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## The Impact of COVID-19 on the U.S. Child Care Market: Evidence from Stay-At-Home Orders

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## ABSTRACT

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# The Impact of COVID-19 on the U.S. Child Care Market: Evidence from Stay-At-Home Orders<sup>1</sup>

Stay-at-home orders (SAHOs) have been implemented in most U.S. states to mitigate the spread of COVID-19. This paper quantifies the short-run impact of these containment policies on the supply of and demand for child care. The child care market may be particularly vulnerable to a SAHO-type policy shock, given that many providers are liquidity-constrained. Using plausibly exogenous variation from the staggered adoption of SAHOs across states, we find that online job postings for early care and education teachers declined by 13% after enactment. This effect is driven exclusively by private-sector services. Indeed, hiring by public programs like Head Start and pre-kindergarten has not been influenced by SAHOs. In addition, we find little evidence that child care search behavior among households has been altered. Because forced supply-side changes appear to be at play, our results suggest that households may not be well-equipped to insure against the rapid transition to the production of child care. We discuss the implications of these results for child development and parental employment decisions.

**JEL Classification:** H75, J21, I28

**Keywords:** child care, coronavirus, COVID-19, early care and education, stay-at-home orders

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## I. Introduction

The COVID-19 pandemic, and the resulting “stay-at-home” orders in most states, are likely to have large—and potentially permanent—negative consequences for the U.S. child care market. Indeed, given that child care businesses generate most of their revenue from parent fees, it is not surprising that 17% of providers in a recent survey reported they would not survive a closure of any length, and an additional 30% said they would not survive a closure of more than two weeks (NAEYC, 2020). Evidence of large-scale program closures is already abundant. For example, 57% percent of Florida’s child care providers are temporarily shuttered, while 35% of Louisiana’s programs expect to close permanently (Bryson, 2020; Sonnier-Netto et al., 2020). Moreover, while recent evidence suggests that labor demand collapsed throughout the economy, Figure 1 shows that demand—as measured by online job postings—has fallen especially sharply for child care: these job postings are at roughly 60% of their January 2019 levels, compared to 80% for job postings overall (Kahn et al., 2020; Rojas et al., 2020).

These developments, together with the large literature showing the importance of early childhood education to later schooling and labor market outcomes, highlight the need for systematic evidence on how COVID-19 is influencing the child care market (Herbst, 2017; Ludwig & Miller, 2007; Havnes & Mogstad, 2011; Cunha, Heckman & Schennach, 2010).

There are at least two mechanisms through which the pandemic—and the resulting stay-at-home orders—may influence the child care market. First, there could be a direct effect arising from the mandatory closure of child care services for public health reasons associated with the national containment strategy.<sup>2</sup> We call this the “supply side” effect. Second, there may be an indirect decline in parent demand for child care. Given that most states have issued stay-at-home (and mandatory business closure) orders, working parents are now largely at home. In addition, the pandemic may change parent preferences for

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<sup>2</sup> In several states the mandatory closure of child care businesses is explicit. Indeed, businesses in 12 states were ordered to close as per governors’ executive action (Hunt Institute, 2020). In other states child care providers were not deemed “essential” or were given the option to close. Anecdotal evidence suggests that many have exercised this option, electing to furlough or layoff their employees.

child care. The rapidly spreading virus could alter the health and safety perceptions of out-of-home child care settings, in which relatively large groups of children interact in close proximity. If a child’s perceived risk of contracting the virus is sufficiently high, parents may elect to shift the locus of caregiving from out-of-home services to in-home, parent care so that the environment can be closely monitored. We refer to these dynamics as “demand side” effects. Disentangling these channels is important for understanding the welfare effects of the pandemic on parents: if the supply side channel is operational, then parents are unable to self-insure against the shock; otherwise the changes simply reflect evolving demand.

This paper provides the first quantitative evaluation of the impact of pandemic-related containment policy on the supply of and demand for child care in the U.S. To measure supply, we make use of unusually rich proprietary data on the number of online job postings for early care and education (ECE) teachers. The measure of demand is based on the intensity of internet searches for the topic “child care” extracted from Google Trends. We construct a state-by-day panel of observations over the period January 15 to April 14, 2020. Our identification strategy exploits plausibly exogenous variation in the staggered adoption of state-level “stay-at-home” orders (SAHOs) to estimate their causal effect on child care supply and demand. SAHOs are important policies because they are enforceable by law (Pearl et al., 2020); they have been shown to limit public gatherings while increasing the proportion of people remaining at home (Abouk & Heydari, 2020; Brzezinski et al., 2020); and they have substantially slowed the spread of COVID-19 (Dave et al., 2020). The nation’s first SAHO was enacted in California on March 19, 2020; approximately four weeks later, 40 states and the District of Columbia had also issued one. We exploit this state-by-day variation using a difference-in-differences (DD) design along with an event study analysis to examine SAHO-driven changes in child care supply and demand.

Our results suggest that the enactment of a SAHO reduced the number of ECE job postings by over 13% *per day*—implying a reduction in supply—but the enactment has no discernible effect on Google searches for child care—implying little impact on demand. To put this in perspective, child care job postings declined by roughly 40%, relative to the pre-pandemic trend in 2019, so we interpret the SAHO

elasticity as economically meaningful. The reduction in overall labor demand is driven by preschool-age teacher positions as well as providers in the private-sector. Indeed, SAHOs do not appear to influence hiring behavior in the market for Head Start and pre-kindergarten teachers. Back-of-the-envelope calculations imply that as many as 1,000 fewer teachers are hired—resulting in a decreased capacity to care for 10,000 fewer children—every month that a SAHO is in effect.

