Entry Regulation and the Provision of Medical Services

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Introduction

- Ongoing debate on best way to allocate medical services
- Majority of nations do not rely solely on the market and implement strict regulations for equitable access to general practioner care:
  - Direct distribution mechanism: blocking entry using a demand-planning system $\longrightarrow$ Incentive schemes like subsidies debated as less distortionary alternative
  - Other regulatory instruments: price controls, licensing, certification

This paper

1. Study causal effects of entry restriction itself for GPs in Germany
2. RDD setting with planning target $\Rightarrow$ same amount of GPs at threshold $\longrightarrow$ estimate pure incentive/quality effects of regulation

Contribution

Our paper contributes to multiple strands of economic literature:

1. Large literature on entry restrictions
   - Much of this research focuses on occupational licensing *(e.g. Kleiner and Soltas, 2023)*
   - Smaller subset focuses on medical markets:
     - *Kugler and Sauer (2005)* study immigrant physician licensing requirements
     - *Mocetti (2016)* and *Pagano et al. (2022)* study entry restrictions for Italian pharmacies
   - **Our contribution:** Pure incentive/quality effects of a demand planning system for general practioners in Germany
2. Work on labour supply of doctors
   - For example, *Gartwaithe (2012)* show how hours with patients react to changes in reimbursement.
3. Health economics works that focus on the quality of medical services
   - Relates to works that study the effects of doctor quality on patient choices *(e.g. Santos et al., 2017; Biørn and Godager, 2010)*

Preliminary findings

1. No difference in current medical supply
   (Nr. of GPs, Nr. of practices, opening hours)
2. No difference in patients' satisfaction
   (Unchanged practice ratings)
3. Significant differences in health outcomes
   (Life expectancy and mortality, esp. for diseases linked to GPs)

Institutional Background: The German Demand Planning System

- **Goal:** Control the spatial distribution of medical services, i.e. prevent over- and undersupply
  - How? Uniform target adjusted by regional factors is set by authorities
    ▸ Planning procedure
  - If target exceeded by 10%: Automatic blocking, i.e. no new practices are allowed to settle
- Applies to all GPs treating statutorily insured patients (90% of the population)

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$\longrightarrow$ Blocking itself does not affect the current but the future supply with GPs at the threshold (no quantity effect)

$\longrightarrow$ Still might impact patients through

1. Affecting incentives and competition
2. Composition effects

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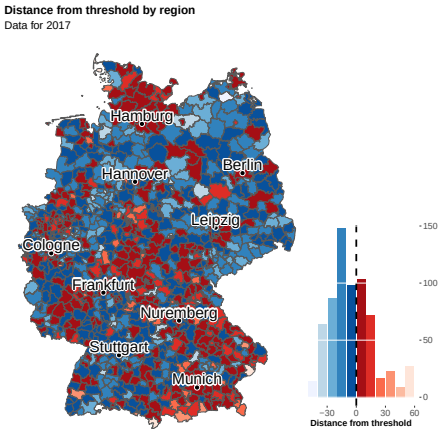
Distance from planning threshold by region



Similar urban regions are close to the threshold

Example Comparison:

City	Population	Coverage Rate
Darmstadt	294,710	109%
Heidelberg	291,560	110%

Data

Combine data from several sources from 2014 to 2019:

1. Annual **demand planning reports** from the federal Association of SHI-accredited medical doctors at the **planning area level**
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   - Mortality and hospitalization data by cause (only 2016 and 2017)
   - Use population-weighted cross-walk to planning areas

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4. **Subjective doctor ratings and opening hours** from the largest doctor review website in Germany (Jameda) at **practice level**

