Did California's 2020 Medi-Cal Expansion Improve Health Insurance Coverage and Mental Health Outcomes Among Young Adults Without US Citizenship? A Population-based, Quasi-Experimental Study

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Abstract

Did California's 2020 Medi-Cal Expansion Improve Health Insurance Coverage and Mental Health Outcomes Among Young Adults Without US Citizenship? A Population-based, Quasi-Experimental Study

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Background: In 2020, California became one of the first states to expand Medicaid (Medi-Cal) to low-income young adults, irrespective of US citizenship. The primary aim of this study was to assess whether California's 2020 Young Adult Medi-Cal expansion improved healthcare access and mental health outcomes among low-income (<200% Federal Poverty Line) young adults aged 18-25 who lacked US citizenship.

Methods: This study used a quasi-experimental design to analyze repeated cross-sectional data from the 2016-2021 waves of the California Health Interview Survey (CHIS). A difference-in-difference regression was used to estimate the impact of coverage expansion on health insurance coverage, healthcare access, and mental health outcomes. Outcomes were

compared between a treatment group of low-income young adults without US citizenship (n=522) and a control group of low-income young adults with US citizenship (n=3,585), before and after the coverage expansion.

Results: This study found evidence of persistent disparities in insurance coverage and healthcare access for low-income young adults in California without US citizenship, who had lower rates of any coverage and measures of healthcare access relative to young adults with US citizenship. The 2020 Medi-Cal expansion was associated with an additional 10 percentage-point increase in private health insurance coverage for young adults without US citizenship (95% CI: 1% 19%) and an additional 12 percentage-point increase in access to a usual source of care (95% CI: 2%, 21%), relative to those with US citizenship. This analysis found no significant difference for any coverage or Medi-Cal coverage associated with the expansion, although Medi-Cal coverage appeared to decline by 8 percentage points for those without US citizenship (95%CI: -18%, 3%), relative to those with US citizenship. Both groups of young adults saw increases in the prevalence of serious psychological distress over the study period.

Conclusion: This study found evidence of an inconsistent benefit from the 2020 Medi-Cal expansion. Private coverage and access to a usual source of care improved for young adult Californians without US citizenship, however, they remain less likely overall to have health coverage of any type or to have had a routine check-up or a usual source of care than young adult Californians with US citizenship. Further assessments are needed to address how the 2020 Young Adult expansion of Medi-Cal is affecting health insurance rates, healthcare access disparities, and mental health among low-income young adults without US citizenship.

Table of Contents

Background

In 2010, California became one of the first states to adopt the Medicaid expansion provisions of the Affordable Care Act (ACA). This early expansion, alongside subsequent expansions in 2014 and after, extended Medicaid to millions of low-income adults throughout the state and led to notable increases in insurance coverage and improvements in healthcare access [1, 2]. In 2016, Medicaid coverage (known as Medi-Cal in California) was further extended to include low-income children regardless of US citizenship status and then again expanded in 2020 to include low-income young adults without US citizenship (aged 18-25).

While prior expansions have shown positive impacts in improving healthcare coverage and access [1–3], the specific effects of the 2020 expansion for young adults without US citizenship have not yet been evaluated. Despite general declines in uninsurance rates, recent evidence has indicated that the effects of ACA expansions have not been distributed equally. Significant racial and ethnic disparities persist even after the expansions, as well as lingering barriers faced by those lacking documentation, including lower absolute rates of coverage, greater emergency department utilization, and a lower likelihood of having a routine check-up [4–7]. Evidence from these studies suggests that greater disparities observed for those without documentation were directly related to ineligibility for benefits such as Medicaid [4, 5], underscoring the need to assess whether the present expansion has impacted these disparities in coverage. This is especially the case given that California is now one of only a handful of states that offer Medicaid benefits to young adults regardless of US citizenship or documentation status.

It remains unclear whether and to what extent statewide coverage expansions have translated into improved outcomes or reduced healthcare disparities for young adults without US

citizenship. The demographic, cultural, and socioeconomic circumstances of immigrants are complex. When disaggregated by race/ethnicity, migration pathways, region of origin, or documentation status, research has often emphasized the presence of comparative health advantages for foreign-born immigrants compared to US-born residents [8–10]. However, recent evidence has begun demonstrating that immigrants face heightened risk for a range of poor health outcomes, including barriers to care as well as psychosocial and cardiovascular health challenges [8, 11–17]. Recent efforts to untangle the complexities of critical health challenges experienced by immigrants have focused on approaches such as generation-to-generation comparisons [11, 18], comparisons according to time spent in the US [19, 20], as well as efforts to disaggregate according to racial and ethnic heritage [4, 21–23]. The evidence available for California has found significant disparities affecting undocumented and uninsured immigrants, especially related to coverage and healthcare access [4, 5, 7]. These are largely due to factors such as limited eligibility for public insurance programs based on immigration status, limited multilingual resources in healthcare settings, unstable access to employment-based coverage, as well as limited income, and high out-of-pocket costs [4, 5]. However, few studies have examined the intersection of healthcare and mental health disparities experienced by immigrants among young adults specifically.

Evidence from early in the past decade found the most significant disparities in accessing health care and mental health services were present among young adult immigrants aged 18-24 [24], though no studies have followed up to examine if these outcomes improved in response to ACA expansions. Young adults, in general, are already the age group least likely to have health insurance. Previous research has demonstrated an uninsured rate as high as 1 in 3 among young adults prior to the ACA expansions [25]. Although the expansions led to a decline in the

uninsured rate for young adults broadly, disparities based on socioeconomic status and other factors remained [26], indicating that disparities worsen for those with greater socioeconomic disadvantage and suggesting that the benefits of the expansion may not be shared equally. Undocumented young adults are among those most likely to lack insurance in California [27]. When young adults without US citizenship also face significant socioeconomic disadvantages, it is probable that disparities in healthcare coverage and access are further compounded. However, the extent to which prior expansions have addressed these inequities in coverage and access for young adults without US citizenship remains to be discovered.

In addition to these barriers, structural and systemic factors contribute to limited access to healthcare services and ongoing health inequities experienced by immigrants [13, 28]. While coverage expansions are one policy-related tool that addresses a dimension of structural inequities for individuals without US citizenship, other factors lie outside the direct influence of these policies and have severe implications for the health of immigrants. These include non-healthcare anti-immigrant policies and legislation, immigration status discrimination in the health system, hesitancy to apply to government programs, anti-immigrant political sentiment, as well as deportation or immigration enforcement measures [28–31]. Consequently, further research is needed to understand better the extent to which Medicaid expansions do or do not alleviate these multifaceted health disparities.

Prior evidence on ACA expansions in California has demonstrated positive impacts on health insurance coverage broadly, including indicators of enrollment in Medi-Cal and private insurance, as well as measures of healthcare access and utilization [2, 4–7, 32]. However, evidence for mental health outcomes was largely absent, as were assessments of these outcomes for young adults specifically. Besides the broad improvements in coverage for low-income adults

demonstrated early in the ACA expansions [2], Bustamante and colleagues found gradual improvements in health insurance coverage among Latines, the largest immigrant and ethnic population in California [5]. Similarly, Chu and colleagues found coverage improvements (between 9 and 14 percentage points) among Latines, as well as non-Latino/a Asian and non-Latino/a white immigrants [6]. However, disparities driven by immigration status, income, and English proficiency remained. Benefits were also less clear concerning healthcare access: in some cases, measures of access declined after the ACA expansions were implemented [6], indicating that the role of health insurance coverage in improving access and utilization remains unclear, especially in marginalized communities with multifaceted and persistent inequities.