At the broadest level, our paper contributes to large literature on early childhood development and the allocation of time towards child care and home production activities. Dating back to at least Becker (1965), child care has been viewed as a form of household production with a degree of substitutability with market activities (Rogerson, 2007). However, parents value time allocated to child care, especially in comparison with other home production activities (Juster, 1985; Robinson & Godbey, 1990; Krueger et al., 2009). Moreover, the time allocated to child care is increasing in parents' wage rate and educational attainment (Guryan et al., 2008). Although the degree of substitutability between market- and home-based care varies based on its quality, there is a general recognition that investments in child development at early ages are particularly important because of the presence of “dynamic complementarities” (Cunha & Heckman, 2006; 2007). If the pandemic decreased the use of market-based child care more by force than by choice, it raises concerns that families may not be fully prepared to transition to home production quickly (or effectively) enough to avoid disruptions to the child development process. This could generate scarring effects on children, much like growing up (Giuliano & Spilimbergo, 2013; McGuire & Makridis, 2020) or graduating (Kahn, 2010; Oreopoulos et al., 2012) during a recession. Given that 13 million (or 60%) of preschool-aged children were regularly attending some form of non-parental child care prior to COVID-19, the scale of the child development effects may be large (Corcoran & Steinley, 2019).

Our paper also contributes to the policy discussion on the role of family leave and child care policies in parental employment decisions. Although the U.S. has witnessed large increases in the share of employed mothers—thereby fueling the demand for parental leave and subsidized child care—there are persistent gaps in the coverage and generosity of such benefits (Herbst, 2018). For example, the federal

Family and Medical Leave Act (FMLA) provides only 12 weeks of *unpaid* leave and covers only 60% of private sector workers (Rossin-Slater & Uniat, 2019). In addition, just six states and the District of Columbia have enacted *paid* leave programs (Bana et al., 2019; Bartel et al., 2018), and there is considerable variation at firm-level in the availability and quality of these benefits.<sup>3</sup> As for child care, the largest subsidy programs—the Child Care and Development Fund (CCDF) and Head Start—are means-tested (both), contain strict work requirements (CCDF), or do not operate full-day, year-round programs (Head Start) (Herbst & Tekin, 2016). These constraints imply that such policies may be of limited value to many families for employment purposes. As a result, families either pay for child care services out-of-pocket or shift into unpaid, informal caregiving arrangements (Gathman & Sass, 2018; Herbst, 2018). This discussion suggests that, given the limitations of in-work family supports, coupled with the liquidity boost from the CARES Act, the recent transition to home-based employment may be beneficial to some parents, particularly those who have stronger preferences for spending time with their children, who face greater consequences from taking time off work, or who are highly sensitive to the price of child care.

## II. Data Sources and Measurement

Data for this paper come from three sources. We begin by analyzing the *supply of child care* using the universe of online early care and education (ECE) job postings obtained from the labor market analytics company EMSI. EMSI’s job posting data are advantageous because it combines information from multiple external sources, including Indeed and CareerBuilder, among many others.<sup>4</sup> Our dataset includes all job postings pertaining to the two-digit standard occupational classification (SOC) code for education (SOC-25). We then utilized a variety of keyword search methods to locate postings in three key sectors of the center-based ECE market: child care, Head Start (and Early Head Start), and pre-kindergarten. Although we were careful to limit the data to pedagogical (i.e., teaching) positions within each sector, we

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<sup>3</sup> For example, Liu et al. (2019) use data from Glassdoor to show that firms offer higher quality maternity leave benefits in labor markets that contain fewer skilled female workers.

<sup>4</sup> To our knowledge, these data have not been used previously, although they are comparable to those from Burning Glass Technology, which have been used in some recent papers (e.g., Hershbein & Kahn, 2018).



analyze the full spectrum of such positions, including lead and assistant teachers, teacher’s aides, co-teachers, and floating classroom teachers. These positions were advertised by local and state government agencies, for- and non-profit centers (including national chains), places of worship, community-based organizations, and school-based before- and after-school programs. We further categorized the job postings according to the child-age of the classroom that the teacher would operate: infant, toddler, or preschool classrooms, as well as before- and after-school settings. Finally, these data were collapsed into state-by-day cells, giving us the number of ECE job postings over the period January 15 to April 14, 2020.

We then study a measure of *child care demand* based on the intensity of internet searches for child care, extracted from Google Trends.<sup>5</sup> We examine Google search data for the *topic* “child care,” which includes search terms related to child care (i.e., day care), different spellings of the search terms (e.g., childcare), and varying languages. Google Trends creates a score representing the intensity of internet searches for a given term or topic. Specifically, it reflects the number of “child care” searches as a share of the total searches within a particular geographic area and time period. The share ranges between zero and 100 in each area, with zero representing the point in time with the lowest search intensity for “child care” and 100 representing the point in time with the highest intensity. This analysis relies Google search scores for all 50 states and the District of Columbia on each day over the period January 15 to April 14, 2020.

We also collect information on the enactment dates of several state-specific COVID-19 containment policies, importantly the enactment of statewide SAHOs. The SAHO data were collected from multiple sources, including Mervosh et al. (2020), Dave et al. (2020), and the National Governors Association (NGA). California was the first state to implement a SAHO—on March 19—and 40 states plus the District of Columbia had enacted one as of April 14. See Appendix Table 1 for a list of states operating under a SAHO (and the enactment dates) during our study period.<sup>6</sup> We also collect information

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<sup>5</sup> Google Trends have been used to study the demand for religion (Bentzen, 2020), unemployment insurance benefits (Goldsmith-Pinkham & Sojourner, 2020), and health care (Hanna & Hanna, 2019).

