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STATE AND REGIONAL COMPARISONS OF BREASTFEEDING POLICIES AND
RATES: A NATIONAL STUDY

By Erin Johnson

A thesis submitted to the faculty of The University of Mississippi in partial fulfillment of
the requirements of the Sally McDonnell Barksdale Honors College.

Oxford
May 2019

Approved by

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DEDICATION

To my mother

ABSTRACT

ERIN MICHELLE JOHNSON: State and Regional Comparisons of Breastfeeding

Policies and Rate: A National Study

(Under the direction of John Green)

State legislation focused on promoting and supporting breastfeeding is relatively new, beginning in the 1990s. The purpose of this study is to determine if there is an association between state breastfeeding rates and state breastfeeding legislation and other institutional policies. The Centers for Disease Control and Prevention releases breastfeeding report cards with the most up-to-date state breastfeeding rates. These reports are used to examine the relationship between state breastfeeding rates and number of breastfeeding policies passed by a state. Government initiatives, such as Healthy People Initiative, and organizational practices, such as Baby-Friendly USA Inc., are also studied to determine their possible influence on state breastfeeding rates. For the purpose of this study, states are divided into four regions to allow for regional comparisons in breastfeeding rates, breastfeeding legislation, other breastfeeding policies, and socioeconomic effects to be observed. This study found that state legislation regarding breastfeeding has an unclear relationship with breastfeeding rates; however, the increased presence of Baby-Friendly facilities may be a moderating factor for increased breastfeeding initiation rates.

TABLE OF CONTENT

| | |
|-------------------------|----|
| ABSTRACT..... | iv |
| LIST OF FIGURES..... | vi |
| INTRODUCTION..... | 1 |
| LITERATURE REVIEW..... | 5 |
| METHODS..... | 18 |
| FINDINGS..... | 25 |
| DISCUSSION..... | 39 |
| CONCLUSION..... | 43 |
| LIST OF REFERENCES..... | 44 |
| APPENDIX..... | 48 |

LIST OF FIGURES

Figure 1. National Breastfeeding Rate and Healthy People 2010/2020 Goal

Figure 2. State Level 2018 Ever Breastfed Rates by Category

Figure 3. Ever Breastfed Rates by Region for 2007 and 2018

Figure 4. Region with States in the Highest 2007 Percent Quartile for 2007 and 2018 Ever Breastfed Rates

Figure 5. Number of States who Have Met the Healthy People 2020 Goal in 2018

Figure 6. Regional Median for Percent of Females (25 Years and Older) with Bachelor's Degree or Higher

Figure 7. Regional Median Values for Family Poverty Rate and Family Poverty Rate with Children under 5 Years Old

Figure 8. Median Health Ranking of States by Region (Excluding the District of Columbia)

Figure 9. Median Breastfeeding Rates by State Policy Numbers

Figure 10. Region and 2018 Median Ever Breastfed Rates by Number of Policies

Figure 11. 2018 Regional Median of Baby-Friendly Facilities Per 1 Million People

Figure 12. Live Births Occurring at Baby-Friendly Facilities in 2007, 2012, and 2018

Figure 13: Number of Baby-Friendly Facilities in the US from 1997 to 2018

Table 1. Classification of States by Region

Table 2: Non-Parametrical Statistical Test for Breastfeeding Change Over Time and Between Regions

Table 3: Non-Parametrical Statistical Test for Number of Live Births Occurring in Baby-Friendly Facilities Change Over Time and Between Regions

Table 4: Breastfeeding Policy Present in each State

Table 5: Number of Baby-Friendly Facilities Per State

INTRODUCTION

The Surgeon General's *Call to Action to Support Breastfeeding* in 2011 outlined the importance of breastfeeding in terms of health, psychological, economic, and environmental effects. For example, the report states that breast milk is suited to an infant's specific nutritional needs and has immunological and anti-inflammatory properties beneficial to both the infant and mother. Formula feeding has been associated with higher risk of common childhood illnesses, serious diseases, and major chronic conditions. For women who have never breastfed, the risk of breast cancer is higher. A psychological benefit that breastfeeding mothers have cited is to experience a sense of closeness with the newborn. The economic effect is that families who breastfeed do not have to buy infant formula and also can have lower health care cost due to breastfeeding decreasing the risk of certain illnesses and diseases. Lastly breastfeeding has a global environmental effect because the practice does not require packaging and transportation like formula does (Office of the Surgeon General (US), 2011a).

These and other benefits are why so many prominent health care organizations such as the World Health Organization, the American Academy of Pediatrics, and the American Public Health Association recommend breastfeeding for 12 months. However, the rate of breastfeeding declined in the mid 20th century, due to infant formula companies' aggressive marketing campaigns aimed at physicians, major economic changes, and women's increase in workforce participation (Stevens, Patrick, & Pickler, 2009). In addition, multiple social, cultural, and economic factors have limited women's ability to breastfeed in contemporary times. In 1972, only 22% of mothers breastfed.

Around this time, movements began with the goal of increasing breastfeeding rates (Institute of Medicine (US) Committee on Nutritional Status During Pregnancy and Lactation, 1991). Since the 1970s, breastfeeding rates have increased. Multiple United States Surgeon Generals have identified breastfeeding as an important health issue, with the first meeting on the importance of breastfeeding occurring in 1984 (United States Breastfeeding Committee (USBC), n.d.). In 1990, the United States joined other countries in signing onto the *Innocenti Declaration on the Protection, Promotion, and Support of Breastfeeding*, which called upon those countries' governments to support breastfeeding, take action on the *International Code of Marketing Breast-milk Substitutes* (WHO, 1981), and create policies and laws that protect workplace breastfeeding (WHO/UNICEF, 1990). Soon after in 1991, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) created the Baby-Friendly Hospital Initiative (BFHI), whose purpose was to implement the *Ten Steps to Successful Breastfeeding* and the *International Code of Marketing Breast-milk Substitutes* (Baby-Friendly USA, n.d.). In 1999, the US Department of Health and Human Services released the *HHS Blueprint for Action on Breastfeeding*, which declared breastfeeding a key public health issue (Office of the Surgeon General, 2011b).

States began creating legislation in the 1990s to protect the practice of breastfeeding. Some examples of the legislation put into law are protecting a mother's right to breastfeed where she is otherwise authorized to be, exempting breastfeeding from being considered public indecency, excusing breastfeeding mothers from jury duty, protecting expression of milk in the workplace, and developing breastfeeding awareness programs. Other types of policies have also come about in an attempt to support and encourage breastfeeding. In 1997, The Baby-Friendly Hospital Initiative (BFHI) created

Baby-Friendly USA, Inc. (BFUSA), the accrediting body and national authority for the BFHI in the US (Baby-Friendly USA, n.d.). BFUSA designates hospitals and birthing centers as Baby-Friendly facilities if they that meet Baby-Friendly criteria, such as implementing the *Ten Steps to Successful Breastfeeding* and following the *International Code of Marketing Breast-milk Substitutes* (Baby-Friendly USA, n.d.).

Another organizational policy attempt was the creation of the Healthy People Initiative. In 1990, Healthy People 2000 was created with objectives expected to be made within the decade in the United States. The breastfeeding objective was to increase breastfeeding initiation rate to 75% nation-wide and the continuation rate at 6 months to 50% (Caldwell, 1999). The Healthy People 2000 objectives, however, were not met, thus the same objectives were used in Healthy People 2010 (Hill, 2000). The breastfeeding objectives for Healthy People 2020 were increased: 81.9% initiation rate and 60.6% breastfeeding at 6 months. Other objectives were created for breastfeeding at 1 year and exclusive breastfeeding at 3 and 6 months (Healthy People 2020, 2010).

Among the total population, breastfeeding rates have been on the rise since the late 20th century. However, research has found that some sociodemographic and economic groups are more likely to breastfeed than others (Institute of Medicine (US), 1991). Racial and ethnic minorities have lower rates of breastfeeding than white women. The Centers for Disease Control and Prevention (CDC) reports that of the children born in 2015, 85.9% of white mothers initiated breastfeeding, while only 69.4% of African American mothers initiated breastfeeding (CDC, n.d.). Breastfeeding rates are historically lower in mothers who are young, low income, unmarried, have low educational attainment, participate in Women, Infants, and Children (WIC) supplemental nutrition programming, report unintended pregnancy, and are overweight or obese (Jones, Power,

Queenan, & Schulkin, 2015). Numerous breastfeeding barriers have been identified that affect initiation and continuation of breastfeeding: pain/discomfort, embarrassment, employment situation, and inconvenience. There are also unique barriers that affect racial and ethnic minorities such as lack of social, employer, and cultural acceptance of breastfeeding. Also, some groups may experience language and literacy barriers and lack of access to information that supports breastfeeding practice (Jones et al., 2015). The need for a mother to return to work soon after having a baby is also a barrier to breastfeeding (Mandal, Roe, & Fein, 2010).

The purpose of this research study is to examine the variations that exist between state-level breastfeeding initiation rates and how state breastfeeding legislation may affect breastfeeding initiation rates for that state. Regional differences in breastfeeding rates, institutional policies, and other factors will also be studied.

LITERATURE REVIEW

History of Infant Feeding Practices

Throughout the history of infant feeding science and research, breastmilk has always been the medically preferred method (Stevens et al., 2009). However, alternative methods have also been explored for mothers who do not wish or are unable to breastfeed. Wet nursing, the act of a lactating woman feeding another woman's infant from her breast (Huntoon, 2009), has been practiced throughout the centuries as an alternative method, from as early as 2000 BC to the end of the 19th century. Wet nursing became unpopular, culturally unacceptable in many places, and eventually went extinct when the feeding bottle was refined in the 19th century and animal's milk became available. Artificial feeding became a popular choice as a substitute to breastfeeding around the beginning of the 20th century. Many advancements were made in infant formula during the 20th century, such as placing an emphasis on cleanliness and improved care of dairy cattle. Also, in the 1910s, milk was able to be stored in iceboxes and easy-to-clean rubber nipples were made available. As research was released about the efficacy of infant formula, formula companies began to market their products directly to physicians. Physicians began to regard formula as a safe substitute to breastmilk. This idea trickled down into the general population, leading infant formula to be seen as a well-known and safe alternative to breastmilk. This view led to a steep decline in breastfeeding rates in the United States (Stevens et al., 2009). Of the babies born between 1936 and 1940, 77% were breastfed. Less than four decades later, in 1972, only 22% of

babies were breastfed (Institute of Medicine (US), 1991). This significant change in breastfeeding initiation rate may be partially due to women's increased participation in the labor force during this time. During the twenty years after World War II, the United States experienced major economic growth, which increased the demand for labor dramatically. Coupled with the civil rights movement, equal employment opportunity legislation, and women's rights movement, more women began working outside the home. Also, during this time, women's status changed socially, demographically, and economically. More women remained single, women who married got married later in life, women stayed in school longer, women waited to have children at a later age and had fewer children, and women divorced more often. In 1950, 34% of women participated in the workforce; by 1980, that number had increased to 52% (Toossi, 2002). During this time, and as the result of social movements pushes, lawmakers began to draft legislation to address pregnancy while working. In 1972, the Equal Employment Opportunity Commission created guidelines that required employers to treat disabilities from pregnancy in the same way as other temporary disabilities. In 1978, an amendment was added to Title VII of the Civil Rights Act which prohibited discrimination based on pregnancy, childbirth, or related medical conditions. This amendment, however, did not provide time off after giving birth. The ability to take leave after child birth was not entitled to an employee until 1993 when President Bill Clinton signed the Family and Medical Leave Act into law (Sholar, 2016).

