untreated ailments. However, in Austria, many workers participate in sick leave insurance, which compensates workers for lost earnings due to illness, and by law employers must grant time off to see a doctor during working hours (Ahammer, 2018).

[51]When observing hospitalizations at the intensive margin, we find that female workers spend, on average, 1 fewer day in the hospital, which could indicate that these workers are able to visit the hospital at an earlier stage in an illness.

[52]Similarly, we estimate no increases in physician fees or hospital fees billed or the number of physician visits.

[53]We also consider the possibility that at age 40 women are more likely to go to the doctor for a mammogram. However, we find no evidence that extending UI insurance changes behavior on this margin. See Figure A9. Similarly, we find no discontinuous effect on workers choosing to have a baby after unemployment. See Figure A10.

[54]Specifically Black, Devereux, and Salvanes (2015) estimate a dynamic difference-in-differences model and find that job displacement in Norway for workers in their early 40s led to a decline in cardiovascular health, driven by increase in smoking behavior, although they do not document any other significant health effects. Vogli and Santinello (2005) find that changes in smoking and excessive drinking behaviors are a result of the psychosocial stress suffered by the unemployed.

[55]For heart disease that is less severe, we may also expect to see an increase in prescriptions for heart medications. Indeed, we find that prescriptions for all heart medications, including beta blockers and cholesterol drugs, increase for male workers when they are eligible for 9 additional weeks of UI benefits. We find no such effects for the placebo sample, male workers unemployed near the age 40 cutoff that are not eligible for the extension in benefits.

When analyzing the dynamic effects of such acute illness, following Black, Devereux, and Salvanes (2015), we find that these effects are largest at least 4 months after job loss (see Figure A6). These delayed effects of extended unemployment duration for male workers may be unsurprising given that heart disease triggered by exertion and stress develop slowly, and individuals can have warning signs and symptoms of chest pain weeks in advance. Importantly, none of these effects are present prior to unemployment, providing additional support for the idea that these cardiac events are related to unemployment and not preexisting anomalies of the data.

When we investigate how these effects differ across worker types, estimates in Table 13 indicate that the average increases in cardiac events are driven by men working full-time jobs and physically demanding jobs (Panels (c) and (d)), as well as men with low-skilled jobs and lower education levels (Panels (b) and (e), respectively).[56] While effects for parents are positive and statistically significant across all cardiac outcomes, because we lack full birth certificate information on fathers, this may represent effects for a biased sample, as described above in Section 3.

7. Effects of Longer UI Duration on Child Health

Next, we analyze how a change in mother's UI benefit length can affect the health of their children. There are two arguments that support the idea that child health will improve with longer UI duration: (i) more leisure time for women could lead to more scheduled and attended well-visits and/or (ii) longer UI leading to a "better match" job with higher wages may allow for less stress within the household and/or a better affordability of complements to health, like more nutritious food.

We present estimates on proxies for child health separately by child age in Table 14 based on their parent's age of unemployment.[57] In Columns 1 and 2 we present estimates for outpatient expenditures and visits, respectively, and in Column 3 we present estimates for a count of total inpatient days. We find that when workers are eligible for longer UI assistance, children under the age of 6 have large decreases in outpatient expenses (30.1 percent).

When investigating this further, we find that these are driven primarily by both lower physician expenses and fewer drug expenses. Estimates for visits are statistically insignificant for all ages. Similarly, estimates for inpatient stays (Column 3) are statistically insignificant at the 5 percent level, suggesting that there are little effects of UI benefits on total hospitalizations for children. These estimates provide

[56]Moreover, when we estimate effects for female workers, estimates indicate that some women, namely those without children and those in less physically demanding jobs, have a *lower* probability of experiencing a cardiac event when eligible for 9 additional weeks of UI benefits, suggesting that the extension in job search time may benefit certain types of female workers.

[57]RDD figures for children of female workers are presented in Figure 8.

some support for the notion that when parents are unemployed longer, they spend less on their child's health but do not neglect doctor's visits.[58]

In Column 4, we separately analyze effects of longer UI duration on preventative care visits for children. This includes all screenings, including mother/child well visits. Notably, well visits for young children have a financial incentive for all mothers in Austria, regardless of household income. Therefore, perhaps unsurprisingly, we find no change in the probability that a child will complete a preventative care doctor's visit.

Nonetheless, even if the total number of visits is unchanged, we may be interested in any changes observed as a part of the visits that occur before and after unemployment. In Column 5 of Table 14, we analyze effects on "curative" health expenditures. Again, estimates are statistically significant for children under the age of 6, and suggest lower expenditures of approximately 31.3 percent, similar to the decline in overall health care expenditures. One possible explanation is when parents have access to an additional 9 weeks of UI benefits, they see the doctor earlier and do not let a child's illness progress to a stage that may be more costly. Notably, across columns and panels we see little to no effects on children above the age of 6. If anything, we see an increase in expenditures for children aged 12–17, which may indicate that either these children are old enough to know when they are sick and can stay home by themselves from school even if their parents are working, or are better able to articulate to their parents what their needs are.

Taken with our previous results, our findings altogether suggest that when mothers are eligible for 9 additional weeks of UI benefits, they are less likely to be depressed, less likely to use opioids, and are able to find a higher paying job, potentially leading to improvements in child health.

8. Effects of Longer UI Duration on Disability Claims

Finally, to the extent that unemployment leads to worsening health outcomes, individuals may be more likely to claim disability as a result.[59] Moreover, declining opioid use could reduce disability caseloads if more workers are able to substitute other analgesics which are less habit-forming, and return to work with less pain. We explore these possibilities in Figure 9. Specifically, we test whether unemployed workers eligible for extended UI benefit duration are more or less likely to claim disability before retirement, and we present these results separately by gender.

[58] Unfortunately, our data do not contain information on vaccines, as they are not covered by public health insurance.

[59] See Savych, Neumark, and Lea (2018) for recent work on the effects of opioid prescriptions on disability, which motivates this analysis.

We find that unemployed female workers eligible for extended UI benefits are 0.7 percentage points less likely to claim disability, while unemployed male workers are 0.6 percentage points *more* likely to claim disability. These effects increase as workers near age 50. This is consistent with work by Sullivan and Wachter (2009), which suggests that older workers who become unemployed may be close enough to retirement that they fill in the gap of unemployment and retirement with disability.[60] Altogether these findings provide additional evidence suggesting that extending unemployment benefit duration may beneficial for female workers but harmful for male workers.

9. Testing the Sensitivity of the Estimates

Our findings may overstate the true effects of unemployment on health if firms hire and fire different types of workers based on their knowledge of the age 40 cutoff. Importantly, firms do not receive any type of penalty or reward based on this threshold, and Austrian UI benefits are not experience-rated. Nonetheless, in Figure 10 we present an age distribution of unemployed workers and estimated discontinuity in the number of jobless workers near this cutoff. We find no lumpiness in this age distribution, implying there is no manipulation of the eligibility cutoff in layoff decisions.

Next, we explore whether there exist discontinuities in other types of observable characteristics, including gender, as well as urbanicity, migrant status, education, experience and log wage. Graphical evidence is presented in Figure 11, and formal estimates are presented in Table A3. Across all outcomes these estimates are statistically insignificant at the 1 percent level, providing additional support that workers on either side of the UI extension eligibility threshold are similar on measurable characteristics.

Relatedly, we test whether omitting observations in a small neighborhood around the age cutoff (i.e., a "donut") affects our results, as is practice in other age-based designs (e.g., Barreca, Guldi, Lindo, and Waddell, 2011; Barreca, Guldi, Lindo, and Waddell, 2016; and Carpenter and Dobkin, 2009). In Figure 12 we show RD estimates for a sample without female workers who become unemployed within one quarter before and after their 40^{th} birthday.[61] These estimates are very similar to the baseline, which mitigates concerns that other events interfere with our identification strategy.

To further test whether these health effects are simply an artifact of the data, in Table 15 we present effects for the three months prior to unemployment. This is especially important if certain types of workers with physical or mental illness are more likely to be laid off work. All estimates prior to job

[60] In related work, Mueller, Rothstein, and von Wachter (2016) find that the expiration of UI benefits does not induce workers to file for disability.

[61] Estimates for other outcome variables and for male workers are also statistically similar to the baseline.

loss are statistically insignificant at the 5 percent level, providing additional support for the notion that unemployed workers eligible for the UI extension are comparable to unemployed workers that are just below the age cutoff and do not become unemployed due to existing physical or mental health ailments that would be observed even in the absence of the benefit extension.

Additionally, we test whether workers that do not meet the criteria to receive 39 weeks of UI benefits (namely, the experience criterion). As discussed above, this eligibility provision requires that workers have worked at any job for at least 6 out of the last 10 years. In particular, in Table 16 we show our baseline effects for both female and male workers compared to workers that are laid off at age 40 but *not* eligible for the extension in benefits. We find that female workers eligible for the program are driving the main results, which provides further evidence that the extension in benefits, and not unemployment itself, is responsible for changes in physical and mental health.[62] Similarly, male workers are not more likely to experience cardiac events prior to unemployment.[63]

Finally, we show that our effects are not sensitive to various functional forms or bandwidths in Tables 17 (female workers) and 18 (male workers). In Columns 1 and 4 we replicate our baseline results from Equation (1) for female and male workers, respectively. In Columns 2 and 5 we present results from a specification that allows the running variable to vary quadratically, while Columns 3 and 6 show results from a model that allows the running variable to vary cubically. Estimates are similar to the main results for females across specifications for all outcome variables and indicate reductions in opioid prescriptions ranging from 20.0–53.3 percent and reductions in antidepressant prescriptions ranging from 8.5–9.4 percent. For males, estimates for opioid prescriptions are inconsistent, implying that effects for men represent only suggestive (or inconclusive) evidence of a decline. However, estimates for cardiac events are stable and consistent across columns and indicate effects ranging from 20–35 percent.

In Figures A12–A15 we present coefficients and their respective 95% confidence intervals across a wide range of bandwidths, highlighting the MSE-optimal bandwidth for comparison. Estimates are consistent across bandwidths and estimates relying on the MSE-optimal bandwidth reinforce our main findings.[64]

[62] When estimating effects for eligible workers, using a difference-in-RD approach with the ineligible unemployed workers as a control groups, estimates are similar to these baseline results and indicate reductions in opioid prescriptions, antidepressant prescriptions, and inpatient expenditures.

[63] Although we estimate some small effects on prescriptions for male workers, generally, antidepressant and benzodiazepine as well as health care utilization results for male workers are inconsistent across samples and bandwidths.

[64] Lastly, in Tables A4–A6 we provide evidence that the inclusion of various fixed effects does not have a meaningful effect on our main estimates. Estimates are statistically similar across columns, suggesting that the inclusion of fixed effects does not drive our results.

10. Discussion and Conclusion

In this paper we study the effects of increased UI benefit duration on worker health. In particular, we exploit a feature of the Austrian UI system, namely that workers between the ages of 40 and 50 are eligible for an additional 9 weeks of UI benefits, and analyze UI take-up on unemployment duration, opioid use, cardiac events, health care utilization, and mental health outcomes. We find that UI significantly impacts time unemployed, physical health and prescription purchases, and that these effects vary by gender. Specifically, we find that female workers remain unemployed 4 days longer, and are less likely to use opioids, less likely to experience a heart attack or stroke, less likely to use antidepressants, and less likely to claim disability as a result. We find that these positive health effects for mothers reduce health expenditures for their children under the age of 6. Male workers, on the other hand, are more likely to experience a heart attack or stroke, and more likely to claim disability retirement. Across physical and mental health outcomes, effects are largest for low-skill workers and parents.

Despite the fact that economic theory suggests that UI should be allocated at the amount where the direct and moral hazard costs equal the beneficial effects of consumption smoothing, we note that existing calculations will be misspecified given the spillover effects to workers themselves.[65] Overall, our findings shed light on the effects of unemployment on health in the context of a universal health care system. Moreover, we measure how unemployment affects men and women differently and to what extent there exist externalities within the household. At a time when female labor force participation is at an all-time high, and women are still disproportionately engaging in more work in the household, these results have important implications for gender-neutral policies including paid family leave, medical leave, and sick leave. Finally, we note that any calculations of the optimal allocation of UI that fails to consider differential effects by gender will understate the true benefits of UI on female workers.

[65]For work on optimal UI payments and inefficiency, see, for example, Chetty (2008); Lalive, Landais, and Zweimüller (2015); Kroft and Notowidigdo (2016); Landais, Michaillat, and Saez (2018).

References

Ahammer, A. (2018): "Physicians, sick leave certificates, and patients' subsequent employment outcomes," *Health Economics*, 27, 923–936.

Angelucci, M., and O. Attanasio (2013): "The Demand for Food of Poor Urban Mexican Households: Understanding Policy Impacts using Structural Models," *American Economic Journal: Economic Policy*, 5(1), 146–205.

Armand, A., O. Attanasio, P. Carneiro, and V. Lechene (2016): "The Effect of Gender-Targeted Conditional Cash Transfers on Household Expenditures: Evidence from a Randomized Experiment," *IZA DP No. 10133*.

Barreca, A., M. Guldi, J. M. Lindo, and G. R. Waddell (2011): "Saving Babies? Revisiting the Effect of Very Low Birth Weight Classification," *The Quarterly Journal of Economics*, 126(4), 2117–2123.

——— (2016): "Heaping-Induced Bias in Regression-Discontinuity Designs," *Economic Inquiry*, 54(1), 268–293.

Black, S. E., P. J. Devereux, and K. G. Salvanes (2015): "Losing Heart? The Effect of Job Displacement on Health," *ILR Review*, 68(4), 833–861.

Bloemen, H., S. Hochguertel, and J. Zweerink (2015): "Job Loss, Firm-Level Heterogeneity and Mortality: Evidence from Administrative Data," IZA Discussion Paper No. 9483, Available at http://ftp.iza.org/dp9483.pdf.

Browning, M., A. M. Dano, and E. Heinesen (2006): "Job Displacement and Stress-Related Health Outcomes," *Health Economics*, 15(10), 1061–1075.

Browning, M., and E. Heinesen (2012): "Effect of Job Loss Due to Plant Closure on Mortality and Hospitalization," *Journal of Health Economics*, 31, 599–616.

Calonico, S., M. D. Cattaneo, M. H. Farrell, and R. Titiunik (2016): "rdrobust: Software for Regression Discontinuity Designs," Discussion paper, University of Michigan.

Card, D., R. Chetty, and A. Weber (2007a): "Cash-On-Hand and Competing Models of Intertemporal Behavior: New Evidence from the Labor Market," *Quarterly Journal of Economics*, 122(4), 1511–1560.

——— (2007b): "The Spike at Benefit Exhaustion: Leaving the Unemployment System or Starting a New Job?," *The American Economic Review*, 97(2), 113–118.

Card, D., D. S. Lee, Z. Pei, and A. Weber (2015): "Inference on Causal Effects in a Generalized Regression Kink Design," *Econometrica*, 83(6), 2453–2483.

Carpenter, C. S., and C. Dobkin (2009): "The Effect of Alcohol Consumption on Mortality: Regression Discontinuity Evidence from the Minimum Drinking Age," *American Economic Journal: Applied Economics*, 1(1), 164–182.

Carpenter, C. S., C. B. McClellan, and D. I. Rees (2017): "Economic Conditions, Illicit Drug Use, and Substance Use Disorders in the United States," *Journal of Health Economics*, 52, 63–73.

Case, A., and A. Deaton (2015): "Rising Morbidity and Mortality in Midlife among White Non-Hispanic Americans in the 21st Century," *Proceedings of the National Academy of Sciences*, 112.

Chetty, R. (2008): "Moral Hazard versus Liquidity and Optimal Unemployment Insurance," *Journal of Political Economy*, 116(2), 173–234.

Classen, T., and R. A. Dunn (2012): "The Effect of Job Loss and Unemployment Duration on Suicide Risk in the United States: A New Look Using Mass-Layoffs and Unemployment Duration," *Health Economics*, 21, 338–350.

Cylus, J. M., M. M. Glymour, and M. Avendano (2015): "Health Effects of Unemployment Benefit Program Generosity," *American Journal of Public Health*, 105(2), 317–323.

Deb, P., W. Gallo, P. Ayyagari, J. Fletcher, and J. Sindelar (2011): "The Effect of Job Loss on Overweight and Drinking," *Journal of Health Economics*, 30(2), 317–327.

Dickens, W., L. Goette, E. L. Groshen, S. Holden, J. Messina, M. E. Schweitzer, J. Turunen, and M. E. Ward (2007): "How Wages Change: Micro Evidence from the International Wage Flexibility Project," *Journal of Economic Perspectives*, 21(2), 195–214.

Dobkin, C., and S. L. Puller (2007): "The Effects of Government Transfers on Monthly Cycles in Drug Abuse, Hospitalization and Mortality," *Journal of Public Economics*, 91(11–12), 2137–2157.

Elison, M., and D. Storrie (2006): "Lasting or Latent Scars? Swedish Evidence on the Long-Term Effects of Job Displacement," *Journal of Labor Economics*, 24(4), 831–856.

European Commission (2019): "Key Data on Early Childhood Education and Care in Europe – 2019 Edition," Discussion paper, Eurydice Report. Luxembourg: Publications Office of the European Union.

EVS (2017): "Where Have All the Workers Gone? An Inquiry into the Decline of the U.S. Labor Force Participation Rate," Available at https://europeanvaluesstudy.eu/.

Federal Ministry Republic of Austria (2018): "Overview of the Horizontal Issue of Disability in Austria," Accessed 18-November-2019 at https://broschuerenservice.sozialministerium.at/Home/Download?publicationId=441.

Fu, W., and F. Liu (2019): "Unemployment Insurance and Cigarette Smoking," *Journal of Health Economics*, 63, 34–51.

Hollingsworth, A., C. J. Ruhm, and K. Simon (2017): "Macroeconomic Conditions and Opioid Abuse," *Journal of Health Economics*, 56, 222–233.

Jäger, S., B. Schoefer, S. G. Young, and J. Zweimüller (2019): "Wages and the Value of Nonemployment," NBER Working Paper 25230, Available at https://www.nber.org/papers/w25230.

