

WYOMING



Wyoming NFP

Wyoming Department of Health Community &
Family Health Division

EVALUATION REPORT 7

Initiation (July 1996) through September 30, 2006

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EXECUTIVE SUMMARY

This is the seventh evaluation report for the Nurse-Family Partnership (NFP) operated by Wyoming NFP, based on the intervention model developed and tested by Dr. David Olds and colleagues. Wyoming Department of Health Community & Family Health Division coordinates the implementation of this program in State of Wyoming. This report presents analysis of data available from program initiation through September 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.

Wyoming NFP has been in operation since July 1996. Since that time, 1,690 participants have enrolled in the program and 951 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 241 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 July 1, 1999 and June 30, 2002 (Cohort 1) with those who entered the program between July 1, 2002 and September 30, 2006 (Cohort 2).

PART I. GRADUATES OF THE WYOMING NFP PROGRAM

PARTICIPANT CHARACTERISTICS AT PROGRAM INTAKE

- Wyoming NFP graduates: median age 19; median education 12 years; 79% unmarried; 58% unemployed; 71% Medicaid recipients
- Race/Ethnicity: 79% non-Hispanic White; 14% Hispanic; 4% multiracial/other; 3% Native American
- There were statistically significant socio-demographic differences between Wyoming NFP graduates and non-completers at intake:
 - Median age for graduates was 19 compared to 18 for non-completers
 - Graduates had more years of education than non-completers (12 vs. 11). Fifty percent (50%) of graduates had finished high school whereas only 39% of non-completers had finished high school.
 - A larger proportion of non-Hispanic White participants and a smaller proportion of Native American participants were among the graduates.
 - Eight percent (8%) of graduates were receiving Food Stamps compared to 14% of non-completers.
 - More graduates lived with their husband/boyfriend (45% vs. 37% for non-completers) or alone (7% vs. 5% for non-completers) while more non-completers lived with their mother (45%) or others (14%) than did graduates (41% & 7% respectively).
- Ten percent (10%) of Wyoming NFP graduates reported experiencing a mental disorder at intake compared to 5% national NFP graduates.

PROGRAM IMPLEMENTATION

- Twenty-nine percent (29%) of Wyoming NFP graduates were enrolled by the 16th week of pregnancy, a rate lower than the national NFP average of 41%; 88% of Wyoming NFP graduates were enrolled by the 28th week (91% national NFP).
- Wyoming NFP graduates received an average of 8.9 visits during the pregnancy phase, 19.1 visits during the infancy phase, and 13.4 visits during the toddler phase. National NFP averages for the number of visits per graduate were 9.5, 17.5, and 11.7, respectively.

- Visit lengths in each program phase averaged more than 69 minutes; the NFP objective is a minimum of 60 minutes.
- Wyoming NFP has met the program guidelines for home visits with two small exceptions. Many NFP sites struggle to meet the guidelines for maternal role during infancy. It is a notable strength that Wyoming NFP came very close to meeting this goal (44% vs. 38% national NFP vs. 45-50% NFP objective). Additionally, Wyoming NFP did not quite meet the objective for life course development in toddlerhood (16% vs. 17% national NFP vs. 18-20% NFP objective.)
- For those who could have completed the program by September 30, 2006, the largest proportion of dropouts occurred during the infancy phase.

OUTCOMES FOR WYOMING NFP GRADUATES

- There was a statistically significant reduction (28%) in the number of women smoking during pregnancy (15% national NFP). Among those who reported smoking at least 5 cigarettes a day at intake and continued to smoke during pregnancy, there was a significant reduction in the number of cigarettes smoked (-4.3 Wyoming NFP vs. -2.6 national NFP graduates).
- The overall prematurity rate for Wyoming NFP graduates' infants was 13.2% (9.7% for national NFP graduates); prematurity rates for the predominant ethnic groups were: 14% for non-Hispanic Whites (9.4% for national NFP graduates) and 6.3% for Hispanics (8.6% for national NFP graduates).
- The overall low birth weight rate for Wyoming NFP graduates' infants was 11.3% (8.5% of national NFP graduates); low birth weight rates for the predominant ethnic groups were: 11.5% for non-Hispanic Whites (7.9% for national NFP graduates) and 3.1% for Hispanics (7.5% for national NFP graduates).
- Sixty percent (60%) of toddlers scored above the 50th percentile on language production. Eight percent (8%) scored below the 10th percentile, compared to 10% of NFP toddlers nationwide. Scoring below the 10th percentile may indicate a delay in language skills.
- Eighty-seven percent (87%) of Wyoming NFP graduates initiated breastfeeding (69% national NFP graduates), and 13% continued to breastfeed at 12 months infant age (16% national NFP graduates).
- Wyoming NFP graduates' rates for completion of recommended infants' (age 12 months) immunizations were 99% - 100% with the exception of HIB (95%). The immunization rates for toddlers, age 24 months, were 93% - 99% with the exception of the DTP/DTaP (83%). DTP/DTaP and HIB rates may be underreported because of different dosage patterns among pharmaceutical products.
- Thirteen percent (13%) of participants had a subsequent pregnancy by 12 months after the birth of their first child (12% national NFP participants), while 36% experienced a subsequent pregnancy by 24 months postpartum (31% national NFP participants).
- By program completion, 39% of the women who entered the program without a high school diploma/GED had received their diploma/GED and 8% were continuing their education beyond high school; an additional 21% were still working toward their diploma/GED.
- Of those who were 18 or older at intake, workforce participation was 52% at program completion. For those 17 years or younger, 56% at program completion.
- Wyoming NFP graduates, as well as national NFP graduates, worked an average of 7 months in the first year after the birth of their child. During the second year postpartum Wyoming NFP graduates worked an average of 7 months (vs. 8 months national NFP).

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

PARTICIPANT CHARACTERISTICS

- There were several statistically significant socio-demographic differences between cohorts at intake:
 - Cohort 2 participants were older than Cohort 1 participants (19 vs. 18)

- Cohort 2 participants had completed more years in school (12 vs. 11 for Cohort 1)
- More Cohort 1 participants were unemployed (62% vs. 54% for Cohort 2)
- Smaller percentages of Cohort 2 participants lived with their mother or with others than did Cohort 1; larger percentages of Cohort 2 participants lived alone or with their husband/boyfriend
- More Cohort 2 participants used Medicaid (78% vs. 71% for Cohort 1)
- Cohorts were similar on other demographic characteristics including ethnic composition and income.
- More Cohort 2 participants had a mental health score of greater than 3.0 at intake than Cohort 1 participants.

PROGRAM IMPLEMENTATION

- There is a statistically significant difference ($p < .05$) between Cohort 1 and Cohort 2 enrollment. Enrollment by 16 weeks of pregnancy was 31% for Cohort 1 and 40% for Cohort 2; the total rate of enrollment by gestational week 28 was 86% for Cohort 1 and 93% for Cohort 2.
- Attrition was higher for Cohort 2 during the pregnancy phase (14.4% vs. 11.6% for Cohort 1) and lower during the infancy (40.1% vs. 44.6% for Cohort 1) and toddler phases (15.5% vs. 18.5% for Cohort 1).
- The average number of completed visits was higher for all phases for Cohort 2 (8.0, 10.6, 4.6) compared to Cohort 1 (7.3, 8.9, 3.2). The length of time spent on a visit was similar for both cohorts over the three phases.
- All guidelines for home visit content were met by both cohorts with the exception of maternal role during the infancy phase for Cohort 1 (40% vs. 45-50% NFP guidelines) and Life Course Development for both cohorts during toddlerhood (17% Cohort 1 vs. 14% Cohort 2 vs. 18-20% NFP guidelines). It is a notable strength that Wyoming NFP Cohort 2 met the guidelines for maternal role during infancy (47% vs. 45-50% NFP guidelines).

PARTICIPANT OUTCOMES

- Both cohorts showed statistically significant reductions in the number of smokers during pregnancy (-24% for Cohort 1; -26% for Cohort 2). Both cohorts had significant reductions in the numbers of cigarettes smoked by those who continued to smoke during pregnancy (-2.8 Cohort 1 vs. -3.4 Cohort 2).
- Over time, premature (8.5% Cohort 1 vs. 10.0% Cohort 2) and low birth weight (5.9% Cohort 1 vs. 8.3% Cohort 2) births increased. This trend was especially true for Hispanics whose prematurity rate rose from 8.6% for Cohort 1 to 10.8% for Cohort 2 and whose low birth weight rose from 5.6% for Cohort 1 to 8.8% for Cohort 2.
- Immunization rates were similar for the cohorts at 12 months.
- All immunization rates for both cohorts were above 90% by 24 months of child age with the exception of DTP/DTaP for Cohort 2 (78%) which may be underreported because of different dosage patterns among pharmaceutical products.
- Subsequent pregnancy rates were the same (14%) for the cohorts at 12 months postpartum, and showed a decrease over time at 24 months postpartum (41% Cohort 1, 31% Cohort 2).
- Cohort 2 showed an increase in the percentage of mothers working from intake to 24 months postpartum for both participants 18 years or older at intake and those 17 years and younger at intake.
- The average number of months worked in the first and second years postpartum was 7 months for both Cohort 1 and Cohort 2.

