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Supplement Report: Analysis of New Hampshire Pregnancy Risk Assessment Monitoring System (PRAMS) to Better Understand Breastfeeding Initiation and Duration by Industry Category

Introduction

In October of 2017, the NH Occupational Health Surveillance Program published a [report on breastfeeding barriers associated with returning to work among women enrolled in the NH Special Supplemental Nutrition Program for Women, Infants and Children \(WIC\)](#). Results of a survey conducted among 682 participants in the NH WIC Program indicated varied breastfeeding behaviors as well as a lack of accommodations in the workplace to support breastfeeding among working mothers.

Additional analyses of the survey data resulted in an [article published in the International Journal of Environmental Research and Public Health](#) (published 13 February 2019), focused on identifying barriers and supports to breastfeeding in the workplace experienced by mothers in the NH WIC Program utilizing the *Total Worker Health* framework.

This supplemental report provides additional information on breastfeeding initiation and duration, and a woman's job category (industry) as reported to the NH

Division of Vital Records Administration via the NH birth certificate. De-identified responses in the NH birth certificate data linked to the responses in the Pregnancy Risk Assessment Monitoring System (PRAMS) survey data provided the opportunity to better understand duration of breastfeeding by a woman's industry. The findings may be useful to policymakers and employers when framed in terms of the health and economic benefits of breastfeeding to inform workplace policy formation.

Background

The American Academy of Pediatrics (AAP) reaffirms its recommendation of exclusive breastfeeding for about the first six months of a baby's life, followed by breastfeeding in combination with the introduction of complementary foods until at least 12 months of age.ⁱⁱ The World Health Organization has recently recognized the need for increased supports to improve breastfeeding duration and initiation rates, recommending women breastfeed for two years.ⁱⁱⁱ

Fewer than twenty-nine states have laws related to breastfeeding support in the workplace, despite all fifty states having some form of protection for nursing in public places.^{iv} Employers are left to make critical decisions that affect nursing mothers' ability to return to work and continue breastfeeding their baby when a state is without workplace related breastfeeding legislation.

NH survey results published in the *International Journal of Environmental Research and Public Health* indicate that, by industry, a greater percentage of women who had ever breastfed worked in healthcare and a smaller percentage worked in accommodation and retail than women who had never breastfed.^v The study found significant associations between industry and breastfeeding initiation, pumping at work, and the policies and physical environment related to breastfeeding and pumping. Specifically, women in service-oriented industries (i.e., accommodation and retail) reported the lowest rates of breastfeeding initiation and workplace supports for breastfeeding and pumping.

Methods

Data Sources

A total of 49,073 NH Resident Births were analyzed for the period of 2014 through 2017. Key variables from the birth certificate included industry and "is infant being breastfed even partially?" (hereafter referred to as breastfeeding initiation).

PRAMS, the Pregnancy Risk Assessment Monitoring System, is a surveillance project of the Centers for Disease Control and Prevention (CDC) and state health departments. New Hampshire PRAMS collects state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy for NH resident births. The initiative is aimed at reducing infant mortality and low birth weight.

In New Hampshire, approximately one of every twelve mothers of newborns is selected for [PRAMS](#). Mothers are randomly chosen from birth records. Data collection procedures and instruments are standardized in all participating states.

NH PRAMS data were used (linked to birth certificate data) to represent all NH resident births from 2014-2017. The key variable from NH PRAMS included, "How many weeks or months did you breastfeed or pump milk to feed your baby?" Breastfeeding status in PRAMS was categorized as never, ≤ 8 weeks, and > 8 weeks.

NH PRAMS survey methods have been described more thoroughly elsewhere.^{vi} Analysis of NH PRAMS data was done with SPSS (version 26) using the Complex Survey Module to account for the complex survey sampling design.

The NH birth certificate collects industry (type of business) and occupation (type of work done during last year) in text form (referred to as I-O). Industry literals from a

total of 49,073 de-identified birth records from 2014-2017 were batch auto-coded using the National Institute for Occupational Safety and Health (NIOSH) Industry and Occupation Computerized Coding System (NIOCCS) version 2.0.^{vii} The Census 2010 coding scheme and high confidence options were used to code for industry according to the *North American Industry Classification System (NAICS)*, the standard for industrial classification systems in the U.S. government.

Those that were not coded automatically by NIOCCS were hand-coded by a trained occupational health expert using the same coding scheme. Emphasis was on documenting industry broad categories as being sufficient to describe the type of work the mother was involved in at or around the time of the birth. Additional information on the NAICS classification system is available [here](#).

