

# Workplace Leave and Breastfeeding Duration Among Postpartum Women, 2016–2018

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**Objectives.** To examine associations of workplace leave length with breastfeeding initiation and continuation at 1, 2, and 3 months.

**Methods.** We analyzed 2016 to 2018 data for 10 sites in the United States from the Pregnancy Risk Assessment Monitoring System, a site-specific, population-based surveillance system that samples women with a recent live birth 2 to 6 months after birth. Using multivariable logistic regression, we examined associations of leave length (< 3 vs ≥ 3 months) with breastfeeding outcomes.

**Results.** Among 12 301 postpartum women who planned to or had returned to the job they had during pregnancy, 42.1% reported taking unpaid leave, 37.5% reported paid leave, 18.2% reported both unpaid and paid leave, and 2.2% reported no leave. Approximately two thirds (66.2%) of women reported taking less than 3 months of leave. Although 91.2% of women initiated breastfeeding, 81.2%, 72.1%, and 65.3% of women continued breastfeeding at 1, 2, and 3 months, respectively. Shorter leave length (< 3 months), whether paid or unpaid, was associated with lower prevalence of breastfeeding at 2 and 3 months compared with 3 or more months of leave.

**Conclusions.** Women with less than 3 months of leave reported shorter breastfeeding duration than did women with 3 or more months of leave. (*Am J Public Health.* 2021;111(11):2036–2045. <https://doi.org/10.2105/AJPH.2021.306484>)

Breast milk is recognized globally as the ideal form of nutrition for most infants for optimal growth and development.<sup>1,2</sup> Improving US breastfeeding rates is a public health priority.<sup>3,4</sup> In the United States, the American Academy of Pediatrics recommends that mothers exclusively breastfeed for about 6 months and continue breastfeeding as complementary foods are introduced through the infant's first birthday.<sup>1</sup> Although most mothers initiate breastfeeding,<sup>5</sup> many face multiple barriers to continuing.<sup>4,6,7</sup> Specifically, mothers employed outside the home

face unique challenges, including separation from their infants when returning to work and inadequate time or space to express milk at work, which can lead to early cessation of breastfeeding.<sup>6,7</sup> Over the past half century, the number of first-time mothers participating in the workforce has increased, with the percentage who worked during pregnancy increasing from 44% in 1961 to 1965 to 66% in 2006 to 2008.<sup>8</sup> In 2018, nearly two thirds of women who had a live birth in the past year were in the workforce in the United States.<sup>9</sup>

The US *Surgeon General's 2011 Call to Action to Support Breastfeeding* outlined actions employers could take to support employees who breastfeed, including establishing paid maternity leave and lactation support programs.<sup>4</sup> Policies that support maternal leave and breastfeeding for women in the workplace include the Family Medical Leave Act (FMLA),<sup>10</sup> the Patient Protection and Affordable Care Act,<sup>11</sup> paid family leave policies enacted or passed in 8 states and the District of Columbia,<sup>12</sup> and, for federal employees, the Federal Employee Paid Leave Act (effective

October 2020).<sup>13</sup> In addition to leave policies at the state and federal levels, several large organizations offer their employees paid family leave.<sup>14</sup> Although the FMLA (up to 12 weeks of unpaid leave)<sup>10</sup> and paid family leave policies<sup>12–14</sup> provide opportunities for mothers to take leave after delivery, many cannot afford to take unpaid leave, are not covered by the policies, or do not meet the eligibility criteria (e.g., length of time employed, number of hours worked) to participate.<sup>4</sup> Limited access to leave means many women are also returning to the workforce soon after giving birth.<sup>8</sup>

Research examining data before the Surgeon General's *Call to Action*<sup>15–19</sup> and, more recently, state-specific examinations on the effects of paid leave<sup>20,21</sup> and small-scale studies on specific populations (e.g., military)<sup>22</sup> have demonstrated that women who are able to remain on leave longer are also more likely to continue breastfeeding. Population-based analyses that consider both paid and unpaid leave are lacking. We compared the prevalence of breastfeeding initiation and any breastfeeding at 1, 2, and 3 months by length of leave taken, both paid and unpaid, among a large representative sample of recently postpartum women who gave birth during January 2016 to December 2018.

