



Published in final edited form as:

J Pediatr. 2017 March ; 182: 321–326.e1. doi:10.1016/j.jpeds.2016.11.053.

Differences in Infant Care Practices and Smoking Among Hispanic Mothers Living in the U.S.

Lauren E Provini, BA¹, Michael J Corwin, MD², Nicole L Geller, MPH², Timothy C Heeren, PhD³, Rachel Y Moon, MD⁴, Denis V Rybin, MS⁵, Carrie K Shapiro-Mendoza, PhD⁶, and Eve R Colson, MD¹

¹Department of Pediatrics, Yale University School of Medicine

²Slone Epidemiology Center, Boston University

³Department of Biostatistics, Boston University School of Public Health

⁴Department of Pediatrics, University of Virginia School of Medicine

⁵Data Coordinating Center, Boston University School of Public Health

⁶Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention

Abstract

Objective—To assess the association between maternal birth country and adherence to the American Academy of Pediatrics (AAP) safe sleep recommendations in a national sample of Hispanic mothers, given that data assessing the heterogeneity of infant care practices among Hispanics are lacking.

Study design—We used a stratified, 2-stage, clustered design to obtain a nationally representative sample of mothers from 32 U.S. intrapartum hospitals. 907 completed follow-up surveys (administered 2–6 months postpartum) were received from mothers who self-identified as Hispanic/Latina, forming our sample, which we divided into 4 subpopulations by birth country (U.S., Mexico, Central/South America, and Caribbean). Prevalence estimates and aORs were determined for infant sleep position, location, breastfeeding, and maternal smoking.

Results—When compared with U.S.-born mothers, we found that: mothers born in the Caribbean (aOR 4.56) and Central/South America (aOR 2.68) were significantly more likely to room share without bed sharing. Caribbean-born mothers were significantly less likely to place infants to sleep supine (aOR 0.41). Mothers born in Mexico (aOR 1.67) and Central/South America (aOR 2.57)

Corresponding Author: Eve R Colson, MD, MHPE, Professor of Pediatrics, Department of Pediatrics, Yale School of Medicine PO Box 208064, New Haven, CT 06520-8064 Phone: 203-785-6935, Fax: 203-688-8676, eve.colson@yale.edu.

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The authors declare no conflicts of interest.

Portions of the study were presented at the meetings of: the Pediatric Academic Societies, San Diego, CA, April 25–28, 2015; Cribs for Kids, <city, state>, <dates>, 2015; International Conference on Stillbirth SIDS and Baby Survival, <city, state/country>, <dates>, 2016.

were significantly more likely to exclusively breastfeed; Caribbean-born mothers (aOR 0.13) were significantly less likely to do so. Foreign-born mothers were significantly less likely to smoke before and during pregnancy.

Conclusions—Among U.S. Hispanics, adherence to AAP safe sleep recommendations varies widely by maternal birth country. These data illustrate the importance of examining behavioral heterogeneity among ethnic groups and have potential relevance for developing targeted interventions for safe infant sleep.

Keywords

sudden unexpected infant death; sudden infant death syndrome; infant mortality; Hispanic

Adherence to American Academy of Pediatrics (AAP) guidelines for safe infant sleep has been associated with decreased Sudden Unexpected Infant Death (SUID), including Sudden Infant Death Syndrome.¹⁻⁶ The AAP recommends that infants sleep in the supine position, room share but not bed share, breastfeed (exclusively for the first 6 months), and be in a smoke-free environment.² However, there is heterogeneity in infant care practices associated with sleep-related death across racial/ethnic groups.^{1, 5, 7-9} To date, examination of infant care practices and health outcomes among Hispanics has been limited to broadly pooled racial/ethnic categories. Given the growth of the Hispanic population in the U.S. and extent of cultural variation within this group, there is likely to be variation in infant care practices within this broad ethnic category. To address this knowledge gap, the purpose of this study was to examine the adherence to AAP recommendations for infant care practices, especially safe sleep, among Hispanic subgroups defined by maternal birth country using the Study of Attitudes and Factors Effecting Infant Care Practices (SAFE), a nationally representative survey of mothers of young infants.

