Unemployment Insurance Generosity and Healthcare Use: Evidence from Sweden

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Motivation

▶ Unemployment is harmful to mental and physical health. Why?
  (e.g., Brand 2015; Wanberg 2012; Picchio and Ubaldi 2023)

  ▶ Liquidity constraints due to income loss (e.g., Cutler et al. 2012; Lleras-Muney et al. 2025)
  ▶ Stress, social stigma, loss of social contacts and social identity (e.g., Jahoda 1982)
  → Latter affects health **independently of income loss**

▶ Adverse health effects matter because we care about the welfare of the unemployed...

▶ ...but they can also create **fiscal externalities** if healthcare use increases

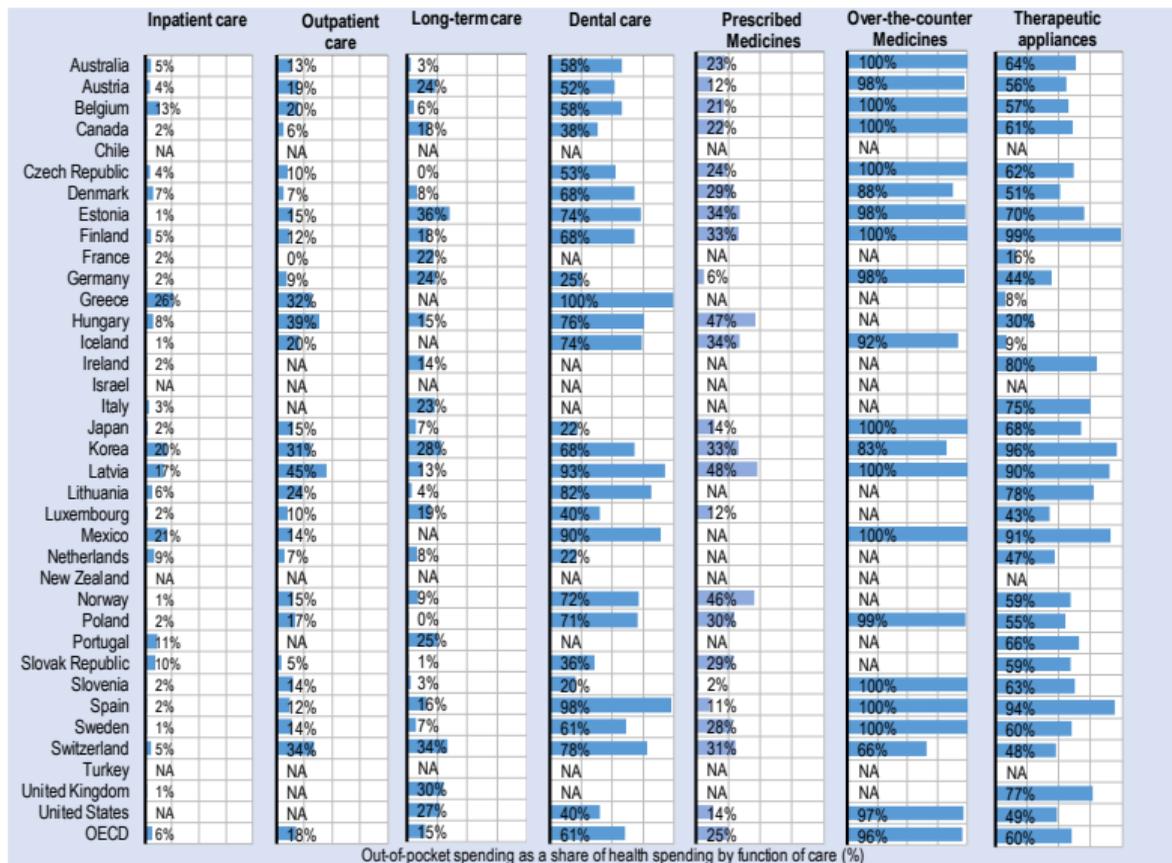▶ These fiscal externalities could be large since healthcare is highly subsidized

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	Inpatient care	Outpatient care	Long-term care	Dental care	Prescribed Medicines	Over-the-counter Medicines	Therapeutic appliances
Australia	5%	3%	3%	58%	23%	100%	64%
Austria	4%	19%	24%	52%	12%	98%	56%
Belgium	13%	20%	6%	58%	21%	100%	57%
Canada	2%	6%	18%	38%	22%	100%	61%
Chile	NA	NA	NA	NA	NA	NA	NA
Czech Republic	4%	10%	0%	53%	24%	100%	62%
Denmark	7%	7%	8%	68%	29%	88%	51%
Estonia	1%	15%	36%	74%	34%	98%	70%
Finland	5%	2%	18%	68%	33%	100%	99%
France	2%	0%	22%	NA	NA	NA	16%
Germany	2%	9%	24%	25%	6%	98%	44%
Greece	26%	32%	NA	100%	NA	NA	8%
Hungary	8%	39%	15%	76%	47%	NA	30%
Iceland	1%	20%	NA	74%	34%	92%	9%
Ireland	2%	NA	14%	NA	NA	NA	80%
Israel	NA	NA	NA	NA	NA	NA	NA
Italy	3%	NA	23%	NA	NA	NA	75%
Japan	2%	15%	7%	22%	14%	100%	68%
Korea	20%	31%	28%	68%	33%	83%	96%
Latvia	17%	45%	13%	93%	48%	100%	90%
Lithuania	6%	24%	4%	82%	NA	NA	78%
Luxembourg	2%	10%	19%	40%	12%	NA	43%
Mexico	21%	14%	NA	90%	NA	100%	91%
Netherlands	9%	7%	8%	22%	NA	NA	47%
New Zealand	NA	NA	NA	NA	NA	NA	NA
Norway	1%	15%	9%	72%	46%	NA	59%
Poland	2%	17%	0%	71%	30%	99%	55%
Portugal	11%	NA	25%	NA	NA	NA	66%
Slovak Republic	10%	5%	1%	36%	29%	NA	59%
Slovenia	2%	14%	3%	20%	2%	100%	63%
Spain	2%	12%	16%	98%	11%	100%	94%
Sweden	1%	14%	7%	61%	28%	100%	60%
Switzerland	5%	34%	34%	78%	31%	66%	48%
Turkey	NA	NA	NA	NA	NA	NA	NA
United Kingdom	1%	NA	30%	NA	NA	NA	77%
United States	NA	NA	27%	40%	14%	97%	49%
OECD	6%	18%	15%	61%	25%	96%	60%

Out-of-pocket spending as a share of health spending by function of care (%)

Source: OECD Health Statistics 2018 (Data refer to 2016).

Note: Shows the share of total healthcare spending covered by household out-of-pocket costs, separately by spending category.

This Paper

Research question:

How does the generosity of unemployment insurance affect the healthcare use of recipients?

