SUPPORTING STATEMENT PART B FOR

Revision to OMB Number 0584-0580
WIC Infant and Toddler Feeding Practices Study-2 (WIC ITFPS-2): Age 3 Extension

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Part B
Collections of Information Employing Statistical Methods

B.1   Respondent Universe and Sampling Methods

Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.

Respondent Universe

The respondent universe for the Age 3 Extension includes infants enrolled in the base cohort. ITFPS-2 uses a longitudinal design and the revision will continue to gather data from mothers/caregivers about their 30- and 36-month old children via a telephone survey (Appendices G and J) and will collect height and weight data from WIC administrative records, healthcare providers, or direct measurements at WIC site offices (using Appendices O, S, and V).

As described in Section B.2, our base cohort sample was designed to obtain minimum detectable differences (MDDs) of 5 to 10 percentage points between subgroups of interest at the originally planned final measurement of 24 months. With the expansion of the study to 36 months, we project our current sample will yield 2,580 completed 30-month interviews and 2,444 completed 36-month interviews, assuming 10 percent annual attrition from

the 24-month interview (with 5 percent attrition from the 24-month interview to the 30-month interview).[1] The projected sample sizes at 36 months are expected to yield MDDs of 6 to 12 percentage points between subgroups of interest for estimates at 36 months.

WIC program representatives in the WIC State and Local Agencies will provide important information to the study. A total of 27 State WIC administrators and 80 local WIC site staff will continue to support data collection efforts for the Age 3 Extension. Finally, we anticipate contacting 196 health care providers to obtain height and weight data for children who have discontinued their participation in WIC and are unable to revisit the WIC site office for measurements.

Sampling Methods

The Age 3 Extension will continue to collect data from participants that were recruited in the base study; no additional sampling will be undertaken.

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[1] The ITFPS-2 annual attrition rate (as of 4/10/14) for eligible respondents is 3.5 percent. We expect this will increase in Year 2 and beyond.

Response Rates and Non-Response Bias Analysis

Preliminary analysis of the base study indicates a response rate of 92 percent for the 1 month interview, which was completed in August 2014. The expected response rate of the base cohort to the 24-month interview is 67 percent, and based on that, projected response rates for the 30- and 36-month interviews in the Age 3 Extension are 64 percent and 60 percent, respectively. To the extent that respondents in the Age 3 Extension are systematically different from the population as a whole with respect to characteristics used in an analysis, the potential for nonresponse bias exists. Statistical methods used to compensate for missing data (weighting and imputation) aim to reduce nonresponse bias. Since there is generally no way to directly measure the difference in key survey characteristics between respondents and the population as a whole, various methods have been developed that aim to assess the potential for nonresponse bias.

We will use the approach proposed in the base study to examine bivariate cross tabulations of data available for the eligible, enrolled cohort by response status at 36-month interview to check for evidence of nonresponse bias at 36-month interview. We also plan to compare unadjusted estimates (i.e., computed using weights that do not include the adjustment for nonresponse to the particular wave) to adjusted estimates. We will identify a few key variables to be used in these bias analyses.

B.2   Procedures for the Collection of Information

Describe the procedures for the collection of information including:

- **Statistical methodology for stratification and sample selection,**

- **Estimation procedure,**

- **Degree of accuracy needed for the purpose described in the justification,**

- **Unusual problems requiring specialized sampling procedures, and**

- **Any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

Statistical Methodology for Stratification and Sample Selection

The Age 3 Extension will continue to collect data from participants that were recruited in the base study; no additional sampling will be undertaken.

Degree of Accuracy Needed for the Purpose Described in the Justification

The sample size requirements for the WIC ITFPS-2 base study were determined based on power projections and precision requirements for estimates at 12 and 24 months. Our primary source of information for these analyses was the baseline interview of ECLS-B (Early Childhood Longitudinal Study – Birth Cohort). We used this survey both to estimate the sizes of key subgroups and to project likely intra-class correlation (ICC). In projecting sample sizes, we focused on the following key outcomes: breastfeeding initiation, breastfeeding at 6 months (with no sub-setting on initiation), and the introduction of solid foods before the age of six months.

The precision requirement was that for key national estimates for the full "currently on WIC" group, a 95 percent confidence interval should have a half-width of no more than 5 percentage points. Additionally, for subgroup estimates (for key subgroups), a 90 percent confidence interval should have a half-width of no more than 5 percentage points. The core sample size was determined by the need to meet the precision target on the breastfeeding initiation rate for African-American mothers. The supplemental sample size was driven by the need to provide the same precision on the comparable statistic restricted to African-American mothers who keep their children on WIC for 24 months. Other statistics for the population that keep their

children on WIC for 24 months are also at the desired precision limit. Table B2.1 shows the expected minimum detectable differences (MDDs) between subgroups of interest for three critical outcomes using a test size of 0.05 and power of 0.80, based on the original target sample sizes for the base study. They range from 5 to 10 percentage points. Note that MDDs for upward and downward changes are slightly different. The numbers shown in this table are the average of the MDDs and upward and downward change. These figures use the total of the core and supplemental samples.

