SUPPLEMENT ARTICLE

Infant Feeding Practices Study II: Study Methods

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ABSTRACT

OBJECTIVE. Our goal is to describe the methods used in the Infant Feeding Practices Study II (IFPS II), a study of infant feeding and care practices throughout the first year of life. Survey topics included breastfeeding, formula and complementary feeding, infant health, breast-pump use, food allergies, sleeping arrangements, mother's employment, and child care arrangements. In addition, mothers' dietary intake was measured prenatally and postnatally.

PARTICIPANTS AND METHODS. The IFPS II sample was drawn from a nationally distributed consumer opinion panel of 500 000 households. All questionnaires were administered by mail, 1 prenatally and 10 postpartum. Qualifying criteria were used to achieve the sample goals of mothers of healthy term and late preterm singleton infants. In addition to the questionnaires about the infants, women were sent a diet-assessment questionnaire prenatally and at ~4 months after delivery; this questionnaire was also sent to members of a comparison group who were neither pregnant nor postpartum.

RESULTS. A sample of 4902 pregnant women began the study, and ~2000 continued through their infant's first year. Response rates ranged from 63% to 87% for the different questionnaires. Compared with adult mothers of singletons from the nationally representative sample of the National Survey of Family Growth, IFPS II participants had a higher mean education level; were older; were more likely to be middle income, white, and employed; were less likely to smoke; and had fewer other children. Compared with women who participated in the National Immunization Survey who gave birth in 2004, IFPS II mothers were more likely to breastfeed and to breastfeed longer.

CONCLUSIONS. The IFPS II provides a valuable database because of its large sample size, the frequency of its questionnaires, and its wide coverage of issues salient to infant feeding. *Pediatrics* 2008;122:S28–S35

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Key Words
breastfeeding, bottle feeding, infant nutrition, physiology, infant care

Abbreviations
IFPS—Infant Feeding Practices Study
FDA—Food and Drug Administration
CDC—Centers for Disease Control and Prevention
WIC—the Special Supplemental Nutrition Program for Women, Infants, and Children
DHQ—Diet History Questionnaire
NSFG—National Survey of Family Growth
NIS—National Immunization Survey

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THE INFANT FEEDING Practices Study II (IFPS II) is a longitudinal study of women from late pregnancy through their infant's first year of life. It is a follow-up to the IFPS I, conducted by the US Food and Drug Administration (FDA) in 1992–1993, which provided detailed information about general infant feeding patterns and infant health.[1–13] In the approximate decade since the original study, there have been significant changes in the products, policies, information, and education related to infant feeding choices. For example, breast pumps have become more effective and more affordable for individuals, new ingredients have been added to infant formula, changes in state and federal laws have reduced the barriers that women face in choosing to breastfeed, and policies and recommendations about infant feeding have changed. In addition, research has more clearly defined the health benefits of breastfeeding for infants in developed countries,[14] and new breastfeeding-promotion campaigns have been conducted.

The IFPS II was conducted to better understand the infant feeding practices used by women in the United States in the context of these changes. The study was designed to obtain detailed information about the feeding patterns of infants during their first year of life, along with information about the infants' health, factors that may affect the infants' feeding, and information about the mothers' health and diet. The study was also designed to serve as a component in evaluation of the National Breastfeeding Awareness Campaign.[15]

The IFPS II was conducted by the FDA in collaboration with the Centers for Disease Control and Prevention (CDC). It was guided by a working group with representatives from the funding agencies within the Department of Health and Human Services (FDA, CDC, Office of Women Health [Department of Health and Human Services], *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, Office of Dietary Supplements, and National Cancer Institute [National Institutes of Health], and the Maternal and Child Health Bureau [Health

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Services and Resources Administration]. In addition, scientists from the US Department of Agriculture and from academia served on the working group. The group included experts in nutrition, general and neonatal pediatrics, demography, study design, dietary assessment, food allergies, breast pump regulation, infant formula regulation, infant sleep arrangements, breastfeeding and employment issues, and other topics.