Jäger, S., B. Schoefer, and J. Zweimüller (2019): "Marginal Jobs and Job Surplus: A Test of the Efficiency of Separations," NBER Working Paper 25492, Available at https://www.nber.org/papers/w25492.

Kohler, H.-P., and R. Thornton (2012): "Conditional Cash Transfers and HIV/AIDS Prevention: Unconditionally Promising?," *The World Bank Economic Review*, 26(2), 165–190.

Kroft, K., and M. J. Notowidigdo (2016): "Should Unemployment Insurance Vary With the Unemployment Rate? Theory and Evidence," *The Review of Economic Studies*, 83(3), 1092–1124.

Krueger, A. B. (2017): "Where Have All the Workers Gone? An Inquiry into the Decline of the U.S. Labor Force Participation Rate," Accessed 2-February-2019 at https://www.brookings.edu/wp-content/uploads/2017/09/1_krueger.pdf.

Kuhn, A., R. Lalive, and J. Zweimüller (2009): "The Public Health Costs of Job Loss," *Journal of Health Economics*, 28, 1099–1115.

Kuka, E. (2018): "Quantifying the Benefits of Social Insurance: Unemployment Insurance and Health," *Forthcoming at the Review of Economics and Statistics*, NBER Working Paper 24766, Available at https://www.nber.org/papers/w24766.

Lalive, R., C. Landais, and J. Zweimüller (2015): "Market Externalities of Large Unemployment Insurance Extension Programs," 105(12).

Landais, C., P. Michaillat, and E. Saez (2018): "A Macroeconomic Approach to Optimal Unemployment Insurance: Theory," *American Economic Journal: Economic Policy*, 10(2), 152–181.

Lindo, J. M., J. Schaller, and B. Hansen (2018): "Caution! Men Not at Work: Gender-Specific Labor Market Conditions and Child Maltreatment," *Journal of Public Economics*, pp. 77–98.

Mueller, A. I., J. Rothstein, and T. M. von Wachter (2016): "Unemployment Insurance and Disability Insurance in the Great Recession," *Journal of Labor Economics*, 34(S1).

Mueller, A. I., J. Spinnewijn, and G. Topa (2020): "Job Seekers' Perceptions and Employment Prospects: Heterogeneity, Duration Dependence and Bias," *Working Paper*.

Nekoei, A., and A. Weber (2017): "Does Extending Unemployment Benefits Improve Job Quality," *The American Economic Review*, 107(2), 527–561.

OECD (2019): "Health at a Glance 2019: OECD Indicators," Report, OECD Publishing, Paris, Available at https://doi.org/10.1787/4dd50c09-en.

Rege, M., K. Telle, and M. Votruba (2009): "The Effect of Plant Downsizing on Disability Pension Utilization," *Journal of the European Economic Association*, 7(4), 754–785.

Ruhm, C. J. (1991): "Are Workers Permanently Scarred by Job Displacements?," *The American Economic Review*, 81(1), 319–324.

——— (2000): "Are Recessions Good for Your Health?," *Quarterly Journal of Economics*, 115(2), 617–650.

——— (2015): "Recessions, Healthy No More?," *Journal of Health Economics*, 42, 17–28.

Savych, B., D. Neumark, and R. Lea (2018): "Do Opioids Help Injured Workers Recover and Get Back to Work? The Impact of Opioid Prescriptions on Duration of Temporary Disability," NBER Working Paper 24528, Available at https://www.nber.org/papers/w24528.

Schady, N., and J. Rosero (2008): "Are Cash Transfers Made to Women Spent like Other Sources of Income?," *Economic Letters*, 101(3), 246–248.

Schaller, J., and A. H. Stevens (2015): "Short-Run Effects of Job Loss on Health Conditions, Health Insurance, and Health Care Utilization," *Journal of Health Economics*, 43, 190–203.

Serdarevic, M., C. W. Striley, and L. B. Cottler (2018): "Gender Differences in Prescription Opioid Use," *Current Opinion in Psychiatry*, 30(4), 238–246.

Sullivan, D., and T. V. Wachter (2009): "Job Displacement and Mortality: An Analysis Using Administrative Data," *The Quarterly Journal of Economics*, 124(3), 1265–1306.

Susman, J., and B. Klee (2005): "The Role of High-Potency Benzodiazepines in the Treatment of Panic Disorder," *Primary Care Compantion to The Journal of Clinical Psychiatry*, 7(1), 5–11, Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1076453/.

United Nations (2018): "Narcotic Drugs: Estimated World Requirements for 2019," Discussion paper, International Narcotics Control Board.

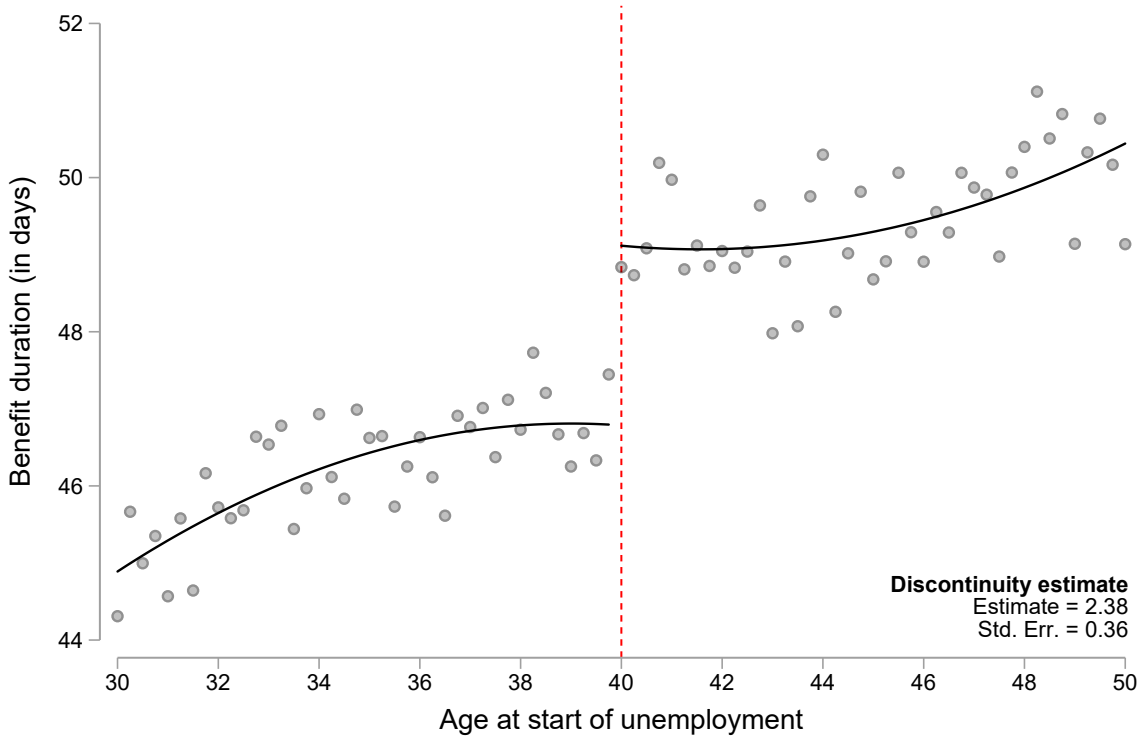
Venkataramani, A. S., E. F. Bair, R. L. O'Brien, and A. C. Tsa (2020): "Association Between Automotive Assembly Plant Closures and Opioid Overdose Mortality in the United States: A Difference-in-Differences Analysis," *JAMA Internal Medicine*, 180(2), 254–262, Available at https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2757788.

Vogli, T. D., and M. Santinello (2005): "Unemployment and Smoking: Does Psychosocial Stress Matter?," *Tobacco Control*, 14(6), 389–395, Available at https://www.ncbi.nlm.nih.gov/pubmed/16319362.

Zweimüller, J., R. Winter-Ebmer, R. Lalive, A. Kuhn, J. Wuellrich, O. Ruf, and S. Büchi (2009): "The Austrian Social Security Database (ASSD)," Working Paper 0901, The Austrian Center for Labor Economics and the Analysis of the Welfare State, University of Linz.

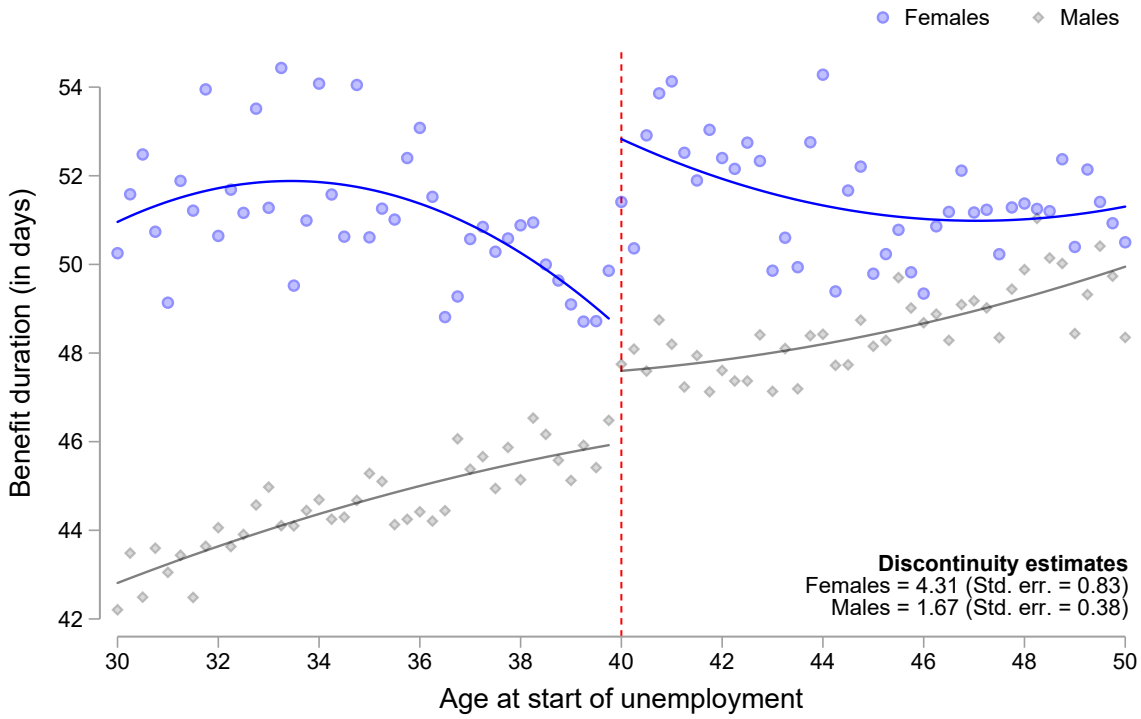
11. Figures and Tables

FIGURE 1 — Effects of UI Extensions on Benefit Duration



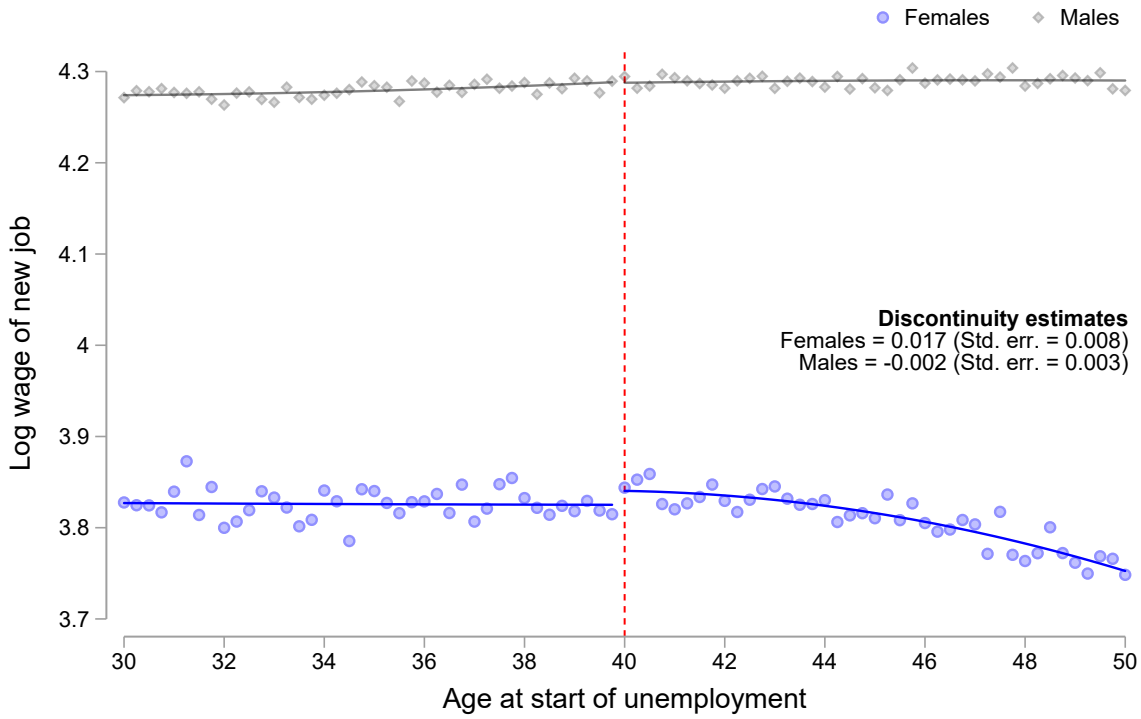
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Scatters represent the mean residual of the listed outcome variable (UI benefit duration, in days) net of quarter-year fixed effects for each 3-month age bin. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. On either side of the cutoff, we display quadratic fits. Age is calculated based on month of birth.

FIGURE 2 — Effects of UI Extensions on UI Benefit Duration by Gender



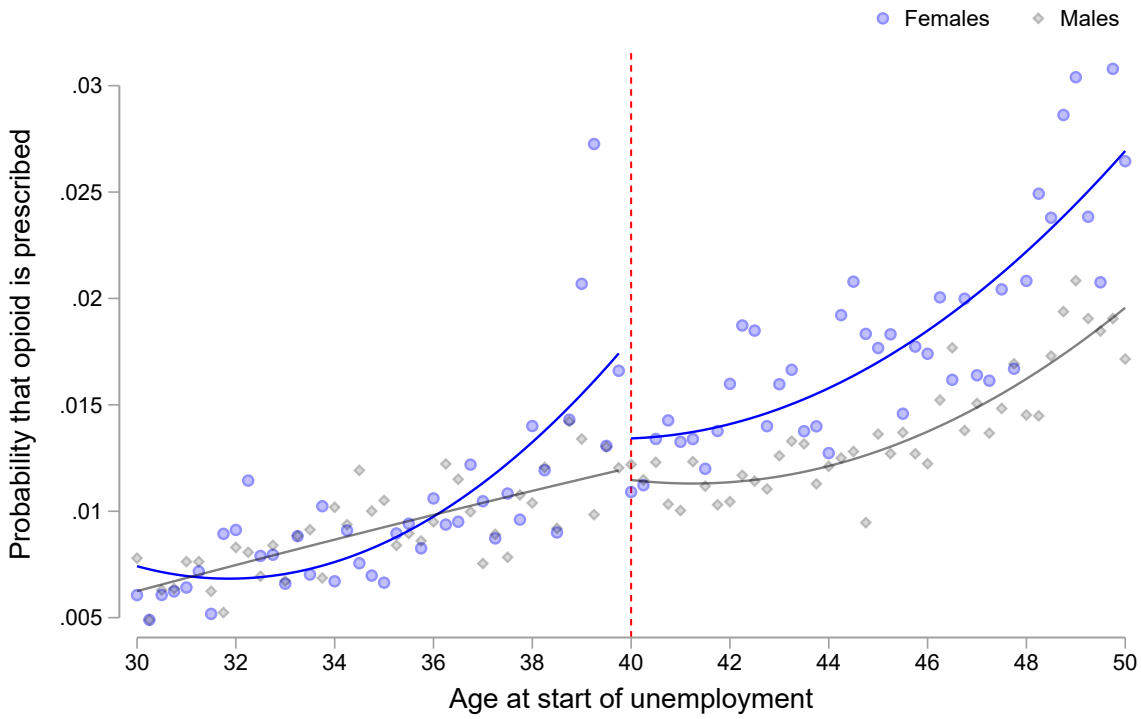
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Scatters represent the mean residual listed outcome variable (nonemployment duration, in days) net of quarter-year fixed effects for each 3-month age bin. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. On either side of the cutoff, we display quadratic fits. Age is calculated based on month of birth. Circles represent averages for female workers, while diamonds represent averages for male workers.

FIGURE 3 — Effects of UI Extensions on Job Quality



Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Scatters represent the mean residual of the listed outcome variable (log wage of the first job after an unemployment spell) net of quarter-year fixed effects for each 3-month age bin. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. On either side of the cutoff, we display quadratic fits. Age is calculated based on month of birth. Circles represent averages for female workers, while diamonds represent averages for male workers. We present the main estimate and the corresponding standard error, based on our main RD approach described by Equation 1.