EVALUATION REPORT FOR
WYOMING NFP



NFP GRADUATES AND TRENDS IN
PROGRAM IMPLEMENTATION

REPORT TIME SPAN:
PROGRAM INITIATION (JULY 1996) THROUGH SEPTEMBER 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 2010⁷ 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 WYOMING 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 Wyoming 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*

	Wyoming NFP Graduates	Wyoming NFP Non-completers	National NFP Graduates
Number Enrolled[†]	241	688	15,874
Demographic Characteristics			
Mother age at enrollment (median)*	19	18	19
Years of education at intake (median)*	12	11	12
Completed high school*	50%	39%	51%
Unmarried	79%	83%	76%
First-time mothers	99%	97%	98%
Race/Ethnicity*			
Hispanic	14%	14%	21%
Native American	3%	9%	6%
African American/black	0%	1%	16%
Non-Hispanic white	79%	72%	52%
Multiracial/other	4%	4%	4%
Asian	0%	0%	2%
Economic Factors			
Household income at intake (median)	\$13,500	\$13,500	\$13,500
Unemployed	58%	63%	61%
Use of Government Assistance			
WIC	64%	66%	76%
Medicaid	71%	76%	61%
Food Stamps*	8%	14%	14%
TANF	7%	11%	5%
Household Size			
Household size (median)*	3	3	3
Household Composition*			
Lives alone	7%	5%	6%
Lives with husband/boyfriend	45%	37%	40%
Lives with mother	41%	45%	40%
Lives with others	7%	14%	13%

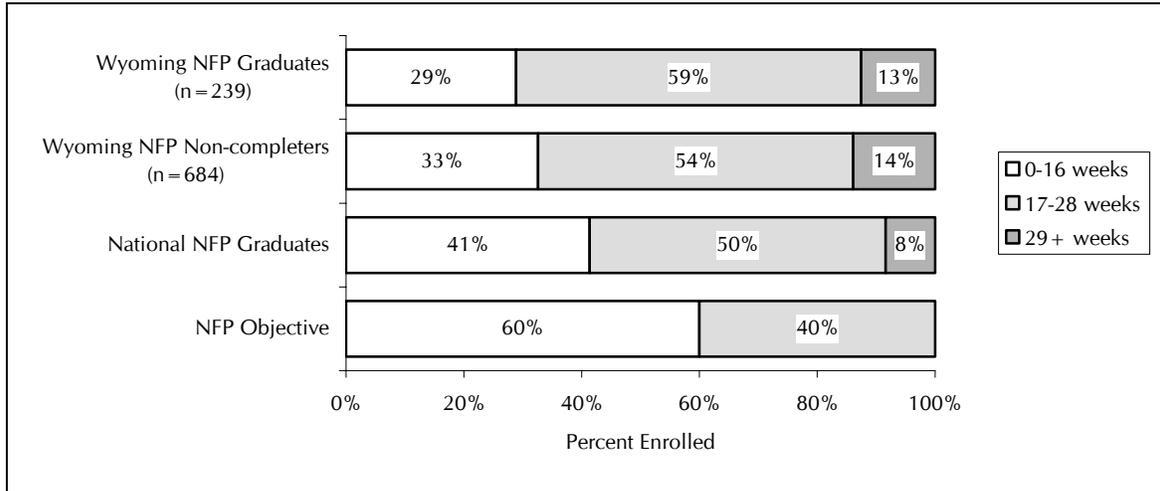
[†] 22 participants (2%) were categorized as neither graduate nor non-completer because whereas the client's child had reached 23 to 24 months of age and home visits were completed between 18 and 24 months of age, the data forms for outcomes at 21 and 24 months were missing.

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

MATERNAL HEALTH CHARACTERISTICS

Figure 1 presents information on when Wyoming 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.

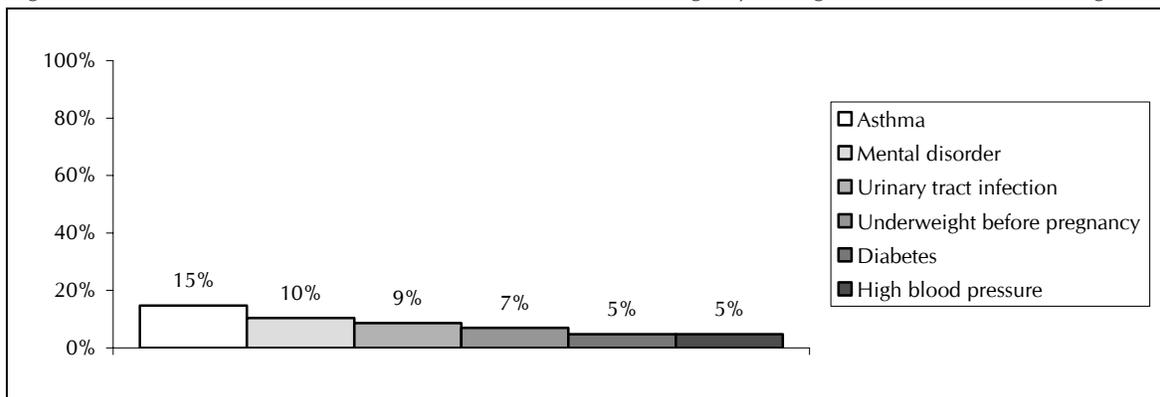
Figure 1. Gestational Age at Enrollment



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 Wyoming 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 (6%), and mental disorder (5%).

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



N = 231

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*

	Wyoming NFP Graduates (N = 228)	Wyoming NFP Non-completers (N = 643)	National NFP Graduates
Percent with mental health score greater than 3.0	81%	81%	82%
Percent with mastery score greater than 3.0	54%	53%	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*

	Wyoming NFP Graduates	Wyoming NFP Non-completers	National NFP Graduates
Current partner is biological father	94% (n = 183)	89% (n = 519)	91%
Average money from biological father per month	\$514 (n = 125)	\$360 (n = 350)	\$239
Contact with biological father	(n = 233)	(n = 623)	
Not at All	17%	16%	12%
Less than once a week	8%	10%	6%
At least once a week	8%	9%	10%
Daily	67%	65%	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 Wyoming NFP by September 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*

	Wyoming NFP		National NFP	
	Percent	Cumulative %	Percent	Cumulative %
Pregnancy	17%	17%	26%	26%
Infancy				
Birth to six months	37%	54%	30%	55%
6 to 12 months	25%	79%	21%	77%
Toddlerhood				
12 to 18 months	17%	96%	17%	94%
18 to 24 months	4%	100%	6%	100%

Of 951 participants who could have graduated from the program by September 30, 2006, 688 (72%) dropped out before completion. There were 22 participants (2%) 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. 241 participants (25%) 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

	Wyoming NFP		National NFP Graduates		NFP Objectives
	Number	Average	Number	Average	
Pregnancy					
Pregnancy Completed	241	-	15,874	-	-
Completed Visits	2,143	8.9	151,097	9.5	-
Expected Visits	2,608	-	190,345	-	-
Percentage of Expected Visits Completed	-	85%	-	85%	80%
Attempted Visits [†]	200	0.8	15,024	0.9	-
Average Visit Length (Minutes)	-	72.9	-	75.8	60
Average Total Contact Time (Minutes)	-	648	-	719	-
Infancy					
Infancy Completed	241	-	15,874	-	-
Completed Visits	4,593	19.1	277,792	17.5	-
Expected Visits	6,989	-	456,605	-	-
Percentage of Expected Visits Completed	-	66%	-	61%	65%
Attempted Visits [†]	568	2.4	38,614	2.4	-
Average Visit Length (Minutes)	-	71.4	-	73.3	60
Average Total Contact Time (Minutes)	-	1,369	-	1,281	-
Toddlerhood					
Toddlerhood Completed	236	-	15,653	-	-
Completed Visits	3,169	13.4	183,218	11.7	-
Expected Visits	4,956	-	325,800	-	-
Percentage of Expected Visits Completed	-	64%	-	56%	60%
Attempted Visits [†]	537	2.3	32,780	2.1	-
Average Visit Length (Minutes)	-	69.6	-	71.1	60
Average Total Contact Time (Minutes)	-	943	-	838	-

[†]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 Wyoming NFP graduates and national NFP graduates, and provides the NFP Objectives.

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

	Wyoming NFP Graduates	National NFP Graduates	NFP Objectives
Pregnancy			
Personal Health	36%	37%	35-40%
Environmental Health	9%	11%	5-7%
Life-course Development	12%	13%	10-15%
Maternal Role	29%	24%	23-25%
Friends & Family	14%	15%	10-15%
Infancy			
Personal Health	19%	20%	14-20%
Environmental Health	10%	13%	7-10%
Life-course Development	14%	15%	10-15%
Maternal Role	44%	38%	45-50%
Friends & Family	13%	15%	10-15%
Toddlerhood			
Personal Health	18%	16%	10-15%
Environmental Health	10%	13%	7-10%
Life-course Development	16%	17%	18-20%
Maternal Role	43%	39%	40-45%
Friends & Family	14%	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 Wyoming NFP graduates and NFP graduates nationwide.