PARTICIPANTS AND METHODS

Longitudinal data were collected with a prenatal questionnaire; a short telephone interview near the time of the infant's birth; a neonatal questionnaire sent when the infant was ~1 month old; and 9 questionnaires about infant feeding, health, care, and related issues sent approximately monthly during infant ages 2 to 7 months and then approximately every 7 weeks until the infant was 12 months old. In addition, the study included 2 maternal dietary assessments, one during late pregnancy and a second one ~4 months after delivery, and a separate dietary assessment (for comparative purposes) of a sample of women of childbearing age who were neither pregnant nor postpartum.

Sample

The study sample consisted of ~4900 pregnant women, ~2000 of whom continued with the study through their infant's first year. Data were collected from May 2005 through June 2007.

The sampling frame for the IFPS II was a nationally distributed consumer opinion panel of >500 000 households. A panel is the most efficient way to identify a nationally distributed sample of pregnant women who are likely to complete repeated questionnaires. The management of the consumer opinion panel that served as the sampling frame updates information on pregnancy status of household members, as well as household demographic information, quarterly for approximately one fourth of the total panel. Because of the timing of the pregnancy-update information, current information was not available for all households at the same time. Therefore, questionnaires had to be mailed over a period of 8 months to obtain the desired sample size. All women identified as being in their third trimester of pregnancy were included in the mailings.

Qualifying criteria on the birth screener were that neither the mother nor the infant could have a medical condition at birth that would affect feeding and that the infant had to have been born after at least 35 weeks' gestation, weigh at least 5 lb, be a singleton, and not have stayed in intensive care for >3 days.

After the birth screener, infant-mother pairs were disqualified if the infant was reported to have a serious, long-term health problem that would affect feeding. Each questionnaire asked about such problems, and the reported problems were evaluated by the same physician who performed this evaluation for the IFPS I and by a pediatrician and a maternal and child health expert. Women were excluded from the sample if 2 of these 3 evaluators thought that their infant had an illness or condition that would affect their feeding behavior. In addition, respondents were excluded from the sample if they lived in a zip code to which the US Postal Service stopped delivering mail as a result of the 2005 Gulf Coast hurricanes. Exclusions because of this mail disruption affected respondents in the prenatal through month-4 questionnaires.

In our analyses, we included data from respondents who were eventually disqualified from further participation in the study through the questionnaire on which they were disqualified. For example, we included data from the prenatal questionnaire and birth screeners for women who were excluded from responding to the neonatal questionnaires because they reported having a long-term health problem that would affect feeding. Exclusion criteria and the number of women disqualified for each reason are provided in Tables 1 and 2.

Questionnaire Development

All questionnaires were developed by the FDA in collaboration with the CDC and members of the working group who had specific expertise in each topic. To the extent possible, questions were taken from the IFPS I. The postpartum depression scale, which was not included in the IFPS I, is a previously validated assessment for self-completion.[16] Before being added to the IFPS II questionnaires, new questions were tested in a series of cognitive interviews with respondents drawn mostly from the consumer opinion panel. Four pilot tests were mailed to a sample of women in the consumer opinion panel whose infants were prenatal, neonatal, in early infancy, and in late infancy. The use of panel members to test questionnaires was important to ensure that the questions and layout were clear to the women who would compose the study sample. An important characteristic of panel members is that they all have at least moderate literacy, and they develop experience completing questionnaires. Therefore, the questions could be written at a higher literacy level than would be appropriate for a general population sample. All questionnaires, other materials sent to respondents, and procedures were approved by the FDA's Research Involving Human Subjects Committee (the institutional review board) and the US Office of Management and Budget.

