

# Provider-Targeted Nudges and Primary Care Appointment Availability

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## Abstract

We aimed to evaluate the impact of provider-targeted nudges on reducing discrimination in primary care appointments. A nationwide randomized field experiment was conducted with research assistants (RAs) seeking appointments at primary care practices. Mailed nudges were sent to providers in three Southern states (AL, LA, and MS), drawing attention to documented discrimination. Data collected before and after the nudge intervention across all fifty states were evaluated using a difference-in-differences framework. Prior to the nudge, White patients in the nudge states were 22 percentage points (pps) more likely to be offered an appointment compared with White patients in control states while Black patients were 17 pps less likely to be offered an appointment. About half of this advantage went away after the nudge. Provider-targeted nudges appear associated with reducing pre-existing advantages in care access among White patients.

## Introduction

Racial and ethnic health disparities persist in the United States<sup>1</sup>. Access to primary care plays a pivotal role in addressing these disparities, yet non-White patients often experience longer wait times<sup>2-3</sup>, which can lead to reduced healthcare utilization and worsened health outcomes. Phone-based primary care appointment scheduling introduces the potential for bias based on patients' names and voices<sup>4-6</sup>.

Interventions to reduce health disparities are needed. Nudge interventions seek to influence recipient behavior by focusing their attention on a specific topic. However, evidence regarding the effectiveness of nudges in healthcare is limited.

Randomized field experiments provide a way to (1) separate the effects of discrimination from other contributing factors, and (2) evaluate the potential efficacy of nudge interventions on improving equitable access.

This study deployed a provider-focused nudge seeking to reduce racial and ethnic discrimination in primary care appointment access.

## Methods and Materials

### Physician Selection:

Physicians were randomly selected from the American Medical Association's (AMA) Physician Masterfile and state boards of medicine listings. The sample included family medicine specialists, internal medicine specialists, general practitioners, general preventive medicine specialists, and urgent care medicine specialists.

### Simulated Patient Assignment:

Simulated patients with distinct names, genders, and insurance types were created. RAs were randomly assigned to providers, making appointment requests with these identities, and documenting appointment offers and insurance acceptance, among other outcomes. Data collection occurred between June 2020 and June 2022.

### Nudge Intervention:

Physicians in Alabama, Louisiana, and Mississippi received a mailed letter in February 2022, informing them of research findings on discrimination in access to primary care and suggesting measures to reduce discrimination. Six weeks later, appointment requests were made for these physicians using the above procedures.

### Empirical Approach:

To examine the associations between simulated patients seeking care before and after a nudge and appointment access outcomes, we employed a variation on a difference-in-differences (DiD) model (below, varying by caller  $i$  reaching provider  $j$  in state  $k$  in time  $t$ , with fixed effects at each level). We also conducted DiD and event study regressions separately for Black, Hispanic, and White sub-groups.

$$Y_{ijkt} = \alpha + \beta_1 \text{Nudge}_k * \text{Black}_i * \text{Post}_t + \beta_2 \text{Nudge}_k * \text{Hispanic}_i * \text{Post}_t + \beta_3 \text{Nudge}_k * \text{White}_i * \text{Post}_t + \beta_4 \text{Nudge}_k * \text{Black}_i * \text{Pre}_t + \beta_5 \text{Nudge}_k * \text{Hispanic}_i * \text{Pre}_t + \beta_6 \text{Nudge}_k * \text{White}_i * \text{Pre}_t + \beta_7 \text{Black}_i + \beta_8 \text{Hispanic}_i + \lambda_i + \tau_t + \delta_j + \theta_k + \varepsilon_{ijkt}$$

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## Results

Overall, 3,742 appointments with complete pre- and post-nudge data were included. Of the simulated patients, 45% were offered the requested appointments, and 59% had their insurance accepted.

