CALIFORNIA

Fresno NFP

Department of Community Health

EVALUATION REPORT 7
Initiation (August 1997) through April 30, 2006

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EXECUTIVE SUMMARY

This is the seventh evaluation report for the Nurse-Family Partnership (NFP) operated by Fresno NFP, based on the intervention model developed and tested by Dr. David Olds and colleagues. Department of Community Health coordinates the implementation of this program in Fresno County, California. This report presents analysis of data available from program initiation through April 30, 2006. The analyses for this report were conducted by the National Center for Children, Families and Communities (NCCFC) at the University of Colorado at Denver and Health Sciences Center using data entered into the Clinical Information System maintained by the NCCFC.

Fresno NFP has been in operation since August 1997. Since that time, 505 participants have had the opportunity to complete the full program cycle from pregnancy through their child's second birthday. In Part I of this report, demographics and other descriptive statistics will be presented for graduates (those who remained in the program until their child's second birthday) and non-completers (those who dropped from the program before their child's second birthday). Further consideration of program, mother, and infant outcomes will be given to the 234 participants who have completed the program.

Also of interest is whether participant characteristics, program implementation, and participant outcomes changed over time. Part II of this report compares those who entered the program between March 1, 2000, and February 28, 2003 (Cohort 1) with those who entered the program between March 1, 2003, and April 30, 2006 (Cohort 2).

PART I. GRADUATES OF THE FRESNO NFP PROGRAM

PARTICIPANT CHARACTERISTICS AT PROGRAM INTAKE

- Fresno NFP graduates: median age 18; median education 11 years; 82% unmarried; 77% unemployed; 75% Medicaid recipients
- Race/Ethnicity: 62% Hispanic; 16% African American/Black; 10% non-Hispanic White; 6% Asian; 4% multiracial/other; 2% Native American
- There were three statistically significant socio-demographic differences between graduates and non-completers at intake:
  - More Fresno NFP graduates (44%) were high school graduates than non-completers (27%)
  - The median household income was greater for graduates ($13,500 vs. $10,500 for non-completers)
  - Fewer graduates (11%) used TANF than non-completers (17%).
- Although not statistically significant, other differences between graduates and non-completers at intake include:
  - Greater proportions of Hispanic participants and smaller proportions of African American/Black participants were among the completers
  - Fewer graduates (18%) used Food Stamps than non-completers (25%)
  - More graduates lived with their husband/boyfriend (35% vs. 28% for non-completers); more non-completers lived with others (18% vs. 12% for graduates).

PROGRAM IMPLEMENTATION

- Fresno NFP graduates received an average of 10.1 visits during the pregnancy phase, 20.1 visits during the infancy phase, and 13.9 visits during the toddler phase. National NFP averages for the number of visits per graduate were 9.5, 17.5, and 11.6, respectively.
- Visit lengths in each program phase averaged over 72 minutes; the NFP objective is a minimum of 60 minutes.

- Fresno NFP has closely matched the program guidelines for home visits with the exception of maternal role development. Like many NFP sites, Fresno NFP has struggled to meet the guidelines for maternal role during infancy (38% vs. 37% national NFP vs. 45-50% NFP objective).
- 25% of Fresno NFP graduates were enrolled by the 16th week of pregnancy, a rate lower than the national NFP average of 42%; 94% of Fresno NFP graduates were enrolled by the 28th week.
- For those who could have completed the program by April 30, 2006, the largest proportion of drops occurred during the infancy phase.

OUTCOMES FOR FRESNO NFP GRADUATES

- 9.1% of Fresno NFP graduates' infants were premature (9.8% for national NFP graduates); premature rate for Hispanics, the predominant ethnic group, was 7.6% (8.4% for national NFP graduates).
- 9.4% of Fresno NFP graduates' infants were low birth weight (8.6% of national NFP graduates); low birth weight rate for Hispanics, the predominant ethnic group, was 9.7% (7.6% for national NFP graduates).
- Fresno NFP graduates' rates for completion of recommended infants' (age 12 months) immunizations were 95% - 99% with the exception of HIB (80%). The immunization rates for toddlers, age 24 months, were 99% - 100% with the exception of the DTP/DTaP (78%) and HIB (77%). DTP/DTaP and HIB rates may be underreported because of different dosage patterns among pharmaceutical products.
- 78% of Fresno NFP graduates initiated breastfeeding (68% for national NFP graduates), and 22% continued to breastfeed at 12 months infant age (16% national NFP graduates).
- The largest percentage of toddlers (29%) scored between the 25th and 50th percentiles on language production. Ten percent scored below the 10th percentile, as did 10% of NFP toddlers nationwide. Scoring below the 10th percentile may indicate a delay in language skills.
- 14% of participants had a subsequent pregnancy by 12 months after the birth of their first child (13% for national NFP participants), while 32% experienced a subsequent pregnancy by 24 months postpartum (32% for national NFP participants).
- By program completion, 41% of the women who entered the program without a high school diploma/GED had received their diploma/GED and 24% were continuing their education beyond high school; an additional 29% were still working toward their diploma/GED.
- Of those who were 18 or older at intake, workforce participation increased from 36% at intake to 54% at program completion. For those 17 years or younger, 6% were working at program intake and 31% at program completion.
- Fresno NFP graduates worked an average of 6 months in the first year after the birth of their child and 8 months during the second postpartum year.
- The percentage of participants who were married increased from 18% at intake to 30% at program completion.

PART II. COMPARISON OF FRESNO NFP COHORT 1 AND COHORT 2

PARTICIPANT CHARACTERISTICS

- There were two statistically significant socio-demographic differences between cohorts at intake:
  - A greater percentage of Cohort 2 participants had completed high school (43% vs. 35% for Cohort 1)
  - A greater percentage of Cohort 2 participants used Medicaid (81% vs. 71% for Cohort 1).
- Although not statistically significant, as compared to Cohort 1, there were increases among Cohort 2 participants in the percentages of Hispanic and non-Hispanic White participants and decreases in the percentages of African American/Black and Asian participants.

PROGRAM IMPLEMENTATION

- Enrollment by 16 weeks of pregnancy was similar for the two cohorts (30% for Cohort 1 and 26% for Cohort 2); the total rate of enrollment by gestational week 28 was at least 95% for both groups.
- Attrition was similar for the two cohorts during the pregnancy phase (7.2% Cohort 1, 8.8% Cohort 2) and showed a slight increase during the infancy phase (27.9% Cohort 1, 31.9% Cohort 2). Toddlerhood attrition was 15.2% for Cohort 1 and 24.2% for Cohort 2.
- The average length of completed visits showed slight increases from Cohort 1 to Cohort 2 during each program phase.
- All guidelines for home visit content were met by both cohorts with the exception of maternal role during the infancy phase. There was an increase with Cohort 2 in the percentage of time devoted to maternal role during infancy (38% Cohort 1 vs. 43% Cohort 2 vs. 45-50% objective).

PARTICIPANT OUTCOMES

- Both cohorts showed reductions in the number of smokers during pregnancy (-33% for Cohort 1; -27% for Cohort 2). However, caution should be taken when interpreting this information based on the small number of smokers.
- There were not statistically significant differences in premature and low birth weight births between the two cohorts, though the percentage of low birth weight births decreased over time (10.5% Cohort 1, 9.1% Cohort 2).
- At 12 months, immunization rates were 95-99% for Cohort 1 and 98-100% for Cohort 2 with the exception of HIB (81% Cohort 1, 87% Cohort 2). HIB may be underreported because of different dosage patterns among pharmaceutical products.
- All immunization rates for both cohorts were at least 99% by 24 months of child age with the exception of DTP/DTaP and HIB which may be underreported because of different dosage patterns among pharmaceutical products.
- Subsequent pregnancy rates decreased over time for the cohorts at 12 months postpartum (17% Cohort 1, 9% Cohort 2).
- Both cohorts showed small increases in the percentage of mothers working from intake to 12 months postpartum for participants 18 years or older at intake.
- The average number of months worked in the first postpartum year was 6 months for both cohorts.

EVALUATION REPORT FOR

FRESNO NFP

NFP GRADUATES AND TRENDS IN PROGRAM IMPLEMENTATION

REPORT TIME SPAN:
PROGRAM INITIATION (AUGUST 1997) THROUGH APRIL 30, 2006

About NFP Reports

The principal questions of NFP reports focus on whether the program is being implemented with fidelity to the original model and to what extent the program outcomes attained parallel NFP Objectives. One of the potential pitfalls in the dissemination of any model program is that if the results the program was expected to attain are not realized in the new setting, local leaders are likely to quickly claim that the program "really does not work." All too often, however, the underlying issue may not be the lack of effectiveness of the program, but rather a failure to implement the program as it was designed and previously tested.

Quantitative aspects of program fidelity, which are examined in all reports, include the extent to which the program has: (a) recruited and retained a population of low income, first-time mothers; (b) enrolled families early in pregnancy and followed them through the child's second birthday; and (c) conducted visits that are of comparable frequency, duration, and content as expected for the appropriate program phase.

Evaluation Reports, Years 1, 2, 3, and 4

In the first Evaluation Report, health and well-being of mothers and infants enrolled in the program are evaluated through looking at changes in smoking, alcohol, and other substance use during pregnancy, and gestational age and weight of the infant at birth. As clients move through the program, additional information on infant health and development is included in later reports such as immunization rates, breastfeeding rates, prevalence and type of developmental delays, and language development. The mother's life course development is also analyzed, including the rate of subsequent pregnancies as well as changes in work, school enrollment, marital status, and use of public assistance programs.

Evaluation Reports, Year 5 and Beyond

More in-depth analyses become possible when a site has been in operation for five years or more, thus Evaluation Reports 5 and beyond provide detailed information on graduates of the program (Part I), as well as a comparison of cohorts (Part II). In Part I, demographics and other descriptive statistics are presented for graduates and non-completers, whereas further consideration of program implementation and mother and infant outcomes is given to participants who have completed the program.

Part II of these reports examines aspects of program fidelity for those who entered the program earlier in program operations (Cohort 1) versus those who entered the program more recently (Cohort 2). These analyses allow you to see whether adherence to the program model has changed over time. Selected outcome data for the cohorts are also compared.

NFP Objectives

NFP Objectives (see Appendix B) have been developed based on data from randomized clinical trials of the NFP, maternal and child statistics compiled by the Centers for Disease Control, and Healthy People 2010[7] Objectives. These objectives are used to draw inferences about how the program is working in different sites. Careful thought has been given to crafting these NFP Objectives, but it should be noted that they are being offered in provisional form because they are the first iteration of objectives for guiding program performance. Program sites and other stakeholders are, therefore, to view them as "stretch goals" for establishing quality improvement plans and any comparisons to the objectives should be regarded in this light. It should also be noted that any inferences drawn need to be interpreted with caution as the outcome data are based largely upon maternal self-report.

PART I:
GRADUATES OF THE FRESNO NFP PROGRAM

PARTICIPANT CHARACTERISTICS

Demographic information gathered for evaluative purposes includes a variety of characteristics about participants, other family members, and their households. This information is provided by the participant who may or may not know all of the information being requested, particularly if the participant is a young teen. This section of the report includes information on participants who have completed the program, those who have dropped from the program, and the national sample of NFP graduates.

SOCIO-DEMOGRAPHIC INFORMATION

Table 1 notes various demographic characteristics of the participants who graduated from Fresno NFP, those who dropped from the program prior to their child's second birthday, and the national sample of NFP graduates.

Table 1. Characteristics of Participants at Intake

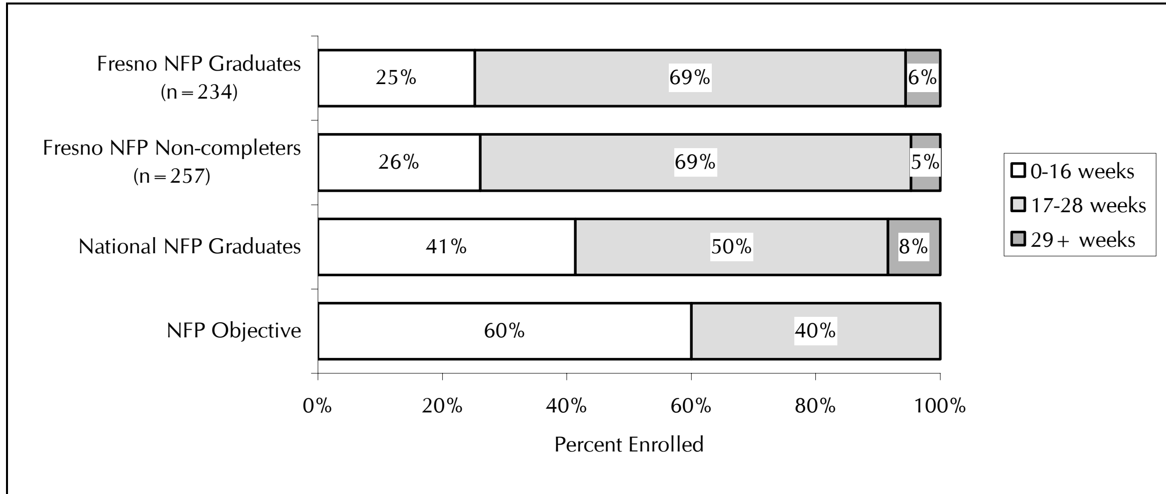
	Fresno NFP Graduates	Fresno NFP Non-completers	National NFP Graduates
Number Enrolled†	234	257	14,423
Demographic Characteristics			
Mother age at enrollment (median)	18	18	19
Years of education at intake (median)	11	11	12
Completed high school*	44%	27%	51%
Unmarried	82%	87%	75%
First-time mothers	98%	98%	98%
Race/Ethnicity			
Hispanic	62%	57%	20%
Native American	2%	2%	6%
African American/Black	16%	24%	16%
Non-Hispanic White	10%	9%	52%
Multiracial/other	4%	4%	4%
Asian	6%	4%	2%
Economic Factors			
Household income at intake (median)*	$13,500	$10,500	$13,500
Unemployed	77%	83%	61%
Use of Government Assistance			
WIC	80%	76%	76%
Medicaid	75%	70%	60%
Food Stamps	18%	25%	14%
TANF*	11%	17%	5%
Household Size			
Household size (median)	4	4	3
Household Composition			
Lives alone	2%	1%	6%
Lives with husband/boyfriend	35%	28%	40%
Lives with mother	52%	53%	40%
Lives with others	12%	18%	13%

† 14 participants (3%) were were categorized as neither graduate nor non-completer because whereas the client's child had reached 23 to 24 months of age and home visits were completed between 18 and 24 months of age, the data forms for outcomes at 21 and 24 months were missing.
** Statistically significant difference ($p < .05$) between graduates and non-completers*

MATERNAL HEALTH CHARACTERISTICS

Figure 1 presents information on when Fresno NFP graduates and non-completers entered the program with respect to gestational age compared to the national sample of NFP graduates and NFP Objectives. Program sites are encouraged to strive towards the NFP Objective of having 60% of participants enrolled by the 16th week of pregnancy and the remainder enrolled by the 28th week of pregnancy. Early enrollment is related to stronger participant retention during infancy, and also allows home visitors ample time to work with participants on health-related behaviors.

