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Evaluation of the Birth Month Breastfeeding Changes to the WIC Food Packages

December 2011



FNS | **USDA**
Food & Nutrition Service

Executive Summary

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Birth Month
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Executive Summary

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Executive Summary

ES.1 Background

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) provides nutritious foods, nutrition education, breastfeeding support, and health referral services to low-income mothers and their children. In 2007, USDA published an Interim Rule changing the composition and quantities of prescribed foods in the WIC food packages (72 Federal Register 68965-69032). In particular, the regulatory changes sought to encourage WIC mothers to choose breastfeeding for their infants. The Interim Rule took effect in 2009.

A large body of research shows multiple benefits of breastfeeding for infant health, nutrition, immune system function, and social and psychological development. Leading health associations in the United States and internationally recommend exclusive breastfeeding, except in rare circumstances, for six months postpartum and support for breastfeeding up to 12 months (AAP, 2005; AAFP, 2007; APHA, 2007; WHO, 2003). WIC may affect breastfeeding in multiple ways. The provision of free infant formula could encourage formula feeding, while WIC's food package design and vigorous breastfeeding education efforts could encourage breastfeeding. Breastfeeding promotion and support are central tenets of the WIC Program.

ES.2 Changes to the WIC Food Package

WIC offers distinct food packages for mother-infant pairs (or "dyads") based on breastfeeding status: full breastfeeding, partial breastfeeding, and full formula. The Interim Rule limited the amount of infant formula available to dyads receiving the partial breastfeeding package. To encourage the successful initiation of breastfeeding, when the infant was in its birth month, WIC formula was no longer routinely provided to these partial breastfeeding dyads, and the amount that could be provided was limited to no more than 104 ounces. To encourage greater duration and intensity of breastfeeding, when the infant was aged 1-5 months, the formula amount for these partial breastfeeding dyads was limited to no more than about 45% of the maximum formula amount. After implementation, if a dyad required more than these amounts of formula, the mother would receive the full formula WIC package, even if she was partially breastfeeding her infant. Receiving the full formula package instead of the partial breastfeeding package may be a significant change. The full formula package provides less food for the mother, and these maternal benefits end when the infant is six months old. The partial breastfeeding provides more food for the mother, and the benefits last throughout the infant's first year.

ES.3 Study Design

The study focused on infants and their mothers for the birth month and the next five months postpartum, in 17 randomly sampled Local WIC Agencies (LWAs). The data came from several sources in each period, including interviews with State and local WIC staff, administrative records for all dyads with an infant aged 0-5 months in the sampled LWAs, and participant surveys with mothers of infants aged 0-9 weeks who had initiated breastfeeding.

The study used a pre/post research design, comparing outcomes shortly before and shortly after implementation of the Interim Rule. In some analyses, multivariate regression models were used to control as well as possible for explanatory variables that may have changed, but the basic research design had no control group. The well-known limitation of a pre/post research design without control group is its inability to account for all environmental changes that coincided in time with the implementation of the Interim Rule. In this study, the policy “treatment” appeared sufficiently strong, and the time periods before and after implementation appeared sufficiently close, that this limitation seemed acceptable. If we observe changes in outcomes between the pre-implementation and post-implementation period, we cannot be sure of causation, but the adoption of the Interim Rule is a leading candidate explanation.

ES.4 Study Outcomes

The study evaluated the impact of the Interim Rule on five outcome domains:

- *Domain 1: WIC participation.* After implementation, were there changes in WIC participation patterns and the demographic and economic characteristics of participants?
- *Domain 2: Food package choices and infant formula amounts.* (2a) Was there a change in the percentage of participants receiving each WIC package? (2b) Was there a change in infant formula amounts?
- *Domain 3: Breastfeeding initiation.* Was there a change in the percentage of participants who initiated breastfeeding?
- *Domain 4: Breastfeeding duration.* Was there a change in the duration of breastfeeding?
- *Domain 5: Breastfeeding intensity.* Was there a change in the percentage of participants with exclusive breastfeeding, a combination of breastfeeding and formula feeding, and exclusive formula feeding?