The questionnaires were organized to maximize the comparability of participants' responses over time to the many repeated questions. The first 3 questionnaires (prenatal, birth screener, and neonatal) asked mostly questions that were unique. The prenatal questionnaire was used to collect information about the infants' family medical history and the mothers' health and health care, dietary changes because of pregnancy, employment status, breastfeeding attitudes and experiences, infant feeding plans and confidence in breastfeeding, sources of information about diet and infant feeding, and participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). In addition, it included questions to evaluate the National Breastfeeding Awareness Campaign. The birth screener was used to collect information about the infants' birth date and birth weight and medical problems of the mothers and

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TABLE 1 Disposition of the IFPS II Sample for the Prenatal Questionnaire, Birth Screener, and Neonatal Questionnaire

Disposition	Subtotal	Total
Prenatal questionnaire		
Total mailed, *n*		15147
Disqualified from mailing list after questionnaires were mailed, *n*		529
Undeliverable, *n*	484	
Duplicate, *n*	5	
Gulf Coast hurricane zip code, *n*[a]	40	
Adjusted total mailed, *n*		14618
Disqualified, *n*		601
Infant already born, *n*	21	
Miscarried, *n*	18	
Under 18 y, *n*	95	
Expecting twins, *n*	92	
No one in household pregnant, *n*	375	
Refused, *n*		46
Not returned, *n*		9069
Complete and qualified, *n*[b]		4902
Birth screener		
Total prenatal respondents, *n*		4902
Disqualified from mailing list after questionnaires were mailed, *n*		67
Undeliverable, *n*	19	
Gulf Coast hurricane zip code, *n*[a]	48	
Adjusted total attempted to reach, *n*		4835
Disqualified, *n*[c]		673
No one in household pregnant, *n*	16	
Infant not due in date range, *n*	193	
Infant died, *n*	10	
Birth weight < 5 lb, *n*	82	
Multiple births, *n*	17	
Mother had medical problems that prevented her from feeding the infant for >1 wk, *n*	89	
Infant stayed in intensive care >3 d, *n*	107	
Infant had medical problems that affected feeding, *n*	115	
Born prematurely (born ≥36 d before due date), *n*	38	
Born after field closing date, *n*	6	
Refused, *n*		4
No due date given, *n*		46
Returned after due date, *n*		58
No answer, *n*		618
Complete and qualified, *n*		3452
Response rate: (No. of surveys completed/adjusted No. of interviews attempted) − No. of women disqualified, %		82.9
Neonatal questionnaire		
Total mailed, *n*[d]		4226
Disqualified from mailing list after questionnaires were mailed, *n*		213
Undeliverable, *n*	31	
Duplicate, *n*	12	
Gulf Coast hurricane zip code, *n*[a]	8	
Accidentally dropped from sample, *n*	162	
Adjusted total mailed, *n*		4013
Disqualified, *n*[e]		70
Born prematurely (born ≥36 d before due date), *n*	38	
Born after field date, *n*	6	
Long-term illness, *n*[f]	26	
Refused, *n*		23
Not returned, *n*		890
Complete and qualified, *n*		3033
Response rate: (No. of surveys completed/adjusted No. mailed − No. of women disqualified), %		76.9

[a] Sample members were excluded from the remainder of the study if they resided in the zip codes to which the US Postal Service stopped delivery as a result of the 2005 Gulf Coast hurricanes.

[b] Response rates for the prenatal questionnaire could not be calculated because only eligible respondents returned the questionnaire. The likely number ineligible could not be estimated because women could be disqualified for multiple reasons and data showing how these criteria overlap are not available.

[c] When a respondent was disqualified on the birth screener for a specific reason, the remaining potential disqualifying conditions were not assessed. The conditions are listed in the order in which they were asked on the questionnaire, beginning with multiple births. Respondents were not asked whether their infant had died, but they were expected to give this information if their infant had died.

[d] Mothers who could not be reached for the birth screener by telephone or an interactive voice-response interview were mailed a neonatal questionnaire and birth screener at the same time. Therefore, some mothers who did not complete a birth screener were mailed a neonatal questionnaire.

[e] Because some respondents received the birth screener at the same time as the neonatal questionnaire, respondents were disqualified on the neonatal questionnaire for some of the birth-screener reasons. Cases in the first 2 reasons for disqualification are duplicates of disqualifications from the birth screener.