Additional categories include *Non-paid worker*, established by NIOSH and coded accordingly in NIOCCS, to classify responses that indicate the person is not in the work force. Those responses include, homemaker, student, volunteer, retired, disabled/unable to work.

Those responses to I-O that were not sufficient enough to code were coded in NIOCCS as *Insufficient Information* and therefore not coded for Industry/NAICS. Those who did not respond at all (left blank) in the birth certificate were coded as *Missing Information*.

10.6 % of NH resident births were categorized as *Missing* or *Insufficient Information*. Out-of-state births to NH residents (9.3% of the total resident births) were more likely to be coded as *Missing* or *Insufficient Information* (29.9%) vs 8.6% of Occurrent births coded as *Missing* or *Insufficient Information*.

Since PRAMS does not use I-O fields as weighting variables, the distribution of industry for all births was compared to the weighted distribution of industry in the PRAMS sample to assure reasonable representation (Figure 1). The distributions were found to be similar.

Analyses limited to the birth dataset included all records. Analyses that included PRAMS data were limited to the top 6 NAICS categories to provide categories large enough for analysis.

These categories included:

- Non-Paid Workers
- Health Care and Social Assistance
- Educational Services
- Retail Trade (combined with Wholesale Trade)
- Accommodation and Food Services
- Professional, Scientific, and Technical Services

These six broad industry categories represented 74.3% of births as calculated using the weighted PRAMS data (weighted population estimate 35736/48130).

Results

Figure 1: Distribution of NAICS broad industry categories for all births and for PRAMS (see Appendix A for accessible tables).