## METHODS

We derived data from the Pregnancy Risk Assessment Monitoring System (PRAMS), a multisite, population-based surveillance system. During the years examined, PRAMS collected data on maternal attitudes, behaviors, and experiences before, during, and shortly after pregnancy using a standardized questionnaire and protocol from 47 states, the District of Columbia, New York City

(NYC), and Puerto Rico (hereafter described as “sites”). PRAMS sites selected a stratified random sample of women with a recent live birth from site birth certificate files 2 to 6 months after birth. Sampled women were mailed a self-administered survey. Following non-response to 3 mailed surveys, PRAMS sites initiated telephone follow-up (up to 15 calls). Each site's PRAMS survey included a mandatory “core” questionnaire, and each site had the option to include additional “standard” questions from a library of optional question modules that expanded on or addressed different topics not captured by core questions. We analyzed PRAMS 2016 to 2018 data from 10 sites (Massachusetts, Maryland, Minnesota, Missouri, North Carolina, New Hampshire, New York State, Vermont, Wisconsin, and NYC) that included standard workplace leave-related questions on their site-specific survey and achieved a weighted response rate of 55% or greater for at least 1 year during the study period. The Centers for Disease Control and Prevention weights PRAMS data for sampling design, noncoverage, and nonresponse to be representative of each site's live birth population. PRAMS sites mailed sampled women a written informed consent with the survey. For those who completed the survey during telephone follow-up, informed consent was completed before starting the survey. Further detail on PRAMS methodology has been described elsewhere.<sup>23</sup>

## Measures

**Type of leave and leave length.** Women who were employed during pregnancy and had returned (or planned to return) to the same job they had during pregnancy after giving birth reported

on the type of leave they took and the length of leave they had taken or planned to take. Respondents were asked, “Did you take leave from work after your new baby was born? (check all that apply)” and asked to respond from the following options: “I took paid leave from my job,” “I took unpaid leave from my job,” and “I did not take any leave.” NYC and Missouri included site-specific responses on type of leave. We coded the NYC response option “I took leave and used temporary disability insurance” as paid leave. In NYC, 29.7% of women who took leave reported receiving temporary disability insurance. We coded the Missouri response option “Family Medical Leave (paid or unpaid)” as unpaid leave based on Missouri Family Medical Leave laws.<sup>24</sup>

We coded type of leave into 4 categories: (1) “paid leave only,” (2) “unpaid only,” (3) “both paid and unpaid leave,” and (4) “no leave.” Women who reported taking any leave were also asked, “How many weeks or months of leave, in total, did you take or will you take?” We categorized leave length as less than 3 months ( $\leq 12$  weeks; this included women reporting no leave) and 3 or more months ( $\geq 13$  weeks) of leave. We selected this categorization, as women might have qualified for up to 12 weeks of leave under the FMLA,<sup>10</sup> and this categorization has been used previously in research assessing breastfeeding outcomes.<sup>25</sup> We also examined the following 3-level categorization of leave length—0 to 5 weeks, 6 to 12 weeks, and 13 or more weeks of leave—as this categorization has also been used in previous research on breastfeeding outcomes.<sup>25</sup> We did not find differences in breastfeeding outcomes between women with 0 to 5 and 6 to 12 weeks of leave (Table A

[available as a supplement to the online version of this article at <http://www.ajph.org>]; therefore, we report on leave categorized as less than 3 versus 3 or more months of leave. To describe whether any leave was paid, we also created a dichotomous indicator distinguishing “no paid leave” (this included women reporting no leave and unpaid leave only) and “any paid leave” (this included women reporting paid leave only or both paid and unpaid leave).

**Breastfeeding initiation and any breastfeeding at 1, 2, and 3 months.** To measure breastfeeding initiation, respondents were asked, “Did you ever breastfeed or pump breast milk to feed your new baby, even for a short period of time?” We used 2 questions to measure breastfeeding duration: (1) women who ever breastfed were asked, “Are you currently breastfeeding or feeding pumped milk to your new baby?” and (2) women who had stopped breastfeeding when they completed the PRAMS survey were asked, “How many weeks or months did you breastfeed or pump milk to feed your baby?” Women whose infant was deceased or not living with them when they completed the survey were instructed to skip breastfeeding-related questions.

We created the following 4 dichotomous yes–no indicators for breastfeeding: (1) breastfeeding initiation, (2) any breastfeeding at 1 month (4 weeks), (3) any breastfeeding at 2 months (9 weeks), and (4) any breastfeeding at 3 months (13 weeks).