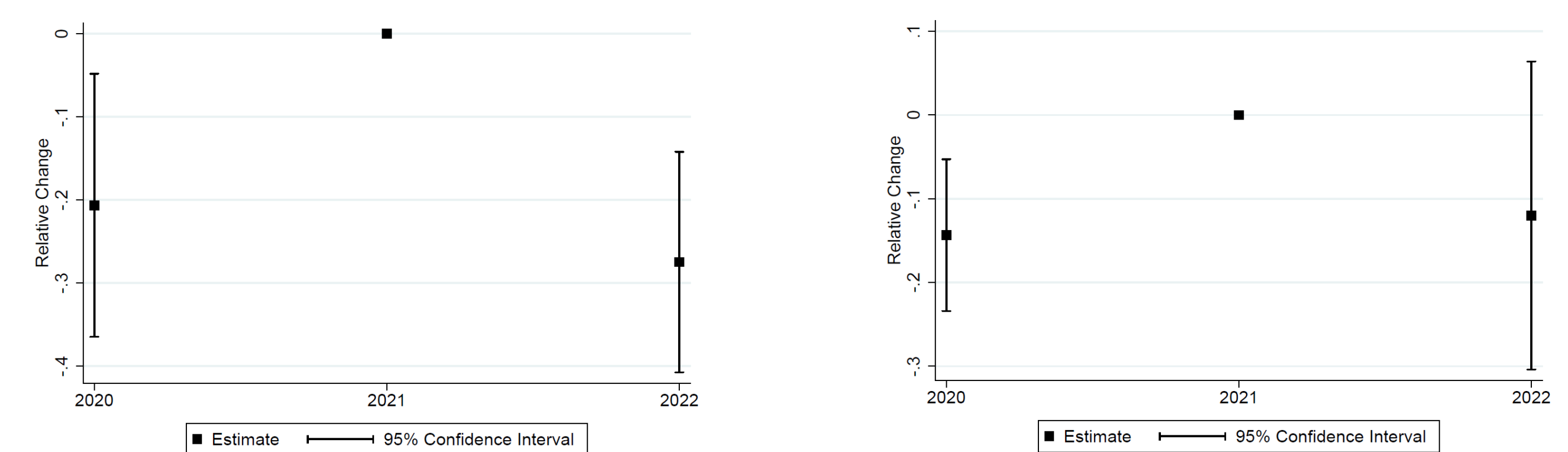
We find that, compared to White patients in non-Nudge states, White patients in Nudge states were offered appointments 17 pps more often (95% CI: 0.03 to 0.30,  $p=0.02$ ) and were 16 pps more likely to have their insurance accepted (95% CI: 0.06 to 0.26,  $p<0.01$ ) before the intervention. After the nudge, they received 22 pps fewer offers (95% CI: -0.33 to -0.10,  $p<0.01$ ) [Table 1].

As for Black simulated patients in Nudge states, prior to the nudge, they received 17 pps fewer offers (95% CI: -0.29 to -0.05,  $p=0.01$ ) and were 10 pps less likely to have their insurance accepted (95% CI: -0.16 to -0.04,  $p=0.02$ ). After the nudge, Black simulated patients received 15 pps more offers (95% CI: 0.01 to 0.29,  $p=0.04$ ) and were 23 pps more likely to have their insurance accepted (95% CI: 0.14 to 0.32,  $p<0.01$ ) [Table 1]. While the results for White patients hold under event study consideration, the results for Black patients do not [Figures 1-4].