Emerging research has demonstrated that sufficient access to healthcare is critical for proactive treatment for those facing mental health distress [33]. Recent national-level findings by Coombs and colleagues indicate that those experiencing psychological distress are more likely to forgo medical care due to cost and experience complications navigating care. They may also face greater stigma when receiving care from medical professionals [33], further aggravating treatment and raising questions about whether stigmas toward mental illness intersect with stigmas based on documentation status among those without US citizenship. More broadly, young adults appear to be facing long-term declines in mental health status [34], further exacerbated by the COVID-19 pandemic [35]. These findings suggest that healthcare access and mental health burden are intertwined, prompting questions about how state healthcare expansions for immigrants might address the particular healthcare access barriers and mental health burden of young adults without US citizenship or documentation. Furthermore, considering the disproportionate declines in mental health among young adults, those who also lack US citizenship and confront structural marginalization, enduring social stigmas, and insufficient

access to healthcare may be at greater risk of exacerbated mental health challenges as a result. This issue is a pressing public health concern, given the continued decline in young adult mental health and the persistent disparities in coverage experienced by young adults without US citizenship.

Past evidence has focused less on the mental health burden of immigrants and more on the 'immigrant health paradox'—the phenomenon in research where immigrants appear to have better health outcomes than native-born residents despite socioeconomic marginalization [11, 36, 37]. The evidence that is available suggests that mental health challenges of immigrants may be disguised when compared only to US-born citizens [16, 20, 24], necessitating comparisons that take into account how mental health status among immigrants has changed over time and how it intersects with persistent disparities, such as healthcare access. For instance, insufficient access to mental health care for immigrants appears to be driven in part by inadequate coverage and access to health care [24]. Additionally, more recent evidence indicates that younger immigrants who have spent more time in the US experience an increased detriment to mental health compared to older or newly-arrived immigrants [20], drawing attention to the mental health challenges faced by younger adult immigrants specifically. Lastly, exclusionary policies, anti-immigrant political sentiment, and discrimination in healthcare settings also appear to directly exacerbate healthcare access disparities, promote poor mental health, and threaten health improvements from prior policies such as Deferred Action for Childhood Arrivals (DACA) [20, 28, 30, 38, 39]. Taken together, these findings motivate the need to assess how psychosocial and healthcare access outcomes for younger and undocumented immigrants evolve over time, not just in comparison to their peers with US citizenship. Specific policies and their role in addressing the disparities experienced by young adults without US citizenship must also be

evaluated. Critically, evaluation of the impact of healthcare expansions on young adults and their mental health is lacking in existing literature, along with assessments of whether Medi-Cal access—and thus mental health resources —can improve the burden of acute and chronic mental health challenges faced by young immigrants.

To build on existing evidence and address these critical gaps in the literature, the objective of this study was to assess the impact of California's 2020 Young Adult Medi-Cal expansion on health insurance coverage, healthcare access, and mental health outcomes for low-income young adults (ages 18-25) without US citizenship. This was achieved through a difference-in-difference, quasi-experimental design. The aim was to evaluate whether California's Medi-Cal expansion led to changes in insurance coverage, measures of healthcare access, and short and long-term impacts on mental health. Outcomes were compared between a treatment group of low-income young adults without US citizenship and a control group of low-income young adults with US citizenship, using pre- and post-policy expansion data.

This study expands upon previous research by assessing a previously unevaluated coverage expansion and examining not only changes in coverage but also healthcare access and mental health status. I focus on a socioeconomically marginalized and under-researched population with notable disparities in coverage. Building on prior evidence on the effectiveness of previous coverage expansions, I anticipated that the 2020 expansion would be associated with a modest increase in any insurance coverage and in Medi-Cal coverage to the extent that enrollment barriers, persistent structural inequities, or other unique barriers experienced by those lacking US citizenship did not hamper the benefits of broadened eligibility. To my knowledge, this is the first study to estimate the impacts of ACA or Medi-Cal expansions for young adults without US citizenship. Confirming the impacts of the expansion using population-level data

offers valuable insight into the ongoing effects of Medicaid expansions and whether coverage expansions can address access and utilization disparities, as well as mental health challenges. Understanding whether broadened eligibility translates into meaningful health improvements is critical for health and immigration policy for young adults without US citizenship. This research contributes to a deepening focus on the complex nature of individual and structural-level barriers to healthcare access and mental health care faced by those who are structurally and socially marginalized by immigration policies, healthcare-related and otherwise.

Methods

i. Study Design & Setting

This study is a secondary analysis of publicly available data from the California Health Interview Survey and employs a difference-in-difference (DiD) quasi-experimental design to compare outcomes between a treatment group of low-income young adults without US citizenship and a control group of low-income young adults with US citizenship. The study combines annual repeated cross-sectional data from the adult California Health Interview Survey (CHIS), a state-representative survey of non-institutionalized adults in California [40]. Administered by the University of California Los Angeles, CHIS is the largest state-administered, population-based survey and one of the foremost sources on immigrant health due to its extensive inclusion of diverse ethnic and racial groups, including individuals without US citizenship or documentation. The survey interviews participants about their health status and a range of health-related behaviors and conditions, including health insurance coverage, healthcare access, and mental health status.

The data for this study was drawn from the 2016-2021 annual samples. The pre-expansion period includes 2016-2019, while the post-expansion period includes 2020-2021.

The cutoff for statistical analysis was set as January 1, 2020, which marks the date of Medi-Cal coverage expansion to young adult Californians without US citizenship. By comparing the change in outcomes between the treatment and control groups before and after the policy implementation, this approach estimates the policy's impact on insurance coverage, access outcomes, and impacts on mental health distress.

Outcomes

The primary study outcomes encompass the following measures: (1) changes in health insurance coverage (including any coverage, Medi-Cal enrollment, and private or employment-based coverage); and (2) changes in measures of healthcare access (including 'have a usual place to go when sick or needing health advice', 'have visited a doctor in the past 12 months', and 'delayed getting necessary care due to cost or no insurance in the past 12 months'). To assess the secondary aim related to mental health burden, I examined changes in the prevalence of moderate and serious psychological distress using the Kessler 6-item Psychological Distress Scale (K6). The K6 scale consists of six questions assessing the frequency of symptoms of nonspecific psychological distress (e.g., nervousness, hopelessness, restlessness, worthlessness, etc.), resulting in a total score ranging from 0 to 24. The scale is widely used as a reliable indicator of nonspecific serious mental illness at the community or population level, but it has demonstrated utility in clinical samples with specific mental illnesses as well [41]. A score between 5 and 13 is considered 'moderate' psychological distress, while a score of 13 or more is interpreted as a state of 'serious' distress and is reliably associated with increased mortality [42]. Moderate psychological distress was assessed within the past month to evaluate current psychological status, while serious psychological distress was assessed based on

respondents' "worst month within the prior year" to evaluate whether the coverage expansion had any role in reducing the likelihood of episodes of serious distress.

