Breast Milk Feeding of Infants at Birth Among People With Confirmed SARS-CoV-2 Infection in Pregnancy: SET-NET, 5 States, March 29, 2020–December 31, 2020

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Objectives. To describe prevalence of breast milk feeding among people with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection during pregnancy and examine associations between breast milk feeding, timing of maternal infection before delivery, and rooming-in status during delivery hospitalization.

Methods. We performed a retrospective cohort study using data from Massachusetts, Minnesota, Nebraska, Pennsylvania, and Tennessee of whether people with confirmed SARS-CoV-2 infection during pregnancy in 2020 initiated breast milk feeding at birth.

Results. Among 11 114 (weighted number) people with SARS-CoV-2 infection in pregnancy, 86.5% (95% confidence interval [CI] = 82.4%, 87.6%) initiated breast milk feeding during birth hospitalization. People with infection within 14 days before delivery had significantly lower prevalence of breast milk feeding (adjusted prevalence ratio [APR] = 0.88; 95% CI = 0.83, 0.94) than did those with infection at least 14 days before delivery. When stratified by rooming-in status, the association between timing of infection and breast milk feeding remained only among infants who did not room in with their mother (APR = 0.77; 95% CI = 0.68, 0.88).

Conclusions. Pregnant and postpartum people with SARS-CoV-2 infection should have access to lactation support and be advised about the importance of breast milk feeding and how to safely feed their infants in the same room. (*Am J Public Health*. 2022;112(S8):S787–S796. https://doi.org/10.2105/AJPH.2022.307023)

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Breast milk is the best source of nutrition for most infants.[1] During the COVID-19 pandemic, maternity care practices were affected by infection prevention and control (IPC) measures implemented to protect patients and health care providers (e.g., mother–infant separation, decreased access to lactation services).[2] However, data describing frequency and factors associated with breast milk feeding practices of people with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in the United States were limited.

Recommendations regarding mother–infant contact and direct breastfeeding varied greatly early in the COVID-19 pandemic and changed rapidly over time. In the absence of direct evidence about the risk of SARS-CoV-2 transmission from mothers to infants

and the severity of SARS-CoV-2 infection in infants, in February 2020, the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) recommended considering separation of infants from mothers with suspected or confirmed COVID-19 and providing expressed breast milk for feeding.[3] As more data accumulated on the risk of transmission of SARS-CoV-2 from mothers to their infants, especially when appropriate IPC measures were taken,[4,5] the AAP and the CDC updated recommendations in July and August 2020 to encourage rooming-in and breastfeeding, with precautions taken to protect the infant, including hand hygiene and mask use for breastfeeding mothers with SARS-CoV-2 infection.[6,7] Understanding the impact of the COVID-19 pandemic and risk communications on breast milk feeding is critical to inform public health recommendations, health care practices, and lactation support services.

We sought to report prevalence of breast milk feeding among people with SARS-CoV-2 infection during pregnancy, assess trends in breast milk feeding and rooming-in status over the course of the COVID-19 pandemic, and identify characteristics associated with breast milk feeding. We also sought to examine the association between breast milk feeding and timing of maternal SARS-CoV-2 infection in pregnancy before delivery and whether the association differed when stratified by rooming-in status.

METHODS

The Surveillance for Emerging Threats to Mothers and Babies Network (SET-NET) is a collaboration between the CDC and health departments to conduct longitudinal surveillance of pregnant people and their infants to understand the effects of emerging and reemerging threats, including COVID-19.[8] We found people with SARS-CoV-2 infection during pregnancy through reporting of pregnancy in COVID-19 surveillance or linkages of COVID-19 surveillance data with local data systems (e.g., vital statistics) to determine pregnancy status.

The SET-NET inclusion criteria indicated that a person had to have a laboratory-confirmed SARS-CoV-2 infection (i.e., positive molecular testing) during pregnancy and to have delivered between January 20, 2020 and December 31, 2020. We included data reported to the CDC as of December 3, 2021 in this analysis. We restricted inclusion for this analysis to live births from 5 states collecting data on breast milk feeding: Massachusetts, Minnesota, Nebraska, Pennsylvania, and Tennessee. We excluded people with multiple gestation pregnancies because of known decreased rates of breast milk feeding.[9] We also excluded infants who died on the date of delivery because of the limited chance that breast milk feeding could be initiated. The surveillance period from January 20, 2020 through December 31, 2020 restricted this analysis to only include Alpha, Beta, and Gamma variants. COVID-19 vaccination was not available to the majority of the included population at this time.