In addition to these five domains, the study reported on the implementation of the Interim Rule.

ES.5 Results

Program Participation Patterns (Domain 1)

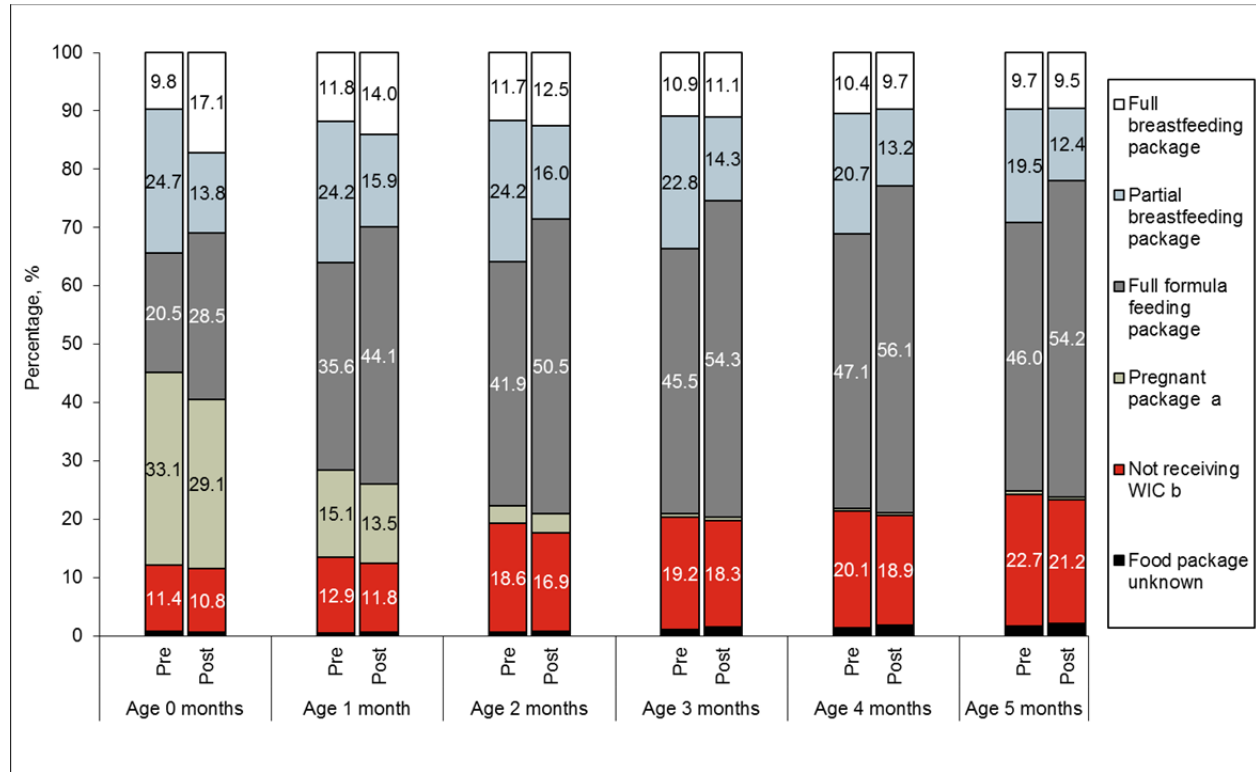
There was little pre/post difference in WIC program participation patterns among mothers and infants. The percentage of mothers receiving WIC during pregnancy whose infants were enrolled after birth was the same before and after implementation. The average age of infant’s first enrollment was the same before and after implementation. The average demographic characteristics of WIC mothers and infants were largely the same before and after implementation. The lack of these differences in patterns bolsters the hypothesis that any changes in the remaining outcomes can be attributed to the implementation of the Interim Rule.

