The Baby-Friendly Hospital Initiative and the Initiation of Breastfeeding in Washington

Rachel Hays

A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Public Health

University of Washington

2017

Committee:

Stephen Hawes

Lesley Steinman

Program Authorized to Offer Degree:

Health Services

University of Washington

Abstract

The Baby-Friendly Hospital Initiative and the Initiation of Breastfeeding in Washington

Rachel Hays

Chair of the Supervisory Committee:

Associate Professor Stephen Hawes

Department of Epidemiology

Background: Though breastfeeding rates have increased over the last 20 years in the United States and in Washington State, increasing the proportion of infants who are breastfed and reducing disparities in breastfeeding rates remain public health priorities. The Baby-Friendly Hospital Initiative (BFHI) aims to improve breastfeeding initiation rates and decrease disparities in breastfeeding.

Research Aims: To examine the relationship between giving birth in a BFHI facility and initiation of breastfeeding overall and according to maternal race, education, Women, Infants, and Children (WIC) status, and insurance status.

Methods: This population-based study included 73,475 women who gave birth to a single, live-born infant in a Washington State birth facility. Maternal and infant characteristics, infant feeding outcomes, and facility of birth were extracted from Washington State birth certificates.

Results: Breastfeeding initiation was very high, with 98.4% and 95.5% of women initiating breastfeeding in BHFI facilities and non-BFHI facilities, respectively. Overall, women who gave birth in a BFHI accredited facility had significantly higher odds of initiating breastfeeding (unadjusted odds ratio 2.90, 95% CI: 2.44, 3.44). After adjusting for race, education, birth country, marital status, parity, WIC status, insurance status, delivery method, and smoking status, the odds of breastfeeding among women who

gave birth in a BFHI accredited facility continued to be significantly higher (OR=2.14, 95% CI: 1.79, 2.56). Race, education, WIC status, and insurance were not found to modify the relationship between hospital designation status and breastfeeding.

Conclusion: BFHI facilities are effective in improving breastfeeding initiation rates overall, even in a state where breastfeeding initiation is already high.

Background

Breastfeeding is one of the most cost-effective health promotion strategies available to improve maternal child health and health throughout the life course (Bartick & Reinhold, 2010; Ip et al., 2007). Because breastfeeding provides such substantial benefits to mothers and infants, the American Academy of Pediatrics (AAP) and other prominent health professional organizations recommend breastfeeding through 12 months of age and exclusive breastfeeding for the first six months of life (American Academy of Pediatrics, 2012). The Healthy People 2020 targets for initiating breastfeeding, exclusively breastfeeding at 6 months, and any breastfeeding at one year are 82%, 25%, and 34%, respectively (U.S. Department of Health and Human Services, 2017). In 2016, national rates were 81% for initiation, 22% for exclusive breastfeeding at 6 months, and 31% for breastfeeding at one year (Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, 2016). Rates varied across states, with higher breastfeeding rates observed in Washington, where our study took place (Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, 2016).

While breastfeeding initiation, duration, and exclusivity have increased over the last 20 years, women still face many challenges and racial and ethnic disparities remain; for example, breastfeeding rates are lowest among African American and American Indian/ Alaska Native (AIAN) women (Centers for Disease Control and Prevention, 2013a; Jones, Power, Queenan, & Schulkin, 2015). Lower levels of education and socioeconomic status are also associated with not initiating breastfeeding and early discontinuation of breastfeeding (Centers for Disease Control and Prevention, 2013a; Jones et al., 2015).

Subsequently, the need for coordinated systems to improve breastfeeding outcomes and eliminate disparities is acknowledged not only in the Healthy People 2020 targets but also in the Surgeon General's Call to Action to Support Breastfeeding, Centers for Disease Control and Prevention (CDC) Guide to Strategies to Support Breastfeeding Mothers and Babies, and the World Health Organization's (WHO) Global Strategy for Infant and Young Child Feeding (Centers for Disease Control and Prevention, 2013b; U.S. Department of Health and Human Services, 2011; World Health Organization, 2002). These recommendations call for policy changes across all sectors including communities, healthcare,

employers, and government, with an emphasis on hospital policy, so that every mother has access to culturally competent, high quality care and has an equal opportunity to initiate breastfeeding in the hospital (Centers for Disease Control and Prevention, 2013b; U.S. Department of Health and Human Services, 2011; World Health Organization, 2002).

