

Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

Alternative Study Design: Assigning Treatment at the NPI-Level

Our primary statistical analysis compared prescription use and spending for members visiting practices with the RTPB service to outcomes for members visiting practices without the RTPB service. However, an alternative design option could leverage clinicians within athenahealth practices that do not have access to the RTPB tools (i.e., the clinicians who write unstructured scripts) as a comparison group. This design might be preferable to the original if it helps control for unobserved time-varying differences in beneficiaries receiving prescriptions from treated versus untreated practices. For example, if beneficiaries receiving prescriptions from treated practices switched to comparatively more generous health insurance coverage in 2019 compared to those at untreated practices, comparative trends in out of pocket-spending in the post-period (largely based in 2019) may look different from the pre-period (largely based in 2018). However, this design might be more prone to spillover effects if we believe access to the tool might change practice-level prescribing patterns or the likelihood of writing structured scripts.

For the alternative analysis, we subset the original analytic dataset to prescriptions fills written by primary prescribers at practices with the RTPB service. Then, we identified clinicians as treated if they appeared in the RTPB data; otherwise, they were untreated. We ran the following difference-in-differences regression:

$$Y_{ijt} = \beta_0 + \beta_1 Treated_j \times Post_t + \beta_2 NPI_j + \beta_3 Month_t + \beta_5 Covariates_i + \beta_6 HMO_i \times HRR_i \times Year_t + \epsilon_{ijt},$$

limited to fills at practices with access to RTPB tools. We found no impact on our primary outcomes (eTable 4).

eTable 1. Difference-In-Differences Estimates for Primary and Secondary Outcomes, Adjusted for Days Supplied

Outcome	Differential Change for Treated vs Untreated Practices in Post Period	
	Estimate (95% CI)	P value
Log OOP spend, \$	0.01 (-0.01 to 0.03)	0.22
Log prescription spend, \$	0.01 (-0.00 to 0.01)	0.12
Fills, No.	0.01 (-0.01 to 0.03)	0.42

Note: Outcomes are measured at the beneficiary-month level and adjusted to reflect the cost and fills for a 30-day supply. Fills are adjusted by dividing the days supplied by 30 for prescriptions with days supplied greater than 30, and 1 otherwise. Outcomes are adjusted by dividing the raw spending outcome by the number of adjusted fills. Regression controls for month, TIN, HMO X HRR X year, and beneficiary covariates. Standard errors are clustered at the TIN level.

eTable 2. Difference-In-Differences Estimates for Primary and Secondary Outcomes Among Continuously Enrolled Beneficiaries

Outcome	Differential Change for Treated vs Untreated Practices in Post Period	
	Estimate (95% CI)	P value
Log OOP spend, \$	0.01 (-0.01 to 0.03)	0.27
Log prescription spend, \$	0.01 (-0.00 to 0.02)	0.10
Fills, No.	0.01 (-0.00 to 0.03)	0.05
Mail-in from insurer, %	0.00 (-0.00 to 0.00)	0.95
90-day prescriptions, %	-0.00 (-0.01 to 0.00)	0.13

Note: Outcomes are measured at the beneficiary-month level. Sample restricted to beneficiaries who were enrolled in a health plan with the insurer throughout the entire sample period. Regression controls for month, TIN, HMO X HRR X year, and beneficiary covariates. Standard errors are clustered at the TIN level.

eTable 3. Difference-In-Differences Estimates for Primary and Secondary Outcomes using Alternative Treatment Cutoff

Outcome	Differential Change for Treated vs Untreated Practices in Post Period	
	Estimate (95% CI)	P value
<i>Treated Cutoff >=10%</i>		
Log OOP spend, \$	0.03 (0.00 to 0.05)	0.03
Log prescription spend, \$	0.00 (-0.00 to 0.01)	0.33
Fills, No.	0.01 (-0.01 to 0.02)	0.34
Mail-in from insurer, %	-0.00 (-0.00 to 0.00)	0.58
90-day prescriptions, %	-0.00 (-0.00 to 0.001)	0.14
<i>Treated Cutoff >=90%</i>		
Log OOP spend, \$	0.01 (-0.01 to 0.03)	0.55
Log prescription spend, \$	0.01 (-0.00 to 0.02)	0.06
Fills, No.	0.02 (0.00 to 0.03)	0.03
Mail-in from insurer, %	0.00 (-0.00 to 0.00)	0.09
90-day prescriptions, %	0.00 (-0.00 to 0.00)	0.81
<i>Treated Cutoff >=90% and Untreated Cutoff <10%</i>		
Log OOP spend, \$	0.01 (-0.01 to 0.34)	0.28
Log prescription spend, \$	0.01 (-0.00 to 0.02)	0.08
Fills, No.	0.02 (0.00 to 0.03)	0.04
Mail-in from insurer, %	0.00 (-0.00 to 0.00)	0.13
90-day prescriptions, %	0.00 (-0.00 to 0.00)	0.93