ii. Study Population

For this study, the treatment group was defined as those most likely to benefit from the expanded eligibility. All low-income young adults aged 18 to 25 without US citizenship and who resided in California were included for the selected sample years (inclusion/exclusion criteria further detailed in Figure 1). Considering the complexity of circumstances that may qualify an individual or household for Medi-Cal benefits, such as varying income thresholds by county, access to insurance benefits from parents, and life statuses like pregnancy, a moderately expanded and inclusive income limit was chosen. This study defined low-income as 200% of the Federal Poverty Line (FPL) for the primary analysis instead of the standard Medicaid eligibility threshold of 138% of FPL. This threshold was decided upon after surveying examples in the literature and in consultation with a scholar with expertise in the subject (Dr. Héctor E. Alcalá, personal communication, May 5, 2023). By setting a modestly higher threshold the risk of excluding individuals eligible for other reasons not apparent from their reported income was reduced. This approach increased the likelihood of identifying those who are likely to benefit from the impact of the Medi-Cal expansion over the entirety of the respective period of eligibility (ages 18 to 25), especially considering fluctuations in their income or job status. A higher threshold also enhances the representability of the results, making it more applicable to those who share similar socioeconomic and demographic characteristics with this sample and are similarly likely to benefit from the expansion, either directly or indirectly. However, a higher threshold may reduce the specificity of the study population, making it challenging to precisely

identify the exact impact of the expansion by including individuals who may not actually be eligible and, therefore, cannot be considered to have benefitted from the expansion. I discuss the implications of this further in the discussion and limitations sections.

To facilitate an effective comparison, the control group consisted of 18-25 year-olds who self-reported as US-born or naturalized citizens and had individual or household incomes below 200% of the FPL. The Institutional Review Board at the University of Washington has determined that this study does not require Institutional Review Board review or an exempt determination due to the absence of involvement of human subjects.

iii. Statistical Analyses

Descriptive statistics were calculated to assess sample characteristics, including income, education level, trends in insurance coverage, as well as other sociodemographic and behavioral health characteristics of the study groups. All analyses were performed in R Software (version 4.1.2)

A difference-in-difference (DiD) framework was used to estimate the impact of Medi-Cal expansion for the primary and secondary outcomes of interest. Difference-in-differences is a commonly used quasi-experimental design that evaluates the impact of a given policy change or non-randomized intervention by comparing pre- and post-intervention time periods between at least one treated group and one control group. The standard estimating equation for the model is as follows:

$$Y_{gt} = \beta_0 + \beta_1 T_g + \beta_2 P_t + \beta_3 (T_g \times P_t) + \varepsilon_{gt}$$

In the potential outcomes framework, the comparison group serves as a proxy for the counterfactual scenario had the expansion not been implemented [43]. The core assumptions of

difference-in-difference models are that unmeasured confounders between the groups and time periods are time- and group-invariant, respectively, and that the outcome in both groups prior to and after the intervention are expected to show a common or parallel trend, except for the treated group after the intervention (in the scenario that the intervention actually has an effect) [43]. This latter assumption is known as the common or parallel trends assumption, and can be evaluated graphically and analytically. The validity of this assumption for the present study is evaluated in the limitations and in supplemental materials in the appendix.

The interactions between indicator variables for US citizenship status and the post-expansion, known as the DiD estimator, were the primary regression coefficients of interest. The DiD estimator can be interpreted as an estimate of the average treatment effect of the respective intervention under the common trend assumption. Other coefficients of interest include the treatment group coefficient, which can be interpreted as the average difference between the treatment and control groups irrespective of time period, and the coefficient for time period, which can be interpreted as a difference in the average outcome between the pre- and post-expansion periods, irrespective of group. In ideal circumstances, the DiD format controls for the combined effects of unmeasured confounders that differ systematically between group or time period. Statistical significance for all coefficients was assessed at the <0.05 level.

Lastly, in light of the restricted and highly selected nature of the sample and to simplify the interpretation of intervention impacts within a quasi-experimental framework, survey-naive (unweighted) descriptive statistics and model estimates are presented. The results are evaluated as if the sample were participants enrolled in a quasi-experimental study, and were all equally likely to be enrolled. For this preliminary analysis, I proceeded with the assumption that bias resulting from unweighted analysis was non-differential with respect to the treatment and control

groups, and this was validated through comparison of weighted and unweighted model results during analysis. Further implications of this decision are discussed in the limitations section.

Results

Descriptive and Demographic Statistics

Between 2016-2021, a total of 131,947 adults completed the California Health Interview Survey. After adults over age 26 and those with individual or household incomes exceeding 200% of the FPL were excluded, the final analytic sample (n=4,107) consisted of 522 young adults (aged 18 to 25) without US citizenship in the treatment group, and 3,585 young adults with US citizenship in the control group (Figure 1).

Table 1 provides unweighted sociodemographic and health characteristics for both groups before and after the implementation of the expansion. The treatment and control groups were largely similar in terms of gender, employment status, self-reported health status, and income, although the control group showed a higher proportion of women in the post-expansion period. The treatment group predominantly consisted of Latino/a and non-Latino/a Asian individuals, while the control group predominantly consisted of Latino/a and non-Latino/a white individuals. Prior to and following the expansion, young adults without US citizenship were more likely to be uninsured (pre: 28% vs 11%; post: 23% vs 9.1%), less likely to be enrolled in Medi-Cal (pre: 50% vs 55%; post: 47% vs 59%), more likely to have not completed high school (pre: 23% vs 7.2%, post: 11% vs 3.6%), and more likely to have limited or no English proficiency. On the other hand, young adults with US citizenship had a higher rate of serious psychological distress in the past year (score $\geqq$13 on the Kessler Psychological Distress Scale) compared to those without US citizenship (pre: 24% vs 14%, post: 38% vs 31%). However, the mean past-month

K6 scores (out of 24) were similar for both groups (pre: 5.9 vs 5.2, post: 7.9 vs 7.9), as was the prevalence of moderate psychological distress. Both groups experienced notable increases in the prevalence of serious psychological distress in the post-expansion period, which coincided with the onset of the COVID-19 pandemic.

Figure 2 depicts annual unadjusted, unweighted rates of healthcare coverage (any insurance, Medi-Cal coverage, and private or employment-based coverage) among the sample, plotted according to US citizenship status. In the pre-expansion period, young adults with US citizenship had higher coverage rates than young adults without US citizenship for all coverage types in most years, except for a brief period of higher Medi-Cal enrollment in 2017 and 2018. Medi-Cal enrollment for those without US citizenship declined annually between 2017 and 2020 before a modest increase occurred in 2021. This could indicate a lagged effect of the eligibility expansion; however a similar rate increase was observed in the control group in 2021. Coverage rates for those with US citizenship remained stable until 2020 and 2021 when there was a decline in private insurance coverage and an increase in Medi-Cal coverage. In the post-expansion period, those without US citizenship had lower rates of any insurance coverage and Medi-Cal coverage compared to those with US citizenship. Regarding private or employment-based coverage, young adults without US citizenship had a lower rate of coverage than young adults with US citizenship for each year, except in 2020 when they briefly had a higher rate.

Regression Results

Healthcare Coverage

Table 2A presents the difference-in-difference estimates for the effects of California's expansion of Medi-Cal eligibility on healthcare coverage, as well as estimates of between-group differences. Across both time periods, young adults without US citizenship had lower absolute

insurance coverage rates on average for all coverage types. Those without US citizenship had, on average, a 17 percentage-point lower estimated rate of any insurance coverage (95% CI: -20%, -13%) and a 10 percentage-point lower rate of private coverage (95% CI: -15%, -5%) compared to young adults with US citizenship. Although the results for Medi-Cal coverage (5 percentage points lower for the treatment group) did not reach statistical significance at the conventional level, they were qualitatively consistent with the other findings (95% CI -10%, 1%).