Supportive maternity care policies and practices in the hours and days following birth can directly impact breastfeeding success (DiGirolamo, Grummer-Strawn, & Fein, 2008; Perez-Escamilla, Martinez, & Segura-Perez, 2016). The Baby-Friendly Hospital Initiative (BFHI), established by WHO and UNICEF in 1991 and implemented in the United States by Baby-Friendly USA, specifies 10 maternity care practices known as the *Ten Steps to Successful Breastfeeding* that are associated with successful breastfeeding (Figure 1) (UNICEF, 2002).

While increasing the proportion of births that occur at Baby-Friendly Hospitals is a public health priority, only about 18.3% of infants in the U.S. are born in hospitals that are designated Baby-Friendly (Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, 2016; U.S. Department of Health and Human Services, 2011). Beginning in 2012, the Washington State Department of Health, the Breastfeeding Coalition of Washington, and the Statewide Perinatal Advisory Committee formed a partnership in Washington aimed at assisting nineteen facilities to improve breastfeeding support practices, yet only 11.5% of 2013 Washington State births occurred at a BFHI facility (Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, 2016).

Most of the research of the effectiveness of the BFHI has been conducted internationally. In a 2016 systematic review that included 58 mostly internationally-conducted studies published prior to December 2012, 55 studies found that that adherence to the BFHI's *Ten Steps* has a positive impact on short-term, medium-term and longer-term breastfeeding outcomes and none suggested a negative impact (Perez-Escamilla et al., 2016). However, when the U.S. Preventive Services Task Force published their recommendations in 2016, their literature review included only two domestically-conducted studies from 2014 and 2015 (Patnode, Henninger, Senger, Perdue, & Whitlock, 2016). Based on the findings of these

two studies, the U.S. Preventive Services Task Force concluded there to be limited mixed evidence of the effectiveness of the BFHI in increasing breastfeeding rates (Patnode et al., 2016). Because of their *a priori* selection criteria, they excluded many observational studies and before-and-after studies that found an association between BFHI designation and elevated breastfeeding rates (Declercq, Labbok, Sakala, & O'Hara, 2009; DiGirolamo et al., 2008; Merewood, Mehta, Chamberlain, Philipp, & Bauchner, 2005; Philipp et al., 2001; Rosenberg, Stull, Adler, Kasehagen, & Crivelli-Kovach, 2008). The two studies that were included in the literature review used PRAMS data from Maine and from five states, including Washington, for a multi-state analysis; neither study found an overall difference in breastfeeding initiation rates (Hawkins, Stern, Baum, & Gillman, 2014, 2015). However, despite finding no overall difference in breastfeeding initiation rates, they found that the BFHI did positively impact breastfeeding initiation rates in women who had less education (Hawkins, Stern, Baum, & Gillman, 2014, 2015).

To build on this previous mixed research examining BFHI's relationship with breastfeeding initiation, this study has two aims. First, we will examine the relationship between giving birth in a BHFI facility and initiation of in-hospital breastfeeding. Second, we will evaluate the impact of designation as a Baby-Friendly hospital on breastfeeding initiation by maternal race, education, Women Infants, and Children (WIC) status, and insurance status.

Methods

Design

This study is a state-based cross-sectional study and was approved by the Washington State Institutional Review Board.

Data collection

All data was extracted from Washington State birth certificates from 2015. Birth certificates in Washington are completed by the hospital or birth attendant and are filed with the State Department of Health electronically via the Electronic Birth Certificate.

Setting

Washington spans 70,000 miles and was home to as estimated 7,061,410 people living in diverse urban and rural communities in 2015 (Office of Financial Management, 2015). In 2015, there were 90,372 live births in Washington State and there were 60 facilities that had more than 90 births during the year.

Sample

Of the 90,371 live births in Washington for whom we had complete information on facility of birth, we excluded 2,554 mothers who gave birth at facilities with less than 90 births in 2015. We excluded 1,686 mothers who gave birth at home, out of state, in an unknown location or other medical facility and 1,014 whose breastfeeding status was unknown. We also excluded 46 mothers who had HIV. We then excluded 7,069 mothers whose infants were admitted to the NICU during the birth hospitalization and an additional 191 mothers whose infants passed away during the birth hospitalization or were transferred. We also excluded 57 women who were in the ICU. Lastly, we excluded 1,673 multiple births and 2,606 infants who were born before 37 weeks gestation, using the clinical estimate of gestation.