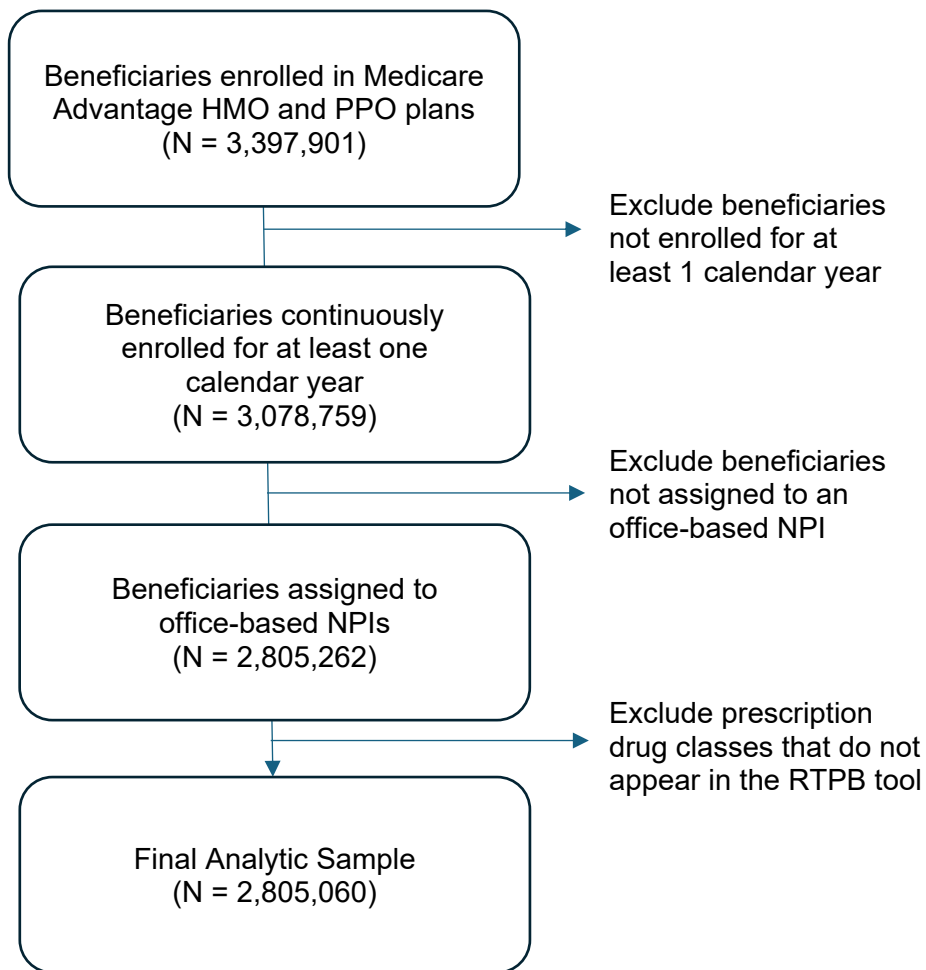
Note: Outcomes are measured at the beneficiary-month level. We tested three alternative methods for defining treated practices. *Treated Cutoff >=10%* assigns all practices with greater than 10% of clinicians appearing in the RTPB data as treated and the remaining practices as untreated. *Treated Cutoff >=90%* assigns all practices with greater than 90% of clinicians appearing in the RTPB data as treated and the remaining practices as untreated. *Treated Cutoff >=90% and Untreated Cutoff <10%* assigns all practices with greater than 90% of clinicians appearing in the RTPB data as treated and practices with less than 10% of clinicians appearing in the RTPB data as untreated. Regression controls for month, TIN, HMO X HRR X year, and beneficiary covariates. Standard errors are clustered at the TIN level.

eTable 4. Difference-In-Differences Estimates for Primary and Secondary Outcomes Under Alternative Study Design Assigning Treatment at the NPI-Level

Outcome	Differential Change for Treated vs Untreated Practices in Post Period	
	Estimate (95% CI)	P value
Log OOP spend, \$	0.01 (-0.01 to 0.03)	0.23
Log prescription spend, \$	0.01 (-0.00 to 0.01)	0.19
Fills, No.	0.01 (-0.01 to 0.02)	0.36
Mail-in from insurer, %	-0.00 (-0.00 to 0.00)	0.77
90-day prescriptions, %	-0.00 (-0.00 to 0.00)	0.23