Table 7. Telephone Contacts with Families

	Wyoming NFP Graduates			National NFP Graduates		
	Pregnancy	Infancy	Toddlerhood	Pregnancy	Infancy	Toddlerhood
Number of participants with phone contacts	73	110	109	3,944	5,947	4,073
Total number of phone calls	160	386	321	10,836	24,744	15,322
Mean number of calls per participant	2	4	3	3	4	4
Range of number of calls per participant	1-7	1-26	1-20	1-78	1-159	1-58
Average time per call in minutes	18	19	18	13	13	13
Time devoted to program domains						
Personal health	48%	23%	20%	57%	29%	23%
Environmental health	6%	5%	6%	7%	8%	9%
Life-course development	8%	16%	23%	12%	16%	24%
Maternal role	24%	35%	34%	16%	40%	35%
Friends & family	7%	11%	12%	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.[^]

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 Wyoming 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 16% 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 Wyoming NFP Graduates: Program Intake and 36 Weeks of Pregnancy, Program Intake and One Year of Infancy*

Pregnancy	N	36 Weeks of		Percent Changed
		Intake	Pregnancy	
Cigarette smoker	178	43	31	-28% *
Smoked 5+ cigarettes last 24 hrs.	178	22	12	-45% *
Marijuana use	177	0	0	-
Alcohol use	177	3	0	-100%
Cocaine use	177	0	0	-
Other drug use	177	1	0	-100%

Infancy	N	One Year of		Percent Changed
		Intake	Infancy	
Cigarette smoker	165	39	49	26% *
Smoked 5+ cigarettes last 24 hrs.	165	25	35	40% *
Marijuana use	164	0	4	- *
Alcohol use	165	3	29	867% *
Cocaine use	165	0	0	-
Other drug use	165	1	0	-100%

*Statistically significant change at $p < .05$

Relative percent change = (percent after-percent before)/percent before

[^] It should be noted that data collected in Wyoming 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 Wyoming 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
Wyoming NFP Graduates (n = 22)	-4.3 *
National NFP Graduates	-2.6 *
NFP Objective	-3.5

*Statistically significant change at $p < .05$

INFANT HEALTH

BIRTH OUTCOMES

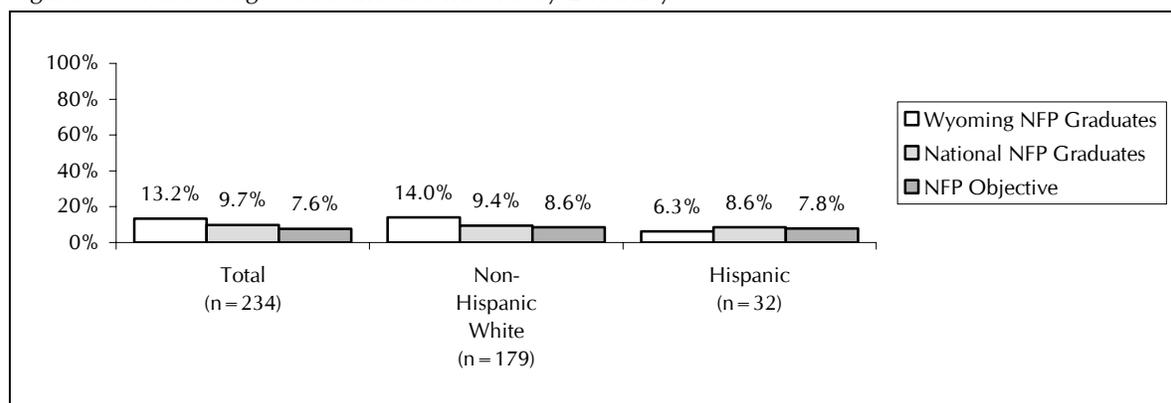
Gestational age and weight at birth are measures of infant health, with birth before 37 weeks gestation considered premature, and weight less than 2500 grams considered low birth weight.

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 Wyoming 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 Objectives⁷ 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 Wyoming NFP, along with the respective intermediate NFP Objectives.

Figure 3. *Percentage of Premature Infants by Ethnicity*

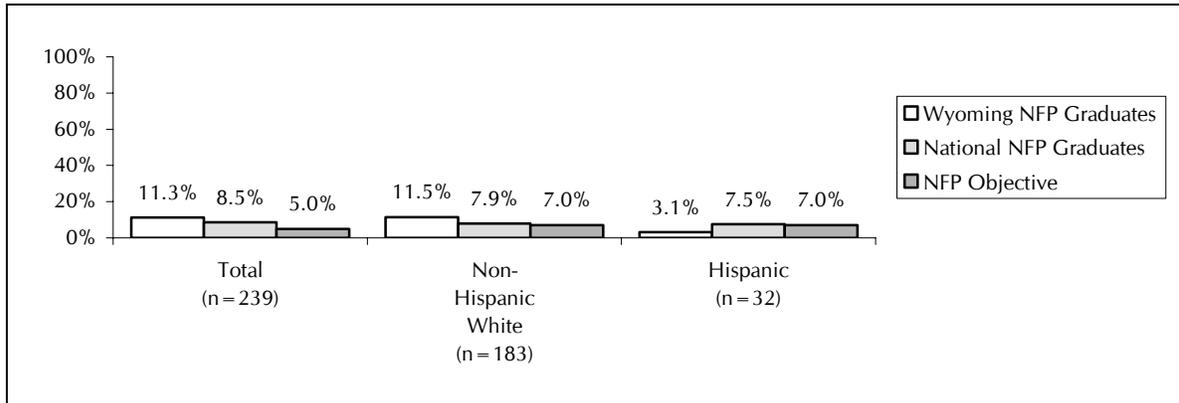


Sample sizes presented are for Wyoming NFP

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 Wyoming 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 Wyoming NFP.

Figure 4. Percentage of Low Birth Weight Infants by Ethnicity

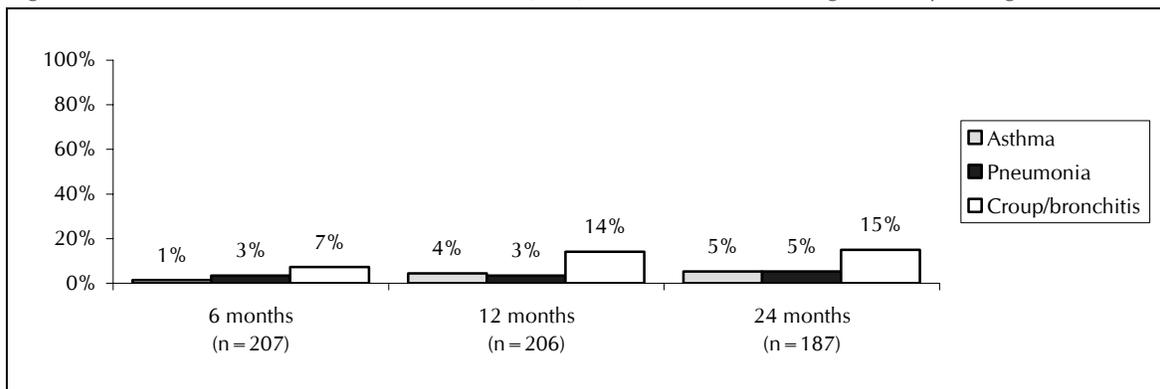


Sample sizes presented are for Wyoming NFP

ILLNESSES

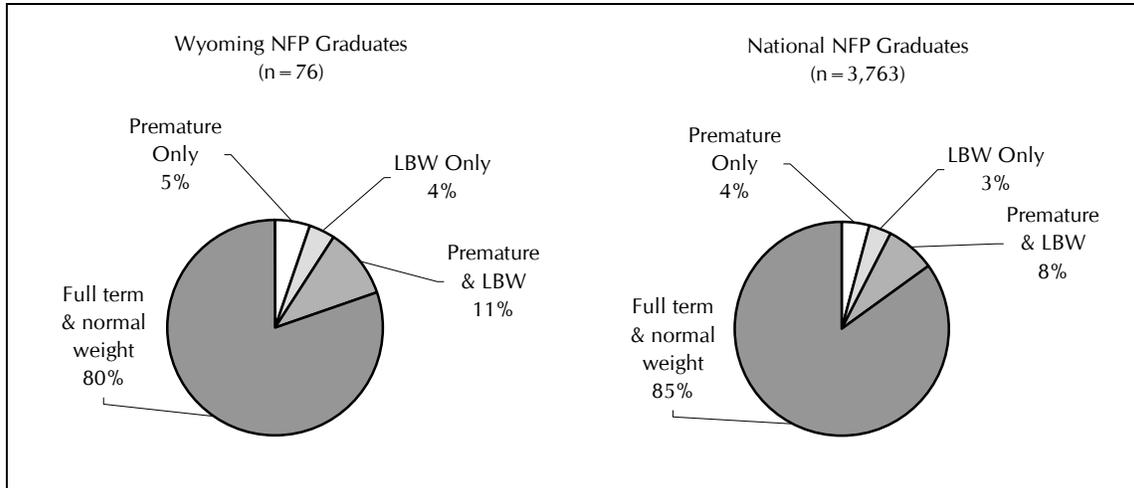
Wyoming NFP graduates were asked about their children’s illnesses at 6, 12, and 24 months of age. The most frequently reported illnesses are provided in Figure 5 below. The most commonly reported infant illnesses among national NFP graduates are: croup/bronchitis (6-12%), asthma (4-10%), pneumonia (2-7%),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

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

		Wyoming NFP	
Method [†]		Graduates	National NFP Graduates
At 6 months (N = 207)	Denver II	12%	21%
	Ages & Stages questionnaire	54%	47%
	Nurse observation	63%	61%
	Physician or health care provider	11%	4%
At 12 months (N = 206)	Denver II	12%	22%
	Ages & Stages questionnaire	65%	52%
	Nurse observation	64%	64%
	Physician or health care provider	17%	4%
At 24 months (N = 187)	Denver II	14%	22%
	Ages & Stages questionnaire	72%	54%
	Nurse observation	76%	68%
	Physician or health care provider	20%	6%

[†]More than one category could be chosen

Sample sizes presented are for Wyoming NFP

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

	Wyoming NFP Graduates			National NFP Graduates		
	6 Months	12 Months	24 Months	6 Months	12 Months	24 Months
N	207	206	187	7,255	7,396	7,213
Percentage of children with delay ^a	2%	4%	9%	2%	3%	8%
Types of delay^b						
Gross Motor	1%	3%	2%	2%	2%	1%
Fine Motor	1%	2%	2%	1%	1%	2%
Mental/Cognitive	1%	2%	2%	†	†	1%
Speech/Language	1%	3%	9%	†	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%