The final sample had 73,475 women who gave birth to a single, live born baby in a facility in Washington State, with 8,576 women (11.6%) birthing in a facility that was designated Baby-Friendly in 2015.

Measurement

Exposure and Outcome Variables

Baby-Friendly USA, the accrediting agency for the Baby-Friendly Hospital Initiative in the United States, provides a list of hospitals designated by state and includes the month and year of designation. For our analysis, we defined Washington State Baby-Friendly Hospitals in 2015 as Evergreen Hospital Medical Center, Jefferson Health Care, Legacy Salmon Creek Medical Center, Three Rivers Hospital, and University of Washington Medical Center (Baby-Friendly USA, 2017). Legacy Salmon Creek Medical Center did not receive their official designation until July of 2015, but was counted as a Baby-Friendly Hospital in our analysis for the entirety of 2015. This facility would already have been well on the path towards designation and would have undergone their site visit prior to designation in July 2015, thus

ensuring that they were in compliance with BFHI requirements. We defined breastfeeding initiation as yes if on the birth certificate the box was marked “Yes” next to the question, “Is infant being breastfed?”

Demographic Variables

Birth certificate data includes information on maternal race, age, birth country, education, marital status, payment and method of delivery, smoking status, and other characteristics of the mother and infant. We combined the variables for maternal race and ethnicity to more accurately capture the proportions of non-Hispanic white, non-Hispanic black and Hispanic mothers. If women reported either her race or her ethnicity to be Hispanic, she was counted as such. We dichotomized the variable for country of birth as US-born or foreign-born. For maternal age, we categorized women into 5 categories: less than 20 years old, 20-24, 25-29, 30-34, and 35 and above. For maternal education, we collapsed the variable for education into 5 categories: did not finish high school, high school graduate or GED, some college, associate’s degree or bachelor’s degree, and master’s degree, Ph.D., or professional degree. For payment of delivery, we created a category called “Other” for charity care, other government insurance, and Indian Health insurance and compared it to private health insurance, Medicaid, and Tricare (U.S. Armed Forces). For delivery method, vaginal deliveries and vaginal birth after previous cesarean section(s) were considered vaginal births and primary or repeat cesarean sections (with or without labor) were considered cesarean section. For parity, the variable for previous live-born children was dichotomized into primiparous and multiparous. For smoking status, if a woman smoked more than one cigarette in trimester one, two, or three, then she was considered a smoker.

Data analysis

For the first aim of this study, we first used logistic regression and calculated an unadjusted odds ratio to examine the relationship between giving birth in a facility with the Baby-Friendly designation and the initiation of breastfeeding. We then used multivariable logistic regression to calculate an adjusted odds ratio, including variables that were decided *a priori* and are known to be associated with breastfeeding duration: maternal race, maternal country of birth, maternal education attainment, maternal age, marital status, parity, WIC status, insurance used to pay for delivery, method of delivery, and smoking status.

For our second aim, based on past studies and our knowledge of socioeconomic and racial disparities in breastfeeding, we fit four additional logistic regression models with interaction terms to study if race, maternal education, insurance status, or WIC status modified the relationship between hospital designation status and breastfeeding and calculated marginal odds ratios.

Results

Table 1 illustrates demographic characteristics by hospital status. Women who gave birth in Baby-Friendly facilities were more likely to be born outside the United States, be older, have more education, and be married. Women who gave birth in non-BFHI facilities were more likely to have Medicaid, use WIC, and have a vaginal birth.

We found evidence of an effect of the BFHI on breastfeeding initiation. Breastfeeding initiation in our study population was very high, with 98.4% of women initiating breastfeeding in BFHI facilities and 95.5% of women initiating breastfeeding in non-BFHI facilities. Women who gave birth in a BFHI facility were more likely to breastfeed than women who gave birth in a non-BFHI facility (OR=2.90, 95% CI: 2.44, 3.44).

The data did not provide any evidence that maternal educational attainment (p=0.23), insurance status (p=0.20), WIC status (p=0.49), or race (p=0.34) modified the association between hospital designation status and breastfeeding (Table 2).

After adjusting for race, education, birth country, marital status, parity, WIC status, insurance status, delivery method, and smoking status, we estimate that the odds ratio of breastfeeding between a woman who gave birth in a BFHI facility and a woman who gave birth in a non-BFHI facility was 2.14 (95% CI: 1.79, 2.56).