<sup>6</sup> It is important to note that, in a few states, the stay-at-home order took effect at 11:59pm. Our coding establishes the following day as the first day of implementation.

on emergency declarations, mandatory non-essential business closures, and public school closures at the state-level. Enactment dates for these policies were collected from the NGA and Hunt Institute.<sup>7,8</sup>

Figure 2 provides descriptive evidence on the time series pattern of ECE job postings and child care internet search intensity over the period January 14 to April 14, 2020. Although there is substantial day-to-day variation, there is an unambiguous decline in both series starting in mid-March, which coincides with the timing of the national state of emergency declaration and social distancing recommendations.<sup>9</sup> Although the decline is meaningful for both series, it is substantially larger for job postings. As we show in more detail later, this is consistent with our main result that the supply effects appear to dominate the demand side effects. Figure 3 shows the variation in our key independent variable—implementation of a SAHO—by displaying the fraction of states with a SAHO on each day between March 1 and April 14. We see that there is considerable variation in the timing that different states adopted these policies.<sup>10</sup>

### III. Identification Strategy

To quantify the impact of the COVID-19 pandemic on the supply of and demand for child care, we exploit plausibly exogenous variation in the staggered adoption of SAHOs across the states. That is, we begin with a variant of a difference-in-differences (DD) estimator by comparing supply and demand in states that adopted these orders sooner versus later than their counterparts:

$$Y_{st} = \gamma SAHO_{st} + \theta \mathbf{X}'_{st} + \phi_s + \lambda_t + \epsilon_{st} \quad (1)$$

where  $Y$  denotes our measure of the supply or demand for child care in state  $s$  and day  $t$ ,  $SAHO$  denotes a binary indicator for whether a given state has implemented a stay-at-home order, and  $\phi$  and  $\lambda$  denote

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<sup>7</sup> The NGA data can be found here: <https://www.nga.org/coronavirus/>. The Hunt Institute data can be found here: <http://www.hunt-institute.org/covid-19-resources/k-12-state-specific-resources/>.

<sup>8</sup> In some models, we control for the number of COVID-19 cases by day and state. Such data were extracted from the *New York Times* Coronavirus (Covid-19) Data in the United States Database. This database provides information on the cumulative number of cases and deaths by state (and county) and day, starting on January 21. A confirmed case is defined as a patient who tests positive for COVID-19 and is reported as such by a federal, state, or local government agency.

<sup>9</sup> The child care searches, in particular, display a clear within-week pattern, rising during the weekdays and then falling abruptly throughout weekend. This is consistent with the idea that the demand for child care is employment-driven.

<sup>10</sup> Out of an abundance of caution that these laws are introduced in response to deteriorating health conditions, we also test for the presence of reverse causality by estimating linear probability models of the timing of these laws on the number of infections; we find no statistically significant effects.

state and day-of-the-year fixed effects. Standard errors are clustered at the state- and month-levels (Bertrand et al., 2004). Our identifying assumption is that the timing of these SAHOs is plausibly exogenous—that is, that job postings or Google searches for child care in states that adopted a SAHO would have trended similarly to those that did not, conditional on observables and fixed effects. While we recognize that states with Republican versus Democrat governors behave differently, and that states with different demographic characteristics (e.g., population density) may be more at risk, our state fixed effects control for these potential threats to identification. In addition, there may be unobserved national shocks to child care supply and demand (e.g., federal mandates or recommendations as well as presidential announcements); these potential aggregate confounders are eliminated by the day fixed effects.

Nonetheless, one concern is that the supply or demand for child care might be influenced by factors that are also correlated with the timing of states’ SAHO enactment. For example, governors undertook a variety of symbolic and policy-oriented actions contemporaneously with the implementation of SAHOs. Therefore, we include in equation (1) a vector of state-level variables, denoted by  $\mathbf{X}'$ , to control for the declaration of a state of emergency and a statewide school closure order. We are also concerned that states may adopt a SAHO based on increasing concern among its businesses, which could be correlated with other economic fundamentals that shift the supply and demand for child care. Failure to account for these underlying economic conditions would also lead to biased estimates. To address this concern, in some specifications, we control for the overall number of education-related job postings and the number of COVID-19 infections, which addresses potential time-varying omitted variables that could be correlated with both the passage of state policies and the demand or supply of child care. By controlling for these two terms, we isolate variation that is uniquely affecting child care. As a final test of our identifying assumption, we implement an event study analysis to test our parallel trends assumption, which investigates whether child care demand and supply were already shifting in states prior to the enactment of SAHOs.

## IV. Results

### Main Results

We begin by estimating equation (1) under several different specifications in Table 1. Columns (1) and (5) show that there is a strong negative association between a SAHO and both ECE job postings (i.e., supply) and child care internet search behavior (i.e., demand). However, these effects are heavily influenced by cross-sectional and temporal confounders, especially those influencing the demand for child care. Once we introduce state and day fixed effects, we find a large decline in the coefficient magnitudes. We nonetheless find a statistically significant 13.1% decline in ECE job postings *per day* following the adoption of a SAHO, but no statistically significant effect on Google searches for child care. While the estimate is negative—consistent with the potential for a demand-side effect—it is indistinguishable from zero.