METHODS

SAFE had the overall objective of evaluating, in a nationally representative sample, the prevalence of recommended infant care practices and identifying and quantifying factors associated with adherence to these recommendations. SAFE used a stratified, 2-stage, clustered design to obtain a nationally representative sample of mothers of infants aged 2 to 6 months, oversampling Hispanic and non-Hispanic Black mothers. The first stage sampled 32 intrapartum hospitals (Appendix; available at www.jpeds.com) with at least 100 births reported in the past year, using the 2010 American Hospital Association annual survey of hospitals. Among the 32 hospitals initially selected, 69% agreed to participate; sampling procedures were used to identify replacement hospitals within the same stratum (matched for location and population) to complete the full sample of 32 hospitals. Institutional Review Board approval was obtained at all participating institutions.

In the second stage, sampled hospitals were assigned targets for sampling and enrollment of Hispanic, NH-Black, and NH-other race mothers so that approximately 3,000 completed follow-up surveys were obtained from mothers of infants aged 2 to 6 months, including at least 25% of surveys each from Hispanic and NH-Black mothers. Mothers were enrolled between January 2011 and March 2014.

Mothers were eligible for enrollment if they spoke English or Spanish, lived in the United States, and would be caring for their infant by 2 to 4 months after delivery. Eligible mothers were recruited by staff located on site at each hospital, who were specifically trained for the study by the national SAFE staff. At the time of enrollment, during the birth hospitalization, mothers providing written informed consent completed a short initial interview to collect demographic information including: mother's age, education, and income level; pregnancy and delivery history including infant sex and birth weight and mother's parity; and contact information for follow-up from national SAFE staff. Mothers were eligible to complete the follow-up survey, either online or by telephone (administered live by a member of the national SAFE staff) according to personal preference, once their infant was >60 days old. Each mother received a reminder to complete the survey a few days prior to her infant's 60th day of age, and then approximately weekly thereafter until completion of the survey, or until her infant's 180th day of age. Reminders to complete the survey were sent via e-mail, text message, or telephone. After 180 days of age, mothers received no additional reminders but were permitted to complete the survey.

For this paper, we conducted a sub-analysis of participants who responded "yes" to the question, "Do you consider yourself Hispanic or Latina" on the initial enrollment survey. For simplicity, we will refer to all of these mothers as "Hispanic" throughout the remainder of the paper. Of 1124 mothers who identified themselves as Hispanic, completed follow-up surveys were received from 912; of those, 907 completed the portions of the survey relevant to this analysis, for a response rate of 80.7%. 323 Hispanic mothers (35.4%) completed the survey in Spanish, and 589 (64.6%) completed the survey in English. In addition, 452 (49.6%) of the Hispanic mothers completed the survey by telephone, and 460 (50.4%) completed it online.

The initial enrollment survey included questions about maternal demographics, including birth country, and about smoking. The follow-up survey included questions regarding infant care practices, including sleep position, sleep location, and breastfeeding. All measures were self-reported.

Maternal Birth Country and Demographics

In the initial enrollment survey, mothers were asked in which country they were born so that we could gather more information that would allow us to further define ethnicity in our sample. For the analysis, these birth countries were categorized into four regional groups: United States, Mexico, Central/South America, and Caribbean. The language in which the mother chose to take the survey was recorded as her primary language.

Maternal Smoking

In the initial enrollment survey, mothers were asked if they had smoked at least one cigarette per day in the year before their pregnancy. A response of "yes" was classified as *smoked in the year before pregnancy*, and a response of "no" was classified as *no smoking in year before pregnancy*. Mothers who reported smoking before pregnancy were then asked whether they stopped smoking before or during their pregnancy. A response of "yes" was

classified as *no smoking during pregnancy*, whereas a response of “no” or “stopped during the Xth month of pregnancy” was classified as *smoked during pregnancy*.

Infant Sleep Position

To determine infant sleep position, mothers were asked in which position they had usually placed their baby to sleep over the last two weeks. A response of “on the back” was classified as *supine sleep position*, “on the stomach” was classified as *prone sleep position*, and “on the side” was classified as *side sleep position*.

Infant Sleep Location

To determine infant sleep location, mothers were asked where they had usually placed their baby to sleep over the last two weeks. A response of “in a parent’s (or other adult’s) room in his/her own crib” was classified as *room sharing without bed sharing*; “in a parent’s (or other adult’s) bed for part of the night”, “in a parent’s (or other adult’s) bed for the whole night”, “in another child’s bed for part of the night”, or “in another child’s bed for the whole night” were classified as *bed sharing*; and “alone in his/her own room” or “in another child’s room in his/her own crib or bed” were classified as *in a separate room*.