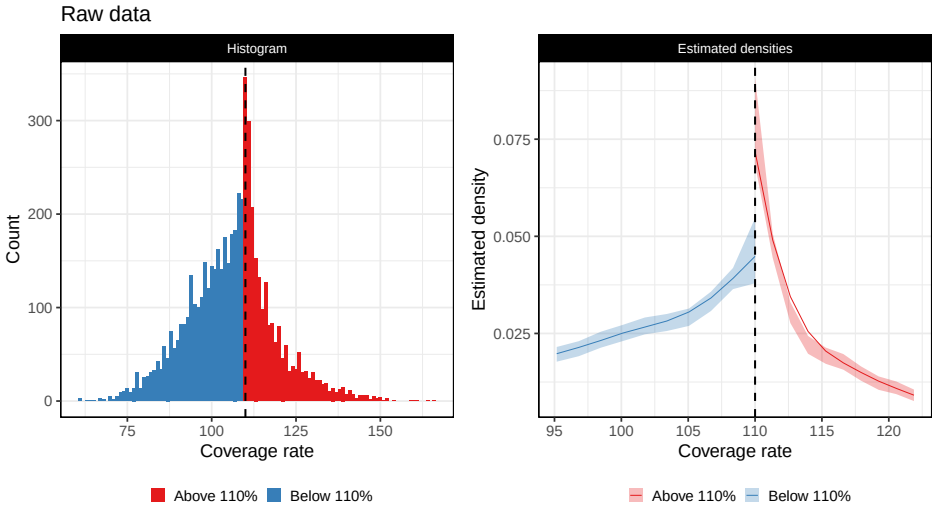
RDD Identification Strategy

For RDD identification we need two assumptions:

1. Treatment units may not be able to manipulate their treatment status
   - Legal leeway for the associations of insurance providers and physicians to influence local targets,

     BUT: Little possibility for them to admit physicians in closed regions
   - Overshooting when new physicians can be addmitted at 109% mechanically leads to excess mass right after the threshold.
   - For manipulation by local authorities we would expect excess mass just below the threshold
2. No other systematic differences between regions around the cutoff exist
   $\longrightarrow$ Tests of covariate discontinuity

Density at the cut-off



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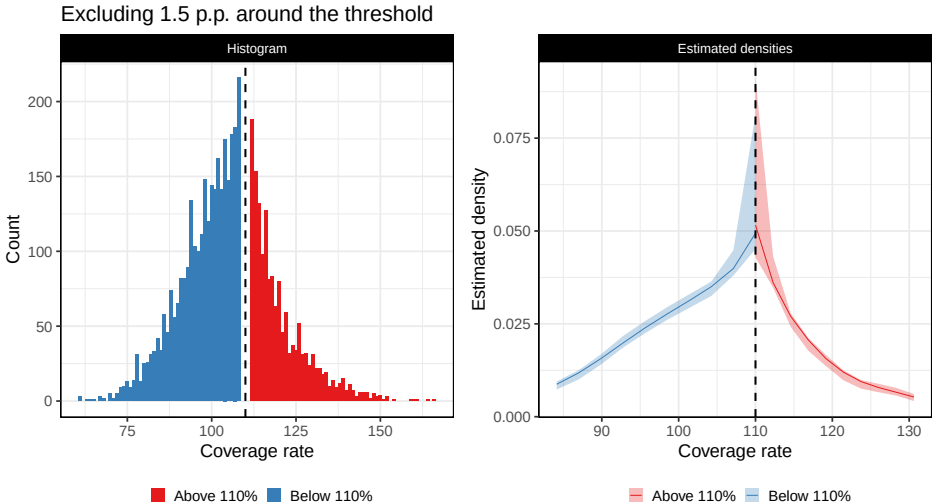
Density at the cut-off (Donut Hole)