Turning to the estimated effects of the expansion on health insurance coverage: young adults without US citizenship experienced a modest additional increase of 3 percentage points (95%CI: -4%, 10%) for any coverage relative to young adults with US citizenship in the post-expansion period, although the association was not statistically significant. Surprisingly, private insurance contributed more to this elevation than public insurance did: the treatment group experienced an additional 10 percentage-point increase (95% CI: 1%, 19%) in private insurance coverage during the post-expansion period while exhibiting an 8 percentage-point *decline* in Medi-Cal coverage (95%CI: -18%, 3%), relative to the control group, although this decline was not statistically significant at the conventional threshold. Additionally, the findings show a statistically significant time-related effect, with 4 percentage point increase in the rate of Medi-Cal coverage in the post-expansion period irrespective of group (95% CI: 0%, 8%), which is suggestive of other time-related trends that may have contributed to the observed changes.

Healthcare Access

Table 2B presents regression estimates for three dimensions of healthcare access: having a usual source of care, experiencing delays in necessary care due to cost, and lacking a routine check-up or doctor visit in the prior year. Consistent with the disparities observed for coverage, young adults without US citizenship exhibited a lower absolute rate of access to a usual source of

care (-16%, 95% CI: -21%, -11%) and a lower rate of having a routine check-up or doctor visit in the prior year (-14%, 95% CI: -19%, -9%) compared to citizen young adults, on average across all time periods. No notable differences were observed between groups concerning delays in necessary care due to cost, as this outcome was relatively uncommon for both groups (less than 10%). A modest improvement in access to a usual source of care was associated with the eligibility expansion, with the percentage of those reporting a usual source of care increasing by an additional 12 percentage points for those without US citizenship in the post-expansion period relative to those with US citizenship (95% CI: 2%, 21%). There were no significant associations for delays in needed care due to cost or for routine check-ups or doctor visits in the past year. However, a significant time-related effect suggests that the post-expansion period was associated with an estimated 7 percentage-point lower rate of having a routine check-up or doctor visit in the past year, irrespective of US citizenship status (95% CI: -11%, -4%).

Psychological Distress

Table 2C displays regression estimates for differences in the prevalence of moderate psychological distress in the past month (K6 score 5-13) and serious psychological distress in the past year (K6 score ≧13), along with DiD estimators of the intervention effects. Throughout both periods, on average, young adults without US citizenship had a 6 percentage-point lower prevalence of moderate psychological distress (95% CI: -11%, -1%) and an 11 percentage-point lower prevalence of serious psychological distress (95% CI: -15%, -5%), compared to young adults with US citizenship. In the post-expansion period, the estimate of the expansion effect suggests that those without US citizenship experienced an additional 6 percentage-point increase in moderate psychological distress (95% CI: -4%, 17%), and an additional 4 percentage-point increase in the prevalence of serious psychological distress (95% CI: -5%, 13%) relative to their

counterparts with US citizenship. However, these effects were not statistically significant, and the overall prevalence of moderate or serious psychological distress remained higher, on average, among young adults with US citizenship. Notably, the post-expansion period was associated with a 14 percentage-point increase in serious psychological distress, regardless of US citizenship status (95%CI: 10%, 17%), suggesting other time-related trends may be responsible for the observed changes in mental health status.

Discussion

In this study, evidence is presented indicating that despite expanded Medi-Cal eligibility, disparities in insurance coverage and healthcare access persisted for low-income young adults in California without US citizenship. In its first two years, California's Medi-Cal young adult expansion was associated with an inconsistent benefit for insurance coverage across coverage types and three dimensions of access to healthcare. Before the expansion, on average, low-income young adult Californians without US citizenship had lower coverage rates across all coverage types, and experienced greater healthcare access disparities compared to young adults Californians with US citizenship. Analysis of the impact of the 2020 expansion did not confirm that rates of any insurance coverage or Medi-Cal coverage increased or decreased more for young adults without US citizenship than for those with US citizenship in the post-expansion period. Instead, Medi-Cal rates appeared to *decline* by an additional 8 percentage points beyond the change experienced by young adults with US citizenship, although this effect was not statistically significant at the conventional level. Rates of private or employment-based coverage, on the other hand, were found to have risen by an additional 10 percentage points higher for young adults without US citizenship than for their counterparts with US citizenship, suggesting at least one potential impact of the expansion on coverage. Young adults without US citizenship

also showed greater improvements than young adults with US citizenship in one dimension of healthcare access (having a usual source of coverage), but no expansion-related differences were found for other measures, including delays in necessary care due to cost or actually visiting a provider for routine check-ups. Furthermore, both the treatment group and control group saw a decline in mental health status across the study period. Despite some evidence of a few modest improvements associated with the Medi-Cal expansion, low-income young adult Californians without US citizenship continue to face significant healthcare-related disparities.

These findings are partially consistent with previous work. Generally, previous ACA expansions in California have realized important improvements in coverage. For example, the 2016 expansion to low-income children in California without US citizenship was associated with gains in any coverage and Medi-Cal coverage of 9 and 12 percentage points, respectively [3]. Studies on past Medicaid expansions in California found evidence of modest increases in coverage and some improvements in healthcare access for the general population, including among immigrants [2, 4, 6]. However, no prior studies have analyzed healthcare coverage, access, and mental health outcomes among low-income young adults lacking US citizenship, so it is unclear if prior coverage improvements applied to young adult immigrants in particular. In the present study, low-income young adults with US citizenship did not appear to have a higher uninsured rate (~10%) than the general populace (5-10%), which differs from previous findings that suggest that young adults had greater coverage disparities (as high as 1 in 3) [25]. This may have been due to relatively high rates of Medi-Cal enrollment (>55%) in our sample, representing gains from prior waves of the ACA expansions. The present study expands on former analyses of Medicaid expansions by assessing the most recent coverage expansion in California and assesses changes in coverage and access alongside changes in mental health

distress. This study also extends the past decade of study on Medicaid expansions to a novel context—how do coverage expansions fare in the face of widespread economic, social, and healthcare disruptions from the COVID-19 pandemic? To date, no published evidence evaluating Medicaid expansions concurrent with the onset of the COVID-19 pandemic has been found.

It is unclear how to interpret findings that confirm an increase in private insurance coverage for young adults without US citizenship as being the result of an expansion in Medi-Cal coverage. One possibility relates to strong secular trends due to the economic disruptions and pressures of the COVID-19 pandemic, including disruptions in employment, healthcare systems, or impacts on mental health. Descriptive analysis indicates that both groups experienced a similar decline (>10%) in employment after 2020 (Table 1). However, there was a differential effect on employment or privately purchased insurance coverage between the two groups: those without US citizenship experienced an increase, while those with US citizenship had minimal changes to private coverage. Young adults without US citizenship may have disproportionately relied on or turned to employment-based coverage, which may have been facilitated by factors such as hesitancy to apply for government benefits despite the expanded eligibility. Since those without US citizenship were disproportionately uninsured pre-expansion, even a modest increase in insurance enrollment through the most accessible channel available (employment-based coverage) could explain the observed difference-in-differences. Analysis of annual trends also lends some support to the presence of strong exogenous factors since much of the observed change occurred during 2020 specifically, followed by a decline the following year (Figure 2, Figure 3). The pressures of the pandemic may have motivated the uptake of private or employment-based coverage, such as seeking enrollment in a parent's plan or through private purchase. More importantly, as described in the limitations and supplemental material, analysis

of pre-existing trends raises doubts about the validity of the parallel trends assumption for this outcome. The plain interpretation suggests that the observed effect may be more related to exogenous factors than the direct effects of the intervention.