We defined being fed breast milk if the infant was ever given colostrum or breast milk from their birth mother, even once, including feeding directly at the breast or by bottle, syringe, or other method during the birth hospitalization. This did not include donor milk. We obtained breast milk feeding information from the birth certificate or medical records. We categorized the timing of maternal infection before delivery (determined by date of first positive SARS-CoV-2 molecular test during pregnancy) as within 14 days or more than 14 days before delivery. We chose the 14-day window to reflect practices and recommendations for isolation and quarantine procedures early in the COVID-19 pandemic. We obtained rooming-in status of mother and infant during the birth hospitalization from medical record abstraction and indicated any rooming-in during the birth hospitalization period.

The covariates we explored were maternal age at infection, maternal race/ethnicity, health insurance at the time of delivery, maternal education, trimester of SARS-CoV-2 infection, maternal COVID-19 disease severity (as previously defined in Galang et al.[10]), labor and delivery characteristics, preterm birth, and neonatal intensive care unit (NICU) admission.[11,12] We classified maternal COVID-19 disease severity criteria as asymptomatic, mild, moderate to severe, or critical from state-reported data from case report forms or maternal medical records. Given previous published reports of racial/ethnic disparities in breastfeeding initiation,[13] we included maternal race/ethnicity as a covariate as a marker of larger health inequities, but we did not assume it to be an independent or biologically plausible explanatory variable.

Of the 5 included states, Minnesota, Nebraska, and Pennsylvania conducted medical record abstraction for all eligible cases; we gave these records a weight of 1.0. Massachusetts and Tennessee implemented random sampling approaches for medical record abstraction. We weighted sampled cases from Massachusetts and Tennessee to account for selection probability and nonresponse for each state.[14] We report weighted prevalence of breast milk feeding by selected maternal, labor

and delivery, and infant characteristics. We also present weighted prevalence of breast milk feeding by month of delivery and rooming-in status stratified by timing of maternal infection, and we used interaction terms to test for statistical differences in trends over time by timing of maternal infection. We estimated adjusted prevalence ratios (APR) and 95% confidence intervals (CIs) for breast milk feeding by Cox regression using constant time at risk to examine timing of maternal infection before delivery and controlling for maternal age, maternal race/ethnicity, health insurance at delivery, and gestational age of infant, which are known risk factors for not initiating breast milk feeding. Because maternal education is a strong predictor of breast milk feeding but was highly missing from 1 state, we fit a second model controlling additionally for maternal education as a sensitivity analysis. We also stratified by rooming-in status to examine differences in the association between breast milk feeding and timing of maternal infection. We conducted analyses using SAS 9.4 software (SAS Institute, Cary, NC) and survey procedures to account for sampling.[15]

RESULTS

The 5 states reported data on 4618 people with SARS-CoV-2 infection in pregnancy and their singleton live-born infants, which after weighting was 11 114 people and their infants. Deliveries included in our analysis occurred between March 29, 2020 and December 31, 2020. Pregnant people were most commonly aged 25 to 29 years (30.8%) and 30 to 34 years (28.8%). Most were reported as non-Hispanic White (46.9%) or Hispanic or Latina (28.4%), 48.2% had Medicaid as their health insurance at delivery, and 31.8% had some college education (Table 1). Maternal infections were identified in the first trimester for 25.5%, in the second trimester for 32.4%, and in the third trimester for 42.1% of people (Table 2). The median time between maternal SARS-CoV-2 infection and delivery was 95.8 days (interquartile range [IQR] = 30.1 days, 175.8 days; data not shown), with 81.9% of people infected more than 14 days before delivery and 18.1% within 14 days before delivery. Among the infants, 69.3% were born via vaginal birth, 91.7% had a gestational age of at least 37 weeks, and 14.6% were reported to have been admitted to the NICU (Table 1).