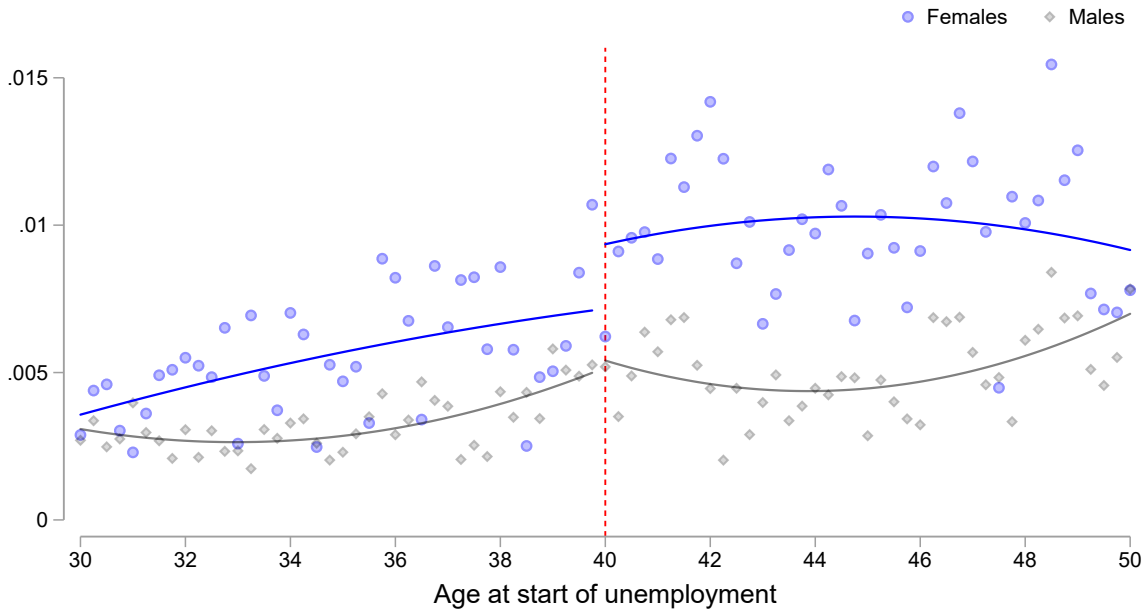
FIGURE 4 — Effects of UI Extensions on Opioid Prescriptions



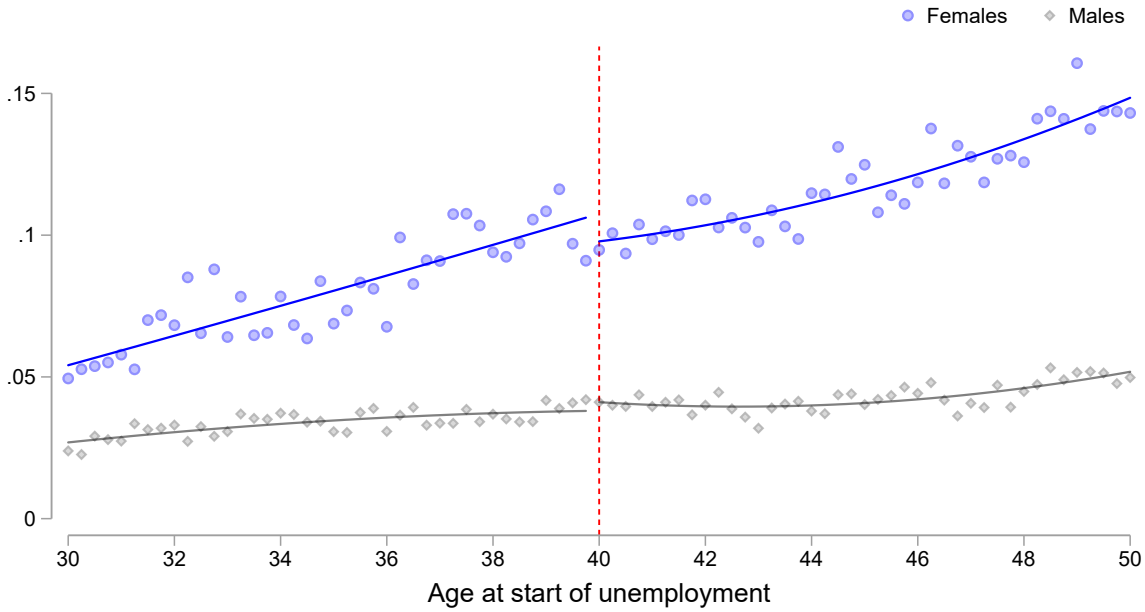
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Scatters represent the mean residual of the listed outcome variable (whether a worker received an opioid prescription within 9 months after job loss) net of quarter-year fixed effects for each 3-month age bin. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. Age is calculated based on month of birth.

FIGURE 5 — Effects of Extended UI Benefit Duration on the Probability of Being Prescribed Drugs for Anxiety or Depression

(a) Benzodiazepines

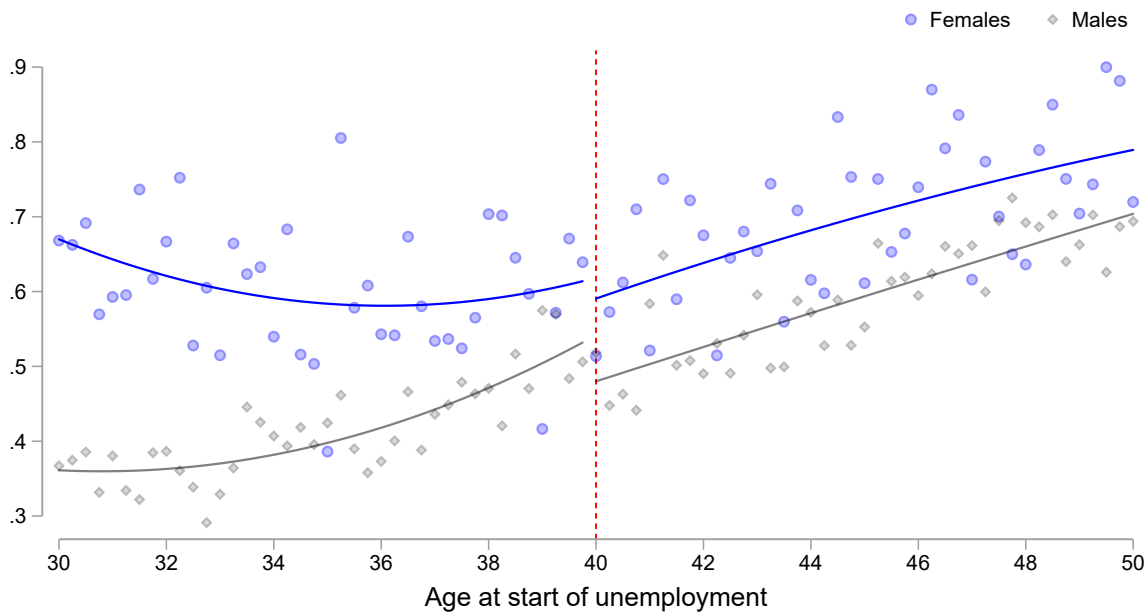


(b) Antidepressants



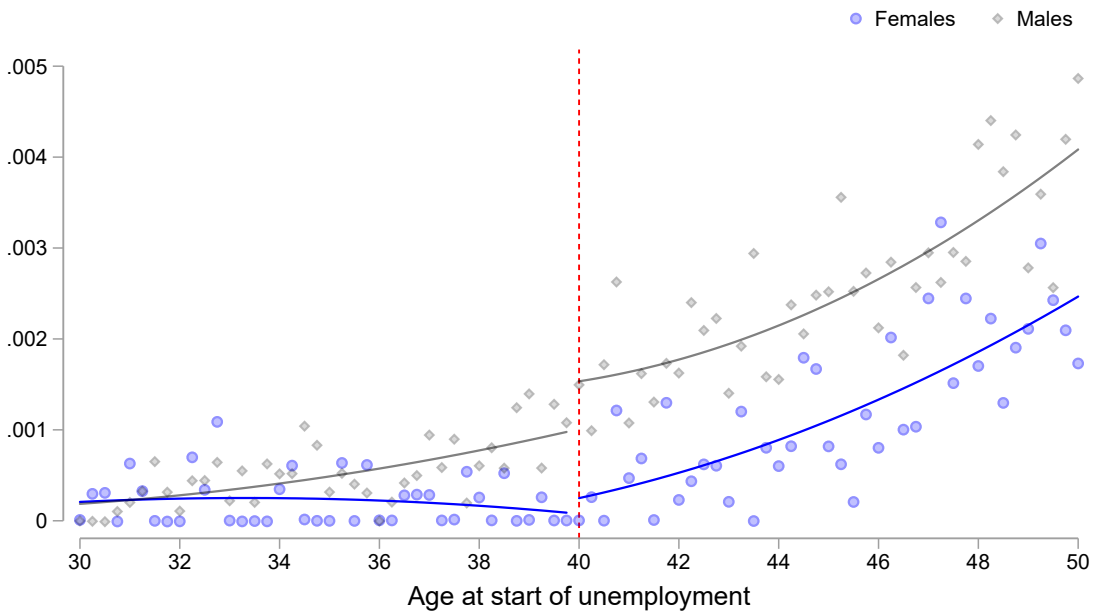
Notes: See notes for Figure 4. Prescription categories are defined by ATC codes, where N05 indicates benzodiazepines and other sleeping and antianxiety pills, and N06 indicates antidepressants. For a full list of ATC code N medications, see https://www.whocc.no/atc_ddd_index.

FIGURE 6 — Effects of Extended UI Benefit Duration on Health Care Utilization



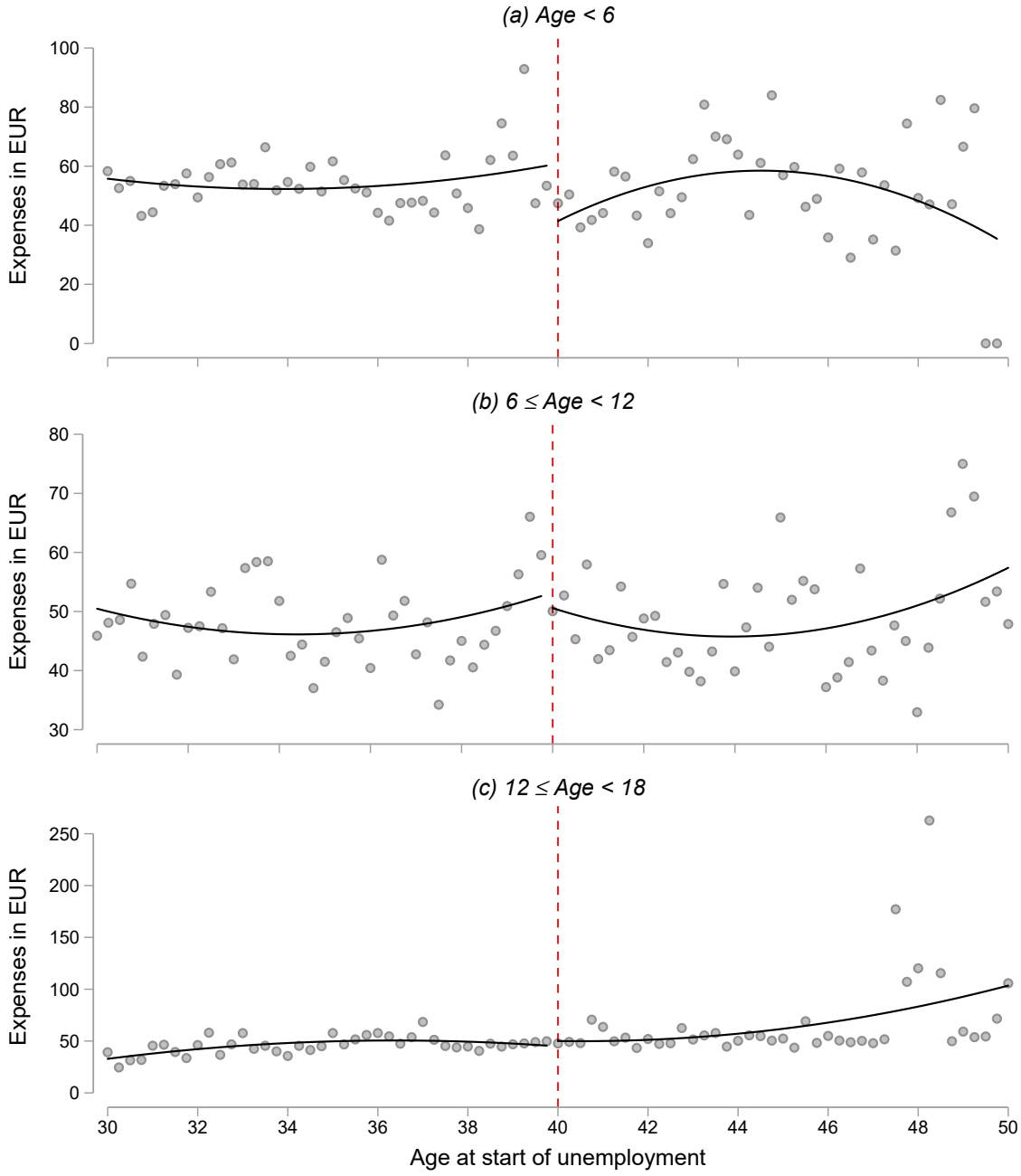
Notes: See notes for Figure 4. The outcome is the total number of inpatient hospital stays for unemployed workers within 9 months of job loss.

FIGURE 7 — Effects of Extended UI Benefit Duration on Cardiac Events



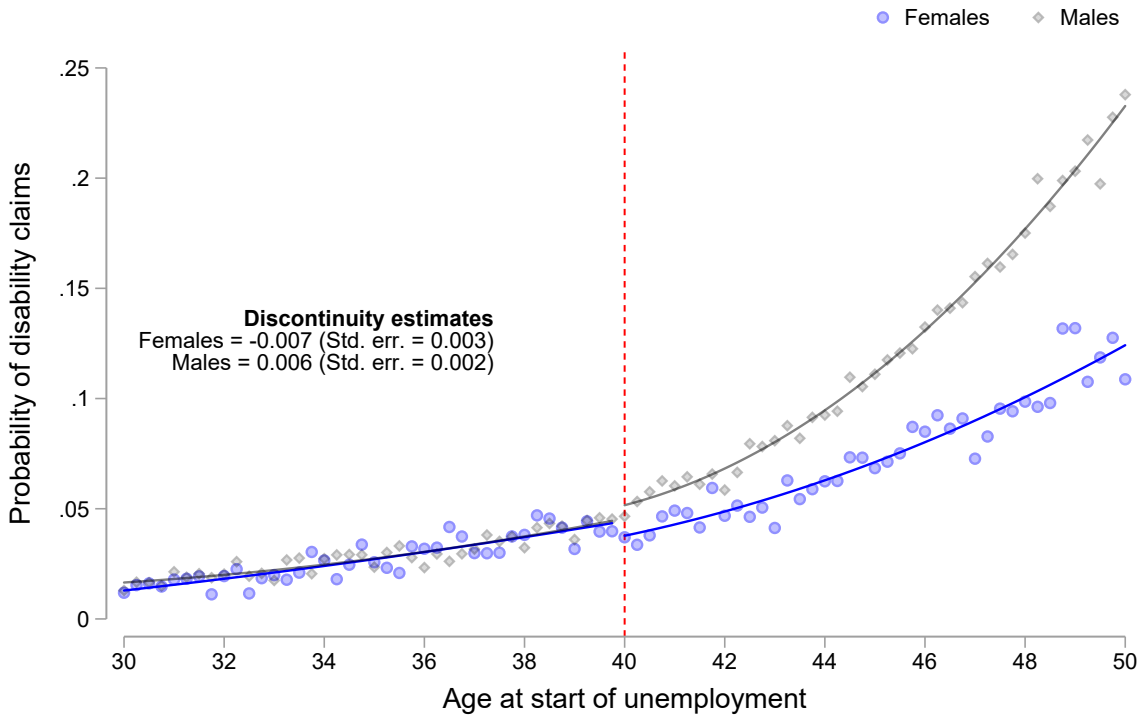
Notes: See notes for Figure 4. Cardiac events include heart attack and stroke.

FIGURE 8 — Effects on Outpatient and Drug Expenditure for Children of Unemployed Female Workers, by Child Age



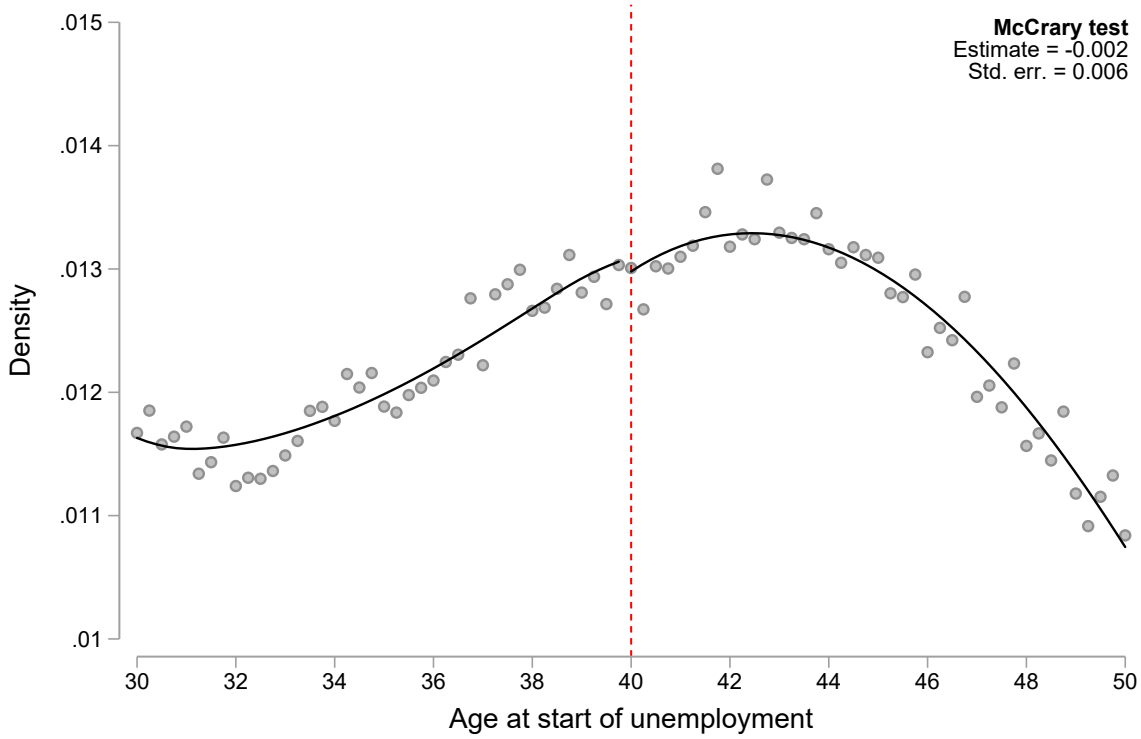
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. Age is calculated based on month of birth. Scatters represent the average residual of the listed outcome variable net of quarter-year fixed effects for each 3-month age bin.