To address potential concerns associated with omitted variable bias, we introduce in columns (3) and (7) two indicators that control for the timing of state of emergency declarations and for school closure mandates. These indicators address the concern that the main effect is coming from other policies that were introduced around the same time as a SAHO. The coefficient on SAHO is robust to the inclusion of these controls in the model for child care supply, while that for demand remains statistically insignificant (although it remains negatively signed). Interestingly, the additional policy controls do not influence ECE supply or demand. Finally, in columns (4) and (8), we add a control for the total number of educational services job postings (excluding ECE job postings), which addresses the concern that there is a common state-specific shock that is correlated with both the enactment of a SAHO and the job posting outcomes. Inclusion of this control reduces somewhat the point estimate on SAHO in the model for ECE job postings, to 11.2%, but it remains statistically significant at the 10% level.

Given the robust association between SAHOs and ECE job postings, we now investigate whether these state policies differentially affect job postings by the age-group of children served and by sector, as shown in Table 2. Column 1 presents our baseline estimate for all ECE job postings, as in Table 1. We find that the adoption of a SAHO is not associated with job postings for infant/toddler teachers [column

(2)], but is associated with a 15% reduction in postings for preschool-age teachers [column (3)] and a 7.2% reduction in school-age teacher postings [column (4)]. A potential explanation for this pattern is that parents may be particularly likely to take care of very young children regardless of the pandemic and presence of SAHOs, making the demand for infant/toddler child care more inelastic.

We uncover similar heterogeneity across different ECE sectors. In particular, we find striking evidence that the implementation of SAHOs reduced private-sector child care job postings by 14% [column (5)], but had no effect on job postings for the public-sector Head Start and pre-kindergarten programs [columns (6) and (7)]. That public-sector hiring is less sensitive to SAHO-driven shocks may be attributed to a few factors, including that these services are less sensitive to negative shocks. Indeed, they do comparatively little hiring even during periods of strong growth (in part because they are smaller programs), and it is possible that they received stimulus funding (independent of the Paycheck Protection Program) to remain operational (e.g., serve the children of essential workers) during the pandemic.

### **Robustness and Heterogeneity**

Our earlier results are identified off of within-state variation in the timing of SAHO adoptions. We have also shown that our main results are robust to the inclusion of overall education job postings, which isolates variation unique to child care. We now present additional robustness exercises that address identification challenges. First, we begin by examining the presence of pre-trends in our DD estimator. We adopt a state-by-day event study design, relying on the staggered adoption of SAHOs at different times. This methodology is useful for examining whether child care demand and supply were already shifting in states prior to the implementation of SAHOs. We estimate the event study model as follows:

$$Y_{st} = \sum_{j=-10}^{10} \gamma_{t+j} d_{st0+j} + \theta \mathbf{X}'_{st} + \phi_s + \lambda_t + \epsilon_{st}$$

where  $d_{s,t0+j}$  denotes a set of indicator variables centered around the day on which each state implemented its SAHO,  $t_0$ . We construct an indicator variable for each of the 10 days prior to and after

enactment of the policy, using as the benchmark period 15 to 11 days prior to enactment. The event study model includes the other state policy variables as well as the state and day fixed effects.

The event study results for ECE job postings are present in Figure 3.<sup>11</sup> We estimate a separate version of the model for all ECE postings (Panel A), private-sector child care postings (Panel B), and the public-sectors programs Head Start (Panel C) and pre-kindergarten (Panel D). As shown in Panel A, while the pre-SAHO trends show a small relative decline in the three days prior to policy enactment, we uncover a sharper and larger reduction in overall ECE job postings immediately after enactment. Evidence of pre-trends is even less detectable in the sector-specific analyses shown in Panels B through D. Together, these findings provide support for our methodological approach. Moreover, consistent with our primary DD results, while we see little evidence of a decline in job postings for Head Start and pre-kindergarten teachers, we see an economically meaningful decline in the 10 days following a SAHO for overall ECE and private-sector child care job postings—roughly a 0.5% to 1.5% decline. As more data becomes available, the confidence intervals on these estimates will also become more precise.

Second, since SAHOs were introduced in part as a response to the number of local infections, our estimates might be biased if infections also had a direct effect on ECE job postings. While we view the decline in job postings largely a function of the national quarantine, rather than the direct health effects, we nonetheless investigate the robustness of our results to the role that emerging health risks might have played. Specifically, we control for the logged number of cumulative COVID-19 cases. Doing so reduces our estimate on the SAHO indicator from -0.132 (p-value = 0.034) to -0.053 (p-value = 0.340). Although not statistically significant at conventional levels, we view this as an overly strong test given the correlation between confirmed cases and the timing of SAHO adoption.

We also explore potential heterogeneity in the treatment effects. When we estimate our baseline

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<sup>11</sup> We conduct a similar event study analysis of the Google Trends child care search intensity score. As shown in Appendix Figure 1, there is no evidence of pre-trends. Although in the 10 days following the enactment of a SAHO the impact is consistently negative—again implying a reduction in demand—the estimates are never statistically significant.

equation for ECE job postings, we find some evidence of heterogeneity by states: the estimated treatment effect on SAHOs is -0.116 in states with Republican governors and -0.053 in states with Democrat governors, but the standard errors are large and do not allow us to reject the null that they are the same. In addition, we find evidence that the reduction in ECE job postings are concentrated in states that are above the median in terms of COVID-19 cases per capita.

Finally, Table 3 explores heterogeneity across categories of job postings according to the minimum level of education required and work hours offered. For reference, column (1) begins with our baseline effect on all ECE job postings. We subsequently allow elasticities to vary by job postings without any educational requirements, those requiring a high school diploma, those requiring an AA degree, and those requiring a BA degree (or more).<sup>12</sup> We find statistically significant declines in each category, although the magnitudes are somewhat smaller for job postings requiring an AA or BA degree. We also find that the elasticities are almost identical when we distinguish between part- and full-time jobs.