What I do:

▶ Use Swedish register data on unemployment spells, UI payments, and healthcare use

▶ For identification, use a **regression kink design** exploiting caps in the benefit amount

▶ Study effects on
  ▶ Hospital (inpatient) visits,
  ▶ Specialist (outpatient) care, and
  ▶ Prescription drug purchases

▶ **Novelty:** Measure **total costs** of healthcare use, not just out-of-pocket costs

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What I find:

▶ Find little evidence that more generous UI affects healthcare use

▶ In response to a 1 SEK ↑ in unemployment benefits, my 95% CIs can rule out

  ▶ Changes (↑ or ↓) in total healthcare costs > 0.08 SEK
  ▶ Changes in hospital + specialist costs > 0.18 SEK
  ▶ Changes in costs of drug purchases > 0.02 SEK

  during the first 40 weeks since the start of the unemployment spell

▶ Conclusion holds

  ▶ across socioeconomic groups (men & women, young & old, singles & couples),
  ▶ across different margins of use,
  ▶ across types of hospital/specialist visits and drug purchases, and
  ▶ when tracking healthcare use week-by-week over the spell

▶ My findings differ from U.S. evidence that ↑ UI generosity → ↑ healthcare use (Kuka 2020)

▶ ...and Austrian evidence that ↑ UI duration → ↑ health (Ahammer and Packham 2023)

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Potential Mechanisms
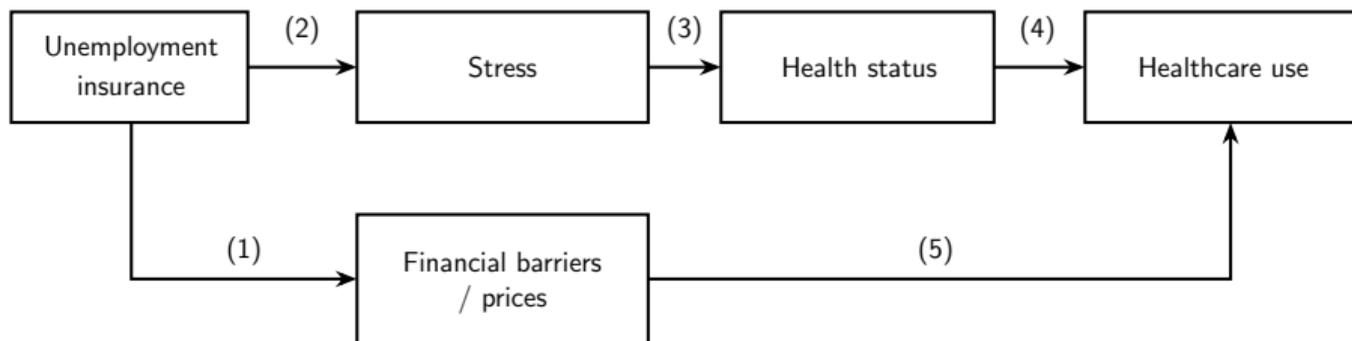
(At least) Two potential channels through which more generous UI could affect healthcare use:

▶ **Direct:**

  ▶ Reduces sensitivity to co-payments and other OOP costs (arrow (1));
  ▶ Which can affect healthcare use (arrow (5))

▶ **Indirect:**

  ▶ Reduces stress associated with unemployment (arrow (2));
  ▶ Which improves physical and mental health (arrow (3));
  ▶ Which can affect healthcare use (arrow (4))

Implications for Welfare Analysis of UI

Key insight: Any UI-induced changes in healthcare costs enter the welfare analysis of UI.

Stylized model: Static model of job search & UI with **health** + **subsidized healthcare**

- Two states: employed $(s = E)$, unemployed $(s = U)$
- **Health production**: $h_s = H_s(m_s; h_0)$, where m_s = healthcare use
- **Total resource costs of healthcare**: $\kappa(m_s, h_s)$, share $\theta \in [0, 1]$ publicly financed

Baily-Chetty Formula with Healthcare-Related Fiscal Externalities

Optimal benefit level b^* satisfies

$$\frac{u_c(c_U, h_U)}{v_c(c_E, h_E)} = 1 + \left(1 + \theta \frac{\kappa(m_U, h_U)}{b} \right) \varepsilon_{1-e,b} + FE^{health}(b),$$

where $FE^{health}(b) = \theta \left[\frac{d\kappa(m_U, h_U)}{db} + \frac{e}{1-e} \frac{d\kappa(m_E, h_E)}{db} \right]$ is the **healthcare fiscal externality** and

$$\frac{d\kappa(m_s, h_s)}{db} = \underbrace{\kappa_m(m_s, h_s) \frac{dm_s}{db}}_{(1)\ \text{direct effect}} + \underbrace{\kappa_h(m_s, h_s) \frac{dh_s}{db}}_{(2)\ \text{indirect effect}}.$$

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Institutional Background

Unemployment insurance:

- ▶ Two types of UI: basic benefits and earnings-related benefits ← this paper
- ▶ Eligible for earnings-related benefits if
    - (i) 20–65 years old,
    - (ii) fulfill work history requirement,
    - (iii) actively search for new job, and
    - (iv) contributed to UI fund (A-Kassa) continuously in the previous 12 months.
- ▶ Benefits replace a constant fraction of previous daily wage, up to a cap
- ▶ Benefit cap relatively low ($\sim$ 53–65% of median monthly wage)

Healthcare system: Highly subsidized national healthcare system

- ▶ Relatively low patient fees in inpatient and outpatient care (as well as primary care)
- ▶ Residents covered automatically by generous prescription drug insurance scheme
- ▶ Out-of-pocket costs accounted for 1% of inpatient, 14% of outpatient, and 28% of prescription drug expenses in 2016 (OECD 2019, Figure 2)

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Data & Analysis Sample

▶ Data on unemployment spells from Public Employment Service registers

▶ Data on weekly UI payments from the Unemployment Insurance Inspectorate (IAF)

▶ Data on socioeconomic background from Statistics Sweden
  ▶ Form control variables, measured in calendar year before start of unemployment spell:
  ▶ Age, gender, education, married/cohabiting, any children, county of res., employer industry (inc. missing)

▶ Measure healthcare use using registers of the National Board of Health and Welfare:
  ▶ Inpatient care (hospital) visits + Outpatient care (specialist) visits
    ▶ Measure visit's <u>total costs</u> using its MDC* and data on national avg. per-day costs of MDC
    ▶ Covers resource (drugs, materials, operations, etc.) & underlying (staff, admin, etc.) costs
  ▶ Prescription drug purchases from outpatient pharmacies
    ▶ Observe disaggregated total costs (i.e., OOP costs & costs covered by insurance)
  ▶ (Primary care and dental care visits not observed)

*MDC = Major Diagnostic Category

Measuring costs of in-/outpatient visits

Data & Analysis Sample

- Unemployment spells with a start date between 2007-03-07 – 2014-07-14

- UI scheme: Replaces 80% of previous daily wage, up to a cap of 680 SEK per day
  $\longrightarrow$ Reach benefit cap with a daily wage $\geq$ 850 SEK ($\leftarrow$ kink point)

- Analysis sample:
    - Individuals aged 20–64 in the year before start of spell, daily wage btw 150–1800 SEK
    - Measure healthcare use over first 40 weeks since start of unemployment spell
    - Sample contains 340,955 spells for 320,592 individuals

Research Design: Daily Benefits and Replacement Rate Around Kink
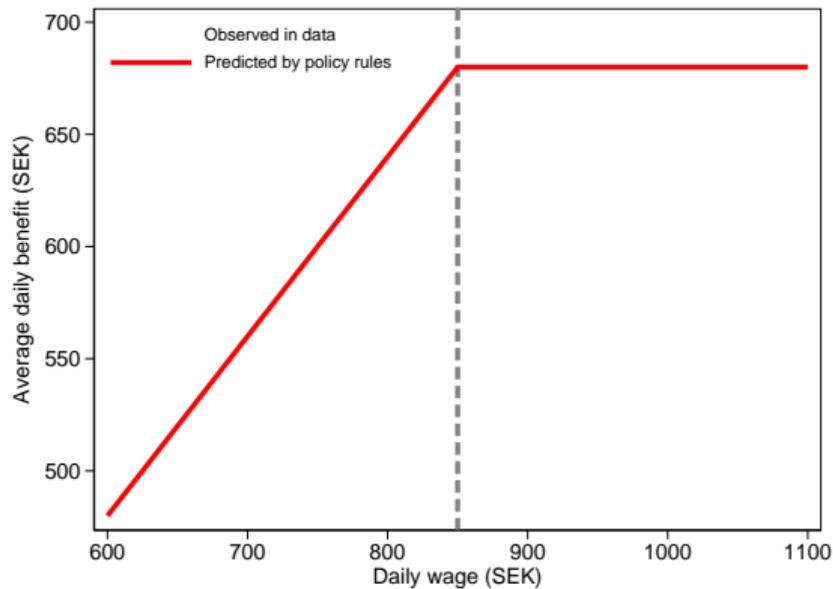
Average daily benefit