[f] Throughout the study, women were disqualified if they indicated that their infant had a long-term illness or condition, including Down syndrome, cleft palate, Duarte galactosemia, dysphagia, and pyloric spasms.

infants. The neonatal questionnaire was used to collect information about the mothers' birth experience; breastfeeding practices and problems; breastfeeding support received in the hospital and after discharge; knowledge of, attitudes toward, and confidence in breastfeeding; planned duration of breastfeeding; reasons for not trying to breastfeed; and formula-feeding practices. It also asked about the infants' dietary consumption through a food-frequency checklist, consumption of dietary supplements and herbs, and jaundice and its treatment.

Every postnatal questionnaire included questions about the frequency with which the infants received foods from various food groups (eg, breast milk, formula, fruits, vegetables, cereals); vitamin, mineral, and herbal supplements given to infants; formula feeding and breastfeeding; infant illnesses and health measures; and the mothers' participation in WIC. Periodically during the infants' first year, additional details were collected about breastfeeding and formula feeding, maternal employment, child care, sleeping arrangements, food allergies, the mothers' awareness of the National Breastfeeding Awareness Campaign, and the mothers' sources of information about infant feeding. Table 3 lists the topics and indicates when the set of questions about each was administered.

To assess the mothers' dietary intake, the IFPS II used a modified version of the Diet History Questionnaire (DHQ), a food-frequency measure developed by the National Cancer Institute.[17–20] Modifications included changing the time frame of the DHQ from 1 year to 1 month and adding specific foods of interest for pregnant women, including specific types of fish and specific dietary supplements.

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TABLE 2 **Disposition of the IFPS II Sample on the Postnatal Questionnaires**

Disposition	Month									Total Birth Screener-Month 12[d]
	2	3	4	5	6	7	9	10	12	
Total mailed, *n*[a]	3096	3045	3021	3008	2982	2970	2939	2902	2850	
Disqualified from mailing list after questionnaires were mailed, *n*	22	20	25	21	28	37	36	47	48	
Undeliverable, *n*	9	9	17	20	28	36	35	46	48	144
Accidentally dropped from sample, *n*	2		1	1	0	1	1	1	0	169
Gulf Coast hurricane zip code, *n*[b]	11	11	7	0	0	0	0	0	0	81
Adjusted total mailed, *n*	3074	3025	2996	2987	2954	2933	2903	2855	2802	
Disqualified, *n*	2	0	0	2	0	0	0	0	0	554[c]
Infant died, *n*	1	0	0	0	0	0	0	0	0	11
Long-term illness, *n*	1	0	0	2	0	0	0	0	0	29
Refused, *n*	1	5	2	4	7	13	11	25	0	94
Not returned, *n*	519	632	756	798	852	900	948	1022	995	
Complete and qualified, *n*	2552	2388	2238	2183	2095	2020	1944	1808	1807	
Response rate: (No. of surveys completed/adjusted No. mailed − No. of women disqualified), %	83.1	78.9	74.7	73.1	70.9	68.9	67.0	63.3	64.5	

[a] The number of questionnaires mailed decreased slightly across the months because of disqualifications on earlier questionnaires. However, the questionnaires were mailed so close in time to each other that sometimes the subjects who disqualified could not be removed from the sample before the next mailing. Therefore, some subjects who did not qualify were mailed questionnaires each month.

[b] Sample members were excluded from the remainder of the study if they resided in the zip codes to which the US Postal Service stopped delivery as a result of the 2005 Gulf Coast hurricanes.

[c] Includes all disqualification categories, beginning with the birth screener.

[d] The total number includes cases from the Birth Screener and the Neonatal Questionnaire as listed in Table 1.

TABLE 3 **IFPS II Postnatal Questionnaire Topics and Month in Which Questions on Those Topics Were Administered (Excluding the DHQ)**

