

Can a deductible kill?

The effect of patient cost-sharing on health

Padmaja Ayyagari¹ Martin Salm² **Eric Sargent²**

¹University of South Florida

²Tilburg University

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Motivation

Patients pay 20% total healthcare costs out-of-pocket in OECD countries (OECD, 2023)

Patient cost-sharing in health insurance intended to limit costs and moral hazard

- Under full insurance patients have no incentive to limit care

Strong evidence that cost-sharing reduces healthcare costs

- RAND Experiment - Manning et al. (1987), Shigeoka (2014), Brot-Goldberg et al. (2017), Avdic et al. (2024)

Concerns about effects of cost-sharing on health

- Ability to pay, behavioral hazard - Baicker et al. (2015), Brot-Goldberg et al. (2017)

Literature

Existing evidence on health effects of cost-sharing is inconclusive

Traditionally believed that cost sharing reduces moral hazard with limited effect on health

- RAND Experiment - Manning et al. (1987)
- Japanese seniors - Shigeoka (2014)

Recent evidence that aggressive cost-sharing can increase mortality in select populations

- Permanent copayment for high income Colombians - **Buitrago et al. (2023)**
- Medicare part D donut hole for elderly Americans - Chandra et al. (2024)

This Paper

Research Question: What is effect of a moderate deductible on healthcare costs and health?

Regression discontinuity around the timing of medical emergencies

- Compare patients admitted to the emergency room just before and after a deductible reset
- Administrative data from Netherlands

Examine effects on health and healthcare use

- Short- and long-run effects
- Heterogeneous effects by income and health risk

Dutch health insurance

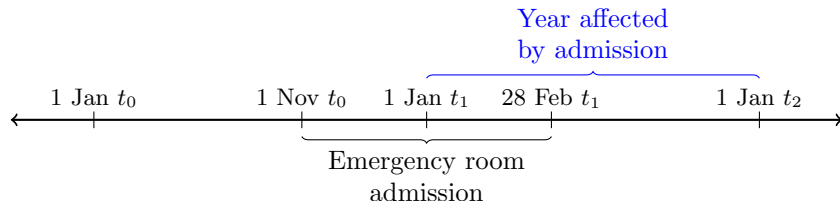
Mandatory health insurance for all residents

Covers GP care, specialist care, hospital care, pharmaceuticals, emergency care

Annual deductible (€385)

Deductible *resets* every year on January 1

Our approach: Regression discontinuity



Annual deductible resets January 1

The cost of an emergency room visit will exceed yearly deductible, care is free for the rest of the year

Build RD around the timing of emergency room visits

Regression discontinuity

$$y_i = \beta_0 + \tau D_i + \beta_1 X_i + \beta_2 D_i X_i + \varepsilon_i$$

y_i outcome for individual i .

X_i running variable, time of emergency room visit relative to January 1 of year t_1

$D_i = \mathbf{1}[X_i \geq 0]$, treatment is emergency room admission in t_1 , τ parameter of interest

Bandwidth = 61 days, triangular kernel, Robust SE

Data and sample selection

Administrative data on population of the Netherlands

Universe of emergency room admissions 2013-2016

- Use emergency room admissions from 1 November to 29 February

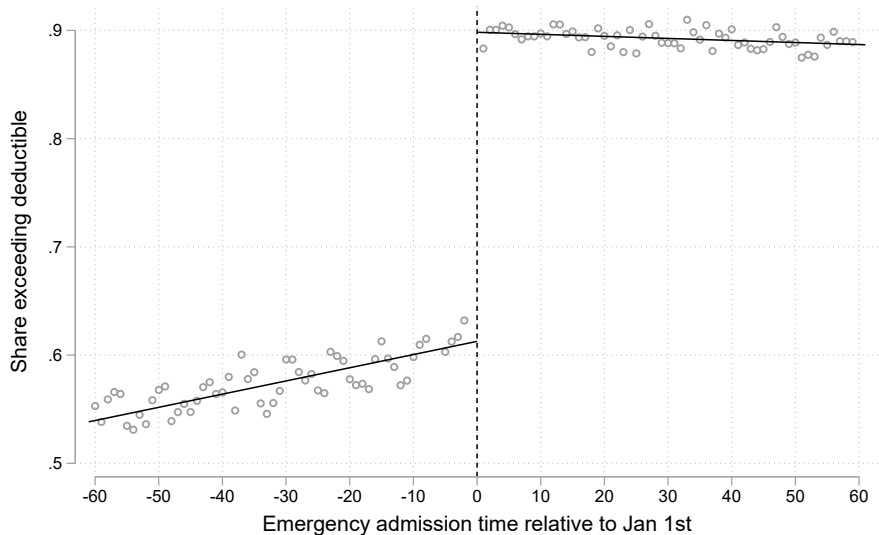
Exclude emergency room admissions on 25,26,31 Dec, 1 Jan