Overall, 86.5% (95% CI = 82.4%, 87.6%) of mothers reported feeding breast milk to their infant during the birth hospitalization (Table 1). The age distribution was not statistically different between mothers who provided breast milk and those who did not. Mothers with Medicaid and those of non-Hispanic Black race/ethnicity had a lower prevalence of breast milk feeding than did those with private insurance or of other race/ethnicities. Mothers with less education had a lower prevalence of breast milk feeding than did those with college or more education. Mothers whose infants were born preterm or were admitted to the NICU also had a lower prevalence of breast milk feeding relative to mothers of term infants or mothers whose infant was not admitted to the NICU. In addition, mothers who had SARS-CoV-2 infection within 14 days before delivery or had critical illness within 14 days before delivery had a lower prevalence of breast milk feeding than did mothers with infection more than 14 days before delivery or mothers with asymptomatic, mild, or moderate to severe COVID-19.

After adjusting for maternal age, maternal race/ethnicity, health insurance status at delivery, and gestational age of infant, mothers with SARS-CoV-2 infection within 14 days before delivery were less likely to feed breast milk than were mothers with SARS-CoV-2 infection more than 14 days before delivery (APR = 0.90; 95% CI = 0.85, 0.96; Table 3). Results were similar in the secondary analysis when adjusting additionally for education (APR = 0.89; 95% CI = 0.82, 0.97).

Overall, 76.3% (95% CI = 73.3, 79.3) of mothers roomed in with their infants. Prevalence of breast milk feeding was significantly higher among mothers who roomed in with their infants than among those who did not (89.4% vs 77.6%; Table 1). Among mothers who did not room in with their infants, those with SARS-CoV-2 infection within 14 days before delivery were less likely to feed breast milk than were mothers with SARS-CoV-2 infection more than 14 days before delivery (APR = 0.77; 95% CI = 0.68, 0.88; Table 3). Results were similar when adjusting additionally for education (APR = 0.79; 95% CI = 0.67, 0.92). However, among mothers who did room in, there was no association between timing of maternal infection before delivery and breast milk feeding (APR = 0.96; 95% CI = 0.89, 1.04).

In April and May 2020, prevalence of breast milk feeding among people with SARS-CoV-2 infection within 14 days before delivery was less than 70%, which was significantly lower than breast milk feeding prevalence among those with SARS-CoV-2 infection more than 14 days before delivery, but differences in prevalence of breast milk feeding were not significantly different in June through December of 2020 (Figure 1). March 2020 births were not included in Figure 1 because of small numbers. The frequency of rooming-in was lowest early in

TABLE 1— Maternal, Labor and Delivery, and Infant Characteristics Associated With Breast Milk Feeding of Infants at Birth Among People With Confirmed SARS-CoV-2 Infection During Pregnancy: SET-NET, 5 US States, March 29, 2020–December 31, 2020

