

COLORADO



State of Colorado Nurse-Family Partnership

EVALUATION REPORT 6
Initiation through June 30, 2006

CONTENTS

LIST OF TABLES	V
LIST OF FIGURES	VII
EXECUTIVE SUMMARY	IX
GRADUATES OF THE COLORADO NFP PROGRAM.....	IX
PARTICIPANT CHARACTERISTICS AT PROGRAM INTAKE	IX
PROGRAM IMPLEMENTATION.....	X
OUTCOMES FOR COLORADO NFP GRADUATES.....	X
COMPARISON OF COLORADO NFP COHORT 1 AND COHORT 2.....	XI
PARTICIPANT CHARACTERISTICS	XI
PROGRAM IMPLEMENTATION.....	XI
PARTICIPANT OUTCOMES	XII
EVALUATION REPORT FOR STATE OF COLORADO NURSE-FAMILY PARTNERSHIP.....	1
ABOUT NFP REPORTS.....	2
EVALUATION REPORTS, YEARS 1, 2, 3, AND 4.....	2
EVALUATION REPORTS, YEAR 5 AND BEYOND	2
NFP OBJECTIVES	2
PART I: INTRODUCTION	3
DESCRIPTIONS OF COLORADO AGENCIES IMPLEMENTING THE NFP	4
CHARACTERISTICS OF NFP STAFF.....	5
PART II: GRADUATES OF THE COLORADO NFP PROGRAM.....	6
PARTICIPANT CHARACTERISTICS	7
SOCIO-DEMOGRAPHIC INFORMATION	7
MATERNAL HEALTH CHARACTERISTICS.....	8
FAMILY CHARACTERISTICS	10
ROLE OF BIOLOGICAL FATHER.....	10
MATERNAL EXPERIENCE OF ABUSIVE RELATIONSHIPS.....	10
PROGRAM IMPLEMENTATION.....	12
NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS.....	12
CONTENT OF HOME VISITS.....	13
TELEPHONE ENCOUNTERS.....	14
PARTICIPANT OUTCOMES	15
CHANGE IN MATERNAL HEALTH BEHAVIORS	15
CHANGE IN EXPERIENCE OF DOMESTIC VIOLENCE.....	16
INFANT HEALTH	17
BIRTH OUTCOMES.....	17
PREMATURE BIRTHS	17

LOW BIRTH WEIGHT	18
ILLNESSES.....	19
DEVELOPMENTAL DELAYS	20
LANGUAGE DEVELOPMENT	20
BREASTFEEDING	21
IMMUNIZATIONS	22
EMERGENCY ROOM VISITS AND HOSPITALIZATIONS	23
MATERNAL LIFE COURSE DEVELOPMENT	24
SUBSEQUENT PREGNANCIES	24
EDUCATION.....	25
WORKFORCE PARTICIPATION	26
MARITAL STATUS.....	27
USE OF PUBLIC ASSISTANCE PROGRAMS	28

PART III: COMPARISON OF COLORADO NFP COHORT 1 AND COHORT 2..... 29

COHORT COMPARISONS30

SOCIO-DEMOGRAPHIC INFORMATION 30

PROGRAM IMPLEMENTATION 31

GESTATIONAL AGE AT ENROLLMENT	31
REASONS PARTICIPANTS DROPPED FROM THE PROGRAM	33
TIMING OF PARTICIPANT ATTRITION.....	35
NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS	36
CONTENT OF HOME VISITS	37

PARTICIPANT OUTCOMES..... 38

CHANGE IN MATERNAL HEALTH HABITS.....	38
CHANGE IN EXPERIENCE OF DOMESTIC VIOLENCE	39
BIRTH OUTCOMES	40
LANGUAGE DEVELOPMENT	40
BREASTFEEDING.....	41
IMMUNIZATIONS	41
EMERGENCY ROOM VISITS AND HOSPITALIZATIONS	43
MATERNAL LIFE COURSE DEVELOPMENT	44

CONTACTS.....48

REFERENCES49

APPENDIX A: COLORADO NFP DATA BY INDIVIDUAL SITE.....50

APPENDIX B: ADDITIONAL ANALYSES72

FACTORS RELATED TO PROGRAM ATTRITION DURING PREGNANCY, INFANCY AND

TODDLERHOOD 73

ATTRITION DURING PREGNANCY	74
ATTRITION DURING INFANCY	75
ATTRITION DURING TODDLERHOOD	76

RISK FACTORS FOR LOW BIRTH WEIGHT (LBW) IN COLORADO NFP	79
BIRTH OUTCOMES BY AGE OF THE MOTHER	79
RISK FACTORS FOR SUBSEQUENT PREGNANCIES.....	80
APPENDIX C: NURSE-FAMILY PARTNERSHIP OVERVIEW	82
THE PROGRAM MODEL	82
DISSEMINATION OF THE NURSE-FAMILY PARTNERSHIP.....	83
APPENDIX D: NURSE-FAMILY PARTNERSHIP OBJECTIVES	84
OBJECTIVES CONCERNING FIDELITY TO PROGRAM MODEL	84
OBJECTIVES CONCERNING MATERNAL AND CHILD OUTCOMES	85
APPENDIX E: COLORADO PRAMS DATA	87

LIST OF TABLES

TABLE 1.	DESCRIPTION OF COLORADO AGENCIES IMPLEMENTING THE NFP	4
TABLE 2.	CHARACTERISTICS OF COLORADO NFP STAFF.....	5
TABLE 3.	CHARACTERISTICS OF PARTICIPANTS AT INTAKE.....	7
TABLE 4.	AGES OF PARTICIPANTS AT INTAKE	8
TABLE 5.	PSYCHOSOCIAL PARTICIPANT CHARACTERISTICS AT INTAKE.....	9
TABLE 6.	ROLE OF BIOLOGICAL FATHER AT INTAKE.....	10
TABLE 7.	NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS FOR NFP GRADUATES	12
TABLE 8.	AVERAGE PERCENT OF NURSE VISIT TIME SPENT ON EACH DOMAIN AREA.....	13
TABLE 9.	TELEPHONE CONTACTS WITH FAMILIES	14
TABLE 10.	CHANGE IN MATERNAL HEALTH HABITS AMONG COLORADO NFP GRADUATES : PROGRAM INTAKE AND 36 WEEKS OF PREGNANCY, PROGRAM INTAKE AND ONE YEAR OF INFANCY.....	15
TABLE 11.	CHANGE IN MATERNAL HEALTH HABITS AMONG NATIONAL NFP GRADUATES : PROGRAM INTAKE AND 36 WEEKS OF PREGNANCY, PROGRAM INTAKE AND ONE YEAR OF INFANCY.....	16
TABLE 12.	CHANGE IN NUMBER OF CIGARETTES SMOKED PER DAY DURING PREGNANCY.....	16
TABLE 13.	CHANGE IN MATERNAL HEALTH HABITS IN COLORADO MOTHERS.....	16
TABLE 14.	CHANGE IN EXPERIENCE OF DOMESTIC VIOLENCE BETWEEN PROGRAM INTAKE AND 36 WEEKS OF PREGNANCY FOR PROGRAM COMPLETERS.....	17
TABLE 15.	CHANGE IN EXPERIENCE OF DOMESTIC VIOLENCE BETWEEN PROGRAM INTAKE AND 36 WEEKS OF PREGNANCY FOR PROGRAM NON-COMPLETERS	17
TABLE 16.	OTHER INFANT HEALTH CHARACTERISTICS	19
TABLE 17.	METHOD OF ASSESSMENT FOR DEVELOPMENTAL DELAY DETERMINED AT 6, 12, AND 24 MONTHS	20
TABLE 18.	DEVELOPMENTAL DELAYS AT 6, 12, AND 24 MONTHS.....	20
TABLE 19.	PERCENTAGE OF AND REASONS FOR EMERGENCY DEPARTMENT VISITS AND HOSPITALIZATIONS REPORTED AT 6, 12, AND 24 MONTHS OF AGE BY COLORADO NFP GRADUATES	23
TABLE 20.	CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY BY COHORT	30
TABLE 21.	PARTICIPANTS' AGES AT PROGRAM ENTRY BY COHORT	31
TABLE 22.	PSYCHOSOCIAL PARTICIPANT CHARACTERISTICS BY COHORT.....	31
TABLE 23.	REASONS PARTICIPANTS DROPPED BY COHORT	33
TABLE 24.	REASONS COLORADO PARTICIPANTS DROPPED COMPARED TO NATIONAL NFP	34
TABLE 25.	TIMING OF PARTICIPANT ATTRITION	35
TABLE 26.	NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS BY COHORT.....	36
TABLE 27.	AVERAGE PERCENT OF NURSE VISIT TIME SPENT ON EACH DOMAIN BY PHASE AND COHORT	37

TABLE 28.	CHANGE IN PERCENT SMOKING DURING PREGNANCY BY COHORT OVER TIME.....	38
TABLE 29.	CHANGE IN NUMBER OF CIGARETTES SMOKED PER DAY DURING PREGNANCY BY COHORT...	38
TABLE 30.	CHANGE IN EXPERIENCE OF DOMESTIC VIOLENCE BETWEEN PROGRAM INTAKE AND 36 WEEKS OF PREGNANCY FOR COHORTS	39
TABLE 31.	EMERGENCY ROOM VISITS AND HOSPITALIZATIONS.....	43
TABLE 32.	PARTICIPANT STATUS BY YEAR OF ENROLLMENT	50
TABLE 33.	COMPARISON OF ALL COLORADO SITES' PARTICIPANTS' DEMOGRAPHIC CHARACTERISTICS AT PROGRAM INTAKE	52
TABLE 34.	COMPARISON OF ALL COLORADO SITES' PARTICIPANTS' RACE/ETHNICITY AT PROGRAM INTAKE	53
TABLE 35.	COMPARISON OF ALL COLORADO SITES' PARTICIPANTS' HOUSEHOLD COMPOSITION AT PROGRAM INTAKE.....	54
TABLE 36.	COMPARISON OF ALL COLORADO SITES' PARTICIPANTS' USE OF GOVERNMENT ASSISTANCE AT PROGRAM INTAKE	55
TABLE 37.	COMPARISON OF ALL COLORADO SITES' PARTICIPANTS' PSYCHOLOGICAL RESOURCES AT PROGRAM INTAKE.....	56
TABLE 38.	COMPARISON OF ALL COLORADO SITES' PARTICIPANTS' MATERNAL HEALTH CHARACTERISTICS AT PROGRAM INTAKE.....	57
TABLE 39.	NUMBER AND DURATION OF NURSE HOME VISITS BY SITE DURING PREGNANCY.....	58
TABLE 40.	NUMBER AND DURATION OF NURSE HOME VISITS BY SITE DURING INFANCY.....	62
TABLE 41.	NUMBER AND DURATION OF NURSE HOME VISITS BY SITE DURING TODDLERHOOD	66
TABLE 42.	PRETERM RATES BY SITE	70
TABLE 43.	LBW RATES BY SITE.....	71
TABLE 44.	REFERRALS TO OUTSIDE SERVICES	72
TABLE 45.	CHARACTERISTICS ASSOCIATED WITH PARTICIPANT ATTRITION DURING PREGNANCY.....	74
TABLE 46.	CHARACTERISTICS ASSOCIATED WITH PARTICIPANT MOVING DURING PREGNANCY.....	75
TABLE 47.	CHARACTERISTICS ASSOCIATED WITH PARTICIPANT ATTRITION DURING INFANCY.	75
TABLE 48.	CHARACTERISTICS ASSOCIATED WITH PARTICIPANT MOVING DURING INFANCY.	76
TABLE 49.	CHARACTERISTICS ASSOCIATED WITH PARTICIPANT ATTRITION DURING TODDLERHOOD.....	76
TABLE 50.	CHARACTERISTICS ASSOCIATED WITH PARTICIPANT MOVING DURING TODDLERHOOD.	77
TABLE 51.	PERCENTAGE OF PREMATURE INFANTS BY AGE OF THE MOTHER AT INFANT BIRTH.....	79
TABLE 52.	PERCENTAGE OF LOW BIRTH WEIGHT INFANTS BY AGE OF THE MOTHER AT INFANT BIRTH....	79
TABLE 53.	TIMING OF SUBSEQUENT PREGNANCY.....	80
TABLE 54.	SUBSEQUENT PREGNANCIES AT 24 MONTHS POSTPARTUM BY AGE OF THE MOTHER AT ENROLLMENT	80