National Movements to Increase Breastfeeding Rates

Grassroots movements began in the 1970s in order to support breastfeeding mothers and increase breastfeeding rates. In the decades to come, public health officials began

programs and initiatives in an attempt to systematically increase breastfeeding rates across the world. In 1974 at the twenty-seventh World Health Assembly, the general decline of global breastfeeding was recognized, and member countries were called to examine the promotion and market of breast-milk substitutes and put forth remedial measures. This began a cascade of meetings to occur during World Health Assembly meetings with the objective of discussing infant and young child feeding. In May 1980, leaders came to a consensus that an international code addressing the marketing of breast-milk substitutes be created. The *International Code of Marketing Breast-milk Substitutes* was adopted at the Thirty-fourth World Health Assembly in May 1981 (World Health Organization, 1981).

The provisions outlined in the Code (1981) are:

1. No advertising of breast-milk substitutes to families.
2. No free samples or supplies in the health care system.
3. No promotion of products through health care facilities, including no free or low-cost formula.
4. No contact between marketing personnel and mothers.
5. No gifts or personal samples to health workers.
6. No words or pictures idealizing artificial feeding, including pictures of infants, on the labels or product.
7. Information to health workers should be scientific and factual only.
8. All information on artificial feeding, including labels, should explain the benefits of breastfeeding and the costs and hazards associated with artificial feeding.
9. Unsuitable products should not be promoted for babies.
10. All products should be of high quality and take account of the climate and storage conditions of the country where they are used. (Baby-Friendly USA, n.d.)

In the United States, the first national attempt occurred in 1984 when US Surgeon General C. Everett Koop pushed recommendations at a workshop on breastfeeding and lactation.

The five recommendations were:

- Strengthen the support of breastfeeding in the health care system
- Improve professional education in human lactation and breastfeeding
- Develop public education and promotional efforts
- Develop a broad range of support services in the community
- Initiate a national breastfeeding promotion effort directed to women in the workforce and expand research on human lactation and breastfeeding (USBC, n.d.)

In 1985 and 1991, follow-up reports were created to document the progress that nation had made concerning these five recommendations. In 1990, the United States joined other countries across the world in signing the *Innocenti Declaration on the Protection, Promotion, and Support of Breastfeeding*, which recognized the unique benefits of breastfeeding such as providing ideal nutrition for infants, reducing incidence and severity of infectious diseases, and reducing a mother's risk of having breast and ovarian cancer. This declaration also made recommendations that an infant should be exclusively breastfed for at least the first 4 to 6 months of life, then supplemented with adequate foods while continuing breastfeeding for up to two years or beyond. The declaration called for countries to reinforce a culture of breastfeeding, by increasing a mother's confidence in her ability to breastfeed. The declaration outlined that countries should develop breastfeeding policies, set national targets to meet by 2000, and create a system to monitor breastfeeding rates. Target goals were set and expected to be met by 1995; the goals include the appointment of a national breastfeeding coordinator, creation of a breastfeeding committee, assurance that every birthing facility practices the *Ten Steps to Successful Breastfeeding* and follows the *International Code of Marketing Breast-milk Substitutes*, and creation of policies that protect a women's right to breastfeed in the workplace (World Health Organization/ UNICEF, 1990).

Substantial evidence exists showing that implementing the *Ten Steps to Successful Breastfeeding* significantly improves breastfeeding rates by impacting early initiation, exclusive breastfeeding, and the total duration of breastfeeding (World Health Organization/UNICEF, 2018). The Ten Steps were revised in 2018 and are as followed:

1. Comply fully with the *International Code of Marketing Breast-milk Substitutes* and relevant World Health Assembly resolutions, have a written infant feeding policy that is routinely communicated to staff and parents, and establish ongoing monitoring and data-management systems.
2. Ensure that staff have sufficient knowledge, competence and skills to support breastfeeding.
3. Discuss the importance and management of breastfeeding with pregnant women and their families.
4. Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.
5. Support mothers to initiate and maintain breastfeeding and manage common difficulties.
6. Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.
7. Enable mothers and their infants to remain together and to practice rooming-in 24 hours a day.
8. Support mothers to recognize and respond to their infants' cues for feeding.
9. Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.
10. Coordinate discharge so that parents and their infants have timely access to ongoing support and care. (World Health Organization/ UNICEF, 2018)

In order to better implement the *Ten Steps to Successful Breastfeeding* and *International Code of Marketing Breast-milk Substitutes*, the WHO and UNICEF created the Baby-Friendly Hospital Initiative. Hospitals and birthing facilities that follow the aforementioned guidelines can receive the Baby-Friendly designation. The purpose of the BFHI is to give mothers the information, confidence, and skills to initiate and continue breastfeeding. In 2007, there were only 60 baby-friendly designated hospitals and birthing centers in the United States, translating to only 3% of all US births occurring in these facilities. By 2018, however, more than 25% of US births occurred in a Baby-

Friendly designated facility. Baby-Friendly facilities can now be found in all 50 states (Baby-Friendly USA, n.d.). Through this initiative, according to Baby-Friendly USA website, “maternity wards have transformed from places historically infused with enormous influence from formula companies and maternity care and infant feeding practices that undermined breastfeeding, to environments in which evidence-based care is provided, education is free from commercial interest, and mothers are supported in reaching their infant feeding goals.”

Healthy People 2000 was created in September 1990 as a strategy for improving the health of Americans. There were 22 priority areas and 319 unduplicated main objectives. Objectives for breastfeeding called for an initiation rate of 75% and continuation rate at 6 months of 50%. Breastfeeding initiation rate in 1988 was 54%; continuation rate at 6 months was 21% in 1988. The data collected in 1996 showed that these goals would not be met by the turn of the century. According to Caldwell (1999), the Baby-Friendly Initiative was organized too late in the decade for it to have an effect on the 2000 objectives. Also, legislation protecting mothers breastfeeding in the workplace and a national breastfeeding committee did not exist until 1998. Many promotion programs were still in the planning or early implementation phase in the late 1990s. In 2000, breastfeeding initiation rate reached 64% and continuation rate at 6 months was only 29% (Hill, 2000).

Since the Healthy People 2000 breastfeeding objectives were not met, those objectives were carried over to the Healthy People 2010 breastfeeding objectives. Additional objectives were also added: breastfeeding at 1 year (target 25%), exclusive breastfeeding at 3 months (target 40%), and exclusive breastfeeding at 6 months (target 17%) (Healthy People 2020, 2010). According to the Center for Disease Control and

Prevention's 2010 Breastfeeding Report Card, the nation achieved the initiation rate objective at exactly 75% initiation in 2010. All of the other objectives fell short of their target goal: breastfeeding at 6 months was 43%, at 1 year was 22.4%, exclusive at 3 months was 33%, and exclusive at 6 months was 13.3% (Centers for Disease Control and Prevention, 2010).

Healthy People 2020 breastfeeding objectives were:

- Initiation rate target 81.9%
- Breastfeeding at 6 months target 60.6%
- Breastfeeding at 1-year target 34.1%
- Exclusive breastfeeding at 3 months target 46.2%
- Exclusive breastfeeding at 6 months target 25.5% (Healthy People 2020, 2010)

According to the CDC's 2018 Breastfeeding Report Card, the United States has exceeded the initiation rate target (81.9%) with a rate of 83.2%, the breastfeeding at 1-year target with a rate of 35.9%, and exclusive breastfeeding at 3 months target with a rate of 46.9% (Centers for Disease Control and Prevention, 2018a).

Disparities in Breastfeeding

Socioeconomic, racial, and ethnic disparities in breastfeeding rates can be seen through the decline of rates in the mid 20th century to the rise of rates in the late 20th and through today. When formula feeding was introduced, those who were wealthy enough adopted the practice of formula feeding. Usually those wealthy enough at that time were white women, so the breastfeeding rate among white women fell. Because of this, breastfeeding rates were higher among black mother than white mothers before 1960. However, after 1960, breastfeeding rates among black mothers fell sharply leading to white mothers having a higher rate of breastfeeding (Institute of Medicine (US), 1991).

According to *Nutrition during lactation* released by the Institute of Medicine (1991), differences in trends “represent the trickling down of values and behaviors from economically and socially advantaged women to less advantaged women.” This can explain why black mothers were later to adopt infant formula feeding compared to the wealthier white mother. After the record low rate of 22% in 1972, breastfeeding initiation rate increased across all racial groups, but the rate increase was higher in white women. As with the adoption of infant formula, wealthier women were the first to adopt breastfeeding again. Other disparities seen in the 1989 data were that married mothers were more likely to breastfeed versus unmarried, and mothers with any college education are more likely to begin breastfeeding (Institute of Medicine (US), 1991). Between 1984 and 1989, breastfeeding rates fell by 13%, from almost 60% to 52%. It was not until 1995 that breastfeeding rates returned to 60%, and by 2001, the breastfeeding initiation rate was at its highest (69.5%) since when data began to be collected in 1955. The medical community deemed this increase was due to an increase in groups who had previously had low breastfeeding rates, such as black women, lesser educated women, and women enrolled in WIC (Wolf, 2003).

Disparities in breastfeeding rates can also be seen today. As of 2015, Asian mothers have the highest initiation rate of 89.3%. The second highest initiation rate is white mothers at 85.9%, and Hispanic mothers have the third highest rate of 84.6%. Comparatively, American Indian mothers have an initiation rate of 76.4%, and black mothers have the lowest initiation rate of 69.4%. Black and American Indian mothers are the only racial/ethnic group with rates lower than the Healthy People 2020 goal of 81.9% (CDC, n.d.). Breastfeeding has a slightly greater benefit in minority mothers due to minority women having a greater incidence of obesity, diabetes, and cardiovascular

disease (Jones et al., 2015). Mothers who breastfeed exclusively are more likely to lose weight and, infants who are breastfed have a decreased risk for childhood obesity.

Participation in WIC is strongly associated with lower incidence of breastfeeding and early termination of breastfeeding; African American and Hispanic mothers make up the largest minority proportion of WIC participation (Jones et al., 2015).

Disparities concerning a mother's education level and poverty level can be seen as affecting breastfeeding initiation rates. A study conducted by Sparks (2010) found that "mothers with less than a high school education or a high school diploma have lower odds of initiating breastfeeding compared to mothers with some college education or more, controlling for all variables in the model" (Sparks, 2010, p. 124). Another study by van Rossem et al. (2009) found that a mother's decision to breastfeed is impacted by her educational background. A strong association was found between the percentage of mothers who initiated breastfeeding and their educational level. Of the highest-educated mothers, 95.5% initiated breastfeeding compared to only 73.1% of the lowest-educated mothers (van Rossem et al., 2009). When considering the effect of both education level and poverty, Newhook et al. (2017) found that "socioeconomically marginalized (SEM) populations with low levels of education and income are much less likely to breastfeed than their relatively privileged peers with higher levels of income and education."