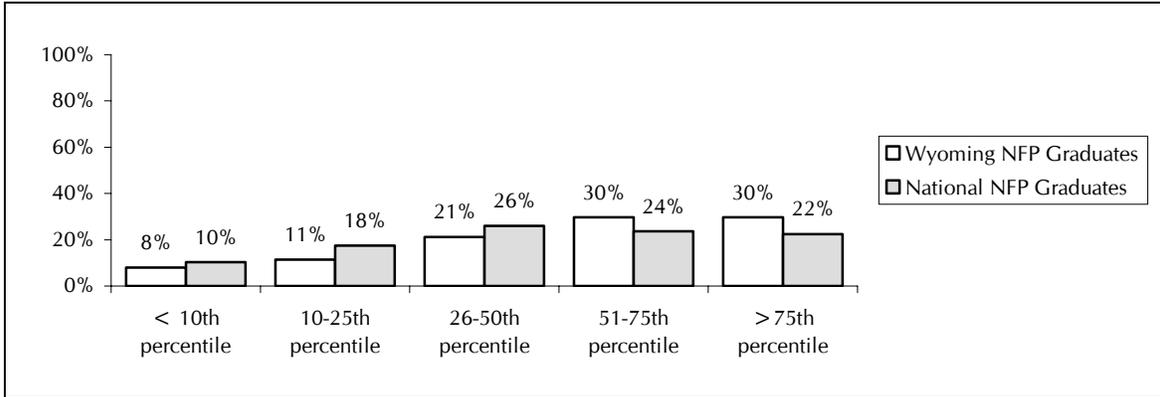
LANGUAGE DEVELOPMENT

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 Wyoming 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

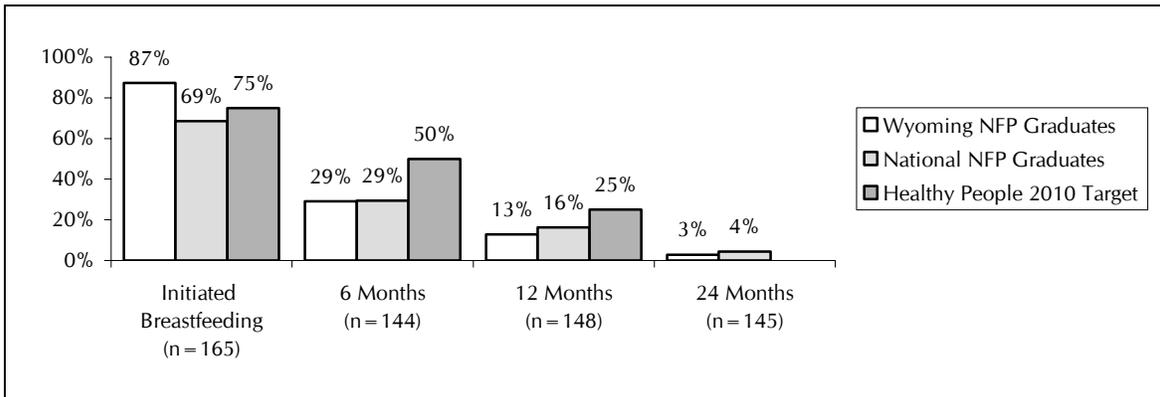


N = 175 for Wyoming NFP

BREASTFEEDING

Figure 8 illustrates breastfeeding rates reported at 6, 12, and 24 months of infant age for Wyoming 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 Wyoming 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 Wyoming NFP graduates 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

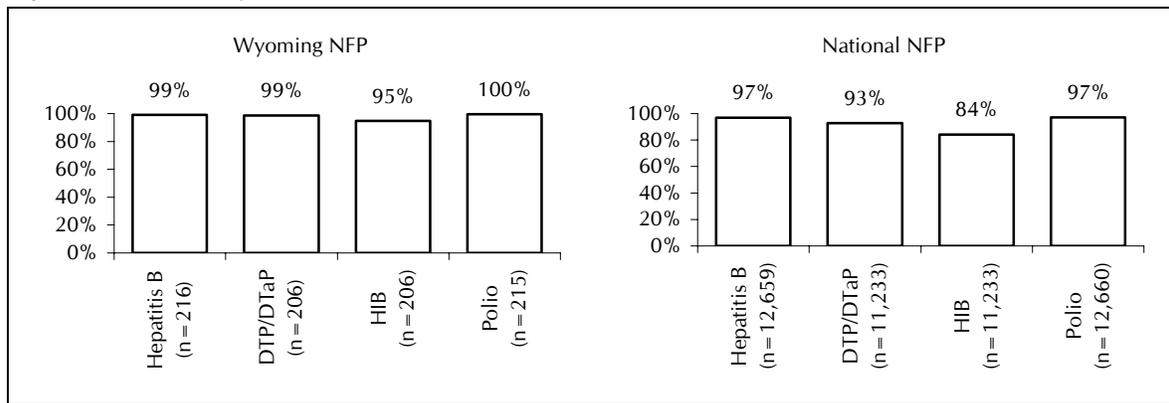
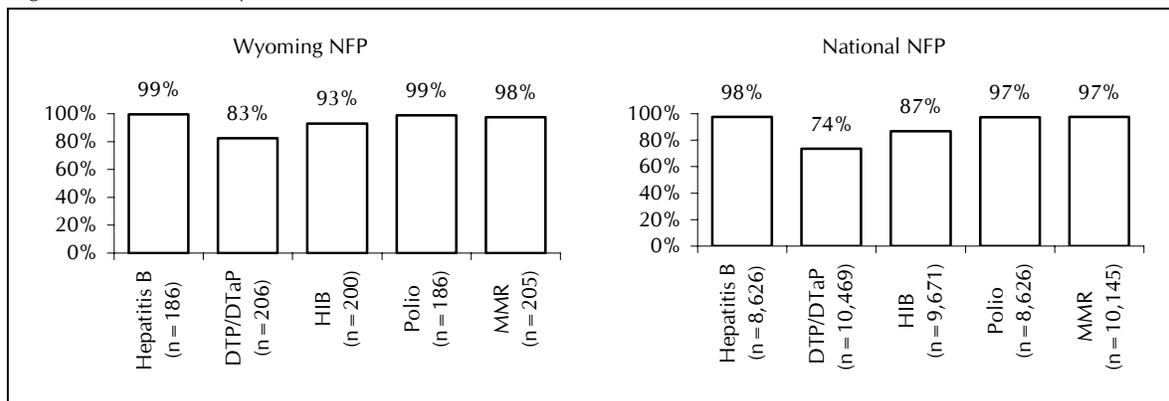


Figure 10. Summary of Immunization Rates at 24 Months



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 Wyoming 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 Wyoming NFP Graduates

Emergency Department Visits		Hospitalizations	
6 Months (n = 206)		6 Months (n = 206)	
0 visits	56%	0 admissions	83%
1 visit	28%	1 admission	16%
2 visits	9%	2 admissions	2%
3+ visits	7%	3+ admissions	0%
Reasons (n = 144)		Reasons (n = 40)	
Illness	94%	Illness	98%
Injury	5%	Injury	0%
Ingestion	1%	Ingestion	3%
12 Months (n = 206)		12 Months (n = 205)	
0 visits	38%	0 admissions	77%
1 visit	31%	1 admission	18%
2 visits	15%	2 admissions	4%
3+ visits	17%	3+ admissions	2%
Reasons (n = 253)		Reasons (n = 64)	
Illness	89%	Illness	97%
Injury	10%	Injury	3%
Ingestion	1%	Ingestion	0%
24 Months (n = 186)		24 Months (n = 185)	
0 visits	29%	0 admissions	76%
1 visit	26%	1 admission	16%
2 visits	18%	2 admissions	6%
3+ visits	27%	3+ admissions	2%
Reasons (n = 331)		Reasons (n = 62)	
Illness	84%	Illness	97%
Injury	15%	Injury	3%
Ingestion	2%	Ingestion	0%

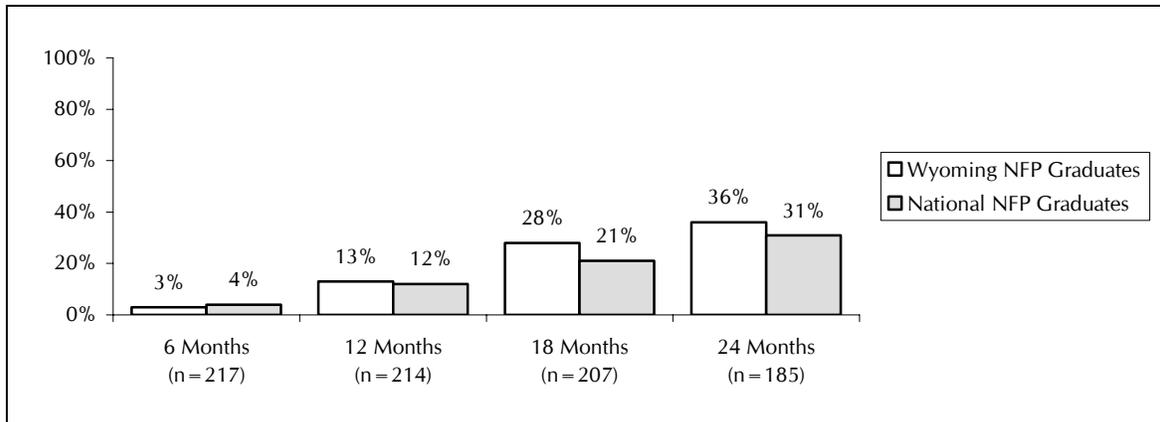
MATERNAL LIFE COURSE DEVELOPMENT

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 Wyoming 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 Wyoming NFP Graduates*