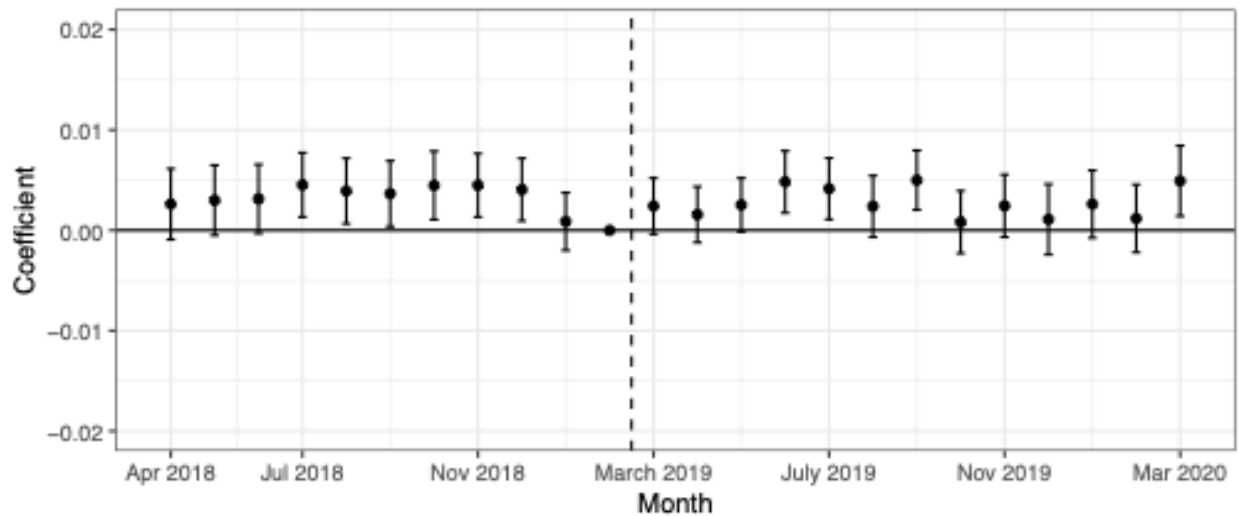
Note: Outcomes are measured at the beneficiary-month level. Sample restricted to beneficiaries who were enrolled in a health plan with the insurer throughout the entire sample period. Regression controls for month, NPI, HMO X HRR X year, and beneficiary covariates. Standard errors are clustered at the NPI level.

eFigure 1. Sample Exclusion Criteria

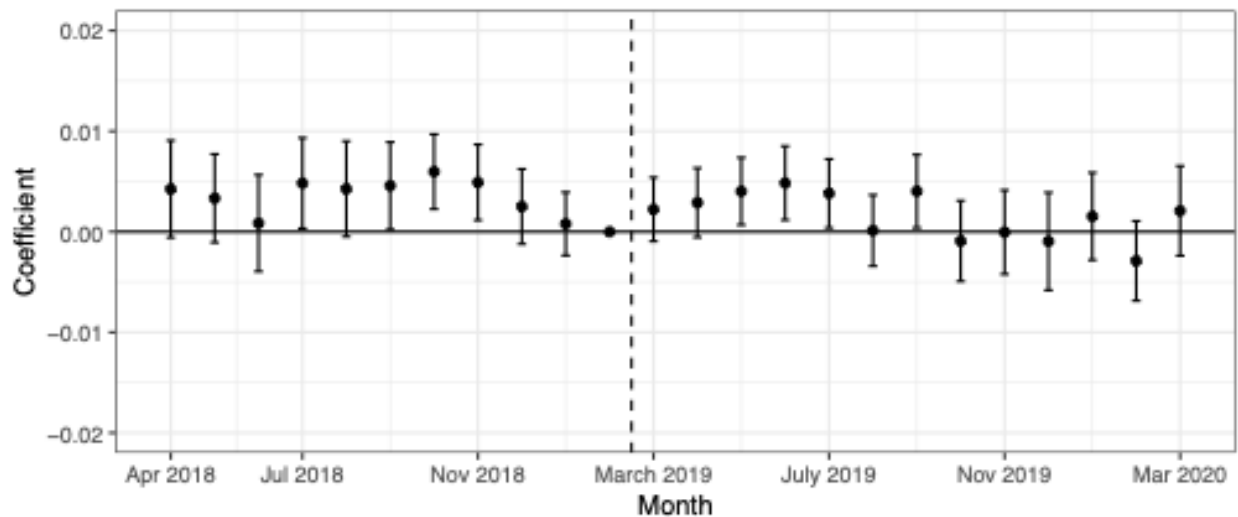


eFigure 2. Relative Changes in Secondary Outcomes per Beneficiary per Month, Before and After RTPB Adoption

Panel A: % of Mail-In from Insurer Per Beneficiary Per Month



Panel B: % 90-Day Prescriptions Per Beneficiary Per Month



Note: Outcomes are measured at the beneficiary-month level. Regression controls for month, TIN, HMO X HRR X year, and beneficiary covariates. Standard errors are clustered at the TIN level.