FIGURE 9 — Effects of Extended UI Benefit Duration on the Probability of Disability Claims



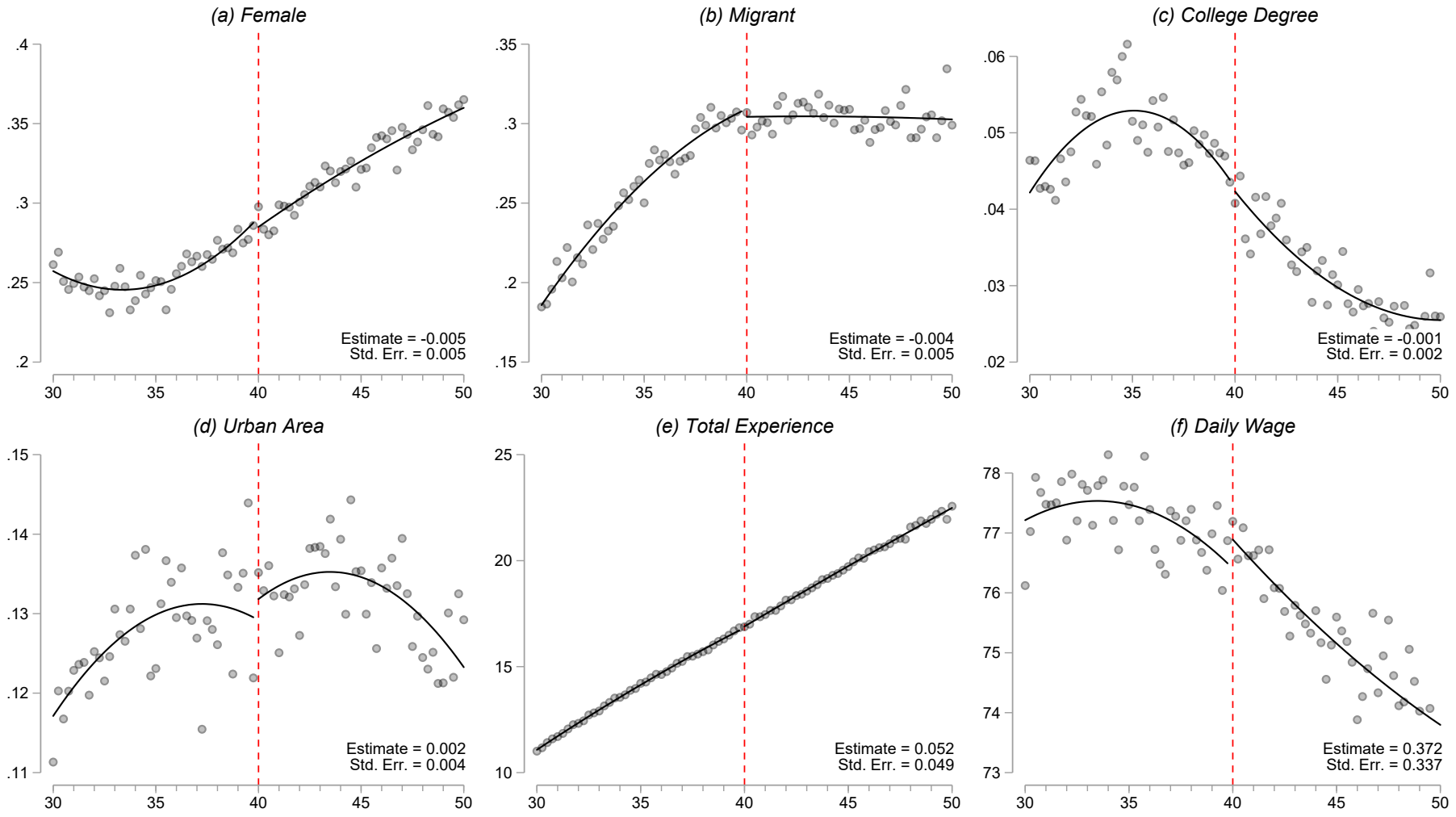
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. Age is calculated based on month of birth. Scatters represent the average residual of the listed outcome variable net of quarter-year fixed effects for each 3-month age bin. Circles represent averages for female workers, while diamonds represent averages for male workers. Our main variable of interest is an indicator variable equal to one if a worker claims disability pension between the time unemployed and the end of our sample, December 31, 2018, and zero otherwise. On average, 6.9 percent of workers (5.6 percent of females and 7.4 percent of males) in our sample ever claim disability pension. We present estimates and their respective standard errors for these two samples (female and male workers, respectively), based on our main RD approach described by Equation 1.

FIGURE 10 — Age Distribution



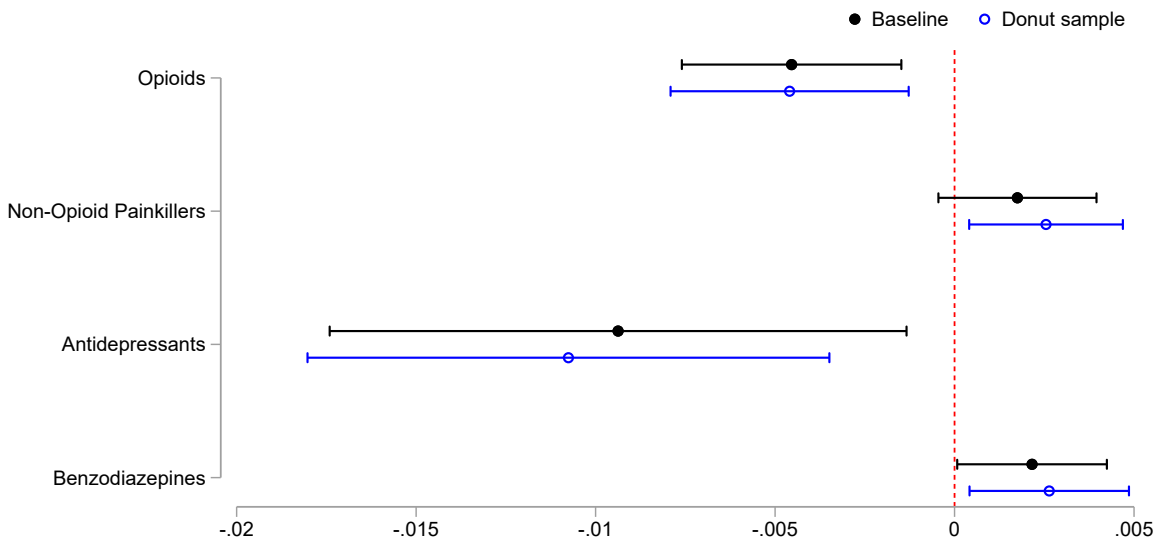
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. Age is calculated based on month of birth. Scatters represent the age density for each 3-month age bin. We present a discontinuity estimate and corresponding standard error, based on our main RD approach described by Equation (1).

FIGURE 11 — Testing Discontinuity of Socioeconomic and Labor Market Characteristics



Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. The vertical line represents the age at which workers are eligible for an additional 9 weeks of UI benefits. Age is calculated based on month of birth. Scatters represent the average residuals for each 3-month age bin for the listed outcome variables. In panels (a)-(d) we consider indicator variables equal to one for workers who are female, migrants, have a college degree, live in an urban area and zero otherwise. In panels (e) and (f) we present residualized binned means of worker experience, in years, and worker's daily wage in Euros. In each panel we present discontinuity estimates and standard errors, based on our main RD approach described by Equation 1.

FIGURE 12 — Difference in RD Estimates on Prescriptions Leaving out a Donut Sample (Female Workers)



Notes: The donut sample omits a sample of workers that become unemployed withing a one-quarter-year window around the cutoff. The solid black dots resemble the baseline estimates from Table 4, panel (b). The hollow blue dots are RD estimates based on the donut sample. Each regression includes quarter-year fixed effects. Bars indicate 90% confidence intervals.

TABLE 1 — Descriptive Statistics

	Full Sample		By Gender		
	Mean	Std. dev.	Females	Males	Difference
	(1)	(2)	(3)	(4)	(5)
Prescriptions					
Opioids	0.012	0.111	0.015	0.011	−0.004***
Non-Opioid Painkillers	0.006	0.077	0.008	0.005	−0.003***
Antidepressants	0.058	0.233	0.104	0.038	−0.066***
Benzodiazepines	0.005	0.073	0.008	0.004	−0.004***
Health Care Utilization					
Outpatient Expenditure	95.3	259.4	134.2	79.0	−55.1***
Outpatient Visits	5.8	18.5	9.2	4.4	−4.8***
Inpatient Days	0.5	3.9	0.7	0.5	−0.2***
Cardiac Events					
Any Cardiac Event	0.0013	0.0361	0.0008	0.0015	0.0007***
Heart Attack	0.0010	0.0315	0.0005	0.0012	0.0007***
Stroke	0.0003	0.0178	0.0003	0.0003	0.0000
Disability Claims					
Disability Pension Claim	0.069	0.253	0.056	0.074	0.018***
Socioeconomic Information					
Female	0.29	0.46			
Migrant	0.28	0.45	0.22	0.31	0.09***
College Degree	0.04	0.20	0.06	0.03	−0.03***
Urban Area	0.13	0.34	0.15	0.12	−0.03***
Total Experience (years)	17.05	5.99	16.24	17.38	1.14***
Daily Wage (Euros)	69.17	27.28	50.29	76.79	26.50***
Unemployment Spell Information					
Benefit Duration (days)	47.9	40.2	51.0	46.7	−4.4***
Nonemployment Duration (days)	75.0	97.5	87.5	69.8	−17.7***
Search Time (days)	290.1	809.8	394.1	247.0	−147.1***
UI Claims (Euros)	29.3	7.2	24.7	31.2	6.6***

Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files. Descriptive statistics include the means and standard deviations for the listed outcomes from 2003–2013 for all workers and workers split by gender separately, measured in the month of the start of the unemployment spell, with one exception. The outcome variable "Disability Pension Claim" alternatively measures an indicator variable equal to one if we observe a worker claim disability pension prior to December 31, 2018. Columns (1) and (2) present means and standard errors for all workers, respectively, while Columns (3) and (4) present means for male and female workers separately. In Column (5), we provide the difference in means of the respective variable between females and males according to a two-sample t test. N=1,113,759
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 2 — Estimates on Nonemployment Duration and Search Time

	Nonemployment (1)	Search Time (2)
Pooled	4.13***	19.93***
	(0.88)	(7.55)
Females	7.99***	34.49**
	(2.13)	(17.49)
Males	2.71***	14.04
	(0.99)	(8.95)

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each regression includes quarter-year fixed effects. Column 1 presents estimates for workers experiencing an unemployment spell, Column 2 presents estimates for unemployed female workers, and Column 3 presents estimates for unemployed male workers. Robust standard errors are clustered on the age bin level and are shown in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 3 — Wage Effects, by Nonemployment Quartiles

	Quartile 1 (1–22 Days) (1)	Quartile 2 (23–50 Days) (2)	Quartile 3 (50–93 Days) (3)	Quartile 4 (94–273 Days) (4)
(a) Females				
Discontinuity	0.03***	0.02*	0.03***	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Sample mean	3.84	3.84	3.80	3.80
(b) Males				
Discontinuity	−0.00	0.01	0.01*	−0.02***
	(0.00)	(0.00)	(0.00)	(0.01)
Sample mean	4.28	4.30	4.30	4.25

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each regression includes quarter-year fixed effects. Columns 1–4 present separate estimates for workers' nonemployment days in quartile bins. Robust standard errors are clustered on the age bin level and are shown in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 4 — Effects of Extending UI Benefits on Prescriptions within 9 Months of Job Loss

	Opioids	Non-opioid Painkillers	Antide-pressants	Benzodia-zepines
	(1)	(2)	(3)	(4)
(a) Pooled				
Discontinuity	−0.002**	0.0004	−0.0005	0.0009
	(0.0008)	(0.0005)	(0.002)	(0.0006)
Sample mean	0.012	0.006	0.058	0.005
Observations		1,113,759		
(b) Females				
Discontinuity	−0.005**	0.002	−0.009*	0.002*
	(0.002)	(0.001)	(0.005)	(0.001)
Sample mean	0.015	0.008	0.104	0.008
Observations		329,034		
(c) Males				
Discontinuity	−0.0006	−0.0002	0.003*	0.0004
	(0.0009)	(0.0006)	(0.002)	(0.0007)
Sample mean	0.011	0.005	0.038	0.004
Observations		784,725		

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each estimate presents separate effects of an additional 9-week eligibility of UI benefits for the 9 months following unemployment for the listed outcome. Each regression includes quarter-year fixed effects. Panel (a) presents estimates for all workers experiencing an unemployment spell, Panel (b) presents estimates for the sample of unemployed female workers, and Panel (c) presents estimates for the sample of unemployed male workers. Robust standard errors are clustered on the age bin level and are shown in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 5 — Effects of Extending UI Benefits on Prescriptions within 18 Months of Job Loss, Using a 3-Month Rolling Window

	Opioids (1)	Non-opioid Painkillers (2)	Antide-pressants (3)	Benzodia-zepines (4)
(a) Female Workers				
3 Months	−0.004*	0.005***	−0.01*	0.003**
	(0.002)	(0.002)	(0.005)	(0.002)
6 Months	−0.003*	0.003*	−0.009*	0.002*
	(0.002)	(0.002)	(0.005)	(0.001)
9 Months	−0.005**	0.002	−0.009*	0.002*
	(0.002)	(0.001)	(0.005)	(0.001)
12 Months	−0.005**	0.0008	−0.01**	0.002*
	(0.002)	(0.001)	(0.005)	(0.001)
15 Months	−0.005**	0.0008	−0.01**	0.002
	(0.002)	(0.001)	(0.005)	(0.001)
18 Months	−0.004**	0.0009	−0.01***	0.002*
	(0.002)	(0.001)	(0.005)	(0.001)
(b) Male Workers				
3 Months	0.0004	0.0004	0.004*	0.0005
	(0.001)	(0.0008)	(0.002)	(0.0007)
6 Months	−0.0004	0.0004	0.004*	0.0003
	(0.001)	(0.0006)	(0.002)	(0.0007)
9 Months	−0.0006	−0.0002	0.003*	0.0004
	(0.0009)	(0.0006)	(0.002)	(0.0007)
12 Months	−0.0002	−0.0007	0.004**	0.0006
	(0.0009)	(0.0006)	(0.002)	(0.0007)
15 Months	−0.00002	−0.0008	0.004**	0.0006
	(0.0009)	(0.0006)	(0.002)	(0.0007)
18 Months	0.0005	−0.0007	0.004**	0.0005
	(0.0009)	(0.0006)	(0.002)	(0.0006)

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each estimate presents separate effects of an additional 9-week eligibility of UI benefits for the 9 months following unemployment for the listed group of workers. Each regression includes quarter-year fixed effects. Panel (a) presents estimates for female workers, while Panel (b) presents estimates for male workers, based on a rolling 3-month window after an unemployment spell. Robust standard errors are clustered on the age bin level and are shown in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 6 — Effects of UI Extensions on Opioid and Benzodiazepine Prescribing, by Potency

	Opioid Potency		Benzodiazepine Potency	
	Low	High	Low	High
	(1)	(2)	(3)	(3)
(a) Pooled				
Discontinuity	−0.0013*	−0.0002	−0.0006	0.0011**
	(0.0008)	(0.0002)	(0.0004)	(0.0005)
Sample mean	0.0114	0.0010	0.0026	0.0030
Observations	1,044,245			
(b) Females				
Discontinuity	−0.0025**	−0.0002	−0.0002	0.0025***
	(0.0012)	(0.0006)	(0.0009)	(0.0009)
Sample mean	0.0138	0.0012	0.0049	0.0037
Observations	306,762			
(c) Males				
Discontinuity	−0.0008	−0.0002	−0.0008**	0.0006
	(0.0009)	(0.0002)	(0.0004)	(0.0005)
Sample mean	0.0104	0.0009	0.0017	0.0027
Observations	737,483			

Notes: See Table 4. "Weak" opioids include opoids in ATC categories N02AX, like tramadol, and "strong" opioids, including those categorized by N02AA, like morphine or oxycodone (but not codeine and dihydrocodeine, which are also in N02AX but we classify as "weak"). "Weak Benzodiazepines" are defined according to government regulations that inform judicial sentencing, and include Triazolam, Lorazepam, Bromazepam, and Alprazolam.
$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 7 — Effects of Extending UI Benefits on Health Outcomes within 9 Months of Job Loss, by Subgroup (Female Workers)

	Opioids (1)	Non-opioid Painkillers (2)	Antide-pressants (3)	Benzodia-zepines (4)
(a) Parent				
Yes (n = 206,672)	−0.009***	−0.0004	−0.006	0.0002
	(0.003)	(0.001)	(0.006)	(0.001)
No (n = 122,362)	0.004	0.006***	−0.01	0.005**
	(0.003)	(0.002)	(0.008)	(0.003)
(b) Low-Skilled Occupation				
Yes (n = 293,615)	−0.004**	0.002*	−0.009*	0.003*
	(0.002)	(0.001)	(0.005)	(0.001)
No (n = 35,419)	−0.006	−0.004	−0.01	−0.003
	(0.004)	(0.002)	(0.017)	(0.004)
(c) Job with Hardship				
Yes (n = 137,283)	−0.009***	0.0008	−0.001	0.006***
	(0.002)	(0.002)	(0.006)	(0.002)
No (n = 163,839)	0.003*	0.002	−0.004	−0.0004
	(0.002)	(0.002)	(0.007)	(0.002)
(d) Part-Time				
Yes (n = 162,726)	−0.005***	−0.0005	0.007	0.003*
	(0.002)	(0.002)	(0.006)	(0.002)
No (n = 138,354)	0.001	0.004***	−0.02**	0.002
	(0.002)	(0.002)	(0.007)	(0.002)
(e) Low Education				
Yes (n = 263,327)	−0.006***	0.002	−0.01**	0.003**
	(0.002)	(0.001)	(0.005)	(0.001)
No (n = 51,042)	0.004	−0.0003	−0.02*	−0.003
	(0.003)	(0.002)	(0.012)	(0.003)

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013, although hardship and part-time indicators are not available for 2013. Each estimate presents separate effects of an additional 9-week eligibility of UI benefits for the 9 months following unemployment for the listed group of workers. "Parent" is an indicator variable equal to one if a worker has at least one child. "Low-Skilled Occupation" is defined based on the International Standard Classification of Occupations (ISCO) code of an individual's last occupation. "Receives Hardship Allowance" is an indicator variable equal to one if a worker receives an allowance due to working a job that is hazardous or otherwise physically demanding. "Low Education" is an indicator equal to one if a worker has not met criteria to attend college. "Part-time Worker" indicates an employee that works less than 35 hours per week. Robust standard errors are clustered on the age bin level and are shown in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 8 — Effects on Antidepressants and Benzodiazepines by Whether Workers are in Psychotherapy (Female Workers)

	No Psychotherapy		In Psychotherapy	
	Antidepressants (1)	Benzodiazepines (2)	Antidepressants (3)	Benzodiazepines (3)
Discontinuity	−0.008*	0.002	−0.052	0.037**
	(0.004)	(0.001)	(0.053)	(0.017)
Sample mean	0.09	0.01	0.57	0.02
Observations	322,618		6,416	

Notes: See notes for Table 4.

