Assignment 2

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Response

As shown in Table 1, the effect of anti-vaping laws is significant. On average, states with anti-vaping laws experience a 3.6% decrease in the number of lung hospitalizations compared to those without such laws. Figure 1 plots the temporal trends of lung hospitalizations for the two groups separately, and the minimal differences between them during the pre-trend periods suggest that the important parallel trends assumption for difference-in-differences models is met. Across all models, state and year fixed effects. Since there are 50 states, 49 state-level fixed effects are included. These fixed effects account for unobserved, time-invariant state characteristics that may be correlated with both the implementation of anti-vaping laws and the baseline number of lung hospitalizations. The p-value for the chi-square test on whether all state fixed effects are zero is below 0.05; hence, we can reject the null hypothesis and conclude that at least one state fixed effect is significantly different from zero.

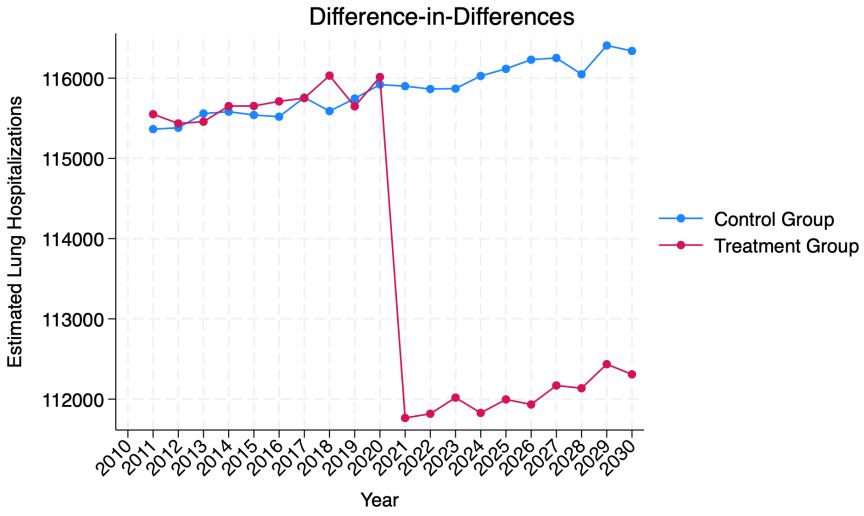

Figure 1: The Effect of Anti-Vaping Law

Notes: This graph plots the estimated temporal trends of lung-related hospitalizations for treated and control states separately. In 2021, the treated states implemented anti-vaping laws, which are associated with a significant reduction in lung hospitalizations as shown in the graph. The analysis includes state and year fixed effects to account for unobserved heterogeneity across states and over time.

Table 1: The Effect of Anti-vaping Law on Lung Hospitalizations

	Poission:Lung Hospitalizations	
	(1)	(2)
Anti-Vaping Law x Post		-0.0364*** (0.000565)
Anti-Vaping Law × Year=2011	0.00161 (0.00187)	
Anti-Vaping Law × Year=2012	0.000474 (0.00186)	
Anti-Vaping Law × Year=2013	-0.000880 (0.00181)	
Anti-Vaping Law × Year=2014	0.000606 (0.00182)	
Anti-Vaping Law × Year=2015	0.000970 (0.00170)	
Anti-Vaping Law × Year=2016	0.00166 (0.00181)	
Anti-Vaping Law × Year=2017	-0.0000699 (0.00189)	
Anti-Vaping Law × Year=2018	0.00382* (0.00188)	
Anti-Vaping Law × Year=2019	-0.000839 (0.00173)	
Anti-Vaping Law × Year=2020	0.000816 (0.00174)	
Observations	550	1050
Fixed Effects:		
Year	Yes	Yes
State	Yes	Yes

Notes: This table presents Poisson regression models estimating the causal effect of anti-vaping laws on the number of lung-related hospitalizations, controlling for state and year fixed effects. Model 1 examines year-by-year differences in lung hospitalizations between treated states and control states during the pre-treatment period (before 2021) to assess parallel trends requirement. Year 2010 is the reference year. Model 2 estimates the impact of anti-vaping laws by including an interaction term between a post-2021 dummy variable (indicating years after 2020) and a treatment indicator for states that implemented anti-vaping laws in 2021. The coefficient in Model 2 indicates that on average, states with an anti-vaping law experienced a 3.6% decline in the number of lung-related hospitalizations following the law's implementation. Standard errors are in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$