

Do open data impact citizens' behavior?

Assessing face mask panic buying behaviors during the Covid-19 pandemic

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Background

- Open data initiatives have expanded worldwide. But, **do data actually change citizens' behaviors?**
- This study investigates exemplary open-data use cases and evaluations of their impacts are insufficient.

Case & Research questions

- Taiwanese open-data initiative during Covid-19 pandemic.
 - To reduce panic buying behaviors. the government opened the store-level face mask stock data to the public.
 - Civic tech developed apps showing mask availability



- RQ1** : how the open data initiative impacted citizens' panic buying behaviors ?
- RQ2** : how, if at all, the impacts of the open data initiative differ among socioeconomic characteristics ?

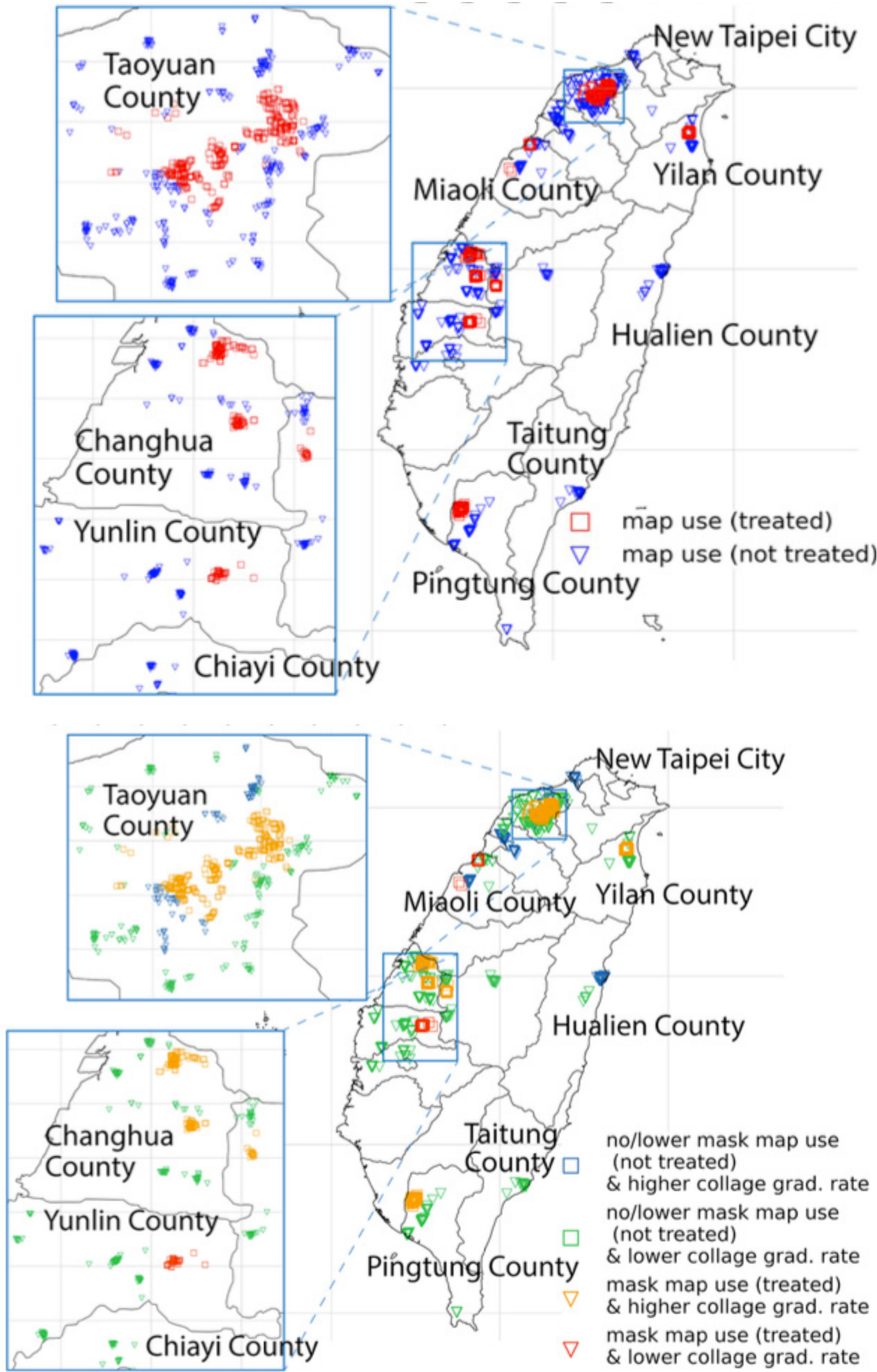


Figure 1. The mask selling stores' locations used for the study

Methods & Data

- A quasi-experiment approach, difference-in-difference (DiD) approach.
 - The model compares the changes in **sold mask numbers** (the degree of panic buying behavior) between the **stores in mask map use areas** (treatment group) and **those in no/lower mask map use areas** (not-treated group) before and after the government loosened the mask purchase policy.