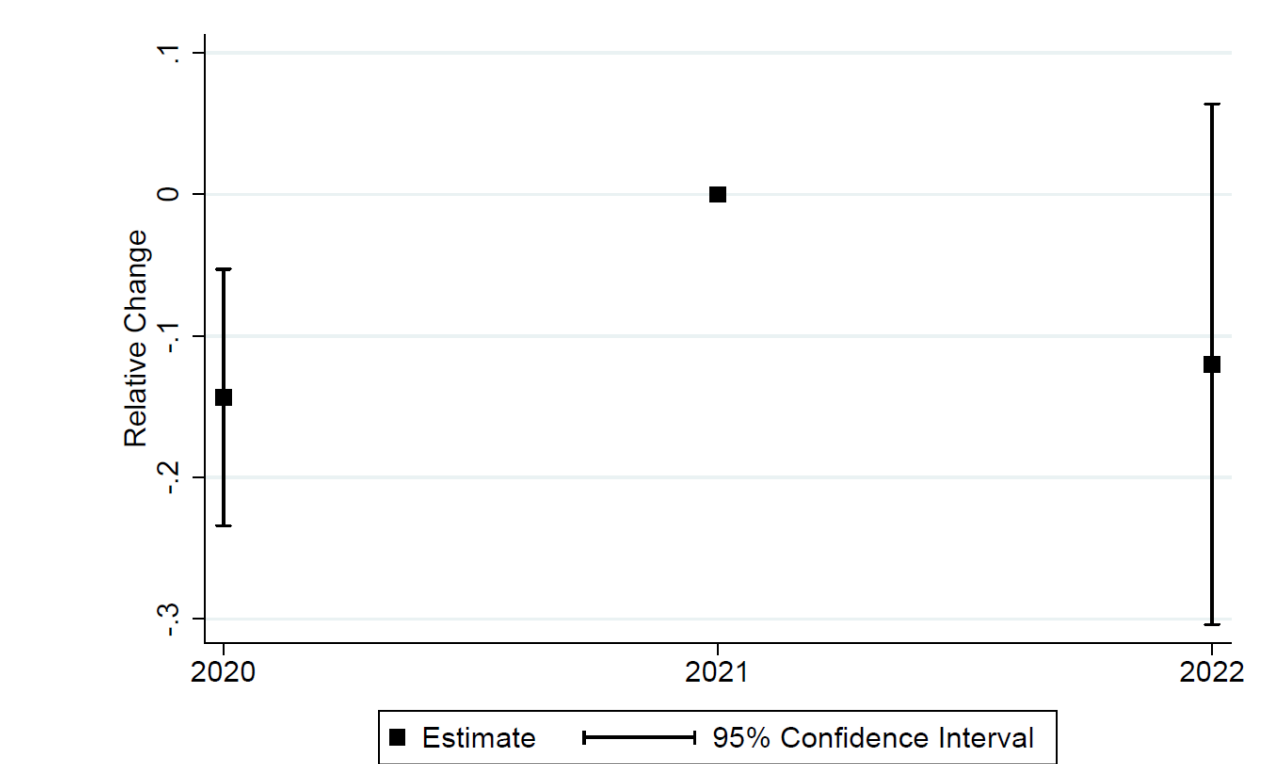
**Table 1.** Change in Call Outcomes by Patient Race/Ethnicity and Nudge

	Requested Appt Offered	Insurance Accepted
Post-Nudge * Black	0.15** (0.01 to 0.29)	0.23*** (0.14 to 0.32)
Post-Nudge * White	-0.22*** (-0.33 to -0.10)	-0.10 (0.07 to 0.27)
Pre-Nudge * Black	-0.17** (-0.29 to -0.05)	-0.10*** (-0.16 to -0.04)
Pre-Nudge * White	0.17** (0.03 to 0.30)	0.16*** (0.06 to 0.26)
Mean (SD)	0.450 (0.498)	0.590 (0.492)
N (for Appointment Offers)	3,742	

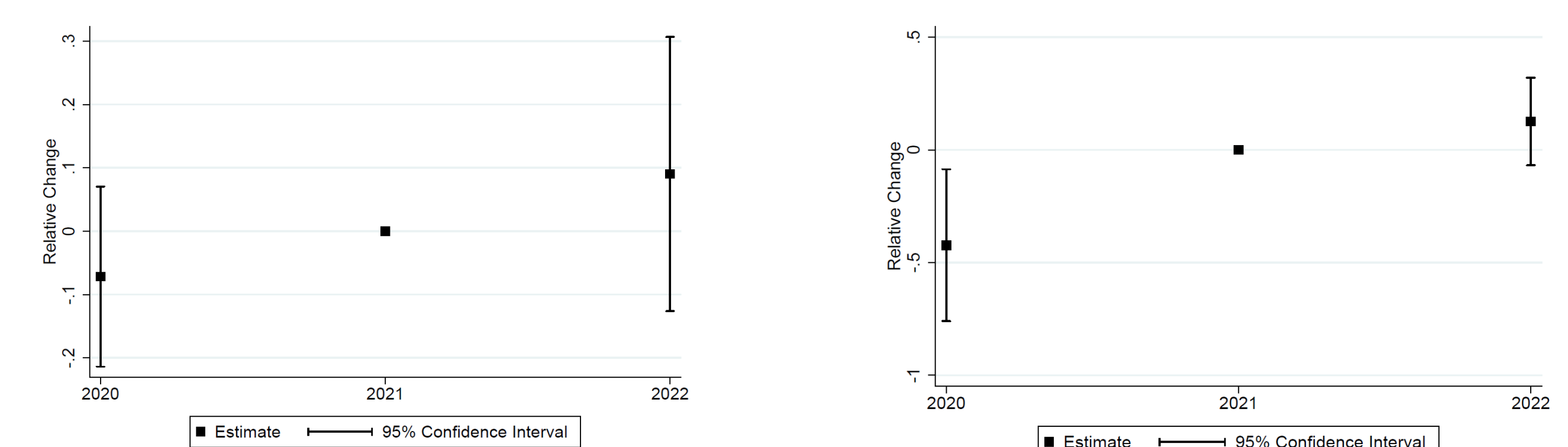
Notes: \*  $p<0.10$  \*\*  $p<0.05$  \*\*\*  $p<0.01$