## Statistical Analyses

Our analytic sample excluded women whose infants were deceased or not living with them at time of survey completion, women who did not work for pay

during pregnancy, those who were not returning to the same job they had during pregnancy, those who were aged 17 years or younger at time of delivery (because of federal and state-level age restrictions on work hours),<sup>26</sup> and those who were missing data on covariates or leave type and length. We also excluded women who reported inconsistent information between leave type and duration from the analysis. After excluding those with missing or discordant data between leave type and length (3.2% and 4.3%, respectively), missing data on breastfeeding initiation and duration (0.2% and 1.2%, respectively) and covariates (5.5%), our final analytic sample included 12 301 (weighted  $n = 718\,139$ ) women who had worked during pregnancy and had returned or planned to return to the same job after giving birth and for whom leave length and breastfeeding were known.

We performed descriptive statistics (the  $\chi^2$  test and 95% confidence intervals [CIs]) to assess leave length (< 3 and  $\geq 3$  months) overall and separately for selected characteristics and by PRAMS site. We identified selected characteristics a priori based on measures that have been associated with leave or breastfeeding outcomes.<sup>15,19</sup> Data for these characteristics came from birth certificate data available in the PRAMS data set and from PRAMS survey data. Selected characteristics from birth certificate data included maternal race and Hispanic origin (Hispanic, non-Hispanic White, non-Hispanic Black, and non-Hispanic other), age (18 – 24, 25 – 34, and  $\geq 35$  years), education ( $\leq$  high school diploma or general equivalency diploma, some college or associate’s degree, and bachelor’s degree or higher), marital status (married and

unmarried), parity (primiparous and multiparous), and infant gestational age (preterm: < 37 weeks; term:  $\geq 37$  weeks). Federal poverty level ( $\leq 100\%$ ,  $> 100\%–200\%$ , and  $> 200\%$ ) was available from PRAMS survey data. We also examined leave length by type of leave (no paid leave and any paid leave).

We constructed 4 separate models to describe the associations of each breastfeeding outcome (breastfeeding initiation and breastfeeding at 1, 2, and 3 months) with leave length (< 3 and  $\geq 3$  months of leave). We calculated the model-based prevalence estimate for each breastfeeding outcome with predicted marginal means and then estimated both unadjusted prevalence ratios (PRs) and adjusted prevalence ratios (APRs) and their associated 95% CIs for leave length. Each model adjusted for all previously mentioned characteristics, timing of survey completion (< 6 vs  $\geq 6$  months after giving birth), and PRAMS site.

Because previous research has shown that the association of leave length with breastfeeding outcomes varies by select characteristics,<sup>21</sup> we also examined interactions. For each of the selected characteristics previously mentioned, we constructed a separate model, which included an interaction term between the respective characteristic being examined and leave length. If there was a significant interaction ( $P < .01$  based on the F-test for 2-way interaction), we stratified results by the respective characteristic. We also constructed a model to examine the interaction term between leave length and paid leave, and we report these stratum-specific results. Each model contained only 1 interaction term and adjusted for all other selected characteristics.

For all analyses examining breastfeeding at 3 months, we restricted the sample to those who completed the PRAMS survey 3 or more months after delivery ( $n = 10\,031$ ). We performed sensitivity analyses on other breastfeeding outcomes among this restricted sample to assess the robustness of our results. We conducted all analyses with SAS version 9.4 (SAS Institute, Cary, NC) and SAS-callable SUDAAN version 11.0.1 (RTI

International, Research Triangle Park, NC) using weighted data to account for the complex sampling design of PRAMS.

## RESULTS

In our study, there were 12 301 women with a recent live birth who had returned or planned to return to the same job they had during pregnancy after giving birth. Among these women,

97.8% reported taking leave (42.1% reported taking only unpaid leave, 37.5% reported only paid leave, and 18.2% reported both unpaid and paid leave). Women who reported taking or planning to take leave had a mean of 12 weeks of leave (median = 11 weeks), with 66.2% of women reporting less than 3 months of leave and 33.8% reporting 3 or more months of leave (Table 1). By site, the prevalence of 3 or more months of leave ranged from

**TABLE 1— Prevalence of Leave Length After Delivery Among Women With a Recent Live Birth by Selected Characteristics: Pregnancy Risk Assessment Monitoring System, 10 US Sites, 2016–2018**