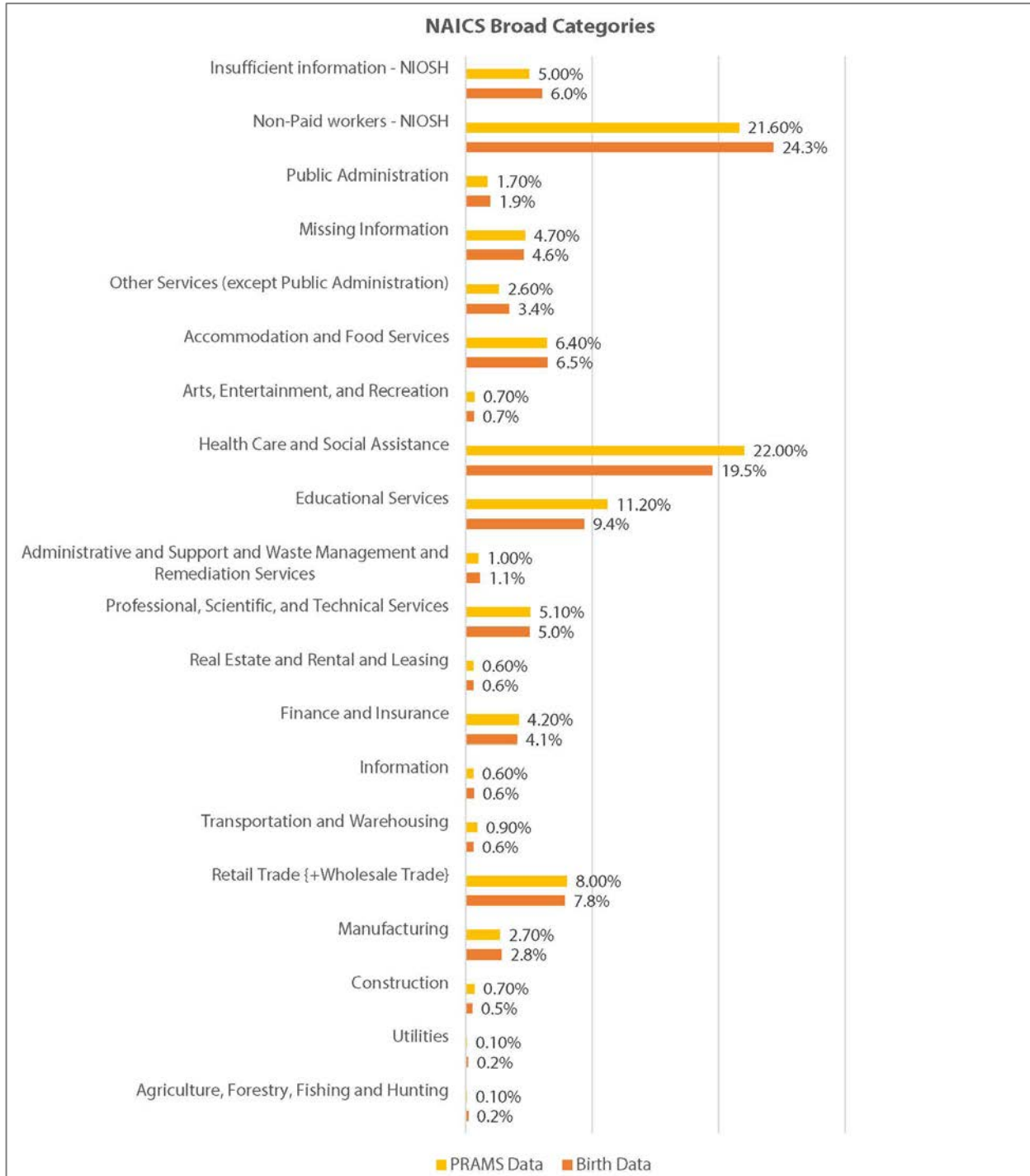
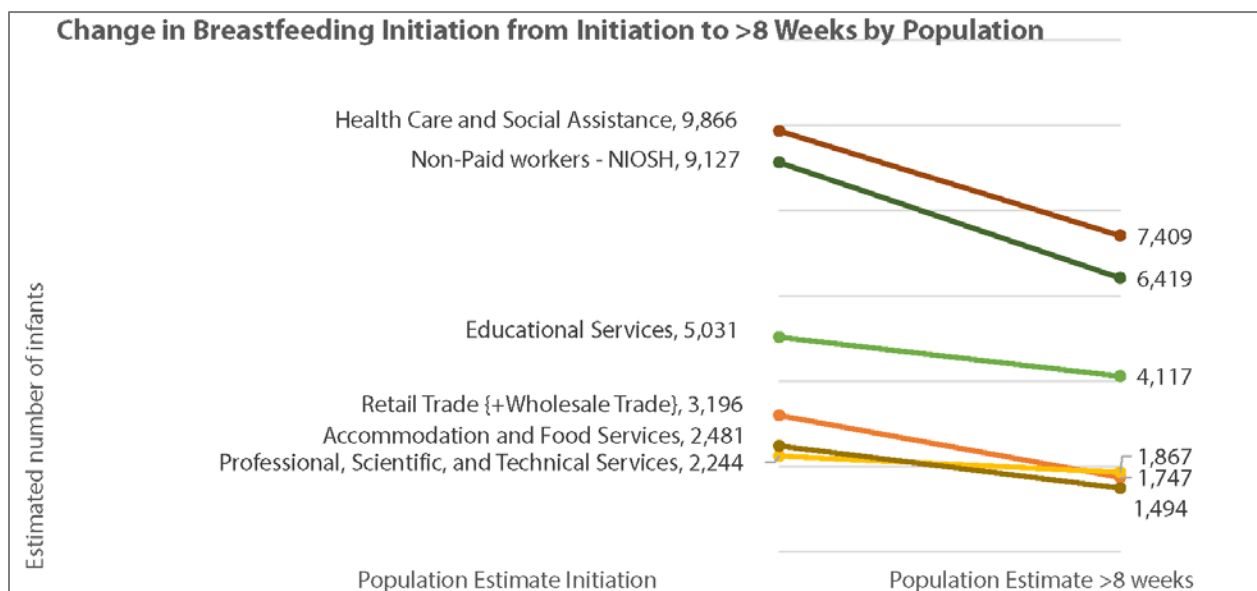
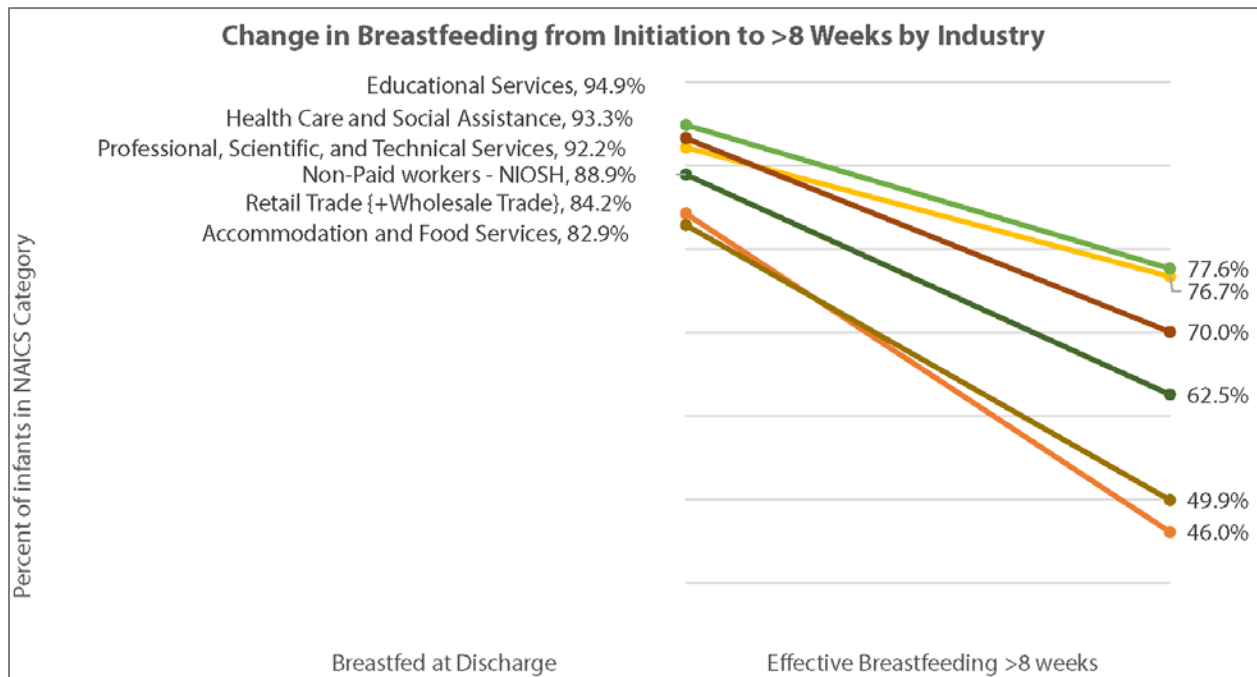