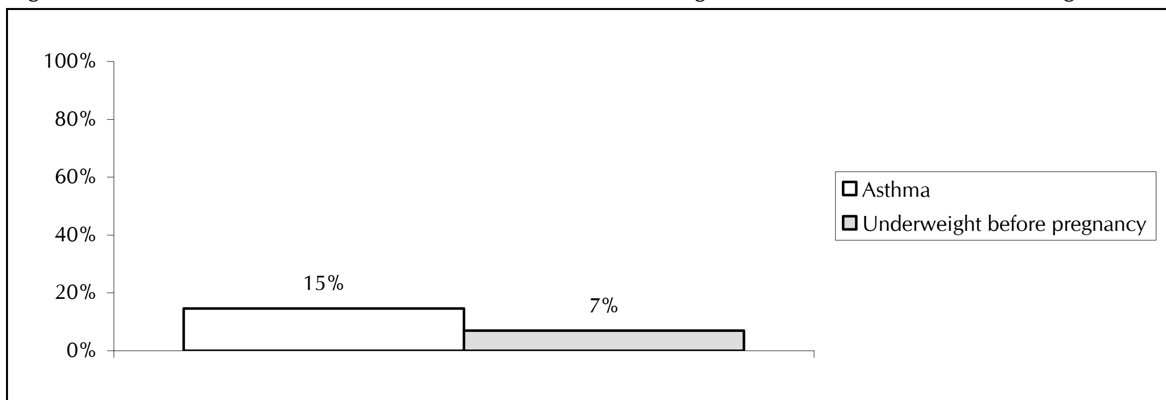
Figure 1. Gestational Age at Enrollment



The mother's general health is an important component of a healthy pregnancy and is assessed by nurse home visitors at entry into the program. The distribution of the predominant maternal health problems and the percentage of participants underweight before pregnancy among Fresno NFP graduates are noted in Figure 2.

The most frequently identified health problems among national NFP graduates are as follows: asthma (14%), underweight before pregnancy (10%), urinary tract infection (7%), and mental disorder (5%).

Figure 2. Predominant Maternal Health Problems among Fresno NFP Graduates at Program Intake



N = 233

Maternal mental health was assessed at program intake using a short version of the RAND Mental Health Inventory. Scores range from 1 to 4, with higher scores indicating better mental health. Additionally, participants' general psychological ability to cope with life stressors was measured using the Sense of Mastery

Scale. Scores range from 1 to 4, with higher scores indicating a stronger sense of mastery over life challenges. Scores for graduates and non-completers are presented in Table 2.

Table 2. Psychosocial Participant Characteristics at Intake

	Fresno NFP Graduates (N = 233)	Fresno NFP Non-completers (N = 256)	National NFP Graduates
Percent with mental health score greater than 3.0	85%	79%	82%
Percent with mastery score greater than 3.0	42%	38%	49%

** Statistically significant difference ($p < .05$) between graduates and non-completers*

FAMILY CHARACTERISTICS

ROLE OF BIOLOGICAL FATHER

Participants are asked at intake to report whether their husband/current boyfriend is the baby's biological father, how much money the biological father provides during the average month, and how frequently they see the biological father. This information is presented in Table 3 below for both graduates and non-completers.

Table 3. Role of Biological Father at Intake

	Fresno NFP Graduates	Fresno NFP Non-completers	National NFP Graduates
Current partner is biological father	93% (n = 186)	93% (n = 200)	91%
Average money from biological father per month	$356 (n = 111)	$199 (n = 149)	$237
Contact with biological father	**(n = 231)**	**(n = 252)**	
Not at All	16%	15%	12%
Less than once a week	6%	4%	6%
At least once a week	10%	17%	10%
Daily	68%	64%	72%

** Statistically significant difference ($p < .05$) between graduates and non-completers*

PROGRAM IMPLEMENTATION

A critical feature of this evaluation focuses on whether the program is being conducted with fidelity to the model on which it is based. This analysis of fidelity considers the frequency, duration, and content of visits received by NFP program graduates. Number and length of telephone contacts that cover program material are also noted. Additionally, for those who dropped from the program, analysis of when these participants dropped from the program is provided.

PARTICIPANT ATTRITION

It is helpful to examine attrition during specific time frames to determine which periods pose the highest risk for clients dropping. For all participants who would have graduated from Fresno NFP by April 30, 2006 but dropped out before completion, Table 4 shows the percentages that dropped during specific intervals. Nationwide, the interval when participants are most likely to drop out of NFP programs is the first six months of infancy.

Table 4. Timing of Participant Attrition

	Fresno NFP		National NFP	
	Percent	**Cumulative %**	**Percent**	**Cumulative %**
Pregnancy	15%	15%	25%	25%
Infancy				
Birth to six months	40%	55%	30%	55%
6 to 12 months	16%	72%	22%	77%
Toddlerhood				
12 to 18 months	21%	93%	17%	94%
18 to 24 months	7%	100%	6%	100%

Of 505 participants who could have graduated from the program by April 30, 2006, 257 (51%) dropped out before completion. There were 14 participants (3%) who were categorized as neither graduate nor non-completer because while their children had reached 23 to 24 months of age and home visits were completed between 18 and 24 months of age, the data forms for outcomes at 21 and 24 months were missing. 234 participants (46%) completed the program.

NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS

Table 5 provides the number and duration of home visits by program phase. The computations of the average number of completed visits per participant, the overall percentage of expected visits completed, and the average visit length are based only on participants who have completed the respective phase of the program. National NFP data for program graduates and NFP Objectives are provided for comparison purposes.

The NFP Objective for percentage of expected visits completed is based on the assumption that this percentage will be calculated using all participants who have, or should have according to their expected date of delivery, completed the appropriate phase of the program, including those who dropped prior to completing that phase. As graduates have no attrition, the percentage of expected visits completed for this group is likely to be higher than the percentage for all program participants.

Table 5. Number and Duration of Completed Nurse Home Visits for NFP Graduates

	Fresno NFP Graduates		National NFP Graduates		NFP
	Number	Average	Number	Average	Objectives
Pregnancy					
Pregnancy Completed	234	-	14,423	-	-
Completed Visits	2,363	10.1	137,589	9.5	-
Expected Visits	2,591	-	173,810	-	-
Percentage of Expected Visits Completed	-	92%	-	85%	80%
Attempted Visits†	285	1.2	13,734	1.0	-
Average Visit Length (Minutes)	-	73.3	-	76.0	60
Average Total Contact Time (Minutes)	-	740	-	722	-
Infancy					
Infancy Completed	234	-	14,423	-	-
Completed Visits	4,715	20.1	252,171	17.5	-
Expected Visits	6,786	-	414,961	-	-
Percentage of Expected Visits Completed	-	69%	-	61%	65%
Attempted Visits†	1,001	4.3	35,203	2.4	-
Average Visit Length (Minutes)	-	72.9	-	73.4	60
Average Total Contact Time (Minutes)	-	1,468	-	1,282	-
Toddlerhood					
Toddlerhood Completed	231	-	14,178	-	-
Completed Visits	3,219	13.9	165,032	11.6	-
Expected Visits	4,851	-	295,155	-	-
Percentage of Expected Visits Completed	-	66%	-	56%	60%
Attempted Visits†	903	3.9	29,826	2.1	-
Average Visit Length (Minutes)	-	74.4	-	71.0	60
Average Total Contact Time (Minutes)	-	1,041	-	832	-

†An attempted visit is one in which the nurse tried to make a visit, but for some reason was unable to conduct the visit (e.g., client was not home when nurse arrived, or client refused visit when nurse arrived). If a family calls to cancel a scheduled visit, this is not considered an attempted visit.

CONTENT OF HOME VISITS

The content of the NFP program is based upon visit-by-visit guidelines that are designed to promote five domains of maternal, child, and family functioning. The proportion of visit time spent on each of these five domains varies depending on the developmental stages and challenges most families encounter during pregnancy, infancy (0 to 12 months), and toddlerhood (13 to 24 months). During the pregnancy phase of the program, the mother's health is of primary concern. After the baby is born, the focus shifts to development of the maternal role while the home visitor continues to emphasize the mother's future plans through time spent on the other domain areas.

The focus of each home visit is agreed upon by the mother and nurse home visitor at the preceding visit to allow for individualization related to the mother's and family members' needs. The five program content domains are:

- personal health of the mother
- environmental health
- mother's life-course development
- maternal role
- relationships with friends and family

Table 6 illustrates the percentage of time devoted to each of the content domains by phase for Fresno NFP graduates and national NFP graduates, and provides the NFP Objectives.

Table 6. Average Percent of Nurse Visit Time Spent on Each Domain Area

	Fresno NFP Graduates	National NFP Graduates	NFP Objectives
Pregnancy			
Personal Health	39%	37%	35-40%
Environmental Health	10%	11%	5-7%
Life-course Development	11%	13%	10-15%
Maternal Role	25%	24%	23-25%
Friends & Family	15%	15%	10-15%
Infancy			
Personal Health	21%	20%	14-20%
Environmental Health	13%	13%	7-10%
Life-course Development	13%	15%	10-15%
Maternal Role	38%	37%	45-50%
Friends & Family	14%	15%	10-15%
Toddlerhood			
Personal Health	18%	17%	10-15%
Environmental Health	12%	14%	7-10%
Life-course Development	17%	17%	18-20%
Maternal Role	38%	38%	40-45%
Friends & Family	15%	15%	10-15%

TELEPHONE ENCOUNTERS

Nurse home visitors report information on all encounters with mothers and families. Although the most frequent encounter is through home visits, there are times when telephone contacts occur that cover program content. Table 7 summarizes this information by phase for both Fresno NFP graduates and NFP graduates nationwide.

Table 7. Telephone Contacts with Families

	Fresno NFP Graduates			National NFP Graduates		
	Pregnancy	Infancy	Toddlerhood	Pregnancy	Infancy	Toddlerhood
Number of participants with phone contacts	169	197	159	3,654	5,490	3,706
Total number of phone calls	769	1,612	835	10,057	22,866	13,975
Mean number of calls per participant	5	8	5	3	4	4
Range of number of calls per participant	1-78	1-53	1-28	1-78	1-159	1-58
Average time per call in minutes	8	9	10	13	13	13
Time devoted to program domains						
Personal health	36%	20%	21%	58%	29%	23%
Environmental health	8%	9%	12%	7%	8%	10%
Life-course development	4%	11%	21%	12%	16%	24%
Maternal role	12%	36%	32%	15%	40%	34%
Friends & family	4%	5%	8%	9%	11%	13%

The percentages of time devoted to program domains are averages based on all participants who have completed the respective phase and had at least one reported telephone contact during that phase.

PARTICIPANT OUTCOMES

An important part of the NFP program consists of improving the health and wellbeing of the mothers and children enrolled in the program and monitoring any changes that occur.[A]

CHANGE IN MATERNAL HEALTH BEHAVIORS

Prenatal use of tobacco, alcohol, and other drugs has been associated with various adverse birth outcomes such as low birth weight, preterm delivery, and spontaneous abortion. Assessments of personal health habits, including smoking and the use of alcohol, are conducted periodically: shortly after enrollment, at 36 weeks of pregnancy, and at 12 months of infancy. Because health habits are measured at different time periods, it is possible to consider changes in these behaviors as intervening outcomes.

Table 8 provides information about the maternal health habits of Fresno NFP graduates between intake and 36 weeks of pregnancy and between intake and one year infancy with information being compared for those with data at *both* time points. The statistical test examines whether the observed difference is simply due to chance, and the interpretation of change depends on the number of participants with a particular status. If a behavior is too infrequently occurring at intake, it is not feasible to examine change in that behavior over time. Please note that the percent change cannot be calculated when no participants reported a certain health habit at intake. Among national NFP graduates who reported at intake that they smoked cigarettes, there was a 15% decrease in the number who smoked during pregnancy. For those NFP national graduates who continued to smoke during pregnancy, there was a 11% reduction in the number who smoked five or more cigarettes per day.