Sample sizes presented are for Wyoming 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 Wyoming NFP Graduates with No High School Diploma or GED at Intake

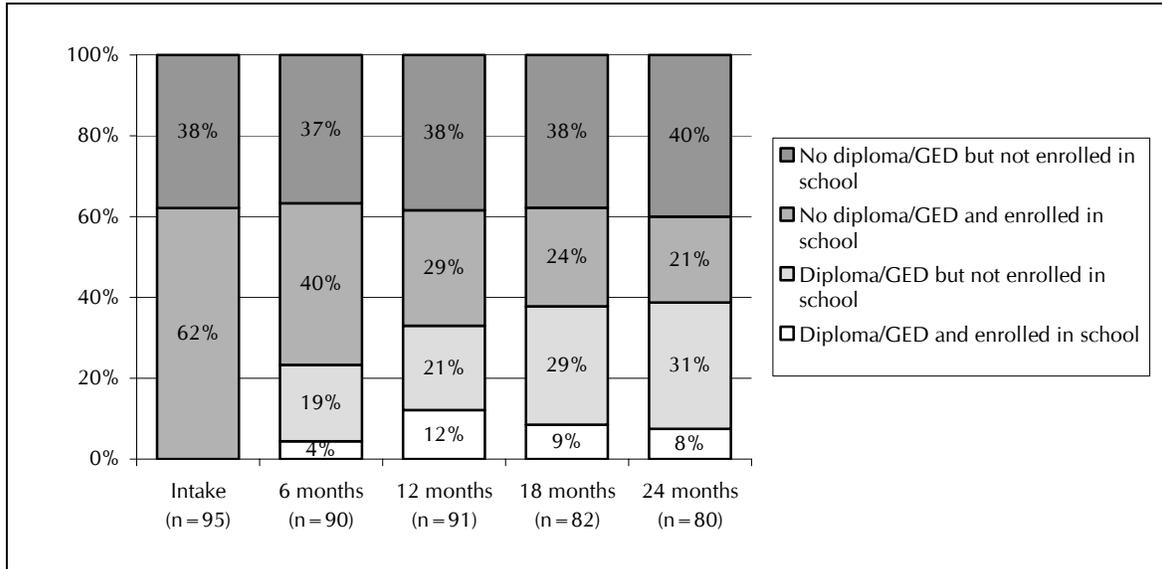
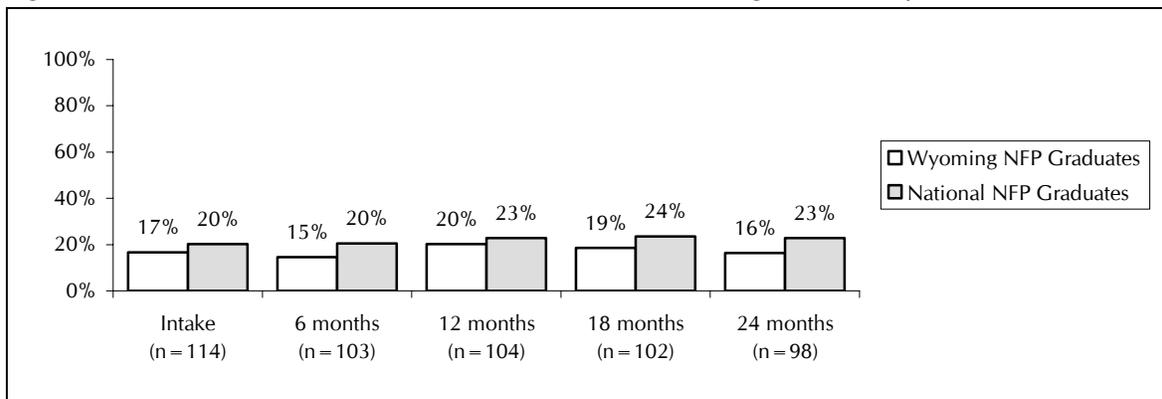


Figure 13 tracks enrollment in schooling beyond high school for those NFP graduates who entered the program *with* a high school diploma or GED.

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

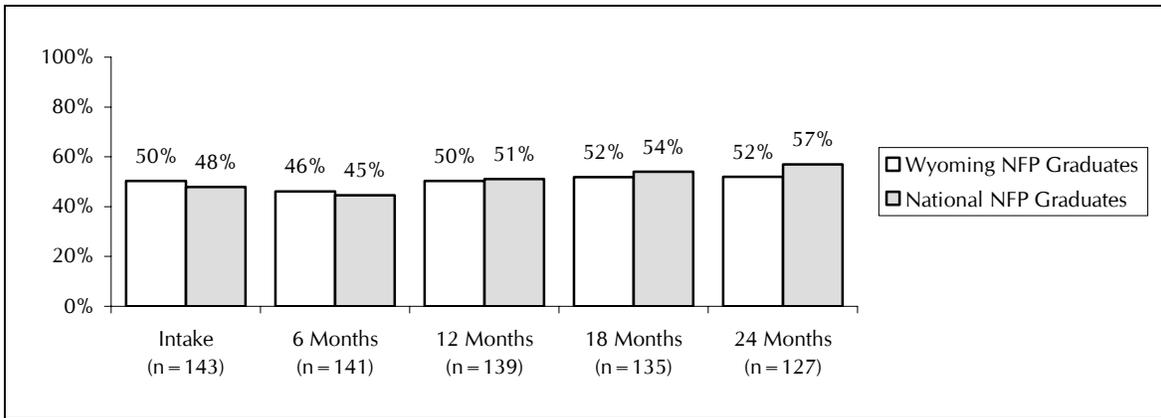


Sample sizes presented are for Wyoming NFP

WORKFORCE PARTICIPATION

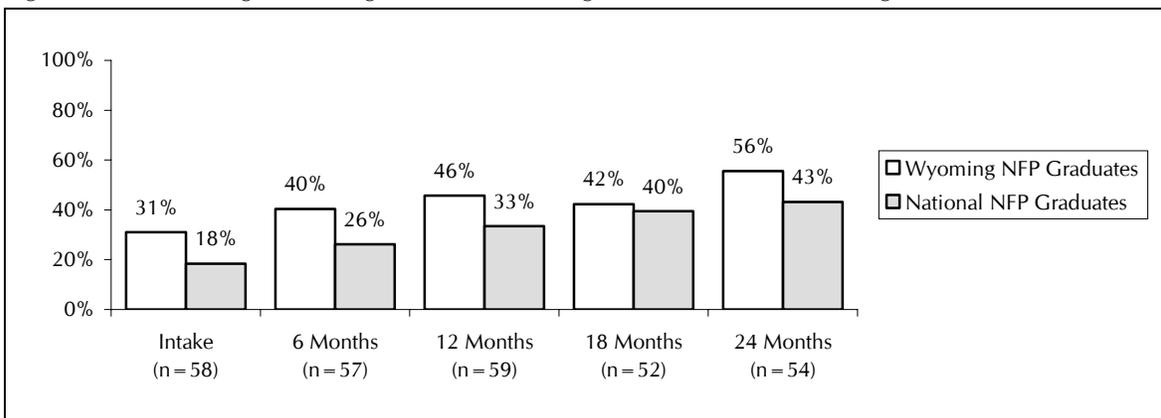
Participation in the workforce is another area that is tracked as an indicator of the mother’s life course development. The percentage participating in the workforce at different time points and the amount of time spent in the workforce are considered. Figure 14 and Figure 15 note the percentage of participants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

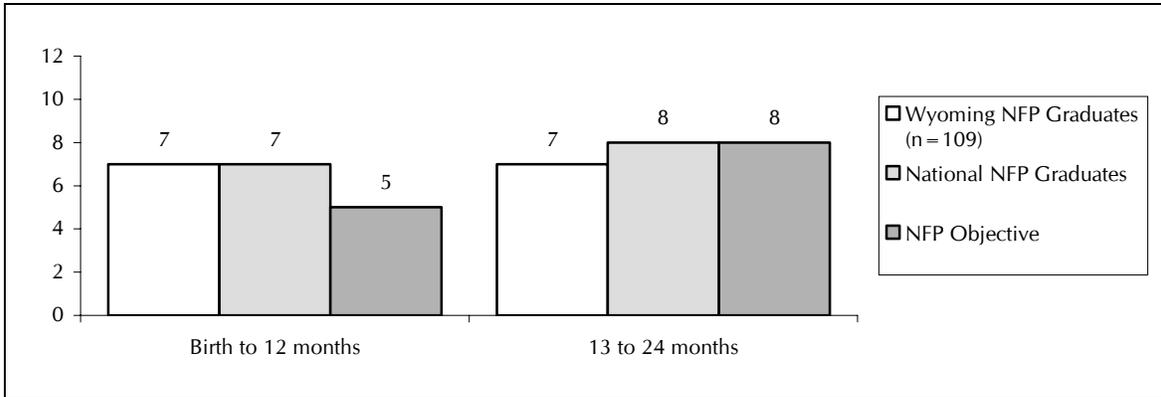
Figure 15. Percentage Working over Time among those 17 Years or Younger at Intake



Sample sizes presented are for Wyoming 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 Wyoming NFP graduates worked is noted in Figure 16, along with the national NFP rates and NFP Objectives.