### **Is the SAHO-Driven Reduction in the Demand for ECE Teachers Really Distinctive?**

Recall that our baseline DD estimate suggests that the number of ECE job postings fell by over 13% for each day that a SAHO was in effect. How does this compare to the demand for workers in all other education occupations? To investigate whether our ECE effects merely reflect across-the-board reductions in labor demand, we re-estimate equation (1), using the log number of *all* education-related job postings (except ECE) as the outcome variable. Results from this DD model are reported in Appendix Table 2. Column (3) shows that all other education job postings fell by a marginally significant 6.9% following the enactment of a SAHO. This estimate is a little less than half the magnitude of that in the model for ECE job postings, suggesting that the ECE labor market—more so than other educational services—has been particularly affected by these containment policies.

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<sup>12</sup> As a point of reference: throughout the month of January—and prior to the implementation of SAHOs—41% of ECE job postings did not specify an education requirement; 30% required a high school diploma; 12% required an AA degree; and 17% required a BA degree or more.

## V. Conclusion

Arguably the most robust state-level policy response to the COVID-19 pandemic has been the implementation of stay-at-home orders (SAHOs). As of April 14, 40 states and the District of Columbia had enacted such a policy in order to slow the spread of the virus and to alleviate any capacity constraints experienced by hospitals and other health care providers. Although SAHOs have been effective at mitigating the spread of COVID-19, in part because of widespread compliance with these orders (at least in the short-run), such policies may have caused substantial job loss and firm closure—perhaps in the short- *and* long-run. One particularly vulnerable, though essential, sector is the market for non-parental child care. Indeed, child care services—many of them small businesses—operate on thin profit margins, with some analyses suggesting that programs must keep enrollments close to maximum capacity in order to stay in business (Workman & Jensen-Howard, 2018). However, the supply of child care needs to remain intact for when states end their SAHOs and parents head back to work.

Although some previous work has surveyed child care providers about their plans to close or alter their hiring behavior in the wake of COVID-19, to date no study has quantified the impact of implementing containment policies like SAHOs on the U.S. child care market. The current paper attempts to fill this gap by estimating the short-run impact of SAHOs on the supply of (i.e., number of online job postings) and demand (i.e., through internet searches) for child care. Our results suggest a reduction of 13% in the number of ECE job postings *per day*—implying a reduction in supply—but no discernible change in internet searches for child care—implying little change in demand. The reduction in job postings is driven by preschool-age teacher positions as well as providers in the private-sector. Indeed, SAHOs do not appear to influence hiring behavior in the market for Head Start and pre-kindergarten teachers.

How do we interpret these results? While we cannot rule out a potentially negative effect of SAHOs on child care search behavior, it is statistically insignificant. In this sense, we interpret the effect of SAHOs on child care as largely a supply-side mechanism—that is, had the COVID-19 pandemic and the national quarantine not hit, parents would have continued searching for child care and job postings



would have continued being posted. One way to assess the magnitude of our results is to compare the DD estimates to the number of ECE job postings prior to the full onset of the pandemic. For example, throughout the month of January, child care providers advertised for 7,723 ECE teacher positions—or an average of approximately 250 positions per day. Therefore, our DD estimates imply that as many as 1,000 fewer teachers are hired for every month that a SAHO is in effect. Given that states mandate a child-to-staff ratio of approximately 10-to-1, on average, in center-based settings, a reduction of 1,000 newly hired teachers means that 10,000 fewer preschool-age children can be cared for each month.

An important point to bear in mind is that we are estimating only the short-run impact of SAHOs. As of this writing, such policies remain in effect in some states and have been lifted in many others. It remains to be seen how the implementation and subsequent removal of SAHOs influences child care demand and supply. Therefore, additional work over the next few months will be needed to trace the full impact of these important containment policies.