Table 8. Change in Maternal Health Habits among Fresno NFP Graduates: Program Intake and 36 Weeks of Pregnancy, Program Intake and One Year of Infancy

Pregnancy	N	Intake	36 Weeks of Pregnancy	Percent Changed
Cigarette smoker	224	2	1	-50%
Smoked 5+ cigarettes last 24 hrs.	224	0	0	-
Marijuana use	196	1	0	-100%
Alcohol use	203	0	0	-
Cocaine use	202	0	0	-
Other drug use	202	0	0	-
Infancy	**N**	**Intake**	**One Year of Infancy**	**Percent Changed**
Cigarette smoker	182	1	8	700% *
Smoked 5+ cigarettes last 24 hrs.	182	0	1	-
Marijuana use	162	1	1	0%
Alcohol use	166	0	9	- *
Cocaine use	167	0	0	-
Other drug use	165	0	0	-

**Statistically significant change at $p < .05$*
Relative percent change = (percent after-percent before)/percent before

[A] It should be noted that data collected in Fresno NFP (as in all dissemination sites) are based entirely upon maternal report, hence results may be under- or overestimated. Nevertheless, many of the outcomes examined in the original trials were based upon maternal report, and when administrative or laboratory data were available to compare with self-report data, the nurse-visited women typically were at least as accurate as their control group counterparts in their reporting. There is likely further bias within the outcome data because data are not available for all participants. For this reason, outcome analyses with data from a small number of enrolled participants need to be interpreted with caution.

Home visitors also work with participants who are unwilling or unable to quit smoking to reduce the number of cigarettes smoked. Table 9 provides the change in the number of cigarettes smoked among Fresno NFP and national NFP graduates who reported smoking five or more cigarettes per day at intake. Data should be interpreted carefully when sample sizes are small.

Table 9. Change in Number of Cigarettes Smoked per Day during Pregnancy

	Average Change
Fresno NFP Graduates (n = 0)	
National NFP Graduates	-2.7 *
NFP Objective	-3.5

**Statistically significant change at $p < .05$*

INFANT HEALTH

BIRTH OUTCOMES

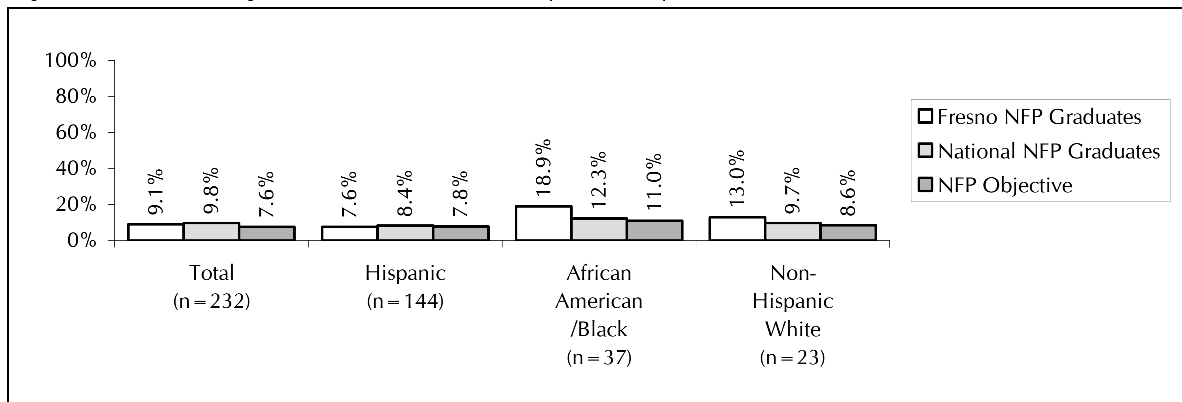
Gestational age and weight at birth are measures of infant health, with birth before 37 weeks gestation considered premature, and weight less than 2500 grams considered low birth weight.

PREMATURE BIRTHS

Reduction of premature births is considered the best way to reduce infant illness, disability, and death.[7] Figure 3 illustrates the rates of premature births for Fresno NFP graduates and national NFP graduates, and provides the NFP Objectives.

The NFP Objective for premature births is consistent with the target goal set in Healthy People 2010 Objectives[7] for the percentage of premature births among all women, irrespective of risk. Whereas it is a national goal to eliminate disparities in health outcomes among populations, health statistics for women from minority and low income populations served by the NFP substantiate the existence of disparities in rates of premature and low birth weight infants by race and ethnicity. Thus, the progress that NFPs can realistically achieve toward the goals may vary based on the ethnic composition of the population served. To help sites monitor their progress toward the longer term target goal for 2010, we have established intermediate objectives for NFP sites that reflect the racial/ethnic distribution of the participants served (see Appendix B). Figure 3 also illustrates the rate(s) of premature births for the predominant ethnic group(s) within Fresno NFP, along with the respective intermediate NFP Objectives.

Figure 3. Percentage of Premature Infants by Ethnicity

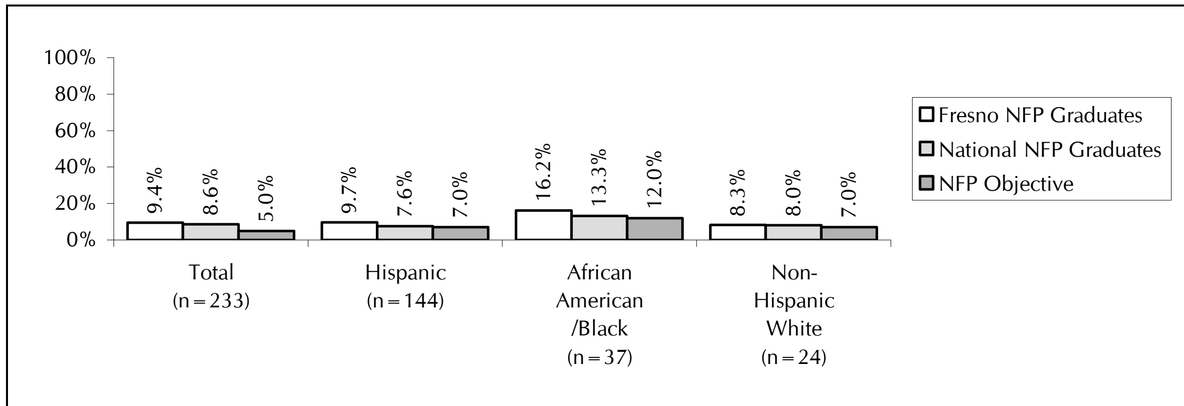


Sample sizes presented are for Fresno NFP

LOW BIRTH WEIGHT

Birth weight is also used as an indicator of infant health, with the occurrence of infant death and/or handicap highly correlated with low birth weight (less than 2,500-grams/5.5 lbs.). Figure 4 demonstrates the percentage of low birth weight (LBW) infants among Fresno NFP graduates and national NFP graduates, and provides NFP Objectives. The overall rate is provided, along with the rate(s) for the predominant ethnic group(s) within Fresno NFP.

Figure 4. Percentage of Low Birth Weight Infants by Ethnicity

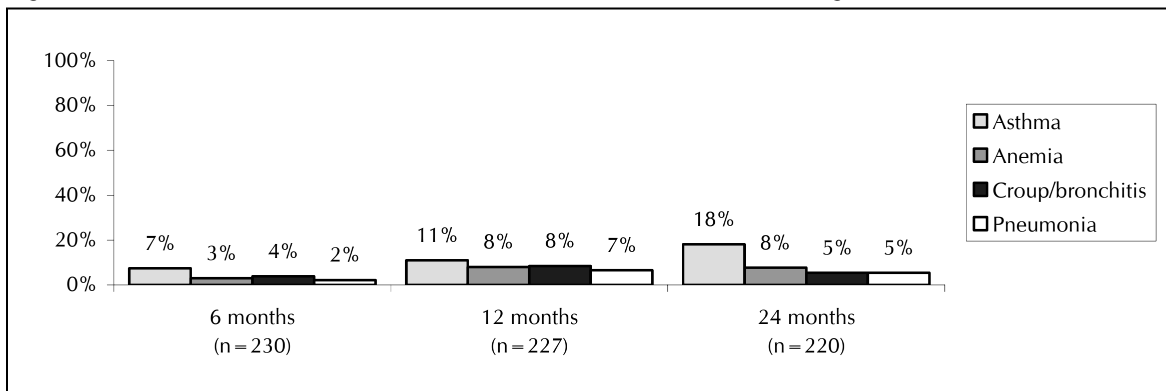


Sample sizes presented are for Fresno NFP

ILLNESSES

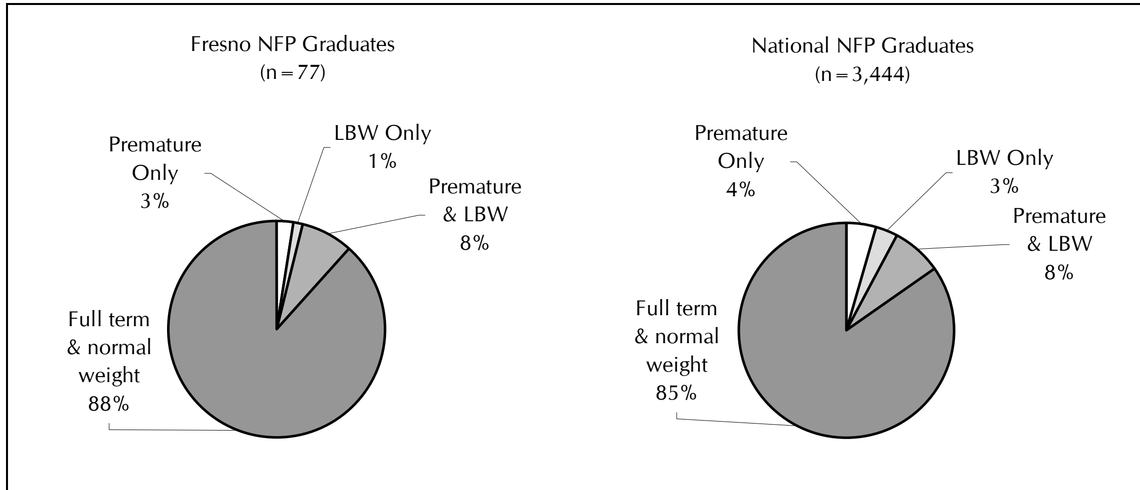
Fresno NFP graduates were asked about their children's illnesses at 6, 12, and 24 months of age. The most frequently reported illnesses are provided in Figure 5 below. The most commonly reported infant illnesses among national NFP graduates are: croup/bronchitis (6-12%), asthma (4-10%), pneumonia (2-7%), and anemia (1-5%).

Figure 5. Predominant Infant Illnesses at 6, 12, and 24 months of age for Fresno NFP Graduates



Given that infants born prematurely or with low birth weight may be at higher risk for respiratory illness (i.e., asthma, croup/bronchitis, and pneumonia), analyses were conducted to examine the percentage of children with such problems who had been born premature or with low birth weight. This information is provided in Figure 6.

Figure 6. Birth Outcomes for Children with Respiratory Illness



DEVELOPMENTAL DELAYS

Developmental milestones are determined by the average age at which children attain specific skills, such as gross motor skills, fine motor skills, mental/cognitive abilities, and speech/language skills. Nurses use one or more of four methods to assess developmental delay at 6, 12, and 24 months, as shown in Table 10. Table 11 provides the percentage of infants considered to have one or more developmental delay(s).

Table 10. Method of Assessment for Developmental Delay Determined At 6, 12, and 24 Months

	Method†	Fresno NFP Graduates	National NFP Graduates
At 6 months	Denver II	2%	21%
(N = 230)	Ages & Stages questionnaire	65%	45%
	Nurse observation	47%	60%
	Physician or health care provider	0%	4%
At 12 months	Denver II	1%	22%
(N = 227)	Ages & Stages questionnaire	79%	50%
	Nurse observation	58%	63%
	Physician or health care provider	0%	4%
At 24 months	Denver II	1%	23%
(N = 220)	Ages & Stages questionnaire	96%	52%
	Nurse observation	80%	68%
	Physician or health care provider	2%	6%

†More than one category could be chosen
Sample sizes presented are for Fresno NFP

Table 11. Developmental Delays at 6, 12, and 24 Months

	Fresno NFP Graduates			National NFP Graduates		
	6 Months	12 Months	24 Months	6 Months	12 Months	24 Months
N	230	227	220	6,200	6,336	6,159
Percentage of children with delay [a]	1%	†	4%	2%	3%	8%
Types of delay [b]						
Gross Motor	1%	†	†	2%	2%	1%
Fine Motor	†	†	0%	1%	1%	1%
Mental/Cognitive	†	0%	0%	†	†	1%
Speech/Language	†	†	4%	†	1%	8%

a This represents the total percentage of children with one or more developmental delay
b Home visitors can record more than one type of delay per child
† <1%

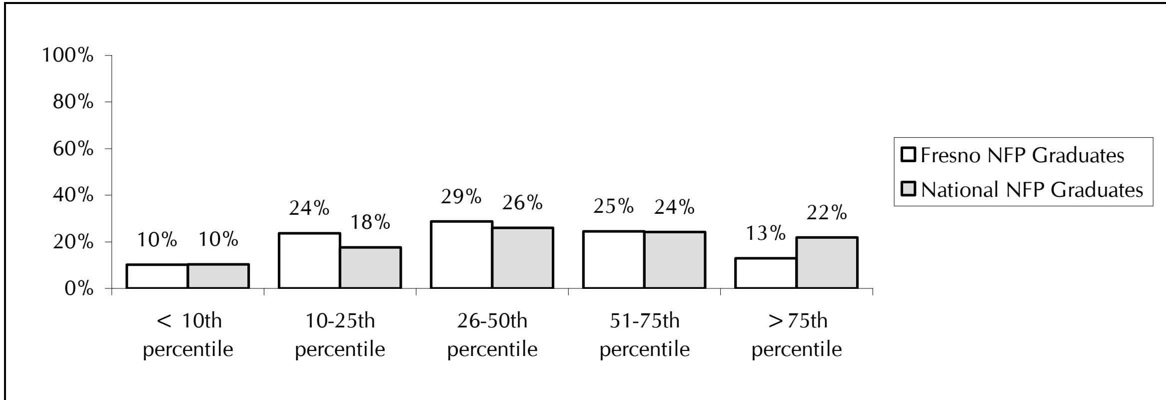
LANGUAGE DEVELOPMENT

Development of language skills during the preschool years is an important indicator of school readiness. The *Language Assessment Form* (i.e., MacArthur CDI Short Form) is administered when toddlers are approximately 21 months of age. [8] The mother is asked to identify which words her child says from a list of 100 words, and the number of words that the infant says is summed and compared to age and gender adjusted norms.