	Overall		Breast Milk Feeding During Birth Hospitalization		No Breast Milk Feeding During Birth Hospitalization		
	No.	Weighted %[a] (95% CI)	No.	Weighted %[b] (95% CI)	No.	Weighted %[b] (95% CI)	*P*[c]
Overall	4618[d]		4081	86.5 (82.4, 87.6)	537	13.5 (10.7, 15.8)	
Age, y							.21
< 25	1023	23.0 (20.0, 25.9)	879	85.1 (81.3, 89.0)	144	14.9 (11.0, 18.7)	
25–29	1423	30.8 (27.4, 34.1)	1255	83.7 (77.4, 90.1)	168	16.3 (9.9, 22.6)	
30–34	1364	28.8 (25.7, 31.9)	1224	90.5 (88.1, 92.9)	140	9.5 (7.1, 11.9)	
≥ 35	794	17.5 (14.6, 20.4)	712	86.8 (79.6, 94.1)	82	13.2 (5.9, 20.4)	
Not reported	14		11		3		
Race/ethnicity							.002
Hispanic or Latina	1313	28.4 (25.8, 31.1)	1142	86.5 (83.8, 89.2)	171	13.5 (10.8, 16.2)	
Non-Hispanic Asian	304	4.3 (3.6, 5.0)	236	83.4 (78.7, 88.2)	68	16.6 (11.8, 21.3)	
Non-Hispanic Black	826	17.9 (15.0, 20.8)	724	77.7 (68.8, 86.7)	102	22.3 (13.3, 31.2)	
Non-Hispanic White	1950	46.9 (43.2, 50.6)	1778	90.0 (86.1, 94.0)	172	10.0 (6.0, 13.9)	
Non-Hispanic multiple or other race[e]	134	2.4 (1.7, 3.1)	121	85.8 (73.8, 97.8)	13	14.2 (2.2, 26.2)	
Not reported	91		80		11		
Health insurance at delivery							.005
Private	2227	46.5 (42.9, 50.2)	2053	90.4 (86.6, 94.2)	174	9.6 (5.8, 13.4)	
Medicaid	1884	48.2 (44.6, 51.9)	1581	82.4 (78.4, 86.5)	303	17.6 (13.5, 21.6)	
Other and self-pay/none	404	5.2 (3.8, 6.7)	354	86.1 (79.2, 93.1)	50	13.9 (6.9, 20.8)	
Not reported	103		93		10		
Maternal education							< .001
Less than high school	404	15.1 (12.5, 17.6)	326	82.7 (77.3, 88.1)	78	17.3 (11.9, 22.7)	
High school	524	24.1 (20.2, 28.0)	425	75.5 (66.6, 84.4)	99	24.5 (15.6, 33.4)	
Some college	631	31.8 (27.3, 36.3)	541	84.2 (77.3, 91.2)	90	15.8 (8.8, 22.7)	
College or greater	612	29.1 (24.6, 33.5)	579	96.0 (94.0, 98.0)	33	4.0 (2.0, 6.0)	
Not reported	2447		2210		237		
Prenatal care appointments							.18
Yes	4518	99.3 (98.9, 99.7)	4005	86.6 (84.0, 89.3)	513	13.4 (10.7, 16.0)	
Number of visits (median, IQR)		10.3 (8.3, 12.1)		10.6 (10.2, 11.0)		9.4 (7.4, 11.3)	
No	35	0.7 (0.3, 1.1)	25	75.3 (55.0, 95.6)	10	24.7 (4.4, 45.0)	
Unknown	65		51		14		
Induction of labor							.89
Yes	1828	40.1 (36.5, 43.7)	1635	86.8 (81.6, 91.9)	193	13.2 (8.1, 18.4)	
No	2758	59.9 (56.3, 63.5)	2420	86.3 (83.6, 89.1)	338	13.7 (10.9, 16.4)	
Not reported	32		26		6		
Mode of delivery							.93
Vaginal delivery	3241	69.3 (66.1, 72.4)	2874	86.4 (83.2, 89.6)	367	13.6 (10.4, 16.8)	
Cesarean delivery	1372	30.7 (27.6, 33.9)	1203	86.7 (82.1, 91.2)	169	13.3 (8.8, 17.9)	
Not reported	5		4		1		
Gestational age at birth (median, IQR)		39.0 (38.0, 39.8)		39.1 (38.3, 39.8)		38.9 (37.74, 39.3)	
Term (≥ 37 wk)	4234	91.7 (89.7, 93.7)	3784	86.9 (84.1, 89.7)	450	13.1 (10.3, 15.9)	.16

Continued

TABLE 1— Continued

	Overall		Breast Milk Feeding During Birth Hospitalization		No Breast Milk Feeding During Birth Hospitalization		
	No.	Weighted %[a] (95% CI)	No.	Weighted %[b] (95% CI)	No.	Weighted %[b] (95% CI)	*P*[c]
Preterm (< 37 wk)	382	8.3 (6.3, 10.3)	295	82.1 (75.4, 88.8)	87	17.9 (11.2, 24.6)	
Unknown/not reported	2		2		0		
NICU admission							
Yes	477	14.6 (12.2, 17.0)	360	78.0 (71.0, 84.9)	114	22.0 (15.1, 29.0)	< .001
No	3804	85.4 (83.0, 87.8)	3440	90.2 (89.0, 91.5)	364	9.8 (8.5, 11.0)	
Not reported	340		281		59		
Roomed in with mother							
Yes	2178	76.3 (73.3, 79.3)	1990	89.4 (86.2, 92.6)	188	10.6 (7.4, 13.8)	< .001
No	672	23.7 (20.7, 26.7)	519	77.6 (72.6, 82.6)	153	22.4 (17.4, 27.4)	
Not reported	1768		1572		196		

Note. CI = Confidence Interval; IQR = interquartile range; NICU = neonatal intensive care unit; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2; SET-NET = Surveillance for Emerging Threats to Mothers and Babies Network. The states studied were Massachusetts, Minnesota, Nebraska, Pennsylvania, and Tennessee.