Breastfeeding

To assess breastfeeding status, mothers were asked what their baby had been drinking over the last two weeks. A response of “only breast milk” was classified as exclusive breastfeeding; “mostly breast milk”, “equally breast milk and formula”, or “mostly formula” were classified as partial breastfeeding; and “only formula” or “other” were classified as no breastfeeding.

Statistical Analyses

All analyses accounted for the stratified 2-stage cluster sample design for both parameter estimates and SEs by using SAS (SAS Institute, Inc., Cary, NC) procedures for complex survey designs. Data were weighted to account for sampling probabilities and participant loss to follow-up and to reflect the national joint distribution of maternal age and race/ethnicity.

For the analyses, Hispanic mothers were divided into 4 subpopulations by maternal birth country. In defining the subgroups, we followed a scheme similar to that used by the Centers for Disease Control and Prevention to study both health behaviors and mortality among Hispanics, in which they focus on ethnicity and cluster by geographic region.¹⁰ Mothers who reported being born in the U.S. (N=433) were assigned to the “United States” subgroup. Mothers who reported being born in Mexico (N=332) were assigned to the “Mexico” subgroup. Mothers who reported being born in Argentina (N=1), Bolivia (N=1), Brazil (N=4), Chile (N=2), Colombia (N=5), Costa Rica (N=3), Ecuador (N=2), El Salvador (N=21), Guatemala (N=30), Honduras (N=21), Nicaragua (N=6), Panama (N=3), Peru (N=5), or Venezuela (N=3) were assigned to the “Central/South America” subgroup. Finally, mothers who reported being born in Cuba (N=5), Dominican Republic (N=6), Jamaica (N=1), Puerto Rico (N=21), or Trinidad (N=1) were assigned to the “Caribbean” subgroup.

Other than those listed, no additional birth countries were reported by the Hispanic mothers in our sample.

To assess the heterogeneity of infant care practices among Hispanic mothers by maternal birth country, weighted frequencies of each infant care practice as outlined above were calculated to obtain prevalence estimates within each of the 4 subgroups, as well as among Hispanic mothers overall. Multivariable logistic regression analyses were performed to assess the association between maternal birth country and the likelihood of reporting adherence to AAP recommendations for infant safe sleep, including breastfeeding and smoking. In this logistic regression model, maternal birth country was the primary variable, and all odds ratios generated were adjusted for the following variables, given documented associations from previous literature:¹¹ maternal age, education level, parity, income, U.S. region of residence (Northeast, Midwest, South/Southeast, West), survey mode, infant sex, birth weight, and infant age at time of interview. U.S.-born mothers were defined as the reference group.

Sample size and power calculations for the SAFE survey focused on supine sleep, where for each cycle of 1000 mothers (500 NH-White, 250 NH-Black, and 250 Hispanic), there would be 86% power of detecting a difference in supine sleep between, for example, Hispanic vs. NH-White mothers, corresponding to an OR of 1.90 (assuming a design effect of 1.5 and 74% prevalence of supine sleep). For this sub-analysis of 907 Hispanic mothers, there is 80% power of detecting differences in supine sleep corresponding to ORs of 1.72, 2.17, and 3.37 when comparing mothers born in Mexico, Central/South America, and the Caribbean, respectively, to U.S.-born mothers.

RESULTS

For the 907 Hispanic mothers in our sample, the distribution among the 4 maternal birth country subgroups was as follows: 433 (49.3%) United States, 332 (37.0%) Mexico, 108 (10.0%) Central/South America, and 34 (3.6%) Caribbean. There were demographic differences among the 4 subgroups (Table I). Mothers born in the U.S. and the Caribbean were primarily English-speaking and reached higher levels of education, whereas those born in Mexico and Central/South America were mostly Spanish-speaking and less educated. In terms of age, mothers born in Mexico and Central/South America were younger than mothers in the other subgroups. Region of residence also differed; although the greatest proportion of U.S.-born mothers resided in the West, mothers born in Mexico and Central/South America primarily resided in the South/Southeast, and Caribbean-born mothers in the Northeast. The subgroups were similar in terms of infant age at survey, birth weight, housing status (own vs. rent), and WIC enrollment.