If the observed effect is indeed an outcome of the expansion, however, one alternative explanation may be related to the impact of social and contextual factors and the overall consistency of the presumed intervention effect. Since decision-making about insurance coverage is embedded within and influenced by a wider context, social and contextual factors may have also led to preferential enrollment in private coverage for young adults without US citizenship. For example, 18-26 year-olds are eligible for benefits through their parents' private insurance. It may be that the Medi-Cal expansion increased the number of young adults eligible for Medicaid, but nonetheless, they chose to access insurance through their working parents (or their own employment). It is also possible that the effect of expanded coverage extends beyond effects on Medicaid enrollment alone. More generally, the results may also differ notably based on unobserved and heterogeneities among those without US citizenship. These may include background, migration experiences, documentation status, experiences of discrimination and prejudice, time in the US, or other sociodemographic factors. Lastly, limitations in determining exact eligibility for the treatment population may have influenced the observed effect. If a significant number of individuals in the treatment population were, in fact, ineligible for the benefit, then private coverage would be their only recourse for changes in insurance coverage status. A combination of the above factors contributing to the outcome is likely. However, given the available evidence and observational design, these potential interpretations cannot be extensively evaluated.

Findings for changes in Medi-Cal enrollment indicating a decline in coverage relative to those with US citizenship are indeed counter to the expected impact of an eligibility expansion. This is especially the case considering the results of prior expansions, as well as data from California Health and Human Services that track increased enrollments during the post-expansion period [44]. However, descriptive analyses of annual changes suggest that the decline in coverage observed for this sample may indicate a continuation of the pre-existing declining trend evident from 2017 onwards (Figure 2). Moreover, based on graphical evidence, the parallel trends assumption for Medi-Cal may only weakly hold for this outcome.

One possible explanation consistent with a beneficial impact of the coverage expansion is that the decline in Medi-Cal coverage in 2020 would have been greater had the eligibility expansion not been enacted. Relatedly, there may be a lagged effect of the expansion, and 2020 may be best considered and analyzed as a 'transition year' incorporating lagged treatment variables to account for such an effect. The reversal of the declining trend in enrollment for the treatment group as of 2021 may be suggestive of potential future trends (Figure 2, Figure 3), although it is premature to determine at this stage. Alternatively, the non-difference in Medi-Cal coverage between the treatment and control groups may simply indicate that coverage expansion alone did not lead to lesser or greater Medi-Cal enrollment for the population of interest relative to their peers with US citizenship, even if the absolute number of enrollees increased. This interpretation would be consistent with broadening literature on the intractability of health disparities despite efforts aimed at addressing these disparities [5–7,13,28,30]. It may also be the case that this study's sample represents a subset of young adults without US citizenship who experienced particularly acute disparities that impeded their enrollment. The observed increases in enrollment, as tracked by state agencies after the eligibility expansion, may not have led to the

expected benefits due to a combination of factors, including pre-existing health disparities and systemic/structural obstacles that may have hindered the full advantage of the expansion. With these factors considered, the persistence of disparities is not entirely unexpected.

Results concerning healthcare access are somewhat inconclusive, though a modest benefit was found for having a usual source of care. An improvement in having a usual source of care alongside the observed increase in private coverage aligns with prior evidence that found access improvements in response to increased enrollments among young adults [25]. However, other access measures did not appear to change in the present study. Similar to the main expected effect of Medi-Cal enrollment, certain access variables may be less immediately sensitive to the impact of coverage expansion, with a larger effect only observed long after enrollment. Events such as past-year routine visits, for instance, may be less sensitive to an enrollment effect compared to an outcome such as subjective judgment of having a usual place of care. Meanwhile, delays in necessary care due to cost may simply be insensitive to enrollment in general, and respondents' decisions about seeking or delaying care may not have been meaningfully affected by the coverage expansion.

Results for our mental health outcomes showed no impact of the expansion on moderate or serious psychological distress for young adults without US citizenship relative to their peers with US citizenship. These findings align with the evidence of an inconsistent or unclear benefit for healthcare coverage and access for young adults without US citizenship. The notable increase in serious psychological distress for both treatment and control groups alike aligns with evidence of overall long-term declining trends in mental health for youth and young adults generally [34], which were only further exacerbated by the COVID-19 pandemic [35].

For this study's secondary aim, I hypothesized that access to mental health care resources through Medi-Cal may lead to reduced barriers to mental health care and, consequently, improvements in mental health burden. Since there was limited or no benefit of the policy expansion with respect to Medi-Cal enrollment, it is not surprising to find that the expansion did not appear to have any impact on the prevalence of mental health distress.

Unlike Medi-Cal, private insurance did appear to meaningfully improve for young adults without US citizenship. However, considering that mental health resources are not consistently included in private coverage, unlike Medi-Cal, it is also not surprising to discover that the observed rise in private coverage for young adults without US citizenship had minimal or no effect on addressing the mental health burden. Nonetheless, more precise investigations are needed to understand how access to mental health resources for enrolled Medi-Cal recipients affects the burden of mental health challenges, especially young adults and those without US citizenship. There is also a question regarding the effectiveness of individual-level mental health care resources in addressing the structural-level factors that hinder health outcomes for individuals without US citizenship. Despite gaining access to mental health care, many of these upstream fundamental causes of healthcare access barriers and mental health distress, such as anti-immigrant sentiment or policies, remain unaddressed. As a result, the unique mental health challenges faced by structurally marginalized young adults without US citizenship may endure, irrespective of their access to mental health care.

Strengths and Limitations

This study benefits from several notable strengths. Sample restriction provides a degree of control for confounding by limiting the sample to specific age and income groups. Relatedly,

by employing a DiD strategy for this analysis, it benefits from control for a range of unmeasured time-varying and group-varying confounders.

However, there are noteworthy limitations that must be acknowledged. Firstly, there are design-related factors to consider. Study power, and therefore the precision of estimates, was limited due to the restricted nature of the study population - young adults without US citizenship. Both are factors that are largely under-represented within population-based surveys, making sample size a limiting factor. Additionally, given the restricted and highly selected nature of this sample, and for ease of interpretation in the context of a quasi-experimental design, I elected to present the results as unweighted. Results must, therefore, be interpreted as provisional. Furthermore, results are unadjusted for confounders. Although the DiD strategy controls for a range of unmeasured confounders by design, and the aforementioned sample restriction improves control for confounding, it is possible that adjustment for other confounding variables not included in this analysis might have meaningfully altered the interpretation of the results.

Secondly, there are necessary assumptions of difference-in-difference analyses that only weakly hold (or likely do not hold) for the present analysis. One key underlying assumption of difference-in-difference analyses is that treatment and control groups have similar trends for most outcomes prior to treatment, known as the parallel trends assumption. Based on the evaluation described above and in the supplemental material, the data is unlikely to represent a robust parallel trend for all the main outcomes prior to the intervention. Given the variability in the outcome in the pre-expansion period and unusually strong secular trends affecting the main outcomes - such as the COVID-19 pandemic and related economic and health system shocks - differences in outcomes across the study period and after the expansion may be better explained by ‘exogenous’ factors. In other words, concurrent secular trends or policies that may have

contributed to the results or better explain the observed intervention effect cannot be ruled out. Another feature of DiD models is the assumption of time- and group-invariant confounders. Although the DiD model aims to address confounding by design, there may be time- or group-variant confounders that would meaningfully alter the results or change the interpretation if accounted for. For example, if a factor such as discrimination based on immigration status increased across time periods evaluated in this study (i.e., a time-varying confounder), it is unlikely that this would qualify as group-invariant. Future research evaluating outcomes between young adults based on US citizenship status will benefit to the extent they can more robustly identify and evaluate such factors.