LIST OF FIGURES

FIGURE 1. GESTATIONAL AGE AT ENROLLMENT.....	8
FIGURE 2. PREDOMINANT MATERNAL HEALTH PROBLEMS AMONG COLORADO NFP GRADUATES AT PROGRAM INTAKE.....	9
FIGURE 3. HISTORY OF DOMESTIC AND/OR FAMILY VIOLENCE FOR PROGRAM COMPLETERS	10
FIGURE 4. HISTORY OF DOMESTIC AND/OR FAMILY VIOLENCE FOR PROGRAM NON-COMPLETERS	11
FIGURE 5. PERCENTAGE OF PREMATURE INFANTS BY ETHNICITY.....	18
FIGURE 6. PERCENTAGE OF LOW BIRTH WEIGHT INFANTS BY ETHNICITY.....	18
FIGURE 7. PREDOMINANT INFANT ILLNESSES AT 6, 12, AND 24 MONTHS OF AGE FOR COLORADO NFP GRADUATES.....	19
FIGURE 8. PERCENTILE BREAKDOWN OF LANGUAGE PRODUCTION SCORES FOR TODDLERS.....	21
FIGURE 9. OCCURRENCE OF BREASTFEEDING	21
FIGURE 10. SUMMARY OF IMMUNIZATION RATES FOR NFP GRADUATES AT 12 MONTHS	22
FIGURE 11. SUMMARY OF IMMUNIZATION RATES FOR NFP GRADUATES AT 24 MONTHS	22
FIGURE 12. SUBSEQUENT PREGNANCIES BY 6, 12, 18, AND 24 MONTHS POSTPARTUM AMONG COLORADO NFP GRADUATES.....	24
FIGURE 13. EDUCATION STATUS OVER TIME FOR COLORADO NFP GRADUATES WITH NO HIGH SCHOOL DIPLOMA OR GED AT INTAKE	25
FIGURE 14. ENROLLMENT IN SCHOOL OVER TIME FOR THOSE WITH A HIGH SCHOOL DIPLOMA OR GED AT INTAKE.....	25
FIGURE 15. PERCENTAGE WORKING OVER TIME AMONG THOSE 18 YEARS OR OLDER AT INTAKE.....	26
FIGURE 16. PERCENTAGE WORKING OVER TIME AMONG THOSE 17 YEARS OR YOUNGER AT INTAKE	26
FIGURE 17. NUMBER OF MONTHS WORKED.....	27
FIGURE 18. PERCENTAGE MARRIED OVER TIME	27
FIGURE 19. PERCENTAGE OF COLORADO NFP GRADUATE USING GOVERNMENT ASSISTANCE BETWEEN PROGRAM INTAKE AND 24 MONTHS OF TODDLER AGE.....	28
FIGURE 20. GESTATIONAL AGE AT ENROLLMENT BY COHORT.....	32
FIGURE 21. PREDOMINANT MATERNAL HEALTH PROBLEMS AT PROGRAM INTAKE BY COLORADO NFP COHORT	32
FIGURE 22. PERCENTAGE OF PREMATURE INFANTS BY ETHNICITY AND COHORT.....	40
FIGURE 23. PERCENTAGE OF LOW BIRTH WEIGHT INFANTS BY ETHNICITY AND COHORT.....	40
FIGURE 24. PERCENTILE BREAKDOWN BY COHORT OF LANGUAGE PRODUCTION SCORES FOR TODDLERS	41
FIGURE 25. OCCURRENCE OF BREASTFEEDING.....	41
FIGURE 26. SUMMARY OF IMMUNIZATION RATES AT 12 MONTHS OF INFANT AGE BY COHORT.....	42
FIGURE 27. SUMMARY OF IMMUNIZATION RATES AT 24 MONTHS OF TODDLER AGE BY COHORT.....	42

FIGURE 28. CUMULATIVE SUBSEQUENT PREGNANCIES BY COHORT.....	44
FIGURE 29. EDUCATION STATUS OVER TIME BY COHORT ONE FOR PARTICIPANTS WITH NO HIGH SCHOOL DIPLOMA OR GED AT INTAKE	44
FIGURE 30. EDUCATION STATUS OVER TIME BY COHORT TWO FOR PARTICIPANTS WITH NO HIGH SCHOOL DIPLOMA OR GED AT INTAKE	45
FIGURE 31. COHORT ENROLLMENT IN SCHOOL OVER TIME FOR THOSE WITH A HIGH SCHOOL DIPLOMA OR GED AT INTAKE	45
FIGURE 32. PERCENTAGE WORKING OVER TIME AMONG THOSE 18 YEARS OR OLDER AT INTAKE.....	46
FIGURE 33. PERCENTAGE WORKING OVER TIME AMONG THOSE 17 YEARS OR YOUNGER AT INTAKE	46
FIGURE 34. NUMBER OF MONTHS WORKED POSTPARTUM BY COHORT.....	47

EXECUTIVE SUMMARY

This is the sixth evaluation report on the implementation of the Nurse-Family Partnership (NFP) in Colorado, funded through SB 00-071, the Nurse Home Visitor Program Act (and therein referred to as the Nurse Home Visitor Program). The Nurse-Family Partnership is based on the intervention model developed and tested by Dr. David Olds and colleagues. Eighteen agencies are currently delivering the NFP program to families in 50 Colorado counties.

This report represents analyses of data available from all eighteen sites from program initiation through June 30, 2006. Throughout the report, indicators of program implementation and maternal and child health and functioning for the Colorado NFP are compared to the national sample of Nurse-Family Partnership participants. 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. Additionally, demographics and mother and infant outcomes are shown from PRAMS data for non-NFP Colorado mothers when data comparable to NFP data are available. (See Appendix E for a description of PRAMS.)

Colorado NFP has been in operation since January 2000. Since that time, 6,603 participants have enrolled in the program, and 3,425 participants have had the opportunity to complete the full program cycle (i.e., their child reached their second birthday). As of June 30, 2006, 4960 babies have been born to NFP mothers; there are 2,002 active families with 1,487 children currently in the program.

Part I of this report describes the agencies and staff implementing the program in Colorado. In Part II 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 1,253 participants who have completed the program.¹

Also of interest is whether participant characteristics, program implementation, and participant outcomes changed over time. Part III of this report compares those who entered the program between February 1, 2000, and August 31, 2003 (Cohort 1) with those who entered the program between September 1, 2003, and June 30, 2006 (Cohort 2).

Appendix A includes demographics, program implementation, and child health data by site for all Colorado NFP participants. Appendix B provides additional analyses for attrition, birth outcomes, and subsequent pregnancies.

GRADUATES OF THE COLORADO NFP PROGRAM

PARTICIPANT CHARACTERISTICS AT PROGRAM INTAKE

- Colorado NFP graduates: median age 19; median education 11 years; 81% unmarried; 60% unemployed; 77% Medicaid recipients
- Race/Ethnicity: 48% Hispanic; 40% non-Hispanic White; 5% multiracial/other; 3% African American/Black; 2% Native American; 1% Asian
- Statistically significant socio-demographic differences between graduates and non-completers at intake include:
 - o More graduates (47%) finished high school than non-completers (39%)
 - o More graduates (40%) were employed than non-completers (34%)
 - o Fewer graduates (2%) used TANF (vs. 3% of non-completers)
 - o The median household size was smaller for graduates (3 vs. 4 for non-completers).

¹ Attrition information is included in Part III and Appendix B of this report.

PROGRAM IMPLEMENTATION

- Colorado NFP graduates received an average of 10.1 visits during the pregnancy phase, 20.4 visits during the infancy phase, and 16.3 visits during the toddler phase. National NFP averages for the numbers of visits per graduate during the three phases were 9.5, 17.5, and 11.7, respectively.
- Visit lengths in program phases averaged 72 to 75 minutes; the NFP objective is a minimum of 60 minutes.
- Colorado NFP has closely matched the program guidelines during all program phases.
 - While many sites struggle to meet the NFP guidelines for maternal role during infancy and toddlerhood, it is a notable strength that Colorado NFP has met or nearly met these guidelines. (Infancy: Colorado NFP, 43%; national NFP, 38%; guideline, 45-50%; Toddlerhood: Colorado NFP, 43%; national NFP, 39%; guideline, 40-45%).
- 46% of Colorado NFP graduates were enrolled by the 16th week of pregnancy, a rate higher than Colorado NFP non-completers (43%) and national NFP graduates (41%); 89% of both Colorado NFP graduates and non-completers were enrolled by the 28th week of pregnancy.

OUTCOMES FOR COLORADO NFP GRADUATES

- The reductions in substance use (cigarettes, alcohol, and marijuana) listed below were all statistically significant.
- There was a 25% reduction in the number of women smoking during pregnancy (16% for national NFP).
- From intake to 36 weeks of pregnancy, there was a 23% reduction in the number of women who smoked at least 5 cigarettes a day. Among those who continued to smoke, there was a reduction of 3.2 in the number of cigarettes smoked per day.
- There was a 58% reduction in the number of women who used marijuana during pregnancy; alcohol use decreased by 39% during pregnancy.
- There was a statistically significant 36% reduction in experience of domestic violence from intake to 36 weeks of pregnancy.
- 7.9% of Colorado NFP graduates' infants were premature (9.7% for national NFP graduates); premature rates for the predominant ethnic groups were: 7.1% for Hispanics (8.6% for national NFP graduates) and 8.4% for non-Hispanic Whites (9.4% for national NFP graduates).
- 8.2% of Colorado NFP graduates' infants were low birth weight (8.5% of national NFP graduates); low birth weight rates for the predominant ethnic groups were: 7.3% for Hispanics (7.5% for national NFP graduates) and 8.8% for non-Hispanic Whites (7.9% for national NFP graduates).
- Colorado NFP graduates' rates for completion of recommended infants' (age 12 months) immunizations were 96% - 98% with the exception of HIB (84%). The immunization rates for toddlers, age 24 months, were 96% - 97% with the exception of the DTP/DTaP (81%) and HIB (78%).
 - DTP/DTaP and HIB rates may be underreported because of different dosage patterns among pharmaceutical products.
 - Additionally, a shortage of the DTP/DTaP vaccine prevented many Colorado toddlers from receiving the immunizations during the recommended timeframe.
- 84% of Colorado NFP graduates initiated breastfeeding (69% for national NFP graduates); 39% continued to breastfeed at 6 months postpartum, and 20% at 12 months infant age (29% and 16% respectively for national NFP graduates).
- The language development scores were evenly distributed across the four quartiles. Nine percent scored below the 10th percentile, compared to 10% of NFP toddlers nationwide. Scoring below the 10th percentile may indicate a delay in language skills.