Characteristics <sup>a</sup>	Total No. <sup>b</sup>	Leave Length		
		< 3 Mo, % (95% CI) <sup>c</sup>	≥ 3 Mo, % (95% CI) <sup>c</sup>	$\chi^2$ P
Total	12 301	66.2 (65.1, 67.3)	33.8 (32.7, 34.9)	
Type of leave <sup>d</sup>				< .001
No paid leave	5 670	70.4 (68.8, 72.0)	29.6 (28.0, 31.2)	
Any paid leave	6 631	62.8 (61.3, 64.3)	37.2 (35.7, 38.7)	
Maternal race and Hispanic origin				< .001
Hispanic	1 276	56.8 (53.0, 60.6)	43.2 (39.4, 47.0)	
Non-Hispanic White	7 303	69.2 (67.9, 70.5)	30.8 (29.5, 32.1)	
Non-Hispanic Black	2 177	61.2 (58.1, 64.2)	38.8 (35.8, 41.9)	
Non-Hispanic other <sup>e</sup>	1 545	61.5 (58.0, 64.9)	38.5 (35.1, 42.0)	
Maternal age, y				< .001
18–24	1 506	78.0 (74.9, 80.8)	22.0 (19.2, 25.1)	
25–34	7 800	66.9 (65.5, 68.3)	33.1 (31.7, 34.5)	
≥ 35	2 995	57.8 (55.4, 60.1)	42.2 (39.9, 44.6)	
Maternal education				< .001
≤ high school diploma or GED	2 199	71.2 (68.4, 73.9)	28.8 (26.1, 31.6)	
Some college or associate's degree	3 337	73.2 (71.1, 75.1)	26.8 (24.9, 28.9)	
Bachelor's or higher degree	6 765	61.2 (59.7, 62.7)	38.8 (37.3, 40.3)	
Marital status				< .001
Married	8 522	64.5 (63.2, 65.8)	35.5 (34.2, 36.8)	
Unmarried	3 779	70.1 (67.9, 72.2)	29.9 (27.8, 32.1)	
Household income by federal poverty level, %				< .001
≤ 100	2 147	72.0 (69.1, 74.6)	28.0 (25.4, 30.9)	
> 100–200	2 333	73.7 (71.2, 76.0)	26.3 (24.0, 28.8)	
> 200	7 821	62.6 (61.2, 64.0)	37.4 (36.0, 38.8)	
Parity				.001
Primiparous	5 524	63.9 (62.2, 65.6)	36.1 (34.4, 37.8)	
Multiparous	6 777	67.9 (66.4, 69.4)	32.1 (30.6, 33.6)	

Continued

**TABLE 1— Continued**

Characteristics <sup>a</sup>	Total No. <sup>b</sup>	Leave Length		
		< 3 Mo, % (95% CI) <sup>c</sup>	≥ 3 Mo, % (95% CI) <sup>c</sup>	$\chi^2$ P
Gestational age at delivery, wk				< .001
Preterm, < 37	1 992	55.5 (52.0, 59.0)	44.5 (41.0, 48.0)	
Term, ≥ 37	10 309	67.0 (65.9, 68.2)	33.0 (31.8, 34.1)	
Site				< .001
Maryland	1 016	68.6 (65.3, 71.7)	31.4 (28.3, 34.7)	
Massachusetts	2 114	56.6 (54.0, 59.3)	43.4 (40.7, 46.0)	
Minnesota	743	67.8 (64.0, 71.4)	32.2 (28.6, 36.0)	
Missouri	1 503	83.0 (80.8, 85.0)	17.0 (15.0, 19.2)	
North Carolina	411	79.1 (74.3, 83.1)	20.9 (16.9, 25.7)	
New Hampshire	668	69.0 (64.7, 73.0)	31.0 (27.0, 35.3)	
New York State	936	64.7 (60.8, 68.4)	35.3 (31.6, 39.2)	
New York City	1 666	44.3 (41.7, 47.0)	55.7 (53.0, 58.3)	
Vermont	1 593	65.0 (62.6, 67.4)	35.0 (32.6, 37.4)	
Wisconsin	1 651	79.3 (76.6, 81.9)	20.7 (18.1, 23.4)	

Note. CI = confidence interval; GED = general equivalency diploma.

<sup>a</sup>Type of leave and household income by federal poverty level were obtained from Pregnancy Risk Assessment Monitoring System (PRAMS) survey data. All other characteristics were obtained from birth certificate data available in the PRAMS data set.

<sup>b</sup>Unweighted sample size.

<sup>c</sup>Weighted % (95% CI).

<sup>d</sup>No paid leave included women reporting no leave and those reporting unpaid leave only. Any paid leave included women reporting paid leave only and those reporting both paid and unpaid leave.