Average replacement rate
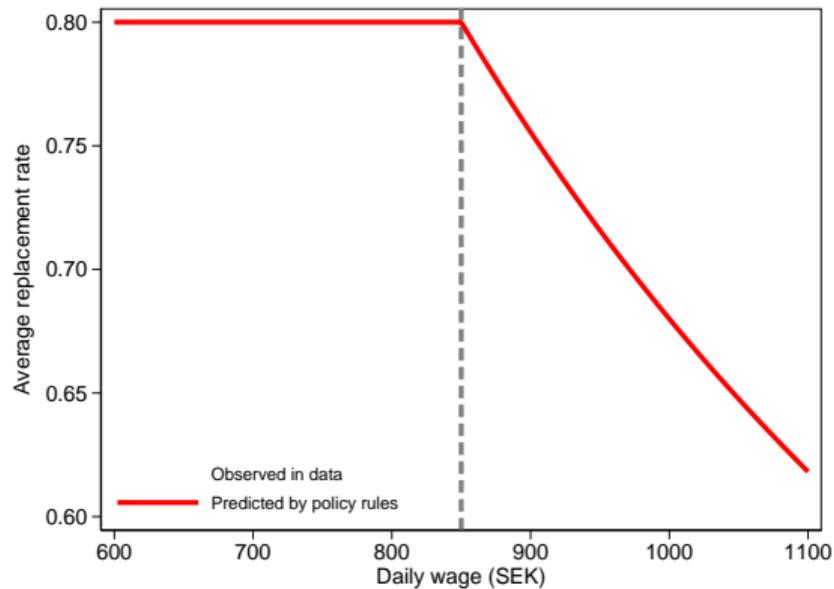
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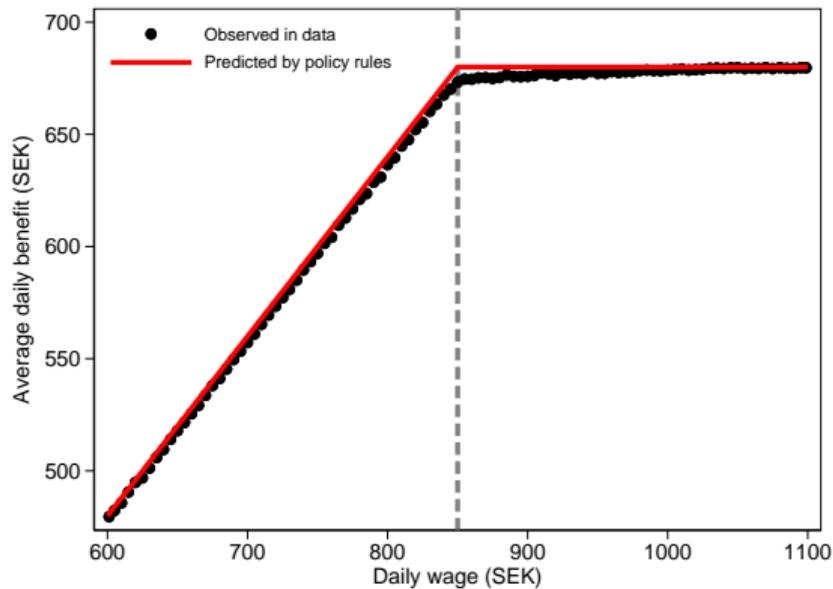
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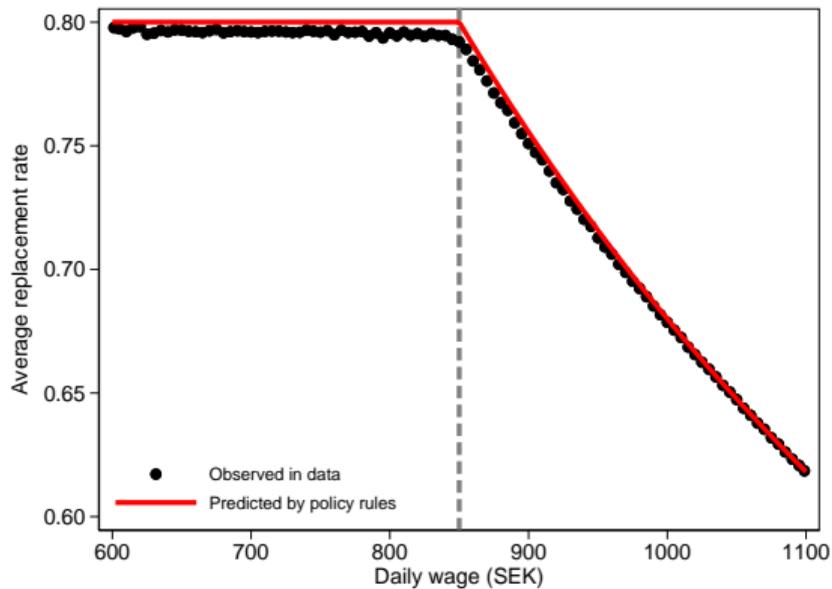
Research Design: Distribution of Daily Wage

Kink point location
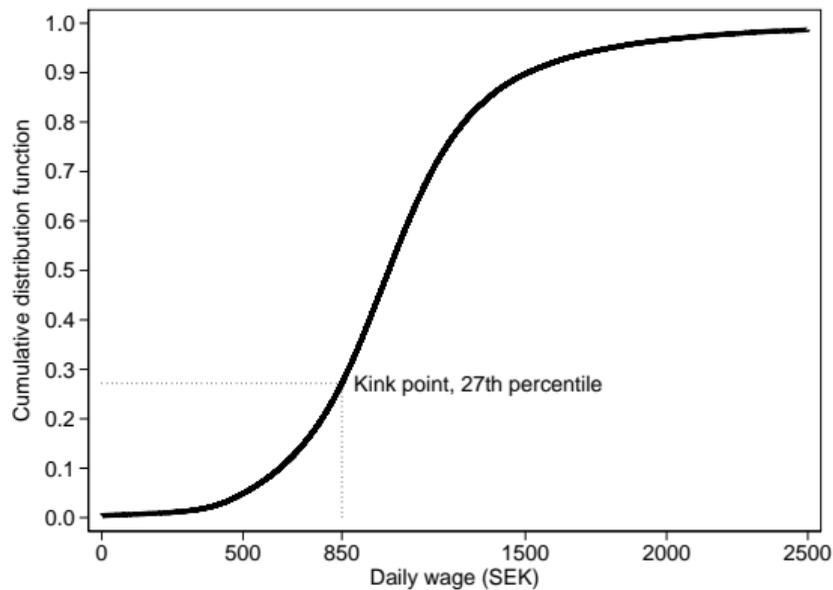
Density of daily wage
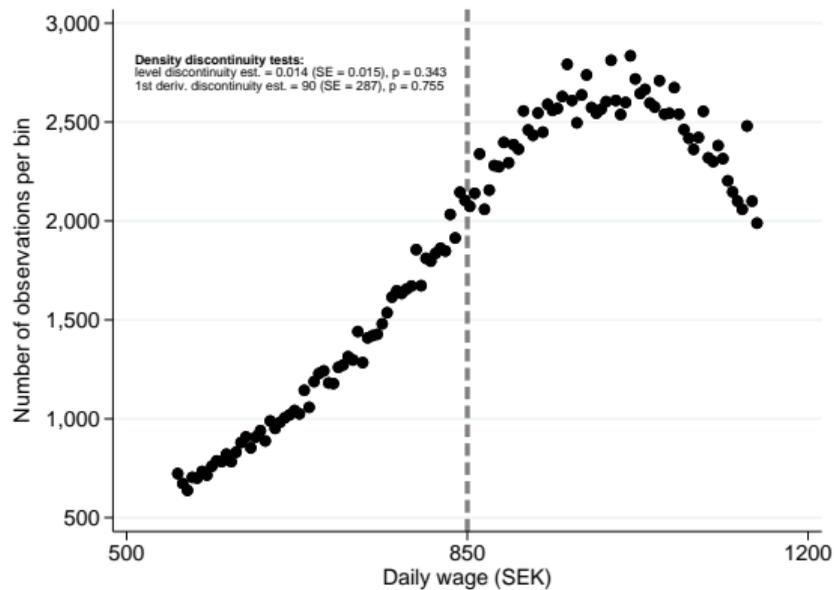
Estimation: Fuzzy Regression Design