To assess the impact of the decision to include Legacy Salmon Creek as a BFHI facility even though it became designed as a BFHI facility in mid 2015, we conducted a sensitivity analysis, excluding this hospital from the analysis. With Legacy Salmon Creek removed, the unadjusted odds ratio of breastfeeding for a woman who gave birth in a BFHI facility and a woman who gave birth in a non-BFHI facility was 4.30 (95% CI: 3.34, 5.58) and the adjusted odds ratio was 2.76 (95% CI: 2.09, 3.65).

Discussion

Rates of breastfeeding initiation were high, but were expected to be high, as women who were at risk for not breastfeeding had been excluded from the study. Our study population is a subset of a larger population in Washington state who already initiates breastfeeding at higher rates than average, when compared to the rest of the United States (Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, 2016).

The findings from this study suggest that women who give birth in Baby-Friendly Hospitals are more likely to initiate breastfeeding, even where breastfeeding initiation is already very common. The relationship that we observed is consistent with much of the previous literature from observational studies that found an overall difference of breastfeeding initiation (Merewood et al., 2005; Perez-Escamilla et al., 2016; Philipp et al., 2001; Rosenberg et al., 2008). As an example, in a 2005 study that used data from 2001 when 32 hospitals in the United States had a Baby-Friendly designation, researchers reported that the mean breastfeeding initiation rate for the 28 reporting Baby-Friendly hospitals was 83.8%, compared with a US breastfeeding initiation rate of 69.5% (Merewood et al., 2005).

Nevertheless, in Australia, in a high-income, high-initiation setting, researchers did not find an overall difference, nor did the researchers in the two longitudinal studies included in the US Preventive Services Task Force Literature Review (Brodribb, Kruske, & Miller, 2013; Hawkins et al., 2014; Hawkins, Stern, Baum, & Gillman, 2015). In the latter two studies, researchers found that while BFHI designation did not increase breastfeeding initiation overall compared to non-BFHI facilities, it benefitted women with less education (≤ 12 years) more than it did women with more education (≥ 13 years). However, in both

studies, they dichotomized education and in our study, we included more categories of education, given that maternal education in Washington is quite heterogeneous, with more than 90% of women completing high school.

Using five education categories, we did not see any interaction between hospital designation status and education, nor did we find any interaction for WIC status, insurance status, or race. Even though there was no statistical difference by education with 5 categories, we observed that higher education was associated with higher breastfeeding initiation. The magnitude of difference in breastfeeding initiation rates was greatest in those with low education. For women who did not graduate high school, 90.2% initiated breastfeeding in non-BFHI facilities and 94.7% initiated breastfeeding in BFHI facilities. For women who graduated high school, in-hospital initiation improved to 93.3% in non-BFHI facilities and 97.9% in BFHI facilities, which is more comparable to the initiation rates of those who at least attended some college. Women who attended some college initiated breastfeeding more than 95% of the time, regardless of BFHI designation status. Therefore, even though we did not find a significant interaction with regards to odds ratios in each group, there was a trend in that the impact, as measured by difference in prevalence of breastfeeding in BFHI facilities vs. non-BFHI facilities, was greatest in those with less education.

In terms of race and ethnicity, the effect of giving birth in a BFHI facility was greatest for Asian, Pacific Islander, and Hawaiian women (OR= 3.94, 95% CI: 2.29, 6.77), but a greater proportion of women initiated breastfeeding for every race and ethnicity in BFHI facilities. We removed AIAN women from the interaction model due to the small sample size of only 65 women giving birth in BFHI facilities, but evidence suggests that this may be a group that would benefit from giving birth in a BFHI facility, as 100% of AIAN women in our study initiated breastfeeding in BFHI facilities and only 88.1% of AIAN women did in non-BFHI facilities. The Indian Health Service (IHS) actively supports breastfeeding promotion and, subsequently, created the IHS Baby-Friendly Hospital Initiative in 2011 (Anstey, MacGowan, & Allen, 2016). At the end of 2014, all 13 IHS hospitals with obstetric services were designated as BFHI facilities, though none were in Washington State (Anstey et al., 2016). Because there are no Washington IHS

obstetric hospitals, AIAN women could have improved breastfeeding outcomes if the facilities that serve them in Washington State receive the BFHI designation. This may be an area where further research is needed.