TABLE 9 — Effects of Longer UI Duration on Total Prescriptions

	Opioids (1)	Non-opioid Painkillers (2)	Antide-pressants (3)	Benzodia-zepines (4)
(a) Pooled				
Discontinuity	−0.0001	0.001	−0.003	0.006**
	(0.002)	(0.0009)	(0.006)	(0.002)
Sample mean	0.025	0.009	0.138	0.012
Observations	1180614	1114171	1114171	1113768
(b) Females				
Discontinuity	−0.004	0.005*	−0.03*	0.008*
	(0.005)	(0.002)	(0.02)	(0.005)
Sample mean	0.029	0.013	0.251	0.018
Observations	345585	329184	329184	329041
(c) Males				
Discontinuity	0.001	0.00004	0.006	0.005*
	(0.003)	(0.0009)	(0.005)	(0.003)
Sample mean	0.023	0.008	0.090	0.010
Observations	835029	784987	784987	784727

Notes: See Table 4. The outcome variables in each column represent the total number of packages prescribed for each type of drug, including zeroes.

TABLE 10 — Effects of Longer UI Duration on the Number of Packages Prescribed, Conditional on Receiving a Prescription

	Opioids	Non-opioid Painkillers	Antide-pressants	Benzodia-zepines
	(1)	(2)	(3)	(4)
(a) Pooled				
Discontinuity	0.19	0.07	−0.04	0.74**
	(0.15)	(0.07)	(0.06)	(0.33)
Sample mean	2.11	1.57	2.39	2.28
Observations	13867	6678	64087	5958
(b) Females				
Discontinuity	0.26	0.14	−0.04	0.86
	(0.27)	(0.16)	(0.07)	(0.65)
Sample mean	2.01	1.65	2.42	2.19
Observations	4914	2600	34162	2676
(c) Males				
Discontinuity	0.18	0.05	−0.03	0.77**
	(0.18)	(0.08)	(0.08)	(0.34)
Sample mean	2.17	1.52	2.36	2.35
Observations	8953	4078	29925	3282

Notes: See Table 4. The outcome variables represent marginal effects, conditional on a patient receiving at least one prescription.

TABLE 11 — Effects of Extending UI Benefits on Health Care Utilization within 9 Months of Job Loss

	Outpatient Expenditure (1)	Outpatient Visits (2)	Inpatient Days (3)
(a) Pooled			
Discontinuity	−1.3	0.2	−0.05**
	(2.5)	(0.09)	(0.03)
Sample mean	95.3	5.8	0.5
Observations		1,113,759	
(b) Females			
Discontinuity	−0.3	0.3	−0.03
	(6.5)	(0.2)	(0.05)
Sample mean	134.2	9.2	0.7
Observations		329,034	
(c) Males			
Discontinuity	−1.8	0.1	−0.06*
	(2.5)	(0.08)	(0.03)
Sample mean	79.0	4.4	0.5
Observations		784,725	

Notes: See notes for Table 4. "Outpatient Expenditure" denotes the total amount spent, in Euros, on doctor's visits. "Outpatient Visits" include the number of visits to a physician. "Inpatient Days" include the number of days spent in a hospital.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 12 — Effects of Extending UI Benefits on Cardiac Events within 9 Months of Job Loss

	Any Cardiac Event (1)	Heart Attack (2)	Stroke (3)
(a) Pooled			
Discontinuity	0.0003**	0.0001	0.0004**
	(0.0002)	(0.00009)	(0.0002)
Sample mean	0.0010	0.0003	0.0013
Observations		1,113,759	
(b) Females			
Discontinuity	−0.00008	0.0002	0.0001
	(0.0001)	(0.0001)	(0.0002)
Sample mean	0.0005	0.0003	0.0008
Observations		329,034	
(c) Males			
Discontinuity	0.0005**	0.00007	0.0005**
	(0.0002)	(0.0001)	(0.0002)
Sample mean	0.0012	0.0003	0.0015
Observations		784,725	

Notes: See notes for Table 4. Cardiac events include recorded hospitalizations for heart attacks and strokes.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 13 — Effects of Extending UI Benefits on Cardiac Events within 9 Months of Job Loss, by Subgroup (Male Workers)

	Any Cardiac Event (1)	Heart Attack (2)	Stroke (3)
(a) Parent			
Yes (n = 358,887)	0.0007**	0.0005***	0.001***
	(0.0004)	(0.0001)	(0.0004)
No (n = 425,838)	0.0002	−0.0003	−0.0002
	(0.0003)	(0.0002)	(0.0003)
(b) Low-Skilled Occupation			
Yes (n = 552,287)	0.0003	0.0002	0.0004
	(0.0003)	(0.0001)	(0.0003)
No (n = 232,438)	0.001**	−0.0001	0.0009
	(0.0005)	(0.0002)	(0.0006)
(c) Job with Hardship			
Yes (n = 544,794)	0.0002	0.0001	0.0004
	(0.0003)	(0.0002)	(0.0003)
No (n = 219,063)	0.0009*	−0.0003	0.0004
	(0.0005)	(0.0003)	(0.0005)
(d) Part-Time			
Yes (n = 100,227)	−0.0005	−0.0003	−0.0008
	(0.0006)	(0.0005)	(0.0007)
No (n = 663,540)	0.0006**	0.00004	0.0006*
	(0.0003)	(0.0001)	(0.0003)
(e)Low Education			
Yes (n = 659,209)	0.0004	0.0001	0.0005*
	(0.0002)	(0.0001)	(0.0003)
No (n = 106,023)	0.002**	−0.0003	0.001
	(0.0008)	(0.0003)	(0.0008)

Notes: See notes for Table 7. Estimates are for a sample of unemployed male workers. Cardiac events include heart attacks and strokes.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 14 — Effects of Extending UI Benefits on Child Health

	Outpatient Expenditure (1)	Outpatient Visits (2)	Inpatient Stays (3)	Disentangling Outpatient Expenditure: Preventative (4)	Disentangling Outpatient Expenditure: Curative (5)
(a) Mothers					
Child Age < 6	−16.184**	−0.053	−0.002	−0.515	−15.669**
	(7.355)	(0.254)	(0.074)	(0.331)	(7.332)
Sample mean	53.70	3.61	0.13	3.72	49.98
Observations			26,466		
6 ≤ Child Age < 12	−1.946	−1.181	−0.161	2.027	−3.973
	(4.485)	(0.776)	(0.135)	(1.469)	(4.362)
Sample mean	48.03	2.75	0.16	0.24	47.79
Observations			49,497		
12 ≤ Child Age < 18	10.283*	0.113	0.044	0.216	10.067*
	(5.537)	(0.302)	(0.032)	(0.330)	(5.580)
Sample mean	56.54	3.54	0.22	0.26	56.28
Observations			96,282		
(b) Fathers					
Child Age < 6	−0.021	0.143	0.003	−0.074	0.054
	(0.549)	(0.134)	(0.003)	(0.051)	(0.525)
Sample mean	3.43	0.24	0.01	0.29	3.15
Observations			146,511		
6 ≤ Child Age < 12	−1.034*	−0.103	−0.001	−0.001	−1.033*
	(0.551)	(0.107)	(0.006)	(0.001)	(0.551)
Sample mean	4.20	0.32	0.01	0.00	4.20
Observations			247,263		
12 ≤ Child Age < 18	−0.438	−0.056	0.016*	−0.051	−0.387
	(0.608)	(0.045)	(0.008)	(0.037)	(0.606)
Sample mean	6.89	0.45	0.03	0.04	6.85
Observations			175,920		

Notes: See notes for Table 4. Panel (a) presents estimates for children with unemployed mothers, while Panel (b) presents estimates for children with unemployed fathers. Estimates are from separate regressions for each listed child age group. “Outpatient Expenditure" denotes the total amount spent, in Euros, on doctor’s visits. “Outpatient Visits" include the number of visits to a physician. “Inpatient Days" include the number of days spent in a hospital.“Preventative" visits include any type of screening or mother/child well visits, excluding vaccinations (due to data limitations). “Curative" visits include visits to the doctor’s office that are not primarily for a sick visit, and do not include any type of preventative care.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 15 — Effects of Longer UI Duration on Health Outcomes 3 Months Prior to Job Loss

	Opioids (1)	Non-opioid Painkillers (2)	Antide-pressants (3)	Benzodia-zepines (4)	Inpatient Days (5)	Cardiac Event (6)
(a) Pooled						
Discontinuity	−0.0002	−0.0002	−0.0006	0.0007	0.03	0.0003
	(0.001)	(0.001)	(0.002)	(0.000)	(0.026)	(0.000)
(b) Females						
Discontinuity	0.0009	0.001	−0.008	−0.0009	−0.03	0.0005
	(0.002)	(0.002)	(0.007)	(0.002)	(0.074)	(0.000)
(c) Males						
Discontinuity	0.002	−0.0002	0.005*	0.0009	0.01	0.0003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.043)	(0.000)

Notes: See Table 4. The sample includes only outcomes during the three months prior to the unemployment spell. Standard errors clustered at the age-bin level are in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 16 — Placebo Tests with Unemployed Workers Who do Not Fulfill the Experience Criterion

	(1)	(2)	(3)	(4)
(a) Prescriptions				
	Opioids	Non-opioid Painkillers	Antide-pressants	Benzodia-zepines
Females	0.0009	0.001	−0.008	−0.0009
	(0.002)	(0.002)	(0.007)	(0.002)
Males	0.002	−0.0002	0.005**	0.0009
	(0.001)	(0.001)	(0.002)	(0.0007)
(b) Health Care Utilization				
	Outpatient Expenditure	Outpatient Visits	Inpatient Days	
Females	−3.7	−0.1	−0.03	
	(5.4)	(0.3)	(0.07)	
Males	4.8	0.4**	0.01	
	(3.3)	(0.2)	(0.04)	
(c) Cardiac Events				
	Any Cardiac Event	Heart Attack	Stroke	
Females	0.0005	0.0003	0.0002	
	(0.0004)	(0.0002)	(0.0003)	
Males	0.0003	0.0006	−0.0002	
	(0.0004)	(0.0004)	(0.0002)	

Notes: Notes: See Table 4. Estimates are based on data reflecting 3 months prior to UI spell.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 17 — Testing Alternative Specifications (Female Workers)

		Different polynomials		Robust CIs	
	Baseline	Linear	Cubic	Triangular kernel	Optimal bandwidth
	(1)	(2)	(3)	(4)	(5)
(a) Prescriptions					
Opioids	−0.005**	−0.004***	−0.010***	−0.004***	−0.006***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)
Non-Opioid Painkillers	0.002	0.0005	−0.002	0.001	0.0009
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Antidepressants	−0.009*	−0.01***	−0.008**	−0.01***	−0.01***
	(0.005)	(0.002)	(0.004)	(0.002)	(0.003)
Benzodiazepines	0.002*	0.003***	0.002*	0.002***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
(c) Health Care Utilization					
Outpatient Expenditure	−0.3	−8.4***	−9.7**	−4.3*	−2.7
	(6.542)	(2.017)	(4.039)	(2.637)	(4.154)
Outpatient Visits	0.3	−0.3	−0.3	0.005	−0.2
	(0.250)	(0.184)	(0.368)	(0.144)	(0.228)
Inpatient days	−0.03	0.02	−0.05	−0.0002	−0.03
	(0.053)	(0.029)	(0.058)	(0.032)	(0.045)
(d) Cardiac Events					
Any Cardiac Event	0.0001	−0.0001	0.0004	0.000002	0.0003*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stroke	0.0002	0.000007	0.0004	0.0001	0.0003**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Heart Attack	−0.00008	−0.0001	0.000005	−0.0001	−0.00009
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each regression includes quarter-year fixed effects. These estimates are only for female workers. Column 1 replicates the baseline estimates for workers experiencing an unemployment spell, Columns 2–3 presents estimates from specifications that allow the running variable to vary linearly and cubically, respectively, and Column 4 presents the baseline estimates using triangular kernel instead of uniform kernel weighting. Column 5 shows estimates from a model using a smaller MSE-driven bandwidth, instead of our baseline one-sided bandwidth of 10 years. Robust standard errors are clustered on the age bin level and are shown in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

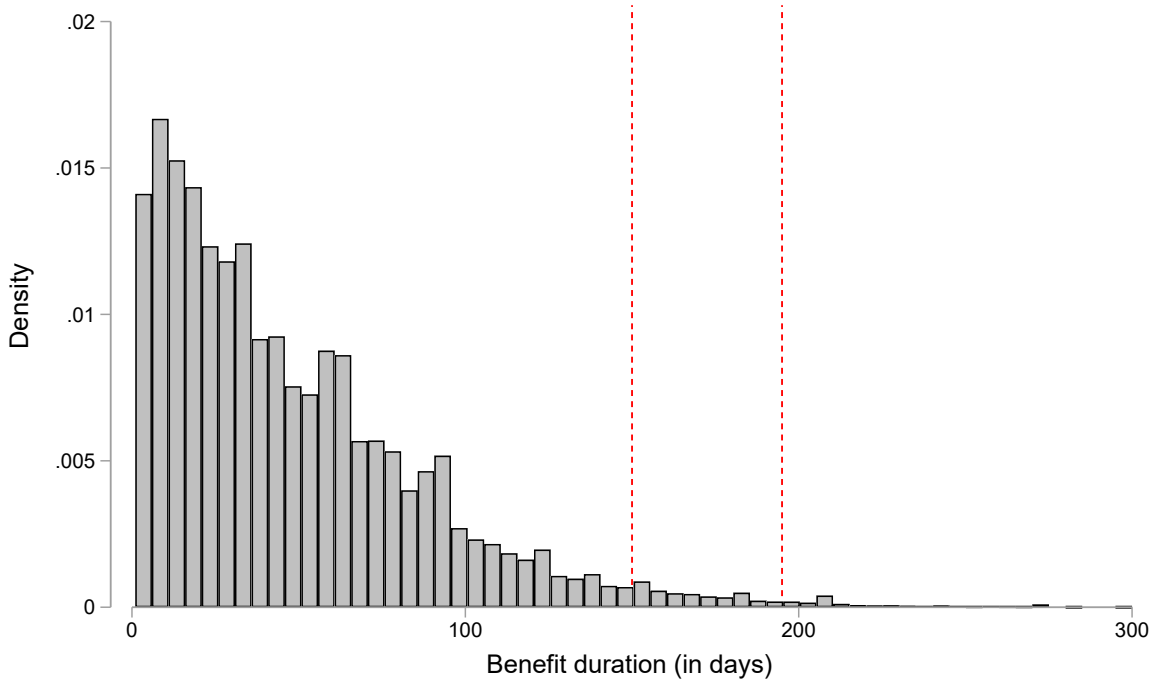
TABLE 18 — Testing Alternative Specifications (Male Workers)

		Different polynomials		Robust CIs	
	Baseline	Linear	Cubic	Triangular kernel†	Optimal bandwidth‡
	(1)	(2)	(3)	(4)	(5)
Opioids	−0.0006	−0.002***	−0.0009	−0.002***	−0.002**
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Non-Opioid Painkillers	−0.0002	−0.0003	0.0003	−0.0002	−0.0003
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
Antidepressants	0.003*	−0.002**	−0.0003	0.0007	0.002
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)
Benzodiazepines	0.0004	−0.00002	0.0006	0.0001	0.0003
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
(c) Health Care Utilization					
Outpatient Expenditure	−1.8	−3.4***	−4.1*	−2.0*	−3.2*
	(2.500)	(1.075)	(2.148)	(1.145)	(1.616)
Outpatient Visits	0.1	0.04	0.09	0.1**	0.2**
	(0.084)	(0.060)	(0.120)	(0.055)	(0.087)
Inpatient days	−0.06*	−0.02	−0.03	−0.04*	−0.05*
	(0.033)	(0.017)	(0.034)	(0.019)	(0.026)
(d) Cardiac Events					
Any Cardiac Event	0.0005**	0.0003**	0.0001	0.0004**	0.0003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stroke	0.00007	−0.00006	0.0001	−0.000005	0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Heart Attack	0.0005**	0.0004***	−0.000004	0.0004***	0.0003*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each regression includes quarter-year fixed effects. These estimates are from a sample using data for just male workers. Column 1 replicates the baseline estimates for workers experiencing an unemployment spell, Columns 2–3 presents estimates from specifications that allow the running variable to vary linearly and cubically, respectively, and Column 4 presents the baseline estimates using triangular kernel instead of uniform kernel weighting. Column 5 shows estimates from a model using a smaller MSE-driven bandwidth, instead of our baseline one-sided bandwidth of 10 years. Robust standard errors are clustered on the age bin level and are shown in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