Thirdly, the potential for misclassification bias introduced by factors such as documentation status in the treatment group, income ascertainment, and Medi-Cal eligibility cannot be ruled out. Income-related misclassification may have been introduced through ascertainment of income based on the prior year, and thus some who may have actually been eligible may have been excluded, while others who were not actually eligible may have been included. Assessing eligibility for programs such as Medicaid is highly complex, as are the circumstances of enrollment and qualification for the benefit, which is why I adopted an inclusive approach to assessing eligibility to address this likelihood. Other factors that could not be accounted for include the possibility that members of the 'treated' population effectively received the intervention prior to the date of expansion due to other eligibility pathways, and thus some of the benefit of the intervention was disguised. This is one motivation for viewing the present intervention on an 'intention-to-treat' basis, but limits clarity on the exact effect of policy expansion and may introduce error from misclassification. Additionally, I was unable to account for factors such as documentation status, which could further impact the outcomes for those

without US citizenship due to unique factors affecting the treatment group alone, including language barriers, experiences of discrimination based on immigration status, or hesitancy to apply for government benefits despite expanded eligibility. These factors may intensify with respect to documentation status and likely understate the impact on the primary outcomes by limiting our ability to assess the exact target population for whom the expanded eligibility may be most effective or to account for these factors as explanatory variables. However, given the limited sample size for the treatment group of young adults without US citizenship, it is not certain this study would have been able to distinguish such effects in an even smaller subset of the present sample. Finally, the data available was limited to the first two years of the eligibility expansion; therefore the results might be sensitive to a lagged effect. Healthcare access variables, such as routine check-ups, might be uniquely sensitive to a lagged effect, for instance, as described in the discussion. As further years post-expansion become available, accounting for time-varying effects by using lagged treatment variables may provide greater clarity on the exact impacts of this expansion.

Conclusion

This study found that the 2020 Medi-Cal expansion for low-income young adults without US citizenship in California was associated with an inconsistent and unclear benefit for healthcare coverage and access, possibly due to the influence of unusually impactful secular trends. These results estimate that the expansion was associated with significant increases in private health insurance coverage and improvements in access to a source of usual care for young adults without US citizenship compared to their counterparts with US citizenship. However, the present study did not find confirmation that the overall insurance coverage rate,

Medi-Cal coverage rate, or other measures of healthcare access improved for young adults without US citizenship compared to those with US citizenship. Conversely, the Medi-Cal coverage rate appeared to trend downward. Young adult Californians without US citizenship continue to face persistent health disparities as they remain less likely to have health coverage of any type or to have had a routine check-up or a usual source of care in the past year compared to young adults with US citizenship. Both groups saw notable increases in serious psychological distress over the study period. Further assessments are needed to address how the 2020 Medi-Cal coverage expansion is affecting health insurance rates, healthcare access disparities, and the prevalence of mental health distress among low-income young adults without US citizenship.

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Appendix

Figure 1. CONSORT Flow Diagram: Study Population Inclusion and Exclusion Criteria

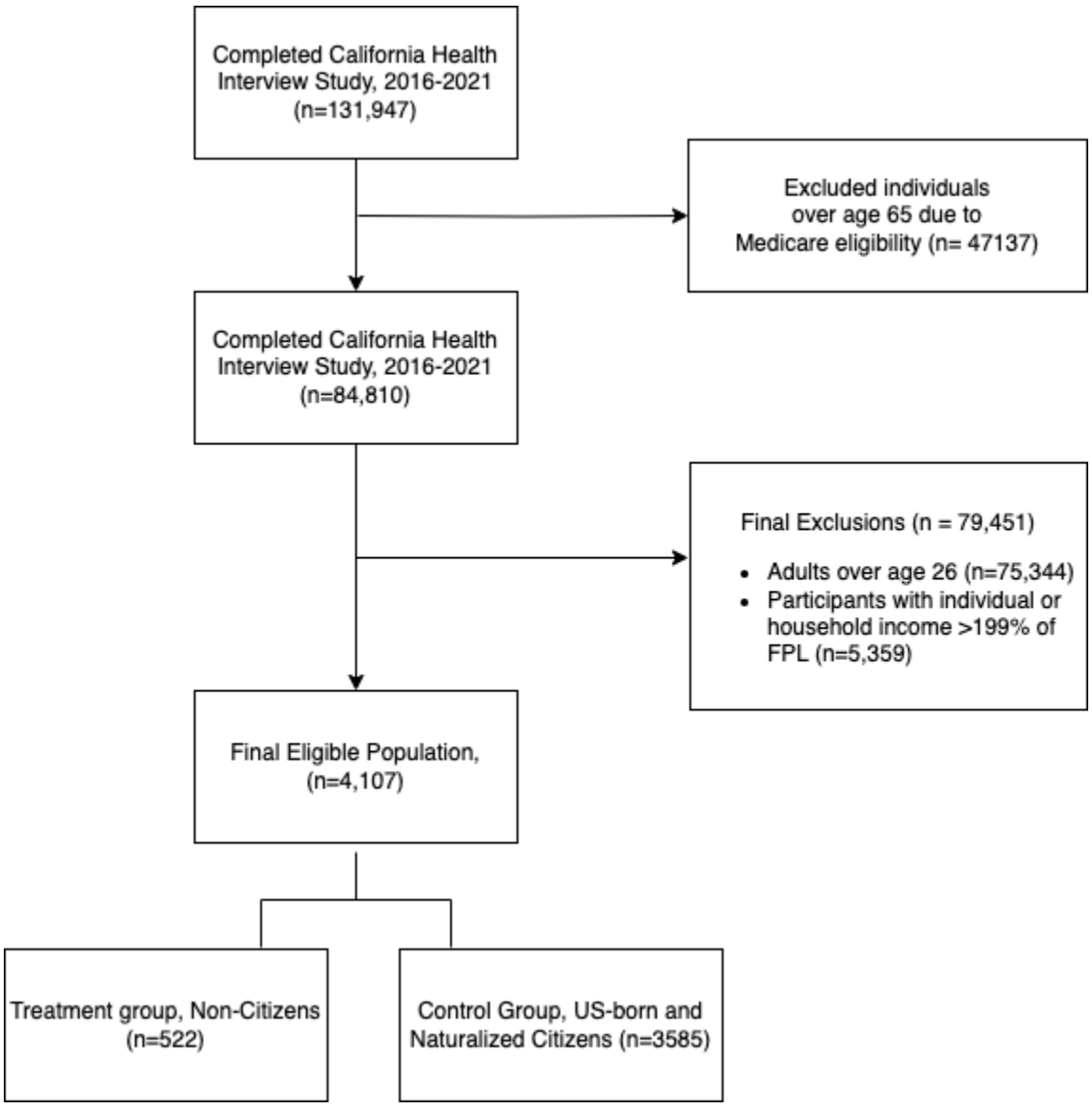

Table 1. Sample Characteristics by US Citizenship Status, before and after 2020 Medi-Cal expansion, among low-income young adults (ages 18-26) in California, CHIS 2016-2021