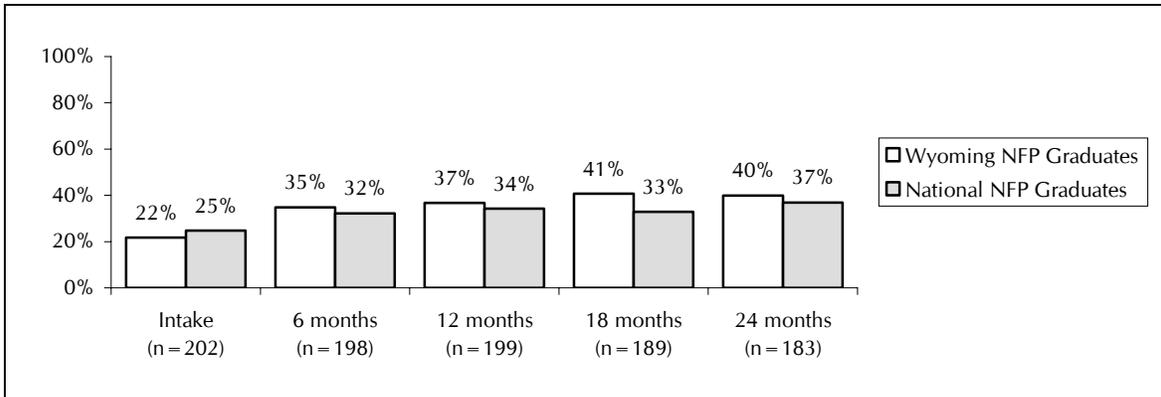
Figure 16. Number of Months Worked



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

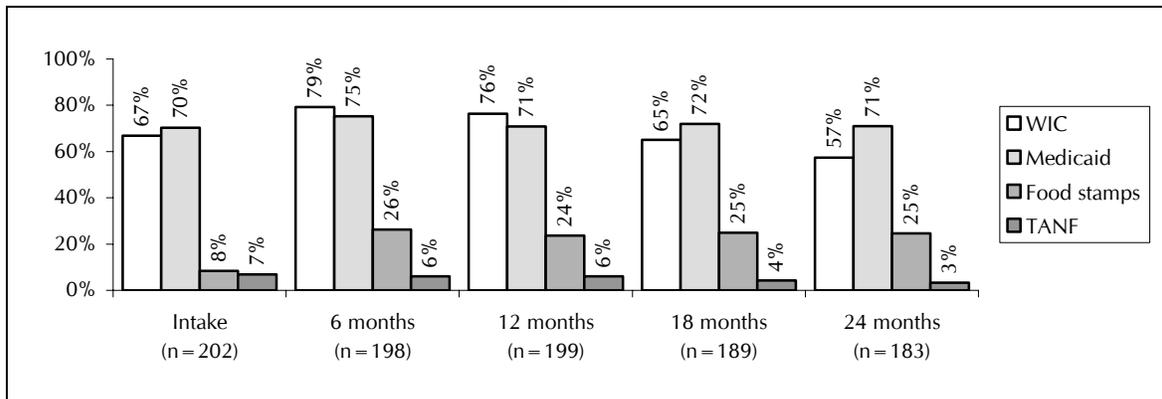


Sample sizes presented are for Wyoming NFP

USE OF PUBLIC ASSISTANCE PROGRAMS

Wyoming 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 is presented in Figure 18 below.

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



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

COHORT COMPARISONS

Wyoming 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: July 1, 1999 and June 30, 2002) and participants who entered the program during the more recent phase (Cohort 2: July 1, 2002 and September 30, 2006). 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 Participants [‡]	National NFP Participants
Number Enrolled	460	1,108	62,348
Demographic Characteristics			
Maternal age (median)*	18	19	19
Maternal education (median)*	11	12	11
Completed high school*	40%	55%	48%
Unmarried	80%	78%	81%
First-time mothers	97%	98%	98%
Race/Ethnicity			
Hispanic	11%	13%	21%
Native American	7%	6%	5%
African American/black	1%	1%	19%
Non-Hispanic white	76%	74%	48%
Multiracial/other	4%	5%	5%
Asian	0%	1%	1%
Economic Factors			
Annual household income (median)	\$13,500	\$13,500	\$13,500
Unemployed*	62%	54%	65%
Use of Government Assistance			
WIC	68%	72%	75%
Medicaid*	71%	78%	65%
Food Stamps	14%	13%	17%
TANF	9%	13%	5%
Household Size			
Number in household (median)	3	3	3
Household Composition*			
Lives alone	5%	6%	6%
Lives with husband/boyfriend	41%	48%	38%
Lives with mother	41%	36%	40%
Lives with others	13%	10%	16%

[†] Cohort 1 participants entered the program between July 1, 1999 and June 30, 2002

[‡] Cohort 2 participants entered the program between July 1, 2002 and September 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 = 427)	Cohort 2 (N = 1035)
Percent with mental health score greater than 3.0	80%	84% *
Percent with mastery score greater than 3.0	55%	51%

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

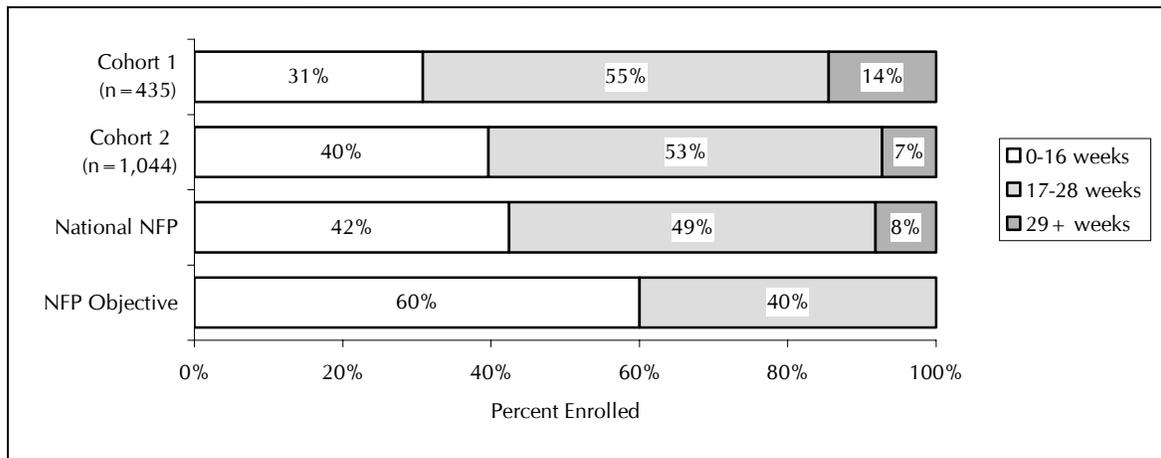
PROGRAM IMPLEMENTATION

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 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 = 441)	(n = 940)	
Declined further participation	3.9%	4.7%	-
Excessive missed appointments	0.5%	1.3%	-
Unable to locate	0.7%	1.8%	-
Moved out of service area	3.6%	4.0%	-
Miscarry/death	2.3%	1.7%	-
Maternal death	0.2%	0.0%	-
Child not in custody	0.0%	0.0%	-
Unable to provide services	0.5%	0.9%	-
No visits for > 180 days	0.0%	0.0%	-
Total	11.6%	14.4%	10%
Infancy	(n = 439)	(n = 661)	
Declined further participation	16.6%	15.1%	-
Excessive missed appointments	4.1%	5.4%	-
Unable to locate	4.3%	5.7%	-
Moved out of service area	13.0%	11.2%	-
Infant death	0.2%	0.2%	-
Maternal death	0.0%	0.0%	-
Child not in custody	3.2%	1.2%	-
Unable to provide services	3.2%	1.2%	-
No visits for > 180 days	0.0%	0.0%	-
Total	44.6%	40.1%	20%
Toddlerhood	(n = 437)	(n = 394)	
Declined further participation	3.7%	4.1%	-
Excessive missed appointments	3.0%	2.5%	-
Unable to locate	3.9%	4.6%	-
Moved out of service area	5.3%	3.0%	-
Infant death	0.2%	0.0%	-
Maternal death	0.0%	0.0%	-
Child not in custody	0.2%	0.3%	-
Unable to provide services	2.3%	1.0%	-
No visits for > 180 days	0.0%	0.0%	-
Total	18.5%	15.5%	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 Objective
	Number	Average	Number	Average	
Pregnancy					
Pregnancy Completed	441	-	940	-	-
Completed Visits	3,202	7.3	7,514	8.0	-
Expected Visits	5,350	-	11,292	-	-
Percentage of Expected Visits Completed	-	69%	-	70%	80%
Attempted Visits [†]	410	0.9	976	1.0	-
Average Visit Length (Minutes)	-	75.0	-	71.9	60
Average Total Contact Time (Minutes)	-	545	-	579	-
Infancy					
Infancy Completed	439	-	661	-	-
Completed Visits	3,924	8.9	7,000	10.6	-
Expected Visits	12,396	-	18,792	-	-
Percentage of Expected Visits Completed	-	32%	-	37%	65%
Attempted Visits [†]	838	1.9	1,067	1.6	-
Average Visit Length (Minutes)	-	69.9	-	69.8	60
Average Total Contact Time (Minutes)	-	632	-	755	-
Toddlerhood					
Toddlerhood Completed	437	-	394	-	-
Completed Visits	1,377	3.2	1,830	4.6	-
Expected Visits	8,910	-	8,127	-	-
Percentage of Expected Visits Completed	-	15%	-	23%	60%
Attempted Visits [†]	346	0.8	281	0.7	-
Average Visit Length (Minutes)	-	68.2	-	70.5	60
Average Total Contact Time (Minutes)	-	216	-	332	-

