

# Paid Family Leave Effects on Breastfeeding: A Quasi-Experimental Study of US Policies

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**Objectives.** To test whether paid family leave policies in California and New Jersey improved breastfeeding practices, overall and among key subgroups.

**Methods.** We conducted difference-in-differences analyses, comparing pre–post policy changes in California and New Jersey with changes in states where no paid family leave policies were implemented. We examined a large, diverse sample of children born during 2001 to 2013 ( $n = 306\,266$ ), drawn from the 2003 to 2015 National Immunization Survey waves. Outcomes included ever breastfed, breastfed exclusively at 3 and 6 months, and still breastfed at 6 and 12 months, as well as duration of any breastfeeding and exclusive breastfeeding. We examined heterogeneity in policy response by maternal characteristics.

**Results.** Paid family leave policies resulted in a modestly greater likelihood of exclusively breastfeeding at 6 months. Subgroup analyses were mixed, although several breastfeeding outcomes were consistently improved among married, White, higher-income, and older mothers.

**Conclusions.** Exclusive breastfeeding improved after implementation of paid family leave policies in the overall sample, and additional benefits were noted for more advantaged mothers. This contributes critical evidence to an ongoing policy discussion, suggesting that subsequent paid family leave policies should be designed to target more vulnerable mothers. (*Am J Public Health.* 2019;109:164–166. doi: 10.2105/AJPH.2018.304693)

Most Americans support paid family leave policies to provide benefits for parents after the birth of a child.<sup>1</sup> Despite the potential benefits of paid family leave, the United States is the only high-income nation without a national policy.<sup>2</sup> Earlier return to work after childbirth is associated with reduced breastfeeding and immunization and worsened maternal health.<sup>3,4</sup> Most previous research is correlational and unable to account for confounding by unobserved maternal characteristics. Policymaking implications are therefore unclear. Several states have implemented family leave policies: California in 2004, New Jersey in 2009, Rhode Island in 2014, and New York in 2018.<sup>5</sup> Evaluating the health effects of these policies may inform future US policymaking.

We used a quasi-experimental difference-in-differences approach to assess the effects of US state-level paid family leave policies on breastfeeding, providing critically needed

evidence of health effects across multiple states and among key subgroups.

## METHODS

We analyzed data from the 2003 to 2015 National Immunization Survey (NIS), a nationally representative serial cross-sectional survey that includes breastfeeding questions ( $n = 306\,266$ ; details available as a supplement to the online version of this article at <http://www.ajph.org>). We evaluated paid family

leave policies in California and New Jersey, which allow up to 6 weeks of partially paid leave.

## Measures

We constructed 7 breastfeeding outcomes: ever breastfed; whether the child remained exclusively breastfed at 3 and 6 months; whether the child was still breastfed at 6 and 12 months; days of exclusive breastfeeding; and days of any breastfeeding. Guidelines recommend exclusive breastfeeding for 6 months and continuing breastfeeding for 12 months.<sup>6</sup>

The primary exposure was whether a child was born in a state and year in which a paid family leave policy had been implemented (i.e., after June 2004 in California; after June 2009 in New Jersey).

## Analysis

We first examined sample characteristics. We then used a difference-in-differences approach to assess whether paid family leave policy implementation changed breastfeeding practices. This method compared the pre–post change in California and New Jersey with the pre–post change in other states without paid family leave. That is, it compared the average change in outcomes in the “treatment” group with the change in the “control” group before and after the policy was implemented, similar to an experimental design.<sup>7</sup> We adjusted for several individual- and time-varying state-level factors, state indicator variables (“fixed effects”) to account

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for unobserved time-invariant state-level confounders, and year indicators to account for secular trends.

We also conducted prespecified subgroup analyses to assess effect heterogeneity by maternal marital status, race, income, and age. Previous work suggested that the Family and Medical Leave Act and California policy resulted in differential take-up and effect by socioeconomic status.<sup>8,9</sup> We expected smaller improvements among disadvantaged women, because they may be less able to afford partial wage replacement and therefore return to work sooner. (Details on the difference-in-differences analysis and sensitivity analyses are available as a supplement to the online version of this article at <http://www.ajph.org>.)