Return to Work and Breastfeeding

A mother's return to work is associated with breastfeeding rates (Mandal et al., 2010). According to Mandal et al. (2010), mothers expecting to return to work had decreased breastfeeding initiation, and mothers returning to work less than 12 weeks after having the baby, regardless of work status, or returning to work after 12 weeks at greater

than 34 hours per week, showed significantly shorter breastfeeding duration. Mandal's (2010) study showed that women who are expecting to return to work later are more likely to initiate breastfeeding and continue breastfeeding beyond 3 months. Low-income women must return to work earlier than wealthier women due to many low-income jobs not being covered under the Family and Medical Leave Act, creating a barrier to breastfeeding. After birth, the majority of the women in the US return to work between 3 to 6 months; however, African American mothers will return to work 2 weeks earlier (Jones et al., 2015).

The Family and Medical Leave Act (FMLA) of 1993 entitles eligible employees who are working for covered employers to take unpaid, job protected leave for specific reasons. One reason that someone can take this leave is because of the birth of a child. There are certain criteria that must be met for an employee to be eligible to take this leave. The employee must have worked for their employer for at least 12 months, have at least 1,250 hours during the 12 months immediately preceding the leave, work at a location where the employer has at least 50 employees within 75 miles, and work for a covered employer. A covered employer is a private-sector employer with 50 or more employees in 20 or more work weeks, public agency regardless of number, or public or private elementary or secondary school regardless of employee number. Employees may take up to 12 weeks of leave in a 12-month period (United States Department of Labor, 1993). At the end of 2017, only 16% of civilian workers had access to paid family leave through their employer (US Bureau of Labor Statistics, 2018). Because most of the nation's employees do not have access to paid leave, most employees feel the need to return to work soon in order not to take a financial loss. Having time off work after having a baby is important for better breastfeeding practices. Mandal's (2010) study

showed that women who are expecting to return to work later are more likely to initiate breastfeeding and continue breastfeeding beyond 3 months.

Once a nursing mother does return to work, she needs to express milk in order to maintain her milk supply when she is away from her baby (Weisband, Keim, Keder, Geraghty, & Gallo, 2017). On March 23, 2010, the Patient Protection and Affordable Care Act created an amendment to the Fair Labor Standards Act. This amendment required employers to provide a nursing mother reasonable break time and suitable place in order to express milk. A nursing mother is allowed reasonable time to express her milk for 1 year after the child's birth. The employer must provide a suitable area to express milk that is not a bathroom and is shielded from view of others and free of intrusion. The employer does not have to compensate the employee for the time taken on these breaks, and employers with under 50 employees are not required to uphold this amendment if it causes undue hardship (United States Department of Labor, 2010). This amendment removes some common barriers to breastfeeding in the workplace such as inadequate break times and no private location or a bathroom stall. By removing these barriers, mothers in the workforce have the opportunity to have a longer duration of breastfeeding, as long as they are employed at a place that is large enough or has the right designation (Murtagh & Moulton, 2011).

Previous Research

Research conducted by Kogan, Singh, Dee, Belanoff, and Grummer-Strawn (2008) examined variations in breastfeeding initiation and duration across the nation to determine the extent to which certain demographic, socioeconomic, and behavioral factors account for breastfeeding variations. The two outcome measurements for

breastfeeding were whether the child was ever breastfed and breastfed for 6 months, with the primary independent variable being state of residence. Covariates used were family's poverty level, child's race/ethnicity, child's gender, family structure, primary spoken language at home, nativity status, smoker in household, maternal self-rated general health and mental health status, and maternal exercise behaviors. The study also took into account breastfeeding legislation at the state level, dividing the states into four categories: (1) in 2003, no legislation that supported breastfeeding, (2) between 1999 and 2003, the first legislation supporting breastfeeding was passed (3) before 1999, one piece of legislation was passed, and (4) before 1999, multiple breastfeeding pieces of legislation were passed. The results from this study found that states in the West and Northwest region had higher breastfeeding initiation estimates than did the other regions of the country (Kogan, Singh, Dee, Belanoff, & Grummer-Strawn, 2008). After conducting a multivariate analysis after all covariates were controlled, Kogan et al. (2008) found that where a child lived had a strong association with breastfeeding initiation, such that a child born in most southern states were 2.5 to 5.15 times less likely to be breastfed than children born in Oregon. They also found that an association between breastfeeding legislation enactment and the estimated percentage of children who were ever breastfed or breastfed at 6 months, states with multiple pieces of breastfeeding legislation had the highest initiation rates. Overall, this study showed that state breastfeeding rate disparities existed, and that breastfeeding legislation may influence breastfeeding decisions by showing breastfeeding as a public health issue (Kogan et al., 2008).

Hawkins, Stern, and Gillman (2012) conducted a similar study using newer data. The purpose of the study was to examine breastfeeding status before and after the enactment of laws between 2000 and 2008, as well as the impact on disparities. Hawkins

et al. (2012) found that breastfeeding initiation rate was 1.7 percentage points higher in states who had enacted workplace breastfeeding laws. A significant interaction was found with Hispanic mothers having 5.8 percentage point increase in breastfeeding initiation in states with new laws for breastfeeding in the workplace. No interaction was found concerning policy change and maternal age for initiation, yet there was one found for duration. Mothers who were 20 years or older were more likely to breastfeed for at least 4 weeks in states that had recently enacted workplace breastfeeding laws. This study did not find any interactions concerning maternal education for initiation or duration. The researchers did find that in states with newly enacted laws allowing a mother to breastfeed in any location, breastfeeding initiation increased by 5.6 percentage points for black/African American mothers. Overall, Hawkins et al. (2012) found that state laws that support breastfeeding in the workplace and in other locations appear to increase breastfeeding initiation and duration, and that such state laws may help reduce disparities between breastfeeding rates.

Informed by research on socioeconomic and regional disparities in breastfeeding along with studies on policy efficacy, the purpose of the present study is to determine if an association exists between state breastfeeding rates and state breastfeeding policies. The effect of organizational policies, such as Baby-Friendly Hospital Initiative, on breastfeeding rates will be considered. Regional differences, especially given the variation in education and poverty rates between regions, will also be explored.

METHODS

This comparative study employed a systemic review of breastfeeding data, state legislation breastfeeding policy, and Baby-Friendly hospitals. The focus was to investigate patterns between state breastfeeding rates, policies, and Baby-Friendly hospitals. The unit of analysis for this study is each state, which was then assigned to a region in the United States.

Regional assignments used in the study are based on the US Census Bureau regions. The Census Bureau separates the country into four sections: The Northeast, Midwest, Southeast, and West (United States Census Bureau Geography Division, n.d.). Table 1 outlines the number of states present in each region and which states are in that region.

Table 1. Classification of States by Region (N=51)

| Northeast (n=9) | Midwest (n=12) | Southeast (n=17) | West (n=13) |
|---|---|--|--|
| Connecticut Maine Massachusetts New Hampshire New Jersey New York Pennsylvania Rhode Island Vermont | Illinois Indiana Iowa Kansas Michigan Minnesota Missouri Nebraska North Dakota Ohio South Dakota Wisconsin | Alabama Arkansas Delaware District of Columbia Florida Georgia Kentucky Louisiana Maryland Mississippi North Carolina Oklahoma South Carolina Tennessee Texas Virginia West Virginia | Alaska Arizona California Colorado Hawaii Idaho Montana Nevada New Mexico Oregon Utah Washington Wyoming |

This study used data from the Centers for Disease Control and Prevention's Breastfeeding Report Card, issue years 2007-2014, 2016, and 2018. The once annual and now biennial report was created to compile breastfeeding data for every state, the District of Columbia, and some US territories to show which areas are succeeding and which states need improvement concerning breastfeeding rates. The report card allows for state-to-state comparisons, along with comparisons to the national average and the Healthy People goals (CDC, 2007).

Breastfeeding rates reported in the Breastfeeding Report Cards are from the CDC National Immunization Survey (NIS). The NIS uses random-digit dialing telephone survey to ask questions about immunization of children within the household. Beginning in July 2001, households with children between the ages of 19-35 months were asked questions about breastfeeding (CDC: National Immunization Survey, 2018b). From 2001-2003, the survey asked three questions to gather information about initiating breastfeeding, duration of breastfeeding, and cessation of breastfeeding. The three questions were:

1. Was [child] ever breastfed or fed breastmilk?
2. How long was [child] breastfed or fed breast milk?
3. How old was [child] when s/he was first fed something other than breast milk or water? [If respondent hesitates, add: This includes formula, juice, cow's milk, sugar water, solid foods, or anything else.]

Question #3 was revised in January 2004 to remove "or water" from the question and add to the list of "others." Another revision to Question 3 was that the surveyor was required to read the list of clarifications, instead of waiting for hesitation from respondent. The final revision to the survey occurred in 2006 to reword some questions and ask an additional question.

The four questions are as followed:

1. Was [child] ever breastfed or fed breast milk?
2. How old was [child's name] when [child's name] completely stopped breastfeeding or being fed breast milk?
3. How old was [child's name] when (he/she) was first fed formula?
4. This next question is about the first thing that [child] was given other than breast milk or formula. Please include juice, cow's milk, sugar water, baby food, or anything else that [child] may have been given, even water. How old was [child's name] when (he/she) was first fed anything other than breast milk or formula?

These questions continue to be used in the NIS survey (CDC: National Immunization Survey, 2018b). Because NIS information on breastfeeding is obtained from mother recall when the children are between 19 and 35 months, the rates are analyzed by birth cohort rather than survey year (CDC, 2018a).

From the data obtained during the NIS, the CDC uses five outcome indicators: ever breastfed, breastfeeding at 6 months, breastfeeding at 12 months, exclusive breastfeeding at 3 months, and exclusive breastfeeding at 6 months. The indicators are derived from Healthy People 2010/2020 objectives focused on increasing the proportion of infants breastfed. Each state's progress and the national progress on these goals are outlined on the breastfeeding report cards (CDC, 2007).

This study also compares state breastfeeding policies and statutes. Five breastfeeding policies were chosen:

- A mother may breastfeed child in any location where the mother is authorized to be
- A breastfeeding mother is excused from jury duty
- A woman breastfeeding does not constitute indecent exposure, public nudity, or obscenity
- Expression of milk in the workplace is protected under law
- State development of breastfeeding awareness programs

A search of these statutes for each particular state was conducted using that state's legislation website. Statutes were found by doing a text search, such as using the word "breastfeed." Statutes could also be found by searching under the appropriate titles and chapters, such as "Courts" or "Juries" to find jury duty exemptions. Outside sources, such as the National Conference of State Legislatures website, were used as a guide to assist in finding state breastfeeding laws. For this study, a state's policy concerning being excused from serving jury duty must specify the mother as breastfeeding, nursing, or expressing milk.