- Colorado NFP graduates' rates for subsequent pregnancies were 12% by 12 months postpartum and 33% by 24 months postpartum compared to national NFP graduates' rates of 12% and 31%, respectively.
- By program completion, 41% of the women who entered the program without a high school diploma/GED had received their diploma/GED and 13% were continuing their education beyond high school; an additional 18% were still working toward their diploma/GED.
- Of those who were 18 or older at intake, workforce participation increased from 48% at intake to 61% at program completion. For those 17 years or younger at intake, 21% were working at program intake compared to 46% at program completion.
- Colorado NFP graduates worked an average of 6 months in the first year after the birth of their child and 8 months during the second year postpartum.
- The percentage of graduates who were married increased from 20% at intake to 36% at program completion.

COMPARISON OF COLORADO NFP COHORT 1 AND COHORT 2

PARTICIPANT CHARACTERISTICS

- There were several statistically significant socio-demographic differences between cohorts at intake:
 - More Cohort 2 participants had completed high school (47% vs. 42% for Cohort 1)
 - A larger percentage of Cohort 2 participants were married (20% vs. 17% for Cohort 1)
 - As compared to Cohort 1, there was an increase among Cohort 2 participants in the percentage of Hispanic participants and decreases in the percentages of African American/Black and multiracial/other participants
 - Fewer Cohort 2 participants were employed (34% vs. 39% for Cohort 1)
 - More Cohort 2 participants used Food Stamps (13% vs. 9% for Cohort 1)
 - Larger percentages of Cohort 2 participants lived with their husband/boyfriend or alone; larger percentages of Cohort 1 participants lived with their mother or others.

PROGRAM IMPLEMENTATION

- Enrollment by 16 weeks of pregnancy decreased slightly over time (47% for Cohort 1 and 44% for Cohort 2); the total rate of enrollment by gestational week 28 was 91% for Cohort 1 and 85% for Cohort 2.
- Attrition decreased over time during the pregnancy phase (16.3% Cohort 1, 11.9% Cohort 2) and was similar during infancy (30.8% Cohort 1, 31.1% Cohort 2) and toddlerhood (15.7% Cohort 1, 16.8% Cohort 2).
 - During all program phases and for both cohorts, the primary reason participants dropped from the program was because they moved out of the program service area, a factor over which programs have little control.
- The lengths and average numbers of completed visits were similar for the cohorts during all program phases.
- All guidelines for home visit content were met by both cohorts with the exception of the maternal role guideline for Cohort 1 during the infancy phase (41% Cohort 1 vs. 47% Cohort 2 vs. 45-50% guideline).

PARTICIPANT OUTCOMES

- Both cohorts showed statistically significant reductions in the numbers of smokers during pregnancy (25% for Cohort 1; 16% for Cohort 2). Both cohorts had significant reductions in the numbers of cigarettes smoked by those who continued to smoke during pregnancy.
- Both cohorts had statistically significant reductions in the experience of domestic violence from intake to 36 weeks of pregnancy. A larger percentage of Cohort 2 participants reported a decrease in physical abuse (49% vs. 32% for Cohort 1).
- There were not statistically significant differences in premature and low birth weight rates between the two cohorts; however, from Cohort 1 to Cohort 2, the overall percentage of premature infants increased over time (8.2% Cohort 1, 9.8% Cohort 2) and the percentage of low birth weight infants decreased (9.5% Cohort 1, 8.6% Cohort 2).
- Immunization rates were similar for the cohorts at both 12 and 24 months of child age. All immunization rates for both cohorts were 95 – 98% with the exception of DTP/DTaP and HIB.
 - o HIB rates were 83% and 86% at 12 months and 76% and 82% at 24 months, for Cohort 1 and Cohort 2, respectively. HIB may be underreported because of different dosage patterns among pharmaceutical products.
 - o At 24 months, DTP/DTaP rates were 79% and 85% for Cohort 1 and Cohort 2, respectively. A shortage of the DTP/DTaP vaccine prevented many Colorado toddlers from receiving the immunizations during the recommended timeframe; additionally, DTP/DTaP rates may be underreported because of different dosage patterns among pharmaceutical products.
- Subsequent pregnancy rates were similar for the cohorts at 12 months postpartum (13% Cohort 1, 11% Cohort 2) and also at 24 months postpartum (32% Cohort 1, 33% Cohort 2).
- Both cohorts showed increases in the percentages of mothers working from intake to 24 months postpartum for participants 18 years or older at intake and for those 17 years and younger at intake.
- Both cohorts averaged working 6 months in the first postpartum year; during the second postpartum year, Cohort 1 participants worked an average of 8 months and Cohort 2 participants worked an average of 9 months.

EVALUATION REPORT FOR
STATE OF COLORADO NURSE-
FAMILY PARTNERSHIP



NFP GRADUATES AND TRENDS IN
PROGRAM IMPLEMENTATION

REPORT TIME SPAN:
PROGRAM INITIATION (JANUARY 2000) THROUGH JUNE 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, as well as a comparison of cohorts. 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.

The cohort section 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 D) 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.

Throughout this report, comparisons are made, where possible, to NFP participants nationwide. These comparisons, rather than the “stretch goals” of the NFP objectives, may form a more realistic basis of comparison for Colorado’s results. Additionally, where available, a comparison is made between Colorado NFP mothers and a sample of Colorado mothers who were not NFP participants. This sample includes mothers with socio-demographic backgrounds similar to those of Colorado NFP mothers.

PART I: **INTRODUCTION**

DESCRIPTIONS OF COLORADO AGENCIES IMPLEMENTING THE NFP

Table 1 presents information on the agencies implementing the NFP program in Colorado including program start dates, and counties served.

Table 1. Description of Colorado Agencies Implementing the NFP

Implementing Agency	Start Date of NFP	Counties Served by NFP	2005-2006 Target Enrollment
Boulder County Health Department	September 2002	Boulder	100
Denver Health and Hospital Authority: Best Babies	January 2000	Denver	100
El Paso County Department of Health and Environment	February 2001	El Paso	200
Family Visitor Program	February 2003	Eagle, Garfield, Pitkin	100
Jefferson County Department of Health and Environment	August 2000	Jefferson, Broomfield	175
Larimer County Department of Health and Environment	November 2000	Larimer	200
Mesa County Health Department	September 2000	Mesa	150
Montrose County Health and Human Services	May 2001	Delta, Gunnison, Hinsdale, Montrose, Ouray, San Miguel	75
Northeast Colorado Health Department	August 2002	Logan, Morgan, Phillips, Sedgwick, Washington, Yuma	50
Northwest Colorado Visiting Nurse Association	January 2001	Jackson, Moffat, Rio Blanco, Routt	50
Prowers County Public Health Nursing Service	August 2001	Baca, Bent, Kiowa, Prowers	50
Pueblo Community Health Center	March 2001	Pueblo	125
San Juan Basin Health Department	February 2000	Archuleta, Dolores, La Plata, Montezuma, San Juan	112
St Anthony Central Hospital (Catholic Health Initiatives Colorado Foundation)	October 2005	Denver, Adams, and Jefferson counties	100
Summit County Public Health Nursing	April 2001	Clear Creek, Gilpin, Lake, Summit	100
Tri County Health Department	January 2000	Adams, Arapahoe, Douglas	200
Valley-Wide Health Services, Inc.	December 2001	Alamosa, Conejos, Costilla, Mineral, Rio Grande, Saguache	125
Weld County Department of Public Health and Environment	May 2001	Weld	150
			2,162

CHARACTERISTICS OF NFP STAFF

Data on the background characteristics of the nurse home visitors and supervisors for the NFP in Colorado were available for 114 staff members, including eighteen supervisors and ninety-six home visitors. Education, nursing experience and demographic information are presented in Table 2.

Table 2. *Characteristics of Colorado NFP Staff*

	Supervisors (N = 18)	Nurse Home Visitors (N = 96)
Average number of years in nursing	22	17
% with maternal/child health experience	94%	81%
% with home visiting experience	94%	94%
Average number of years of supervisory experience	8	8
Race/Ethnicity		
Non-Hispanic White	100%	86%
Hispanic	0%	9%
African-American/Black	0%	2%
Asian/Pacific Islander	0%	1%
Other	0%	2%
Highest Nursing Degree		
Associates Degree	11%	8%
Diploma	0%	3%
Bachelors of Science	50%	70%
Masters of Science	33%	19%
Nursing Doctorate	6%	0%

PART II:
GRADUATES OF THE COLORADO 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 3 notes various demographic characteristics of the participants who graduated from Colorado NFP, those who dropped from the program prior to their child's second birthday, the national sample of NFP graduates, and the Colorado PRAMS sample, provided by the Colorado Department of Public Health and Environment Health, of first-time, low-income mothers.

Table 3. *Characteristics of Participants at Intake*

	Colorado NFP Graduates	Colorado NFP Non- completers	Colorado PRAMS Sample **
Number Enrolled[†]	1,253	2,029	
Demographic Characteristics			
Mother age at enrollment (median)	19	19	
Years of education at intake (median)	11	11	
Completed high school*	47%	39%	62%
Unmarried	81%	83%	62%
First-time mothers	99%	98%	100%
Race/Ethnicity			
Hispanic	48%	46%	39%
Native American	2%	3%	1%
African American/Black	3%	5%	6%
Non-Hispanic White	40%	40%	42%
Multiracial/other	5%	5%	
Asian	1%	2%	5%
Economic Factors			
Household income at intake (median)	\$13,500	\$13,500	
Unemployed*	60%	66%	
Use of Government Assistance			
WIC	71%	70%	66%
Medicaid	77%	76%	70%
Food Stamps	9%	11%	
TANF*	2%	3%	
Household Size			
Household size (median)*	3	4	
Household Composition*			
Lives alone	5%	4%	
Lives with husband/boyfriend	43%	42%	
Lives with mother	38%	36%	
Lives with others	14%	18%	

[†] 143 participants (4%) 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

** See Appendix E for a description of PRAMS

Table 4 shows the percentages of participants by age categories detailing those who graduated and those who dropped from the program. The age categories used by PRAMS and NFP differ; Table 4 summarizes mothers' ages incorporating both types of categories.