Table B2.2 shows minimum detectable differences (MDDs) in child obesity and overweight status by timing of maternal WIC enrollment, controlling for maternal weight status; these are also based on the original target sample sizes for the base study. We assumed that controlling for maternal weight status in these analyses will reduce variances by 20 percent. These projections apply to either age 12 months or 24 months. Power to detect these effects is 0.80.

Table B2.1. Minimum detectable differences between subgroups of interest (based on both the core longitudinal and supplemental cross-sectional samples)

Comparison	Percent initiating breastfeeding	Percent breastfeeding at six months	Percent introduced solid food prior to 6 months
African-American vs. white	9.7	5.8	8.4
Other vs. white	7.6	7.0	7.8
Hispanic vs. Non-Hispanic	6.0	5.9	6.4
Breastfed 1-3 months vs. never	N/A	N/A	7.2
Breastfed 4+ months vs. never	N/A	5.9	7.8
1st trimester enrollment vs. postnatal	8.6	6.4	7.5
2nd or 3rd trimester vs. postnatal	9.0	6.8	6.7
Mom overweight vs. normal or low	8.2	6.8	7.3
Mom obese vs. normal or low	8.1	5.1	7.0
Under 75% poverty vs. 76 to 129%	8.7	5.8	7.9
Over 130% poverty vs. 76 to 129%	7.5	5.9	7.6

Table B2.2. Minimum detectable differences for child obesity and overweight status by timing of WIC enrollment – controlled for maternal weight status – valid at both 12 and 24 months

Timing of maternal WIC enrollment	MDD in percent obese	MDD in percent overweight	MDD in percent obese or overweight
1st trimester enrollment vs. postnatal	3.2	4.4	5.2
2nd or 3rd trimester vs. postnatal	3.3	4.5	5.4

Table B2.3 shows our projected sample sizes and response rates at the interviewing stages that are part of the extension study (namely, the 30- and 36-Month interviews) over time. The projected sample sizes for the 24-Month interview (which is part of the base study) are also given, and are based on the actual consented and enrolled mothers/caregivers of live infants in the sample, since these formed the basis for extending the projections to 30 and 36 months. The response rate assumptions (including attrition) for each of these interviews are shown in the "Rates" columns. The rates shown are computed as the number of completed interviews divided by the cohort size (4,046).

Table B2.3. Expected sample sizes and response rates

	Mother infant events/interviews	Sample[a]	Rates
Cohort	Total live infants consented & enrolled pre/post-natal[b]	4,046	
	24-Month (Base study)	2,716	67%
	30-Month	2,580	64%
	36-Month	2,444	60%
	Total interviews in Extension study[c]	5,024	

[a] Sample sizes are projections based on the full consented/enrolled sample

[b] Total live births in base study cohort

[c] Total of 30- and 36-month samples (24-month interview is part of Base study)

Estimation Procedures

The estimation procedures for the extension are the same as those for the base study. We plan to use standard design-based methods for estimation and variance estimation that will lead to confidence intervals on means and percentages, and hypothesis tests on contrasts of means and percentages. We will prepare a separate set of cross-sectional weights for each wave of data collection, including the 30- and 36-month interviews. The only respondents that will receive a positive weight for a wave will be those who responded to the wave and those who missed the wave but returned to the sample after missing no more than two consecutive waves. Respondents returning to the sample after one or two missed waves will be asked some retrospective "catch-up" questions to get the timing of a few critical items where transitions are noted such as when nursing mothers stopped nursing, and when cereal was introduced into the child's diet. Weighting will be used to adjust for nonresponse to the initial interview and to adjust for attrition. Additionally, a few sets of longitudinal weights (which weight up respondents to particular combinations of interviews) will be developed for specific analyses. Imputation will be used to fill in scattered item nonresponse within completed interviews and missing data from other sources such as hospital records when we have questionnaire data from mothers.

We will develop sampling weights aimed at yielding nearly unbiased estimates of population parameters such as the breastfeeding initiation rate. These weights will begin with the calculation of base weights (the inverse of the probability of selection), and these will be adjusted for nonresponse across the waves of the study. One set of weights will be developed for analyses of the core sample by itself. A different set of weights will be developed for joint analyses of the core and supplemental sample samples. Details of the calculation of the weights and nonresponse are found in Appendix WW of the supporting statement for ICR Reference No. 201208-0584-002 and 201306-0584-008; Expiration date: 05/31/2016. Imputation will be used to adjust for item nonresponse (i.e., missing data for particular items among those who respond to a given wave). As with weighting, a carefully designed imputation procedure will reduce bias due to item nonresponse. Further discussion will be needed to identify the particular set

of items to be imputed but this set should include, at a minimum, variables needed for weighting as well as key survey outcomes and covariates. A cyclical n-partition hot deck (an approach analogous to the Gibbs sampler but using the hot deck to generate the imputations) will be used for imputation. See Appendix WW of the supporting statement for the Base study for details of the imputation process.