All Hispanic Mothers

Table II illustrates prevalence estimates for each infant care practice among all Hispanics and then by maternal birth country grouping. Overall, the majority of Hispanic mothers reported infant care practices consistent with AAP recommendations for both sleep position (supine, 73.8%) and location (room sharing without bed sharing, 70.0%). One-quarter (25.3%) of the Hispanic mothers reported bed sharing. For breastfeeding, more Hispanic

mothers reported practicing partial breastfeeding (38.4%) than exclusive breastfeeding (26.8%) at the time of the follow-up survey. Finally, 9.5% of all Hispanic mothers reported smoking before pregnancy, and 6.4% reported smoking during pregnancy.

Caribbean-Born Mothers

The Caribbean-born mothers differed from the U.S.-born Hispanic mothers with regard to every infant care practice we examined. Compared with U.S.-born Hispanic mothers, those born in the Caribbean were significantly less likely to place their infants in the AAP-recommended (supine) position for sleep (aOR 0.41, 95% CI 0.22–0.77) and were more likely to adhere to AAP recommendations for infant sleep location, with significantly greater odds of room sharing without bed sharing (aOR 4.56, 95% CI 1.07–19.5) and lower odds of bed sharing (aOR 0.05, 95% CI 0.01–0.46). Caribbean-born mothers were also less likely to exclusively breastfeed their infants (aOR 0.13, 95% CI 0.03–0.63). Finally, the Caribbean-born mothers were less likely to smoke before and during pregnancy than were the U.S.-born mothers.

Mexico-Born Mothers

Hispanic mothers born in either the United States or Mexico made up the largest proportion of our sample, and these two subgroups exhibited similar practices with regard to both infant sleep position and location. However, in terms of breastfeeding practice, the mothers born in Mexico were more likely than the U.S.-born mothers to breastfeed their infants, both exclusively (aOR 1.67, 95% CI 1.03–2.72) and partially (aOR 2.23, 95% CI 1.51–3.29). Those mothers born in Mexico, similar to mothers in each of the other 3 foreign-born subgroups, also had significantly lower odds of smoking both before (aOR 0.07, 95% CI 0.02–0.19) and during (aOR 0.05, 95% CI 0.02–0.16) pregnancy than did the U.S.-born mothers.

Central and South America-Born Mothers

Hispanic mothers born in Central/South America differed from mothers born in the U.S. in their choice of infant sleep location, breastfeeding practice, and smoking. For infant sleep location, they had significantly greater odds of sharing a room but not a bed with their infants (aOR 2.68, 95% CI 1.38–5.22) and lower odds of bed sharing (aOR 0.36, 95% CI 0.19–0.67). They were also more likely than the U.S.-born mothers to breastfeed their infants, both exclusively (aOR 2.57, 95% CI 1.09–6.07) and partially (aOR 2.75, 95% CI 1.22–6.22). Finally, similar to all other foreign-born Hispanic mothers in our sample, the mothers born in Central/South America had significantly lower odds of smoking before (aOR 0.22, 95% CI 0.07–0.71) and during (aOR 0.10, 95% CI 0.01–0.97) pregnancy than did the U.S.-born mothers.

DISCUSSION

As hypothesized before undertaking this study, we found that, among Hispanic mothers of infants living in the U.S., infant care practices differ widely among subgroups by maternal birth country. In general we found that U.S.-born Hispanic mothers were less likely to report that they adhered to safe sleep recommendations, especially with respect to infant sleep

location, when compared with those born outside the U.S. And, the U.S. born Hispanic mothers were also more likely to smoke and less likely to breastfeed. In addition, there was some variation in adherence by those mothers born outside the U.S. depending on country of birth.

Although we are not aware of any other studies examining infant care practices by birth country, our findings are similar to previous studies comparing breastfeeding practices between U.S.-born and foreign-born Hispanic mothers. For example, Singh et al¹² found that among U.S.- born Hispanic women, there are lower rates of breastfeeding initiation and breastfeeding duration to 6 months of age than among those born outside the U.S. Similarly, using language as an index of acculturation, Ahluwalia et al¹³ found that Hispanic mothers who were more acculturated (English-speaking) were less likely to initiate breastfeeding, and that among Hispanic mothers who did initiate breastfeeding, those who were less acculturated (Spanish-speaking) were less likely to quit and also more likely to exclusively breastfeed.

In addition to the studies above, Neighbors et al¹⁴ investigated general behavioral health patterns among Hispanics in more detail, following strategies similar to those that we used. By assessing leisure-time physical activity, they found that health behavior varied widely among Hispanics depending on country of origin.