- Holiday emergency room visits very different

Other exclusions [▶ Sample selection](#)

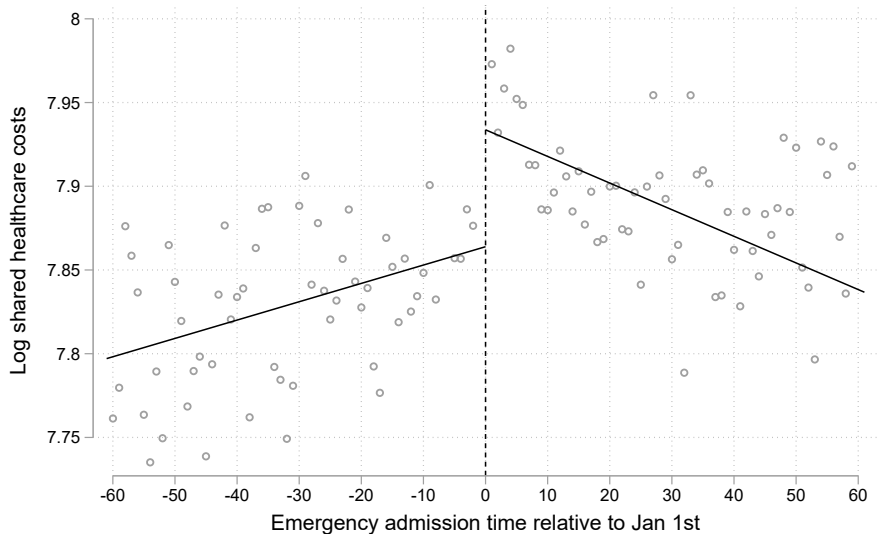
Final sample: 263,562 emergency room admissions

Share of patients exceeding annual deductible



Effect: 0.286, Standard Error: (0.004), p -value: 0.000, Untreated average: 0.613

Log healthcare costs



Effect: 0.070, Standard Error: (0.013), p -value: 0.000, Untreated average: 7.864

What drives the increase in cost?

	Untreated avg.	Effect	Std. error
<i>Costs (log)</i>			
Specialist care	7.349	0.081***	(0.012)
Pharmaceuticals	5.382	0.018	(0.015)
<i>Use (probability)</i>			
Imaging diagnostics	0.253	0.013***	(0.004)
Laboratory tests	0.158	0.007**	(0.003)
Statins & beta-blockers	0.253	0.004	(0.004)
Observations: 263,562			

By health risk

	Untreated avg.	Effect	Std. error
<i>Exceeds deductible</i>			
High risk	0.740	0.205***	(0.005)
Low risk	0.407	0.415***	(0.006)
<i>Log costs</i>			
High risk	8.180	0.044***	(0.017)
Low risk	7.239	0.072***	(0.018)

$N = 118,591$ (high risk), $118,592$ (low risk)

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Effect on mortality

All-cause mortality: No significant effect

- Lower bound of 95% CI: -0.0008
- Baseline rate: 0.0114

Rules out effect sizes by Chandra et al. (2024), Buitrago et al. (2023), one-year age difference, difference between men and women

Even conservative cost-effectiveness ratios far exceed the Dutch threshold ($\text{€}80,000/\text{life-year}$)

Effect on other measures of health

Other objective measures: No significant effect

1. Heart attack
2. Stroke
3. Preventable hospitalizations
4. Future emergency room admissions

No improvements in long-run (+4 years)

- No change in mortality
- No change in treatment for chronic conditions, costs

Result holds across health-risk and income groups

Identifying assumption and potential violations

Potential outcomes are continuous around January 1

1. Patients may manipulate the timing of their admission
 - ▶ Test for discontinuity in timings of emergencies
2. Patients may be different on either side of the cutoff
 - ▶ Placebo regressions on demographics, socioeconomic status, and prior health
3. Accident severity may differ on either side of the cutoff
 - ▶ Regressions short-run mortality and hospital quality, test for discontinuity in distribution of admission type
4. Holiday admissions are special
 - ▶ “Donut hole” regression excluding 8 days around the cutoff

Summary of results

Lower cost-sharing leads to elevated healthcare costs

- Large increases in specialist care, diagnostic care
- No effect on pharmaceutical usage

No detectable effect on mortality or other measures of health

- Holds in the short- and long-run

Greatest effect on costs for low-risk patients

- High-risk patients face weaker incentives to constrain utilization

Conclusion

Cost sharing is an important but controversial policy tool

Whether cost-sharing harms health is a crucial question in this policy debate

The form and intensity of cost-sharing matter immensely

A modest deductible does not kill

Thank you for your attention

`e.s.sargent@tilburguniversity.edu`

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