Parameter of interest is the **fuzzy RK estimand**, or $\frac{\text{reduced form}}{\text{first stage}} = \frac{\Delta\text{slope of outcome at kink}}{\Delta\text{slope of benefits at kink}}$:

$$\tau = \frac{\beta^+ - \beta^-}{\kappa^+ - \kappa^-} = \frac{\lim_{w_0 \to \overline{w}^+} \frac{d\mathbb{E}[Y|W=w]}{dw}\Big|_{w=w_0} - \lim_{w_0 \to \overline{w}^-} \frac{d\mathbb{E}[Y|W=w]}{dw}\Big|_{w=w_0}}{\lim_{w_0 \to \overline{w}^+} \frac{d\mathbb{E}[B|W=w]}{dw}\Big|_{w=w_0} - \lim_{w_0 \to \overline{w}^-} \frac{d\mathbb{E}[B|W=w]}{dw}\Big|_{w=w_0}},$$

where W is daily wage, B is daily benefits, $\overline{w}$ is the kink point.

Preferred estimates based on a **local linear specification**:

▶ Linear estimator and uniform kernel

▶ Quadratic bias correction $+$ robust standard errors (Calonico et al. 2014)

▶ MSE-optimal bandwidth (varies by outcome and specification), omit regularization term

▶ Control for pre-determined covariates locally (Calonico et al. 2019)

Covariates Covariate indices Placebo

Results: Unemployment Benefit Spell Duration Around Kink

(i) Binned scatterplot
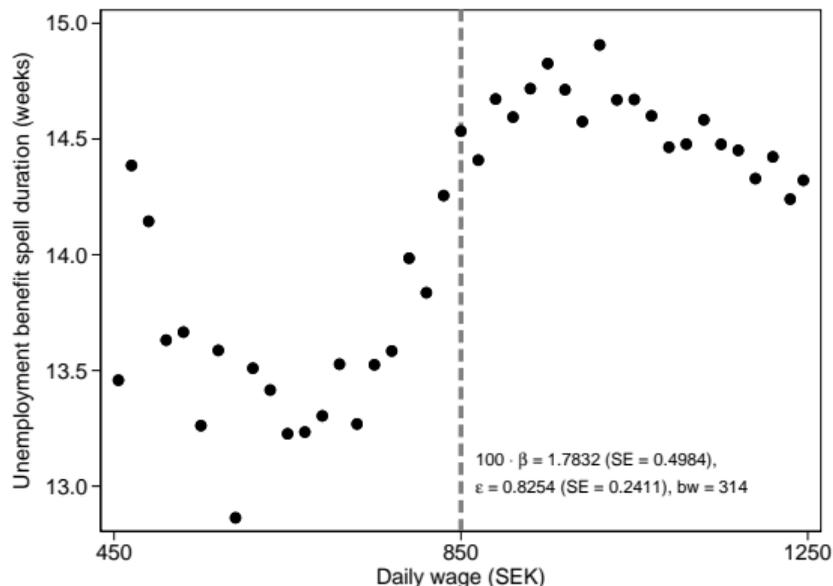
(ii) Sensitivity to bandwidth
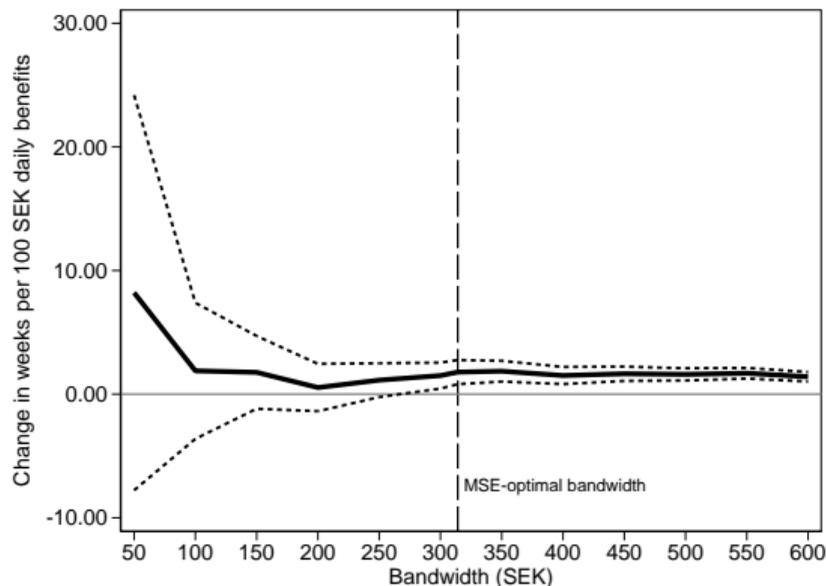
Magnitudes: Implied duration elasticity $\varepsilon = 0.83$ (SE = 0.24), in line with existing literature (Cohen and Ganong 2025).

Results: Overall Healthcare Use Around Kink
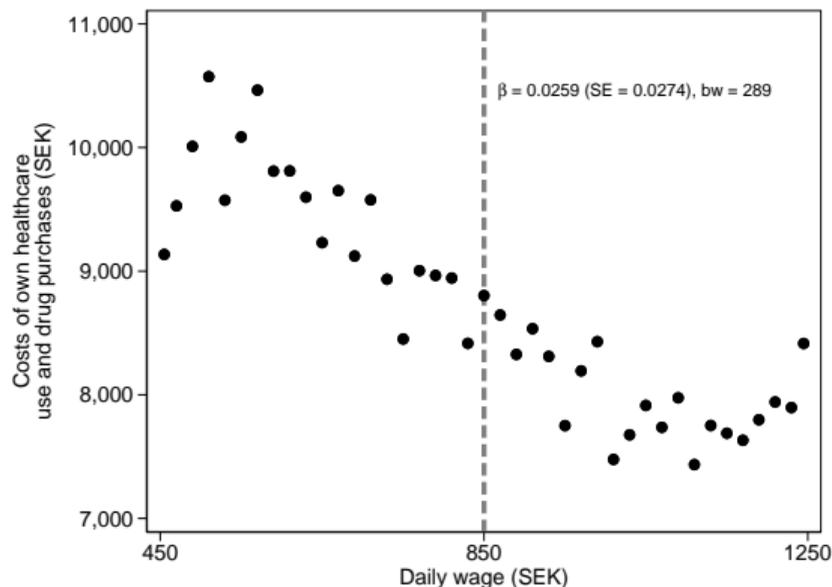
(i) Total costs