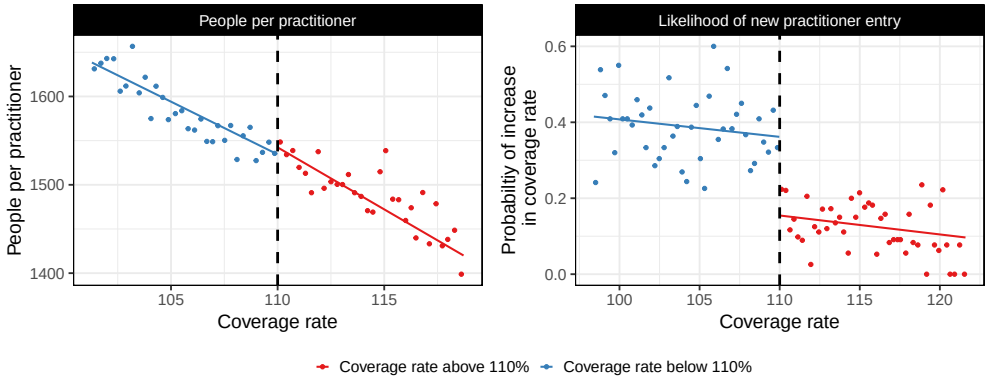


Testing for covariate discontinuity

Covariate	Mean value	Point Estimate	z-Statistic	P-value	95% Confidence Interval
Population density (People per km^2)	873.80	-9.08	-0.27	0.79	[-75.76 ; 57.60]
Absolute population	86552	-3928	-0.44	0.66	[-21379 ; 13522]
Income tax revenue per capita (€ per person)	3486.99	22.16	0.29	0.77	[-129.50 ; 173.83]
Gross domestic product per capita (€ per person)	38506	307.64	0.35	0.72	[-1391 ; 2007]
Share of people in need of nursing care	4.10%	0.04%	0.71	0.48	[-0.0716% ; 0.1530%]
Population share of people over the age of 65	20.49%	-0.08%	-0.54	0.59	[-0.3761% ; 0.2138%]
Population share of women	51.22%	0.02%	0.50	0.62	[-0.0723% ; 0.1220%]

- All confidence intervals are very small and include zero
- Typically, the estimate is smaller than 1% of the mean with the exception of absolute population (with an estimate of 4% of the mean)

People per GP and likelihood of entry



▸ Placebo thresholds ▸ Geographic Placebo ▸ Bandwidth robustness (linear spec.) ▸ Bandwidth robustness (quadratic spec.)
▸ Alternative data

Results: Access to general practioner care

Panel A: People per practitioner

Method	Point Estimate	z-Statistic	P-value	95% Confidence Interval
Conventional Estimate	7.9290	1.27	0.20	[-4.3095 ; 20.1674]
Robust	7.2672	1.02	0.31	[-6.7579 ; 21.2922]

Panel B: Likelihood of an increase in coverage rate

Method	Point Estimate	z-Statistic	P-value	95% Confidence Interval
Conventional Estimate	-0.2071	-6.64	0.00	[-0.2683 ; -0.1459]
Robust	-0.2052	-5.74	0.00	[-0.2752 ; -0.1351]

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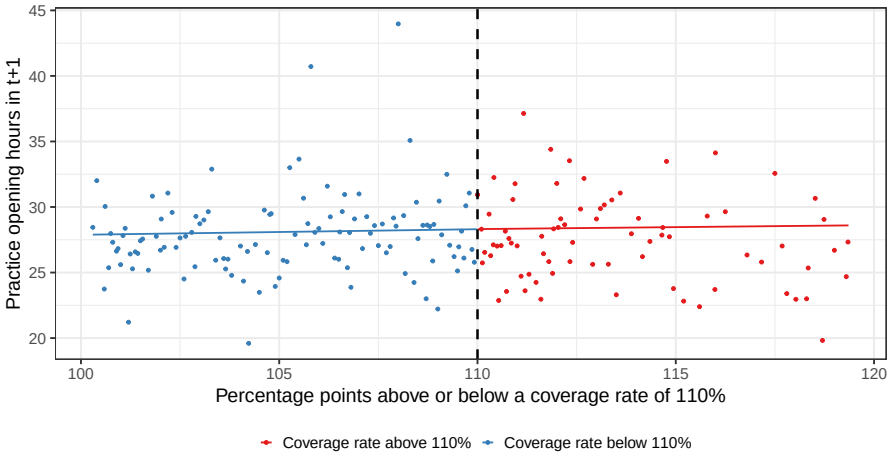
Results: Practice opening hours