WIC Food Package Assignments and Infant Formula Amounts (Domain 2)

After implementation of the Interim Rule, fewer WIC mothers were assigned the partial breastfeeding package, while more mothers were assigned to the full breastfeeding and full formula packages (Exhibit ES.1). For dyads or partial dyads where the infant was in its birth month, the percentage whose mother

received the partial breastfeeding package fell from 24.7% (pre) to 13.8% (post). The percentage receiving the full breastfeeding package rose from 9.8% (pre) to 17.1% (post), and the percentage receiving the full formula package rose from 20.5% (pre) to 28.5% (post).

Exhibit ES.1 Food Packages Issued to New Mothers, by Age of Infant



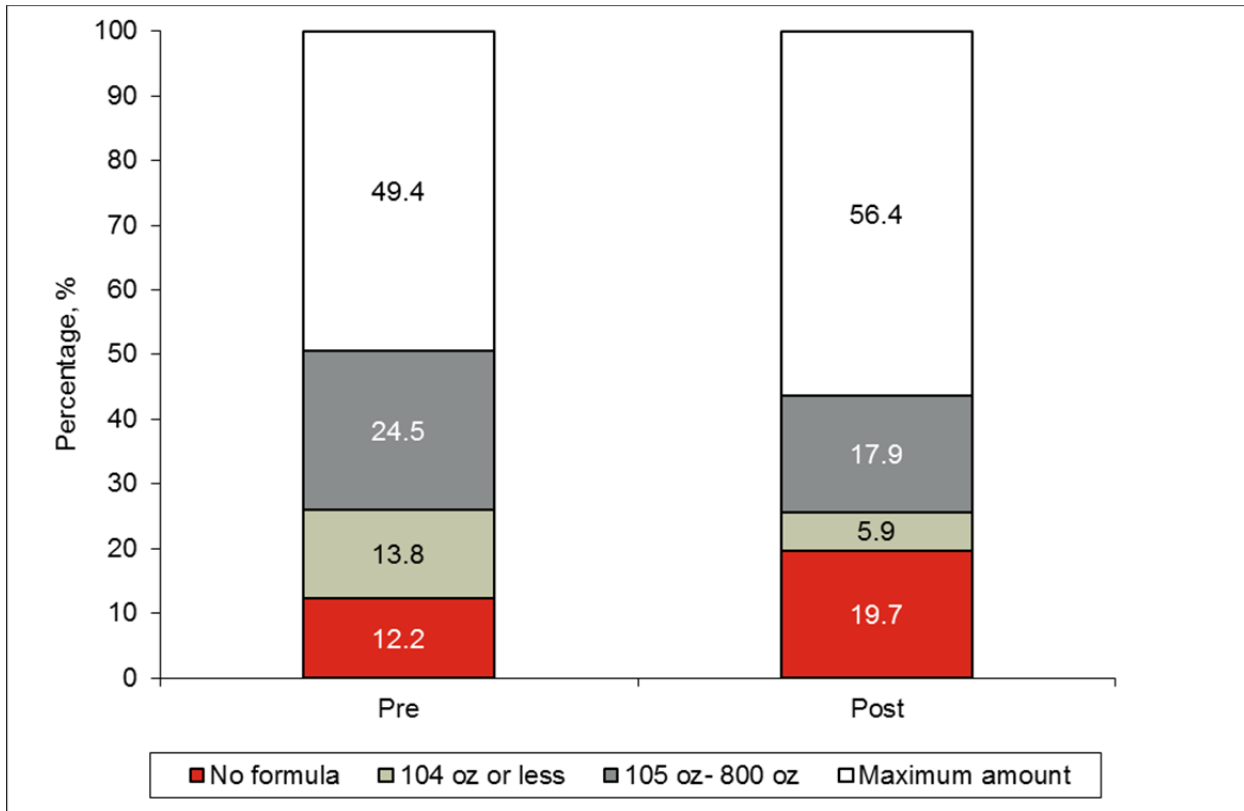
Sample: Administrative records, all dyads with infants aged 0 to 5 months, $n=129,606$ (pre) and $n=528,597$ (post) in analysis months 1-2 (pre) and analysis months 5-12 (post).

Interpretation Guide: Among dyads whose infants were in their birth month, 9.8% (pre) and 17.1% (post) received the full breastfeeding package as the mother’s WIC food package.