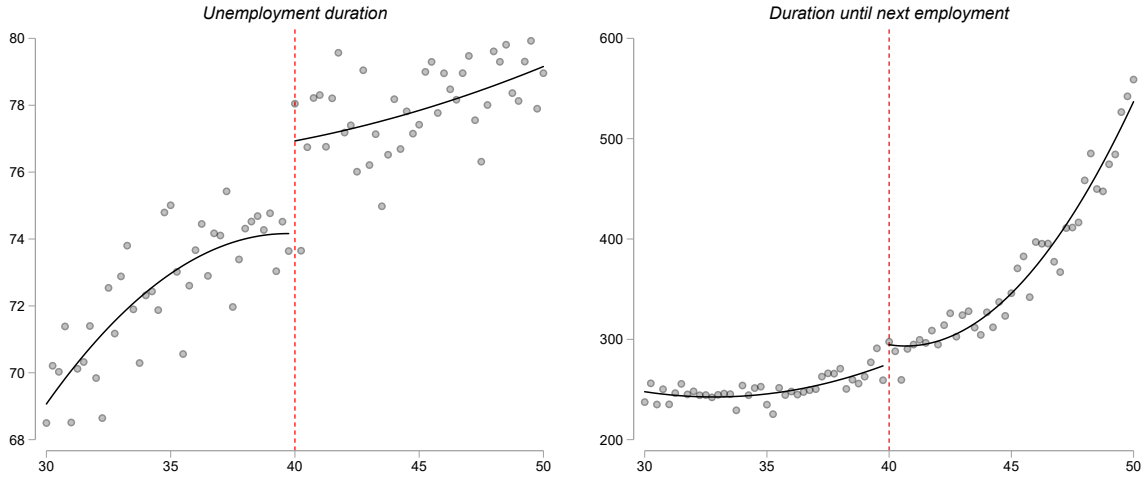
Appendix

FIGURE A1 — Density of UI Benefit Duration Length, in Days



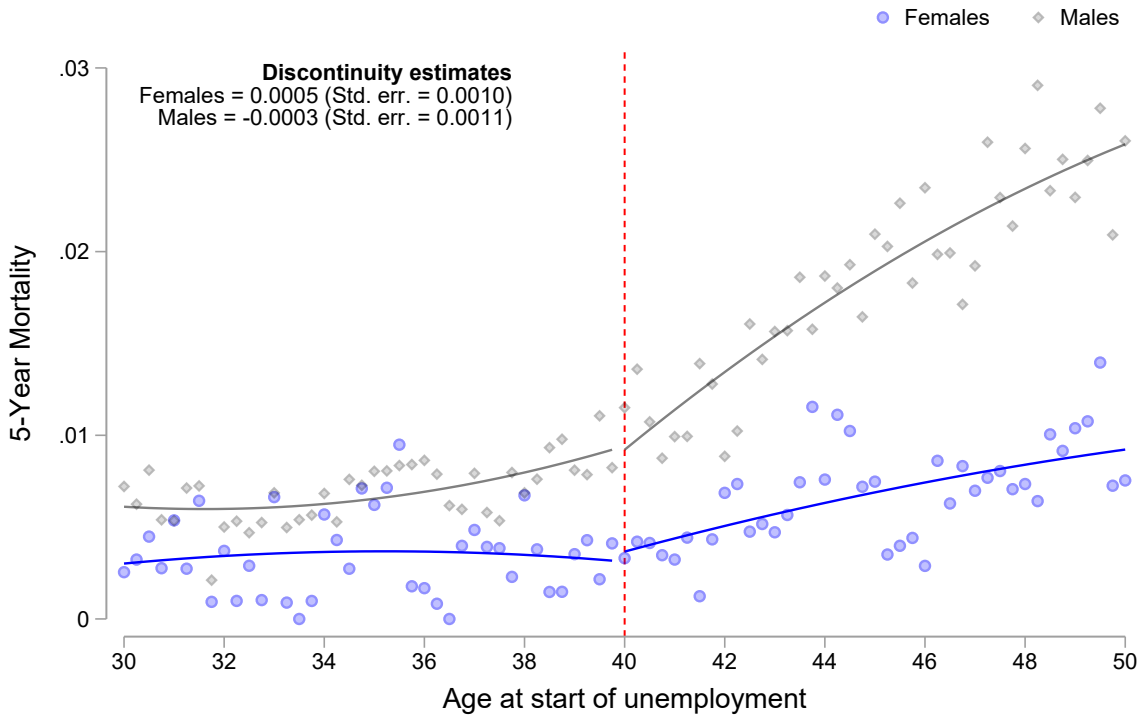
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Bars represent the frequency of UI benefit duration, in days, for the full sample of unemployed workers. The vertical lines represent 30 and 39 weeks of UI benefits (paid 5 days per week).

FIGURE A2 — Nonemployment Duration and Duration Until Next Employment



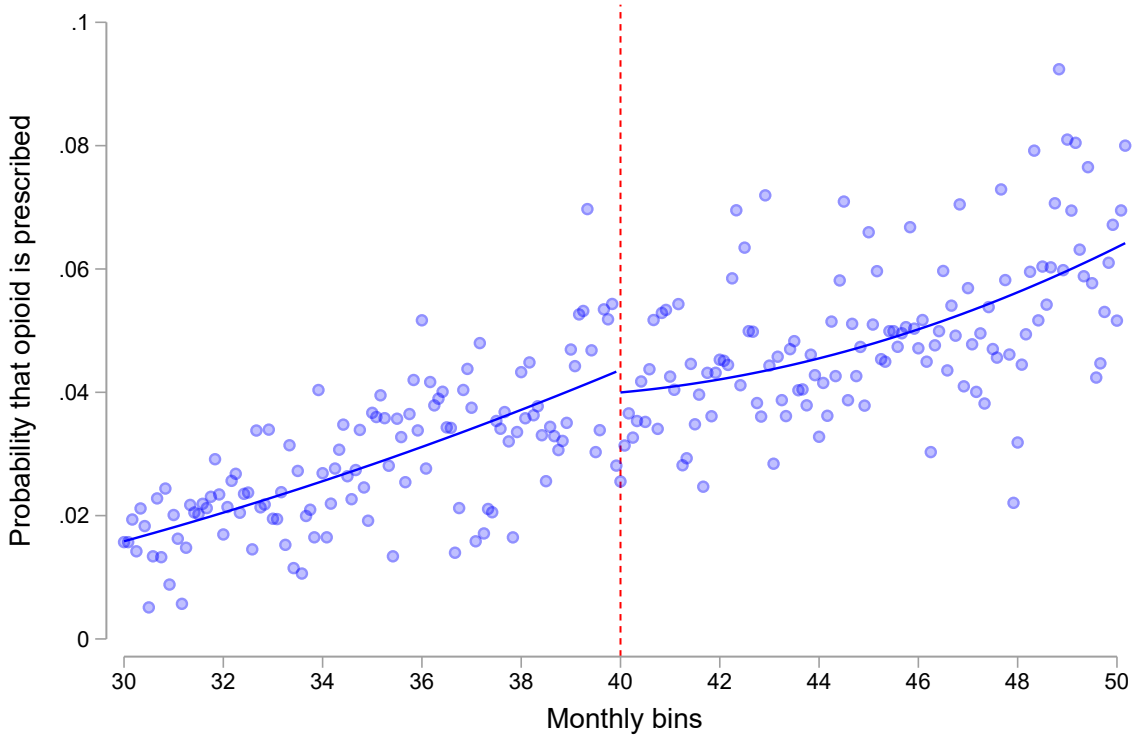
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Scatters represent the average residual non-employment duration in days (left) and days until next employment (right) net of quarter-year fixed effects for each 3-month age bin. Age is calculated based on month of birth.

FIGURE A3 — Effects on Mortality, Within 5 years of Receiving UI Benefits



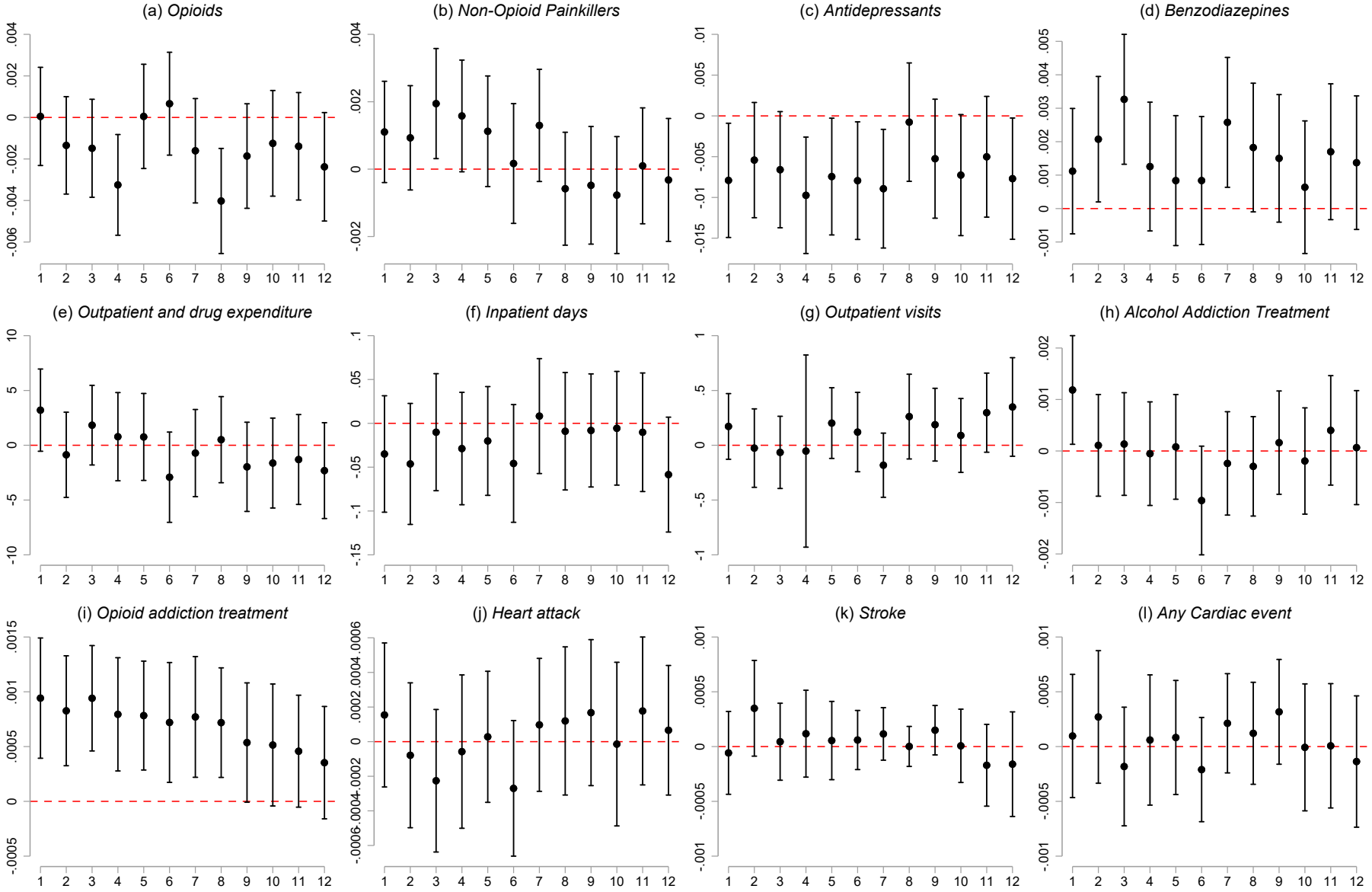
Notes: See notes for Figure 4. The outcome variable is whether a worker dies within five years of receiving UI payments.

FIGURE A4 — Effects of UI Extensions on Opioid Prescriptions, Using 1-Month Bins



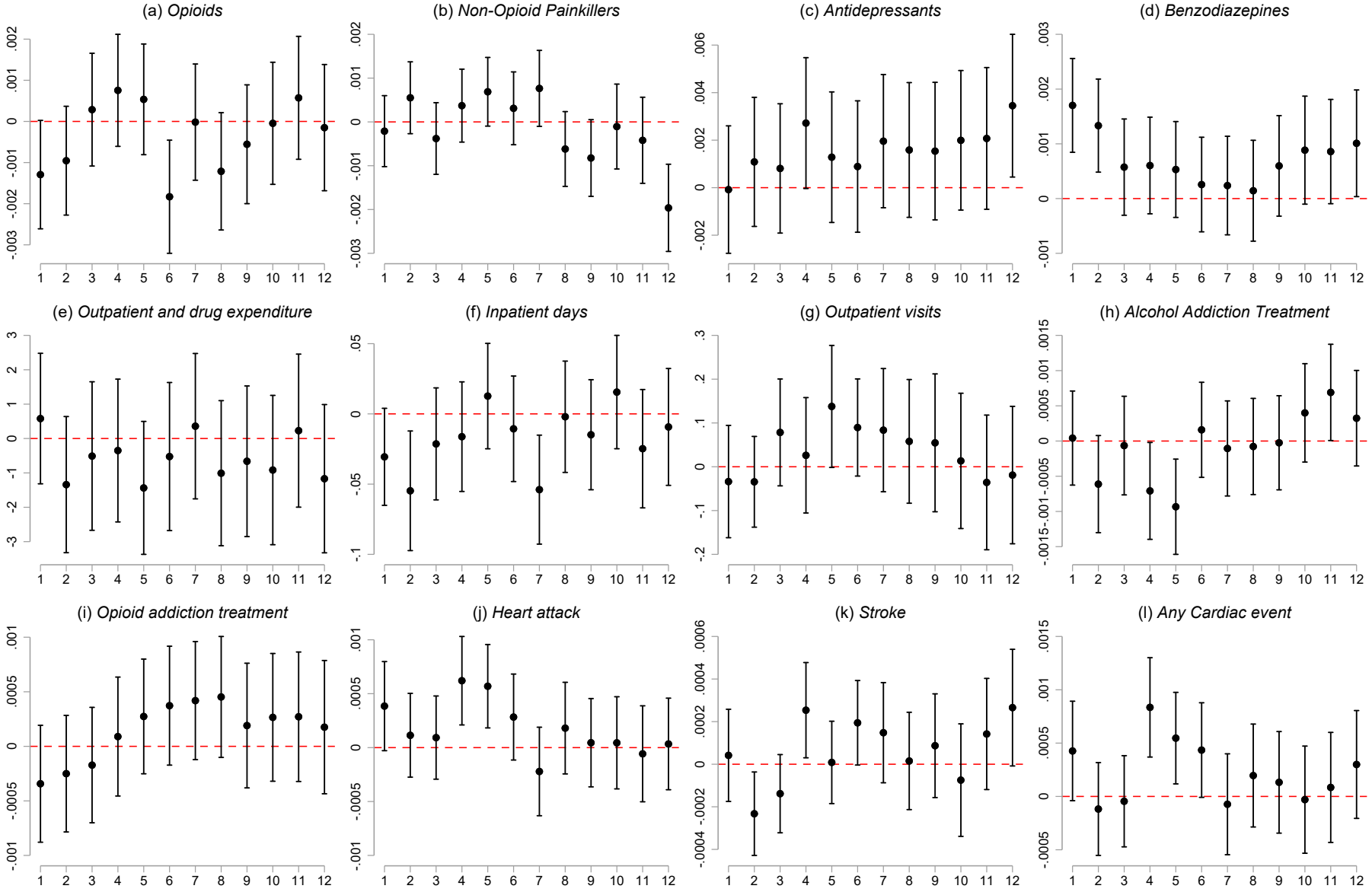
Notes: See notes for Figure 4. Data are plotted using 1-month age bins.

FIGURE A5 — Effects of UI Extensions on Health Over Time, Female Workers



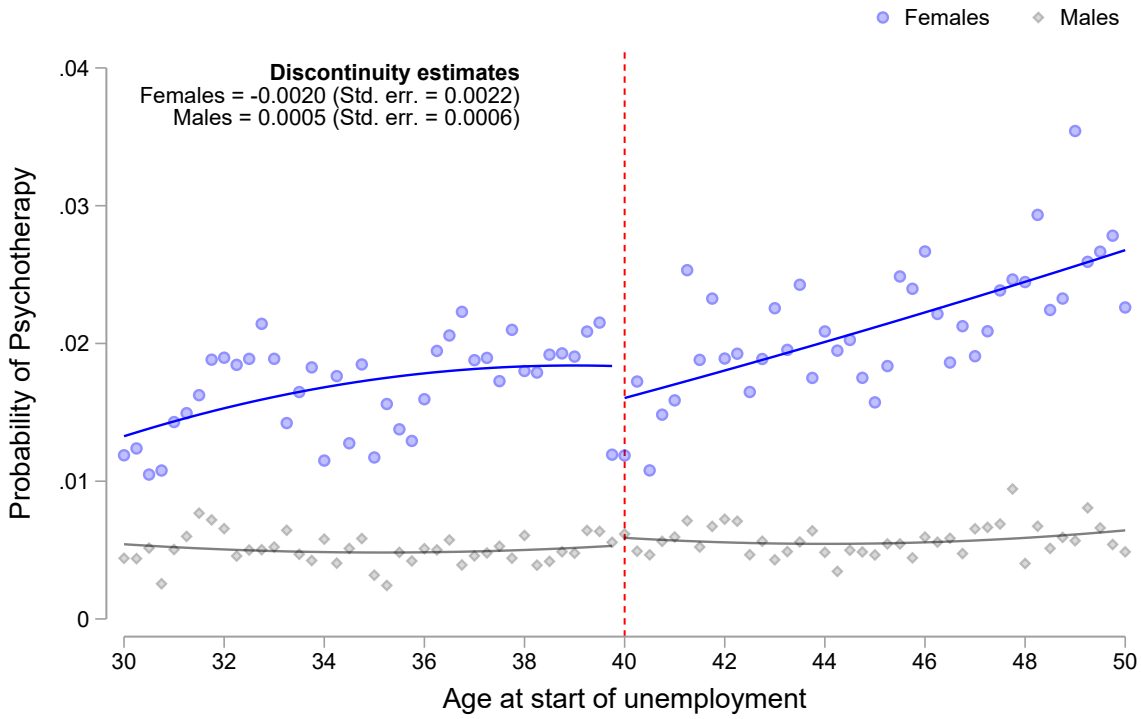
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each scatter represents a coefficient of the main variable of interest from Equation 1. The vertical lines represent corresponding 95% confidence intervals based on age-bin clustered standard errors. An x-axis value of "i" where $i = 0, 1, ...12$ indicates an estimate from our main RD analysis comparing the listed outcome for unemployed workers around the UI eligibility threshold for month i only, where $i = 0$ represents the month of unemployment, $i = 1$ represents one month after unemployment, and so on. Each panel displays estimates for the listed outcome variable of interest using a sample of only female workers.