Figure 2: Change in breastfeeding from initiation to greater than 8 weeks by both percentage and population (see Appendix B for accessible tables)



The slope graphs above show the change in breastfeeding from initiation to greater than 8 weeks by both percentage and population. The greatest decline in the percentage of infants breastfed occurred in the

Accommodation and Food Services (82.9% to 49.9%) and Retail/Wholesale Trade (84.2% to 46%) industry categories. However, since the Health Care and Social Assistance and Non-Paid Workers

categories are much larger, they account for more of the decrease in the overall number of infants breastfed.

Limitations

Industry and occupation questions are intended to be collected and coded together, however when one or the other is not provided, the accuracy of coding can be diminished.

Discussion

As in our previous study, we found significant associations between industry and duration of breastfeeding. Strategies for increasing the duration of infants being breastfed must consider the contribution work plays in a woman's decision to continue breastfeeding. Our results illustrate that women with a more supportive environment (higher income professional jobs) are more likely to initiate breastfeeding and breastfeed longer compared to those without a supportive environment (lower income service-oriented jobs). Factors such as being employed full-time, early return to work after childbirth, lack of flexibility in the work schedule, and maternity leave increase the likelihood of early breastfeeding cessation after childbirth. Intervention strategies need to be developed that either target industry groups where the percentage of decline is greater, or target industries where the decrease in numbers of infants breastfed is higher, or both.

An important strategy to increase breastfeeding among working mothers who

are planning to breastfeed includes comprehensive lactation programs at work.^{viii} Increasing the proportion of US businesses with a comprehensive lactation program is one goal of the Healthy People (HP) 2020.

The Affordable Care Act made a good faith attempt to require employers to provide lactation accommodations for nursing mothers when returning to work but unfortunately left too many gaps, particularly for low-income, part-time and employed mothers that don't fall under the protections of the US Department of Labor, Fair Labor Standards Act.

New Hampshire breastfeeding experts have worked hard to strengthen relationships with businesses and other community stakeholders. The research published in the International Journal of Environmental Research and Public Health provided evidence to guide a grant from the State of New Hampshire Department of Health and Human Services, Centers for Disease Control and Prevention, on a Worksite Lactation Pilot Project (2018-2020) that funded 34 businesses and created more than 40 breastfeeding friendly spaces. The NH Breastfeeding Taskforce has developed a [Workplace Toolkit](#) which includes an Employer Training Module for Workplace Lactation Support.