^a Mothers with infants certified for WIC. ^b Mothers who have not recertified postpartum, but who have infants who have been certified.

Infant formula amounts also changed after the Interim Rule was implemented (Exhibit ES.2). Among dyads with infants in the birth month, the proportion where the infant received no formula increased from 12.2% (pre) to 19.7% (post), which is a favorable outcome. However, the proportion where the infant received the maximum or nearly the maximum formula amount also increased, from 49.4% (pre) to 56.4% (post), which is a less favorable outcome. Both principal findings suggest a move away from intermediate WIC packages and toward the two extremes (full breastfeeding or full formula).

Exhibit ES.2 Infant Formula Amounts (Ounces) Issued for Infants in the Birth Month



Sample: Administrative records, all dyads with infants in the birth month in analysis months 1-2 (pre) and analysis months 5-12 (post).

Interpretation Guide: Among dyads with infants in the birth month, the percentage that receives the maximum amount of formula increased from 49.4% (pre) to 56.4% (post).

Notes: Infant formula amounts are expressed as four categories: (1) no formula; (2) 104 ounces, the post-implementation partial breastfeeding limit for the birth month, or less; (3) more than the post-implementation partial breastfeeding limit of 104 ounces but less than 800 ounces; (4) 800 ounces or more. The actual formula amount provided to a dyad could range from 0-806 ounces in the pre-implementation period and from 0-884 ounces in the post-implementation period (see Exhibit 1.1).

Breastfeeding Initiation Rates (Domain 3)

As measured in administrative records, the breastfeeding initiation rate for WIC participants was essentially unchanged: 65.5% (pre) and 65.1% (post) (Exhibit ES.3). Overall breastfeeding initiation rates appeared quite stable even as WIC package assignments changed.

Exhibit ES.3 Breastfeeding Initiation, Overall and by Mother's Food Package

	Pre (%)	Post (%)	Diff (%)	DF ^a	Chi-Square ^a	p-value ^a
Overall	65.5	65.1	-0.4	1	0.307	0.580
Mother's Food Package:						
Full breastfeeding package	99.6	99.3	-0.3	1	4.444	0.035 *
Partial breastfeeding package	96.5	96.5	0.1	1	0.017	0.895
Full formula feeding package	46.7	55.4	8.7	1	12.812	<0.001
Pregnant package ^b	67.3	64.8	-2.5	1	6.258	0.012
Not receiving WIC ^c	47.7	45.8	-1.9	1	1.213	0.271
	<i>n</i> = 80,658	<i>n</i> = 77,534				

Sample: Administrative records, all dyads with infants aged 0-5 months in analysis month 2 (pre) and analysis month 10 (post).