	Non-Citizen		Citizen	
Characteristic	**Pre-Expansion**, N = 381[1]	**Post-Expansion**, N = 141[1]	**Pre-Expansion**, N = 2,694[1]	**Post-Expansion**, N = 891[1]
Gender				
Men	209 (55%)	69 (49%)	1,272 (47%)	332 (37%)
Women	172 (45%)	72 (51%)	1,422 (53%)	559 (63%)
Insurance Status				
Uninsured	107 (28%)	32 (23%)	308 (11%)	81 (9.1%)
Medi-Cal (Medicaid)	192 (50%)	66 (47%)	1,483 (55%)	527 (59%)
CHIP/Other Public Program	4 (1.0%)	1 (0.7%)	72 (2.7%)	14 (1.6%)
Employment-Based or Privately Purchased	78 (20%)	42 (30%)	831 (31%)	269 (30%)
Years in the US				
US-born	0 (0%)	0 (0%)	2,469 (92%)	820 (92%)
<5 years	162 (43%)	46 (33%)	16 (0.6%)	4 (0.4%)
5-9 years	70 (18%)	44 (31%)	39 (1.4%)	15 (1.7%)
10-14 years	55 (14%)	10 (7.1%)	50 (1.9%)	17 (1.9%)
15+ years	94 (25%)	41 (29%)	120 (4.5%)	35 (3.9%)
Limited or No English Proficiency, %	131 (34%)	19 (13%)	53 (2.0%)	5 (0.6%)
Race / Ethnicity				
Latino/a	249 (65%)	75 (53%)	1,461 (54%)	537 (60%)
Non-Latino/a, Other	1 (0.3%)	1 (0.7%)	24 (0.9%)	3 (0.3%)
Non-Latino/a, American Indian or Alaska Native	0 (0%)	0 (0%)	26 (1.0%)	5 (0.6%)
Non-Latino/a, Asian	101 (27%)	54 (38%)	237 (8.8%)	118 (13%)
Non-Latino/a, African American	9 (2.4%)	1 (0.7%)	157 (5.8%)	30 (3.4%)
Non-Latino/a, white	20 (5.2%)	10 (7.1%)	705 (26%)	173 (19%)
Non-Latino/a, Two+ Race	1 (0.3%)	0 (0%)	84 (3.1%)	25 (2.8%)
Education				
< High School	86 (23%)	15 (11%)	195 (7.2%)	32 (3.6%)
High School grad	151 (40%)	25 (18%)	1,263 (47%)	238 (27%)
Some College or Vocational School	65 (17%)	55 (39%)	684 (25%)	335 (38%)
College Graduate or Higher	79 (21%)	46 (33%)	552 (20%)	286 (32%)
Currently Employed, %	239 (63%)	69 (49%)	1,715 (64%)	452 (51%)
Income as a % of Federal Poverty Level				
0-99% FPL	214 (56%)	73 (52%)	1,328 (49%)	441 (49%)
100-199% FPL	167 (44%)	68 (48%)	1,366 (51%)	450 (51%)
Health Status				
Self Reported Fair or Poor Health	53 (14%)	17 (12%)	468 (17%)	128 (14%)
K6 Psychological Distress Score, past month (0-24)	5.2 (4.8)	7.9 (5.9)	5.9 (5.9)	37.9 (5.7)
Moderate Psychological Distress in past month, %	141 (37%)	62 (44%)	1,159 (43%)	388 (44%)
Serious Psychological Distress in the past yr, %	53 (14%)	44 (31%)	660 (24%)	339 (38%)

[1] n (%); Mean (SD)

Source: Data drawn from 2016-2021 annual samples of CHIS, percentages are unweighted and unadjusted.

Figure 2. Percent (unweighted) of Young Adult Health Insurance Coverage by source, stratified by US citizenship status, CHIS 2016-2021

Source: Data drawn from 2016-2021 annual samples of CHIS, percentages are unweighted and unadjusted.

Table 2A. Regression Results, Unadjusted Differences in Insurance Coverage by type, before and after 2020 Medi-Cal expansion, among low-income young adults (ages 18-26) in California with and without US citizenship, 2016-2021

	Any Coverage, % (95% CI)	Medi-Cal, % (95% CI)	Private, % (95% CI)
Constant	89% ***	55% ***	31% ***
	(87%, 90%)	(53%, 57%)	(29%, 33%)
Treated	-17% ***	-5% *	-10% ***
	(-20%, -13%)	(-10%, 1%)	(-15%, -5%)
Time	2% *	4% **	-1%
	(0%, 5%)	(0%, 8%)	(-4%, 3%)
DID Estimator	3%	-8%	10%**
	(-4%, 10%)	(-18%, 3%)	(1%, 19%)
Observations	4,107	4,107	4,107

Notes: DID Difference-in-Difference.
***p <0.01 **p <0.05 *p <0.1

Table 2B. Regression Results, Unadjusted Differences in Healthcare Access by Outcome before and after 2020 Medi-Cal expansion, among low-income young adults (ages 18-26) in California with and without US citizenship, 2016-2021

	Have a Usual Source of Care %, (95% CI)	Delayed Necessary Care Due to Cost %, (95% CI)	No Routine Check-up or Doctor Visit in Prior Year %, (95% CI)
Constant	74%*** (73%, 76%)	8%*** (7%, 9%)	76%*** (75%, 78%)
Treated	-16%*** (-21%, -11%)	0% (-3%, 3%)	-14%*** (-19%, -9%)
Time	-3% (-6%, 1%)	2% (-0.1%, 4%)	-7%*** (-11%, -4%)
DID Estimator	12%** (2%, 21%)	0% (-6%, 5%)	0% (-9%, 9%)
Observations	4,107	4,107	4,107

Notes: DID Difference-in-Difference.
*** p<0.01 ** p<0.05 * p<0.1

Table 2C. Regression Results, Unadjusted Differences in Psychological Distress before and after 2020 Medi-Cal expansion, among low-income young adults (ages 18-26) in California with and without US citizenship, 2016-2021

	Moderate Psychological Distress in past month, % (95% CI)	Serious Psychological Distress in past year, % (95% CI)
Constant	43%*** (41%, 45%)	24%*** (23%, 26%)
Treated	-6%** (-11%, -1%)	-11%*** (-15%, -6%)
Time	1% (-3%, 4%)	14%*** (10%, 17%)
DID Estimator	6% (-4%, 17%)	4% (-5%, 13%›)
Observations	4,107	4,107

Notes: DID Difference-in-Difference.
***p <0.01 **p <0.05 *p <0.1

Supplemental Material

A. Assessing Validity of the Parallel Trends Assumption for the Primary Outcomes

In the following section we describe graphical and model-based approaches to evaluate pre-existing trends that may be affecting the primary study outcomes. The parallel trends assumption is a core assumption underlying difference-in-difference models. Pre-existing differences may be related to the level of the outcome or trend over time. Figure 3 depicts a simple linear trend between groups across annual samples by coverage types and citizenship status. Viewed by any insurance (inset A), although the levels are clearly different, the overall trend appears similar, exhibiting a gradual increase in coverage. When viewing group-specific trends for Medi-Cal (inset B) the trend appears to be diverging, while for private coverage (inset C) trends appear to be converging. The available graphical evidence suggests that there may not be a common trend between treatment and control groups for Medi-Cal or private insurance. To assess this further, Figures 4A and 4B depict estimates and confidence intervals from a fixed effects linear regression of difference in outcome between groups with year as a fixed effect, restricted only to pre-intervention years [45]. Figure 4A provides some evidence that, aside from 2016, results were not meaningfully different between groups in the years prior to 2020 when you account for yearly effects common to both groups. Figure 4B casts further doubt on a common parallel trend with respect to private insurance, as 3 out of the 4 years prior to 2020 observed differences in the outcome were statistically significantly different between groups, after accounting for yearly effects. These analyses suggest that the parallel trend assumption either only holds weakly, or is otherwise unlikely to hold.