Conclusions

While it is not the intent of this report to address systemic disparities in access to

workplace accommodations and supports for nursing mothers, we must recognize that, in addition to socioeconomic factors, maternity care policies and practices, marketing of infant formula, workplace support policies, family leave, state legislation, social and cultural norms and influence from family and friends all contribute to these disparities.^{ix}

There is much room for improvement in developing supports for breastfeeding moms who work, particularly in low-income, part time, and service-oriented industry groups. The knowledge gained by exploring breastfeeding status by industry groups provides a better understanding of where efforts could be made to increase the duration of infants being breastfed, particularly among women who work.

Appendix A

	Birth	PRAMS		Birth	PRAMS
Agriculture, Forestry, Fishing and Hunting	0.2%	0.1%	Educational Services	9.4%	11.2%
Utilities	0.2%	0.1%	Health Care and Social Assistance	19.5%	22.0%
Construction	0.5%	0.7%	Arts, Entertainment, and Recreation	0.7%	0.7%
Manufacturing	2.8%	2.7%	Accommodation and Food Services	6.5%	6.4%
Retail Trade {+ Wholesale Trade}	7.8%	8.0%	Other Services	3.4%	2.6%
Transportation and Warehousing	0.6%	0.9%	Missing Information	4.6%	4.7%
Information	0.6%	0.6%	Public Administration	1.9%	1.7%
Finance and Insurance	4.1%	4.2%	Non-Paid workers	24.3%	21.6%
Real Estate, Rental and Leasing	0.6%	0.6%	Insufficient information	6.0%	5.0%
Professional, Scientific, and Technical Services	5.0%	5.1%	Educational Services	9.4%	11.2%
Administrative and Support and Waste Management and Remediation Services	1.1%	1.0%	Health Care and Social Assistance	19.5%	22.0%

Appendix B

NAICS Category	Pop Est Initiation	Pop Est >8wks
Retail Trade {+Wholesale Trade}	3,196	1,747
Professional, Scientific, and Technical Services	2,244	1,867
Educational Services	5,031	4,117
Health Care and Social Assistance	9,866	7,409
Accommodation and Food Services	2,481	1,494
Non-Paid workers - NIOSH	9,127	6,419

NAICS Category	Breastfed at Discharge	Effective BF >8wks
Retail Trade {+Wholesale Trade}	84.2%	46.0%
Professional, Scientific, and Technical Services	92.2%	76.7%
Educational Services	94.9%	77.6%
Health Care and Social Assistance	93.3%	70.0%
Accommodation and Food Services	82.9%	49.9%
Non-Paid workers - NIOSH	88.9%	62.5%

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ⁱⁱ American Academy of Pediatrics. (2012). Breastfeeding and the use of human milk. *Pediatrics*, 129(3), e827–e841. Retrieved June 22, 2020, from <https://pediatrics.aappublications.org/content/129/3/e827>.

ⁱⁱⁱ World Health Organization. (2001). *The World Health Organization's infant feeding recommendation*. Retrieved June 22, 2020, from http://www.who.int/nutrition/topics/infantfeeding_recommendation/en/index.html

^{iv} Breastfeeding State Laws. <http://www.ncsl.org/research/health/breastfeeding-state-laws.aspx>. Accessed August 20, 2020.

^v Lauer, E.A.; Armenti, K.; Henning, M.; Sirois, L. Identifying Barriers and Supports to Breastfeeding in the Workplace Experienced by Mothers in the New Hampshire Special Supplemental Nutrition Program for Women, Infants, and Children Utilizing the Total Worker Health Framework. *Int. J. Environ. Res. Public Health* **2019**, *16*, 529.

^{vi} Centers for Disease Control and Prevention, PRAMS Methodology, Retrieved June 22, 2020 from <https://www.cdc.gov/prams/methodology.htm>.

^{vii} NIOSH (2016). NIOSH Industry and Occupation Computerized Coding System (NIOCCS). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, Division of Surveillance, Hazard Evaluation and Field Studies, Surveillance Branch. <http://wwwn.cdc.gov/niosh-nioccs>. Date accessed November 29, 2016.

^{viii} Dinour LM, Szaro JM. Employer-Based Programs to Support Breastfeeding Among Working Mothers: A Systematic Review. *Breastfeed Med.* 2017;12(3):131-141. doi:10.1089/bfm.2016.0182

^{ix} U.S. Department of Health and Human. Executive Summary The Surgeon General's Call to Action to Support Breastfeeding. *Breastfeed Med.* 2011;6(1):3-5. doi:10.1089/bfm.2011.9996