(ii) Any healthcare use
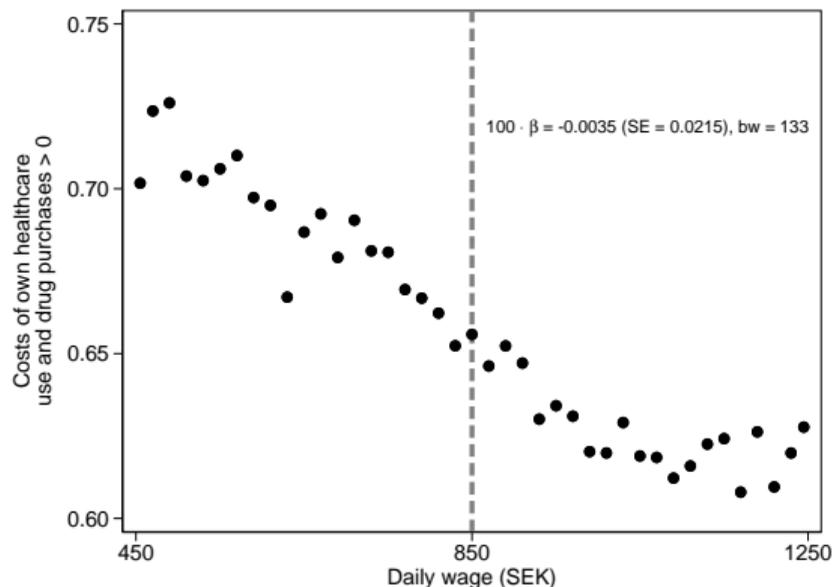
Magnitudes: For total costs, the 95% CI allow ruling out changes ($\uparrow$ or $\downarrow$) > 0.08 SEK per a 1 SEK $\uparrow$ in UI.
Outcomes are (i) the total costs of in- & outpatient care visits and drug purchases, and (ii) 1(Total costs > 0).
Total costs are winsorized above the 99th percentile.

Results: Inpatient and Outpatient Care Use Around Kink

(i) Total costs of visits   (ii) Number of visits   (iii) Any visits
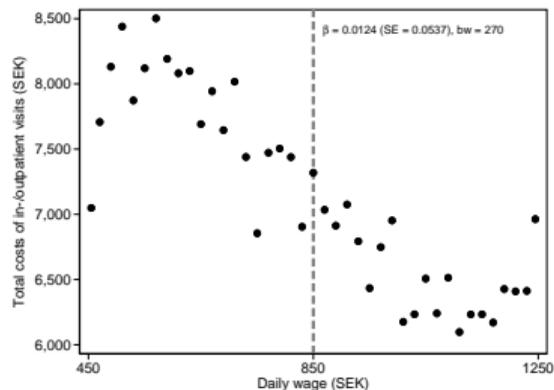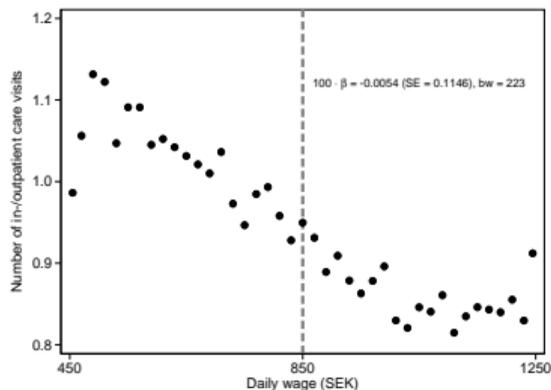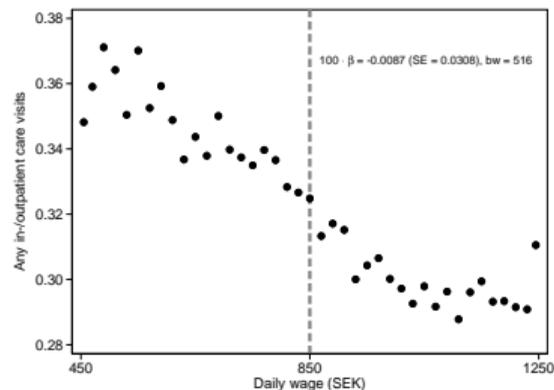
Magnitudes: For total costs, the 95% CI allow ruling out changes ($\uparrow$ or $\downarrow$) > 0.18 SEK per a 1 SEK $\uparrow$ in UI.

Outcomes are (i) the total costs in- & outpatient care visits, (ii) number of visits, and (ii) 1(Number of visits > 0).

Total costs are winsorized above the 99th percentile.

Results: Drug Purchases Around Kink

(i) Total costs

β = 0.0075 (SE = 0.0040), bw = 184

(ii) Any purchases

100 · β = -0.0404 (SE = 0.0345), bw = 118
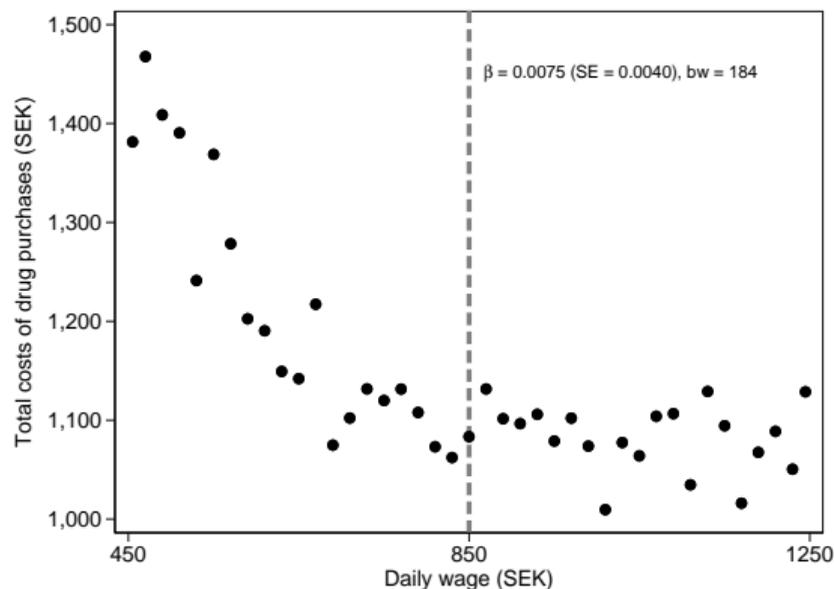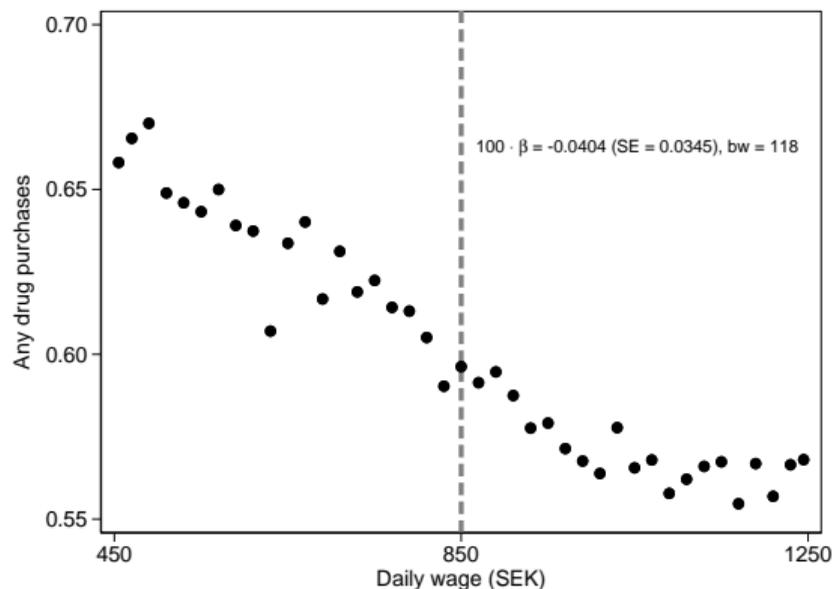
Magnitudes: For total costs, the 95% CI allow ruling out changes (↑ or ↓) > 0.02 SEK per a 1 SEK ↑ in UI.
Outcomes are (i) the total costs (OOP + subsidy) of drug purchases, and (ii) 1(Number of purchases > 0).