## RESULTS

Demographic characteristics were similar across California, New Jersey, and other states (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>), with standardized mean differences less than 0.25. California had fewer White persons and

more Hispanic persons than did other states, whereas New Jersey had more White persons.

California had higher breastfeeding rates across most outcome measures. Of note, difference-in-differences methods assume that the slopes (not the levels) for the treatment and control groups are similar during the prepolicy period (Figures A and B, available as supplements to the online version of this article at <http://www.ajph.org>).

### Difference-in-Differences Analysis

We next examined the effect of paid family leave implementation on breastfeeding practices (Figure 1). Overall, the paid family leave policies increased the percentage of children exclusively breastfed at 6 months (1.3 percentage points; 95% confidence interval = 0.6, 2.0;  $P < .001$ ). Differences in other outcomes were not statistically significantly different at  $P = .05$ .

### Subgroup Analyses

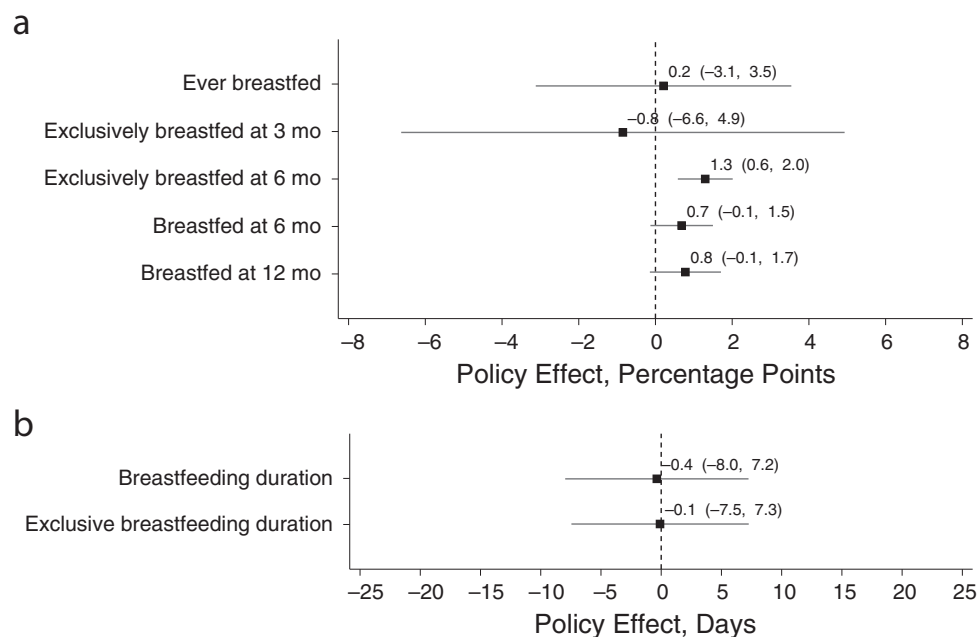
We next assessed heterogeneous effects of the policy by maternal marital status, race, income, and age (Figures C, D, E, and F,

available as supplements to the online version of this article at <http://www.ajph.org>). Here we report only effects for which  $P < .05$  for a joint F test of the subgroup interaction terms.

Relative to unmarried women, married women showed improvements in exclusive breastfeeding at 3 months, any breastfeeding at 6 months, and exclusive breastfeeding duration. Relative to White women, Black women had reduced breastfeeding at 12 months, whereas Hispanic women had improved exclusive breastfeeding at 6 months, and women of other races experienced reductions in ever breastfeeding. Relative to low-income women, middle- and high-income women had improvements in ever breastfeeding, exclusive breastfeeding at 3 months, and breastfeeding duration. Effects by maternal age were similar, except for reduced breastfeeding duration in women younger than 30 years relative to older women.