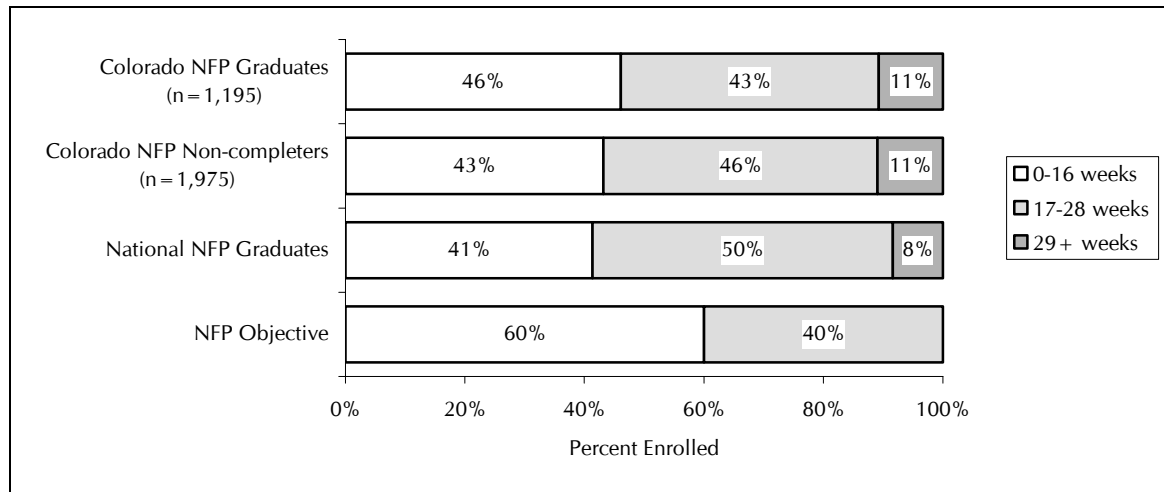
Table 4. *Ages of Participants at Intake*

	Colorado NFP Graduates	Colorado NFP Non-completers	Colorado PRAMS Sample ²
Less than 15 years	3%	4%	-
15 - 19 years	-	-	36%
15 - 17 years	26%	31%	-
18 - 19 years	24%	27%	-
20 - 24 years	31%	28%	41%
25 years or older	15%	9%	24%
25 - 29 years	8%	7%	-
25 - 34 years	-	-	21%
30 years or older	7%	3%	-
35 years or older	-	-	2%

MATERNAL HEALTH CHARACTERISTICS

Figure 1 presents information on when Colorado 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. Additionally, Colorado statute stipulates that women can be enrolled up to one month postpartum.

Figure 1. *Gestational Age at Enrollment*

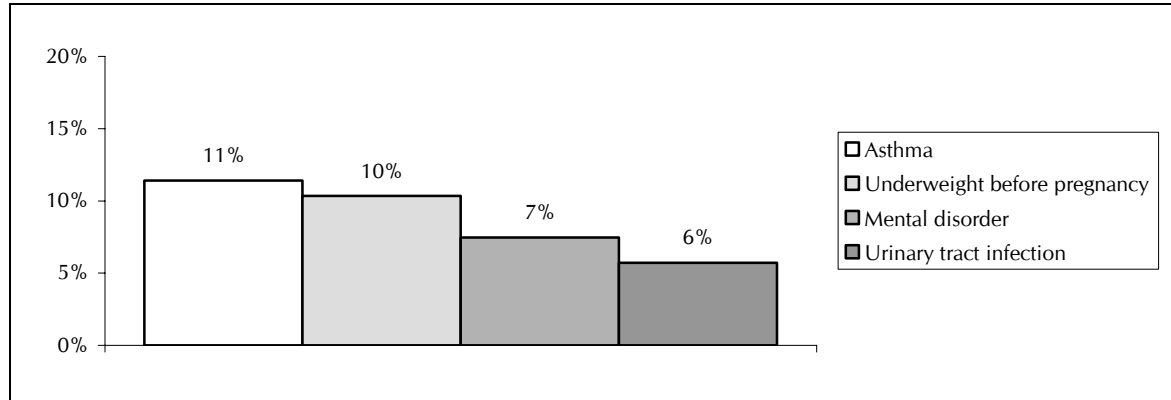


² This Colorado PRAMS data was provided by the Colorado Department of Public Health and Environment Health and includes first-time mothers with incomes below at least 200% of federal poverty level. (See Appendix E for a description of PRAMS.)

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 Colorado NFP graduates are noted in Figure 2.

The most frequently identified health problems among national NFP graduates are as follows: asthma (11%), underweight before pregnancy (10%), mental disorder (7%), and urinary tract infection (6%).

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



N = 1192

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, a participant's 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 5.

Table 5. *Psychosocial Participant Characteristics at Intake*

	Colorado NFP Graduates (N = 1177)	Colorado NFP Non-completers (N = 1876)	National NFP Graduates
Percent with mental health score greater than 3.0	81%	80%	82%
Percent with mastery score greater than 3.0	51%	50%	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 6 below for both graduates and non-completers.

Table 6. *Role of Biological Father at Intake*

	Colorado NFP Graduates	Colorado NFP Non-completers	National NFP Graduates
Current partner is biological father	95% (n = 935)	94% (n = 1525)	91%
Average money from biological father per month	\$315 (n = 1131)	\$302 (n = 1778)	\$239
Contact with biological father	(n = 1176)	(n = 1862)	
Not at All	13%	15%	12%
Less than once a week	6%	7%	6%
At least once a week	11%	9%	10%
Daily	69%	70%	72%

MATERNAL EXPERIENCE OF ABUSIVE RELATIONSHIPS

Home visitors assess at intake the extent to which participants have experienced domestic and/or family violence (i.e. physical, emotional, and/or sexual abuse) within important relationships at various times in their lives. This information is presented in Figure 3 and Figure 4 for Colorado program completers and non-completers, as well as national NFP graduates. It should be noted that domestic violence data are based on self-reported information which may not be divulged until the nurse/client relationship has developed and is more trusting. All interpretation of domestic violence data should take this into account.

Figure 3. *History of Domestic and/or Family Violence for Program Completers*

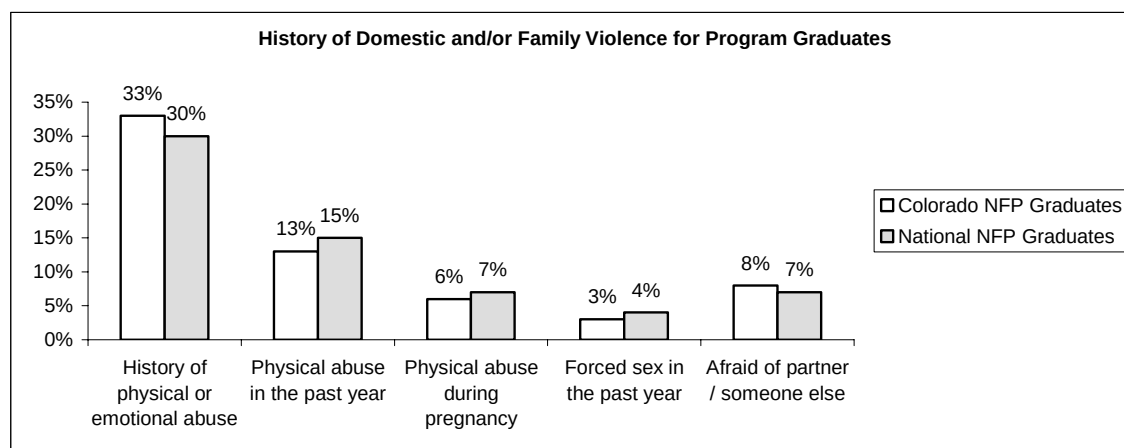
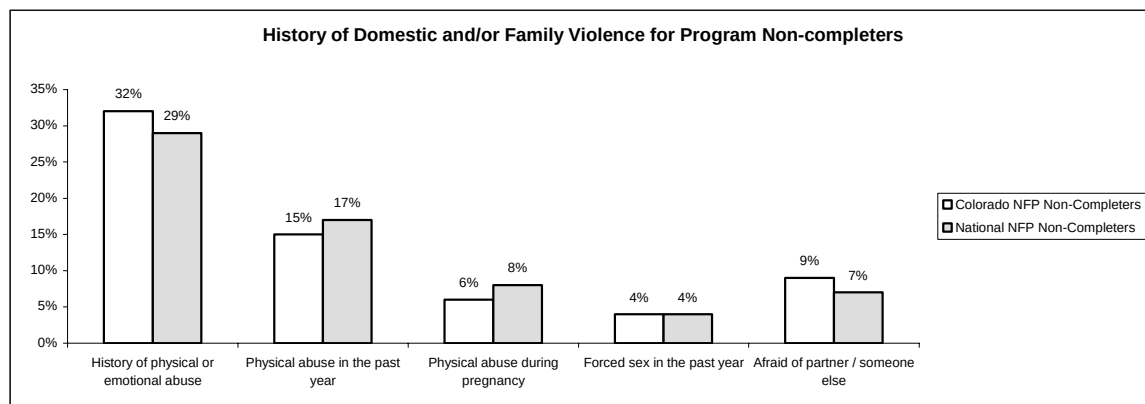


Figure 4. History of Domestic and/or Family Violence for Program Non-completers



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.

NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS

Table 7 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 7. Number and Duration of Completed Nurse Home Visits for NFP Graduates

	Colorado NFP		National NFP Graduates		NFP Objectives
	Number	Average	Number	Average	
Pregnancy					
Pregnancy Completed	1,253	-	15,874	-	-
Completed Visits	12,631	10.1	151,097	9.5	-
Expected Visits	14,480	-	190,345	-	-
Percentage of Expected Visits Completed	-	90%	-	85%	80%
Attempted Visits [†]	1,085	0.9	15,024	0.9	-
Average Visit Length (Minutes)	-	75.0	-	75.8	60
Average Total Contact Time (Minutes)	-	756	-	719	-
Infancy					
Infancy Completed	1,253	-	15,874	-	-
Completed Visits	25,535	20.4	277,792	17.5	-
Expected Visits	36,333	-	456,605	-	-
Percentage of Expected Visits Completed	-	70%	-	61%	65%
Attempted Visits [†]	3,286	2.6	38,614	2.4	-
Average Visit Length (Minutes)	-	72.6	-	73.3	60
Average Total Contact Time (Minutes)	-	1,486	-	1,281	-
Toddlerhood					
Toddlerhood Completed	1,214	-	15,653	-	-
Completed Visits	19,751	16.3	183,218	11.7	-
Expected Visits	25,462	-	325,800	-	-
Percentage of Expected Visits Completed	-	78%	-	56%	60%
Attempted Visits [†]	3,449	2.8	32,780	2.1	-
Average Visit Length (Minutes)	-	71.7	-	71.1	60
Average Total Contact Time (Minutes)	-	1,177	-	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 the 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 8 illustrates the percentage of time devoted to each of the content domains by phase for Colorado NFP graduates and national NFP graduates, and provides the NFP Objectives.

Table 8. Average Percent of Nurse Visit Time Spent on Each Domain Area

	Colorado NFP Graduates	National NFP Graduates	NFP Objectives
Pregnancy			
Personal Health	37%	37%	35-40%
Environmental Health	9%	11%	5-7%
Life-course Development	13%	13%	10-15%
Maternal Role	27%	24%	23-25%
Friends & Family	15%	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	43%	38%	45-50%
Friends & Family	14%	15%	10-15%
Toddlerhood			
Personal Health	16%	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 9 summarizes this information by phase for both Colorado NFP graduates and NFP graduates nationwide.

