Impact of the Change in Payment Mix on the Actual and Perceived Behaviors of Medical Care Providers

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Brief Overview

• This paper leverages a natural experiment to investigate the impact of the change in the sources of the providers payments on the providers' behavior (supply-side) and on the patients perception of the providers behavior (demand-side) using Medical Expenditure Panel Survey data.

• Payment Sources are: private insurance, Medicaid, out-of-pocket (from the patients), and other sources.

• The provider treatment decisions measured are indicator variables: "Any Medicine Prescribed", "Lab Tests", and "Other Diagnostic Test/Exam".

• The patients' perception outcome measures are indicator variables: "Enough Time", "Listen", and "Respect".

Why Study Patient's Perception?

• Patients' satisfaction with their medical care is important to payers, hospital administrators, physicians, and patients.

- It is important because it captures the patients' experience of health care other than the direct effects on health (Institute of Medicine 2001).

- It also acknowledges the role of the patient as partner in health care (Institute of Medicine 2001).

  $\hookrightarrow$ In addition, these changed perceptions may affect trust and follow up in the treatment plan.

- Therefore, it is a goal toward which considerable resources are directed (Dranove et al. 1999).

Natural Experiment and RD Design

- Before the Patient Protection and Affordable Care Act (PPACA) was enacted into law in 2010, young adults who were not full-time students aged out of their parents insurance plans when they turned 19 years old, i.e. 228 months old.

  • RD Design Threshold: Aging out of Parents' Insurance at age 19

- Andrews et al, 2013 and Palmieri et al, 2017 show that there exists a sharp drop in insurance coverage rates that results from young adults aging out of their parents insurance plans.

Main Findings

1. Total payments received by the medical providers did not change significantly across the threshold.

2. Private Insurance expenditure decreased statistically significantly.

3. Out-of-Pocket expenditure increased statistically significantly.

4. None of the actual behaviors of medical providers measured changed across the threshold.

5. All of the measured perceived behaviors of medical providers changed across the threshold.

Data

Medical Expenditure Panel Survey (MEPS) data for the years 1996 through 2009.

- Office-based visit level data.
- 12-month bandwidth around the age 19.
- 7,912 office-based visits.

Empirical Framework - Regression Discontinuity Design

$$
\begin{aligned}
Y_{ivrt} &= \alpha_0 + \alpha_1 \, AO_{iv} + \alpha_2 \, AO_{iv} \times (age_{iv} - 228\text{months}) \\
&+ \alpha_3 \, (1 - AO_{iv}) \times (age_{iv} - 228\text{months}) + \delta \, X_{ivt} \\
&+ \text{ICD9}_{iv} + \alpha_t + \alpha_r + u_{ivrt},
\end{aligned} \tag{1}
$$

where,

- Y_{ivt}: an outcome or treatment measures for patient i at visit v in region r in year t.
- AO_{iv}: stands for Age-Out and is an indicator variable that equals one if the individual i is older than 228 months at time of the visit v.
- age_{ivt}: age of the individual i of the visit v at year t measured in months.
- X_{ivt}: vector of demographic variables including sex, race, gender, region, and employment status.
- ICD9_{iv}: represents the conditions treated for individual i in each visit.

Finally, the model also includes the year (α_t) and region (α_r) fixed effects.

In the language of instrumental variables

- Reduced-form estimates are:
  ↪ the discontinuity in actual provider behavior and patient perceived provider behaviors are the reduced-form estimates.
- The first-stage estimate is:
  ↪ the discontinuity in provider payments.

• There are several ways to compute the IV estimator (Cameron & Trivedi, 2017). I compute the estimator as:

$$\beta \quad = \quad \frac{\dfrac{dy(\text{outcome})}{dz}}{\dfrac{dy(\text{treatment})}{dz}} \quad = \quad \frac{\alpha_1(\text{"Any Medicine Prescribed"})}{\alpha_1(\text{payments})} \quad (2)$$

• where β is the impact of the change in the providers' payments on the actual and perceived behaviors of the providers.