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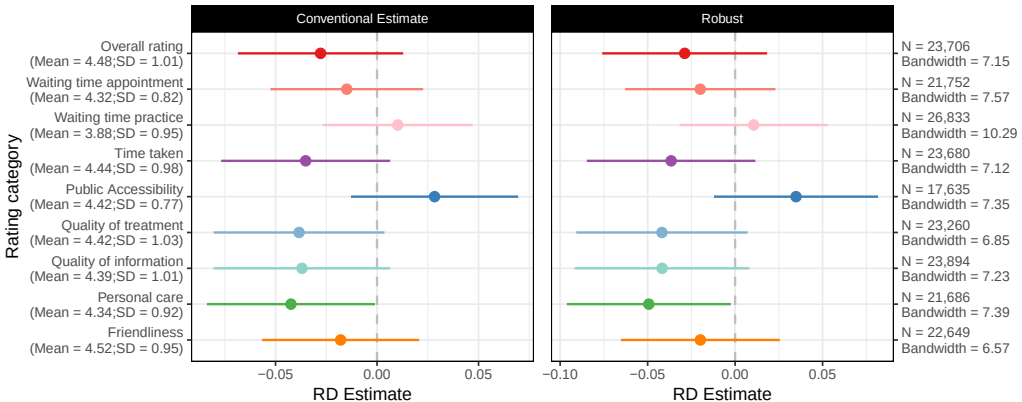
Results: Invidual practice ratings

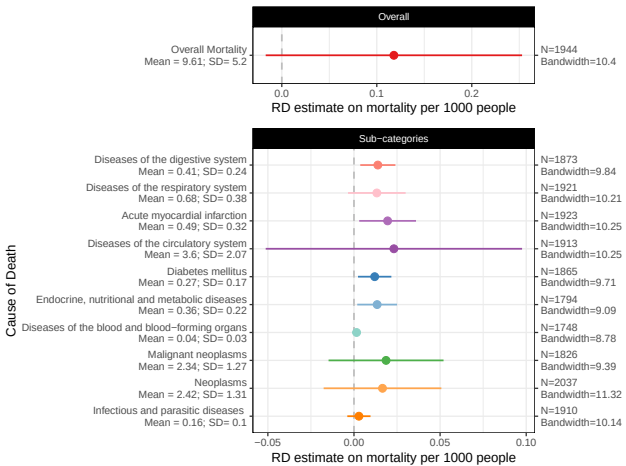


Results: Life Expectancy

Panel A: Life expectancy at birth				
Method	Point Estimate	z-Statistic	P-value	95% Confidence Interval
Conventional Estimate	-0.1070	-2.74	0.01	[-0.1837 ; -0.0304]
Robust	-0.1068	-2.34	0.02	[-0.1962 ; -0.0174]

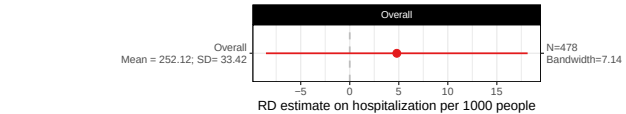
Panel B: Life expectancy at 60				
Method	Point Estimate	z-Statistic	P-value	95% Confidence Interval
Conventional Estimate	-0.0862	-3.12	0.00	[-0.1403 ; -0.0321]
Robust	-0.0865	-2.68	0.01	[-0.1497 ; -0.0234]

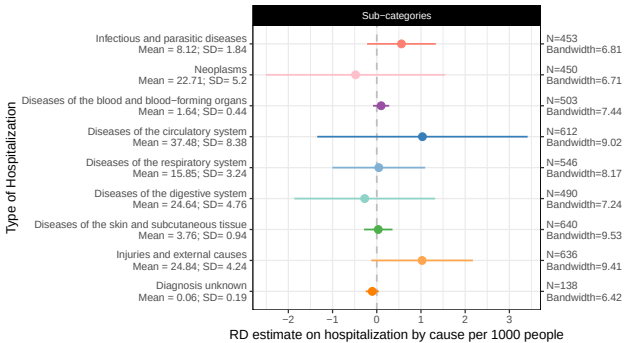
Results: Mortality by cause



- GPs act as preventive care providers
  $\longrightarrow$ screen and help to prevent (avoidable) diseases
- Particularly in the focus of the health check-ups:
  - Cancer, endocrine/metabolical diseases (esp. diabetes), cardiovascular diseases
- Significant effects in cause-speficic mortality related to preventive check-ups

Results: Hospitalizations





- Are the mortality effects influenced by a shift in services away from general practitioner care towards hospital care?

  $\longrightarrow$ Generally no evidence for substitution towards hospitals

Preliminary Conclusion

- New RDD evidence for the effects of a demand planing system on general practioner quality but not access
- Relevant for policy makers seeking to regulate healthcare markets.