Number of Baby-Friendly facilities in a state were found on the Baby-Friendly USA, Inc. website. Baby-Friendly USA, Inc. (BFUSA) is the accrediting body and national authority for the Baby-Friendly Hospital Initiative (BFHI). One of the responsibilities of BFUSA is to assess and accredit birthing facilities that meet the standards of the *International Code of Marketing of Breast-milk Substitutes* and adhere to the *Ten Steps to Successful Breastfeeding*. Number of Baby-Friendly hospitals in a state is dependent upon a state's population. For each state, the number of Baby-Friendly facilities per 1 million people was calculated to account for the relationship between number of facilities and population. The states were separated by region and the median of Baby-Friendly hospitals per 1 million was calculated. In order to show change in Baby-Friendly hospital numbers over time, percent of live births occurring at Baby-Friendly facilities were used. Live births occurring in Baby-Friendly facilities are breastfeeding support indicators reported in all the CDC's Breastfeeding report cards.

The percent of states who have met the Healthy People 2020 goal by 2018 were also studied. This allowed for comparison among regions to better understand which regions are meeting national expectations set by Healthy People Initiative.

For regional comparisons, both state-level education and poverty data were from the American Community Survey conducted by the Census Bureau (US Census Bureau, n.d.). The American FactFinder website allowed for advanced searches to find the data set useful to this study. The education statistics used in this analysis were from the 2015 1 year-estimates of educational attainment. The geographical type chosen was all states within the United States and Puerto Rico, topic was educational attainment, and data set was 1-year estimates. The data set subject that this study focused on percent of females 25 years and up with bachelor's degree or higher. The median percent for each state within a region was calculated, allowing for regional comparison of female educational attainment across the four regions. Poverty statistics used in this analysis were from the 2015 1-year estimates of the poverty status of families in the last 12 months. The geographical type chosen was all states within United States and Puerto Rico, topic was poverty, year was 2015, and data set was 1-year estimates. The data set subjects chosen to be analyzed were percent below poverty level of all families and percent below poverty level of families with related children of householder under 5 years. For each of these two data sets, the median poverty rate for each state within its respective region was calculated. This calculation allowed for comparison across regions in respect to both poverty categories selected and comparison within a region of the two categories.

Health rankings were also used in this study to show the difference in regional health status. The health rankings used are from the United Health Foundation 2018 America's Health Rankings Report. The report uses four categories of health determinants: behaviors, community and environment, policy, and clinical care. These four determinants influence the fifth category, health outcomes. Each of the categories contain sub-categories pertaining to some aspect of health. A state's health ranking is

based on the sum of all sub-categories, giving each state an overall health score. A high overall score means the state has a lower (better) health ranking. This report does not include the District of Columbia in its ranking (United Health Foundation, 2018).

Using the most recent report/data, a heat map was created to show both state and regional comparison for breastfeeding initiation rate. State breastfeeding rates were evenly divided into quartiles. The four categories are rates lower than 80.4%, rates between 80.4% and 83.3%, rates between 83.4% and 87.4%, and rates above 87.5%.

A table was created to show which of the five policy indicators a state had (Appendix Table 4). If a state had one of the policy indicators, it was denoted as “1”. If no such policy existed in a state’s legislation, it was denoted as “0”. This allowed for comparison of total number of policies a state had, and which state had which policy. Quantifying these data also allowed for the analysis of how many states had particular policies. Because all 50 states and the District of Columbia have a policy concerning a mother’s ability to breastfeed where she is allowed to be, this policy was controlled for and not included in the analysis. Categories were created for number of policies each state had: 0 or 1 policies, 2 policies, and 3 or 4 policies. Categories were created due to small sample sizes of policy numbers in each region. States were separated according to region and placed in one of the three policy categories. A bar graph was created to illustrate median breastfeeding rates based on policy number category within a region.

For analysis of data beyond descriptive statistics, non-parametric tests were used to avoid violating distribution assumptions with small groups of cases (Pett, 2016). The Wilcoxon Signed-Ranks Test (a non-parametric equivalent to the paired-samples-t-test) was used to assess changes in breastfeeding initiation rates over time and number of live births occurring in Baby-Friendly facilities over time. Kruskal-Wallis (a non-parametric

equivalent to one-way ANOVA) was used to determine whether there were statistical differences in breastfeeding rates between region and policy groups. Kruskal-Wallis was also used to determine whether there were statistical differences between region and number of live births occurring in Baby-Friendly facilities.

FINDINGS

The national ever breastfed rate has risen 9.4% from 2007 to 2015. Figure 1 shows the change in national ever breastfed rate and also how the national rate compares to Healthy People 2010 and 2020 goals. In 2010, the national average met the Healthy People 2010 goal of 75%. By 2018, the national average had surpassed the Healthy People 2020 goal of 81.9% by 1.3%.

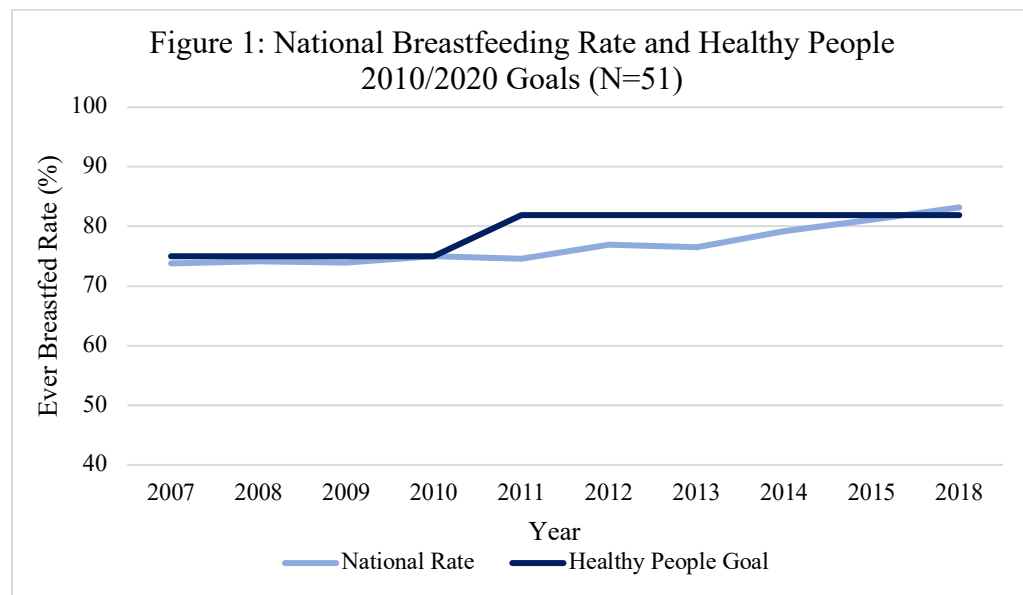
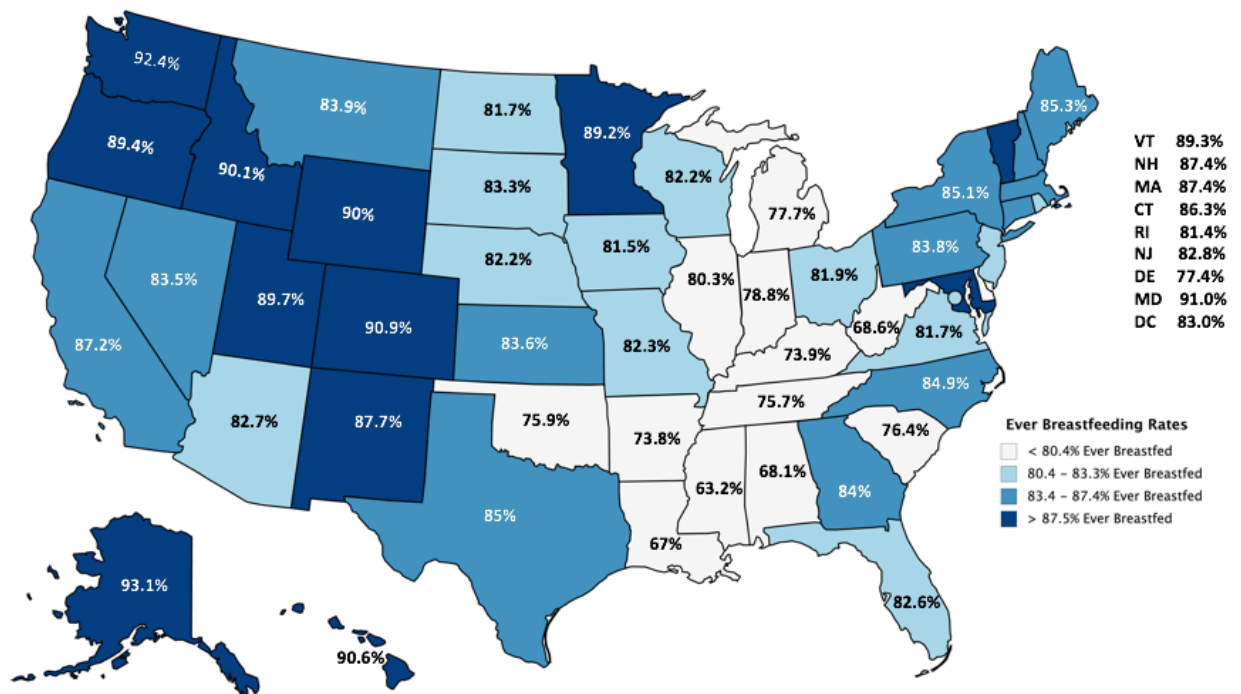


Figure 2 illustrates the differences that exist across the country and among different US regions concerning 2018 ever breastfed rates. For Figure 2, state breastfeeding rates are divided into four different categories: rates lower than 80.4%, rates between 80.4% and 83.3%, rates between 83.4% and 87.4%, and rates above 87.5%. Using the map, most of the lowest breastfeeding rates are found within the Southeast

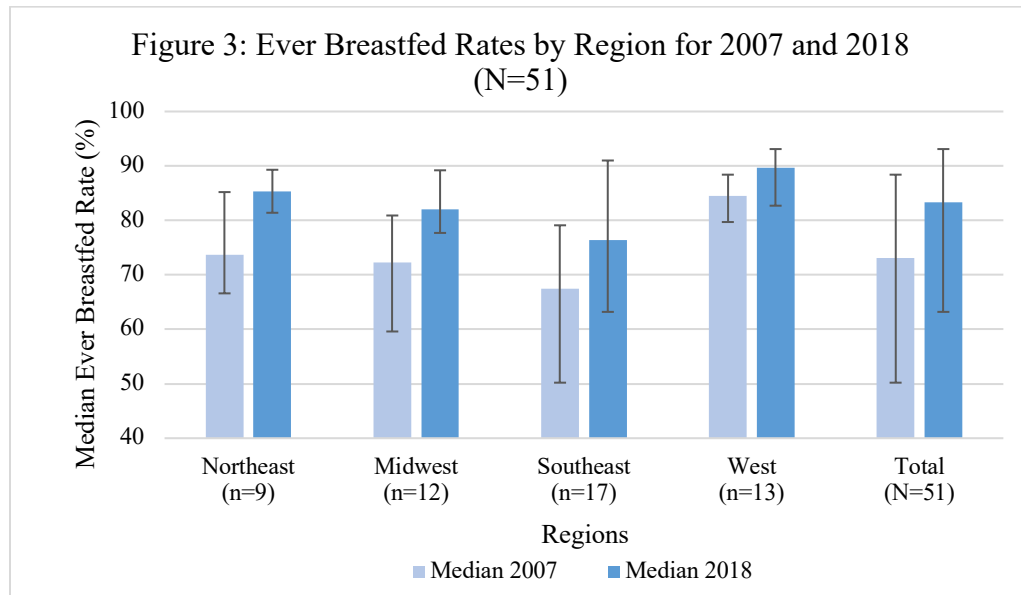
region. Only 3 of the 17 southeastern states are in the second highest rate group, while only 1 state in the southeast region, Maryland, falls within the highest rate category at 91%. The West region contains the most states that fall within the highest rate category. Alaska has the highest ever breastfed rate at 93.1%.