[a]Weighted % is calculated as a column percentage.
[b]Weighted % is calculated as a row percentage.
[c]Comparing breast milk feeding during delivery hospitalization to no breast milk feeding during delivery hospitalization; *P* value calculated using χ^2 test; the Fisher exact test used for expected cell counts < 5.
[d]Weighted n = 11 114.
[e]Other race category composed of American Indian or Alaska Native and Native Hawaiian or Pacific Islander, which were reported too infrequently to calculate reliable estimates.

the pandemic, with only 24.5% of people with infection within 14 days before delivery and 40.7% of those with infection more than 14 days before delivery rooming-in with their infants in April of 2020. Frequency of rooming-in increased for both groups over time, but people with infection within 14 days before delivery remained less likely to room in during later months than did those who had infection identified more than 14 days before delivery. Results from interaction testing indicated that the trends over time for both rooming-in and breast milk feeding did not differ by timing of maternal infection relative to delivery (*P* = .63 and *P* = .98, respectively).

DISCUSSION

We found a significantly lower prevalence of initiation of breast milk feeding among people with confirmed SARS-CoV-2 infection within 2 weeks before delivery. Among mothers who roomed in with their infants, the timing of infection before delivery had less of an effect on the prevalence of breast milk feeding after controlling for characteristics associated with breast milk feeding, including maternal age, race/ethnicity, gestational age, and education. Among mothers who did not room in, however, we continued to see a significant reduction in prevalence of breast milk feeding for those with infection closer to delivery. Given how little was known about the impact of SARS-CoV-2 infection and the concern about potential adverse impacts on the infant, separation of mothers from infants for IPC precautions could have led to less breast milk feeding initiation or less support for mothers with SARS-CoV-2 infection earlier in the pandemic and among mothers with infection closer to delivery. Breast milk feeding and rooming-in appeared to improve later in the pandemic, when the recommendations were updated to emphasize the importance of following safety precautions while breast milk feeding.

Statewide breast milk feeding prevalence reported during the majority of 2020 was similar to baseline prevalence estimates of the 5 included states from SET-NET: 83% of infants were ever fed any breast milk.[16] Disparities in breastfeeding initiation exist among people with lower education status, of younger age, and of Black race.[1,12,13] These characteristics are also associated with an increased risk of SARS-CoV-2 infection.[17] In this analysis, we found that

TABLE 2— Maternal SARS-CoV-2 Timing and Severity Characteristics Associated With Breast Milk Feeding of Infants at Birth Among People With Confirmed SARS-CoV-2 Infection in Pregnancy: SET-NET, 5 US States, March 29, 2020–December 31, 2020