Main take-aways

- Entry restrictions for general practitioners in Germany significantly reduce the entry of new practitioners
- Small but significant decrease in life expectancy and an increase in cause-specific mortality rates for diseases screened during general practitioner check-ups.

What's next?

1. Use insurance billing data to find the main mechanisms for the observed health effects:
   $\longrightarrow$ Do we see actual decreases in screening?
   $\longrightarrow$ Does the behaviour of GPs change?
2. Use 20 years of geo-coded German yellow-pages data to exploit within-region variation:
   $\longrightarrow$ Change in composition towards older practices in closed regions? Where do practices appear/disappear? Dispersion? Does intergenerational transmission of practices differ in closed/open regions?

Planning procedure

Step 1	Determine what type of planing region is used for the the specific specialisation *e.g. general practitioner demand is planned at the mid-level area level*		
Step 2	Determination of a TARGET level of care per physician group (ratios) *e.g. 1,740 inhabitants per general practitioner in a district*		
Step 3	Determination of the actual level of care in the planning area *e.g. 317,417 inhabitants and 249 general practitioners = 1,274 inhabitants per general practitioner*		
Step 4	Comparison of the ACTUAL and TARGET supply level as supply rate *e.g. 1,274 compared to 1,740:* $\frac{\text{TARGET}}{\text{ACTUAL}} = \frac{1{,}740}{1{,}274} = 137\%$		
Step 5	0% – 50 / 75% Undersupply Subsidized admission	50 / 75% - 110% Regular supply Regular admission	$\geq$ 110% Over-supply Closed to entry
	e.g. since TARGET is 137% of ACTUAL the region is closed to new entry		

If attractive regions are closed, doctors who want to set up their own practice have to move to less attractive regions.

Back

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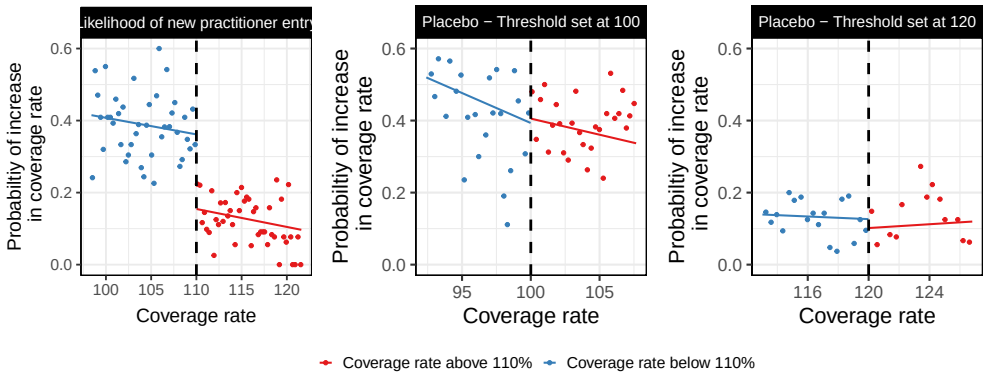
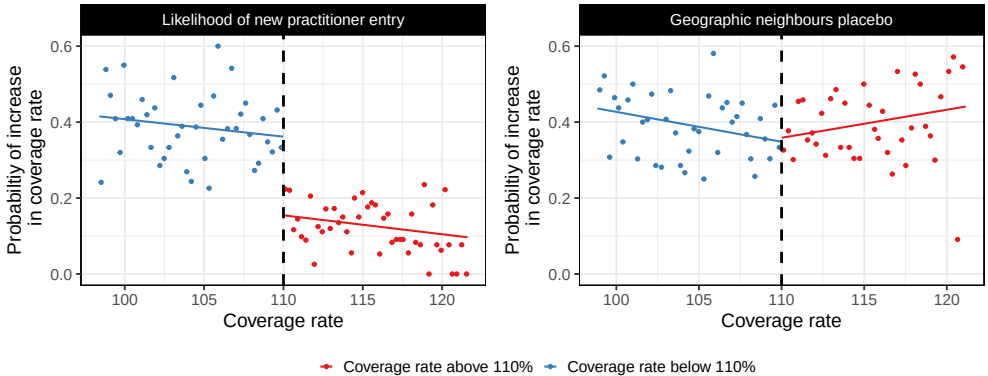
Placebo thresholds