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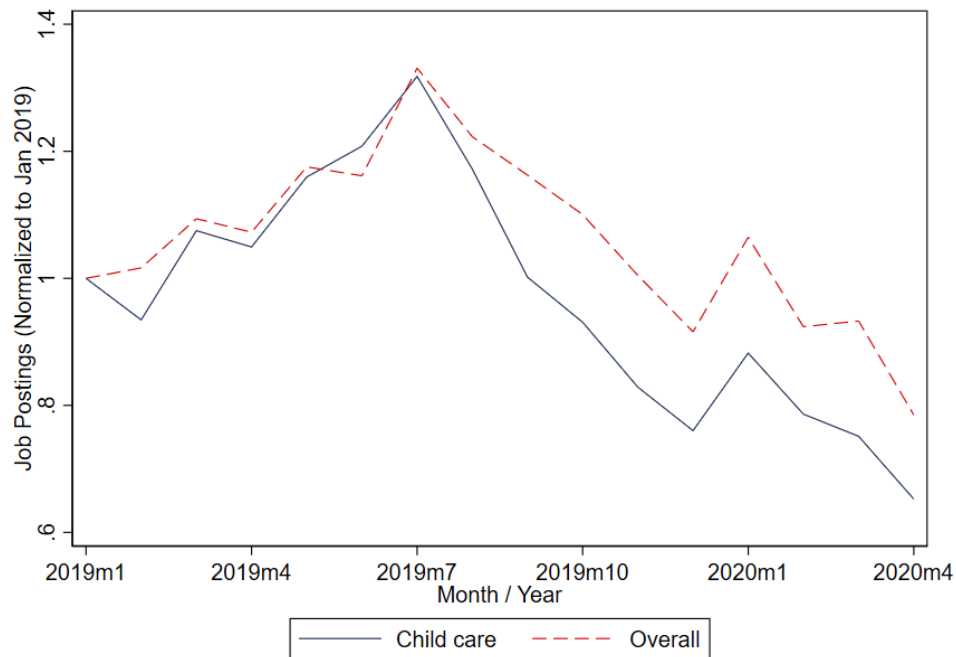
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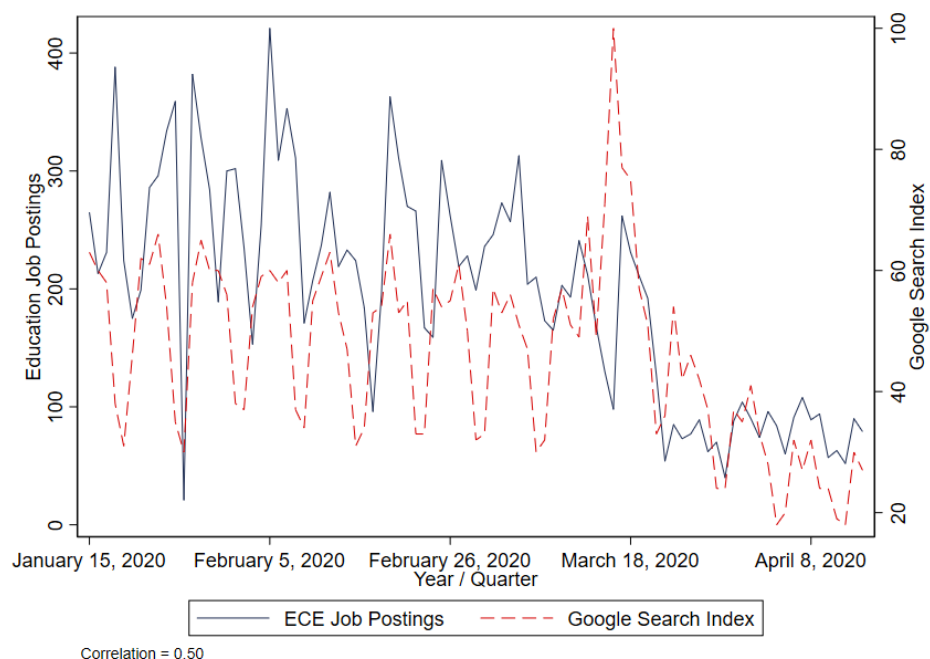
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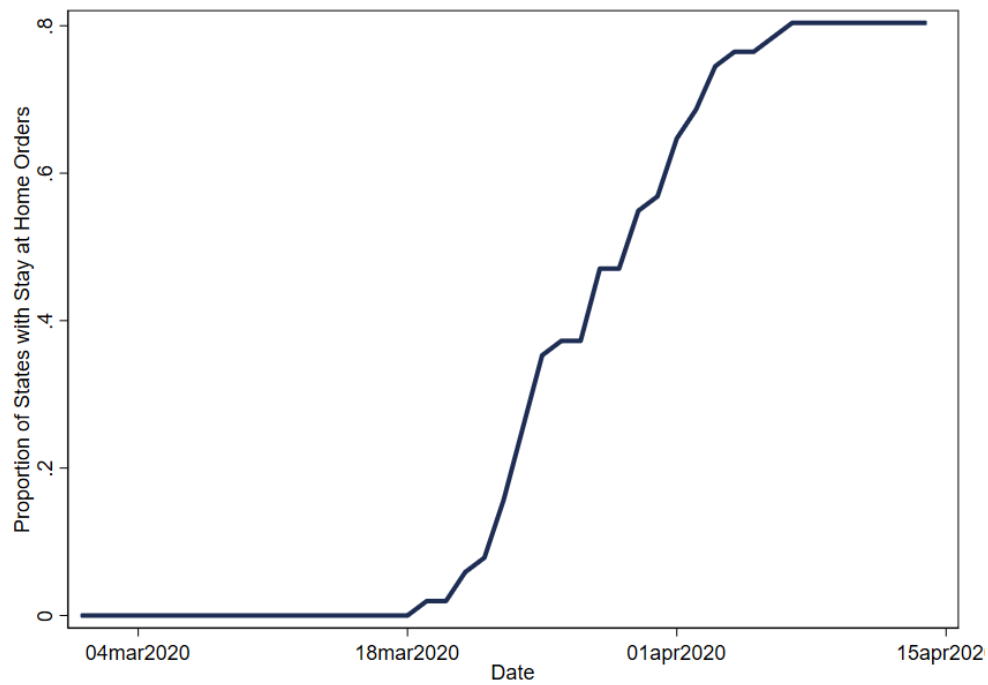
**Figure 1: Time Series Variation in Normalized Early Care and Education and Overall Job Postings, January 2019 to April 2020**

Notes.—Source: Emsi. The figure plots the normalized monthly number of online job postings in early care and education (ECE) occupations (SOC 25-2011, 25-2012, 25-2021, 25-2052), as well as total number of job postings, between January 2019 and April 2020 (normalized to January 2019).