Figure 7 shows the percentile breakdown of language scores for toddlers of Fresno NFP graduates and national NFP graduates. The NFP Objective for this measure is to have 25% or fewer toddlers scoring below the 10th percentile. This objective takes into account the lower socioeconomic population that NFP serves.

Scoring below the 10th percentile may indicate a delay in language skills and a need for referral to other services. However, scoring above the 10th percentile on this assessment does not necessarily rule out the possibility of a language delay, as multiple factors may influence test scores. Home visitors are encouraged to consider all relevant sources of information (e.g. other assessments, observation) when making an assessment regarding any type of developmental delay, including language delay, and to work with local service providers in determining criteria for referral to their agency for further evaluation.

Figure 7. Percentile Breakdown of Language Production Scores for Toddlers

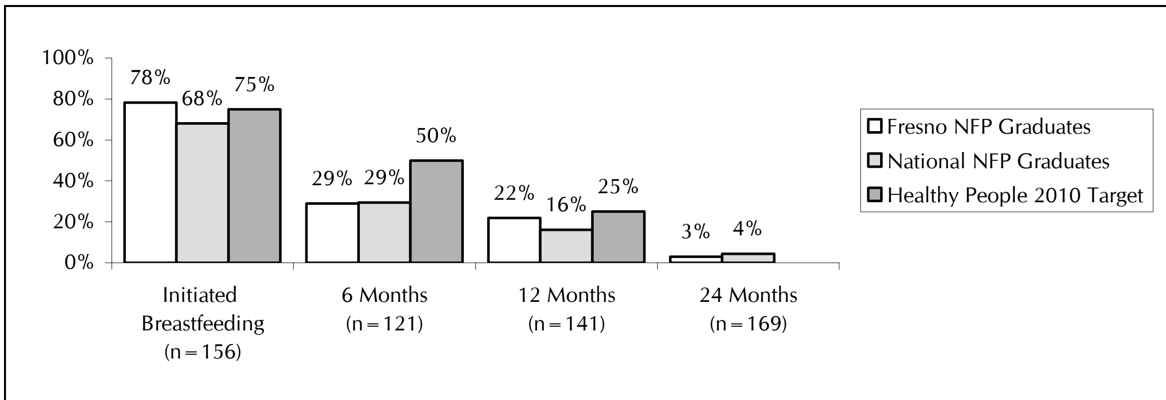


N=216 for Fresno NFP

BREASTFEEDING

Figure 8 illustrates breastfeeding rates reported at 6, 12, and 24 months of infant age for Fresno NFP graduates, along with rates reported among NFP graduates nationwide and Healthy People 2010 target goals. Breast milk is considered the ideal form of infant nutrition, with the practice of breastfeeding demonstrating wide-ranging benefits for infants' general health, immune systems, and development.[7]

Figure 8. Occurrence of Breastfeeding



Sample sizes presented are for Fresno NFP

IMMUNIZATIONS

Figure 9 and Figure 10 provide summaries of the percentages of infants immunized at 12 and 24 months of infant/toddler age for each of the recommended immunizations. Rates are provided for both Fresno NFP gradates and national NFP graduates. The NFP Objective is 90% or greater completion rates for all immunizations by 24 months of toddler age.

Completion rates of the HIB and DTP/DTaP immunizations could be biased toward an underestimation because of differences in pharmaceutical products. For example, if PedvaxHIB or ComVax (Merck) is administered at ages 2 and 4 months, a dose at 6 months is not required. However, our calculations assume that a 6-month dose was required (the most common scenario) and that there should be three doses by 12 months and four doses by 18 months, leading to underestimates for completion at 12, 18, and 24 months, respectively.

In addition, a lower completion rate of DTP/DTaP at 24 months may reflect vaccine shortages over past years, resulting in the decision by many health care providers to defer the fourth dose of the vaccine given at 15-18 months in order to assure that there was an adequate supply of the vaccine for immunization of younger infants.

Figure 9. Summary of Immunization Rates at 12 Months

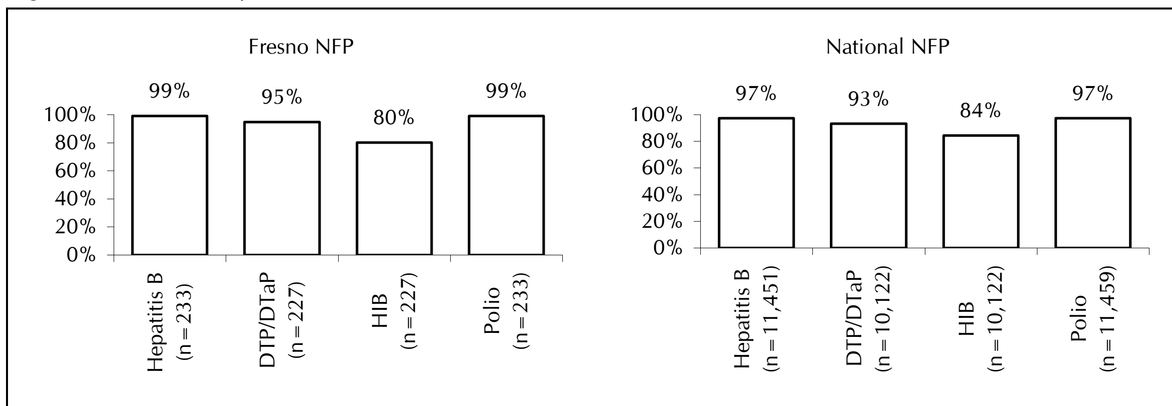
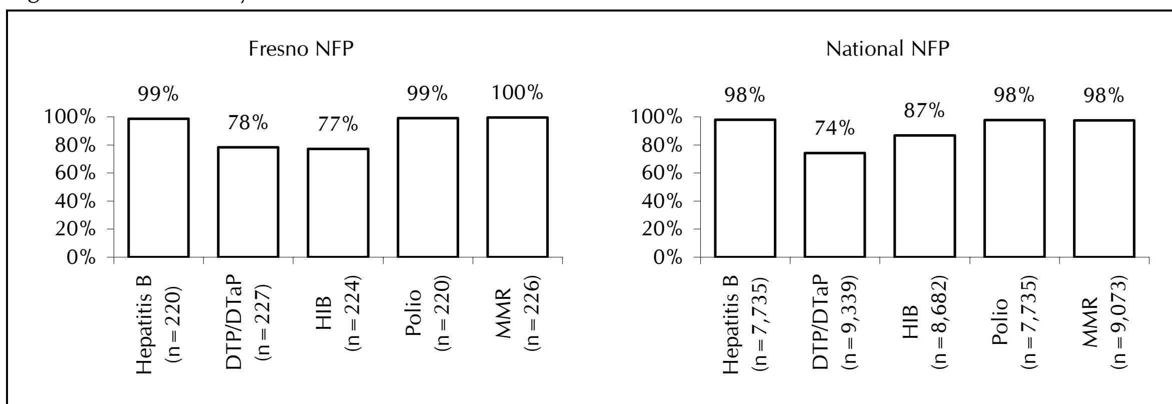


Figure 10. Summary of Immunization Rates at 24 Months



EMERGENCY ROOM VISITS AND HOSPITALIZATIONS

Table 12 displays information on the frequency of and reasons for emergency department visits and hospitalizations reported at 6, 12 and 24 months of infant age by Fresno NFP graduates. Emergency department visits and hospitalizations due to injury or ingestion are possible indicators of abuse or inadequate supervision of young children's activities.

Table 12. Percentage of and Reasons for Emergency Department Visits and Hospitalizations Reported at 6, 12, and 24 Months of Age by Fresno NFP Graduates

Emergency Department Visits		Hospitalizations	
6 Months (n = 230)		**6 Months (n = 228)**	
0 visits	58%	0 admissions	86%
1 visit	23%	1 admission	11%
2 visits	11%	2 admissions	1%
3+ visits	7%	3+ admissions	1%
Reasons (n = 167)		**Reasons (n = 38)**	
Illness	95%	Illness	100%
Injury	5%	Injury	0%
Ingestion	0%	Ingestion	0%
12 Months (n = 227)		**12 Months (n = 225)**	
0 visits	47%	0 admissions	86%
1 visit	28%	1 admission	10%
2 visits	15%	2 admissions	4%
3+ visits	10%	3+ admissions	0%
Reasons (n = 232)		**Reasons (n = 40)**	
Illness	95%	Illness	100%
Injury	4%	Injury	0%
Ingestion	1%	Ingestion	0%
24 Months (n = 220)		**24 Months (n = 217)**	
0 visits	35%	0 admissions	82%
1 visit	25%	1 admission	13%
2 visits	17%	2 admissions	4%
3+ visits	23%	3+ admissions	1%
Reasons (n = 354)		**Reasons (n = 50)**	
Illness	89%	Illness	92%
Injury	11%	Injury	8%
Ingestion	1%	Ingestion	0%

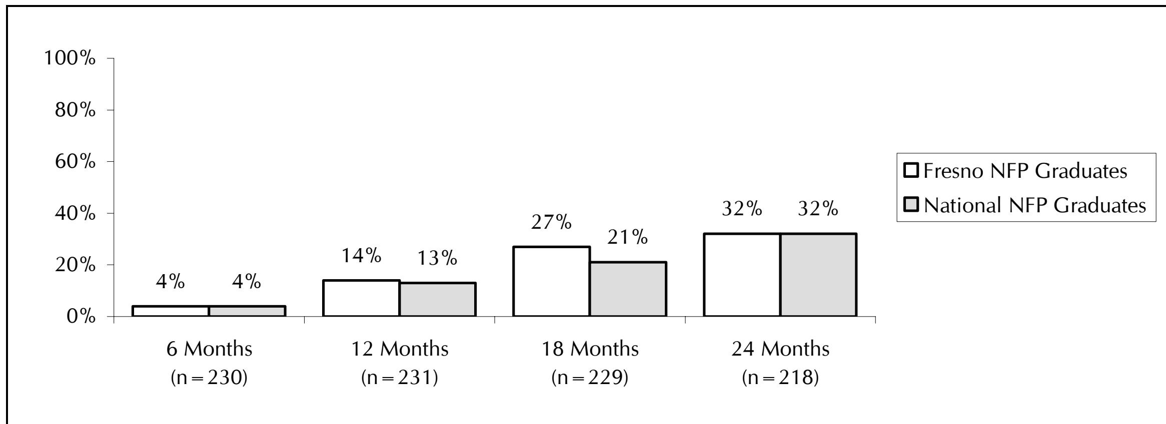
MATERNAL LIFE COURSE DEVELOPMENT

SUBSEQUENT PREGNANCIES

The NFP focuses on helping mothers achieve life course development goals through the planning of future pregnancies, completion of their education, procurement of employment, and development of stable partner relationships. The timing and number of subsequent pregnancies have important implications for a mother's ability to stay in school, find work, and/or find appropriate child care.

Figure 11 indicates rates of subsequent pregnancies among Fresno NFP graduates and national NFP graduates. The NFP Objective for subsequent pregnancies is 25% or less by 24 months of toddler age.

Figure 11. Subsequent Pregnancies by 6, 12, 18, and 24 months Postpartum among Fresno NFP Graduates



Sample sizes presented are for Fresno NFP

EDUCATION

Education status and enrollment in school are other factors to consider when looking at participants' life course development. Home visitors work with participants to set educational and career goals, including completion of a high school diploma or GED. Figure 12 tracks those participants who entered the program *without* a high school diploma or GED in terms of diploma/GED completion and school enrollment.