Addressing disparities and improving breastfeeding outcomes for black women is an important public health priority in the United States (Jones et al., 2015). In 2013, only 66.3% of black women initiated breastfeeding nationwide, yet black women in our study initiated breastfeeding at much higher rates (Centers for Disease Control and Prevention, 2015). Overall, 95.5% of black women in our study initiated breastfeeding; 97.8% initiated breastfeeding in BFHI facilities and 95.2% did so in non-BFHI facilities. We found no evidence that a large population of foreign-born black women accounted for the difference. Using birth certificate data to generate breastfeeding initiation rates does not explain the much higher rates of breastfeeding initiation seen in our study for black women in Washington state. Other studies have found breastfeeding initiation rates generated from birth certificate data to be similar to those estimated using survey data; therefore, birth certificates do not systematically overestimate breastfeeding initiation and is not an explanation for the higher rates seen in our study (Kachoria & Oza-Frank, 2014; Li et al., 2014; Thompson et al., 2013). Further research is needed to understand why black women in the rest of the country are initiating breastfeeding at rates much lower than in Washington State.

Similar to maternal education and race, even though we did not find a significant interaction with regards to odds ratios for WIC status and insurance status, there was a trend in that the impact, as measured by difference in prevalence of breastfeeding in BFHI facilities vs. non-BFHI facilities, was greatest in those who paid with Medicaid (96.7% vs. 92.9%) and those who received WIC (96.6% vs. 93.2%).

Because being born in a BFHI facility has a positive impact on breastfeeding outcomes, more research is necessary in Washington State to explore the reasons why there are relatively few BFHI facilities. In Washington State, currently there is some research being conducted to understand the barriers and facilitators to becoming a BFHI facility (Bell, Johnson, & Steinman, 2016). As previously mentioned, starting in 2012, in an effort to recognize the administrative and financial barriers to becoming a BFHI

facility, the Washington State Department of Health and partners launched an initiative to improve breastfeeding support practices. In 2015, they expanded the program to give “Bronze,” “Silver,” or “Gold” designations to hospitals who had completed 3, 5, or 7 or more steps, respectively, even if they had not received the BFHI designation. Other researchers have found that there is a dose-response relationship between the number of BFHI steps women are exposed to and the likelihood of improved breastfeeding outcomes, including breastfeeding initiation; the findings from our sensitivity analysis to include Legacy Salmon Creek, which received designation in mid 2015, provided some evidence to support this (Perez-Escamilla et al., 2016). When we did not include Legacy Salmon Creek, the unadjusted odds ratio increased from 2.90 (95% CI: 2.44, 3.44) to 4.30 (95% CI: 3.34, 5.58); therefore, the overall effect was greatest when all policies were being fully implemented. Further research is needed to evaluate if providing designations based on the steps a hospital has completed is an effective alternative to promoting BFHI designation status.

Limitations

The main strength of our study was the large sample size that included data for every birth in every birth facility in the state of Washington in 2015, which is in contrast to PRAMS or similar survey data used by other studies. Our study is the first to use birth certificate data to examine the relationship between designation status and breastfeeding initiation in Washington State. We were also able to extract and adjust for covariates such as race, education, birth country, marital status, parity, WIC status, insurance status, delivery method, and smoking status.

Nonetheless, there were several limitations of our study, such as inability to assess breastfeeding exclusivity and our choice of a cross-sectional study design. Given that the birth certificates in Washington only assess whether an infant is being breastfed or not, we were unable to assess whether an infant was being breastfed exclusively in the hospital.

While our study adds to the base of evidence from observational studies that show that BFHI designated facilities have higher rates of breastfeeding initiation, we cannot make claims about causality due to the

cross-sectional design. In the US Preventive Services Task Force's literature review, only RCTs and before-and-after designs with concurrent control groups were included. They did not include studies that were before-and-after comparisons within single hospitals or retrospective designs. Therefore, future research both in Washington State and elsewhere should aim to use before-and-after designs with concurrent control groups if possible, as RCTs may be questioned or infeasible, from either a logistical or ethical standpoint.

Conclusion

BFHI facilities are effective in improving breastfeeding initiation rates overall, even in a state where breastfeeding initiation is already high. Our results provide support for promoting facilities to acquire a BFHI designation in order to promote breastfeeding initiation. Increasing the proportion of babies born in BFHI facilities should remain a public health priority, as it raises breastfeeding initiation rates for all women.