## DISCUSSION

We used a quasi-experimental approach to examine the effects of state paid family leave



Note. 2003 to 2015 National Immunization Survey data ( $n = 306\,266$ ) show changes in breastfeeding outcomes after a treatment state (California or New Jersey) passed a paid family leave policy. These difference-in-differences estimates are based on multivariable regression models with state fixed effects, fully adjusted for covariates. Error bars represent 95% confidence intervals, clustered at the state level. Full results are available in the supplement to the online version of this article at <http://www.ajph.org>.

**FIGURE 1—Changes in Breastfeeding Practices After State Implementation of a Paid Family Leave Policy in California and New Jersey, Overall Sample, by (a) Binary Outcomes and (b) Continuous Outcomes: National Immunization Survey, 2003–2015**

policies on breastfeeding. Paid family leave policies modestly increased exclusive breastfeeding at 6 months in the sample overall, but we were unable to reject the null hypothesis that there was no effect on the other 6 outcomes. In subgroup analyses, findings were mixed, although women of higher socioeconomic status (i.e., married, White, higher-income, and older mothers) experienced greater benefits for several outcomes.

These findings suggest that paid family leave enactment allowed mothers to modestly extend breastfeeding during infancy, a critical developmental window for child health. Breastfeeding duration is thought to influence infants' risk of infection and other outcomes later in childhood,<sup>10</sup> and future work should examine the long-term health benefits of these policies. Effects on ever breastfeeding were weaker, suggesting that these policies may predominantly increase breastfeeding among mothers who have already decided to breastfeed. Potential mechanisms include increased maternal self-efficacy or bonding beyond the 6 weeks of leave covered by the policies, or increased time to gain the skills and social support to maintain breastfeeding after returning to work.<sup>11</sup> The large sample size enabled us to detect small effects, and effect sizes were modest. This suggests that other factors are also important in breastfeeding initiation and continuation (e.g., milk supply, comorbidities, or subjective norms).<sup>12</sup> However, because we did not have employment information, our sample included both working and nonworking women; because paid family leave policies are less likely to affect breastfeeding among nonworking women, our estimates likely underestimate the effect among employed women. This may in part explain some of the null findings.

This study was the first to examine the differential effects of paid family leave policies on breastfeeding among sociodemographic subgroups. Our findings suggest that the policies examined here favored more advantaged women, consistent with previous studies that found differences in take-up of paid and unpaid leave by socioeconomic status.<sup>9</sup> Because the California and New Jersey policies provide only partially paid leave, the benefits may not be sufficient to support low-income workers who can ill afford any loss of wages, thereby exacerbating health disparities. More generous

benefits may be needed to enable disadvantaged families to take paid leave. Future work should examine how differences in implementation (e.g., benefit duration and generosity) influence employment, breastfeeding, and other maternal and child health outcomes as additional states enact paid family leave policies, especially because California and New Jersey may not be representative of other states.

## PUBLIC HEALTH IMPLICATIONS

Our study provides timely evidence on an ongoing policy discussion, suggesting that, overall, state paid family leave policies modestly increased exclusive breastfeeding at 6 months. Yet we were unable to reject the null hypothesis that there was no effect on the other 6 breastfeeding outcomes. Benefits for several outcomes accrued disproportionately to more advantaged women. If findings are replicated, future policies should be better designed to avoid exacerbating health disparities among vulnerable women. **AJPH**

### CONTRIBUTORS

R. Hamad conceptualized the study design, planned and performed the data analyses, interpreted the findings, and prepared the initial draft of the article. S. Modrek conceptualized the study design, planned the data analyses, interpreted the findings, and critically revised the article. J.S. White conceptualized the study design, planned and performed the data analyses, interpreted the findings, and critically revised the article. All authors approved the final version of the article and have agreed to be accountable for the accuracy and integrity of the work.

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### HUMAN PARTICIPANT PROTECTION

This study used deidentified public data sets, and ethical approval was not required.

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