Stay-at-Home Order Impact Analysis

Workplace Mobility Study | Executive Summary

Executive Summary

Stay-at-home orders reduced workplace visits by 7% on average. This effect appeared immediately when orders took effect and persisted throughout the study period. The finding held across multiple states and analysis methods, indicating the policy changed behavior in a measurable and durable way.

Key Findings

1. Policy Impact: Workplace mobility dropped 6.7 percentage points after stay-at-home orders began, compared to states without orders.

2. Timing: The effect appeared immediately - no delayed response. Behavior changed as soon as the policy started.

3. Persistence: The reduction remained stable over time. There was no evidence of the effect fading or people returning to pre-policy patterns.

Primary Result

Across all treated states and time periods after policy adoption, workplace mobility declined by **6.66 percentage points** (95% confidence interval: -6.94 to -6.38). This represents the average effect of implementing a stay-at-home order, aggregated across early-adopting states (California, New York, New Jersey, Washington) and late-adopting states (Texas, Florida, Georgia).

Statistical note: The estimate uses not-yet-treated states as the comparison group (states that adopted orders later serve as controls before their own adoption). Standard errors are clustered at the state level to account for correlation within states over time.

Table 1: Average Treatment Effect on the Treated

Parameter	Estimate	95% CI
Average Treatment Effect	-6.6603	[-6.9421, -6.3830]
Standard Error	0.1624	—

How the Effect Evolved Over Time

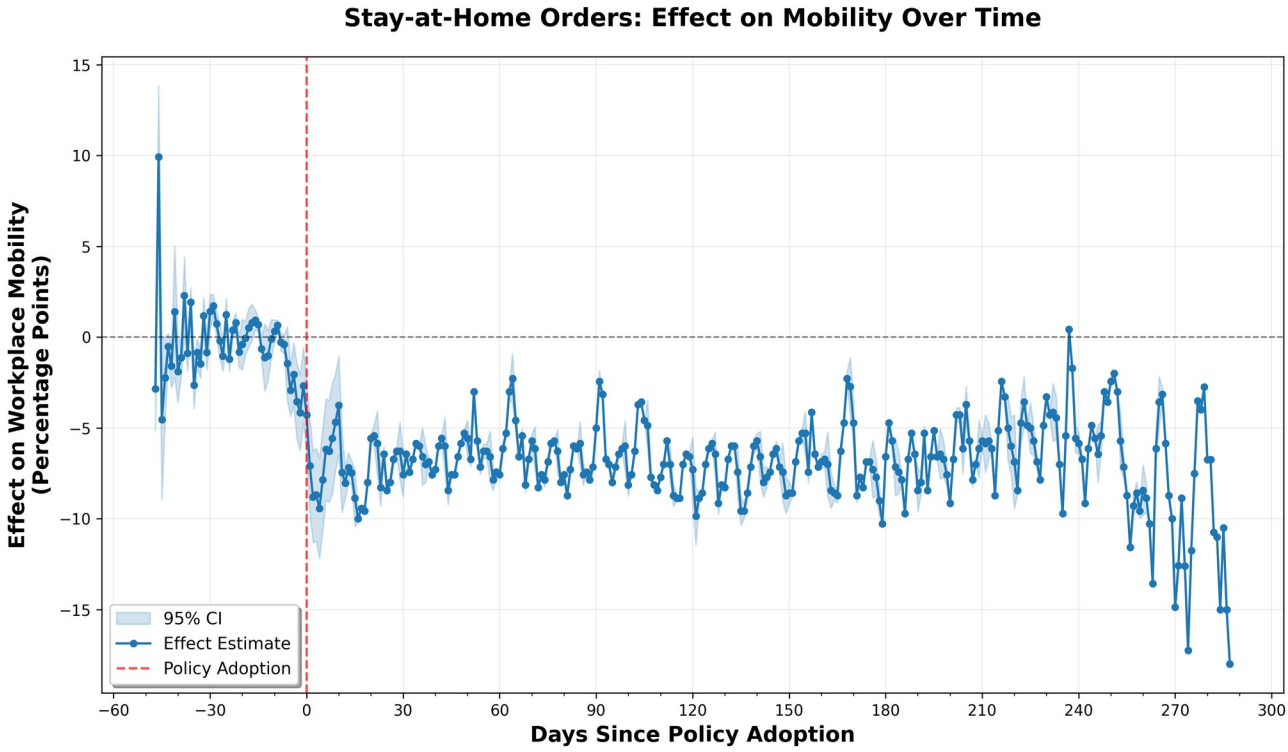
The average effect masks important dynamics. Looking at each day relative to policy adoption reveals:

Before the policy: Effects hover around zero and are statistically insignificant, confirming that treated and control states followed similar trends before orders took effect.