Topics	Month of Questionnaire								
	2	3	4	5	6	7	9	10	12
Food-frequency checklist; dietary supplement and herbal intake	X	X	X	X	X	X	X	X	X
Edinburgh Postpartum Depression Scale	X								
Breastfeeding and infant formula-feeding general information	X	X	X	X	X	X	X	X	X
Infant health problems	X	X	X	X	X	X	X	X	X
Infant length and weight		X		X		X			X
Use of antibiotics and other prescription and nonprescription medicines	X	X	X	X	X	X	X	X	X
Stool characteristics	X	X	X	X	X	X	X	X	X
Stopped breastfeeding: age, reasons, breastfeeding attitudes	X	X	X	X	X	X	X	X	X
WIC participation	X	X	X	X	X	X	X	X	X
Breastfeeding and breast-pumping details	X			X		X			
Mother's dietary changes because of breastfeeding and reasons	X			X		X			
Information sources about breastfeeding, diet while breastfeeding, and breast pumps	X								
Formula-feeding details	X			X		X	X		
Sleeping arrangements		X			X		X		X
Employment status and characteristics		X			X		X		X
Child care		X			X		X		X
Mother's current health and weight		X			X		X		X
Mother's tobacco use and smoking in home		X			X		X		X
National Breastfeeding Awareness Campaign evaluation questions		X				X			
Food allergy			X				X		X
Solid-food feeding details				X	X	X	X	X	X
Sources of information about herbal products and general infant feeding			X					X	

Topics addressed in the prenatal questionnaire, birth screener, and neonatal questionnaire are discussed in the text.

Survey Methods

The prenatal questionnaire was mailed to all women in the panel database who were ~7 months pregnant at the time. It served as the recruitment instrument and was mailed with a brochure explaining the study and a short screening questionnaire, which established that someone in the household was pregnant, at least 18 years old, and expecting a singleton. Although household demographic information was available for all households in the panel database, data on race, education, marital status, and employment status were available only for the person designated as the panel member and that person's spouse. If the mother was not the panel member but was identified because she lived in a panel member's household, she was sent a short demographic questionnaire.

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A subsample of ~1500 respondents completed a modified DHQ prenatally and again when their infants were ~4 months old. The prenatal DHQ was sent to women who returned the study-intake questionnaire (the prenatal questionnaire) early enough for them to complete the DHQ before their infants were born; mailing dates were between May and August 2005. The postpartum DHQ was mailed to women who returned the month 3 questionnaire promptly, because the mothers would also receive another questionnaire when their infants were 4 months old, and we wanted the maximum possible separation between the questionnaires to distribute respondent burden over time. The postpartum DHQ was mailed between September 2005 and February 2006. It was not possible to match season for the pregnant and postpartum women, because the 2 data collections were only 4 to 5 months apart. A total of 877 women completed both the prenatal and postpartum DHQs.

The DHQ comparison group was drawn from the same consumer opinion panel from which the study sample was drawn. A sample of 7830 women aged 18 to 40 years was sent a screener asking them to verify their age, that they were not pregnant, and that they had not had an infant in the previous 12 months and to respond to 2 questions about food-safety issues. Of 3361 questionnaires returned by the cutoff date, 2070 were from women who met the comparison-group criteria. The DHQ was mailed to all women who qualified for the comparison group. The mailing was timed to correspond with the season of the prenatal DHQ: June and July of 2006.

About the time of their infant's birth, prenatal respondents received a short telephone birth-screener interview to establish their infant's birthday and gather the information needed to determine if they met the qualifying criteria. If a household could not be reached by telephone, the respondent was sent a postcard asking her to call a telephone number for an interactive voice-response survey that duplicated the telephone birth screener. If a household was not reached by either of these methods, the respondent was sent a printed birth screener along with the neonatal questionnaire at the time (infant age 1 month) she would have been sent this questionnaire if her infant was born on time.

Consistent with panel policy, respondents were given a small gift for completing each questionnaire. For all questionnaires except the DHQ, the gift cost less than $3.00. The gift was sometimes for the mother (eg, a water bottle or picture frame) and sometimes for the infant (eg, a rattle, toy keys, or rubber duck). For the DHQ, respondents received a $10.00 cash incentive.

Response Rates and Age of Infants at Questionnaire Completion

We calculated a response rate for each questionnaire except the prenatal one. A response rate for the prenatal questionnaire could not be calculated because, except in a few instances, only qualifying but not disqualifying households returned it. Women could be disqualified from the study for any of several reasons at this prenatal stage (as listed in Table 1). Because combinations of the reasons sometimes occur, it was not possible to sum estimates of the occurrences of single conditions to estimate how many nonrespondents did not qualify for the study.