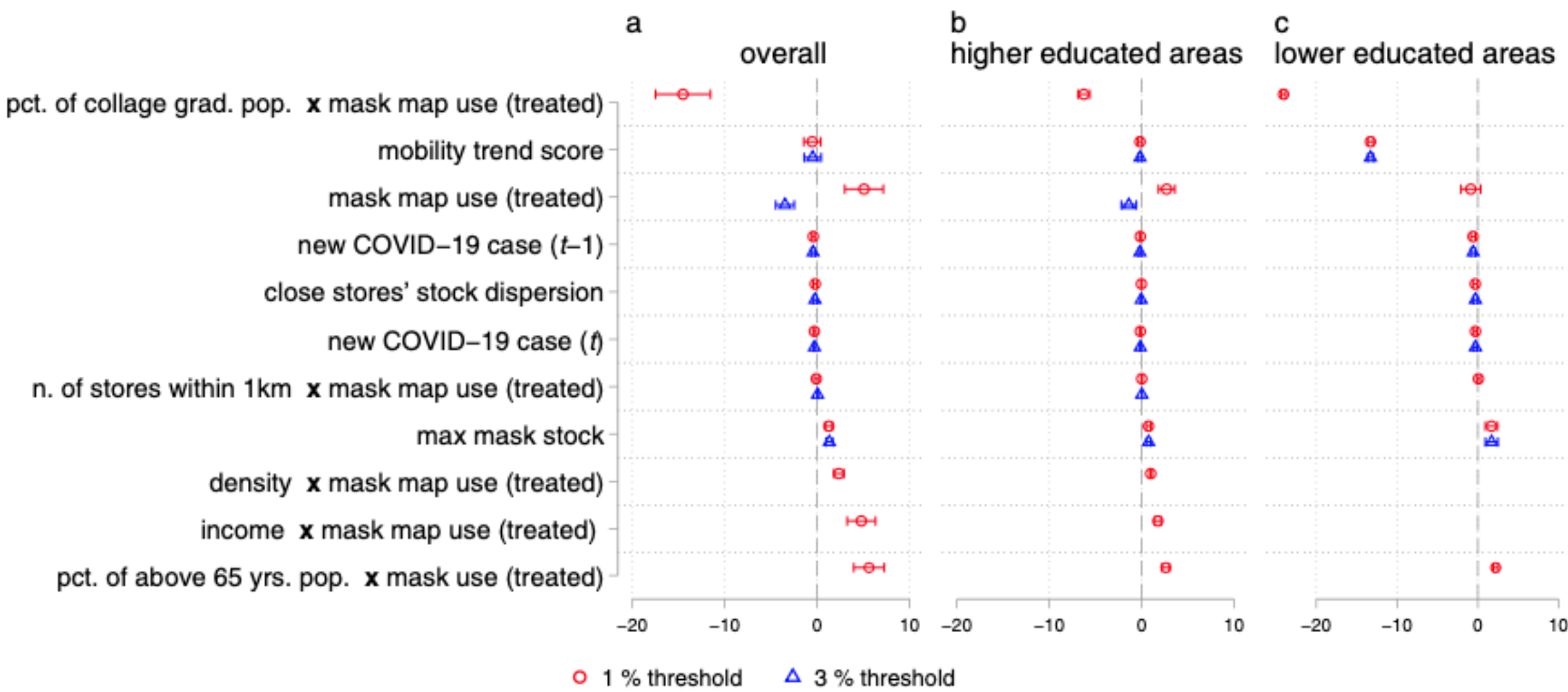


Figure 3. The socioeconomically heterogeneous impacts of mask map use. The impact of the mask map on suppressing sold mask amounts is greater when stores are located in the higher college graduate rate areas.

Results & Discussion

Table. Coefficients estimated with Kernel propensity score matching model.

	all stores		higher educated		lower educated
Treatment threshold	1 %	3 %	1 %	3 %	1 %
Coef. of treatment dummy	-0.522	-0.758**	-1.184***	-0.720*	1.485
Std.err.	(0.572)	(0.272)	(0.329)	(0.271)	(2.099)
Adjusted R ²	0.11	0.31	0.44	0.36	0.07
Number of obs.	29,592	15,760	12,202	10,562	12,718

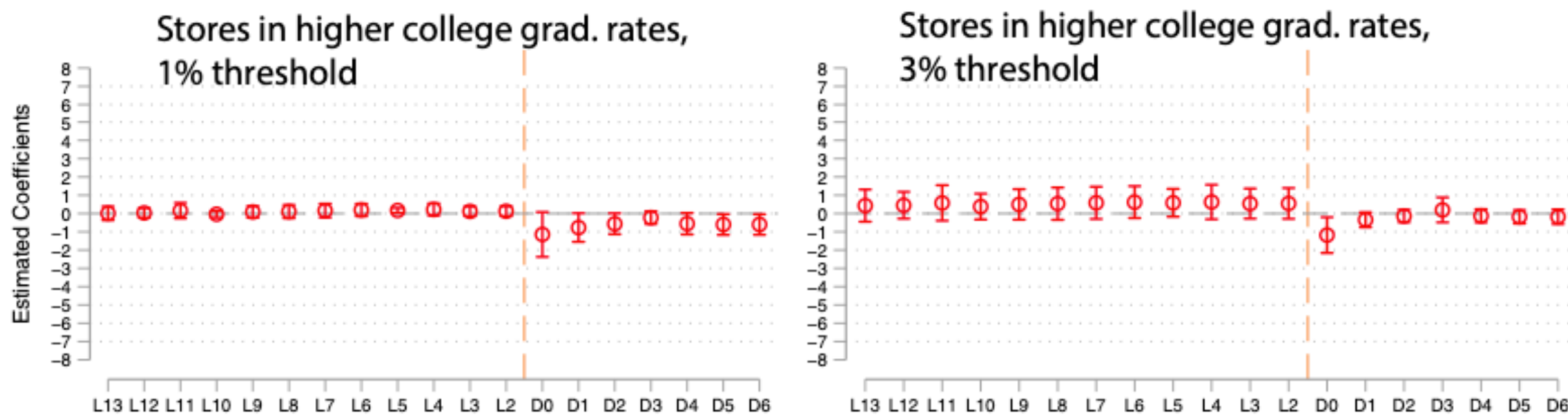


Figure 2. Event-study results on the mask map use effects on mask purchase for assessing parallel trend assumptions

Key takeaways

- The average of daily sold mask numbers per store per household among stores located in mask map use areas was fewer than those of other stores by 2.079.
 - Indicate **a reduced panic buying behavior** as a consequence of the openly accessible information in the form of an online mask map.
- Open-data-based countermeasures did not equally impact every citizen and rather **varied among the education level** (average effect of mask map usage: -14.514)

Shibuya, Y., Lai, CM., Hamm, A. et al. Do open data impact citizens' behavior? Assessing face mask panic buying behaviors during the Covid-19 pandemic. Scientific Reports 12, 17607 (2022).