Figure 12. Education Status over Time for Fresno NFP Graduates with No High School Diploma or GED at Intake

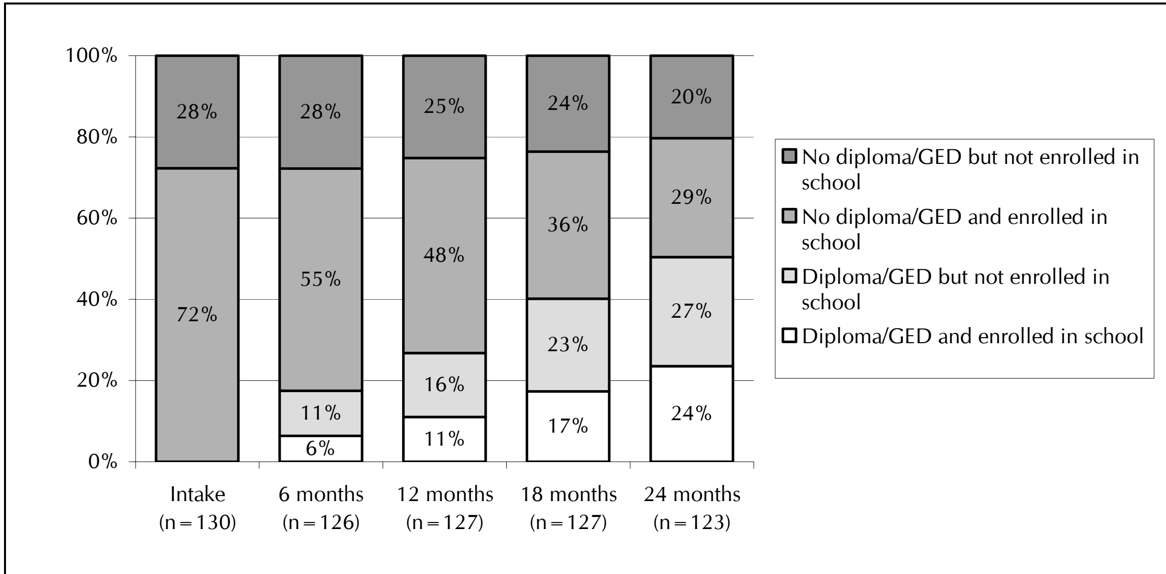
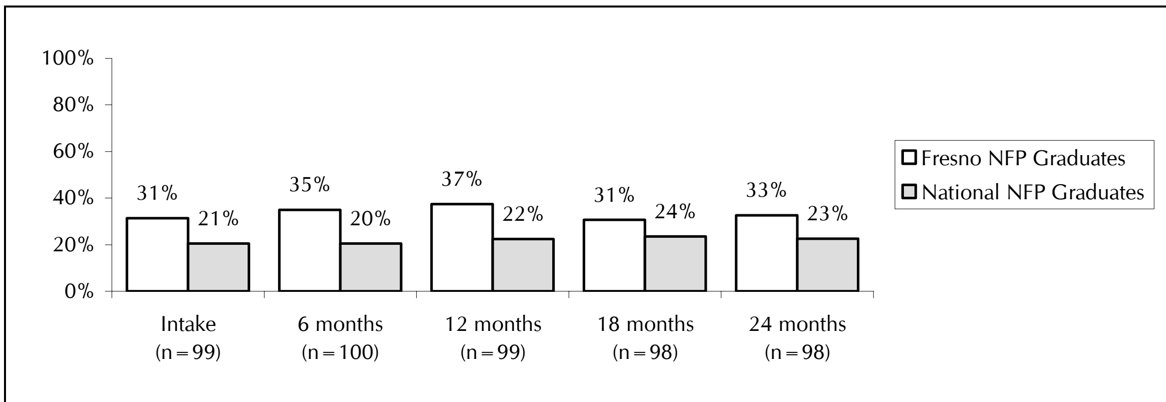


Figure 13 tracks enrollment in schooling beyond high school for those NFP graduates who entered the program *with* a high school diploma or GED.

Figure 13. Enrollment in School over Time for those with a High School Diploma or GED at Intake

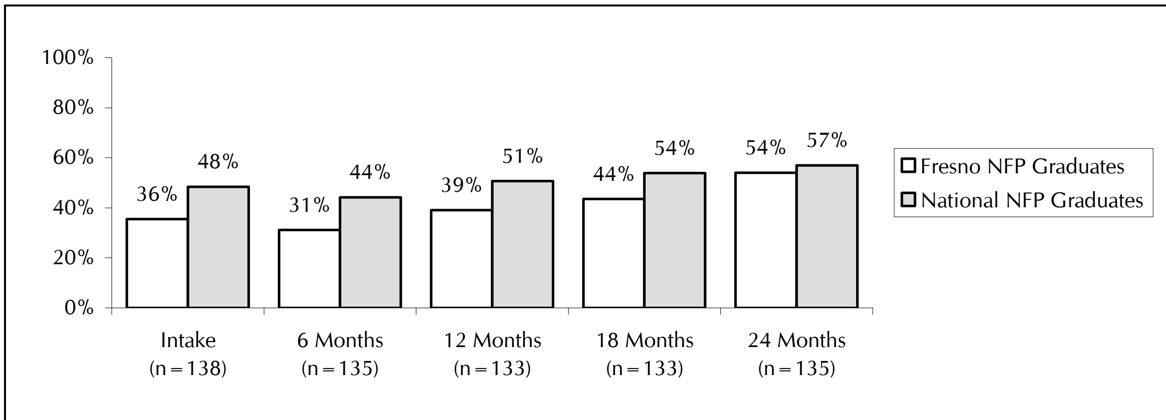


Sample sizes presented are for Fresno NFP

WORKFORCE PARTICIPATION

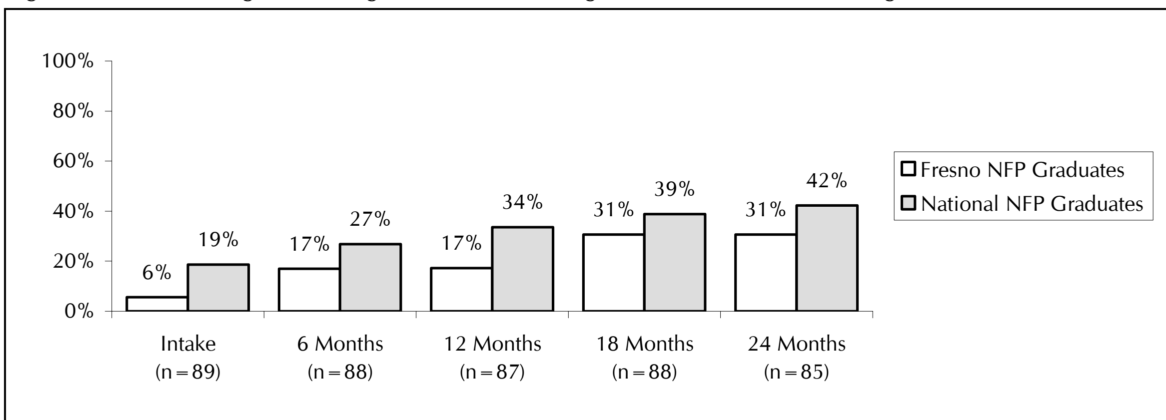
Participation in the workforce is another area that is tracked as an indicator of the mother's life course development. The percentage participating in the workforce at different time points and the amount of time spent in the workforce are considered. Figure 14 and Figure 15 note the percentage of participants in the workforce over time broken down by age for both Fresno NFP graduates and national NFP graduates.

Figure 14. Percentage Working over Time among those 18 Years or Older at Intake



Sample sizes presented are for Fresno NFP

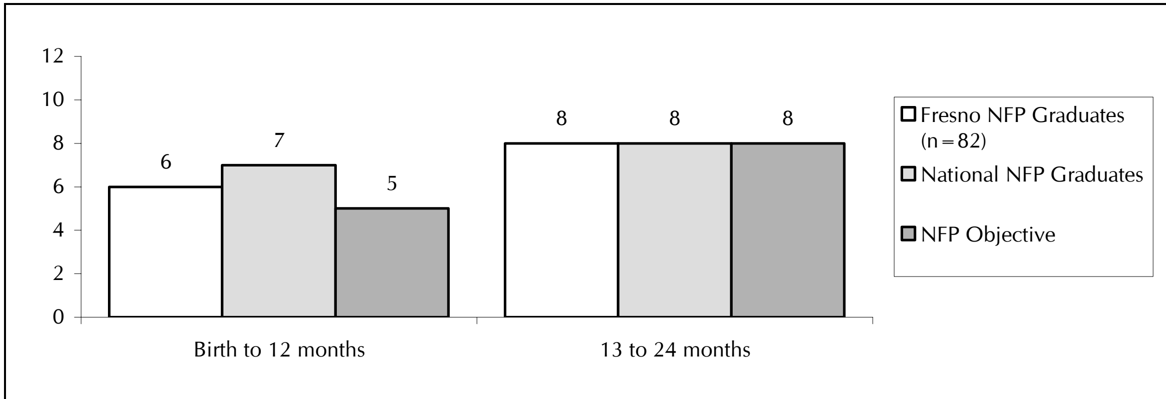
Figure 15. Percentage Working over Time among those 17 Years or Younger at Intake



Sample sizes presented are for Fresno NFP

For participants who reported working at 12 and 24 months of toddler age, the number of months they worked during the first (0-12 months) and second (13-24 months) postpartum years is tracked. The average number of months Fresno NFP graduates worked is noted in Figure 16, along with the national NFP rates and NFP Objectives.

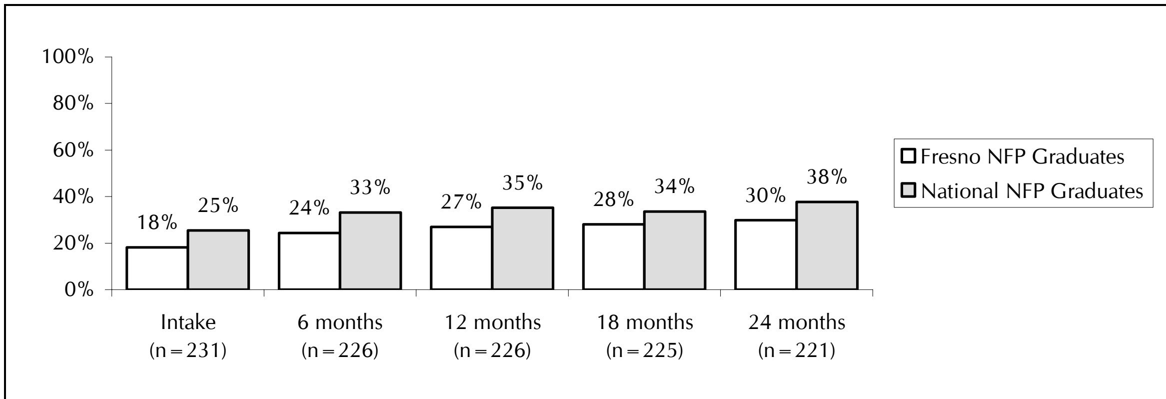
Figure 16. Number of Months Worked



MARITAL STATUS

Marital status of participants is assessed at program intake and every six months after the birth of the participant's baby. Marriage is an important indicator of stable partner relationships which have important benefits for the family's economic and psychological health. Figure 17 demonstrates the percentage of participants who were married from intake to 24 months of infant age.

Figure 17. Percentage Married over Time

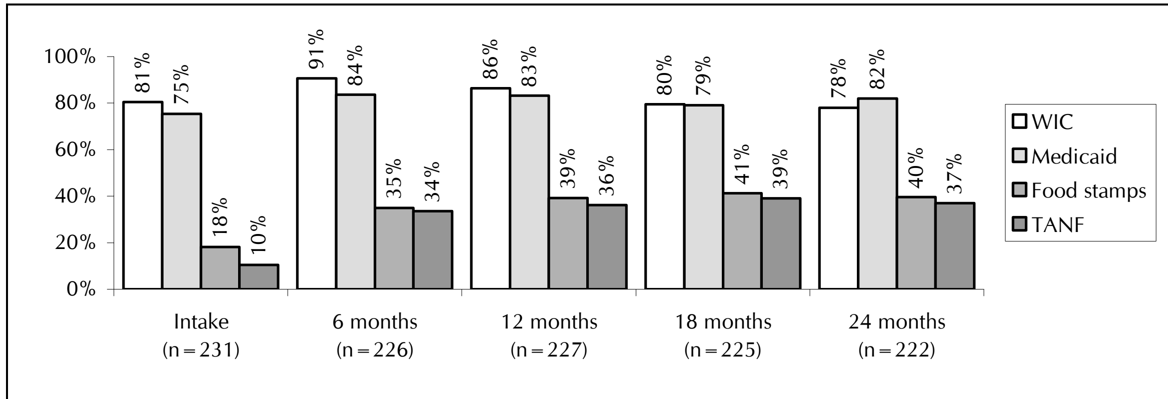


Sample sizes presented are for Fresno NFP

USE OF PUBLIC ASSISTANCE PROGRAMS

Fresno NFP participants were asked to report their use of publicly supported government assistance programs at intake and at 6, 12, 18, and 24 months of infant age. This information in presented in Figure 18 below.

Figure 18. Percentage of Fresno NFP Participants Using Government Assistance between Program Intake and 24 months of Toddler Age



PART II:
COMPARISON OF FRESNO NFP COHORT 1 AND COHORT 2

COHORT COMPARISONS

Fresno NFP has been in operation long enough to allow for comparison of program implementation and selected outcomes between participants who entered during the earlier phase of program operation (Cohort 1) and participants who entered the program during the more recent phase (Cohort 2). Participant characteristics will be noted first, followed by comparisons of program implementation and mother and infant outcomes. Outcome data are presented for specific time points only when they are available for both cohorts.

SOCIO-DEMOGRAPHIC INFORMATION

Table 13 notes various demographic characteristics of the participants in Cohorts 1 and 2.

Table 13. Characteristics of Participants at Program Entry by Cohort

	Cohort 1 Participants†	Cohort 2 Particpants‡	National NFP Participants
Number Enrolled	382	334	57,017
Demographic Characteristics			
Maternal age (median)	18	18	19
Maternal education (median)	11	11	11
Completed high school*	35%	43%	48%
Unmarried	84%	89%	80%
First-time mothers	97%	99%	98%
Race/Ethnicity			
Hispanic	56%	61%	21%
Native American	2%	1%	5%
African American/Black	21%	17%	19%
Non-Hispanic White	11%	14%	49%
Multiracial/other	4%	4%	5%
Asian	6%	3%	1%
Economic Factors			
Annual household income (median)	$13,500	$13,500	$13,500
Unemployed	78%	83%	65%
Use of Government Assistance			
WIC	77%	80%	75%
Medicaid*	71%	81%	65%
Food Stamps	24%	21%	17%
TANF	14%	12%	5%
Household Size			
Number in household (median)	4	4	3
Household Composition			
Lives alone	2%	2%	6%
Lives with husband/boyfriend	30%	33%	38%
Lives with mother	52%	50%	40%
Lives with others	16%	15%	16%

† Cohort 1 participants entered the program between March 1, 2000 and February 28, 2003
‡ Cohort 2 participants entered the program between March 1, 2003 and April 30, 2006
** Statistically significant difference ($p < .05$) between Cohort 1 and Cohort 2*

As noted in Part I of this report, maternal mental health and sense of mastery are measured at intake. Table 14 provides this information for both cohorts.