Figure 2: State Level 2018 Ever Breastfed Rates by Category



Since Figure 2 shows some discrepancies in rates among the US regions, regional breastfeeding rates were compared. Figure 3 shows the 2007 and 2018 median ever breastfed rate for each region. Within each region, an increase from 2007 median ever breastfed rate to 2018 rates can be observed for all regions. The Northeast had the greatest change in rates; it increased from 73.7% in 2007 to 85.3% in 2018. The West experienced the lowest increase in rate, yet still had the highest median rate in 2007 and 2018. Among the regions, the Southeast has the greatest range in ever breastfed rates for

both 2007 and 2018. Using non-parametric tests, Table 2 shows that changes across time and differences between region were statistically significant at an alpha of .05 or lower.



Note: high and low lines represent the maximum and minimum state ever breastfed rates in each region, while the colored bars depict the median rate for the region.

Table 2: Non-Parametrical Statistical Tests for Breastfeeding Change Over Time and Between Regions

| Comparison | Test | p value |
|----------------------------|---------------------------|--------------|
| Change Over Time Total | Wilcoxon Signed Rank Test | ≤ 0.001 |
| Change Over Time by Region | Wilcoxon Signed Rank Test | |
| Northeast | | $= 0.008$ |
| Midwest | | $= 0.002$ |
| Southeast | | ≤ 0.001 |
| West | | $= 0.005$ |
| Difference Between Regions | Kruskal-Wallis Test | |
| 2007 | | ≤ 0.001 |
| 2018 | | ≤ 0.001 |

Another method to show change in ever breastfed rates across the country was to divide the 2007 state breastfeeding rates into quartiles. To fall within the highest quartile, a state had to have a breastfeeding rate greater than 80.7%. Figure 4 illustrates the percent of a region that falls within the 2007 highest ever breastfed rate quartile for both 2007 and 2018. In 2007, the West had the most states (76.9%) with breastfeeding rates higher than 80.7%. No states within the Southeast achieved a breastfeeding rate higher than 80.7%. Using the same 2007 highest quartile value of above 80.7%, 2018 state breastfeeding rates were used to study how many states within a region would fall within this quartile. All states within the Northeast and West achieved breastfeeding rates greater than 80.7%. The Northeast experienced the greatest increase in percent of states in highest 2007 quartile; in 2007 only 11.1% of states were in the highest quartile, but by 2018 all states were in this quartile.

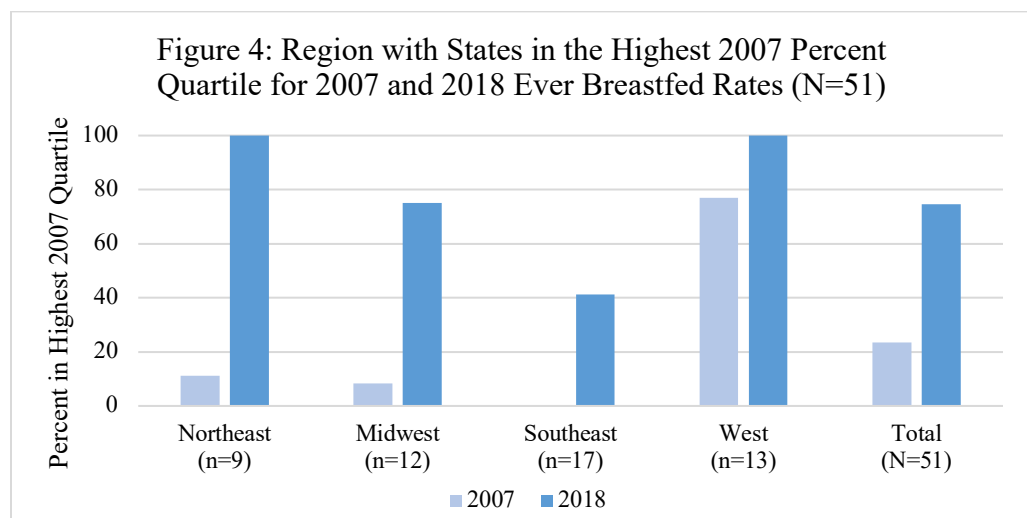
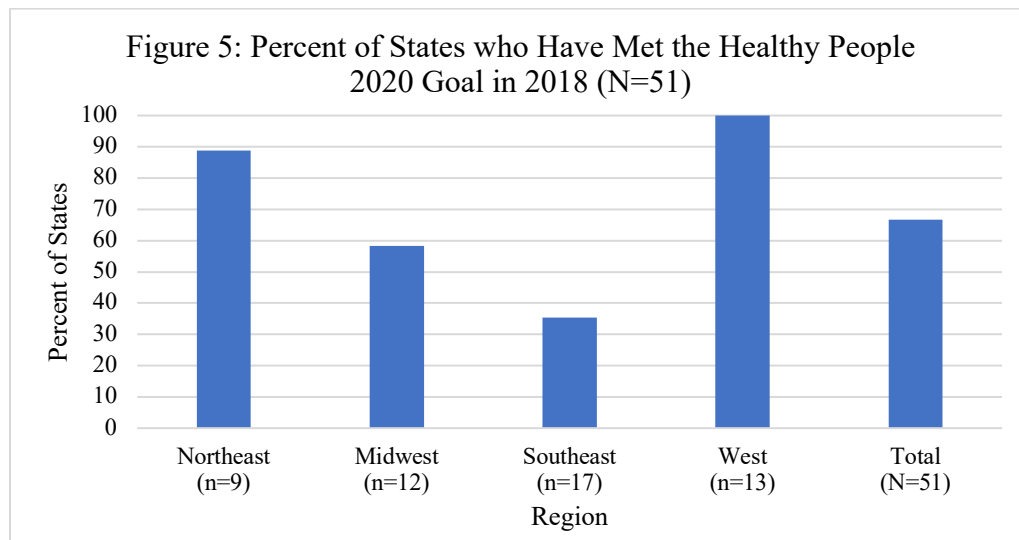
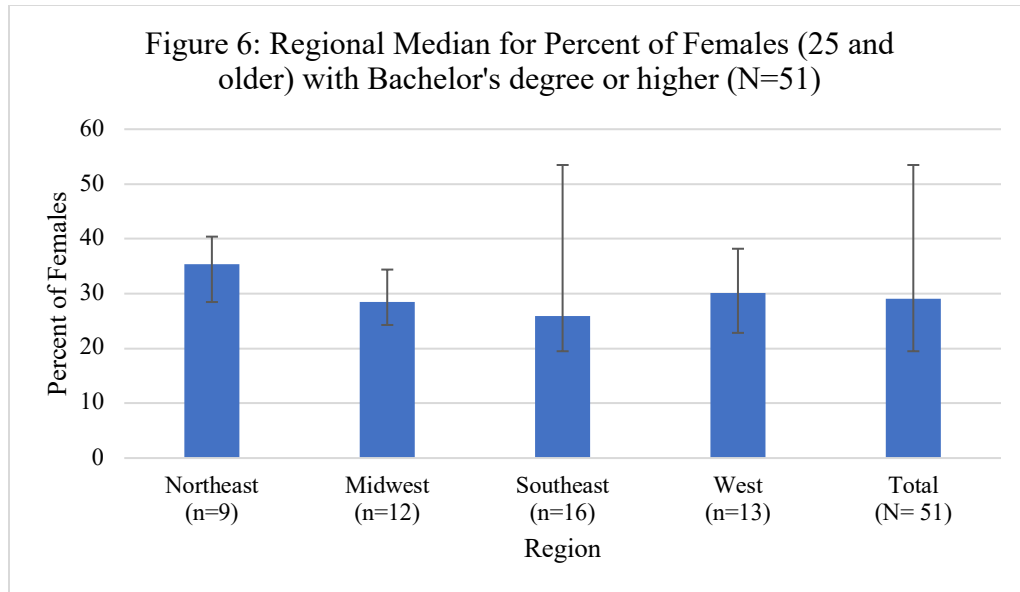


Figure 5 shows the percent of states within a region who have met the Healthy People 2020 ever breastfeeding rate goal (81.9%) based on 2018 breastfeeding rates. In the West Region, all 13 states have met or exceeded the goal. Only one of the Northeast

states have not met the goal. The Southeast region had the fewest states met the Healthy People goal, with only six out of seventeen states meeting the goal.

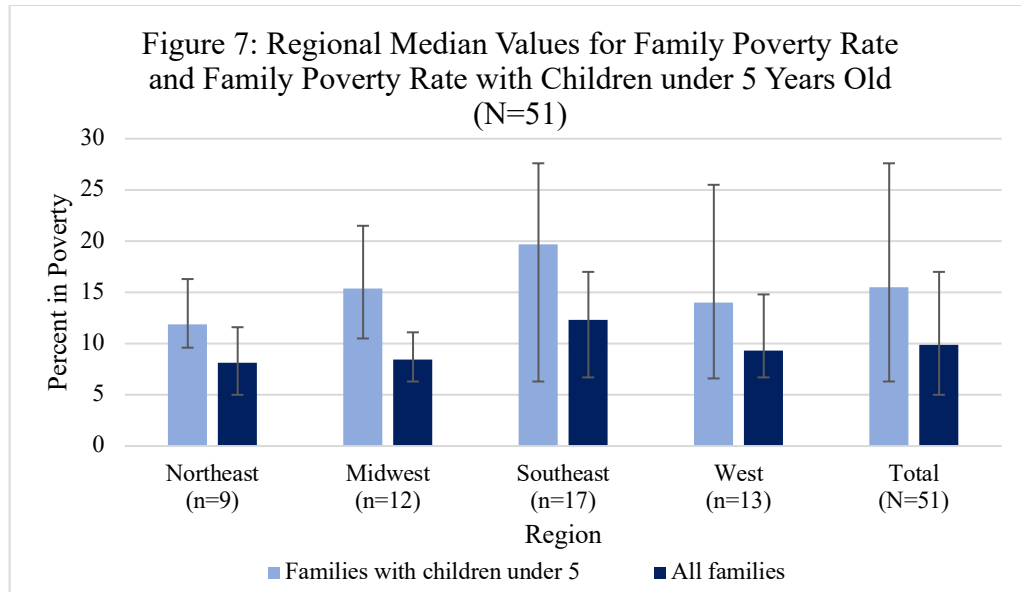


Figures 2-5 show the difference that exists among the US regions in terms of ever breastfed rate. There are multiple factors that could be mediating this relationship. One potential mediator is a mother's education level. Figure 6 shows the regional difference in maternal education. Studies show that mothers with any college education are more likely to begin breastfeeding (Institute of Medicine (US), 1991), Figure 6 focuses on females 25 years and older with a bachelor's degree or higher and how they vary statistically between regions. The Northeast has the highest percent of college educated females at 34.73% of the entire female population in the Northeast. The Southeast had only 25.86% of females 25 years or older with a bachelor's degree or higher, the lowest percent among all regions.