<sup>e</sup>Included women who self-reported as American Indian, Alaska Native, Asian, Hawaiian, Pacific Islander, or mixed race or other non-White on the birth certificate.

17.0% in Missouri to 55.7% in NYC. Prevalence of taking or planning to take 3 or more months of leave after delivery was highest among women who had any paid leave (37.2%), who were aged 35 years or older (42.2%), who had a bachelor's or higher degree (38.8%), who were married (35.5%), who had a household income level higher than 200% the federal poverty level (37.4%), who were primiparous (36.1%), and whose infant was born preterm (44.5%). Prevalence of taking 3 or more months of leave was also higher among those who were Hispanic (43.2%), non-Hispanic Black (38.8%), or non-Hispanic other (38.5%) than among those who were non-Hispanic White (30.8%). Overall, most (91.2%) women reported initiating

breastfeeding; however, the prevalence of any breastfeeding was lower at both 1 (81.2%) and 2 (72.1%) months. Among those who had completed the PRAMS survey at 3 or more months after birth ( $n = 10\,031$ ), 65.3% reported any breastfeeding at 3 months.

In both unadjusted and adjusted analyses (Table 2), a smaller proportion of women who reported taking or planning to take less than 3 months of leave than those reporting 3 or more months of leave reported ever breastfeeding (90.4% vs 93.2%; APR = 0.97; 95% CI = 0.95, 0.98), breastfeeding at 1 month (79.7% vs 84.5%; APR = 0.94; 95% CI = 0.92, 0.97), and breastfeeding at 2 months (70.1% vs 76.2%; APR = 0.92; 95% CI = 0.89, 0.95). Among those who had completed the PRAMS

survey at 3 or more months, a smaller proportion of women who reported taking or planning to take less than 3 months of leave reported any breastfeeding at 3 months than those with 3 or more months of leave (63.2% vs 69.8%; APR = 0.90; 95% CI = 0.87, 0.94). In sensitivity analyses, when restricting to those who had completed the PRAMS survey at 3 or more months, findings for all breastfeeding outcomes at different periods were consistent with that reported for the full sample (Table B [available as a supplement to the online version of this article at <http://www.ajph.org>]).

For breastfeeding initiation and breastfeeding at 1 month after birth, we observed no interactions between any of the maternal and infant characteristics examined and leave length. For

**TABLE 2—** Prevalence and Prevalence Ratio of Breastfeeding Initiation and Breastfeeding at 1, 2, and 3 Months by Leave Length Among Women With a Recent Live Birth Who Were Employed During and After Pregnancy: Pregnancy Risk Assessment Monitoring System, 10 US sites, 2016–2018

	Total No. <sup>a</sup>	Unadjusted % (95% CI) <sup>b</sup>	PR (95% CI)	Adjusted % (95% CI) <sup>b,c</sup>	APR (95% CI) <sup>c</sup>
<b>Initiated breastfeeding, n = 12 301</b>					
Leave length					
< 3 mo	7866	89.6 (88.6, 90.5)	0.95 (0.94, 0.96)	90.4 (89.5, 91.2)	0.97 (0.95, 0.98)
≥ 3 mo	4435	94.3 (93.3, 95.2)	1 (Ref)	93.2 (92.0, 94.3)	1 (Ref)
<b>Breastfeeding at 1 mo, n = 12 301</b>					
Leave length					
< 3 mo	7866	78.7 (77.4, 80.0)	0.91 (0.89, 0.94)	79.7 (78.5, 80.9)	0.94 (0.92, 0.97)
≥ 3 mo	4435	86.1 (84.6, 87.4)	1 (Ref)	84.5 (82.8, 86.0)	1 (Ref)
<b>Breastfeeding at 2 mo, n = 12 301</b>					
Leave length					
< 3 mo	7866	69.0 (67.6, 70.4)	0.88 (0.86, 0.91)	70.1 (68.7, 71.4)	0.92 (0.89, 0.95)
≥ 3 mo	4435	78.0 (76.3, 79.7)	1 (Ref)	76.2 (74.3, 77.9)	1 (Ref)
<b>Breastfeeding at 3 mo, n = 10 031<sup>d</sup></b>					
Leave length					
< 3 mo	6410	62.2 (60.5, 63.8)	0.87 (0.84, 0.90)	63.2 (61.5, 64.7)	0.90 (0.87, 0.94)
≥ 3 mo	3621	71.6 (69.5, 73.5)	1 (Ref)	69.8 (67.6, 71.9)	1 (Ref)

Note. APR = adjusted prevalence ratio; CI = confidence interval; PR = prevalence ratio. This analysis excluded women who did not plan to return to the same job they had during pregnancy.