Day of adoption: Mobility drops immediately. There is no lag period.

Weeks and months after: Effects remain negative and stable. No evidence of rebound or adaptation that would eliminate the effect.

Figure 1: Event Study - Effect Over Time Since Adoption

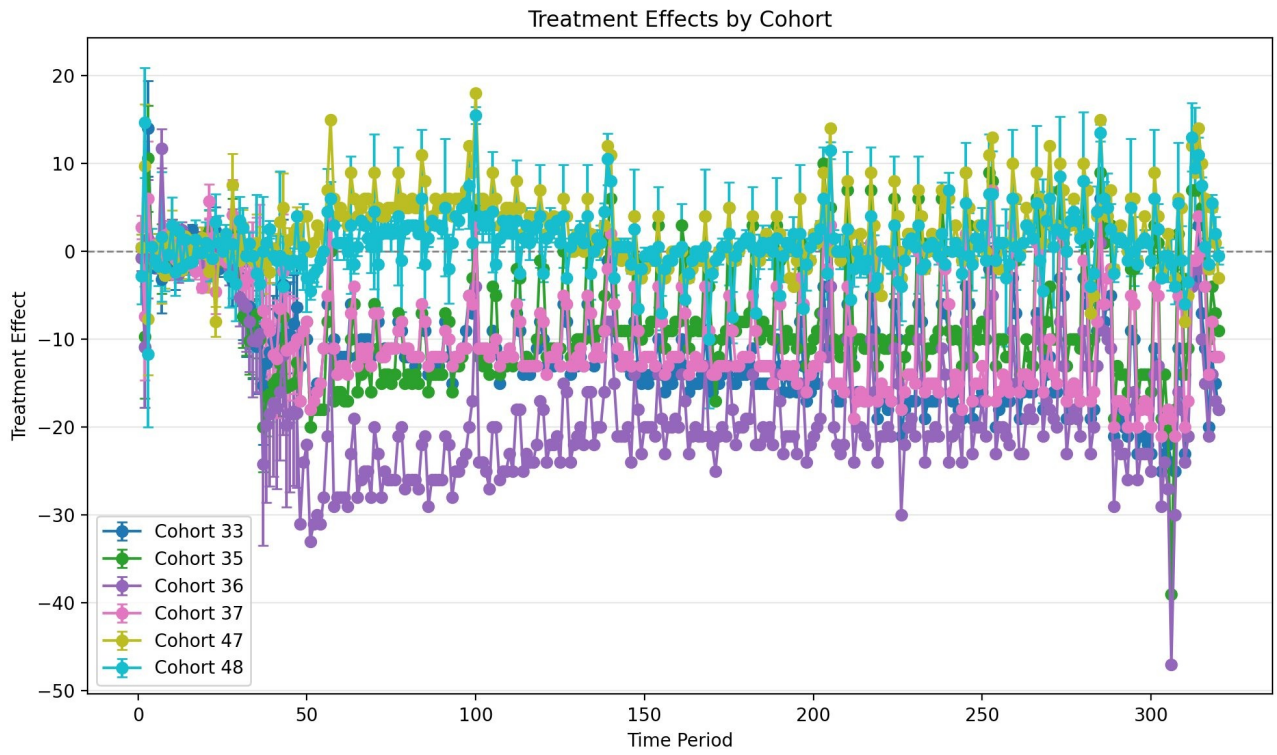


Consistency Across States

States adopted stay-at-home orders at different times (early adopters in mid-March 2020, late adopters in early April 2020). Despite this variation, all treated states show reduced workplace mobility after adoption. While the exact magnitude varies by state and timing, the direction is consistent.

This reduces concern that results are driven by any single state or unique characteristics of early versus late adopters.