FIGURE A6 — Effects of UI Extensions on Health Over Time, Male Workers



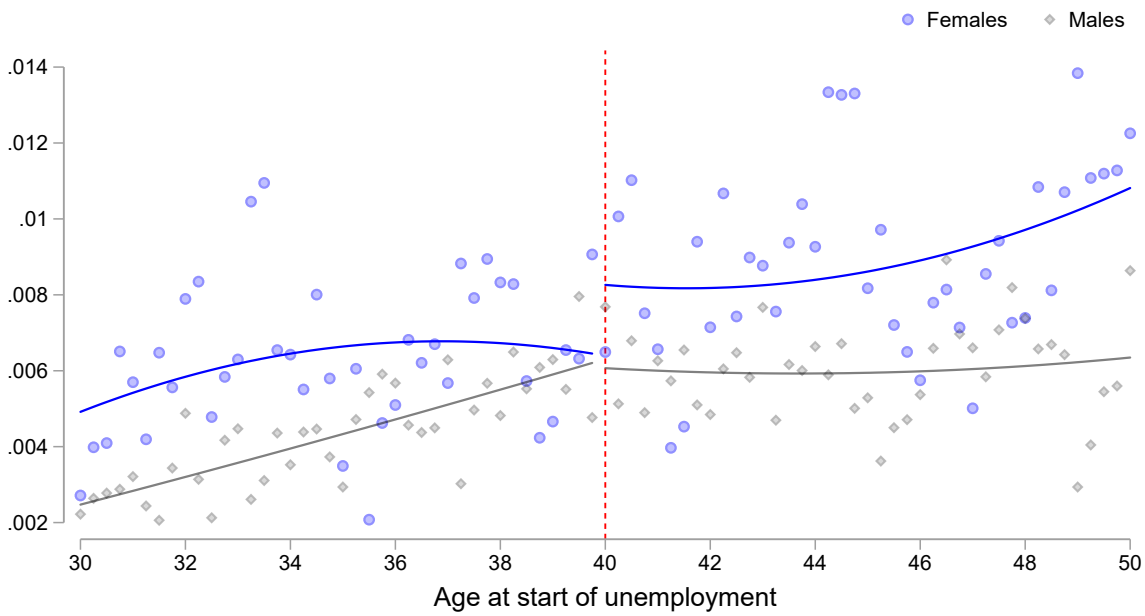
Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each scatter represents a coefficient of the main variable of interest from Equation 1. The vertical lines represent corresponding 95% confidence intervals based on age-bin clustered standard errors. An x-axis value of "i" where $i = 0, 1, ...12$ indicates an estimate from our main RD analysis comparing the listed outcome for unemployed workers around the UI eligibility threshold for month i only, where $i = 0$ represents the month of unemployment, $i = 1$ represents one month after unemployment, and so on. Each panel displays estimates for the listed outcome variable of interest using a sample of only male workers.

FIGURE A7 — Probability of Seeking Psychotherapy



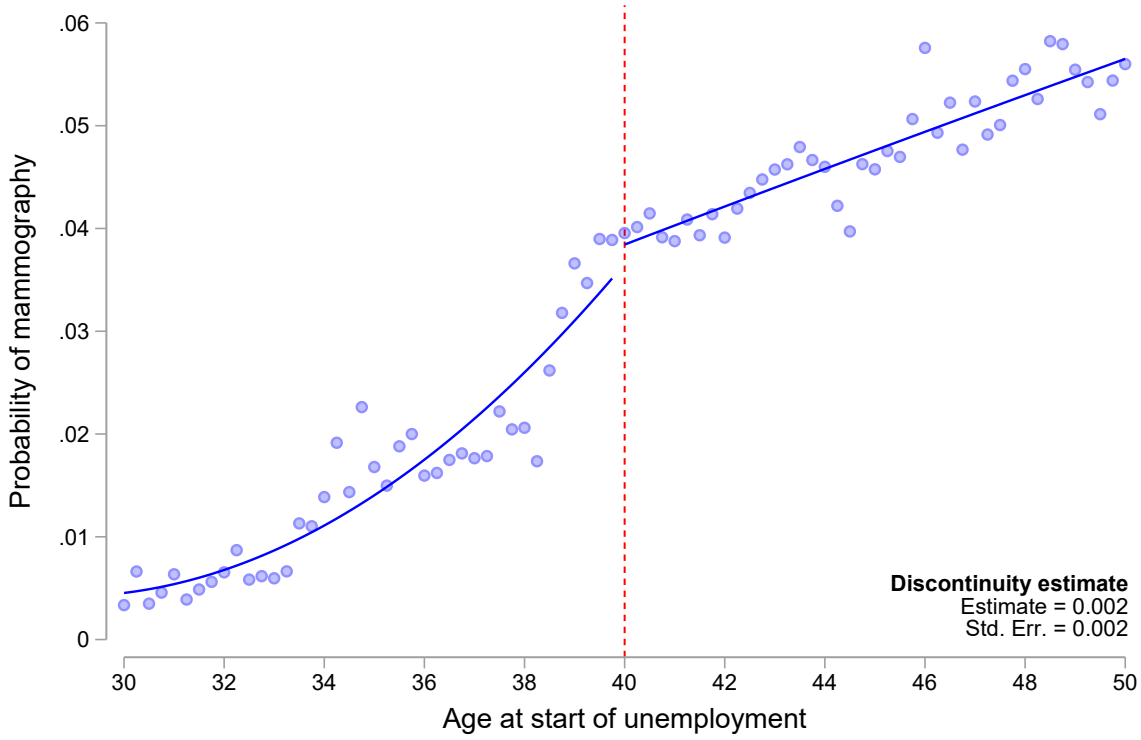
Notes: See notes for Figure 4.

FIGURE A8 — Effects of Extended UI Benefit Duration on the Probability of Being Prescribed Non-Opioid Pain Drugs



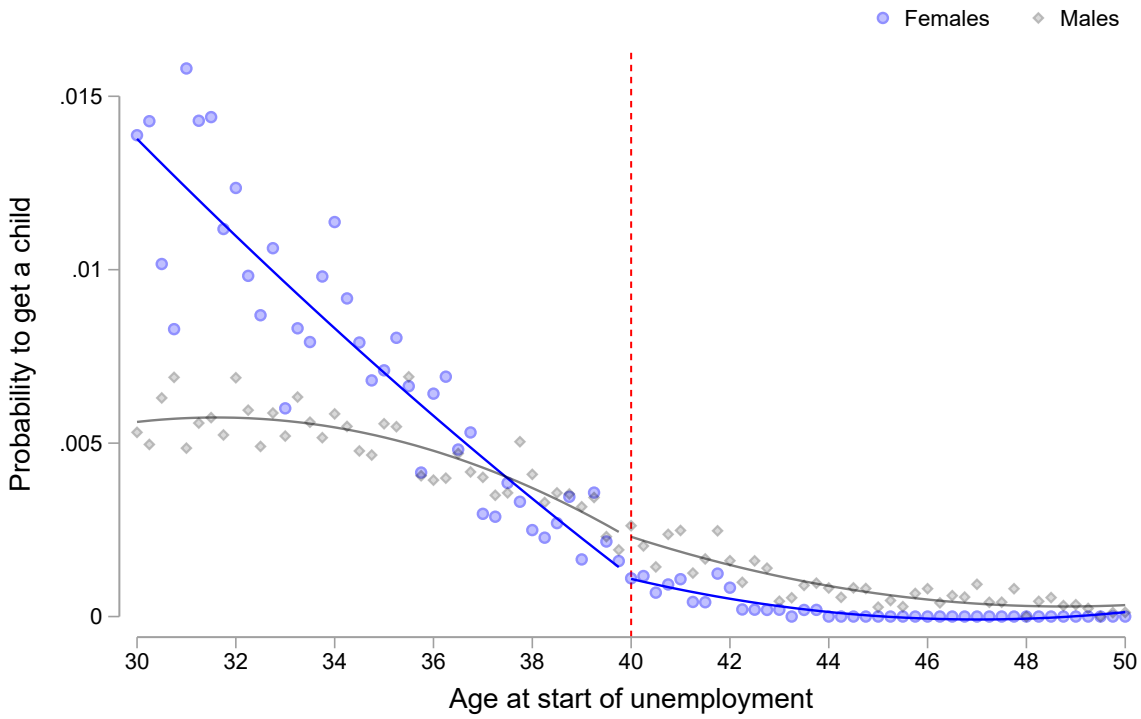
Notes: See notes for Figure 4. Non-opioid analgesics include non-habit-forming pain medication such as nonsteroidal anti-inflammatory drugs and acetaminophen. For a full list of ATC code N medications, see https://www.whocc.no/atc_ddd_index.

FIGURE A9 — Probability of Mammography (Female Workers)



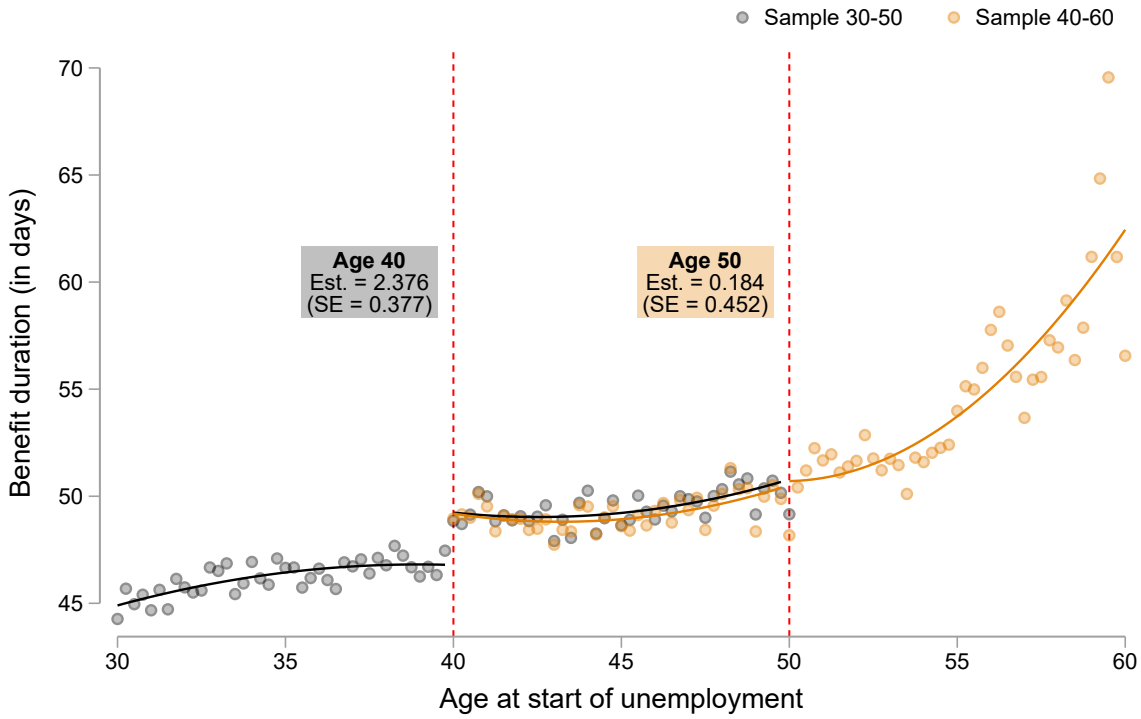
Notes: See Figure 4. Mammographies are recorded in the data and are considered under “screenings", or preventative care.

FIGURE A10 — Probability of Having a Baby



Notes: See Figure 4. The outcome variable is an indicator variable equal to one if a worker (male or female) was registered on newborn's birth certificate during the sample period.

FIGURE A11 — Testing Alternative Discontinuities on Duration of UI Benefit Receipt, in Days

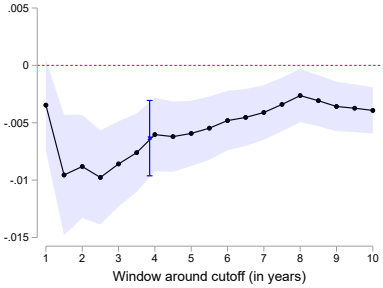


Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. We build two samples, each being symmetric around the respective discontinuity at age 40 and age 50. For each cutoff we present estimates and their respective standard errors for these two samples, based on our main RD approach described by Equation 1.

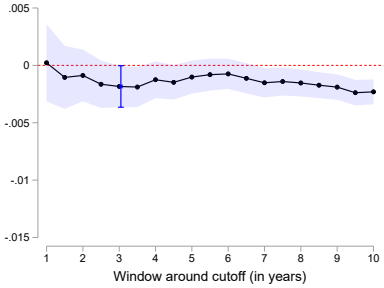
FIGURE A12 — Estimated Effects on Prescriptions Across Bandwidths

(a) Opioids

(i) Females

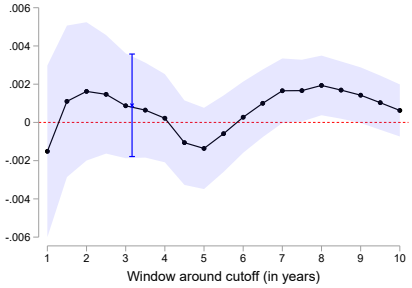


(ii) Males

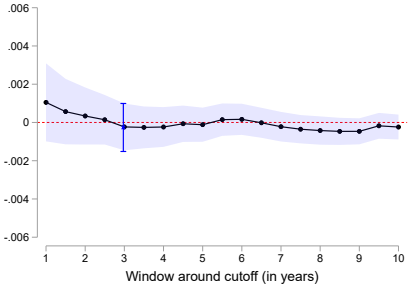


(b) Non-opioid Painkillers

i. Females

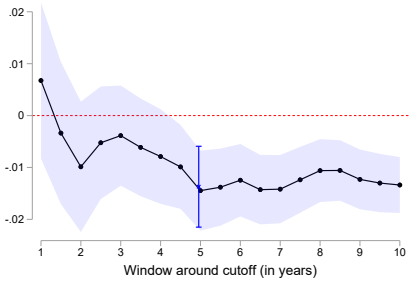


ii. Males

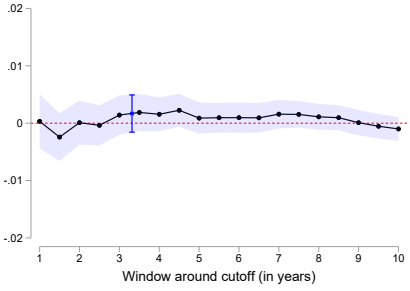


(c) Antidepressants

i. Females

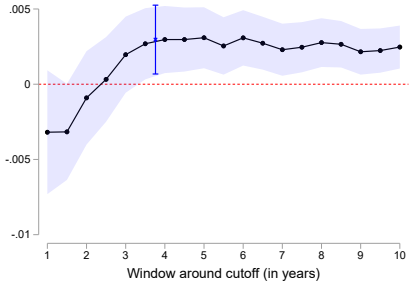


ii. Males

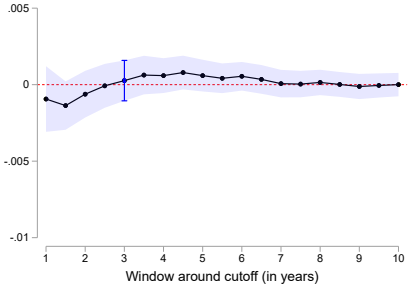


(d) Benzodiazepines

i. Females



ii. Males

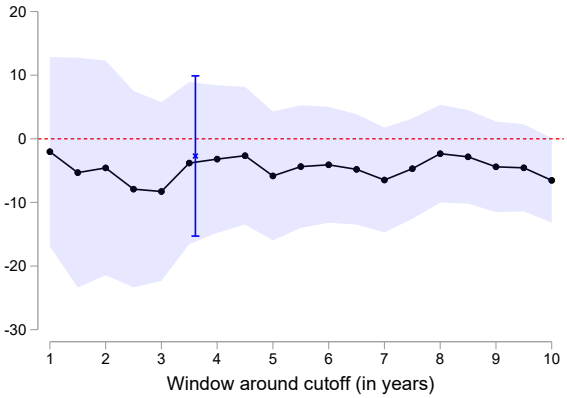


Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each figure shows estimates and their 95% confidence intervals from our preferred specification (Equation 1) using a uniform kernel for a range of bandwidths. The vertical line shows the estimate and corresponding confidence interval using the MSE-optimal bandwidth.