	Overall		Breast Milk Feeding During Birth Hospitalization		No Breast Milk Feeding During Birth Hospitalization		
	No.	Weighted %[a] (95% CI)	No.	Weighted %[b] (95% CI)	No.	Weighted %[b] (95% CI)	*P*[c]
Overall	4618[d]		4081	86.5 (82.4, 87.6)	537	13.5 (10.7, 15.8)	
Trimester in which maternal SARS-CoV-2 infection occurred							.53
1st	861	25.5 (21.7, 29.3)	792	87.1 (79.4, 94.8)	69	12.9 (5.2, 20.6)	
2nd	1555	32.4 (29.0, 35.8)	1404	88.5 (84.2, 92.8)	151	11.5 (7.2, 15.8)	
3rd	2199	42.1 (38.8, 45.4)	1882	84.5 (82.1, 87.0)	317	15.5 (13.0, 17.9)	
Not reported	3		3				
Timing of maternal SARS-CoV-2 infection before delivery, d							<.001
>14	3486	81.9 (80.1, 83.8)	3165	88.3 (85.2, 91.5)	321	11.7 (8.5, 14.8)	
≤14	1010	18.1 (16.2, 19.9)	810	78.1 (74.2, 82.1)	200	21.9 (17.9, 25.8)	
Unknown	122		106		16		
Severity of COVID-19							
Asymptomatic infection	624	18.3 (15.9, 20.7)	537	83.5 (78.8, 88.2)	87	16.5 (11.8, 21.2)	.53
Mild	1073	57.1 (52.7, 61.6)	941	84.9 (79.2, 90.6)	132	15.1 (9.4, 20.8)	
Moderate/severe	476	21.9 (17.6, 26.1)	417	84.4 (73.7, 95.1)	59	15.6 (4.9, 26.3)	
Critical	84	2.7 (1.9, 3.5)	54	70.7 (58.9 ,82.4)	30	29.3 (17.6, 41.1)	
Insufficient information	2361		2132		87	16.5 (11.8, 21.2)	
Severity of COVID-19 in 14 d of delivery							
Asymptomatic infection	378	49.4 (43.7, 55.1)	313	80.9 (74.5, 87.2)	65	19.1 (12.8, 25.5)	.005
Mild	149	33.8 (28.0, 39.6)	116	78.4 (70.2, 86.7)	33	21.6 (13.3, 29.8)	
Moderate/severe	67	12.1 (8.5, 15.8)	54	80.2 (68.2, 92.2)	13	19.8 (7.8, 31.8)	
Critical	33	4.7 (2.8, 6.5)	10	42.8 (22.3, 63.2)	23	57.2 (36.8, 77.7)	
Insufficient information	627		493		134		

Note. CI = confidence interval; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2; SET-NET = Surveillance for Emerging Threats to Mothers and Babies Network. The states studied were Massachusetts, Minnesota, Nebraska, Pennsylvania, and Tennessee.

[a]Weighted % is calculated as a column percentage.
[b]Weighted % is calculated as a row percentage.
[c]Comparing breast milk feeding during delivery hospitalization to no breast milk feeding during delivery hospitalization; *P* value calculated using χ^2 test; the Fisher exact test used for expected cell counts less than 5.
[d]Weighted n = 11 114.

TABLE 3— Prevalence of Breast Milk Feeding During Delivery Hospitalization by Timing of Maternal Infection Before Delivery, Overall and Stratified by Rooming-in Status, Among People With Confirmed SARS-CoV-2 Infection in Pregnancy: SET-NET, 5 US States, March 29, 2020–December 31, 2020

	Unadjusted		Adjusted Model 1[a]		Adjusted Model 2[b]	
	Unweighted No.	PR (95% CI)	Unweighted No.	APR (95% CI)	Unweighted No.	APR (95% CI)
Timing of maternal infection before delivery, d						
>14		1 (Ref)		1 (Ref)		1 (Ref)
≤14	4496	0.88 (0.83, 0.94)	4351	0.90 (0.85, 0.96)	2062	0.89 (0.82, 0.97)
Timing of maternal infection before delivery by rooming-in status						
Roomed in with infant, d						
>14		1 (Ref)		1 (Ref)		1 (Ref)
≤14	2160	0.96 (0.89, 1.04)	2072	0.98 (0.89, 1.06)	662	0.98 (0.86, 1.12)
Did not room in with infant, d						
>14		1 (Ref)		1 (Ref)		1 (Ref)
≤14	661	0.77 (0.68, 0.88)	634	0.77 (0.68, 0.89)	310	0.79 (0.67, 0.92)

Note. APR = adjusted prevalence ratio; CI = confidence interval; PR = prevalence ratio; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2; SET-NET = Surveillance for Emerging Threats to Mothers and Babies Network. The states studied were Massachusetts, Minnesota, Nebraska, Pennsylvania, and Tennessee.