<sup>a</sup>Unweighted sample size.

<sup>b</sup>Weighted % (95% CI).

<sup>c</sup>Adjusted for type of leave, maternal race and Hispanic origin, age, education, marital status, household income by federal poverty level, parity, infant gestational age, timing of survey completion and Pregnancy Risk Assessment Monitoring System (PRAMS) site. Type of leave and household income by federal poverty level were obtained from PRAMS survey data. All other covariates were obtained from birth certificate data available in the PRAMS data set.

<sup>d</sup>Sample was restricted to those who had completed their PRAMS survey at or after 3 mo after giving birth.

breastfeeding at 2 and 3 months, there was only a significant interaction between leave length and maternal race and Hispanic origin (Table C [available as a supplement to the online version of this article at <http://www.ajph.org>]). Breastfeeding at 2 months was lower among women who reported less than 3 months compared with 3 or more months of leave for women who were non-Hispanic Black (64.8% vs 78.5%; APR = 0.83; 95% CI = 0.77, 0.89), non-Hispanic other (72.4% vs 82.3%; APR = 0.88; 95% CI = 0.81, 0.95), and non-Hispanic White (69.7% vs 74.6%; APR = 0.93; 95% CI = 0.90, 0.97), respectively. Breastfeeding at 3 months was lower among women who reported

taking or planning to take less than 3 months compared with 3 or more months of leave for women who were non-Hispanic Black (55.9% vs 73.5%; APR = 0.76; 95% CI = 0.69, 0.83), non-Hispanic other (63.8% vs 73.5%; APR = 0.87; 95% CI = 0.78, 0.96), and non-Hispanic White (63.6% vs 68.8%; APR = 0.92; 95% CI = 0.88, 0.97), respectively. No differences in prevalence of breastfeeding at 2 and 3 months by leave length were observed among Hispanic women (76.4% vs 76.8% at 2 months; 68.6% vs 66.9% at 3 months).

No significant interactions between leave length and type of leave were observed for breastfeeding outcomes (Table 3). Shorter leave length was

associated with lower rates of breastfeeding at 2 and 3 months, independent of whether any leave was paid.

## DISCUSSION

Despite efforts to increase breastfeeding support in the workplace,<sup>11</sup> differences in breastfeeding duration were evident by length of leave. In this analysis of PRAMS data, we found that approximately two thirds of women took or planned to take less than 3 months of leave after delivery. Breastfeeding initiation was high (> 90%); however, fewer women continued to breastfeed at 1, 2, and 3 months, which is consistent with national estimates.<sup>5</sup>

**TABLE 3—** Prevalence and Prevalence Ratio of Breastfeeding Initiation and Breastfeeding at 1, 2, and 3 Months by Leave Length Stratified by Type of Leave Among Women With a Recent Live Birth Who Were Employed During and After Pregnancy: Pregnancy Risk Assessment Monitoring System, 10 US sites, 2016–2018

	Total No. <sup>a</sup>	No Paid Leave		Any Paid Leave		P <sup>e</sup>
		% (95% CI) <sup>b,c</sup>	APR (95% CI) <sup>c,d</sup>	% (95% CI) <sup>b,c</sup>	APR (95% CI) <sup>c,d</sup>	
<b>Initiated breastfeeding, n = 12 301</b>						
Leave length						.3
< 3 mo	7866	91.2 (90.0, 92.3)	0.98 (0.96, 1.00)	89.4 (87.9, 90.7)	0.96 (0.94, 0.98)	
≥ 3 mo	4435	93.2 (91.4, 94.6)	1 (Ref)	93.2 (91.4, 94.6)	1 (Ref)	
<b>Breastfeeding at 1 mo, n = 12 301</b>						
Leave length						.11
< 3 mo	7866	80.9 (79.1, 82.5)	0.96 (0.93, 1.00)	78.5 (76.7, 80.3)	0.93 (0.90, 0.96)	
≥ 3 mo	4435	83.9 (81.4, 86.1)	1 (Ref)	84.9 (82.6, 86.9)	1 (Ref)	
<b>Breastfeeding at 2 mo, n = 12 301</b>						
Leave length						.6
< 3 mo	7866	71.5 (69.5, 73.3)	0.93 (0.89, 0.97)	68.8 (66.8, 70.7)	0.91 (0.87, 0.95)	
≥ 3 mo	4435	76.8 (74.0, 79.3)	1 (Ref)	75.6 (73.0, 77.9)	1 (Ref)	
<b>Breastfeeding at 3 mo, n = 10 031<sup>f</sup></b>						
Leave length						.91
< 3 mo	6410	64.5 (62.2, 66.7)	0.91 (0.86, 0.96)	62.0 (59.7, 64.2)	0.90 (0.86, 0.95)	
≥ 3 mo	3621	71.2 (67.9, 74.2)	1 (Ref)	68.6 (65.7, 71.4)	1 (Ref)	