Table 14. Psychosocial Participant Characteristics by Cohort

	Cohort 1 (N = 375)	Cohort 2 (N = 333)	
Percent with mental health score greater than 3.0	82%	81%	
Percent with mastery score greater than 3.0	43%	34%	*

** Statistically significant difference ($p < .05$) between Cohort 1 and Cohort 2*

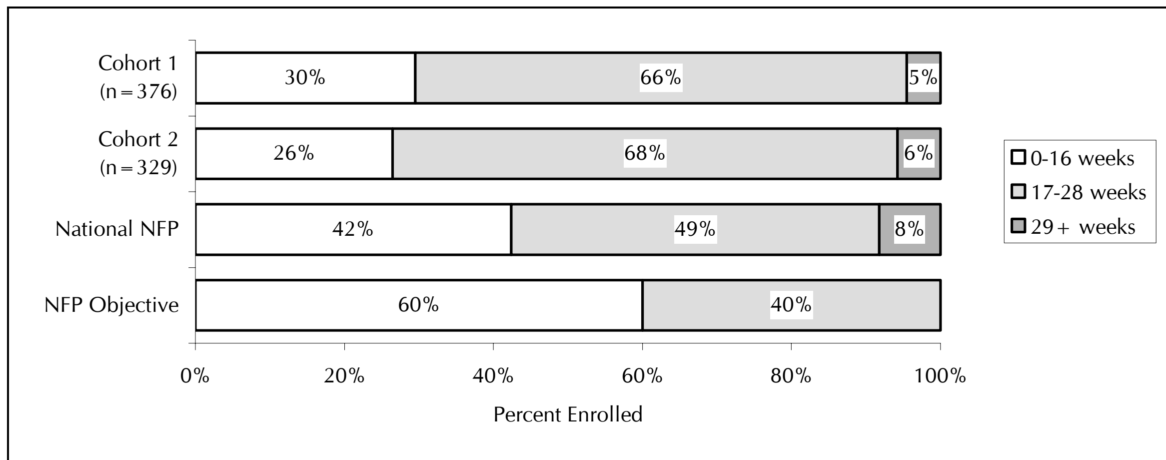
PROGRAM IMPLEMENTATION

As a program progresses and matures, one might expect to see operational differences due to greater understanding of program goals, specific quality improvement efforts, or other administrative initiatives. Differences between early and later program operations are considered below and include gestational age at enrollment, attrition, number and duration of home visits, and content of visits.

GESTATIONAL AGE AT ENROLLMENT

Figure 19 presents information on when participants entered the program during their pregnancies for Cohort 1, Cohort 2, and the national sample of NFP participants, and provides NFP Objectives. Enrolling clients early enough in the program allows home visitors sufficient time to establish a bond with the participant prior to the birth of her baby. This may help limit attrition and at the same time help ensure that the mother receives a sufficient amount of prenatal visits to promote behavioral changes supported through the program.

Figure 19. Gestational Age at Enrollment by Cohort



There is NOT a statistically significant difference ($p < .05$) between Cohort 1 and Cohort 2

REASONS PARTICIPANTS DROPPED FROM THE PROGRAM

Table 15 notes the reasons participants dropped from the program during pregnancy and infancy for both cohorts.

Table 15. Reasons Participants Dropped by Cohort

	Cohort 1	Cohort 2	NFP Objective
Pregnancy	**(n=377)**	**(n=297)**	
Declined further participation	2.4%	4.4%	-
Excessive missed appointments	0.5%	0.7%	-
Unable to locate	1.3%	0.3%	-
Moved out of service area	1.3%	1.3%	-
Miscarry/death	1.3%	0.7%	-
Maternal death	0.0%	0.0%	-
Child not in custody	0.0%	0.0%	-
Unable to provide services	0.3%	1.3%	-
No visits for >180 days	0.0%	0.0%	-
Total	7.2%	8.8%	10%
Infancy	**(n=376)**	**(n=229)**	
Declined further participation	12.8%	14.8%	-
Excessive missed appointments	3.7%	3.1%	-
Unable to locate	6.1%	4.8%	-
Moved out of service area	4.8%	5.2%	-
Infant death	0.5%	0.4%	-
Maternal death	0.0%	0.0%	-
Child not in custody	0.0%	0.4%	-
Unable to provide services	0.0%	3.1%	-
No visits for >180 days	0.0%	0.0%	-
Total	27.9%	31.9%	20%
Toddlerhood	**(n=376)**	**(n=120)**	
Declined further participation	7.2%	12.5%	-
Excessive missed appointments	2.7%	5.0%	-
Unable to locate	2.7%	3.3%	-
Moved out of service area	2.4%	3.3%	-
Infant death	0.0%	0.0%	-
Maternal death	0.0%	0.0%	-
Child not in custody	0.3%	0.0%	-
Unable to provide services	0.0%	0.0%	-
No visits for >180 days	0.0%	0.0%	-
Total	15.2%	24.2%	10%

NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS

Table 16 shows the number and duration of completed home visits for both cohorts as well as NFP Objectives.

Table 16. Number and Duration of Completed Nurse Home Visits by Cohort

	Cohort 1		Cohort 2		NFP
	Number	Average	Number	Average	Objective
Pregnancy					
Pregnancy Completed	377	-	297	-	-
Completed Visits	3,562	9.4	2,718	9.2	-
Expected Visits	4,376	-	3,436	-	-
Percentage of Expected Visits Completed	-	86%	-	83%	80%
Attempted Visits†	684	1.8	397	1.3	-
Average Visit Length (Minutes)	-	73.4	-	75.8	60
Average Total Contact Time (Minutes)	-	693	-	695	-
Infancy					
Infancy Completed	376	-	229	-	-
Completed Visits	5,454	14.5	2,948	12.9	-
Expected Visits	10,714	-	6,554	-	-
Percentage of Expected Visits Completed	-	51%	-	45%	65%
Attempted Visits†	1,585	4.2	754	3.3	-
Average Visit Length (Minutes)	-	72.7	-	74.9	60
Average Total Contact Time (Minutes)	-	1,053	-	969	-
Toddlerhood					
Toddlerhood Completed	376	-	120	-	-
Completed Visits	2,866	7.6	659	5.5	-
Expected Visits	7,749	-	2,499	-	-
Percentage of Expected Visits Completed	-	37%	-	26%	60%
Attempted Visits†	861	2.3	256	2.1	-
Average Visit Length (Minutes)	-	73.4	-	76.6	60
Average Total Contact Time (Minutes)	-	566	-	419	-

†An attempted visit is one in which the nurse tried to make a visit, but for some reason was unable to conduct the visit (e.g., client was not home when nurse arrived, or client refused visit when nurse arrived). If a family calls to cancel a scheduled visit, this is not considered an attempted visit.
-Not applicable

CONTENT OF HOME VISITS

The NFP Objectives for content of home visits reflect the variation in developmental needs of participants as they move through program phases. Different emphases are stressed depending on the stage of a mother's pregnancy or age of the child. Table 17 notes the time spent on each domain area by cohort and includes the NFP Objectives for percentage of time spent on different domains.

Table 17. Average Percent of Nurse Visit Time Spent on Each Domain by Phase and Cohort

	Cohort 1	Cohort 2	NFP Objective
Pregnancy	**(N=377)**	**(N=297)**	
Personal Health	40%	40%	35-40%
Environmental Health	10%	9%	5-7%
Life-course Development	11%	10%	10-15%
Maternal Role	24%	27%	23-25%
Friends & Family	15%	14%	10-15%
Time on planned material	*91%*	*93%*	-
Infancy	**(N=342)**	**(N=206)**	
Personal Health	22%	22%	14-20%
Environmental Health	13%	12%	7-10%
Life-course Development	13%	11%	10-15%
Maternal Role	38%	43%	45-50%
Friends & Family	14%	12%	10-15%
Time on planned material	*89%*	*91%*	-
Toddlerhood	**(N=223)**	**(N=69)**	
Personal Health	18%	19%	10-15%
Environmental Health	13%	11%	7-10%
Life-course Development	17%	15%	18-20%
Maternal Role	37%	42%	40-45%
Friends & Family	15%	13%	10-15%
Time on planned material	*88%*	*90%*	-

PARTICIPANT OUTCOMES

Changes in program implementation over time may affect outcomes for program participants. Outcomes for mothers by cohort are noted below including changes in smoking, subsequent pregnancies, and workforce participation. Outcomes for infants include premature birth, low birth weight status, and immunizations.

CHANGE IN MATERNAL HEALTH HABITS

Table 18 indicates the percentage change in smoking during pregnancy for both cohorts. The NFP Objective for reduction in smoking during pregnancy is 20%.

Table 18. Change in Percent Smoking during Pregnancy by Cohort over Time

	Intake	36 Weeks of Pregnancy	Percent Changed
Cohort 1 (N=317)			
Cigarette smoker	4%	3%	-33%
Smoked 5+ cigarettes last 24 hrs.	†	†	-50%
Cohort 2 (N=273)			
Cigarette smoker	4%	3%	-27%
Smoked 5+ cigarettes last 24 hrs.	†	0%	-100%

**Statistically significant change at P < .05*

Home visitors also work with those participants who are not willing or able to quit smoking to decrease the number of cigarettes they smoke. Table 19 provides this information by cohort.

Table 19. Change in Number of Cigarettes Smoked per Day during Pregnancy by Cohort

	Average Change
Cohort 1 (n=2)	-5.0
Cohort 2 (n=2)	-5.0
NFP objective	-3.5

**Statistically significant change at P < .05*

BIRTH OUTCOMES

Home visitors work with mothers throughout their pregnancies on a range of issues that affect their health and wellbeing as well as that of their babies. Birth outcomes help measure the impact of the program and include rates of premature birth (Figure 20) and low birth weight (Figure 21).

Figure 20. Percentage of Premature Infants by Ethnicity and Cohort

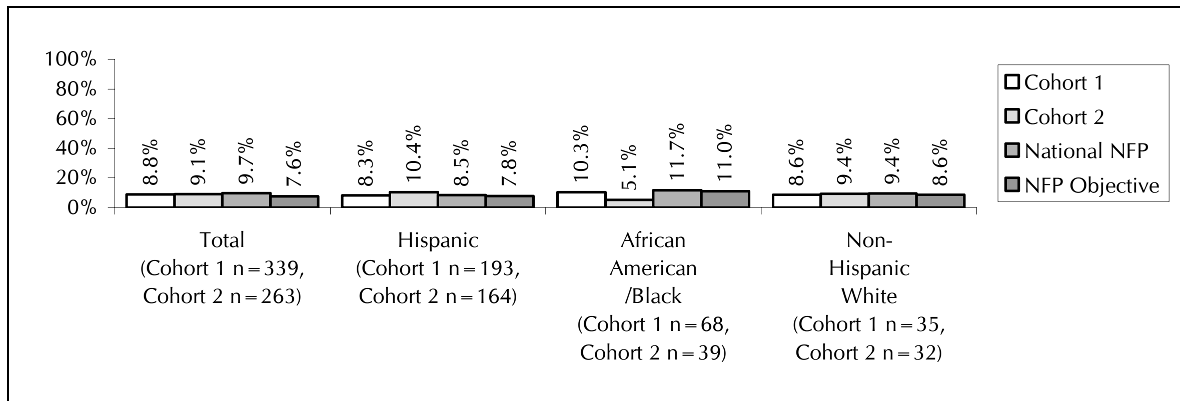
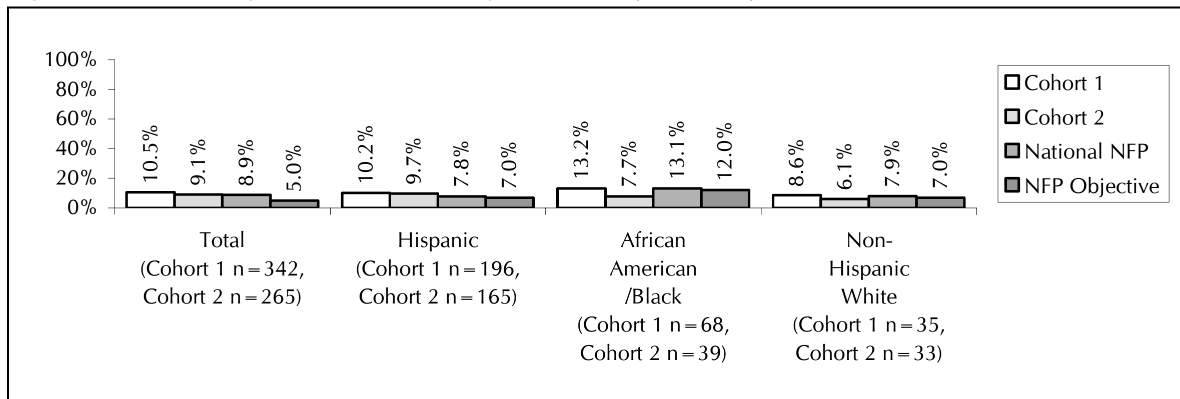


Figure 21. Percentage of Low Birth Weight Infants by Ethnicity and Cohort



IMMUNIZATIONS

Figure 22 notes the 12-month immunization rates for both cohorts, whereas Figure 23 provides 24-month immunization rates (note: 24 month rates may not be available).