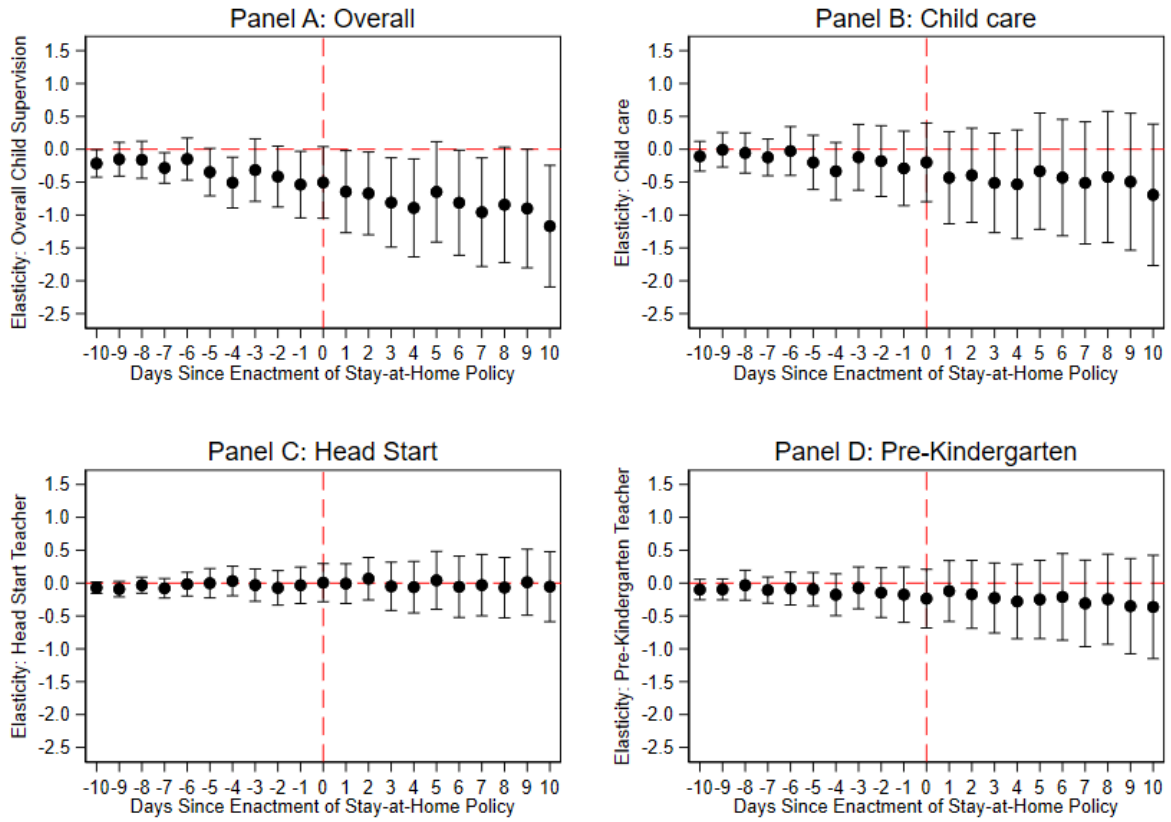
**Figure 2: Time Series Variation in Early Care and Education Job Postings and Child Care Internet Search Intensity, January 15 to April 14, 2020**

Notes.—Source: Google Trends and Emsi. The figure plots the national number of job postings in early care and education (ECE) and the Google Trends search intensity score for the topic of “child care” on each day between January 15 and April 14, 2020.



**Figure 3: Time Series Variation in the Adoption of Stay-at-Home Orders**

Notes.—Source: Mevosh et al. (2020), Dave et al. (2020), and National Governors Association. The figure plots the fraction of states that implemented a SAHO on each day between March 1 and April 30, 2020.



**Figure 3: Event Study Estimates for the Supply of Child Care**

Notes.—Source: Emsi. The figure investigates the presence of pre-trends by regressing the logged number of job postings associated with overall early childhood education (ECE), child care, Head Start, and pre-kindergarten teachers on 10 daily lagged and 10 daily lead variables, conditional on state and day-of-the-year fixed effects. Standard errors are clustered at the state- and month-level.



**Table 1: DD Estimates for the Impact of SAHOs on ECE Job Postings and Google Searches for Child Care**

	ln(number of postings for all ECE jobs)				ln(Google Trends search score “child care”)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1[t > SAHO]	-0.439*** (0.084)	-0.131** (0.062)	-0.132** (0.062)	-0.112* (0.059)	-0.501*** (0.067)	-0.058 (0.057)	-0.057 (0.057)	-0.054 (0.056)
1[t > state of emergency]			-0.048 (0.054)	-0.066 (0.051)			0.028 (0.041)	0.025 (0.041)
1[t > public school closures]			0.073 (0.096)	0.034 (0.097)			0.038 (0.066)	0.031 (0.066)
ln(no. all ed job postings)				0.283*** (0.021)				0.054* (0.029)
Observations	4,641	4,641	4,641	4,641	4,641	4,641	4,641	4,641
R-squared	0.03	0.66	0.66	0.68	0.04	0.37	0.37	0.37
State Fixed Effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Day Fixed Effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes

Notes.—Sources: Emsi. The table reports the coefficients associated with regressions of logged number of all early care and education (ECE) job postings and the logged Google Trends search intensity score for the topic “child care” on an indicator for the passage of a stay-at-home order (SAHO), conditional on an indicator for a state of emergency declaration, school closure orders, the logged number of overall education job postings, and state and day-of-the-year fixed effects. Standard errors, adjusted for clustering in state and month cells, are in parentheses.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

**Table 2: DD Estimates for the Impact of SAHOs on ECE Job Postings, by Age Group and Sector**

	ln(ECE jobs by age-group)				ln(ECE jobs by sector)		
	(1) All ECE	(2) Infant and Toddler	(3) Preschool- Age	(4) School- Age	(5) Child Care	(6) Head Start	(7) Pre- Kindergarten
1[t > SAHO]	-0.132** (0.062)	-0.028 (0.049)	-0.150*** (0.050)	-0.072*** (0.023)	-0.139** (0.063)	-0.004 (0.018)	-0.030 (0.022)
Observations	4,641	4,641	4,641	4,641	4,641	4,641	4,641
R-squared	0.66	0.47	0.54	0.36	0.65	0.2	0.29
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes.—Sources: Emsi. The table reports the coefficients associated with regressions of logged number of early care and education (ECE) job postings by age-group and sector on an indicator for the passage of a stay-at-home order (SAHO), conditional on an indicator for a state of emergency declaration, school closure orders, and state and day-of-the-year fixed effects. Standard errors, adjusted for clustering in state and month cells, are in parentheses.