Table 9. *Telephone Contacts with Families*

	Colorado NFP Graduates			National NFP Graduates		
	Pregnancy	Infancy	Toddlerhood	Pregnancy	Infancy	Toddlerhood
Number of participants with phone contacts	423	666	494	3,944	5,947	4,073
Total number of phone calls	940	2,565	1,774	10,836	24,744	15,322
Mean number of calls per participant	2	4	4	3	4	4
Range of number of calls per participant	1-16	1-45	1-56	1-78	1-159	1-58
Average time per call in minutes	14	13	12	13	13	13
Time devoted to program domains						
Personal health	54%	29%	23%	57%	29%	23%
Environmental health	5%	5%	7%	7%	8%	9%
Life-course development	12%	14%	21%	12%	16%	24%
Maternal role	15%	40%	33%	16%	40%	35%
Friends & family	11%	11%	15%	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.^c

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 10 provides information about the maternal health habits of Colorado 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.

Table 10. *Change in Maternal Health Habits among Colorado 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	1123	177	132	-25% *
Smoked 5+ cigarettes last 24 hrs.	1123	74	57	-23% *
Marijuana use	1123	24	10	-58% *
Alcohol use	1122	31	19	-39%
Cocaine use	1123	0	0	-
Other drug use	1120	0	0	-
Infancy	N	Intake	One Year of Infancy	Percent Changed
Cigarette smoker	1146	174	252	45% *
Smoked 5+ cigarettes last 24 hrs.	1146	70	131	87% *
Marijuana use	1145	24	22	-8%
Alcohol use	1145	32	257	703% *
Cocaine use	1145	0	2	-
Other drug use	1140	0	3	-

*Statistically significant change at $p < .05$

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

^c It should be noted that data collected in Colorado 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.

Table 11. *Change in Maternal Health Habits among National 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	11488	1,916	1,616	-16% *
Smoked 5+ cigarettes last 24 hrs.	11488	999	888	-11% *
Marijuana use	6227	107	54	-50% *
Alcohol use	11363	156	100	-36% *
Cocaine use	6216	3	2	-33%
Other drug use	6209	7	4	-43%
Infancy	N	Intake	One Year of Infancy	Percent Changed
Cigarette smoker	6184	997	1,499	50% *
Smoked 5+ cigarettes last 24 hrs.	6184	495	939	90% *
Marijuana use	5833	90	130	44% *
Alcohol use	6125	92	946	928% *
Cocaine use	5734	3	10	233%
Other drug use	5742	10	11	10%

*Statistically significant change at $p < .05$

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

Home visitors also work with participants who are unwilling or unable to quit smoking to reduce the number of cigarettes smoked. Table 12 provides the change in the number of cigarettes smoked among Colorado NFP and national NFP graduates who reported smoking five or more cigarettes per day at intake.

Table 12. *Change in Number of Cigarettes Smoked per Day during Pregnancy*

	Average Change
Colorado NFP Graduates (n = 74)	-3.2 *
National NFP Graduates	-2.6 *
NFP Objective	-3.5

*Statistically significant change at $p < .05$

NFP data compares smoking rates and other health habits at the time of intake to thirty-six weeks of pregnancy. On the other hand, Colorado PRAMS compares smoking and alcohol use from before pregnancy to rates during pregnancy. It may be possible to assume that some NFP mothers also stopped smoking or using alcohol once they learned that they were pregnant, before starting the NFP program.

Table 13. *Change in Maternal Health Habits in Colorado Mothers*

	Before Pregnancy	At NFP Program Intake	During Pregnancy
Cigarette Smoker			
NFP Colorado Mothers	N/A	15.8%	11.8%
Colorado PRAMS Sample	31.7%	N/A	14.8%
Alcohol Use			
NFP Colorado Mothers	N/A	2.8%	1.7%
Colorado PRAMS Sample	53.2%	N/A	3.3%

N/A – Data not available at this time point

CHANGE IN EXPERIENCE OF DOMESTIC VIOLENCE

Data on domestic violence are collected from participants at program intake and at 36 weeks of pregnancy. Change in the experience of physical abuse and in fear of a partner or other individual are presented in Table 14 and Table 15. Domestic violence data are based on self-reported information which may not be divulged

until the nurse/client relationship has developed and is more trusting. The potential under-reporting of this information should be considered when looking at changes in domestic violence rates over time.

Table 14. Change in Experience of Domestic Violence between Program Intake and 36 Weeks of Pregnancy for Program Completers

	N	Intake	36 Weeks of Pregnancy	Relative Change
Colorado NFP Graduates				
Physical abuse during pregnancy	1011	61	39	-36% *
Fear of partner/other	1010	81	50	-38% *
National NFP Graduates				
Physical abuse during pregnancy	4712	323	205	-37% *
Fear of partner/other	4733	336	208	-38% *

*Statistically significant at $p < .05$

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

Table 15. Change in Experience of Domestic Violence between Program Intake and 36 Weeks of Pregnancy for Program Non-completers

	N	Intake	36 Weeks of Pregnancy	Relative Change
Colorado NFP Non-Completers				
Physical abuse during pregnancy	1008	60	38	-37% *
Fear of partner/other	1017	94	47	-50% *
National NFP Non-Completers				
Physical abuse during pregnancy	4885	385	214	-44% *
Fear of partner/other	4887	341	195	-43% *

*Statistically significant at $p < .05$

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

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 5 illustrates the rates of premature births for Colorado NFP graduates and national NFP graduates, and provides the NFP Objectives.

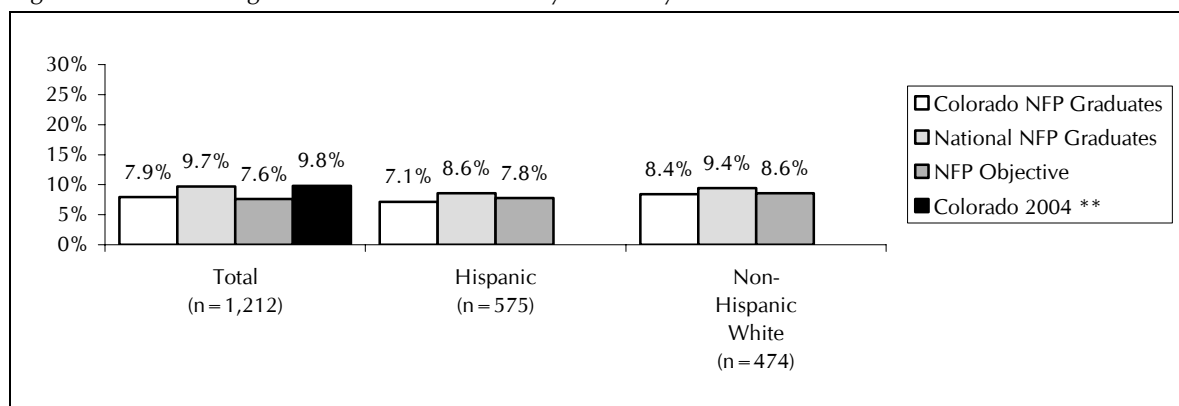
The NFP Objective for premature births is consistent with the target goal set in Healthy People 2010 Objectives⁷ for the percentage of premature births among all women, irrespective of risk. Whereas it is a national goal to eliminate disparities in health outcomes among populations, health statistics 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 5 also illustrates the rate(s) of premature births for the predominant ethnic group(s) within Colorado NFP, along with the respective intermediate NFP Objectives. Also included is the percentage of

premature infants for all Colorado mothers (not just low-income) from the Colorado Department of Public Health's 2004 Vital Statistics.

Birth outcomes by the mother's age may be found in Table 51 and Table 52 in Appendix B: Additional Analyses.

Figure 5. Percentage of Premature Infants by Ethnicity



Sample sizes presented are for Colorado NFP

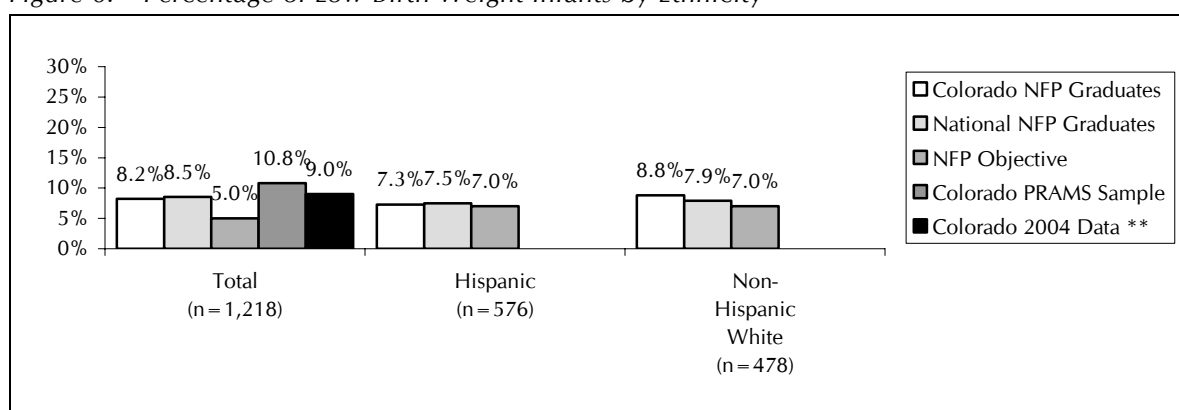
**Colorado 2004 data from the Colorado Department of Public Health Vital Statistics

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 6 demonstrates the percentage of low birth weight (LBW) infants among Colorado 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 Colorado NFP.

The Colorado PRAMS sample of low-income, first-time mothers had a low birth weight rate of 10.8%; the low birth weight rate for all Colorado mothers (not just low-income) in the Department of Public Health's 2004 Vital Statistics was 9.0%.

Figure 6. Percentage of Low Birth Weight Infants by Ethnicity



Sample sizes presented are for Colorado NFP

**Colorado 2004 data from the Colorado Department of Public Health Vital Statistics

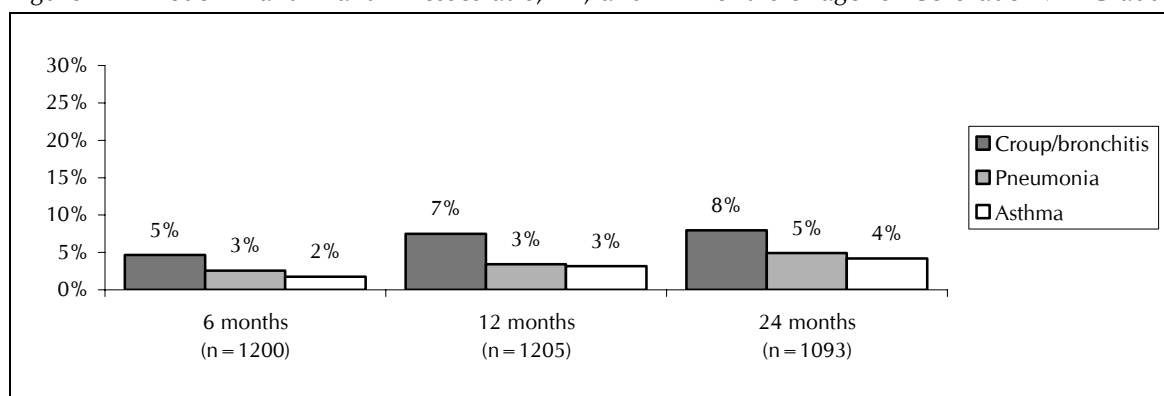
Table 16. *Other Infant Health Characteristics*

	Colorado NFP	National NFP
Percentage of LBW infants who were 5.0-5.5 lbs (n=418)	44%	42%
Percentage of infants who spent time in NICU (n=4559)	12%	13%
Average number of days in NICU (n=531)	11	12

Sample sizes presented are for Colorado NFP

ILLNESSES

Colorado 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 7 below. The most commonly reported infant illnesses among national NFP graduates are: croup/bronchitis (5-8%), asthma (2-4%), and pneumonia (3-5%).