[†]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 = 439)	(N = 934)	
Personal Health	39%	36%	35-40%
Environmental Health	9%	9%	5-7%
Life-course Development	12%	12%	10-15%
Maternal Role	26%	28%	23-25%
Friends & Family	15%	14%	10-15%
<i>Time on planned material</i>	88%	89%	-
Infancy	(N = 349)	(N = 536)	
Personal Health	22%	20%	14-20%
Environmental Health	10%	8%	7-10%
Life-course Development	13%	12%	10-15%
Maternal Role	40%	47%	45-50%
Friends & Family	14%	13%	10-15%
<i>Time on planned material</i>	86%	86%	-
Toddlerhood	(N = 142)	(N = 161)	
Personal Health	18%	16%	10-15%
Environmental Health	11%	9%	7-10%
Life-course Development	17%	14%	18-20%
Maternal Role	40%	47%	40-45%
Friends & Family	15%	13%	10-15%
<i>Time on planned material</i>	82%	84%	-

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 = 237)			
Cigarette smoker	28%	21%	-24% *
Smoked 5+ cigarettes last 24 hrs.	12%	11%	-11%
Cohort 2 (N = 663)			
Cigarette smoker	23%	17%	-26% *
Smoked 5+ cigarettes last 24 hrs.	12%	9%	-22% *

*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=28)	-2.8 *
Cohort 2 (n=78)	-3.4 *
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

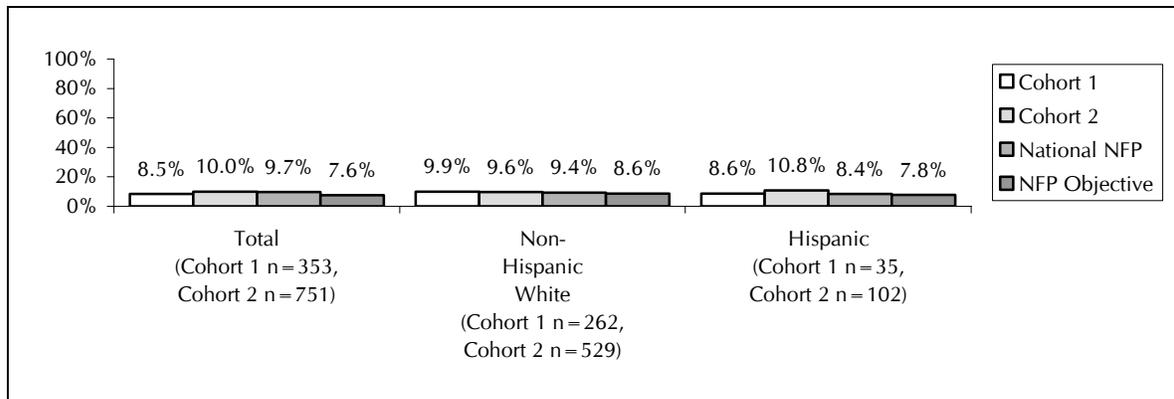
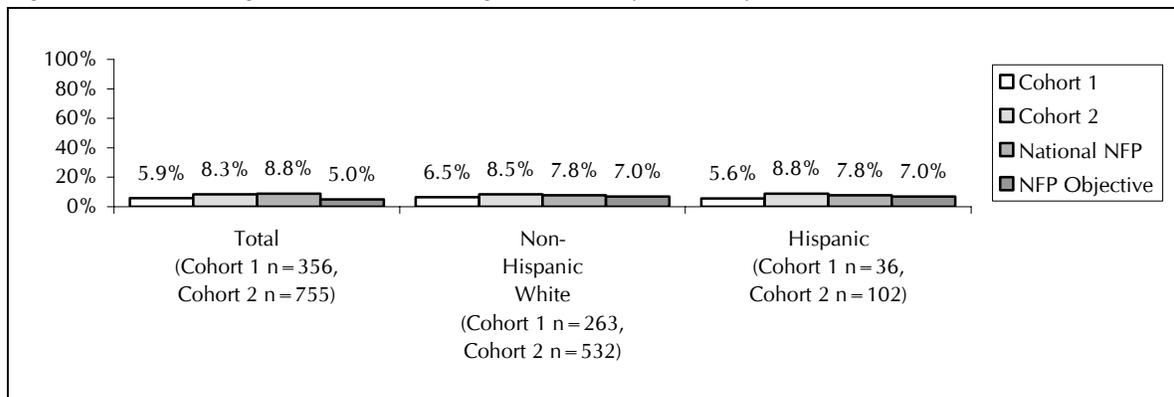


Figure 21. Percentage of Low Birth Weight Infants by Ethnicity and Cohort



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

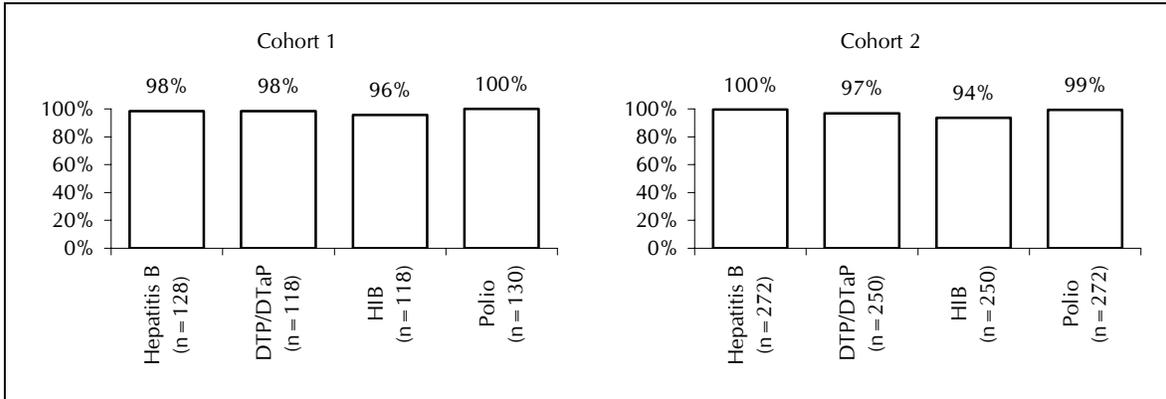
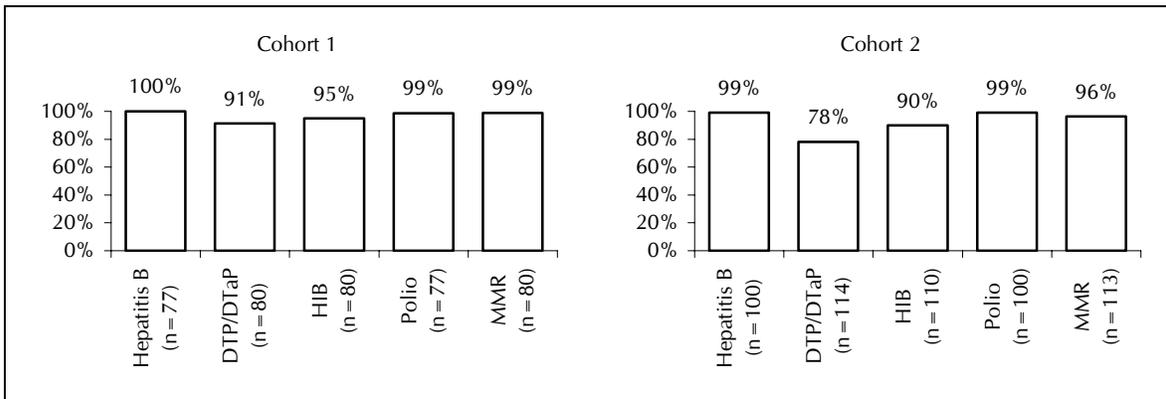


Figure 23. Summary of Immunization Rates at 24 Months of Toddler Age by Cohort



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 Wyoming 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

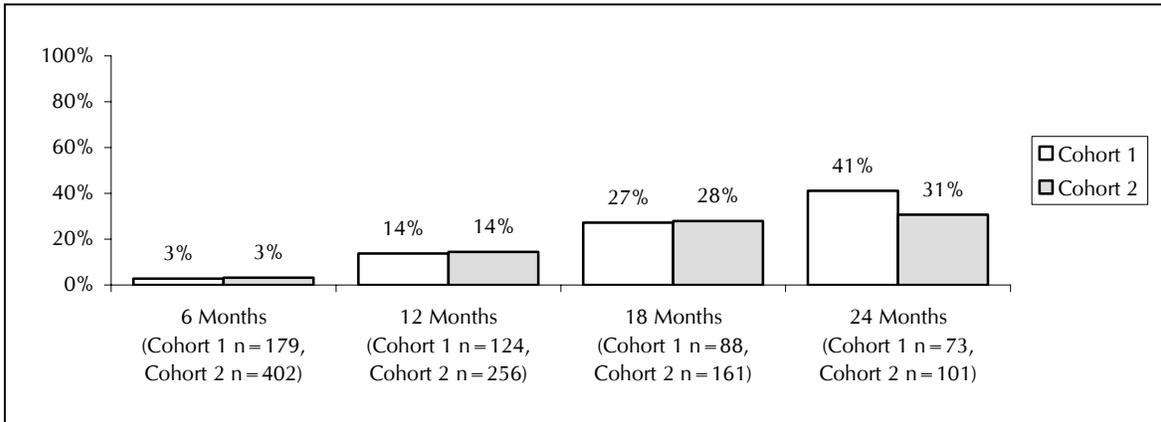


Figure 25 and Figure 26 show the percentages of participants working over time for both cohorts by age at intake.