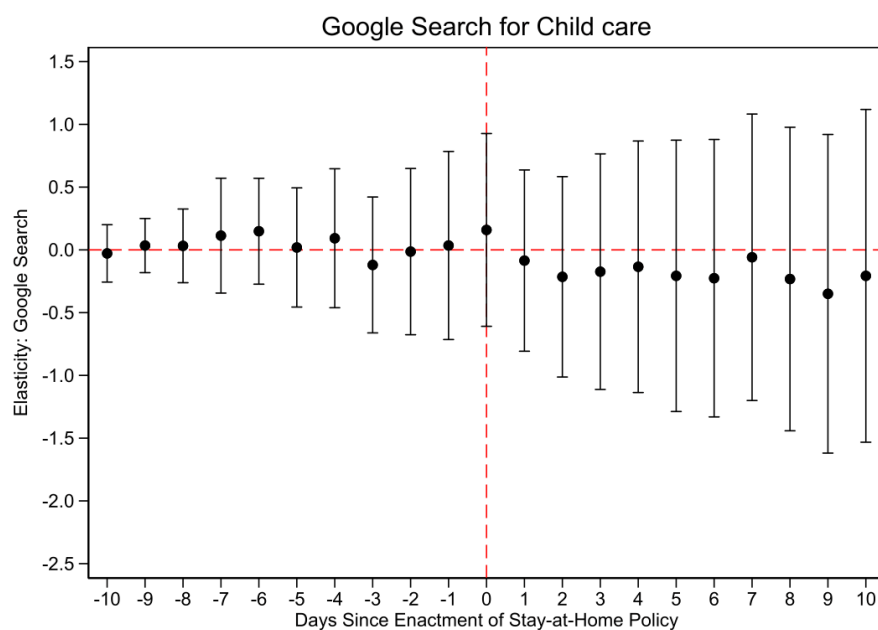
\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

**Table 3: DD Estimates for the Impact of SAHOs on ECE Job Postings,  
by Minimum Education Level Required and Work Hours Offered**

	(1) All ECE	(2) No Ed Listed	(3) High School	(4) AA Degree	(5) BA Degree	(6) Part-time Hours	(7) Full-time Hours
1[t > SAHO]	-0.132** (0.062)	-0.100* (0.052)	-0.089* (0.047)	-0.065** (0.031)	-0.070** (0.033)	-0.120*** (0.039)	-0.118* (0.062)
Observations	4,641	4,641	4,641	4,641	4,641	4,641	4,641
R-squared	0.66	0.53	0.47	0.32	0.39	0.44	0.63
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes.—Sources: Emsi. The table reports the coefficients associated with regressions of logged number of early care and education (ECE) job postings by minimum education level required and part-time/full-time hours offered on an indicator for the passage of a stay-at-home order (SAHO), conditional on an indicator for a state of emergency declaration, school closure orders, and state and day-of-the-year fixed effects. Standard errors, adjusted for clustering in state and month cells, are in parentheses.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.



**Appendix Figure 1: Event Study Estimates for Google Child Care Searches**

Notes.—Source: Emsi. The figure investigates the presence of pre-trends by regressing the logged Google Trends child care search intensity score on 10 daily lagged and 10 daily lead variables, conditional on state and day-of-the-year fixed effects. Standard errors are clustered at the state- and month-level.

**Appendix Table 1: Implementation Dates of Statewide SAHOs**

<b>State</b>	<b>Date</b>	<b>State</b>	<b>Date</b>
Alabama	April 04	Montana	March 28
Alaska	March 28	Nebraska	--
Arizona	March 31	Nevada	April 01
Arkansas	--	New Hampshire	March 28
California	March 19	New Jersey	March 21
Colorado	March 26	New Mexico	March 24
Connecticut	March 23	New York	March 22
Delaware	March 24	North Carolina	March 30
District of Columbia	April 01	North Dakota	--
Florida	April 03	Ohio	March 24
Georgia	April 03	Oklahoma	--
Hawaii	March 25	Oregon	March 23
Idaho	March 25	Pennsylvania	April 01
Illinois	March 21	Rhode Island	March 28
Indiana	March 25	South Carolina	April 07
Iowa	--	South Dakota	--
Kansas	March 30	Tennessee	April 01
Kentucky	--	Texas	April 02
Louisiana	March 23	Utah	--
Maine	April 02	Vermont	March 25
Maryland	March 30	Virginia	March 30
Massachusetts	--	Washington	March 23
Michigan	March 24	West Virginia	March 24
Minnesota	March 28	Wisconsin	March 25
Mississippi	April 03	Wyoming	--
Missouri	April 06		

**Appendix Table 2: DD Estimates for the Impact of SAHOs on  
All Other Education Job Postings**

	ln(no. all education job postings)		
	(1)	(2)	(3)
1[t > SAHO]	-0.327** (0.131)	-0.072* (0.040)	-0.069* (0.039)
1[t > state of emergency]			0.063 (0.047)
1[t > public school closures]			0.137*** (0.050)
Observations	4,641	4,641	4,641
R-squared	0.01	0.83	0.83
State Fixed Effects	No	Yes	Yes
Day Fixed Effects	No	Yes	Yes

Notes: Standard errors, adjusted for clustering in state and month cells, are in parentheses.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.