References:

American Academy of Pediatrics. (2012). Breastfeeding and the Use of Human Milk. *Pediatrics*, *115*(2), 496. http://doi.org/10.1542/peds.2011-3552

Anstey, E. H., MacGowan, C. A., & Allen, J. A. (2016). Five-Year Progress Update on the Surgeon General's Call to Action to Support Breastfeeding, 2011. *Journal of Women's Health*, *25*(8), 768–776. http://doi.org/10.1089/jwh.2016.5990

Baby-Friendly USA. (2017). Find a Facility by State. Retrieved March 28, 2016, from https://www.babyfriendlyusa.org/find-facilities/designated-facilities--by-state

Bartick, M., & Reinhold, A. (2010). The Burden of Suboptimal Breastfeeding in the United States: A Pediatric Cost Analysis. *Pediatrics*, *125*(5), e1048–e1056. http://doi.org/10.1542/peds.2009-1616

Bell, K., Johnson, D., & Steinman, L. (2016). *Exloring Factors that Influence Adoption and Implementation of the Baby-Friendly Hospital Initiative in Washington State*. University of Washington.

Brodribb, W., Kruske, S., & Miller, Y. D. (2013). Baby-Friendly Hospital Accreditation, In-Hospital Care Practices, and Breastfeeding. *Pediatrics*, *131*(4), 685–692. http://doi.org/10.1542/peds.2012-2556

Centers for Disease Control and Prevention. (2013a). Progress in increasing breastfeeding and reducing racial/ethnic differences - United States, 2000-2008 births. *MMWR. Morbidity and Mortality Weekly Report*, *62*(5), 77–80. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/23388550

Centers for Disease Control and Prevention. (2013b). *Strategies to Prevent Obesity and Other Chronic Diseases: The CDC Guide to Strategies to Support Breastfeeding Mothers and Babies*. Atlanta (GA). Retrieved from https://www.cdc.gov/breastfeeding/pdf/BF-Guide-508.PDF

Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, and Obesity. (2016). *Breastfeeding Report Card: United States, 2016*. Atlanta. Retrieved from https://www.cdc.gov/breastfeeding/pdf/2016breastfeedingreportcard.pdf

Declercq, E., Labbok, M. H., Sakala, C., & O'Hara, M. (2009). Hospital Practices and Women's Likelihood of Fulfilling Their Intention to Exclusively Breastfeed. *American Journal of Public Health*, *99*(5), 929–935. http://doi.org/10.2105/AJPH.2008.135236

DiGirolamo, A. M., Grummer-Strawn, L. M., & Fein, S. B. (2008). Effect of Maternity-Care Practices on Breastfeeding. *Pediatrics*, *122*(Supplement 2), S43–S49. http://doi.org/10.1542/peds.2008-1315e

Hawkins, S. S., Stern, A. D., Baum, C. F., & Gillman, M. W. (2014). Compliance with the Baby-Friendly Hospital Initiative and impact on breastfeeding rates. *Archives of Disease in Childhood - Fetal and Neonatal Edition*, *99*(2), F138–F143. http://doi.org/10.1136/archdischild-2013-304842

Hawkins, S. S., Stern, A. D., Baum, C. F., & Gillman, M. W. (2015). Evaluating the impact of the Baby-Friendly Hospital Initiative on breast-feeding rates: a multi-state analysis. *Public Health Nutrition*, *18*(2), 189–197. http://doi.org/10.1017/S1368980014000238

Ip, S., Chung, M., Raman, G., Chew, P., Magula, N., DeVine, D., … Lau, J. (2007). *Breastfeeding and Maternal and Infant Health Outcomes in Developed Countries. Evidence Report/Technology Assessment*. Rockville, MD. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/17764214

Jones, K. M., Power, M. L., Queenan, J. T., & Schulkin, J. (2015). Racial and Ethnic Disparities in Breastfeeding. *Breastfeeding Medicine*, *10*(4), 186–196. http://doi.org/10.1089/bfm.2014.0152

Kachoria, R., & Oza-Frank, R. (2014). Differences in breastfeeding initiation by maternal diabetes status and race, Ohio 2006-2011. *Maternal and Child Health Journal*, *18*(9), 2226–35. http://doi.org/10.1007/s10995-014-1472-5