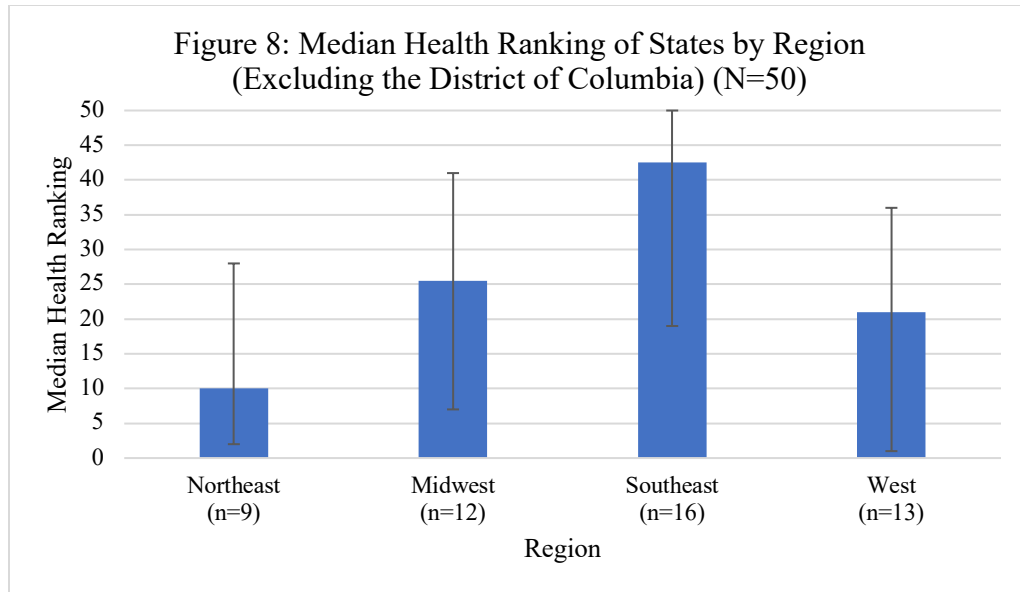
Note: high and low lines represent the maximum and minimum percent of females with bachelor's degree or higher in each region, while the colored bars depict the median percent of females with bachelor's degree or higher for the region. *Kruskal-Wallis $p=0.005$.

Another potential mediating factor for regional differences in breastfeeding rates is poverty. Figure 7 shows regional differences in family poverty rates. Within a region, poverty rate of families with children under 5 years old was compared to the poverty rate of all families. Within all regions, families with children under 5 have higher rates of poverty compared to the poverty rate of all families. The Southeast has the highest poverty rate for both categories, and the Northeast has the lowest in both categories.



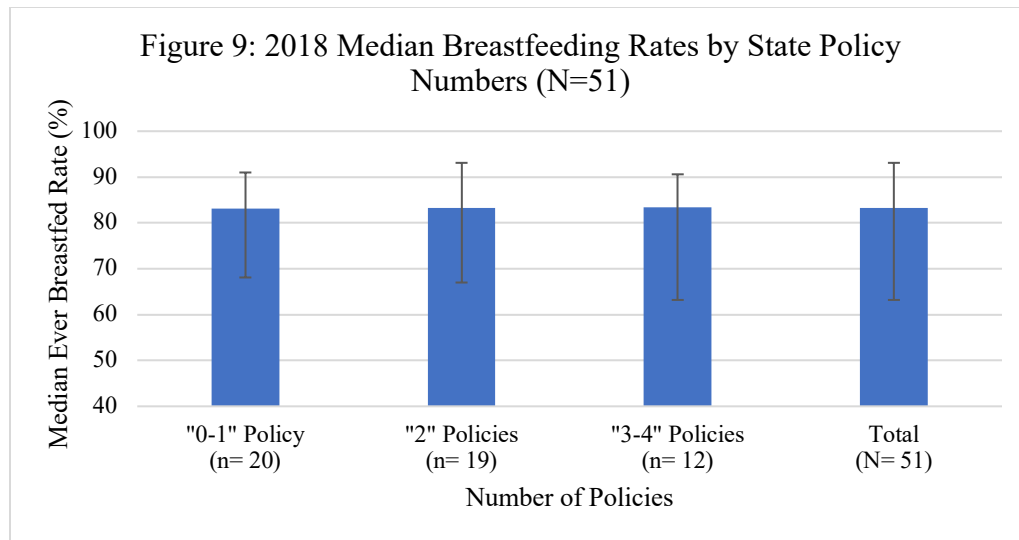
Note: high and low lines represent the maximum and minimum poverty rate in each region for each category, while the colored bars depict the median percent of poverty for each category for the region. *Total for all families Kruskal-Wallis $p=0.001$ and total for families with children under 5 Kruskal Wallis $p=0.040$.

The overall health status of a state or region can contribute to breastfeeding practices, and they may follow similar patterns to breastfeeding rates. Health rankings provide a way of summarizing a state's overall health. Figure 8 focuses on the median health ranking of a region and the range of health rankings for each region. For this analysis, the higher the state ranking, the worse the state's health status. The Southeast's median health ranking surpasses the second region (Midwest) by more than 10 ranks. Each region, except the Southeast, has at least one state with a health ranking below 10. According to this figure, the Southeast has the worse overall health, and the Northeast has the best health.



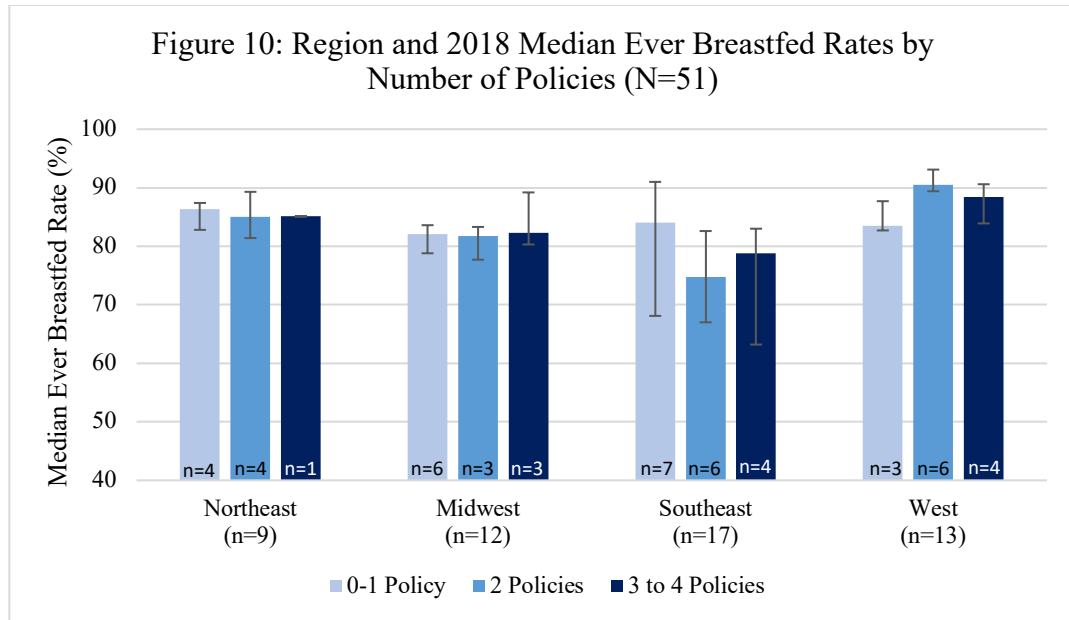
Note: high and low lines represent the highest state ranking and lowest state ranking in each region, while the colored bars depict the median health rank for region. *Kruskal-Wallis $p \leq 0.001$.

This study sought to explore whether state policy could be considered a possible moderator for breastfeeding rates. Figure 9 outlines how the number of policies a state has compared to 2018 state ever breastfed rates. States with 0 or 1 policy have a median breastfeeding rate of 83.15%, states with 2 policies have a median breastfeeding rate of 83.3%, and states with 3 or 4 policies have a median breastfeeding rate of 83.45%. Little variation exists among the policy categories in respect to median ever breastfed rate, and the distribution of ranks were not statistically significant.



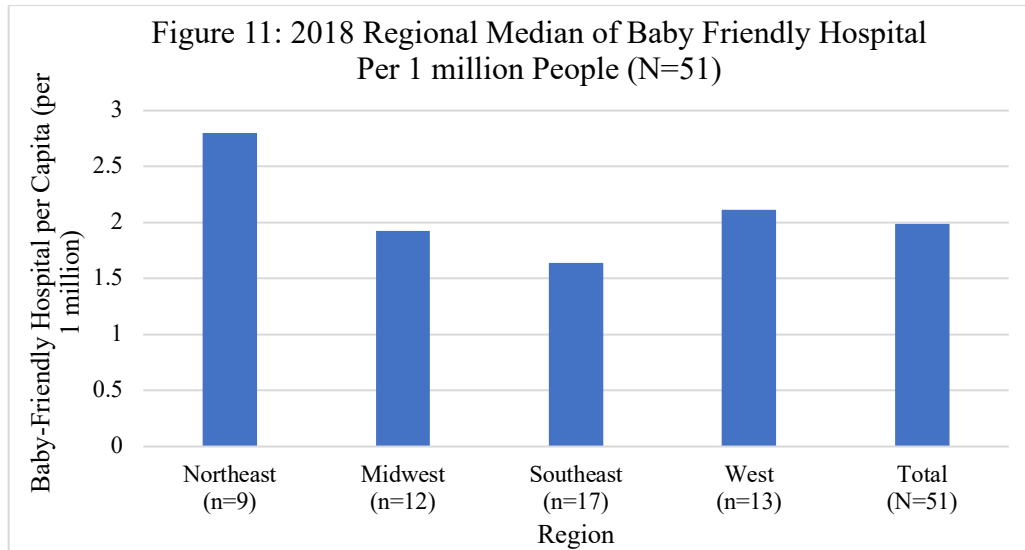
Note: high and low lines represent the maximum and minimum state ever breastfed rates in each category, while the colored bars depict the median rate for the policy category.
 *Kruskal-Wallis $p=0.919$.