Our study provides data about the heterogeneity of infant care practices including smoking and breastfeeding among Hispanics based on country of origin, some limitations should be acknowledged. Even though our sampling techniques were designed to achieve a nationally representative sample of mothers overall, they were not targeted specifically at achieving a nationally representative sample of Hispanic mothers. In addition, given the limited number of Hispanic mothers born in certain countries, our definition of subgroups required some regional clustering. Given this, we may not have uncovered all of the subtleties regarding the relationship between maternal birth country and adoption of infant care practices. For example, our treatment of the U.S.-born mothers as a single subgroup did not account for potential sources of heterogeneity with regard to Hispanic ethnicity within this group. Also, the small numbers of mothers from the Caribbean countries represented in this study meant that we had sparse data through which to examine practices among Caribbean-born individuals, thus making interpretation of our findings for this subgroup more difficult. We used country of origin as the primary marker of Hispanic subculture, which has limitations in understanding fully the connection between culture and behavior and does not address the degree to which an individual is acculturated. With regard to the behavioral data, we did not ask mothers about postpartum smoking to assess infant secondhand smoke exposure, which is tied to SUID risk. Also, in examining breastfeeding practices at a single time point, we did not assess how the exclusivity of breastfeeding may change over time. Finally, all behavioral data represented reported infant care practices rather than the actual care practices themselves.

Despite these limitations, we believe this study sheds some light on differences in behavior within the broad and heterogeneous group of Hispanic mothers caring for their infants. Such differences might be taken into account when designing interventions aimed at changing

health-related behaviors as well as when caring for infants and their families in the clinical setting. Given these findings, further research is needed to understand better these behavior differences in larger studies where additional methods of examining Hispanic subculture might be used. Overall, our findings serve to empower the practitioner to explore the various elements of Hispanic subculture with their patients and to consider these in providing tailored care.

Acknowledgments

Funded by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (U10 HD059207). The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

We thank the study staff at the Boston University Slone Epidemiology Center for coordinating data collection from study sites and for all mother follow-up, as well as the study staff at the participating hospitals for their role in data collection and mother enrollment.

Appendix

Participating hospitals include: Baylor University Medical Center, TX; Baystate Medical Center, MA; Ben Taub General Hospital, TX; Bethesda Memorial Hospital and Kidz Medical Services, FL; Brookdale Hospital and Medical Center, NY; Camden Clark Medical Center, WV; Delaware County Memorial Hospital, PA; Geisinger Regional Medical Center, PA; Genesys Regional Medical Center, MI; Hamilton Medical Center, GA; Jersey Shore University Medical Center, NJ; Johns Hopkins Hospital and Medical Center, MD; Kaweah Delta Health Care District, CA; Lake Charles Memorial Hospital, LA; Medical Center of Arlington, TX; Moreno Valley Community Hospital, CA; Mount Carmel, OH; Natchitoches Regional Medical Center, LA; Nashville General Hospital, TN; NorthCrest Medical Center, TN; Riverside County Regional Medical Center, CA; Riverside Regional Medical Center, VA; Rush-Copley Medical Center, IL Saint Francis Hospital and Medical Center, CT; Saint Joseph Hospital, CA; Saint Mary's Health Care, MI; Socorro General Hospital, NM; Sutter Roseville Medical Center, CA; Tacoma General Hospital, WA; Texas Health Presbyterian Hospital Plano, TX; University of California, Davis Medical Center, CA; Wheaton Franciscan Healthcare, WI.

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Abbreviations

AAP	American Academy of Pediatrics
SUID	Sudden Unexpected Infant Death
SIDS	Sudden Infant Death Syndrome
SAFE	Study of Attitudes and Factors Effecting Infant Care Practices
aOR	adjusted odds ratio