Li, C.-M., Li, R., Ashley, C. G., Smiley, J. M., Cohen, J. H., & Dee, D. L. (2014). Associations of hospital staff training and policies with early breastfeeding practices. *Journal of Human Lactation : Official Journal of International Lactation Consultant Association*, *30*(1), 88–96. http://doi.org/10.1177/0890334413484551

Merewood, A., Mehta, S. D., Chamberlain, L. B., Philipp, B. L., & Bauchner, H. (2005). Breastfeeding Rates in US Baby-Friendly Hospitals: Results of a National Survey. *Pediatrics*, *116*(3), 628–634. http://doi.org/10.1542/peds.2004-1636

Office of Financial Management. (2015). Population by Race, Washington State. Retrieved May 28, 2017, from http://www.ofm.wa.gov/trends/population/fig306.asp

Patnode, C. D., Henninger, M. L., Senger, C. A., Perdue, L. A., & Whitlock, E. P. (2016). Primary Care Interventions to Support Breastfeeding. *JAMA*, *316*(16), 1694.

http://doi.org/10.1001/jama.2016.8882
Perez-Escamilla, R., Martinez, J. L., & Segura-Perez, S. (2016). Impact of the Baby-friendly Hospital Initiative on breastfeeding and child health outcomes: a systematic review. *Maternal and Child Nutrition*, *12*(3), 402–417. http://doi.org/10.1111/mcn.12294
Philipp, B. L., Merewood, A., Miller, L. W., Chawla, N., Murphy-Smith, M. M., Gomes, J. S., … Cook, J. T. (2001). Baby-friendly hospital initiative improves breastfeeding initiation rates in a US hospital setting. *Pediatrics*, *108*(3), 677–81. http://doi.org/10.1542/peds.108.3.677
Rosenberg, K. D., Stull, J. D., Adler, M. R., Kasehagen, L. J., & Crivelli-Kovach, A. (2008). Impact of Hospital Policies on Breastfeeding Outcomes. *Breastfeeding Medicine*, *3*(2), 110–116. http://doi.org/10.1089/bfm.2007.0039
Thompson, L. A., Zhang, S., Black, E., Das, R., Ryngaert, M., Sullivan, S., & Roth, J. (2013). The association of maternal pre-pregnancy body mass index with breastfeeding initiation. *Maternal and Child Health Journal*, *17*(10), 1842–51. http://doi.org/10.1007/s10995-012-1204-7
U.S. Department of Health and Human Services. (2011). *The Surgeon General's Call to Action to Support Breastfeeding 2011*. *Washington DC: U.S. Department of Health and Human Services, Office of the Surgeon General*. Washington, DC: Office of the Surgeon General (US). Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/21452448
U.S. Department of Health and Human Services. (2017). Maternal, Infant, and Child Health Healthy People 2020. Retrieved May 21, 2017, from https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives
UNICEF. (2002). Baby-Friendly Hospital Iniative. Retrieved November 11, 2016, from https://www.unicef.org/programme/breastfeeding/baby.htm
World Health Organization. (2002). *Young Child Feeding Global Strategy for Infant and Young Child Feeding*. Geneva. Retrieved from http://apps.who.int/iris/bitstream/10665/42590/1/9241562218.pdf

Figure 1: The Ten Steps to Successful Breastfeeding (UNICEF, 2002)

1) `Have a written breastfeeding policy that is routinely communicated to all health care staff.
2) Train all health care staff in the skills necessary to implement this policy.
3) Inform all pregnant women about the benefits and management of breastfeeding.
4) Help mothers initiate breastfeeding within one hour of birth.
5) Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
6) Give infants no food or drink other than breast-milk, unless medically indicated.
7) Practice rooming in - allow mothers and infants to remain together 24 hours a day.
8) Encourage breastfeeding on demand.
9) Give no pacifiers or artificial nipples to breastfeeding infants.
10) Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or birth center.