[a]Model 1 was adjusted for maternal age, maternal race/ethnicity, health insurance status at delivery, and gestational age.
[b]Model 2 was adjusted for maternal age, maternal race/ethnicity, health insurance status at delivery, gestational age, and education.

breast milk feeding was also lowest among people with fewer years of education and of Black race. It should be noted that disparities in breast milk feeding both in this report and previously published works are the result of historical injustices, larger social determinants, and lack of equitable societal support of breastfeeding practices.[12] The compounding disparities present before the COVID-19 pandemic, as well as those seen in COVID-19 morbidity and mortality by race/ethnicity, emphasize the continued need for focused and culturally relevant breastfeeding promotion efforts in tandem with education regarding breast milk feeding practices in the setting of COVID-19. Variations in frequency of breast milk feeding followed known demographic and birth characteristics, including a lower frequency among mothers enrolled in Medicaid and with lower education levels as well as among infants born preterm, admitted to the NICU, or who did not room in.[1]

Previous studies have demonstrated that infants rooming-in with their mothers encourages initiation of the infant being fed breast milk, and rooming-in is recommended by numerous public health and clinical organizations to support breastfeeding.[1,18–21] Although early recommendations included consideration for temporary separation of mothers with COVID-19 from their newborns, multiple studies have now found low incidence of SARS-CoV-2 infection among infants born to people with SARS-CoV-2 infection[22] and low risk of transmission from mother to infant when appropriate IPC is followed.[23] Since August 2020, AAP and CDC recommendations have encouraged rooming-in and breastfeeding with the use of appropriate IPC measures (e.g., masks, hand hygiene) as well as access to lactation support and support for maintaining milk expression when separation is necessary.[6,7]

Although most infants who test positive for SARS-CoV-2 have mild symptoms or are asymptomatic, severe disease does occur rarely.[24,25] In addition to the numerous well-documented benefits of breastfeeding to both mothers and infants,[1] accumulating evidence suggests that antibodies against COVID-19 are present in the breast milk of mothers with SARS-CoV-2 infection. Multiple reports have now described detection of SARS-CoV-2–specific IgA and IgG in breast milk after infection.[26,27] Breast milk has not been found to contain any SARS-CoV-2 virus particles that can cause infection, and thus, there has been no documented risk of transmission through breast milk.[26] Although it is unclear exactly what level of protection against postnatal SARS-CoV-2 infection these antibodies may provide for infants receiving breast milk, there is a large