Total costs are winsorized above the 99th percentile.

Results: Implications for Fiscal Externalities

Goal: Bound the size of healthcare-related fiscal externality, $FE^{\text{health}}(b)$.

Issue: In-/outpatient cost measures capture total resource costs (incl. OOP costs).

Approach: Bound $FE^{\text{health}}(b)$ under three assumptions about the public share of costs.
1. Costs fall entirely on patients: $FE^{\text{health}}(b) \in [-0.001, 0.011]$ SEK per 1 SEK $\uparrow$ in b.
2. Costs fall entirely on govt: $FE^{\text{health}}(b) \in [-0.094, 0.129]$ SEK.
3. Costs fall $\propto$ avg. OOP shares: $FE^{\text{health}}(b) \in [-0.044, 0.085]$ SEK.

Comparison benchmark:
Fiscal externalities via spell duration responses: $\left(1 + \theta \frac{\kappa(m_U, h_U)}{b}\right) \varepsilon_{1-e,b} \in [0.84, 0.96]$ SEK.

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Fiscal externalities via spell duration responses: $\left(1 + \theta \frac{\kappa(m_U, h_U)}{b}\right) \varepsilon_{1-e,b} \in [0.84, 0.96]$ SEK.

Results: Implications for Fiscal Externalities

Goal: Bound the size of healthcare-related fiscal externality, $FE^{\text{health}}(b)$.

Issue: In-/outpatient cost measures capture total resource costs (incl. OOP costs).

Approach: Bound $FE^{\text{health}}(b)$ under three assumptions about the public share of costs.
1. Costs fall entirely on patients: $FE^{\text{health}}(b) \in [-0.001, 0.011]$ SEK per 1 SEK ↑ in b.
2. Costs fall entirely on govt: $FE^{\text{health}}(b) \in [-0.094, 0.129]$ SEK.
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Results: Robustness

My findings are robust to

- ▶ Varying bandwidth choices `Details`
- ▶ Different specification choices (polynomial order, kernel, w/ vs. w/o controls) `Details`
- ▶ Different levels at which healthcare costs are winsorized `Details`

Results: Heterogeneity in the Effects on Healthcare Use

A. Total costs of healthcare use

B. Inpatient & Outpatient visits

C. Drug purchases
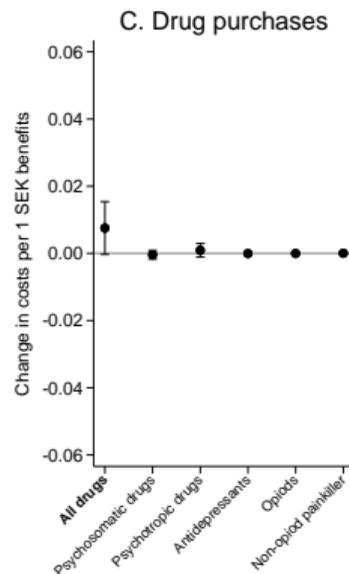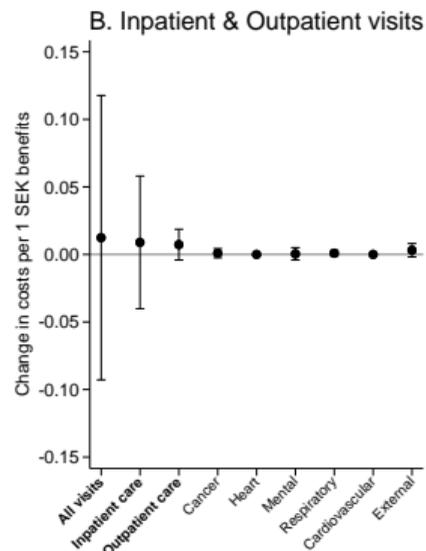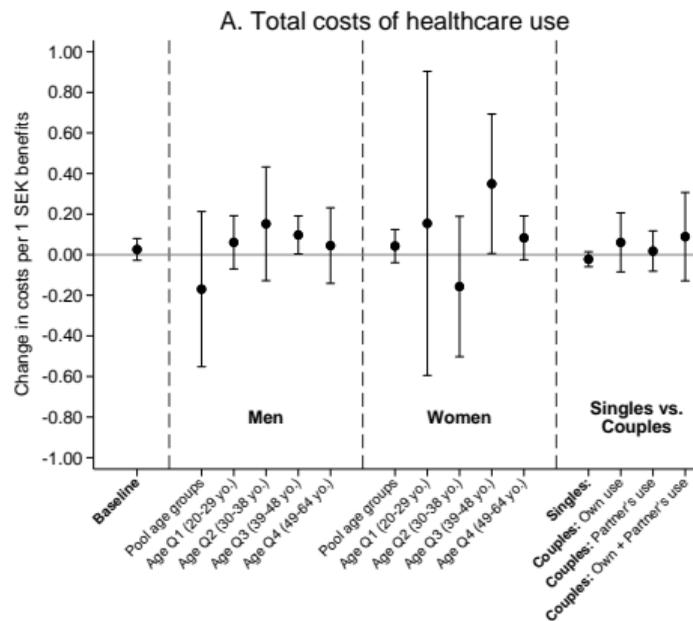
Psychosomatic drugs: Drugs for treating psychological distress (e.g., sedatives, benzodiazepins, and antidepressants)
Psychotropic drugs: Drugs for treating physical ailments linked to prolonged stress (e.g., migraine therapeutics and anti-inflammatory drugs)

Results: Estimates Over Unemployment Spell

Figure: Total costs of healthcare use

Conclusion

- I find little evidence that more generous UI affects healthcare use in Sweden
  - For a 1 SEK ↑ benefits, can rule out changes (↑ or ↓) in total costs > 0.08 SEK
  - True for men & women, young & old, across spending types, week-by-week over the spell
  - Findings contrast with previous evidence (Kuka 2020; Ahammer and Packham 2023)
  - Potential reasons: institutional differences, different policy variation (benefit level vs. PBD)

- Policy implications: Findings suggest that in a universal healthcare system...
  - ...healthcare-related fiscal externalities are not a first-order issue for optimal design of UI
  - ...factors independent of income loss drive health costs of unemployment
    - Such factors could include e.g. stress and loss of social contacts (Jahoda 1982)

- But healthcare-related fiscal externalities could matter when...
  - ...consumption smoothing is costly (Chetty and Looney 2006, 2007)
  - ...out-of-pocket healthcare costs are higher
  - ...studying other social insurance programs (such as DI, see Gelber et al. (2023))

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Appendix

Measuring Costs of Inpatient and Outpatient Visits <small>◂back</small>

Denote inpatient ($i = 1$) and outpatient ($i = 0$) care DRG codes in MDC m by $D(m, i)$.
Fix a reference year t (I use $t = 2020$).