TABLE 4 **Distribution of the Number of Questionnaires Returned by IFPS II Participants**

No. of Questionnaires Returned	No. of Participants	Percentage (of 3033)	Cumulative No. of Participants	Cumulative Percentage
12	1172	38.7	1172	38.7
10–11	641	21.1	1813	59.8
7–9	509	16.8	2322	76.6
4–6	525	17.3	2847	93.9
3[a]	186	6.1	3033	100.0

[a] Respondents had to answer the prenatal questionnaire, birth screener, and neonatal questionnaire to qualify for the neonatal sample.

The response rates for the other questionnaires were based on the number of questionnaires mailed (or number of interviews attempted for the birth screener). In addition to meeting the qualifying conditions listed in Tables 1 and 2, women had to have completed a prenatal questionnaire to be in the sample for the birth screener and the neonatal questionnaire, and they had to have completed a neonatal questionnaire to be in the sample for the postnatal questionnaires. Of 4902 women who completed the prenatal questionnaire, 3033 completed the neonatal questionnaire. This latter number, less the number of women lost to follow-up or disqualified later in the study, was the number of women sent postnatal questionnaires for the remainder of the study. Respondents were not excluded for failing to respond to 1 or more of the postnatal questionnaires.

Response rates ranged from 63% to 83% for the various questionnaires, as shown in Table 2. Table 4 shows how many mothers completed each number of questionnaires; for example, it shows that 1813 completed at least 10 of the 12 questionnaires. The response rates for the DHQ are shown in Table 5.

Sample Characteristics

Although each questionnaire targeted women with infants of a specific age, the infants' age when the questionnaire was completed did not always match this age for 3 reasons. First, the procedure of mailing a birth screener along with a neonatal questionnaire to families who could not be reached by telephone resulted in infants being both older and younger than the target age when the neonatal questionnaires were completed. Although we attempted to move the infants into the correct age group, our ability to do so was limited, because we were concerned that too close administration of multiple questionnaires would result in dropping out of the study. Second, because the questionnaires were only mailed twice per month, some infants were a little younger and some a little older than the target age at the time of the mailing. Third, the mothers did not always complete the questionnaire as soon as they received them. Table 6 shows the target age of the infants when each questionnaire was mailed and the age distribution

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TABLE 5 **Disposition of IFPS II Sample and Comparison Group on the DHQs**

Disposition	Prenatal DHQ	Postnatal DHQ	Comparison DHQ[a]
Total mailed, *n*[b]	1757	1791	2070
Respondent removed from mailing list after questionnaires were mailed, *n*	8	6	0
Undeliverable	8	5	0
Gulf Coast hurricane zip code[c]	0	1	0
Adjusted total mailed, *n*	1749	1785	2070
Respondent not pregnant (prenatal only), *n*	3	0	0
Refused, *n*	0	2	0
Not returned, *n*	244	300	505
Completed and returned, *n*	1502	1483	1565
Response rate (No. completed/adjusted total No. mailed), %	85.9	83.1	75.6

[a] The comparison sample was drawn from the same consumer opinion panel as that for the IFPS II respondents; sample members were neither pregnant nor postpartum.
[b] The DHQs were sent only to a subsample of the IFPS II respondents.
[c] Sample members were excluded from the remainder of the study if they resided in zip codes to which the US Postal Service stopped delivery as a result of the 2005 Gulf Coast hurricanes.