Table 1: Demographic Characteristics of Study Population by Hospital Designation Status

	Baby-Friendly Hospital		Non- Baby-Friendly Hospital	
	N=8,576	%	N=64,899	%
Mother's Race / Ethnicity				
White	5,466	64.1	40,016	62.1
Black	364	4.3	3,464	5.4
Mexican/ Hispanic/ Chicano	1,094	12.8	12,340	19.2
American Indian/ Alaska Native	65	0.8	1,341	2.1
Asian/ Pacific Islander / Hawaiian	1,545	18.1	7,242	11.3
Mother's Country of Birth				
USA-born	6,283	73.3	54,158	83.5
Foreign-born	2,293	26.7	10,716	16.5
Mother's Age				
< 20	275	3.2	2,930	4.5
20-24	1,105	12.9	12,571	19.4
25-29	2,308	26.9	19,408	29.9
30-34	3,047	35.5	18,962	29.2
35 +	1,840	21.5	11,025	17.0
Mother's Education				
12th grade or less	700	8.2	8,278	12.9
High school graduate / GED	1,401	16.5	14,787	23.0
Some college	1,723	20.2	14,817	23.1
Associate's/ Bachelor's degree	3,229	37.9	19,270	30.0
Master's/ Doctorate/ or Professional degree	1461	17.2	7,105	11.1
Marital Status				
Married	6,636	77.5	43,425	67.1
Not married	1,930	22.5	21,308	32.9
Payment for Delivery				
Medicaid	2,450	28.9	26,900	42.0
Private insurance	5,904	69.6	31,456	49.2
Tricare	36	0.4	3,798	5.9
Other	90	1.1	1,830	2.9
WIC Status				
Yes	1,433	17.3	23,531	39.2
No	6,866	82.7	36,475	60.8
Method of Delivery				
Vaginal	5,720	66.7	46,315	71.4
Cesarean section	2,554	29.8	15,931	24.5
Forceps	73	0.9	362	0.6
Vacuum	229	2.7	2,291	3.5
Parity				
Primiparous	2,896	33.8	21,173	32.9
Multiparous	5,667	66.2	43,161	67.1
Smoking Status				
Smoker	427	5.0	4,501	7.0
Non-smoker	8,140	95.0	59,767	93.0

Table 2: Association between BFHI and breastfeeding, overall and by maternal characteristics

	BFHI	Non-BFHI	OR	p-value for difference by characteristic
Overall	8,437/8,576 (98.4%)	61,944/64,899 (95.5%)	2.90 (2.43, 3.44)	
Mother's Education				0.23
Did not complete high school	663/700 (94.7%)	7,473/8,278 (90.2%)	1.93 (1.38, 2.71)	
High school graduate/ GED	1,372/1,401 (97.9%)	13,798/14,787 (93.3%)	3.39 (2.33, 4.93)	
Some college	1,689/1,723 (98.0%)	14,188/14,817 (95.8%)	2.20 (1.55, 3.12)	
Associate's/ Bachelor's degree	3,198/3,229 (99.0%)	18,883/19,270 (97.9%)	2.11 (1.46, 3.05)	
Master's/ Doctorate/ or Professional Degree	1,455/1,461 (99.5%)	7,025/7,105 (98.9%)	2.76 (1.20,6.34)	
Mother's Race / Ethnicity				0.34*
White	5,370/5,466 (98.2%)	38,364/40,016 (95.9%)	2.41 (1.96, 2.97)	
Black	356/364 (97.8%)	3,299/3,464 (95.2%)	2.23 (1.09, 4.57)	
Mexican/ Hispanic/ Chicano	1,073/1,094 (98.1%)	11,659/12,340 (94.5%)	2.98 (1.92, 4.63)	
American Indian/ Alaska Native	65/65 (100%)	1,181/1,341 (88.1%)	NA	
Asian/ Pacific Islander/ Hawaiian	1,531/1,545 (99.0%)	6,990/7,242 (96.5%)	3.94 (2.29, 6.77)	
Payment for Delivery				0.20**
Medicaid	2,368/2,450 (96.7%)	24,984/26,900 (92.9%)	2.22 (1.77, 2.77)	
Private insurance	5,851/5,904 (99.1%)	30,677/31,456 (97.5%)	2.84 (2.12,3.71)	
Tricare	35/36 (97.2%)	3,715/3,798 (97.8%)	NA	
Other	89/90 (98.9%)	1,689/1,830 (92.3%)	NA	
WIC Status				0.49
Yes	1,384/1,433 (96.6%)	21,921/23,531 (93.2%)	2.07 (1.55, 2.77)	
No	6,780/6,866 (98.8%)	35,416/36,475 (97.1%)	1.83 (0.98, 3.39)	

* Excludes American Indians and Alaska Natives in analysis

** Excludes Tricare and Other Payment for Delivery.