Note. APR = adjusted prevalence ratio; CI = confidence interval; PR = prevalence ratio. This analysis excluded women who did not plan to return to the same job they had during pregnancy.

<sup>a</sup>Unweighted sample size.

<sup>b</sup>Weighted % (95% CI).

<sup>c</sup>Adjusted for type of leave, length of leave, maternal race and Hispanic origin, age, education, marital status, household income by federal poverty level, parity, infant gestational age, timing of survey completion and their Pregnancy Risk Assessment Monitoring System site (PRAMS). Type of leave and household income by federal poverty level were obtained from PRAMS survey data. All other covariates were obtained from birth certificate data available in the PRAMS data set.

<sup>d</sup>We constructed separate multivariable survey-weighted logistic regression models to examine the association with each breastfeeding outcome by type of leave between women who reported < 3 mo of leave and those who reported ≥ 3 mo of leave. The reference group for each model was ≥ 3 mo of leave.

<sup>e</sup>P value based on F-test for 2-way interaction between leave length and type of leave.

<sup>f</sup>Sample was restricted to those who had completed their PRAMS survey at or after 3 mo after giving birth.

Women who reported taking or planning to take less than 3 months of leave were less likely to initiate and continue breastfeeding than were women with 3 or more months of leave, with estimates suggesting that this difference increased for each additional month of breastfeeding duration measured. The absolute differences in breastfeeding duration were modest (ranging from 4.8% at 1 month to 6.6% at 3 months). By 3 months, fewer than two thirds of women who had less than 3 months of

leave reported any breastfeeding. Although this finding suggests a low likelihood that women in our sample would meet the American Academy of Pediatrics breastfeeding recommendation to exclusively breastfeed to about 6 months and continue breastfeeding until 1 year or more,<sup>1</sup> we were unable to measure breastfeeding exclusivity or breastfeeding duration beyond 3 months.

Previous studies have yielded mixed results on the relationship between

paid leave and breastfeeding duration, with studies finding a positive or null effect on breastfeeding duration.<sup>15,19</sup> We found no significant interaction between leave length and whether leave was paid for breastfeeding outcomes. Women with shorter leave length, independent of whether it was paid or unpaid, were less likely than were those with longer leave to continue breastfeeding at 2 or 3 months. However, a higher proportion of women with any paid leave reported

taking or planning to take 3 or more months of leave compared with those with no paid leave. These findings suggest that any amount of paid leave might indirectly affect breastfeeding rates by influencing the total length of leave women take. However, we were unable to examine the proportion of usual pay received while on leave, which might also influence decisions on leave length. Previous research has shown that women with paid leave are more likely to take longer leave.<sup>8</sup> Some evidence suggests state-based paid leave policies might be a mechanism for enabling women who might not otherwise be able to afford to take leave to be able to take longer postpartum leave.<sup>20</sup> Of note, women in NYC, where a statewide paid leave policy was implemented in 2018,<sup>12</sup> reported the highest prevalence of 3 or more months of leave among PRAMS sites.

In our sample, the sociodemographic differences (e.g., age, race and Hispanic origin, education) related to the length of leave taken are similar to differences in census data findings on women who received any paid leave and longer periods of leave.<sup>8</sup> Previous studies have also found differences in breastfeeding outcomes by many sociodemographic characteristics, including race and Hispanic origin.<sup>27,28</sup> The significant interaction between leave length and race and Hispanic origin that we found suggests that longer leave minimizes differences in breastfeeding prevalence by race. This finding suggests that access to longer leave may be a strategy to reduce racial/ethnic disparities in breastfeeding rates. Overall, longer leave length was associated with improved breastfeeding rates among all racial/ethnic groups, except for women who were Hispanic. It is unclear

why this relationship was null; however, previous research has demonstrated that Hispanic women have higher breastfeeding rates, independent of other factors typically associated with breastfeeding rates.<sup>29</sup> In addition, it is possible that our analysis might not have been powered to detect differences among Hispanic women.