Estimation and Calculation of Sampling Errors

Two broad classes of methods have been developed for computation of standard errors of estimates from complex sample surveys: (1) replication methods and (2) Taylor series linearization. The WIC ITFPS-2 data files will contain the information necessary for analysts to use either of these approaches to compute standard errors. For WIC ITFPS-2, 40 replicates will be created, and the replication approach that will be used is a modified balanced repeated replication (BRR) method suggested by Fay,[2] with K=0.5 (K is the perturbation factor known as "Fay's factor"). To appropriately reflect the effects of the various stages of weighting on the variances of survey estimates,[3] the procedures used to compute the full-sample weights will be repeated for each of the replicates. Software packages that use Taylor series linearization to estimate variances of statistics from complex sample surveys require the user to specify design information including "stratum" and "cluster" variables.

Unusual Problems Requiring Specialized Sampling Procedures

No specialized sampling procedures are involved.

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[2] Judkins, D. (1990). Fay's method for variance estimation. *Journal of Official Statistics*, 6, 223-239.

[3] Ernst, L.R., and Williams, T.R. (1987).Some aspects of estimating variances by half-sample replication in CPS.*Proceedings of the Section on Survey Research Methods of the American Statistical Association*, pp. 480-485.

Any use of Periodic (less frequent than annual) Data Collection Cycles to Reduce Burden

All data collection activities will occur within a 36 month period. The study design requires that respondents be surveyed at multiple times, as described in Section B.1.

B.3   Methods to Maximize Response Rates and to Deal with Issues of Nonresponse

Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.

WIC State and Local Administrators and Their WIC Sites

The 27 State Agencies and 80 WIC sites were recruited for the base study. They will be contacted again via email, telephone, and web, and asked to attend a conference call that will explain the extension to the study and answer any questions.

WIC Participants

Successful retention of our sample for the extended study hinges on our ability to make participants want to continue in the study and our ability to locate participants over time. While many participants become more committed to the study with each interview they complete, others experience survey fatigue which may overwhelm their interest in continuing.

We will employ these strategies to retain as many members of the sample as possible through the 36-month interview:

1. **Keep Respondents Informed and Excited About the Study.** Send a glossy flyer when the baby turns 21 months old that details the extension of the study to the child's 3rd birthday (Appendices B.1 and B.2) .

2. **Utilize Study Liaisons Who Serve as the Point-of-Contact for the Study.** Four full-time study liaisons (SLs) with a caseload of about 1,000 participants each, will continue to answer respondent questions, offer encouragement for continued study participation, conduct refusal conversion, remind participants about expiring interviews, help schedule appointments for height and weight measurements for participants who are no longer on WIC, and trace respondents whose phone numbers have changed.

3. **Provide Larger Incentives for Followup Interviews.** Increase the incentive for the 30- and 36-month interviews from $20 to $30 and $40, respectively. Further, provide an additional $10 for the respondent's own cell phone. The increased incentive will recognize the value of respondents who stay with the study for the longer time period.

4. **Incentivize Respondents to Update Their Contact Information.** Ask participants to update their contact information when their children are 27- and 33-months old, and provide a $5 incentive for providing this information (Appendices E.1 and E.2).

5. **Attempt Interviews at Different Times of the Day and Week.** Use telephone call scheduling procedures to call numbers at different times of the day (between 8 am and 9 pm in the respondent's time zone) and week (Sunday through Saturday) during the 28 day window, to improve the chances of interviewing participants. When participants cannot be reached, leave voice mail messages periodically and provide a toll-free call-in number that participants can use to complete the interview (Appendices H.1-H.2).

6. **Encourage Participants to Call In.** Send advance letters a few days before the start of the 30- and 36-month interview windows to remind participants about the upcoming interview and provide the toll-free call-in number and hours the telephone center is open to encourage them to call in to complete the interview at their convenience (Appendices I.1, I.2, J.1, and J.2).

7. **Send Texts and Reminder Postcards 10 Days After Start of the Window.** Send out reminder texts and postcards on the 10th day of the interviewing window to respondents who have not completed their 24-, 30-, or 36-month interviews (Appendices H.1-H.2).

8. **Contact Respondents Whose Interview Windows are Expiring.** The study liaisons will continue to make reminder calls and send reminder emails and texts (Appendices H.1 and H.2) to respondents whose interview windows are within 1 week of expiring.

9. **Send Birthday Cards to Respondents.** As part of the relationship building, the study liaisons will send birthday cards to participants that include a gift as a token of our appreciation a small magnetic picture frame with the study name that can be used to hold the child's picture (Appendices K.1 and K.2).

B.4   Test of Procedures or Methods to be Undertaken

Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.

The majority of items that will be included in the interviews at 30 and 36 months have either been cognitively tested for previously approved interviews on this study or drawn from other established studies. Consequently, testing will be done only to evaluate timing and flow of the 30-month interview, with two English speaking and two Spanish speaking respondents. Because the 36-month interview contains only a well-validated 24-hour dietary recall module and socio-demographic questions that are asked at 30 months as well, we will not pretest the 36-month interview questions separately.

B.5   Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data

Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

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