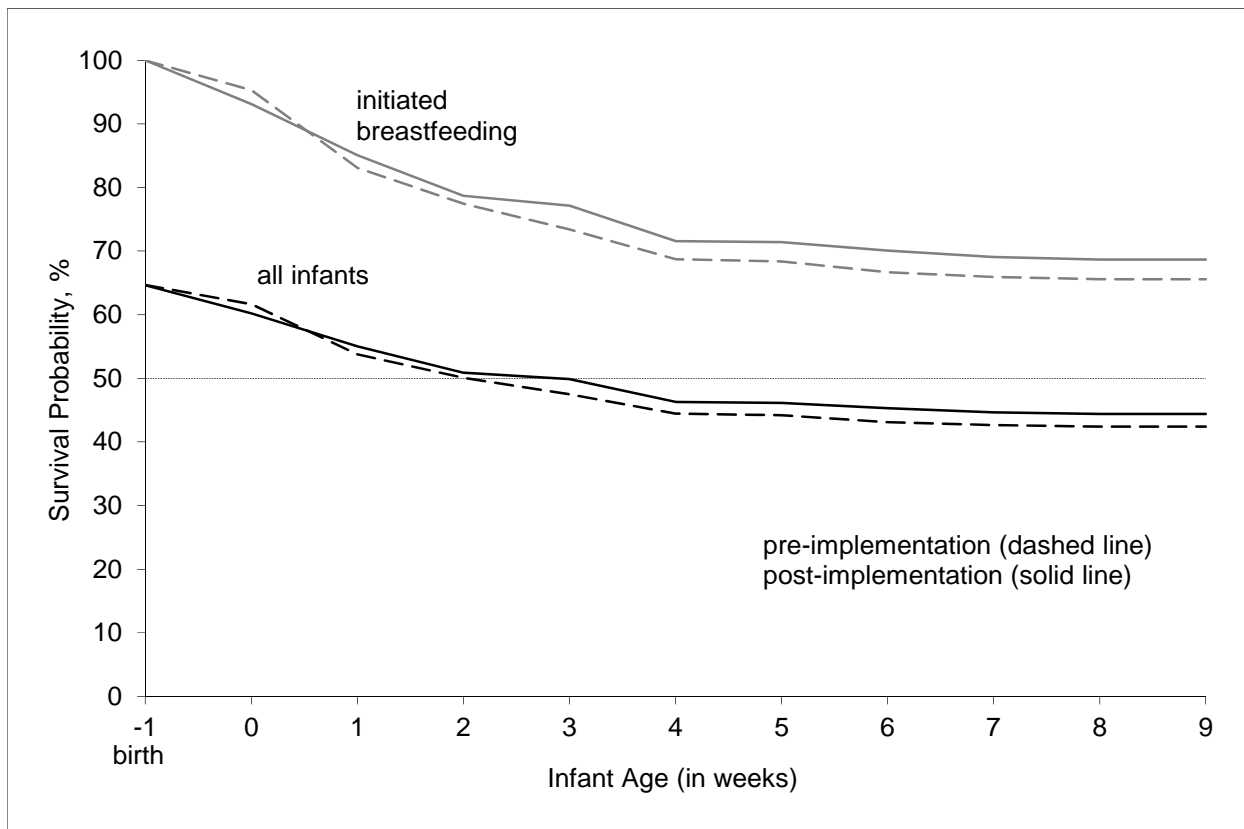
Interpretation Guide: The breastfeeding initiation rate was 65.5% (pre) and 65.1% (post).

^a Chi-square tests indicate pre/post differences. Stars indicate statistical significance of differences between pre and post: **p*<0.05, ***p*<0.01, *** *p*<0.001. Missing values indicate that the test could not be estimated. ^b Mothers who have not recertified postpartum, but who have infants who have been certified. ^c Mothers with infants certified for WIC.

Breastfeeding Duration (Domain 4)

In pre/post comparisons, without adjustment for other explanatory variables, there was a small but statistically significant increase after implementation in breastfeeding duration over the infants' first 10 weeks of life. The duration estimates used data from the survey respondents, all of whom had at least initiated breastfeeding. A survival analysis showed a small statistically significant shift in the profile of breastfeeding duration: at each infant age measured in weeks, the percentage of respondents that was still breastfeeding was slightly higher after implementation than before implementation (Exhibit ES.4).

Exhibit ES.4 Estimated Survival Function of Survey Respondents Who are Still Breastfeeding in a Given Week Postpartum (Pre- and Post-Implementation, 2009-2010)



In addition to this survival analysis described above, simple estimates of respondents with infants who were still breastfeeding after four weeks, measured as a percentage of all respondents with infants observed at age four to nine weeks, increased from 73.1% (pre) to 81.9% (post).¹ Multivariate analysis, holding other factors constant, showed a pre/post difference that was negligible in magnitude and not statistically significant (see Chapter 9). The preponderance of evidence suggests that the Interim Rule had at most small impacts on breastfeeding duration.

Breastfeeding Intensity (Domain 5)

Based on the participant survey data, there was not a statistically significant change after implementation in the intensity of breastfeeding among initiators (Exhibit ES.5). The main analysis categorized participant feeding practices into five categories of breastfeeding intensity: (1) breastmilk only, (2) mostly breastmilk with some formula, (3) breastmilk and formula about equally, (4) mostly formula and some breastmilk, and (5) only formula. There was not a statistically significant difference in the percentage of respondents in these categories before and after implementation of the Interim Rule.