The avg. per-day costs of an inpatient/outpatient visit with MDC code m are then

$$c_{m,i} = \sum_{j \in D(m,i)} \underbrace{\left(\frac{N_j}{N_{m,i}} \right)}_{\substack{\text{DRG } j\text{'s share of all} \\ \text{in-/outpatient visits with MDC } m}} \times \underbrace{\left(w_j \times \frac{c}{d_j} \right)}_{\substack{\text{Average per-day} \\ \text{costs of DRG } j}} \ ,$$

where

- N_j is the total number of visits with DRG code j,
- $N_{m,1}$ is the total number of in-/outpatient care visits with MDC code m,
- w_j is the weight for DRG j,
- d_j is the average duration (in days) of visits with DRG code j, and
- c is the cost per DRG point,

all measured in the reference year.

Covariates Around Kink [back]

Age
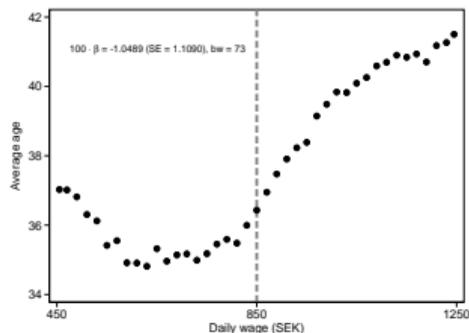
Share female
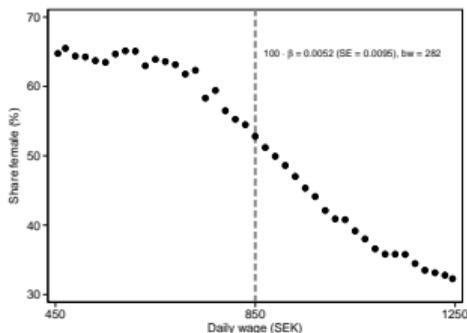
Share married/cohabiting
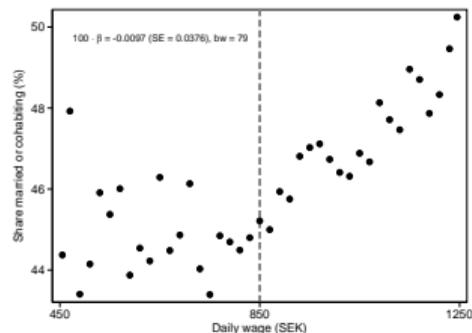
Share w/ u18 children
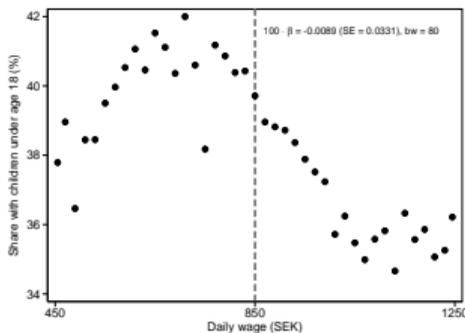
Share w/ higher educated
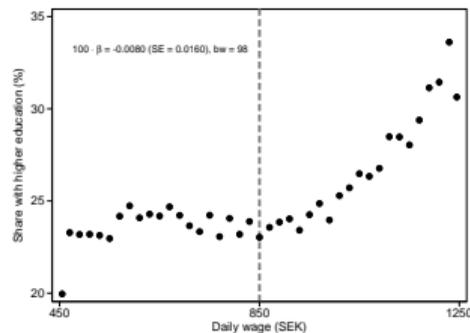
Predicted Healthcare Use Around Kink ◂ back

(i) Total healthcare costs
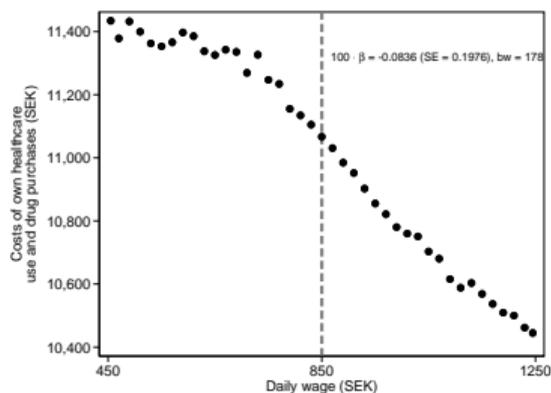
(ii) In-/Outpatient costs
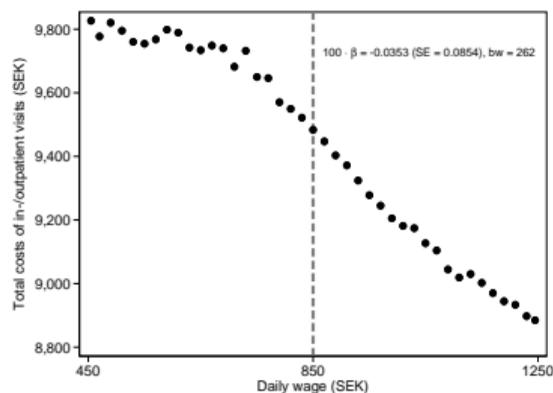
(iii) Costs of drug purchases
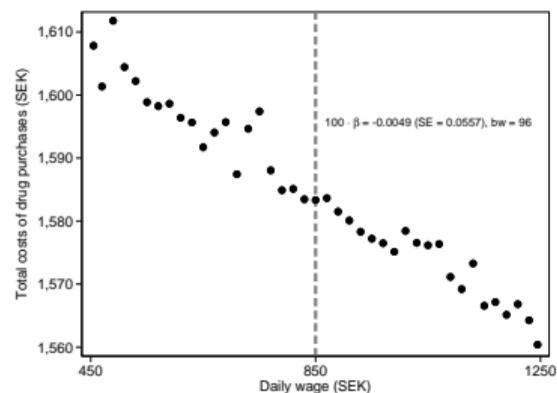
Predicted outcomes are fitted values obtained after regressing each outcome against indicators for being married or cohabiting, female, having higher education, and having children under age 18 at home, indicators for age, indicators for the region of residence, and indicators for the industry of the highest-paying employer (incl. missing industry as a separate category).

Pre-Spell Healthcare Use Around Kink ◂ back

(i) Total healthcare costs
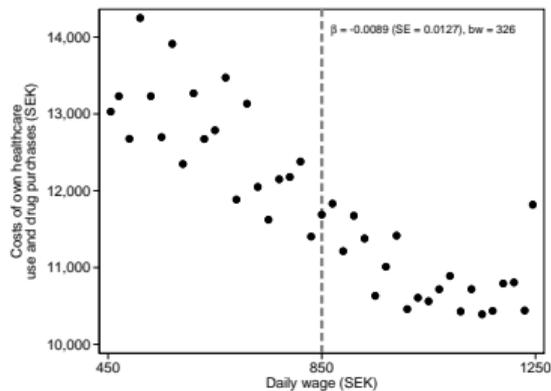
(ii) In-/outpatient costs
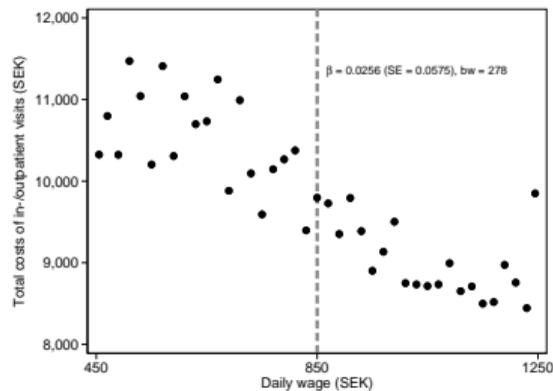
(iii) Costs of drug purchases
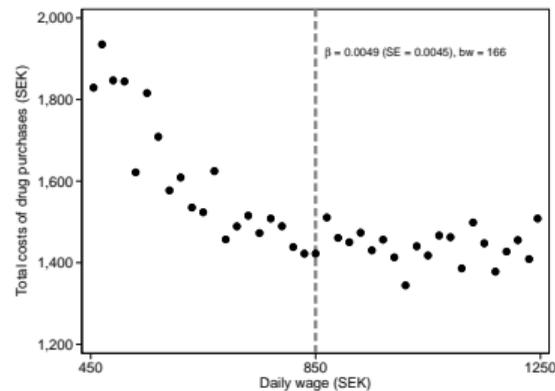
For each outcome, costs are measured over the last 52 calendar weeks prior to the start of the unemployment spell.