Figure 10 compares policy category and median breastfeeding rate in terms of region. Each state in each region was placed in a category based on the number of policies that state had. The number of states in each category is denoted in the figure. For the Northeast and Midwest, little variation were found between policy categories concerning breastfeeding rates. Variation in breastfeeding rates can be seen in the Southeast and West, but the policy category with the highest median rate is different. In the Southeast, the group of states with 0 or only 1 policy have the highest median breastfeeding rate of 84%. In the West, the group of states with 2 policies has the highest median breastfeeding rate of 90.5%. When comparing across the regions, no clear patterns in region, policy category, and median ever breastfed rate can be seen. (Because of the low number of cases in some categories, statistical significant tests could not be conducted.)



Note: high and low lines represent the maximum and minimum state ever breastfed rates in each category, while the colored bars depict the median rate for the policy category.

While state policy number cannot be considered a moderator of 2018 ever breastfed rates, another organizational policy could be considered a moderator. The Baby-Friendly Hospital Initiative has been widely and rapidly implemented across the country within the last decade (see Appendix Table 5 for number of Baby-Friendly hospitals by state). Figure 11 shows median number of Baby-Friendly facilities per capita within a region. Northeast has the highest Baby-Friendly facilities per capita at 2.80 facilities per 1 million people. Southeast has the lowest at 1.64 Baby-Friendly facilities per 1 million.



Note: *Kruskal-Wallis $p=0.344$.

Figure 12 illustrates the change over time in Baby-Friendly hospital numbers. The best way to show this change over time is to use the percent of live births occurring at a Baby-Friendly facility. In 2007, no region had more than 6% of live births occurring at a Baby-Friendly facility. By 2012, a slight increase in number of live births occurred in all regions, but none surpassed 12%. Between 2012 and 2018, all regions experienced a large increase in percentage of live births. The Southeast had the largest increase, from 2.23% in 2012 to 28.45% in 2018.

From 2007 to 2018, the Northeast experienced a 456% increase in the percent of live births occurring in Baby-Friendly facilities, while the Midwest and West experienced a 733% and 713% increase, respectively. The Southeast experienced the greatest change in the number of live births occurring in Baby-Friendly facilities with a 5984% increase. Using non-parametric tests, Table 3 shows that changes across time and differences between region were statistically significant at an alpha of .05 or lower.

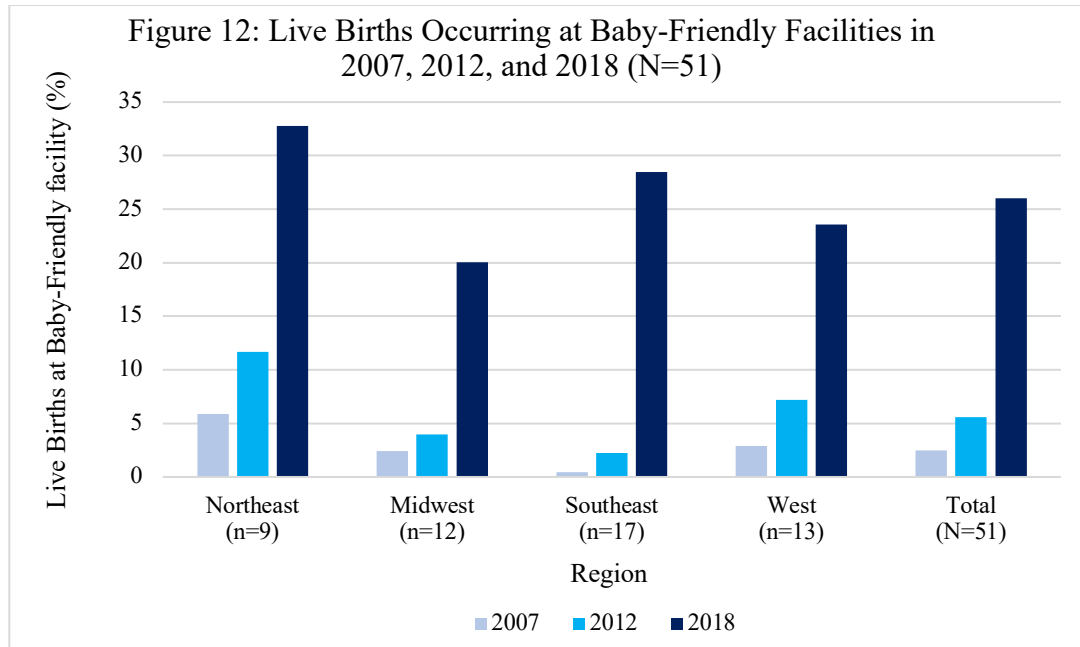


Table 3: Non-Parametrical Statistical Test for Number of Live Births Occurring in Baby-Friendly Facilities Change Over Time and Between Regions

| Comparison | Test | p value |
|---|---------------------------|--------------|
| Change Over Time | Wilcoxon Signed Rank Test | |
| 2007 to 2012 | | ≤ 0.001 |
| 2012 to 2018 | | ≤ 0.001 |
| Change Over Time (2007 to 2018) by Region | Wilcoxon Signed Rank Test | |
| Northeast | | $= 0.008$ |
| Midwest | | $= 0.003$ |
| Southeast | | ≤ 0.001 |
| West | | $= 0.001$ |
| Difference Between Regions | Kruskal-Wallis Test | |
| 2007 | | $= 0.004$ |
| 2012 | | $= 0.016$ |
| 2018 | | $= 0.331$ |

For most analyses conducted in this study, the Southeast lags behind the other regions. This section seeks to highlight which southeastern states are doing well and

which states possibly require intervention concerning breastfeeding rates, Healthy People goal, educational attainment, poverty rate, and Baby-Friendly facilities. This section will also focus on Mississippi's standing within these categories.

Based on Figure 3, the Southeast had the lowest breastfeeding rate in both 2007 and 2018, as well as the largest range in rate for both years. In 2007, Virginia had the highest rate in the Southeast with 79.1% and Mississippi had the lowest at 50.2%, a difference of 28.9. In 2018, Maryland had the highest rate in the Southeast at 91% and Mississippi once again had the lowest at 63.2%, a difference of 27.8.

Figure 5 shows that the southeast has the lowest percent of states to meet the Healthy People 2020 goal. Only 35% of southern states have met the goal, compared to 100% of western states. In the Southeast, only the District of Columbia, Florida, Georgia, Maryland, North Carolina, and Texas have met the Healthy People 2020 goal of 81.9% in 2018.

Figure 6 shows the Southeast of having the fewest females 25 years and older with a bachelor's degree or higher. The state with the highest percentage of educated females is a southeastern state, the District of Columbia, with 53.47% of females meeting this criterion. This high rate can be contributed to the small size and high concentration of professionals living in D.C., because it is the nation's capital. The Southeast region also has the state, West Virginia, with the lowest percent of highly educated females in the nation with only 19.49%. In Mississippi, only 21.93% of females 25 years or older have a bachelor's degree or higher.

According to Figure 7, the Southeast also has the highest rate of poverty in both categories studied. Mississippi has the highest rate among all states for both poverty factors. In Mississippi, 17% of all families are in poverty and 27.6% of families with

children under the age of 5 are in poverty. Comparatively, in the southeast, Maryland has the lowest family poverty rate of 6.7% and District of Columbia has the lowest poverty rate with children under 5 years old with a rate of 6.3%.

Figure 8 shows the Southeast as having the poorest health among all regions. The nine states with the highest numbered ranked (poorest health) are all southeastern states. These are the southeastern states with the poorest health denoted with their respective health ranking: Louisiana (50), Mississippi (49), Alabama (48), Oklahoma (47), Arkansas (46), Kentucky (45), West Virginia (44), South Carolina (43), and Tennessee (42).

The Southeast also has the lowest number of Baby-Friendly facilities per 1 million people, according to Figure 11. Among southeastern states, Kentucky has the lowest number, with only 0.67 Baby-Friendly facilities per 1 million people. Delaware has the highest among southeastern states with 4.14 Baby-Friendly facilities per 1 million people. Mississippi has the second highest number of Baby-Friendly facilities in the southeast with 3.68 facilities per 1 million.

DISCUSSION

Summary of Findings in Context of the Literature

State legislation regarding breastfeeding has an unclear relationship with state breastfeeding rates. Previous work conducted by Kogan et al. (2008) and Hawkins et al. (2012) concluded that state legislation increases breastfeeding rates. The conclusion of this study adds to these two studies because both studies were conducted with older data. Kogan's study focused on legislation and breastfeeding rates from 1999 to 2003; Hawkins' study range was from 2000 to 2008. This study shows the conclusions drawn from those findings may no longer be holding. State legislation generally provides rights and protections for breastfeeding mothers; however, it does not improve upon the education, practice, and forms of support needed for breastfeeding. Other government initiatives, such as breastfeeding goals outlined in Healthy People 2020, provide targets for states to achieve within a decade, yet do not provide framework for meeting goals. Organizational practices and institutional policies, such as Baby-Friendly USA, Inc., can complement state legislation and government initiatives by implementing higher level reforms and practice guidelines that improve breastfeeding practices. For instance, there has been an exponential increase in the number of babies born in Baby-Friendly hospitals in the United States since its inception in 1997 (see Appendix Figure 13). The focus is on redefining maternity wards from places infused with formula company influence to places providing evidence-based care and breastfeeding support.

The increase of Baby-Friendly hospitals across the nation may be a moderating factor for the relationship between social forces influencing breastfeeding and the actual breastfeeding rates. The Southeast region saw an almost 28-point change in the percent of live births taking place in Baby-Friendly hospitals from 2007 to 2018, with a 5984% change, the greatest among all regions. Mississippi, the state with the lowest breastfeeding rate in 2018, had only two Baby-Friendly designated facilities at the end of 2017. By March 2019, Mississippi had 11 Baby-Friendly designated facilities and the second highest number of Baby-Friendly facilities per capita in the Southeast. Mississippi, with 3.68 Baby-Friendly facilities per 1 million people, came in second to Delaware, which has 4.14 Baby-Friendly facilities per 1 million people. In 2017 with only 2 Baby-Friendly facilities, Mississippi had only 0.67 facilities per 1 million people. With increased number of designations in less than a year and a half, Mississippi was able to provide Mississippi mothers and newborns more facilities dedicated to breastfeeding. This increase in Baby-Friendly facilities in Mississippi can be contributed to Blue Cross & Blue Shield of Mississippi Maternity Care Quality Model. Part of this model calls for all delivering Network hospitals in the state to become Baby-Friendly designated, which is part of the requirements for receiving the Blue Distinction for maternity care. In the future, if a facility does not have the Blue Distinction, Blue Cross & Blue Shield of Mississippi will not reimburse those facilities (Blue Cross & Blue Shield of Mississippi, n.d.)