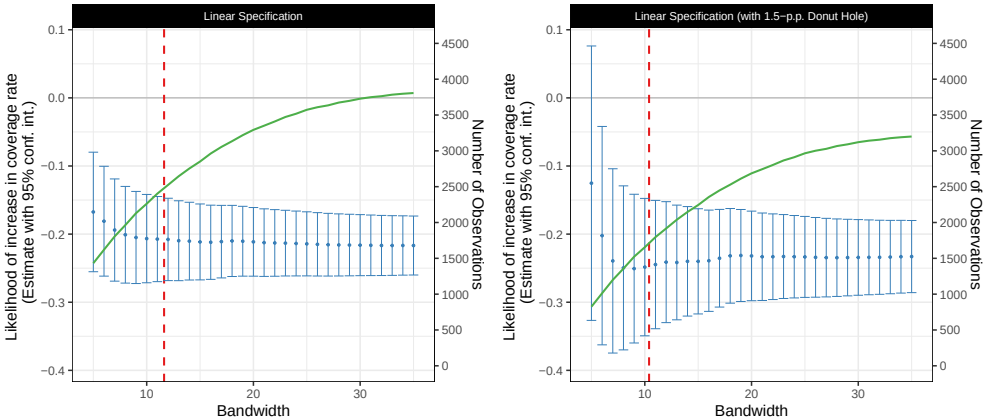
Back

Geographic neighbours placebo



Back

Results: Robustness to specification changes



Back

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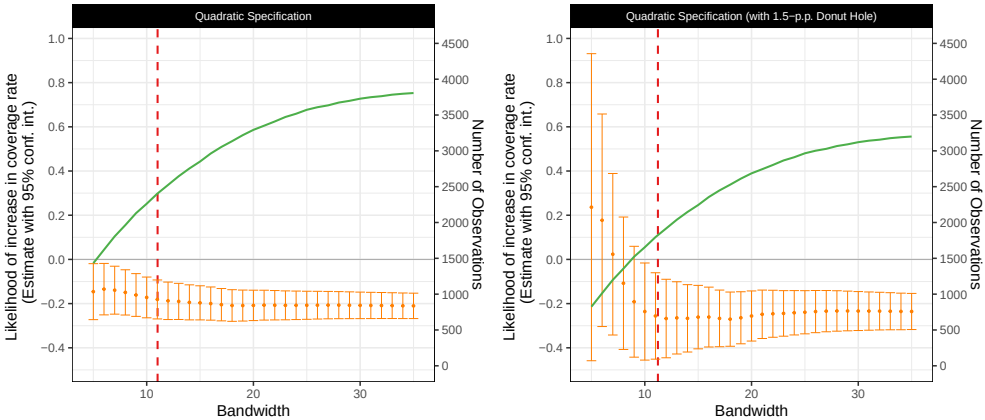

Back

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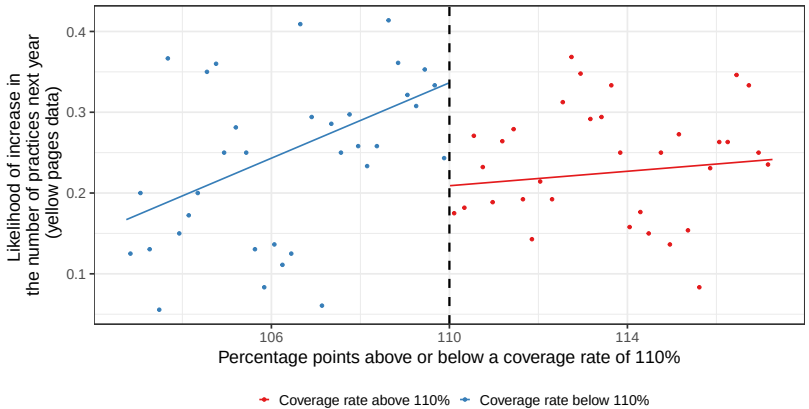
Number of practices - Yellow pages data



Back