Figure 3. Percent (unweighted) of Young Adult Health Insurance Coverage by source, stratified by US citizenship status, CHIS 2016-2021 with linear relationship modeled

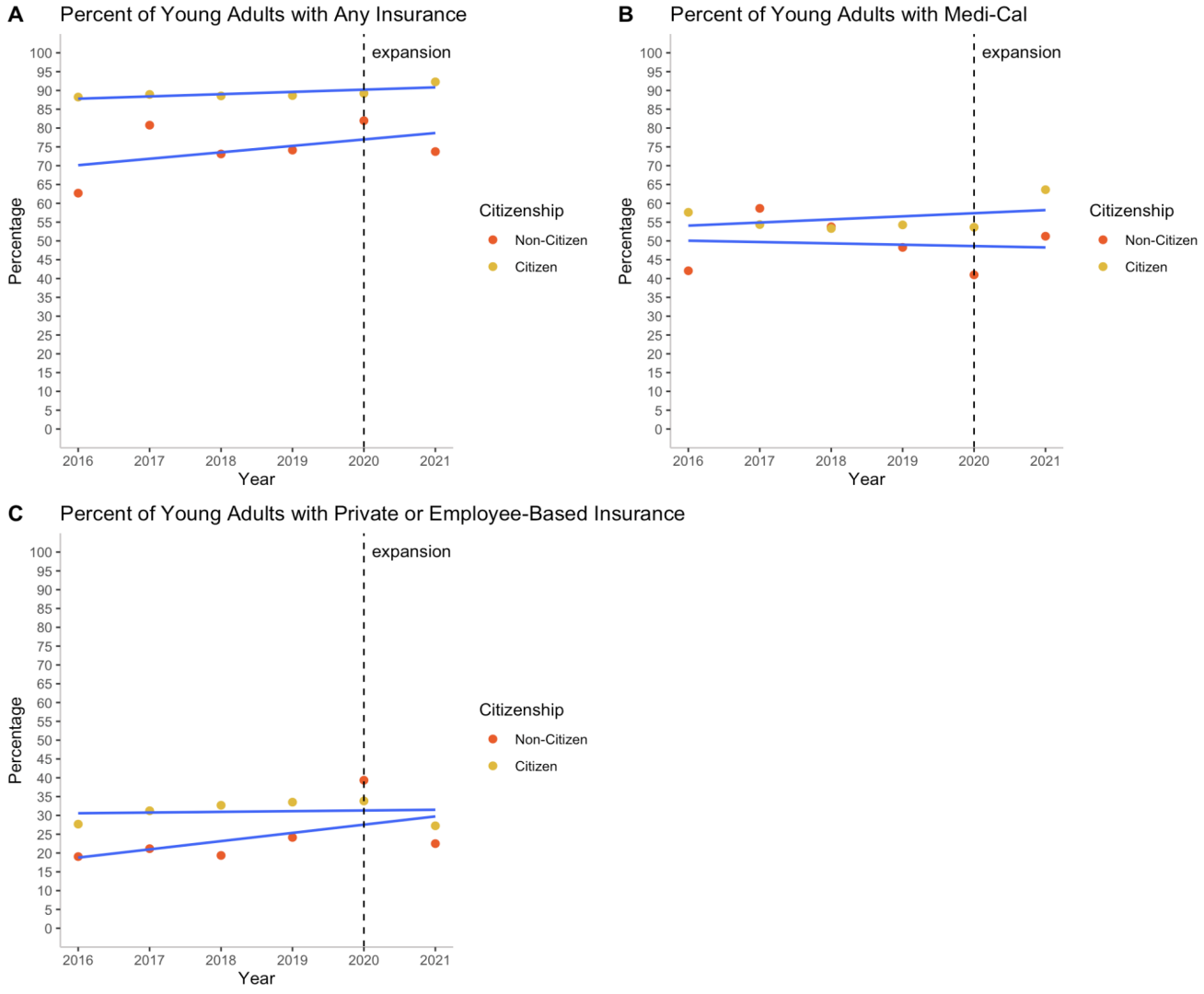

Figure 4A. Evaluating pre-existing trends in Medi-Cal coverage, annual effect of group on outcome prior to intervention, estimates from fixed effects regression.

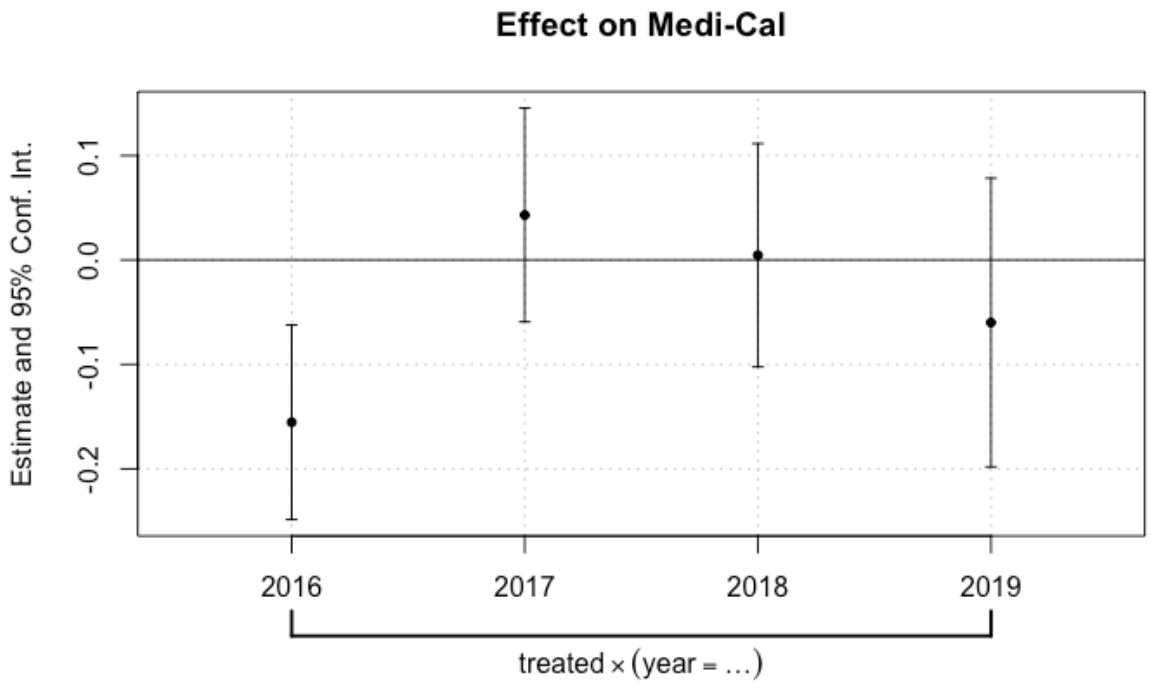

Figure 4B. Evaluating pre-existing trends in private coverage, annual effect of group on outcome prior to intervention, estimates from fixed effects regression.