TABLE 6 **Infants' Age (or Gestational Age) When the IFPS II Questionnaires Were Completed**

Questionnaire	Target Age, wk	50th Percentile	10th Percentile	90th Percentile
Prenatal	28–32	30.4	26.4	33.4
Birth Screener	1.0	2.0	0.3	7.6
Neonatal	4.3	4.6	2.6	8.1
Month 2	8.6	9.1	7.4	13.1
Month 3	12.9	12.9	11.6	16.0
Month 4	17.2	17.4	16.1	19.7
Month 5	21.5	21.4	20.1	23.7
Month 6	25.8	26.3	25.1	28.4
Month 7	30.1	31.4	30.1	34.0
Month 9	38.7	38.4	37.1	41.0
Month 10	45.1	45.6	44.1	48.3
Month 12	53.0	54.3	53.0	57.0

of the infants when the questionnaires were completed; although the median ages match the target ages well, the 10th and 90th percentiles show that some infants were considerably older or younger than the target age when their mothers returned the questionnaires.

Table 7 compares the distribution of select characteristics among respondents to the neonatal questionnaire and women in the National Survey of Family Growth (NSFG) cycle 6 (1998–2000) who were aged 18 to 44 years at the time of their most recent singleton delivery. Members of the IFPS II sample were older, more highly educated, and less likely to have low income than those in the random sample. In addition, the IFPS II participants were more likely to be employed and white, had fewer other children, were less likely to be from the South, were less likely to smoke, took longer maternity leave, and received their first prenatal care a little later in pregnancy.

Because breastfeeding rates and duration have changed in recent years, we compared the IFPS II breastfeeding characteristics with those from a nationally representative survey more recent than the NSFG: the National Immunization Survey (NIS) sample of women

TABLE 7 **Distribution of Select Characteristics Among Participants in the IFPS II and Among Participants in the NSFG (Cycle 6), 2002**

Characteristic	Percentage of IFPS II Sample (Mothers of Infants Born in 2005) ($N = 3033$)[a]	Percentage of NSFG Sample (Mothers of Infants Born in 1998–2000) ($N = 1415$)[b]
Age		
18–24 y[c]	23.3	32.6
25–34 y	61.4	54.9
35–43 y	15.3	12.4
Marital status		
Married or cohabiting[d]	79.1	79.5
Other	20.9	20.5
Education		
High school or less[c]	21.0	47.5
Some college	40.2	27.8
College graduate	38.8	24.7
Income		
<185% of FPL[c]	41.9	45.2
185–349% of FPL	35.8	27.4
>350% of FPL	22.3	27.4
Employment status (prenatal)		
Employed[c]	66.3	61.2
Not employed	33.7	38.8
Parity		
1[c]	29.2	25.3
2	40.9	39.7
≥3	29.9	35.0
Race/ethnicity		
White[c]	84.4	61.5
Black	4.9	14.1
Hispanic	6.2	18.9
Other	4.6	5.4
Region		
West	20.1	24.5
Midwest	30.0	23.7
South[c]	32.6	40.3
Northeast	17.3	11.5
Prenatal smoking		
Yes[c]	9.9	12.0
No	90.1	88.0
Prenatal care		
<13 wk[c]	88.6	91.9
13–21 wk	6.9	5.8
≥22 wk/never	4.5	2.3
Total maternity leave taken (paid and unpaid)		
≤6 wk[c]	21.0	38.1
>6 wk	79.0	61.9

FPL indicates federal poverty level.
[a] Sample sizes vary slightly because of missing data on some variables.
[b] The NSFG sample was limited to most recent singleton live births to women 18 to 44 years old at delivery. Weighted percentages are reported.
[c] *t* tests were conducted to evaluate the differences between NSFG and IFPS characteristics, which required that all variables be dichotomized. Multilevel variables were categorized by keeping 1 category and collapsing all others. The [b] for multilevel variables indicates the category that was kept and that it was significantly different across the 2 samples at $P < .05$. For dichotomous variables, the [b] indicates that the variable was significantly different across samples.
[d] Category was kept and was not significantly different across the 2 samples.

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who gave birth in 2004.[21] The rates were as follows: never breastfed, 26.2% (NIS) and 14.7% (IFPS II); any breastfeeding at 6 months, 41.5 (NIS) and 49.6% (IFPS II); any breastfeeding at 12 months, 20.9% (NIS) and 25.3% (IFPS II). These differences, all of which were statistically significant, indicate that, on average, IFPS II mothers breastfed longer than mothers in the general population.