Table 1

Demographic Characteristics of Hispanic Study Population

Characteristic	All Hispanic Mothers N=907	Born in United States N=433	Born in Mexico N=332	Born in Central/South America N=108	Born in Caribbean N=34
Language					
English	66.3%	97.4%	30.4%	39.1%	85.9%
Spanish	33.7%	2.6%	69.6%	60.9%	14.1%
Mother's age					
Less than 20	10.2%	13.8%	5.4%	8.0%	17.3%
20 to 29	54.6%	61.9%	46.4%	51.3%	48.6%
30 or more	35.2%	24.3%	48.3%	40.7%	34.1%
Infant Age at Survey					
8–11 weeks	53.1%	57.8%	46.9%	59.8%	33.8%
12–15 weeks	24.3%	22.1%	27.9%	18.7%	32.5%
16–19 weeks	11.3%	8.9%	13.4%	12.6%	19.5%
20+ weeks	11.3%	11.2%	11.8%	8.9%	14.3%
Birth Weight					
<2500 g	5.1%	6.0%	5.3%	0.4%	2.3%
2500+ g	94.9%	94.0%	94.7%	99.6%	97.7%
Region					
Northeast	11.4%	14.2%	2.8%	13.0%	56.4%
Midwest	8.4%	5.1%	14.1%	4.6%	6.5%
South/Southeast	42.5%	31.5%	51.4%	66.5%	35.9%
West	37.7%	49.2%	31.8%	15.9%	1.2%
Housing Status					
Own	28.1%	28.4%	29.5%	25.6%	15.2%
Rent	65.0%	62.2%	66.5%	71.0%	72.2%
Unknown	6.9%	9.4%	4.0%	3.4%	12.6%
WIC Enrollment					

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Characteristic	All Hispanic Mothers N=907	Born in United States N=433	Born in Mexico N=332	Born in Central/South America N=108	Born in Caribbean N=34
Yes	74.0%	70.6%	78.4%	71.1%	82.3%
No	26.0%	29.4%	21.6%	28.9%	17.7%
Parity					
1	30.6%	36.5%	21.5%	30.2%	44.0%
2+	69.4%	63.5%	78.5%	69.8%	56.0%
Mother's Education					
Less than HS	28.2%	17.1%	38.7%	45.3%	26.9%
HS or GED	31.6%	31.5%	36.4%	19.1%	18.2%
Some college	26.4%	36.0%	15.1%	14.4%	44.8%
College or more	13.8%	15.5%	9.8%	21.2%	10.0%
Household Income					
Less than \$20,000	39.3%	41.7%	34.9%	39.8%	50.7%
\$20,000–49,999	35.2%	26.4%	47.1%	34.3%	35.3%
\$50,000 or more	13.7%	18.0%	9.6%	11.4%	4.4%
Unknown	11.8%	14.0%	8.4%	14.4%	9.7%
Survey Mode					
Phone	47.7%	33.7%	66.1%	49.1%	47.7%
Web	52.3%	66.3%	33.9%	50.9%	52.3%

Table 2
Prevalence Estimates and aORs for Infant Care Practices for All Hispanics and by Maternal Birth Country

	All Hispanic Mothers N=907	Born in United States N=433	Born in Mexico N=332	Born in Central/South America N=108	Born in Caribbean N=34	Mexico-born vs. U.S.-born		Central/South America-born vs. U.S.-born		Caribbean-born vs. U.S.-born	
						aOR*	95% CI	aOR*	95% CI	aOR*	95% CI
	Weighted %	Weighted %	Weighted %	Weighted %	Weighted %	aOR*	95% CI	aOR*	95% CI	aOR*	95% CI
Sleep position											
Supine	73.8	74.5	75.1	75.1	47.1	1.03	0.78–1.36	1.21	0.74–1.98	0.41	0.22–0.77
Sleep Location											
Room sharing w/o bed sharing	70.0	66.3	69.6	81.7	91.9	1.09	0.75–1.57	2.68	1.38–5.22	4.56	1.07–19.5
Bed sharing	25.3	27.5	27.7	14.6	1.1	0.99	0.64–1.53	0.36	0.19–0.67	0.05	0.01–0.46
Feeding											
Breastfeeding											
Exclusive	26.8	28.3	26.5	28.7	2.9	1.67	1.03–2.72	2.57	1.09–6.07	0.13	0.03–0.63
Partial	38.4	30.3	46.2	50.9	34.9	2.23	1.51–3.29	2.75	1.22–6.22	0.84	0.43–1.66
Maternal Smoking**											
Before pregnancy	9.5	16.9	1.5	5.2	3.6	0.07	0.02–0.19	0.22	0.07–0.71	0.09	0.02–0.51
During pregnancy	6.4	11.6	1.0	1.9	3.6	0.05	0.02–0.16	0.10	0.01–0.97	0.14	0.03–0.76

* Adjusted for infant age, sex, birth weight, parity, maternal age, education, region, income, and survey mode. All aORs were calculated with the U.S.-born mothers as the referent group.

** aORs for Maternal Smoking not adjusted for infant characteristics: infant age, sex and birth weight.