Figure 7. *Predominant Infant Illnesses at 6, 12, and 24 months of age for Colorado NFP Graduates*

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 17. Table 18 provides the percentage of infants considered to have one or more developmental delay(s).

Table 17. Method of Assessment for Developmental Delay Determined At 6, 12, and 24 Months

		Colorado NFP	National NFP
Method [†]		Graduates	Graduates
At 6 months (N = 1200)	Denver II	4%	21%
	Ages & Stages questionnaire	76%	47%
	Nurse observation	69%	61%
	Physician or health care provider	5%	4%
At 12 months (N = 1205)	Denver II	6%	22%
	Ages & Stages questionnaire	84%	52%
	Nurse observation	72%	64%
	Physician or health care provider	5%	4%
At 24 months (N = 1093)	Denver II	5%	22%
	Ages & Stages questionnaire	92%	54%
	Nurse observation	80%	68%
	Physician or health care provider	6%	6%

[†]More than one category could be chosen

Sample sizes presented are for Colorado NFP

Table 18. Developmental Delays at 6, 12, and 24 Months

	Colorado NFP Graduates			National NFP Graduates		
	6 Months	12 Months	24 Months	6 Months	12 Months	24 Months
N	1,200	1,205	1,090	7,255	7,396	7,213
Percentage of children with delay ^a	3%	3%	8%	2%	3%	8%
Types of delay ^b						
Gross Motor	3%	2%	1%	2%	2%	1%
Fine Motor	1%	1%	1%	1%	1%	2%
Mental/Cognitive	†	†	†	†	†	1%
Speech/Language	†	1%	8%	†	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%

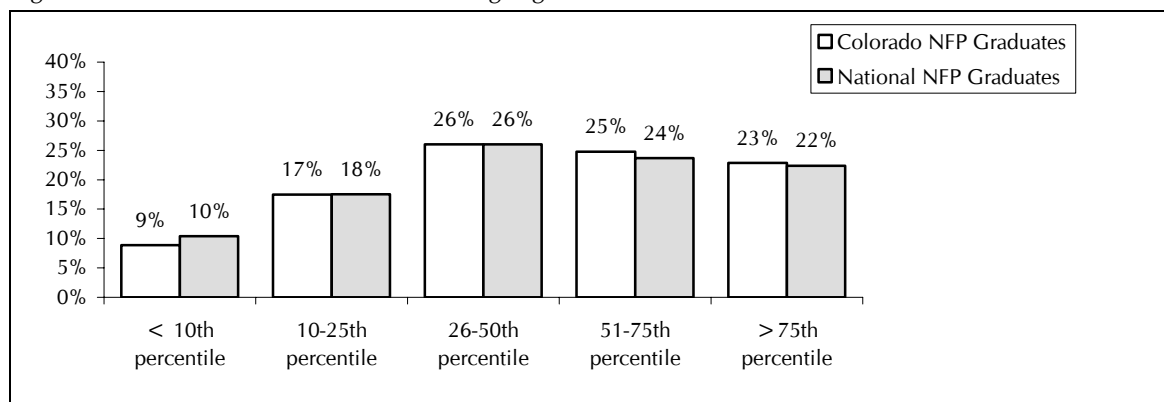
LANGUAGE DEVELOPMENT

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 8 shows the percentile breakdown of language scores for toddlers of Colorado 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 8. Percentile Breakdown of Language Production Scores for Toddlers

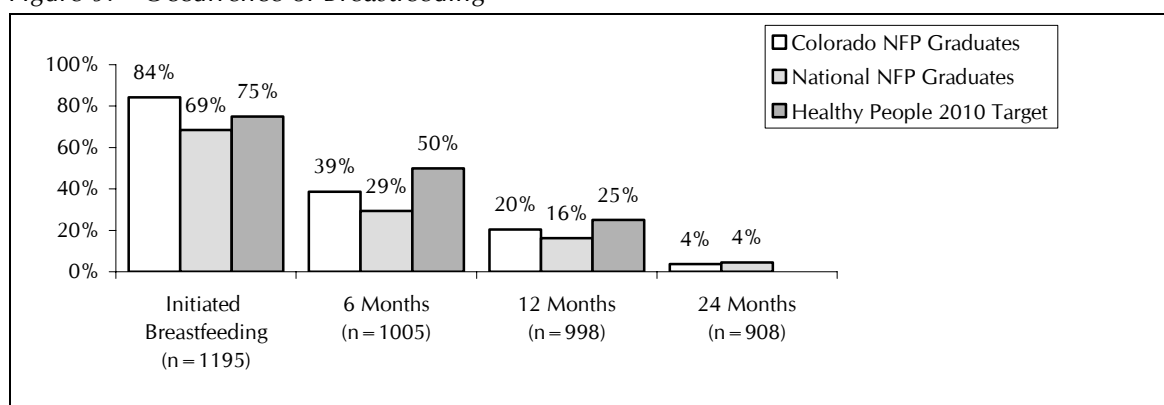


N = 1158 for Colorado NFP

BREASTFEEDING

Figure 9 illustrates breastfeeding rates reported at 6, 12, and 24 months of infant age for Colorado 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 The Colorado PRAMS sample showed that 83% of mothers initiated breastfeeding, 61% of all mothers continued to breastfeed at five weeks postpartum, and 55% at nine weeks postpartum.

Figure 9. Occurrence of Breastfeeding



Sample sizes presented are for Colorado NFP

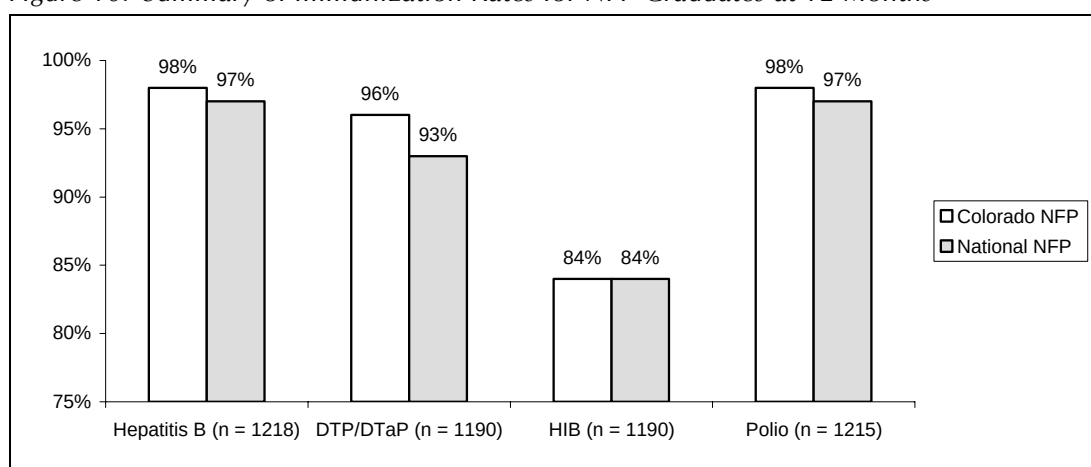
IMMUNIZATIONS

Figures 10 and 11 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 Colorado 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.

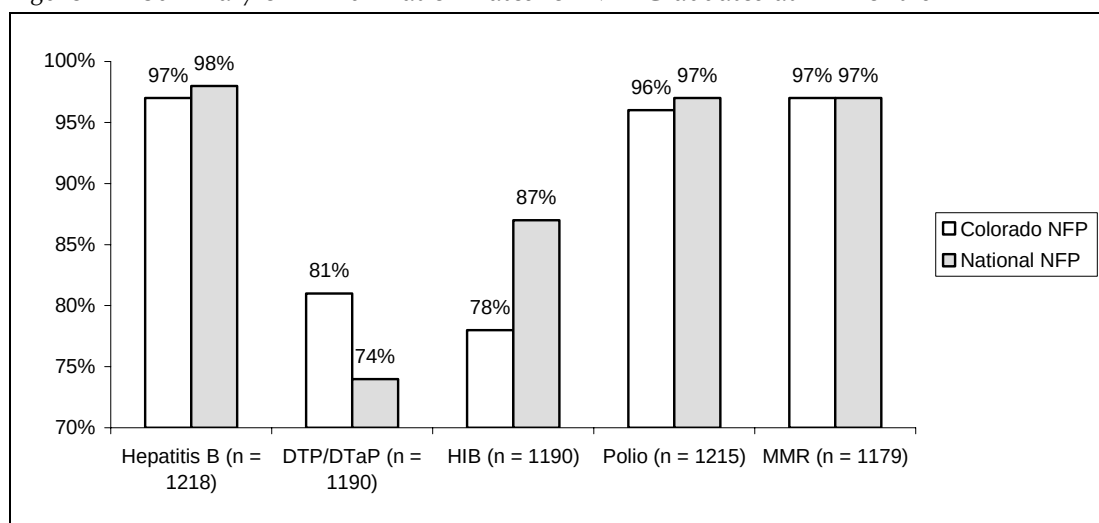
In addition, a lower completion rate of DTP/DTaP at 24 months may reflect vaccine shortages over past years, resulting in the decision by many health care providers to defer the fourth dose of the vaccine given at 15-18 months in order to assure that there was an adequate supply of the vaccine for immunization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

Figure 10. Summary of Immunization Rates for NFP Graduates at 12 Months



Sample sizes presented are for Colorado NFP Graduates

Figure 11. Summary of Immunization Rates for NFP Graduates at 24 Months



Sample sizes presented are for Colorado NFP Graduates

EMERGENCY ROOM VISITS AND HOSPITALIZATIONS

Table 19 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 Colorado 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 19. Percentage of and Reasons for Emergency Department Visits and Hospitalizations Reported at 6, 12, and 24 Months of Age by Colorado NFP Graduates