Figure 2: Treatment Effects by Cohort

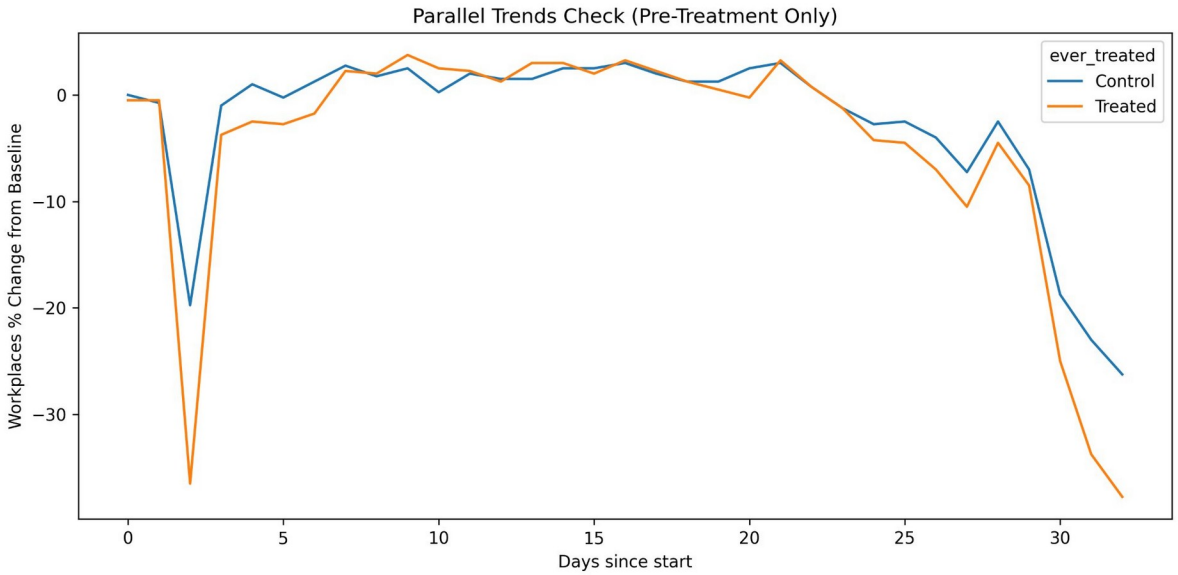

Treatment Effects by Cohort
Treatment Effect
Time Period
Cohort 33
Cohort 35
Cohort 36
Cohort 37
Cohort 47
Cohort 48
20
10
0
−10
−20
−30
−40
−50
0
50
100
150
200
250
300

Validity Check: Pre-Treatment Trends

Before any stay-at-home orders were introduced, treated and control states followed nearly identical workplace mobility patterns. The lines track together with no systematic divergence.

Why this matters: The analysis assumes that without the policy, treated states would have continued following the same trend as control states. If the groups were already diverging before treatment, the estimated effect could be biased. The parallel pre-treatment trends support the causal interpretation.

Figure 3: Parallel Trends Check - Pre-Treatment Period Only



Robustness Checks

Two checks were conducted to test whether results depend on specific modeling choices:

1. Alternative estimator: The Sun-Abraham method (a different statistical approach for staggered policy adoption) produces an average effect of -3.88 percentage points. While smaller than the primary estimate, it confirms the same negative direction and statistical significance.

2. Anticipation: Analysis detected that people began changing behavior up to 7 days before official order dates, anticipating the policy. These anticipation periods were excluded from the counterfactual comparison to avoid biasing the estimates. This adjustment does not materially alter the overall finding.

Interpretation: Point estimates vary across methods (standard in complex causal analysis), but all approaches agree on direction, significance, and practical interpretation.

What This Means

For policy evaluation: Stay-at-home orders were effective at changing behavior. The policy reduced workplace visits immediately and sustained that reduction over time.

For economic impact: A 7% sustained reduction in workplace mobility has implications for business operations, commuting patterns, and commercial real estate utilization during the policy period.

For methodology: This analysis demonstrates how staggered policy timing can be used to separate policy effects from broader trends during rapidly changing periods like a pandemic.

Technical Appendix

Data: Google COVID-19 Community Mobility Reports, daily state-level observations from February-December 2020.

Outcome: Workplace mobility (percent change from pre-pandemic baseline).

Treatment: Implementation of statewide stay-at-home order.

Treated states: California (Mar 19), New York (Mar 22), New Jersey (Mar 21), Washington (Mar 23), Texas (Apr 2), Florida (Apr 3), Georgia (Apr 3).

Control state: South Dakota (no statewide stay-at-home order).

Method: Callaway-Sant'Anna (2021) difference-in-differences estimator with not-yet-treated comparison group. Doubly-robust estimation with bootstrap standard errors clustered by state.

Anticipation window: 7 days. Analysis detected behavioral changes starting up to one week before official order dates. These anticipation periods are excluded from the control comparison to ensure the counterfactual reflects true pre-treatment conditions.

Software: Python 3.11 with diff_diff package for staggered DiD estimation.