¹ Percentages reported here are shown in Exhibit 9.4 in Chapter 9 of the full report.

Exhibit ES.5 Intensity of Breastfeeding, Overall

	Pre (%)	Post (%)	Diff	DF	Chi-Square ^a	p-value
				4	2.755	0.600
Breastmilk only	18.3	20.0	1.7			
Mostly breastmilk and some formula	24.9	23.2	-1.7			
Breastmilk and formula equally	16.1	14.2	-1.9			
Mostly formula and some breastmilk	11.7	14.5	2.8			
Formula only	29.0	28.1	-0.9			
	n=814	n=800				

Sample: Participant surveys, mothers with an infant aged 0-9 weeks who initiated breastfeeding.

Interpretation Guide: 18.3% (pre) and 20.0% (post) of mothers who initiated breastfeeding fed their infants only breastmilk. These differences were not statistically significant.

^a A Chi-square test was conducted.

ES.6 Policy Implications

The Interim Rule sought to address the challenging policy dilemma of balancing breastfeeding promotion with provision of safe and appropriate food for infants who are formula fed. After implementation, the study found more dyads were assigned the full breastfeeding package, but more dyads also were assigned the full formula package. After implementation, this study found no change in initiation and intensity, and only a small change in duration. These results are neutral in the sense that no adverse impact on breastfeeding was observed, but unfavorable in the sense that larger positive changes in breastfeeding outcomes were not observed. These results raise the question of what further policy changes could be explored, subsequent to the implementation of the Interim Rule, as the most sensible next steps toward even more vigorous breastfeeding promotion.

A first policy option is to further increase the economic value of the full breastfeeding and partial breastfeeding packages relative to the full formula package. Although the Interim Rule shifted the package incentives somewhat towards making the full breastfeeding package more valuable, the full formula package continues to have the highest market value. Compared to before implementation, this study found that more dyads had mothers receiving the full formula package after implementation, and that most of these full formula dyads received the maximum or nearly the maximum formula amount. Within the current structure of WIC's overall program design, policy-makers could consider further reducing the food content and economic value of the full formula package, while increasing the food content and economic value of the full breastfeeding package.

A second policy option is to continue to improve staff training and strengthen breastfeeding promotion efforts at the State- and LWA-level. The implementation of the Interim Rule should be seen as one event in an ongoing process of promoting breastfeeding through WIC. This study found considerable diversity across LWAs in breastfeeding promotion, package assignments and infant formula amounts, and breastfeeding outcomes. For example, although the Interim Rule allows the provision of up to 104 ounces of formula for partial breastfeeding dyads with infants in their birth month, LWAs are encouraged routinely to provide no formula to such dyads. FNS anticipates that over time fewer breastfeeding WIC dyads will be provided any formula in the birth month. Later, as the infant reaches ages 1-5 months, about half of the LWAs in this study responded to mothers' requests for additional formula by addressing their concerns through counseling before issuing a new package. Such efforts could be extended to more LWAs. FNS encourages States (a) to review existing policies and procedures to ensure they support

breastfeeding women and infants through minimum supplementation with infant formula, and (b) to ensure staff are adequately trained to provide the necessary counseling and support.

A third policy option, motivated in particular by the stability of the breastfeeding initiation outcomes after implementation of the Interim Rule, is to focus the next stage of WIC policy development on pregnant mothers and the very first days postpartum. WIC could invest even more heavily in educating pregnant women and new mothers about the relative merit of the full breastfeeding package. Through outreach efforts, and perhaps even through changes in the pregnancy WIC package, the WIC program could increase its recruitment of eligible pregnant women. WIC also could study the experience of those States and LWAs with the lowest provision of infant formula to breastfeeding mothers during the infant's birth month to inform further guidance to States. Finally, WIC could be used as a vehicle for more vigorously promoting appropriate lactation policies and practices for U.S. hospitals.