The proportion of women who take any maternity leave has remained stagnant since 1994,<sup>30</sup> despite efforts to expand access through the FMLA and state-level leave programs.<sup>12,20,30</sup> Although some recent evidence suggests that uptake of the Affordable Care Act provision to cover access to lactation services and breast pumps is associated with increased breastfeeding duration,<sup>31</sup> breastfeeding rates remain suboptimal.<sup>1,5</sup> Despite efforts to increase support of breastfeeding in the workplace, we found that leave length was associated with breastfeeding outcomes. This association contributes to existing evidence about the role that leave plays on the ability of women with a recent live birth to meet American Academy of Pediatrics breastfeeding recommendations.

## Limitations

This analysis is subject to several limitations. We did not have data on the type, location, size of the respondents' employer, work schedule (e.g., part-time, full-time, flexible schedule), or specific type of leave (vacation time, sick time, FMLA, etc.), which might also influence breastfeeding duration. Women who return to work full-time are more likely to cease breastfeeding than are women who return to work part-time.<sup>32</sup> The type of work schedule has also been shown to

play an important role in whether women meet their breastfeeding intentions.<sup>33</sup>

Also, data were unavailable on workplace leave taken or plans for leave for women who returned to a different job than the one they had during pregnancy and for women who were unemployed during pregnancy and actively seeking employment. Therefore, our findings might underrepresent women who had returned or were planning to return to work. In addition, PRAMS did not have data on the proportion of usual pay women received while on leave or the proportion of leave that was paid or unpaid for respondents who reported both.

We also could not examine breastfeeding-related measures that might have confounded our findings, such as breastfeeding intentions and reasons for not starting or stopping breastfeeding. We were also unable to examine breastfeeding exclusivity and any breastfeeding beyond 3 months. PRAMS data are self-reported and subject to social desirability and recall bias. Recall bias might be unlikely, as PRAMS data are collected 2 to 6 months after giving birth and most respondents in this study sample (87%) completed and returned the PRAMS survey between 2 to 4 months after giving birth.<sup>34</sup>

Finally, our findings are also limited to PRAMS sites that included work-related questions on their site-specific survey, potentially limiting the generalizability of our findings to other sites. Despite these limitations, PRAMS provides a rich source of data from women with a recent live birth, which allowed us to examine associations of leave length with breastfeeding outcomes and consider important interactions.



## Public Health Implications

Among women who were employed during pregnancy and returning to work after delivery, nearly all reported taking some leave, with approximately two thirds reporting less than 3 months of leave. Women reporting less than 3 months of leave were less likely to initiate breastfeeding and continue breastfeeding at 1, 2, and 3 months than were women with 3 or more months of leave. A higher proportion of women reporting any paid leave reported taking 3 or more months of leave than women reporting no paid leave. However, the association of length of leave with breastfeeding rates, in general, was independent of whether any leave was paid. Women with less than 3 months of leave reported shorter breastfeeding duration than did women with 3 or more months of leave. *AJPH*

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K. Kortsmitt conceptualized the study, conducted the data analyses, and drafted the article. R. Li, S. Cox, C. K. Shapiro-Mendoza, C. G. Perrine, D. V. D'Angelo, W. D. Barfield, H. B. Shulman, C. F. Garfield, and L. Warner provided significant input on interpretation of the data and review and editing of the article.

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### CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

### HUMAN PARTICIPANT PROTECTION

This was a secondary data analysis and was exempt from institutional review board review. The Centers for Disease Control and Prevention and each site's institutional review boards reviewed and approved the Pregnancy Risk Assessment Monitoring System study protocol.

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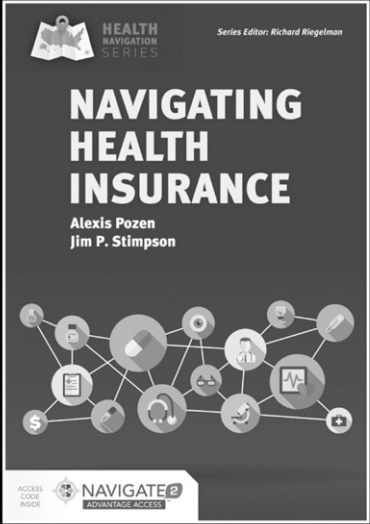
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