Sensitivity to Bandwidth Choice (◀ back)
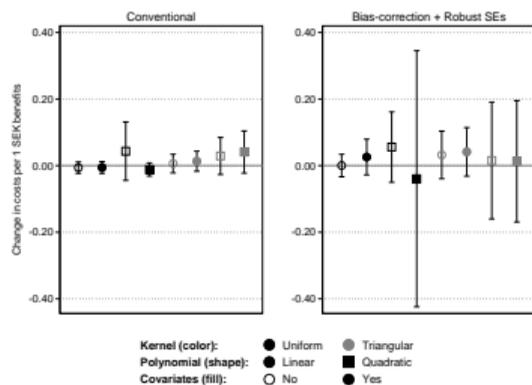
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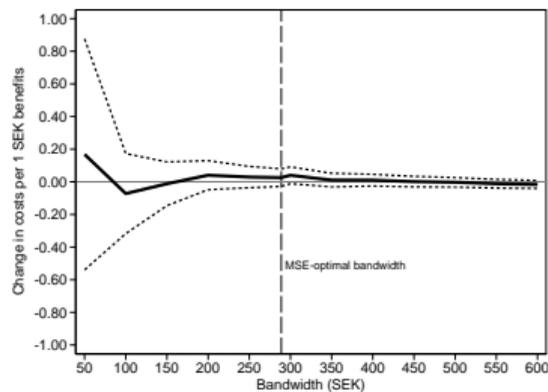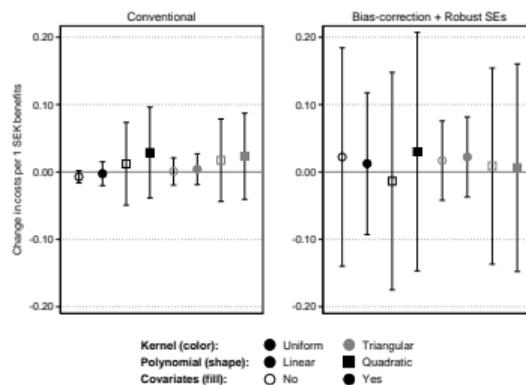
(ii) In-/outpatient costs
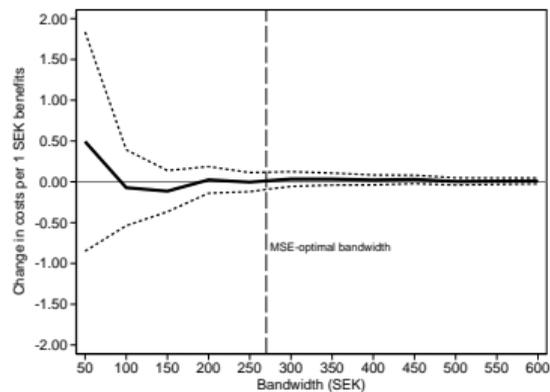
(iii) Costs of drug purchases
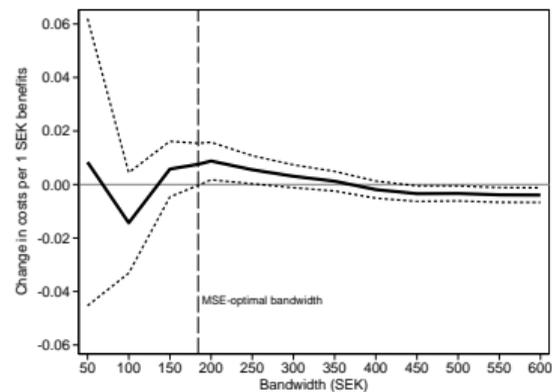
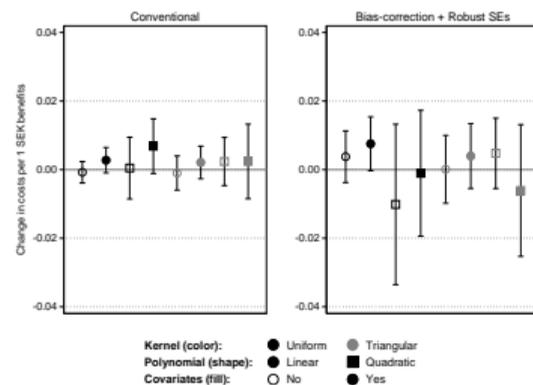# Sensitivity to Specification Choices <small>◂ back</small>

(i) Total healthcare costs

(ii) In-/outpatient costs
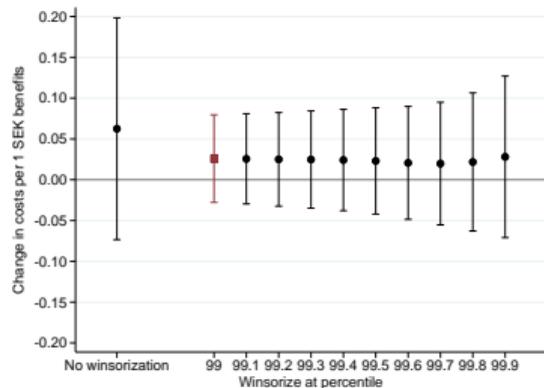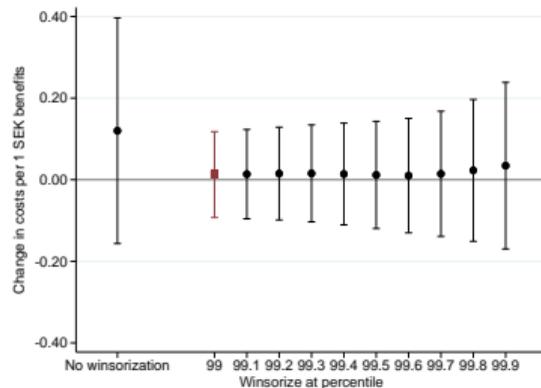
(iii) Costs of drug purchases

Comparing Estimates With vs. Without Winsorization _{back}
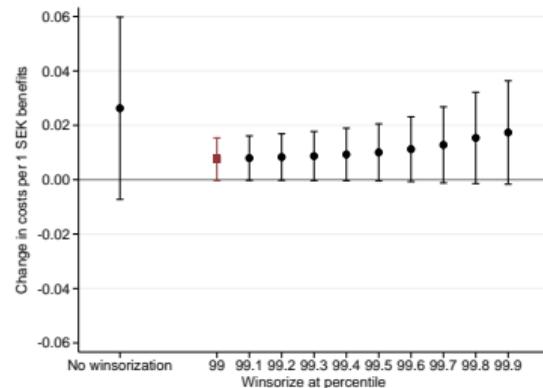

(i) Total healthcare costs   (ii) In-/outpatient costs   (iii) Costs of drug purchases

Red markers show the baseline estimates, which winsorize costs above the 99th percentile.