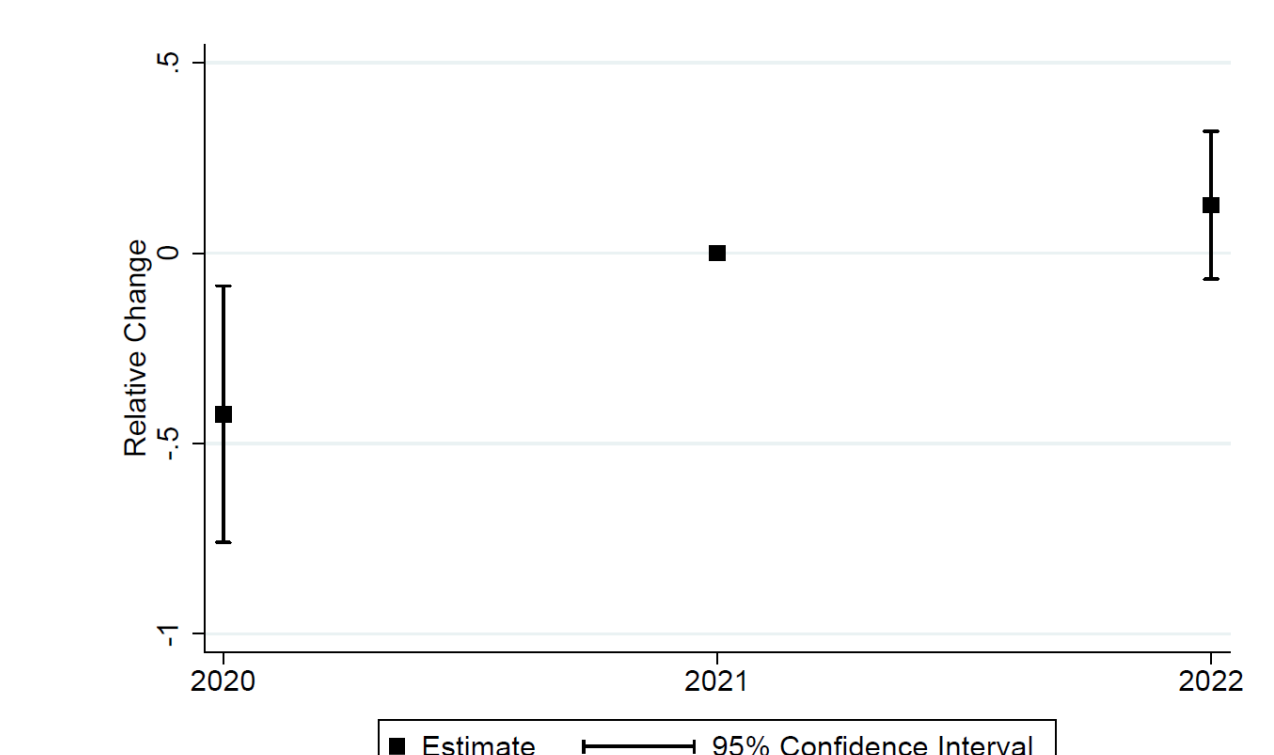
**Figure 1.** Event Studies on Requested Appt Offered (White)



**Figure 2.** Event Studies on Insurance Accepted (White)



**Figure 3.** Event Studies on Requested Appt Offered (Black)



**Figure 4.** Event Studies on Insurance Accepted (Black)

## Discussion

This study highlights the potential efficacy of provider-targeted nudges in mitigating disparities in primary care appointment availability. These findings provide evidence for a possible tool for addressing disparities in healthcare access.

## Conclusions

This study found some effectiveness in provider-targeted nudge interventions.

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