Smoothness Criteria - Important to Identification Strategy

	Mean Below Cutoff	Mean After Cutoff	Regression estimates of discrete jump at 228 months (1 year bandwidth)	S.E. for difference estimates in RD
	(1)	(2)	(3)	(4)
Female	0.63	0.67	0.03	[0.032]
Nonwhite	0.18	0.18	-0.01	[0.022]
Hispanic	0.25	0.29	0.04	[0.024]
Employed	0.72	0.76	0.04	[0.035]
Below 124% of Poverty Line	0.40	0.40	0.01	[0.015]
ICD9	0.04	0.02	-0.00	[0.010]

Notes. The standard errors are clustered at the age level, measured in months. The differences and their related standard errors are estimated using McCary (2008), by regressing each of these demographic variables in the same framework as our regression discontinuity estimates. These difference estimates are also weighted using the individual sample weights assigned in MEPS. The model is estimated on a sample within 12 months above and below the age 228 months threshold. The controls used in this model include year indicators for the years 1996 to 2009, and the region indicators for Northeast, West, Midwest, and South regions.

• The lack of a significant difference in the observable characteristics and further the unobservable characteristics between the two groups of individuals shows the comparability at the baseline around the cutoff age of 228 months.

Overall Findings - Payments

• As young adults lose health insurance coverage, the total per-visit revenue received by medical care providers does not change significantly.

• However, the out-of-pocket payments made by the patients, increases statistically significantly and the payments sourced from private insurance decreased statistically significantly

	Age >228 months (α_1)	SE
Payment Variables:		
Total Payment From All Sources ($)	0.899	[3.462]
Payment by Sources:		
Out-of-Pocket ($)	5.771***	[2.018]
Private Insurance ($)	-9.986***	[2.325]
Medicaid ($)	2.474	[2.150]
Others ($)	2.640	[1.894]

Overall Findings - Actual and Perceived Behaviors

• Overall, medical care providers do not change their actual treatment decisions as their patients age across the threshold of 228 months.

• Overall, across the threshold of age 228 months, patients felt significantly less satisfied with their provider's behavior.

	Age >228 months (α_1)	SE
Outcome Variables - Treatment Decisions:		
Any Medicine Prescribed	-0.036	[0.029]
Lab Tests	-0.039	[0.035]
Other Diag Test/Exam	-0.045	[0.036]
Outcome Variables - Patients' Perception:		
Enough Time	-0.079**	[0.031]
Listen	-0.105***	[0.028]
Respect	-0.091**	[0.034]

Overall Findings - Impact of Change in Payment on Actual and Perceived Behaviors

- The impact of **out-of-payments** on patients' perception is **negative**.

- The impact of **private insurance payments** on patients' perception is **positive**.

- The results of this paper suggest that although the medical care providers do not change their actual treatment plans, the patients feel like they receive less from their medical care providers as their out-of-pocket payments increase.

    - Therefore, as providers work to set policies that improve patient satisfaction, they should pay special attention to the influence of patients' financial payments on their perception of the health care.

Behavior Change per $10 Change in Revenue

	Outcome Variables **Providers' Treatment Decisions:**			**Outcome Variables** **Patients' Perception:**		
$(\frac{\alpha_1^{(outcome)}}{\alpha_1^{(treatment)}} \times \$10)$	Any Medicine Prescribed (1)	Lab Tests (2)	Other Diag Test/Exam (3)	Enough Time (4)	Listen (5)	Respect (6)
Payment Variables:						
Total Payment - All Sources ($)	-0.4004 (1.5755)	-0.4338 (1.7015)	-0.5006 (1.9544)	-0.8788 (3.3994)	-1.1680 (4.5093)	-1.0122 (3.9114)
Payment by Sources:						
Out-of-Pocket ($)				-0.1369** (0.0720)	-0.1819** (0.0800)	-0.1577** (0.0807)
Private Insurance ($)				0.0791** (0.0361)	0.1051*** (0.0372)	0.0911** (0.0401)

• A $10 increase in the patients' out-of-pocket payments received by the provider leads to a statistically significant decrease of 0.1369, 0.1819 and 0.1577 percentage points in the visits where patients' felt their provider spent enough time, listened to them, and respected them respectively. (Negative Relationship.)

• A $10 decrease in private insurance payment leads to a statistically significant decrease of 0.0791, 0.1051 and 0.0911 percentage points in the visits where patients' felt their provider spent enough time, listened to them, and respected them. (Positive Relationship.)

Conclusion and Contribution

- Despite the change in the sources of the total payment, my results showed that there was no change in the actual treatment decisions of the medical care providers. However, the patients did perceive a change for the worse in the behavior of their medical care providers.

- Therefore, it is imperative for the medical care providers to pay special attention to their population with higher out-of-pocket payments, especially as the notion of patient perception is increasingly considered an important area for medical care providers to focus on in their efforts to improve their quality of care. (Rubin et al. 1993; Harris et al. 1995; Vermeire et al. 2001)