Emergency Department Visits		Hospitalizations	
6 Months (n = 1189)		6 Months (n = 1166)	
0 visits	58%	0 admissions	90%
1 visit	24%	1 admission	8%
2 visits	9%	2 admissions	2%
3+ visits	8%	3+ admissions	1%
Reasons (n = 899)		Reasons (n = 142)	
Illness	92%	Illness	94%
Injury	7%	Injury	6%
Ingestion	1%	Ingestion	0%
12 Months (n = 1194)		12 Months (n = 1177)	
0 visits	53%	0 admissions	92%
1 visit	26%	1 admission	7%
2 visits	11%	2 admissions	1%
3+ visits	9%	3+ admissions	0%
Reasons (n = 1000)		Reasons (n = 112)	
Illness	92%	Illness	90%
Injury	6%	Injury	8%
Ingestion	2%	Ingestion	2%
24 Months (n = 1080)		24 Months (n = 1068)	
0 visits	58%	0 admissions	91%
1 visit	21%	1 admission	7%
2 visits	10%	2 admissions	1%
3+ visits	11%	3+ admissions	0%
Reasons (n = 957)		Reasons (n = 119)	
Illness	87%	Illness	92%
Injury	10%	Injury	4%
Ingestion	2%	Ingestion	3%

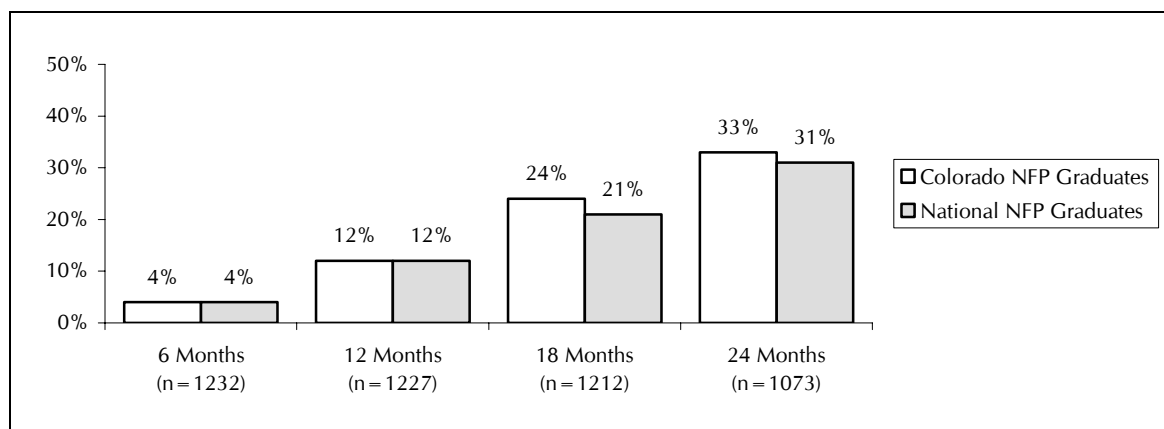
MATERNAL LIFE COURSE DEVELOPMENT

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

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



Sample sizes presented are for Colorado 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 13 tracks those participants who entered the program *without* a high school diploma or GED in terms of diploma/GED completion and school enrollment.

Figure 13. Education Status over Time for Colorado NFP Graduates with No High School Diploma or GED at Intake

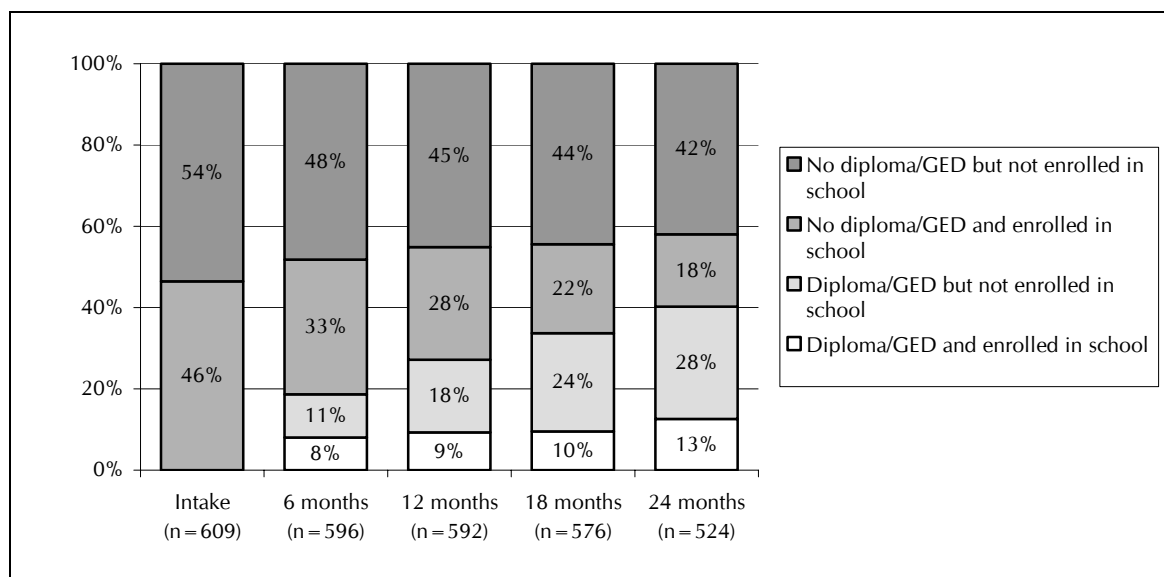
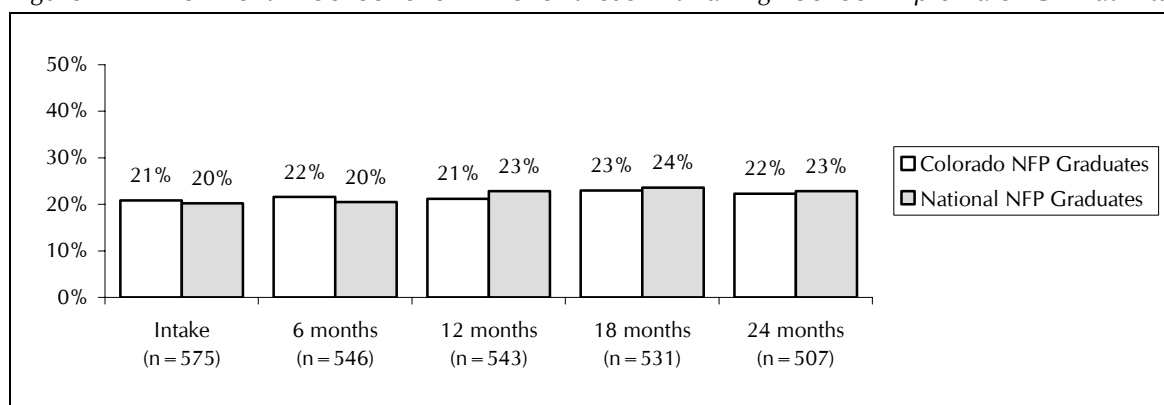


Figure 14 tracks enrollment in schooling beyond high school for those NFP graduates who entered the program *with* a high school diploma or GED.

Figure 14. Enrollment in School over Time for those with a High School Diploma or GED at Intake

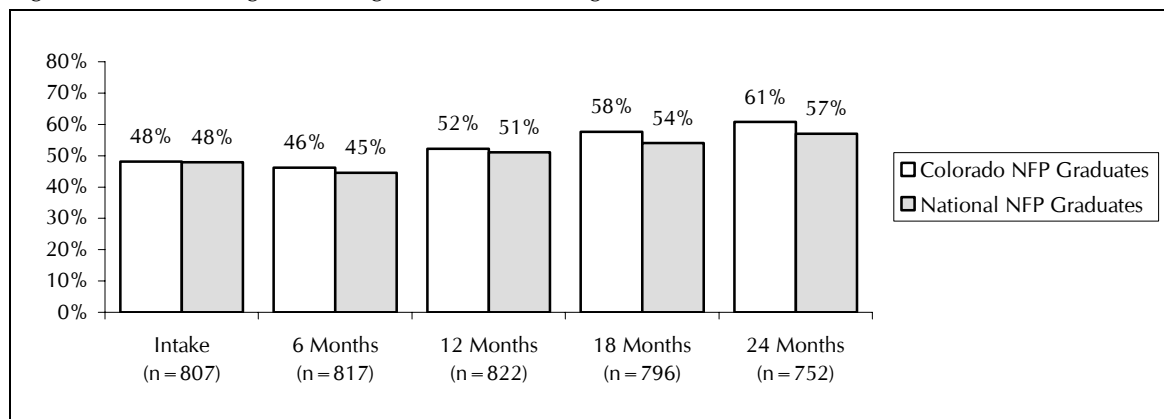


Sample sizes presented are for Colorado NFP

WORKFORCE PARTICIPATION

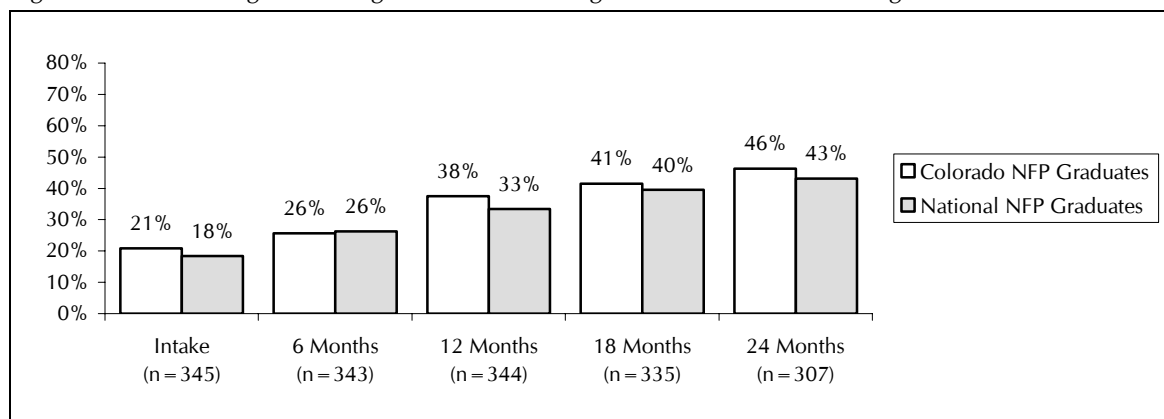
Participation in the workforce is another area that is tracked as an indicator of the mother's life course development. The percentage participating in the workforce at different time points and the amount of time spent in the workforce are considered. Figure 15 and Figure 16 note the percentage of participants in the workforce over time broken down by age for both Colorado NFP graduates and national NFP graduates.

Figure 15. Percentage Working over Time among those 18 Years or Older at Intake



Sample sizes presented are for Colorado NFP

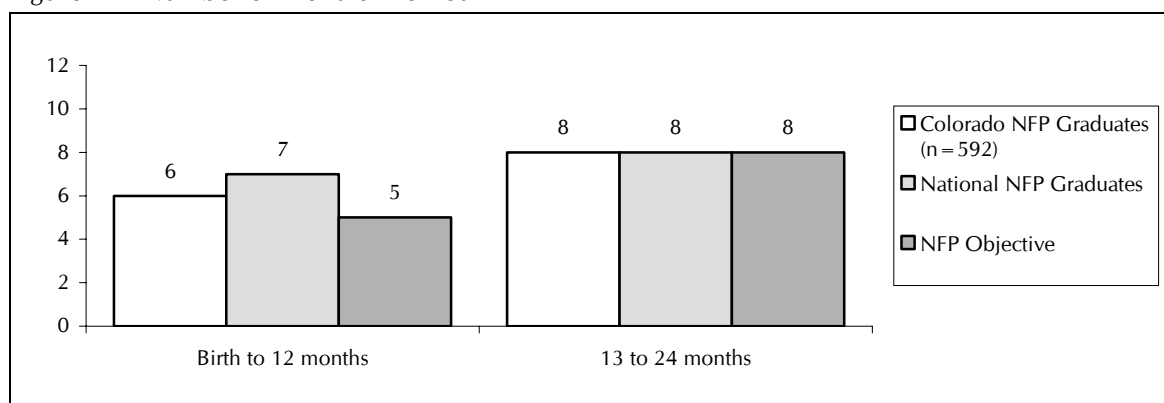
Figure 16. Percentage Working over Time among those 17 Years or Younger at Intake



Sample sizes presented are for Colorado NFP

For participants who reported working at 12 and 24 months of toddler age, the numbers of months they worked during the first (0-12 months) and second (13-24 months) postpartum years are tracked. The average number of months Colorado NFP graduates worked is noted in Figure 17, along with the national NFP rates and NFP Objectives.