In addition, a lower completion rate of DTP/DTaP at 24 months may reflect vaccine shortages over past years, resulting in the decision by many health care providers to defer the fourth dose of the vaccine given at 15-18 months in order to assure that there was an adequate supply of the vaccine for immunization of younger infants.

Figure 22. Summary of Immunization Rates at 12 Months of Infant Age by Cohort

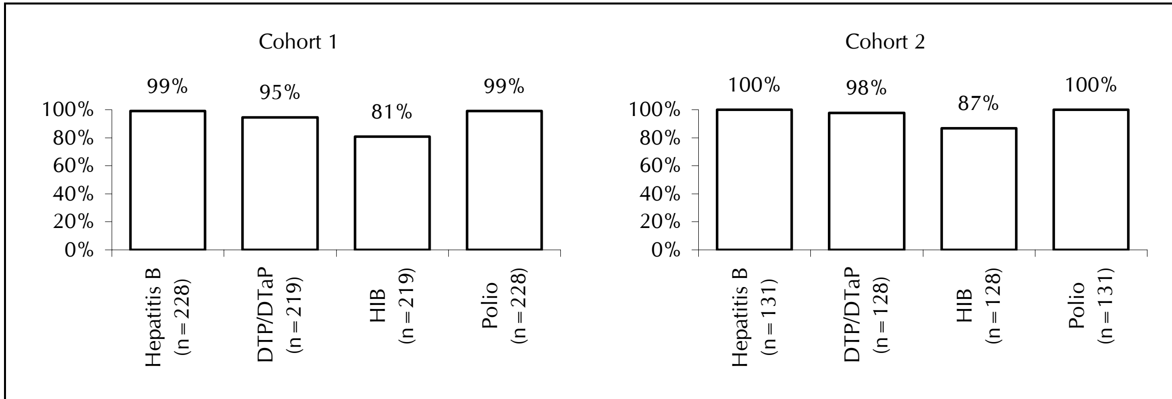
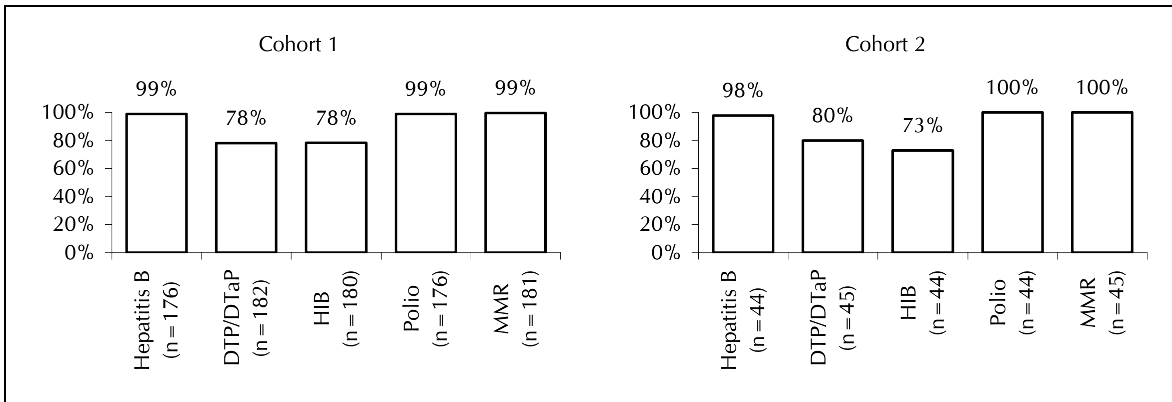


Figure 23. Summary of Immunization Rates at 24 Months of Toddler Age by Cohort



MATERNAL LIFE COURSE DEVELOPMENT

Life course development issues receive greater program emphasis after the mother delivers her baby. This focus helps mothers with planning future education, employment, and family growth. Subsequent pregnancies and participation in the workforce are two outcomes that address life course development.

Rates of subsequent pregnancies for Fresno NFP cohorts are shown in Figure 24 below. The NFP Objective for the rate of subsequent pregnancies is 25% or less by the child's second birthday.

Figure 24. Cumulative Subsequent Pregnancies by Cohort

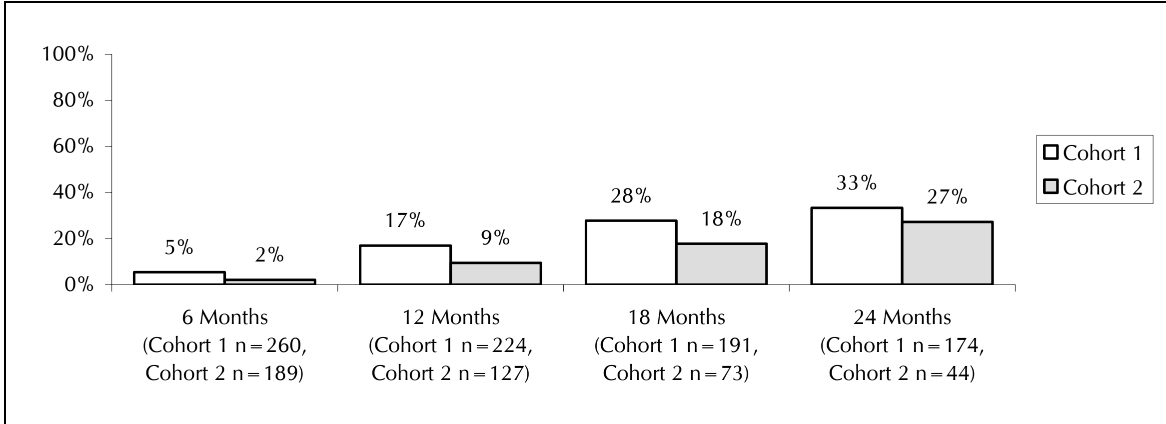


Figure 25 and Figure 26 show the percentages of participants working over time for both cohorts by age at intake.

Figure 25. Percentage Working over Time among those 18 Years or Older at Intake

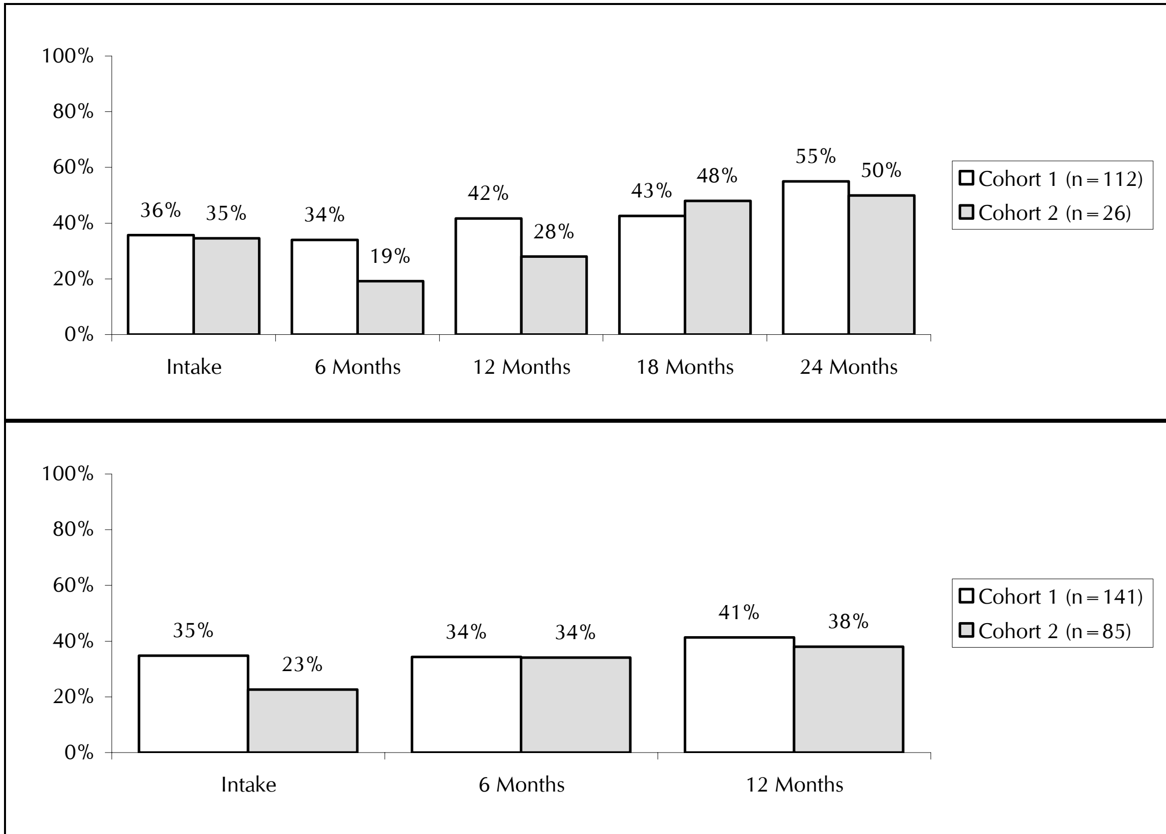
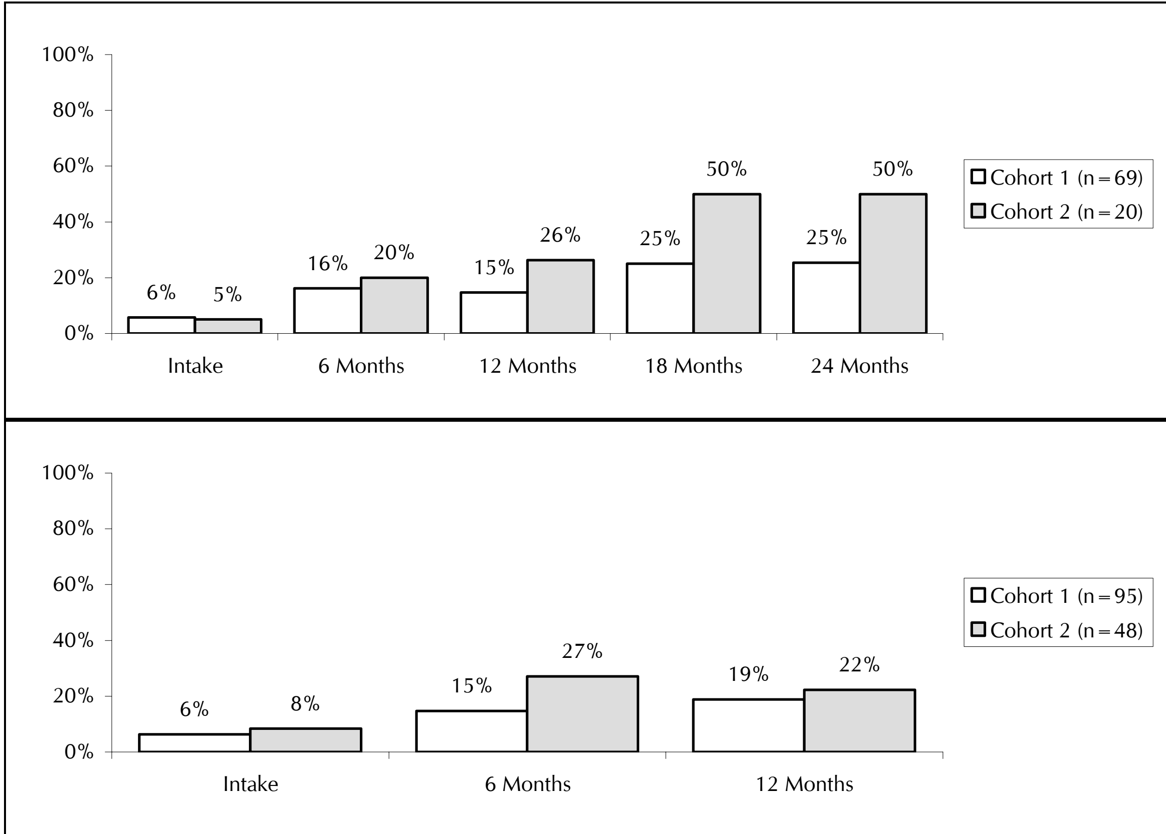
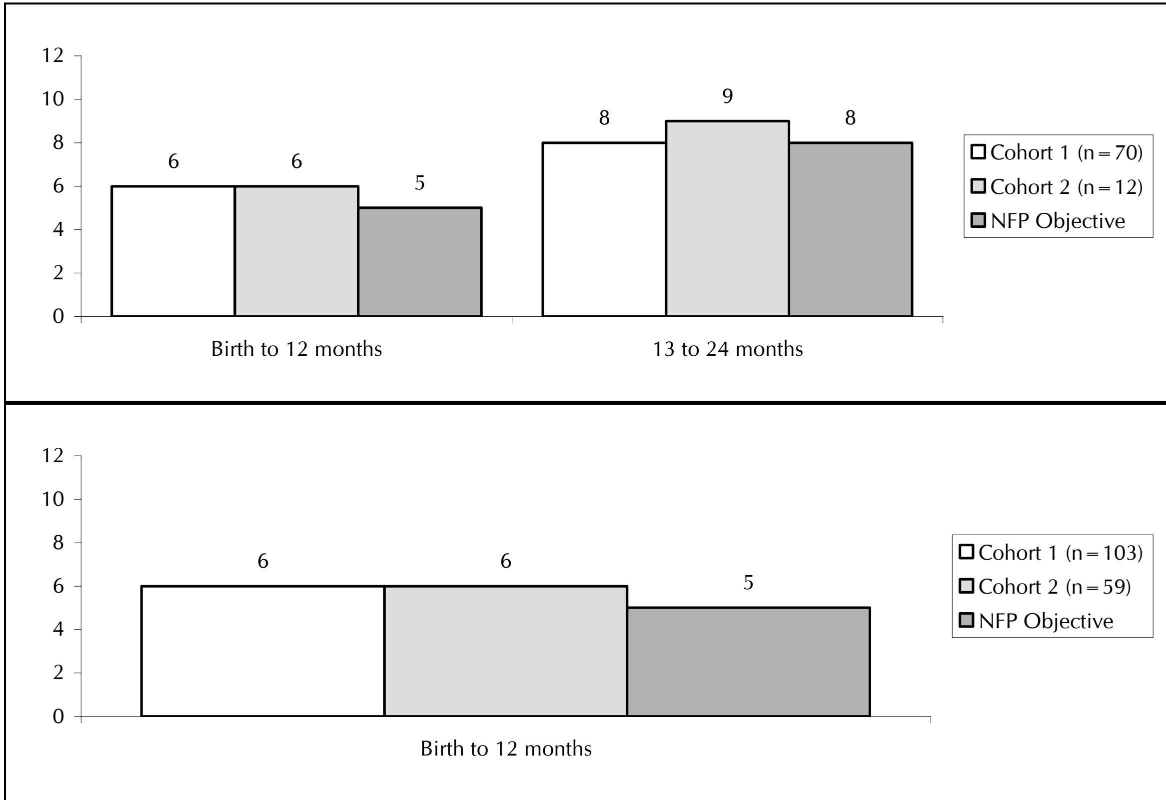


Figure 26. Percentage Working over Time among those 17 Years or Younger at Intake



Another consideration for the mother's life course is the number of months she works per year after the delivery of her baby. Figure 27 provides this information by cohort.