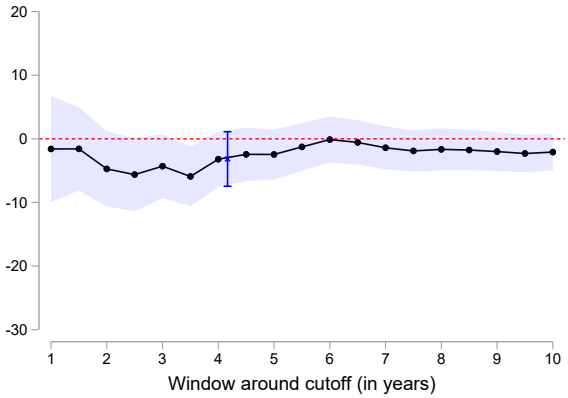
FIGURE A13 — Estimated Effects on Health Care Utilization Across Bandwidths

(a) Outpatient expenditure

i. Females

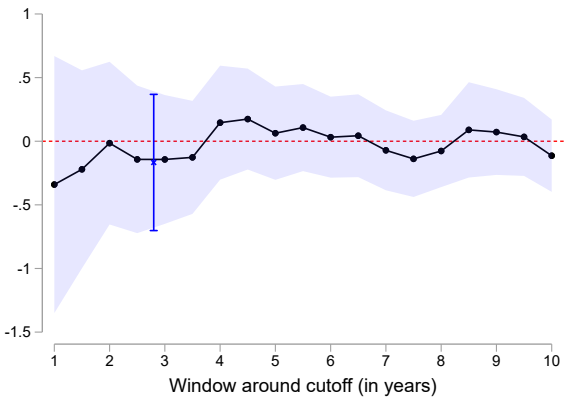


ii. Males

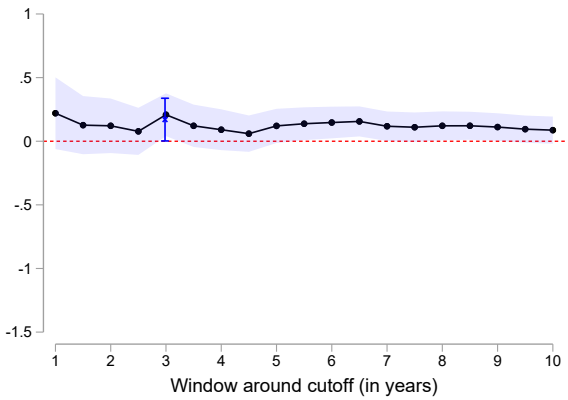


(b) Outpatient Visits

i. Females

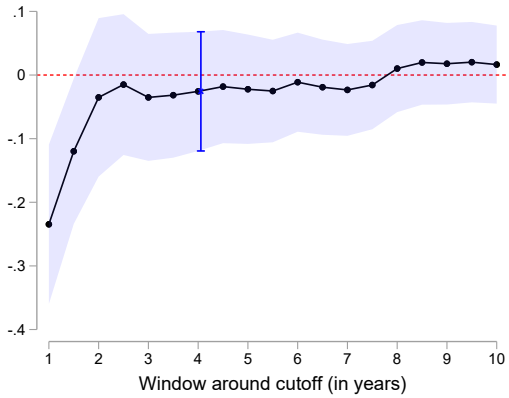


ii. Males

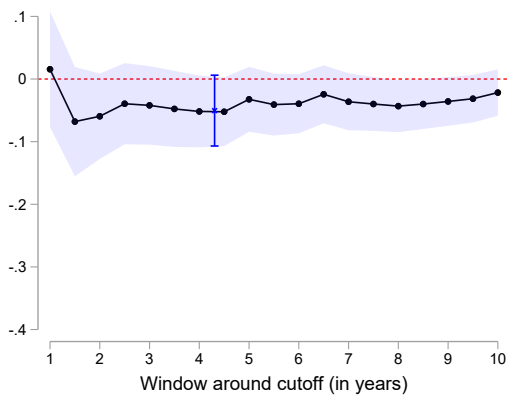


(c) Inpatient Days

i. Females



ii. Males

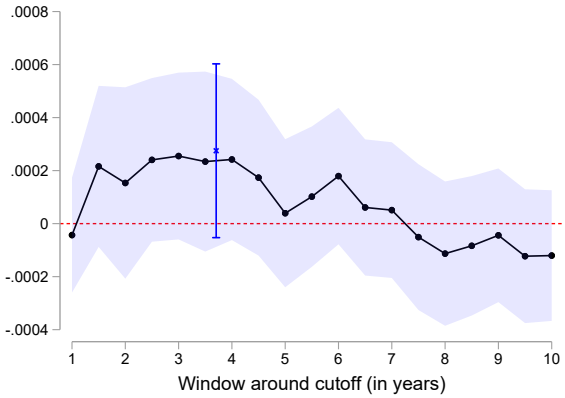


Notes: See notes for Figure A12.

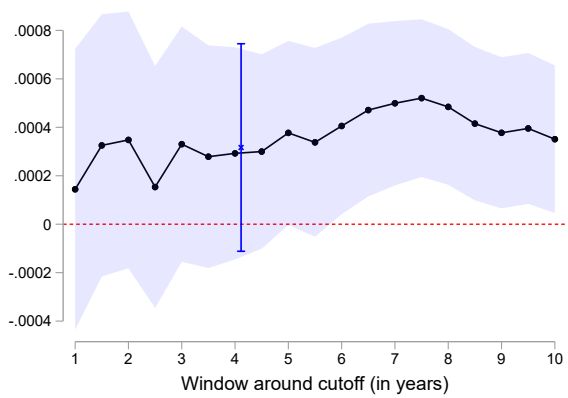
FIGURE A14 — Estimated Effects on Cardiac Events Across Bandwidths

(a) Any Cardiac Event

i. Females

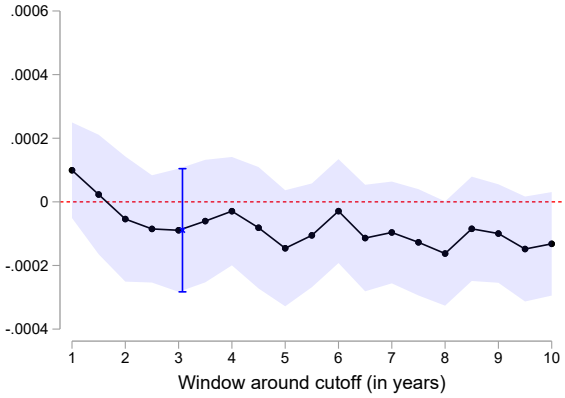


ii. Males

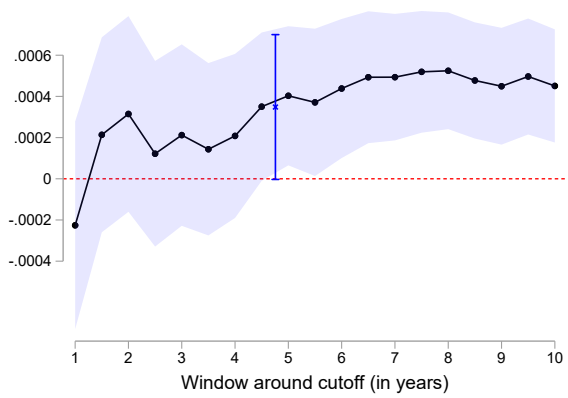


(b) Heart Attack

i. Females

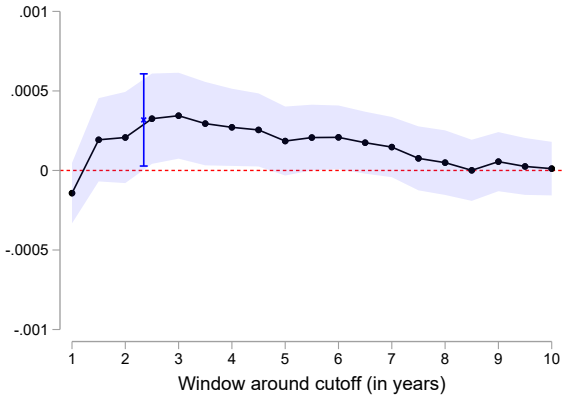


ii. Males

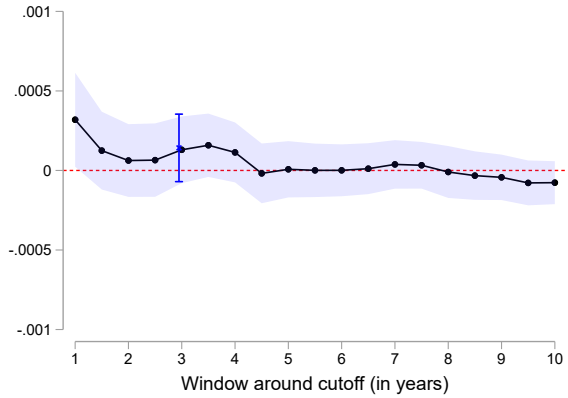


(c) Stroke

i. Females

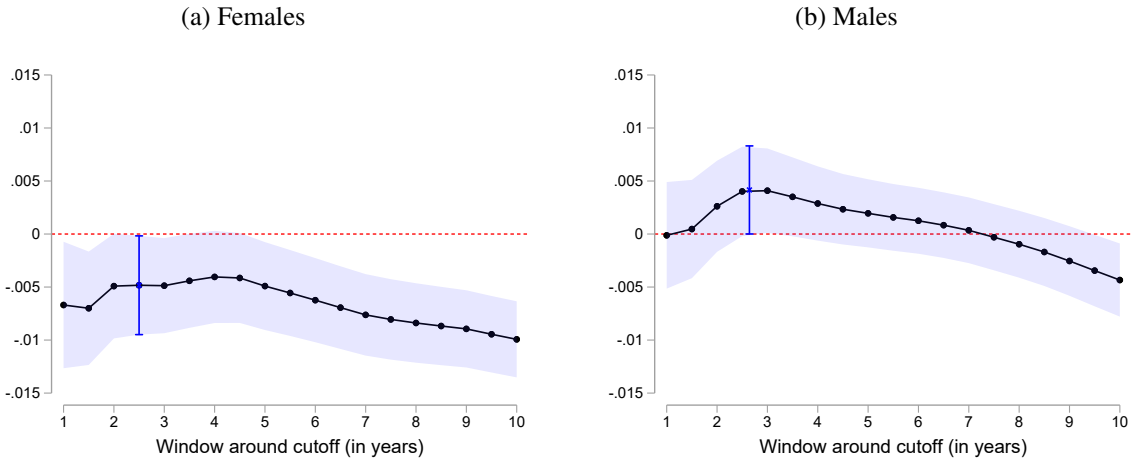


ii. Males



Notes: See notes for Figure A12.

FIGURE A15 — Effects of Extended UI Benefit Duration on the Probability of Disability Claims with Different Bandwidths



Notes: See notes for Figure A12.

TABLE A1 — Effects of Extending UI Benefits on Health Outcomes within 9 Months of Job Loss, by Subgroup (Male Workers)

	Outcome						
	Opioids (1)	Cardiac Event (2)	Inpatient Stays (3)	Antidepressants (4)	Non-Opioid Painkillers (5)	Benzodiazepines (6)	Opioid Treatment (7)
(a) Has child born in wedlock							
Yes (n = 379,251)	0.0007	0.001***	−0.06	−0.00004	0.001	0.0006	−0.0002
	(0.001)	(0.000)	(0.038)	(0.003)	(0.001)	(0.001)	(0.000)
No (n = 455,778)	−0.002	−0.0002	−0.05	0.006**	−0.002**	0.0003	0.0006
	(0.001)	(0.000)	(0.051)	(0.003)	(0.001)	(0.001)	(0.000)
(b) Low skilled occupation							
Yes (n = 585,324)	0.0002	0.0004	−0.07*	0.003	0.00003	−0.0005	0.00003
	(0.001)	(0.000)	(0.036)	(0.002)	(0.001)	(0.001)	(0.000)
No (n = 249,705)	−0.002*	0.0009	−0.03	0.003	−0.0006	0.002*	0.0005
	(0.001)	(0.001)	(0.058)	(0.003)	(0.001)	(0.001)	(0.001)
(c) Receives hardship allowance							
Yes (n = 544,794)	0.0002	0.0004	−0.02	−0.0009	0.0003	−0.0009	−0.000005
	(0.001)	(0.000)	(0.030)	(0.002)	(0.001)	(0.001)	(0.000)
No (n = 219,063)	−0.0007	0.0004	−0.1*	0.008**	−0.002	0.002	−0.002***
	(0.002)	(0.001)	(0.065)	(0.004)	(0.002)	(0.002)	(0.001)
(d) Part-Time							
Yes (n = 100,227)	−0.009**	−0.0008	−0.2***	−0.008	−0.0002	−0.002	0.0005
	(0.004)	(0.001)	(0.080)	(0.007)	(0.002)	(0.003)	(0.001)
No (n = 663,540)	0.001	0.0006*	−0.02	0.003	−0.0005	0.0001	−0.0007***
	(0.001)	(0.000)	(0.033)	(0.002)	(0.001)	(0.001)	(0.000)
(e) Low Education							
Yes (n = 697,722)	−0.001	0.0005*	−0.07**	0.0003	−0.0003	0.0003	0.0002
	(0.001)	(0.000)	(0.035)	(0.002)	(0.001)	(0.001)	(0.000)
No (n = 116,346)	0.01***	0.001	0.03	0.02***	0.006***	0.003	−0.0002
	(0.004)	(0.001)	(0.102)	(0.008)	(0.002)	(0.002)	(0.001)
Mean of outcome	0.008	0.0008	0.4	0.04	0.004	0.003	0.002

Notes: See notes for Table 7. Estimates are for unemployed male workers.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A2 — Descriptions of Most Commonly Prescribed Benzodiazepines in Upper Austria

Drug	Onset	Elimination	Uses	# Prescribed
Triazolam (Halcion)	Fast	Short	Insomnia	300,114
Oxazepam (Serax)	Slow	Short	Anxiety, alcohol withdrawal	226,790
Lorazepam (Ativan)	Intermediate	Intermediate	Anxiety, insomnia, seizures	206,847
Bromazepam (Lexotan)	Intermediate	Long	Anxiety, insomnia, seizures	177,918
Flunitrazepam (Rohypnol)	Fast	Short	Insomnia	139,959
Alprazolam (Xanax)	Intermediate	Intermediate	Anxiety, panic	133,732
Diazepam (Valium)	Fast	Long	Anxiety, seizures, alcohol withdrawal	126,064
Clonazepam (Klonopin)	Intermediate	Long	Anxiety, insomnia, seizures, panic	21,325

Notes: This is a list of the 8 most prescribed benzodiazepines in Upper Austria between 2003 and 2013. Information on the drug characteristics are from https://www.health.harvard.edu/mind-and-mood/benzodiazepines_and_the_alternatives, https://www.drugs.com/mmx/bromazepam.html, and https://link.springer.com/article/10.2165/00003495-198020050-00002. "# Prescribed" indicates aggregate prescriptions from 2003–2013 in Upper Austria.

TABLE A3 — Balancing of Socioeconomic Variables

	Samples		
	Pooled	Females	Males
	(1)	(2)	(3)
Socioeconomic variables			
Female	−0.007		
	(0.005)		
Migrant	−0.006	−0.004	−0.007
	(0.005)	(0.008)	(0.006)
College degree	0.000	0.003	−0.001
	(0.002)	(0.004)	(0.002)
Urban area†	0.002	−0.005	0.006
	(0.004)	(0.007)	(0.004)
Labor market variables			
Total experience†	0.059	0.012	0.061
	(0.050)	(0.089)	(0.057)
Log wage†	0.372	0.588	−0.029
	(0.337)	(0.502)	(0.393)

Notes: Individual-level data on unemployment insurance health events is from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. The listed socioeconomic and labor market variables are measured in the year prior to the start of the unemployment spell. Standard errors in parentheses are clustered on the age bin level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A4 — Testing Different Specifications (Prescription Drugs)

	(1)	(2)	(3)	(4)
(a) Females				
Opioids	−0.005**	−0.005**	−0.005**	−0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Non-opioid Painkillers	0.002	0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Antidepressants	−0.010*	−0.009*	−0.009*	−0.009*
	(0.005)	(0.005)	(0.005)	(0.005)
Benzodiazepines	0.002*	0.002*	0.002*	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Year FEs	No	Yes	Yes	No
Quarter FEs	No	No	Yes	No
Year × quarter FEs	No	No	No	Yes
(b) Males				
Opioids	−0.001	−0.001	−0.001	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Non-opioid Painkillers	−0.000	−0.000	−0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Antidepressants	0.003*	0.003*	0.003*	0.003*
	(0.002)	(0.002)	(0.002)	(0.002)
Benzodiazepines	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Year FEs	No	Yes	Yes	No
Quarter FEs	No	No	Yes	No
Year × quarter FEs	No	No	No	Yes

Notes: RD estimates are based on individual-level data on unemployment insurance health events from linked Upper Austrian Health Insurance Fund database files and Austrian Social Security Database files from 2003–2013. Each estimate presents separate effects of an additional 9-week eligibility of UI benefits for the 9 months following unemployment. Column 1 includes no fixed effects, Column 2 includes only year fixed effects, Column 3 includes year and quarter fixed effects, and Column 4 includes year-by-quarter fixed effects. Panel (a) presents estimates for unemployed female workers and Panel (b) presents estimates for unemployed male workers.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A5 — Testing Different Specifications (Health Care Utilization)

	(1)	(2)	(3)	(4)
(a) Females				
Outpatient Expenditure	−0.63	−0.18	−0.21	−0.32
	(6.59)	(6.53)	(6.54)	(6.54)
Outpatient Visits	0.25	0.28	0.28	0.28
	(0.25)	(0.25)	(0.25)	(0.25)
Inpatient Stays	−0.03	−0.03	−0.03	−0.03
	(0.05)	(0.05)	(0.05)	(0.05)
Year FEs	No	Yes	Yes	No
Quarter FEs	No	No	Yes	No
Year × quarter FEs	No	No	No	Yes
(b) Males				
Outpatient Expenditure	−1.53	−1.69	−1.81	−1.79
	(2.53)	(2.51)	(2.50)	(2.50)
Outpatient Visits	0.16*	0.14*	0.13	0.13
	(0.09)	(0.08)	(0.08)	(0.08)
Inpatient Stays	−0.06*	−0.06*	−0.06*	−0.06*
	(0.03)	(0.03)	(0.03)	(0.03)
Year FEs	No	Yes	Yes	No
Quarter FEs	No	No	Yes	No
Year × quarter FEs	No	No	No	Yes

Notes: See Table A4. "Outpatient Expenditure" denotes the total amount spent, in Euros, on doctor's visits. "Outpatient Visits" include the number of visits to a physician. "Inpatient Days" include the number of days spent in a hospital. $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A6 — Testing Different Specifications, Cardiac Events

	(1)	(2)	(3)	(4)
(a) Females				
Cardiac Event	0.0001	0.0001	0.0001	0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Heart Attack	−0.0001	−0.0001	−0.0001	−0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stroke	0.0002	0.0002	0.0002	0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Year FEs	No	Yes	Yes	No
Quarter FEs	No	No	Yes	No
Year × quarter FEs	No	No	No	Yes
(b) Males				
Cardiac Event	0.0005**	0.0005**	0.0005**	0.0005**
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Heart Attack	0.0005**	0.0005**	0.0005**	0.0005**
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stroke	0.0001	0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Year FEs	No	Yes	Yes	No
Quarter FEs	No	No	Yes	No
Year × quarter FEs	No	No	No	Yes

Notes: See Table A4. Cardiac events include heart attacks and strokes.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.