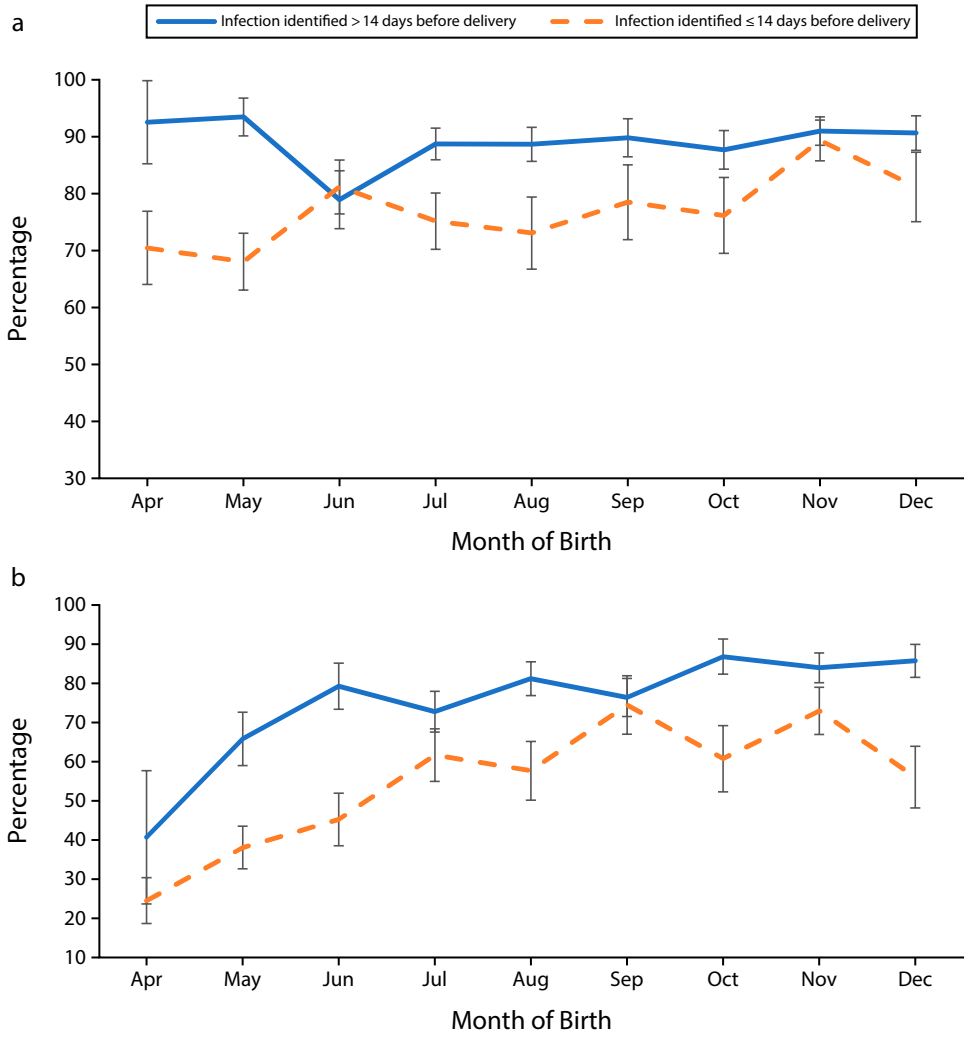

FIGURE 1— Percentage of (a) Breast Milk Feeding and (b) Rooming-in Status During Delivery Hospitalization Among People With Confirmed SARS-CoV-2 Infection During Pregnancy by Month of Birth and Timing of Maternal Infection Before Delivery: 5 US States, Surveillance for Emerging Threats to Mothers and Babies Network, April 1, 2020–December 31, 2020

Note. SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2. The states studied were Massachusetts, Minnesota, Nebraska, Pennsylvania, and Tennessee. March 2020 data are not reported because of small numbers. Whiskers indicate 95% confidence intervals.

body of existing evidence that breast milk feeding reduces infants' risk of respiratory tract infections.[28,29]

Limitations

There are several limitations to note. First, important predictors of maternal breast milk feeding initiation such as marital status, previous initiation of breast milk feeding, skin-to-skin care, and lactation counseling and support are not included in the SET-NET data set. Also, about half of the people in our study did not have enough information available for us to be able to classify disease severity, which may be an important factor in the ability or decision to initiate breast milk feeding. Thus, residual confounding may exist. Second, we were not able to assess or control for facility-level factors that may influence breastfeeding initiation or social determinants of breastfeeding, such as familial support, implicit biases of health care providers, or racism experienced in the health care setting.

Third, SARS-CoV-2 testing or screening practices have varied over the course of the pandemic, complicating interpretation of trends over time. Fourth, medical record abstraction is an ongoing process and might not have been completed for all selected people because of delays in reporting. It is unclear how the addition of these

records might change the findings. Finally, this analysis was limited to breast milk feeding practices at birth hospitalization. It did not account for initiation after birth hospitalization and further follow-up of this cohort is needed to assess the full impact of SARS-CoV-2 infection on breast milk feeding practices over time.

Public Health Implications

All pregnant people, including those with SARS-CoV-2 infection, should be counseled on the benefits of breast milk feeding and rooming-in, the low risk of transmission of SARS-CoV-2 from mothers to infants, and how to safely provide breast milk to their infants with appropriate IPC measures if they have SARS-CoV-2 infection. Health care providers and health care facilities should ensure that people with SARS-CoV-2 infection are supported to feed breast milk. AJPH

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E. L. Lewis, K. R. Woodworth, V. T. Tong, and S. M. Gilboa conceptualized the analysis and drafted the initial article. A. N. Smoots, E. O. Olsen, and V. T. Tong carried out analyses. E. O. Olsen calculated sampling weights. M. Yazdy, H. Shephard, L. Sizemore, H. Wingate, P. Dzimira, B. Reynolds, M. Lush, E. L. Fuchs, K. Ojo, and S. Siebman acquired data. All authors interpreted data, reviewed and revised the article, approved the final article as submitted, and agree to be accountable for all aspects of the work.

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CONFLICTS OF INTEREST

The authors of this article have no conflicts of interest to disclose.

HUMAN PARTICIPANT PROTECTION

This activity was reviewed by the CDC and was conducted consistent with applicable federal law and CDC policy; the activity constitutes a public health surveillance activity deemed not to be research as defined in 45 CFR part 46, 21 CFR part 56; 42 USC Sect. 241(d); 5 USC Sect. 552a; 44 USC Sect. 3501 et seq.

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