Figure 27. Number of Months Worked Postpartum by Cohort



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Appendix A: Nurse-Family Partnership Overview

Federal, state, and local governments and a variety of private efforts have attempted for several decades to create interventions that would prevent or at least reduce the incidence of low birth weight infants, child abuse and neglect, crime, welfare dependency, and other severe social and health problems. These attempts included several models of home visitor programs and some programs based in the social welfare system. Our society, nonetheless, still faces persistent rates of child and family poverty, births to adolescents, infant mortality, and juvenile crime. Many of these problems can be traced directly to the behavior of mothers and fathers and conditions in the family home.

One program of prenatal and infancy home visitation by nurses, the Nurse-Family Partnership, developed and tested by Dr. David Olds and colleagues, addresses many of the programmatic and clinical deficiencies found in programs tested earlier. Scientifically controlled studies of this program in Elmira, New York; Memphis, Tennessee; and Denver, Colorado have produced a variety of positive outcomes for low-income mothers and their children.[1-6]

The Program Model

The program consists of having nurse home visitors work with women and their families in their homes during pregnancy and through the first two years of the child's life to accomplish three goals:

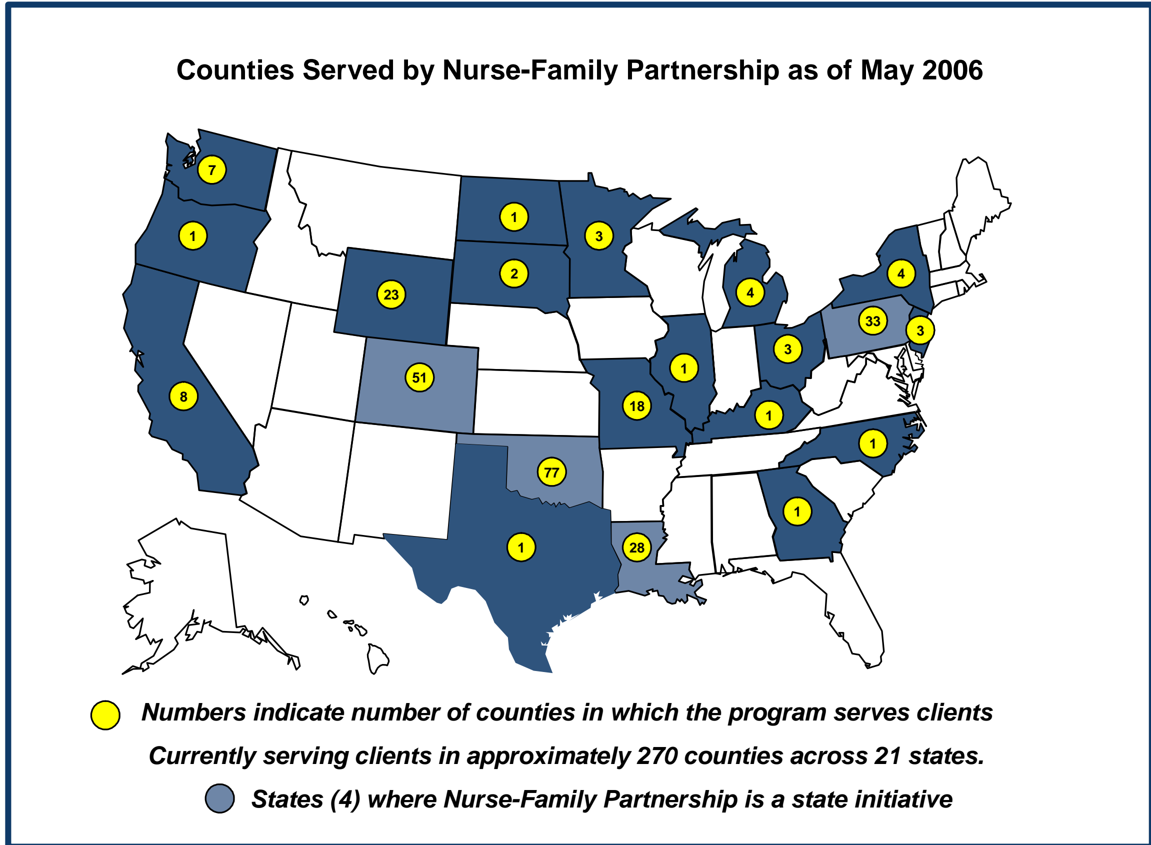
- Improve pregnancy outcomes by helping women alter their health-related behaviors, including reducing use of cigarettes, alcohol, and illegal drugs
- Improve child health and development by helping parents provide more responsible and competent care for their children
- Improve families' economic self-sufficiency by helping parents develop a vision for their own future, plan future pregnancies, continue their education and find work

The model being replicated has a number of key features that differentiate it from other home visitation programs:

- A firm foundation in theories of development and behavioral change and methods to reduce specific risks for poor maternal and child outcomes
- Focus on low-income women bearing first children
- A clinical foundation in health
- Use of registered nurses
- Initiation of visits during pregnancy and continuing involvement with families for two years postpartum
- Use of detailed visit-by-visit protocols to guide the nurses in their work with families

DISSEMINATION OF THE NURSE-FAMILY PARTNERSHIP

The NFP is working with communities to implement this program across the country. The map below highlights the states with active NFP sites and the number of counties served in those states. Additional information about the Nurse-Family Partnership can be found on the web site at http://www.nursefamilypartnership.org.



APPENDIX B: NURSE-FAMILY PARTNERSHIP OBJECTIVES

The Nurse-Family Partnership has drafted objectives to help sites track their fidelity to the model and monitor program outcomes related to common indicators of maternal, child, and family functioning. The objectives have been drawn from the program's research trials, early dissemination experiences, and current national health statistics (e.g., National Center for Health Statistics, Centers for Disease Control and Prevention; Healthy People 2010). The objectives are intended to provide guidance for quality improvement efforts and are long-term targets for sites to achieve over time.

While program staff has given careful thought in crafting these objectives, they are being offered in provisional form because they are, after all, the first iteration of objectives for guiding program performance. Program staff will continue to review national trends emerging from CIS (Clinical Information System) data, as well as changes in national indicators of relevant maternal, child, and family functioning, to identify areas where the objectives may need to be modified. Equally important will be sites' own experiences in working with the objectives. It will be important to understand from actual experience what may need to be added or dropped from the objectives for them to be as useful as possible in supporting efforts to continue to improve the performance of the NFP, both nationally and in each and every site.

OBJECTIVES CONCERNING FIDELITY TO PROGRAM MODEL

PROGRAM IS REACHING THE INTENDED POPULATION OF LOW-INCOME, FIRST-TIME MOTHERS:

1. 75% of eligible referrals are enrolled in the program
2. 100% of enrolled women are first-time mothers (no previous live birth)
3. 60% of pregnant women are enrolled by 16 weeks gestation or earlier

PROGRAM ATTAINS OVERALL ENROLLMENT GOAL AND RECOMMENDED CASELOAD:

4. A caseload of 25 for all full-time nurses within 8-9 months of program operation

PROGRAM SUCCESSFULLY RETAINS PARTICIPANTS IN PROGRAM THROUGH CHILD'S SECOND BIRTHDAY:

5. Cumulative program attrition is 40% or less through the child's second birthday
6. 10% or less for pregnancy phase
7. 20% or less for infancy phase
8. 10% or less for toddler phase

   Although attrition rates may exceed the target objectives defined above when home visitors are first learning the program model (i.e., initial three year program cycle), we believe that program staff needs to carefully attempt to develop strategies to fully engage participants in the program through the child's second birthday. In examining current rates of attrition among our national sample of NFP participants, we note considerable variability among sites, with an overall average of about 65% attrition through the child's second birthday (15% pregnancy, 33% infancy, and 17% toddler). Thus, we have established an intermediate objective of reducing attrition nationally by 12-15% over the next five years.

   To encourage progress toward this intermediate goal, we encourage individual sites to work toward reducing participant attrition by 2-3% each year, targeting those reasons why participants drop out of the program early that are likely to be most amenable to change (e.g., declined further participation, missed appointments, failure to notify agency of address changes, etc.)

HOME VISITORS MAINTAIN ESTABLISHED FREQUENCY, LENGTH, AND CONTENT OF VISITS WITH FAMILIES:

9. Percentage of expected visits completed is 80% or greater for pregnancy phase
10. Percentage of expected visits completed is 65% or greater for infancy phase

11. Percentage of expected visits completed is 60% or greater for toddler phase
12. On average, length of home visits with participants is ≥ 60 minutes.
13. Content of home visits reflects variation in developmental needs of participants across program phases:

Average Time Devoted to Content Domains during Pregnancy	
Personal Health	35-40%
Environmental Health	05-07%
Life Course Development	10-15%
Maternal Role	23-25%
Family and Friends	10-15%
Average Time Devoted to Content Domains during Infancy	
Personal Health	14-20%
Environmental Health	07-10%
Life Course Development	10-15%
Maternal Role	45-50%
Family and Friends	10-15%
Average Time Devoted to Content Domains during Toddlerhood	
Personal Health	10-15%
Environmental Health	07-10%
Life Course Development	18-20%
Maternal Role	40-45%
Family and Friends	10-15%

OBJECTIVES CONCERNING MATERNAL AND CHILD OUTCOMES

REDUCTION IN SMOKING DURING PREGNANCY:

14. 20% or greater reduction in the percentage of women smoking from intake to 36 weeks pregnancy
15. On average, a 3.5 reduction in the number of cigarettes smoked per day between intake and 36 weeks pregnancy (among women who smoked 5 or more cigarettes at intake)

PERCENTAGES OF PREMATURE AND LOW BIRTH WEIGHT INFANTS DEMONSTRATE PROGRESS TOWARD HEALTHY PEOPLE 2010 OBJECTIVES:

16. Premature birth rate of 7.6%
17. Low birth weight (LBW) rate of 5%

The national target objectives listed above are for all women, irrespective of risk. Participants enrolled in the NFP typically are at higher risk for having premature and low birth weight infants because, on average, they are younger, low income, less educated, first-time mothers drawn from diverse racial and ethnic populations. While it is a national goal to eliminate disparities in health outcomes, women from economically disadvantaged and/or minority populations currently demonstrate higher rates of premature and low birth weight infants. Thus, the progress that NFPs realistically can achieve in reaching Healthy People 2010 Objectives may vary based on the composition of the population served.

To help sites monitor their progress toward the longer-term target objectives for 2010, we have established intermediate objectives for 2006 based on the racial/ethnic distribution of participants served. The intermediate targets presented in the table below were established by analyzing data from our national dissemination database (N = 57,017 NFP participants) and setting a target goal for each racial/ethnic population that represents a 10% reduction in our currently observed rates of prematurity and low birth weight for that population. *If a site has already achieved the objectives presented in the table, we encourage that they target site-specific objectives that are 10% below their current percentages for premature and low birth weight infants among their NFP participants.*

18. Intermediate birth outcome objectives by ethnicity:

Racial/Ethnic Status	% Premature Infants	% Low Birth Weight Infants
Asian	8.0	8.0
African American/Black	11.0	12.0
Hispanic	7.8	7.0
Native American	8.3	6.8
Non-Hispanic White	8.6	7.0
Mixed Racial/Ethnic	8.0	6.0

CHILD HEALTH AND DEVELOPMENT:

19. Completion rates for all recommended immunizations are 90% or greater by the time the child is two years of age

20. Percent of toddlers who fall below the 10th percentile on the MacArthur CDI for acquisition of language skills for their age and gender is 25% or less

MATERNAL LIFE-COURSE DEVELOPMENT:

21. Rate of subsequent pregnancies within two years following birth of infant is 25% or less

22. Mean number of months women (18 years or older) employed following birth of infant is:

- 5 months from birth to 12 months
- 8 months from 13 to 24 months