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

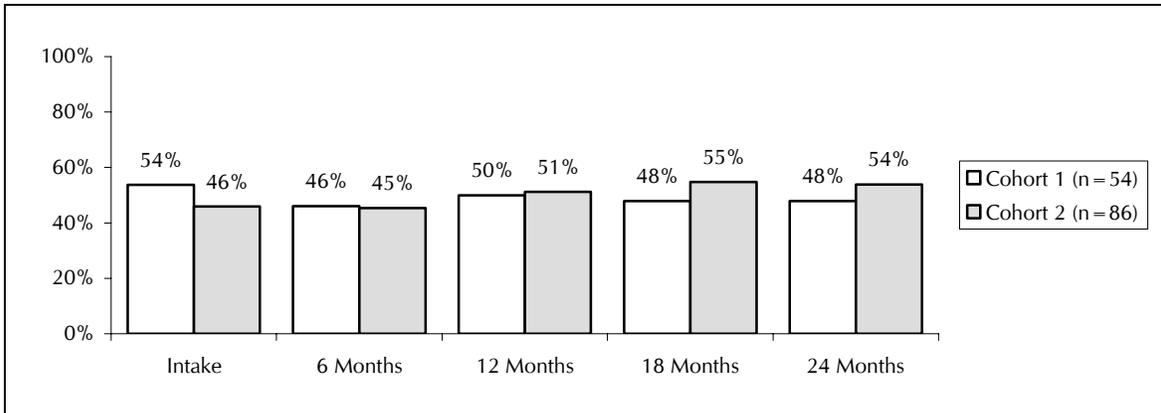
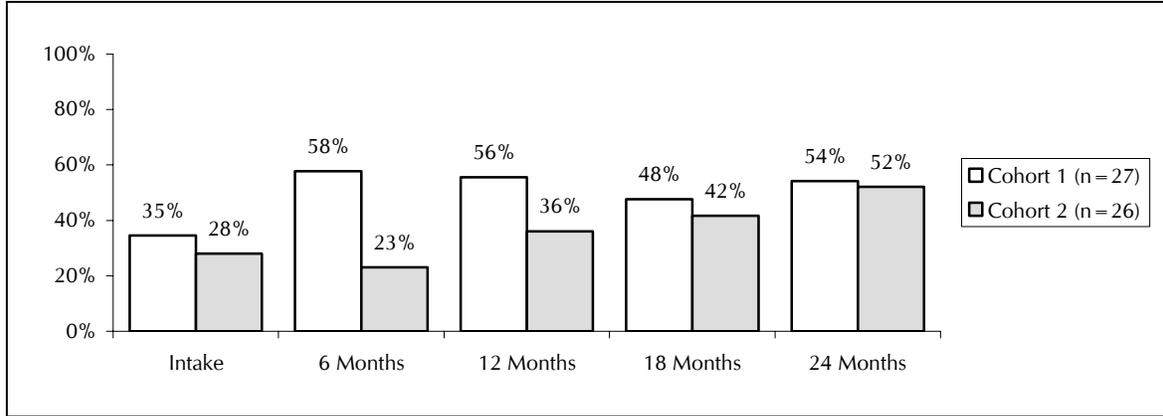
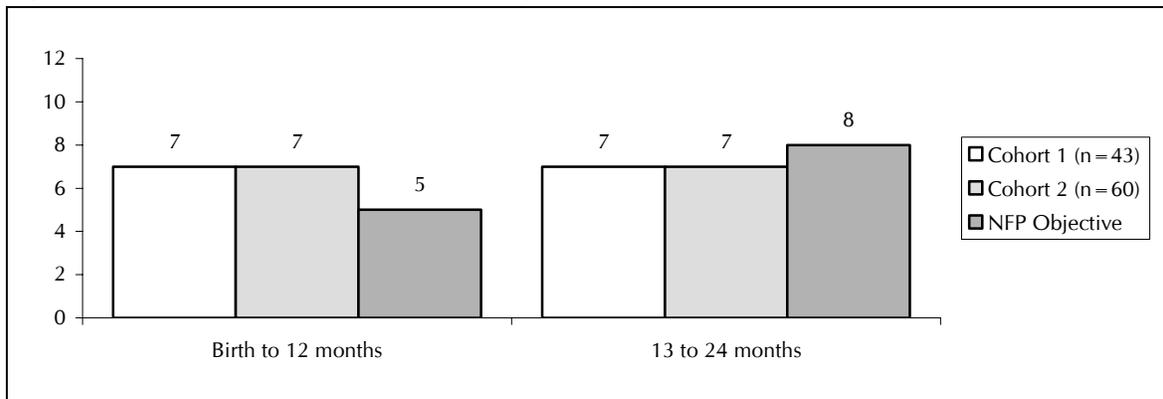


Figure 26. Percentage Working over Time among those 17 Years or Younger at Intake



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



CONTACTS

We encourage you to contact one of the following people if you have questions regarding this report:

Maurene Flory
NFP Reporting
303.327.4276
Maurene.Flory@nursefamilypartnership.org

Terri Cohen
NFP Reporting
303 327 4262
Terri.Cohen@nursefamilypartnership.org

Maggie Zhao
NFP Reporting
303 327 4251
Maggie.Zhao@nursefamilypartnership.org

Cindy Eby
Director – NFP Reporting
303 327 4248
Cindy.Eby@nursefamilypartnership.org

NFP National Service Office Main Number (toll free): 866 864 5226

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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:

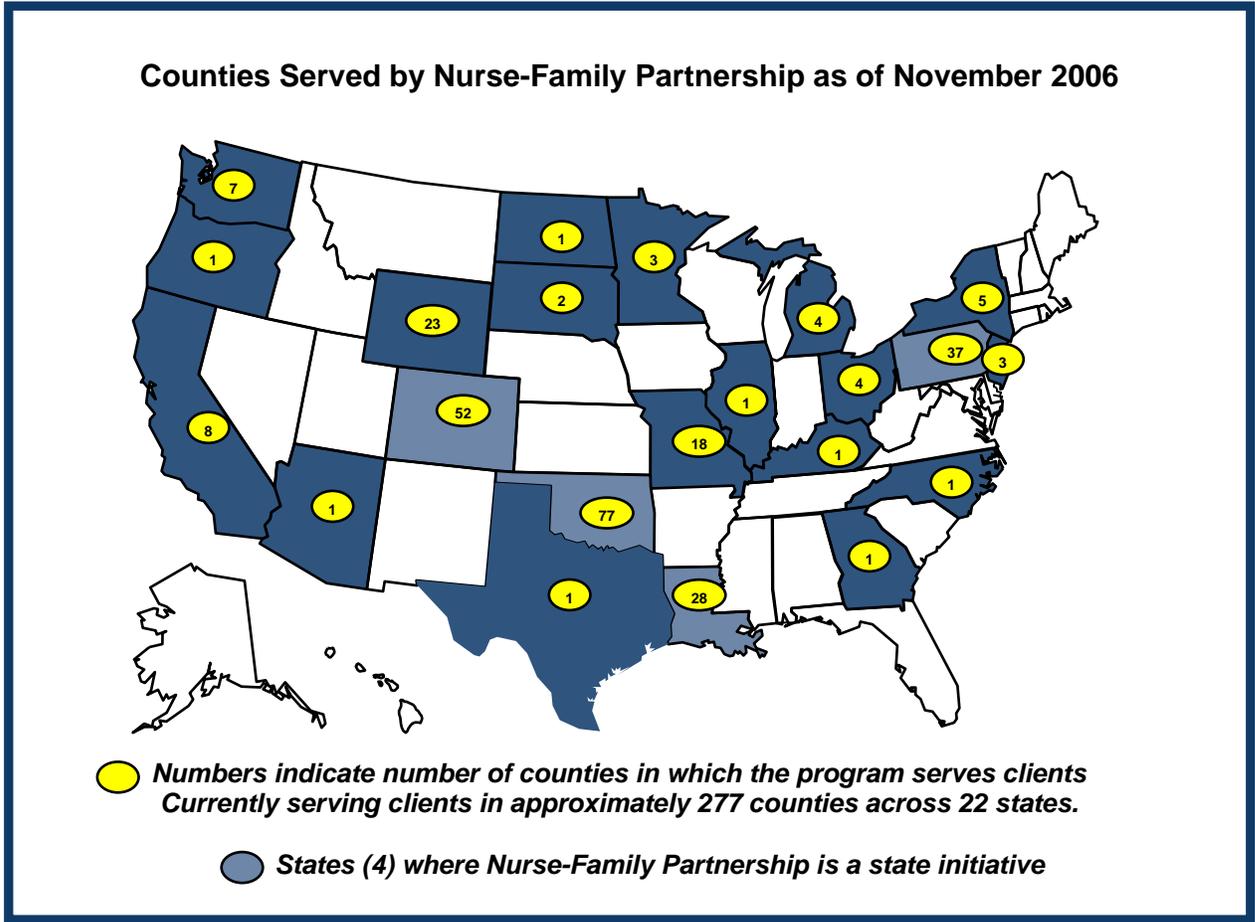
- Improve pregnancy outcomes by helping women alter their health-related behaviors, including reducing use of cigarettes, alcohol, and illegal drugs
- Improve child health and development by helping parents provide more responsible and competent care for their children
- Improve families' economic self-sufficiency 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 = 62,348 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