Data Preparation

We cleaned the data to adjust for inconsistent, conflicting, and implausible responses. For example, if a respondent said that she did not use formula but then indicated which brand, type, and number of ounces her infant consumed, we corrected her response to indicate that she used formula. Or, if a respondent said that the infant's father had a certain health condition but also answered that "none" of the infant's relatives had the health condition, we corrected the "none" from "marked" to "not marked." If a response was clearly implausible, we changed it to "missing." Variables examined for implausible responses included mothers' weight and height, number of teeth infant has, and other biological variables. If a respondent was supposed to skip a set of questions but answered a few of them, we reset the responses to "skipped." We also sometimes imputed missing data, most frequently the date the questionnaire was completed, by which we calculated infants' age when the questionnaire was completed and age of the infant when the mother stopped breastfeeding. The data-collection contractor indicated on each questionnaire when the questionnaire was mailed and when it was returned to the facility. If a respondent failed to write in the date that she completed a questionnaire, we imputed the date mostly on the basis of the average number of days between completion of the questionnaire and the data contractor's receipt of the questionnaire among respondents who filled in the completion date. If a previously breastfeeding mother indicated on a food-frequency question that the infant did not receive breast milk but did not report when she stopped breastfeeding, we used the mean infant age between the time the infant was last reported as breastfeeding and the age at which the infant was first reported to not be breastfeeding.

DISCUSSION

The results of the IFPS II provide valuable data on infant feeding because of the frequency of its questionnaires and its wide coverage of salient issues. Other national surveys that have addressed at least some components of infant feeding include the NIS,[21] the NSFG,[22] the National Health and Nutrition Examination Survey,[23] the Abbott's Ross Mothers Survey,[24] and the Feeding Infants and Toddlers Study.[25] Although all of these surveys contribute to knowledge about how American infants are fed, each has at least 1 of the following limitations: a focus only on milk feeding; a relatively small sample size; no information on infant feeding during the infants' first months of life; assessment of infants' food intake at only 1 point in time; and little information about the determinants of feeding choices or about infants' health.

The main strengths of the study include its prospective design, the extensive testing of survey questions, the detail of the data collected about the infants' feeding patterns and the frequency with which data were collected, the inclusion of questions that address most topic areas likely to affect infant feeding, and the large sample size. In addition, the maternal dietary-intake data were based on an established dietary-intake instrument, and the high response rate for the postnatal questionnaires enabled the analysis of detailed longitudinal data.

The main limitation of the study is that the sample, although well distributed throughout the United States, was not representative of the US population. Although a random sample of pregnant women would have been more representative than a sample drawn from a self-selected consumer panel, identifying women in the third trimester of pregnancy would have entailed enormous screening costs. Moreover, the study required respondents to complete a questionnaire nearly each month from late pregnancy through their infants' first year, and a high response rate was essential to the study's success. People who choose to participate in a consumer opinion panel are much more likely to answer questionnaires than a random sample of the population.[27] Random samples of people and samples derived from consumer panels have been shown to have a similar distribution of many characteristics, although the average socioeconomic status of consumer-panel members tends to be higher.[26] Because the IFPS II used a nonrandom sample in which white women, women of higher socioeconomic status, women who could read English, and women from households with a stable mailing address were overrepresented, its results cannot be generalized to the overall US population of pregnant women and new mothers. Another limitation is that feeding data indicated only the frequency with which infants consumed foods from various food groups but did not indicate the specific food consumed, portion size, or other information that would enable an analysis of nutrient intake. A third limitation is that all data were based on the reports of study participants and, thus, are subject to possible self-reporting biases.

CONCLUSIONS

The purpose of this supplement to *Pediatrics* is to document the methods of the IFPS II and provide the first results on a range of topics. Although the accompanying articles cover only a small number of the research questions that can be addressed through analyses of the IFPS II data, we believe that they demonstrate the value and uniqueness of the IFPS II.

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Infant Feeding Practices Study II: Study Methods

Sara B. Fein, Judith Labiner-Wolfe, Katherine R. Shealy, Rouwei Li, Jian Chen and Laurence M. Grummer-Strawn

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