Limitations

A limitation in this study is that state policies concerning development of breastfeeding awareness programs are difficult to find within the legislation, since many

are only acts or declarations which are not found in a state's statutes or codes. A limitation also involving policy is the effect the Affordable Care Act of 2010 potentially has on the number of states enacting workplace breastfeeding legislation. In 2010, the Affordable Care Act enacted a nation-wide policy focused on the expression of milk in the workplace. Because of the presence of a federal policy, states may have seen it unnecessary to enact a similar state-wide policy. Another limitation of this study is that the most current breastfeeding rate data are based on 2015 births. While the number of live births occurring at a Baby-Friendly facility can be measured and reported for the current year, breastfeeding rates data are collected once a child is between 19 and 35 months, causing a lag in the most recent data. Also, data for number of Baby-Friendly hospitals in a particular year are difficult to find, considering that some previously designated hospitals lose their designation and are removed from the list of Baby-Friendly hospitals.

Further Research and Recommendations

Because the 2018 breastfeeding rate is based off 2015 births, an increase in Mississippi breastfeeding rates is foreseeable in the coming CDC Breastfeeding Report Cards due to the increased presence of Baby-Friendly hospitals in the state. Baby-Friendly hospital designation should be a top strategy for increasing breastfeeding rates because of its institutional-wide implementation. Every mother receives the opportunity, knowledge, education, and encouragement to breastfeeding in a breastfeeding-friendly environment. Baby-Friendly hospital designation has the potential to decrease common disparities seen in breastfeeding practices. Geographical barriers could be diminished because every hospital would be equipped to provide a mother the knowledge and

resources to breastfeeding, instead of just those located in more urban facilities. Racial and socioeconomic barriers to breastfeeding could also be reduced by presenting every mother with the choice, encouragement, and support to breastfeed. Therefore, to further improve breastfeeding rates and reduce disparities, more facilities need to be on track to receive the Baby-Friendly designation, especially in states with lower rates. State legislation can also be expanded to further protect and support breastfeeding mothers. The amendment made by the Patient Protection and Affordable Care Act to the Fair Labor Standards Act to provide reasonable break time to nursing mothers does not apply to all working women. An expansion of this amendment would give more mothers the protection and flexibility to pump at work, thus making those mothers more likely to continue breastfeeding. Also, this amendment could also require employers to provide mothers an adequate cold storage space for mothers to store their breast-milk while at work. Further research is needed to continuously monitor the growing relationship between Baby-Friendly hospitals and breastfeeding rates. Once breastfeeding rates are released for 2018 births, the impact of the number of Baby-Friendly hospitals in 2018 can be seen.

CONCLUSION

It is well known that breastfeeding is best in terms of its physiological, psychological, economical, and environmental effect (Office of the Surgeon General (US), 2011a). However, this study showed that most state breastfeeding rates, specifically the southeastern states, are not as high as they potentially could be. Interventions are necessary in order to assist these states in meeting goals like the Healthy People 2020 goal. This study found that state legislation now has little to no relationship with state breastfeeding rates, although it previously did. Baby-Friendly USA Inc. has the potential to cause an increase in rates in lower breastfeeding rate states because of its creation of a breastfeeding-friendly environment within hospitals. Baby-Friendly hospitals also can reduce disparities that are potential barriers to breastfeeding for low-income or less educated mothers. Further research should be conducted to study the evolving correlation between number of Baby-Friendly facilities and ever breastfed rate.

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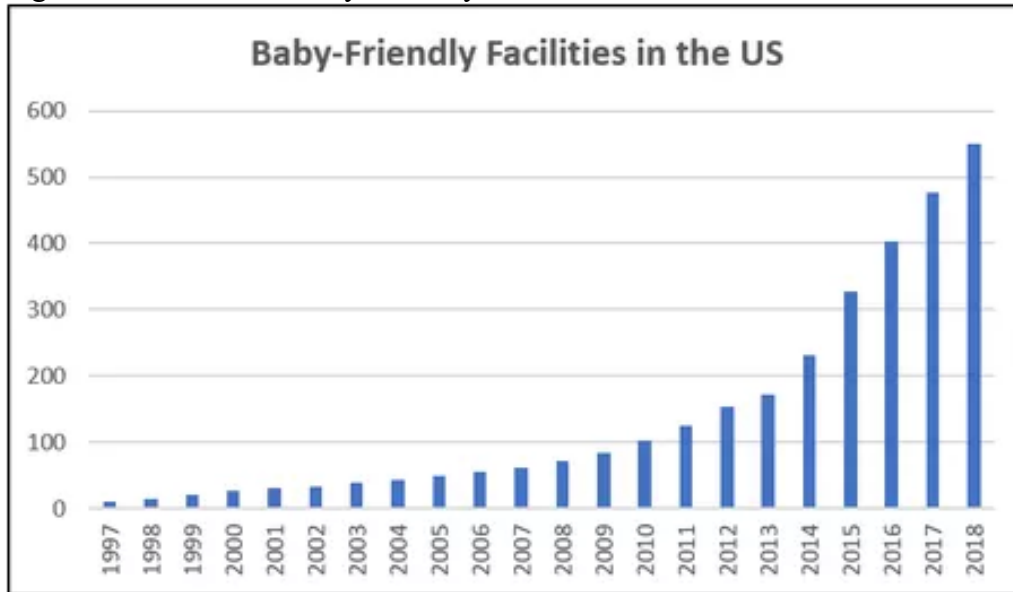
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APPENDIX

Figure 13: Number of Baby-Friendly Facilities in the US from 1997 to 2018



Source: Baby-Friendly USA website

Table 4: Breastfeeding Policy Present in each State

| States | Right to Breastfeed in Any Location | BF Mothers Excused from Jury Duty | Indecency Protection | Protect Expression of Milk in Work | Develop Awareness Programs | Total |
|----------------|-------------------------------------|-----------------------------------|----------------------|------------------------------------|----------------------------|-------|
| Alabama | 1 | 0 | 0 | 0 | 0 | 1 |
| Alaska | 1 | 0 | 1 | 0 | 1 | 3 |
| Arizona | 1 | 0 | 1 | 0 | 0 | 2 |
| Arkansas | 1 | 0 | 1 | 1 | 0 | 3 |
| California | 1 | 1 | 0 | 1 | 1 | 4 |
| Colorado | 1 | 1 | 0 | 1 | 0 | 3 |
| Connecticut | 1 | 1 | 0 | 1 | 0 | 3 |
| Delaware | 1 | 1 | 0 | 1 | 0 | 3 |
| D.C. | 1 | 0 | 1 | 1 | 0 | 3 |
| Florida | 1 | 0 | 1 | 0 | 1 | 3 |
| Georgia | 1 | 0 | 0 | 1 | 0 | 2 |
| Hawaii | 1 | 1 | 0 | 1 | 1 | 4 |
| Idaho | 1 | 1 | 1 | 0 | 0 | 3 |
| Illinois | 1 | 1 | 1 | 1 | 1 | 5 |
| Indiana | 1 | 0 | 0 | 1 | 0 | 2 |
| Iowa | 1 | 1 | 0 | 0 | 0 | 2 |
| Kansas | 1 | 1 | 0 | 0 | 0 | 2 |
| Kentucky | 1 | 1 | 1 | 0 | 0 | 3 |
| Louisiana | 1 | 0 | 1 | 1 | 0 | 3 |
| Maine | 1 | 0 | 0 | 1 | 0 | 2 |
| Maryland | 1 | 0 | 0 | 0 | 1 | 2 |
| Massachusetts | 1 | 0 | 1 | 0 | 0 | 2 |
| Michigan | 1 | 1 | 1 | 0 | 0 | 3 |
| Minnesota | 1 | 0 | 1 | 1 | 1 | 4 |
| Mississippi | 1 | 1 | 1 | 1 | 1 | 5 |
| Missouri | 1 | 1 | 1 | 0 | 1 | 4 |
| Montana | 1 | 1 | 1 | 1 | 0 | 4 |
| Nebraska | 1 | 1 | 0 | 0 | 0 | 2 |
| Nevada | 1 | 0 | 1 | 0 | 0 | 2 |
| New Hampshire | 1 | 0 | 1 | 0 | 0 | 2 |
| New Jersey | 1 | 0 | 0 | 1 | 0 | 2 |
| New Mexico | 1 | 0 | 0 | 1 | 0 | 2 |
| New York | 1 | 0 | 1 | 1 | 1 | 4 |
| North Carolina | 1 | 0 | 1 | 0 | 0 | 2 |
| North Dakota | 1 | 0 | 1 | 1 | 0 | 3 |
| Ohio | 1 | 0 | 0 | 0 | 0 | 1 |
| Oklahoma | 1 | 1 | 1 | 1 | 0 | 4 |
| Oregon | 1 | 1 | 0 | 1 | 0 | 3 |
| Pennsylvania | 1 | 1 | 1 | 0 | 0 | 3 |
| Rhode Island | 1 | 0 | 1 | 1 | 0 | 3 |
| South Carolina | 1 | 0 | 1 | 0 | 0 | 2 |
| South Dakota | 1 | 1 | 1 | 0 | 0 | 3 |
| Tennessee | 1 | 0 | 1 | 1 | 0 | 3 |
| Texas | 1 | 0 | 0 | 1 | 0 | 2 |
| Utah | 1 | 1 | 1 | 1 | 0 | 4 |
| Vermont | 1 | 0 | 0 | 1 | 1 | 3 |
| Virginia | 1 | 1 | 1 | 1 | 0 | 4 |
| Washington | 1 | 0 | 1 | 1 | 0 | 3 |
| West Virginia | 1 | 0 | 1 | 0 | 0 | 2 |
| Wisconsin | 1 | 0 | 1 | 0 | 0 | 2 |
| Wyoming | 1 | 0 | 1 | 1 | 0 | 3 |

Source: Individual state legislation website and National Conference of State Legislatures website as of August 2018. Table by Author.

Table 5: Number of Baby-Friendly Facilities Per State

| State | Number of Baby-Friendly Facilities | State | Number of Baby-Friendly Facilities |
|----------------------|------------------------------------|----------------|------------------------------------|
| Alabama | 7 | Montana | 10 |
| Alaska | 2 | Nebraska | 1 |
| Arizona | 6 | Nevada | 3 |
| Arkansas | 6 | New Hampshire | 7 |
| California | 95 | New Jersey | 11 |
| Colorado | 14 | New Mexico | 11 |
| Connecticut | 10 | New York | 29 |
| Delaware | 4 | North Carolina | 17 |
| District of Columbia | 2 | North Dakota | 2 |
| Florida | 24 | Ohio | 10 |
| Georgia | 15 | Oklahoma | 9 |
| Hawaii | 3 | Oregon | 12 |
| Idaho | 2 | Pennsylvania | 13 |
| Illinois | 25 | Rhode Island | 4 |
| Indiana | 21 | South Carolina | 14 |
| Iowa | 2 | South Dakota | 2 |
| Kansas | 6 | Tennessee | 6 |
| Kentucky | 3 | Texas | 22 |
| Louisiana | 16 | Utah | 1 |
| Maine | 5 | Vermont | 2 |
| Maryland | 8 | Virginia | 7 |
| Massachusetts | 17 | Washington | 9 |
| Michigan | 16 | West Virginia | 4 |
| Minnesota | 17 | Wisconsin | 11 |
| Mississippi | 11 | Wyoming | 1 |
| Missouri | 7 | | |

Source: Baby-Friendly USA website as of March 2019. Table by Author.