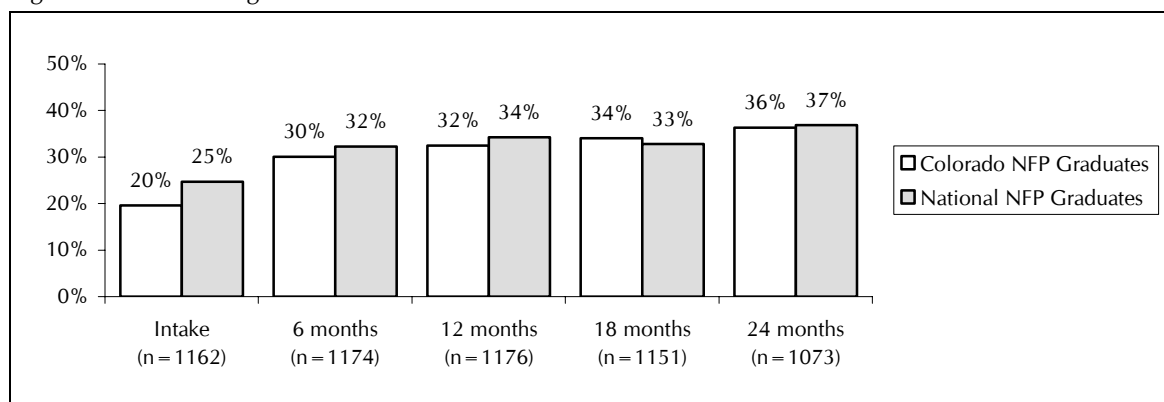
Figure 17. Number of Months Worked



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 18 demonstrates the percentage of participants who were married from intake to 24 months of infant age.

Figure 18. Percentage Married over Time

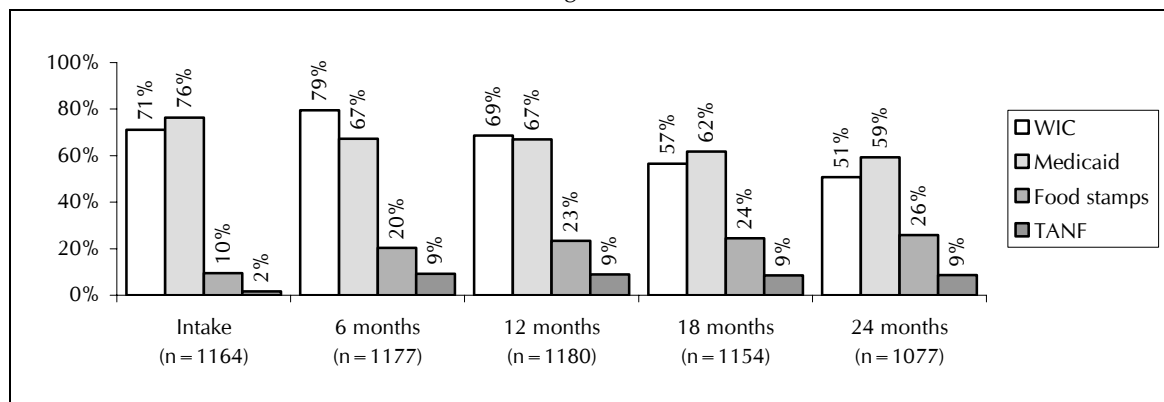


Sample sizes presented are for Colorado NFP

USE OF PUBLIC ASSISTANCE PROGRAMS

Colorado NFP graduates 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 19 below.

Figure 19. Percentage of Colorado NFP Graduate Using Government Assistance between Program Intake and 24 months of Toddler Age



PART III:
COMPARISON OF COLORADO NFP
COHORT 1 AND COHORT 2

COHORT COMPARISONS

Colorado 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 20 notes various demographic characteristics of the participants in Cohorts 1 and 2 and the cohorts combined.

Table 20. Characteristics of Participants at Program Entry by Cohort

	Cohort 1 Participants [†]	Cohort 2 Participants [‡]	Both Cohorts	National NFP Participants
Number Enrolled	2,412	4,191	6,603	62,348
Demographic Characteristics				
Maternal age (median)	19	19	19	19
Maternal education (median)	11	11	11	11
Completed high school*	42%	47%	45%	48%
Unmarried*	83%	80%	81%	81%
First-time mothers	99%	99%	99%	98%
Race/Ethnicity*				
Hispanic	45%	48%	47%	21%
Native American	2%	2%	2%	5%
African American/Black	5%	3%	4%	19%
Non-Hispanic White	41%	41%	41%	48%
Multiracial/other	6%	4%	5%	5%
Asian	1%	1%	1%	1%
Economic Factors				
Annual household income (median)	\$13,500	\$13,500	\$13,500	\$13,500
Unemployed*	61%	66%	64%	65%
Use of Government Assistance				
WIC	69%	70%	70%	75%
Medicaid	75%	72%	73%	65%
Food Stamps*	9%	13%	11%	17%
TANF	2%	3%	2%	5%
Household Size				
Number in household (median)	3	3	3	3
Household Composition*				
Lives alone	4%	5%	5%	6%
Lives with husband/boyfriend	41%	45%	44%	38%
Lives with mother	37%	35%	36%	40%
Lives with others	17%	16%	16%	16%

[†] Cohort 1 participants entered the program between February 1, 2000, and January 31, 2003

[‡] Cohort 2 participants entered the program between February 1, 2003, and June 30, 2006

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

Table 21. *Participants' Ages at Program Entry by Cohort*

	Cohort 1	Cohort2	Both Cohorts	PRAMS Colorado Sample	National NFP 2000-2006
Less than 15 years	4%	3%	3%		3%
15 - 19 years	57%	51%		36%	56%
15 - 17 years	30%	26%	27%		28%
18 - 19 years	27%	25%	26%		28%
20 - 24 years	28%	32%	31%	43%	30%
25 years and older	10%	14%	13%	21%	10%
25 - 29 years	7%	9%	8%		7%
25 - 34 years				19%	
30 years or older	4%	5%	5%		3%
35 years or older				2%	

As noted in Part I of this report, maternal mental health and sense of mastery are measured at intake. Table 22 provides this information for both cohorts.

Table 22. *Psychosocial Participant Characteristics by Cohort*

	Cohort 1 (N = 2194)	Cohort 2 (N = 3843)
Percent with mental health score greater than 3.0	80%	83% *
Percent with mastery score greater than 3.0	51%	52%

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

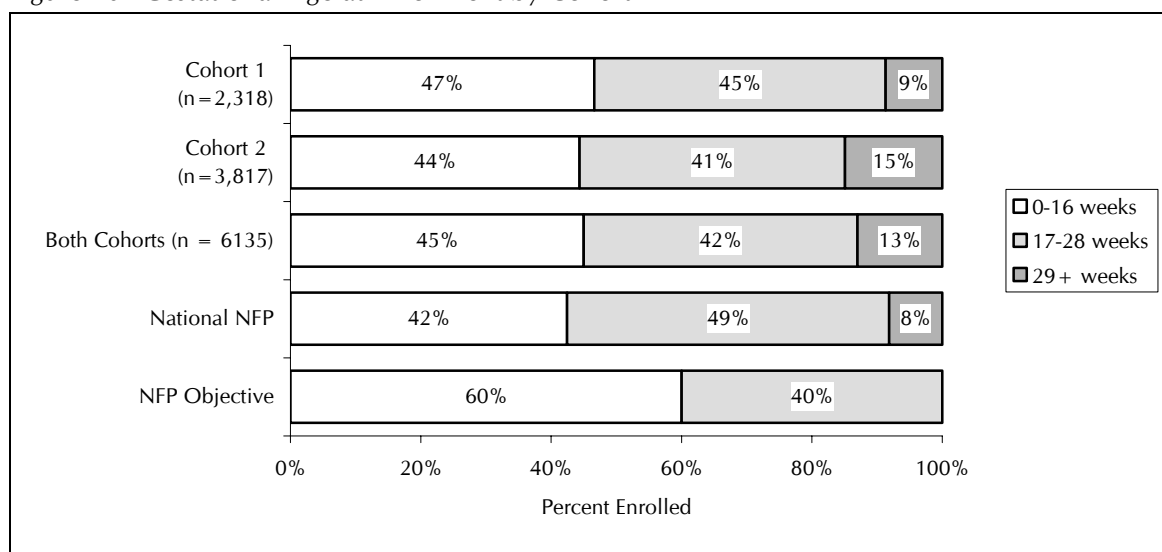
PROGRAM IMPLEMENTATION

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

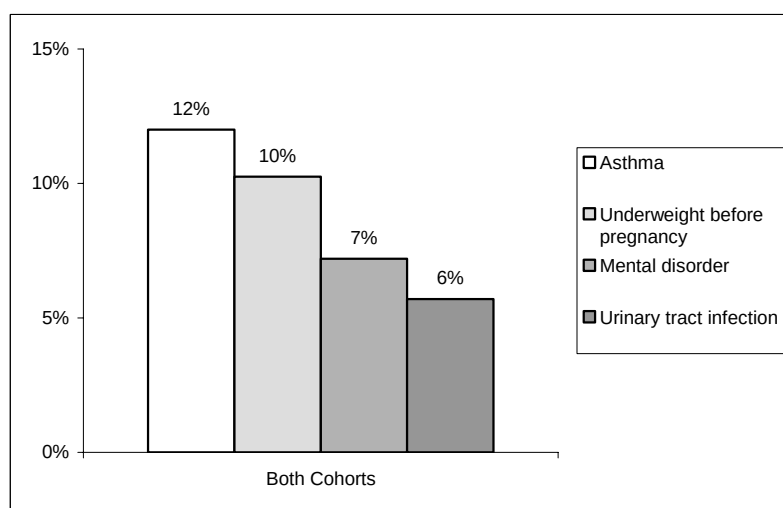
Figure 20 presents information on when participants entered the program during their pregnancies for Cohort 1, Cohort 2, and the national sample of NFP participants, and provides NFP Objectives. Enrolling clients early enough in the program allows home visitors sufficient time to establish a bond with the participant prior to the birth of her baby. This may help limit attrition for reasons considered amenable to intervention 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. Additionally, Colorado statute stipulates that women can be enrolled up to one month postpartum.

Figure 20. Gestational Age at Enrollment by Cohort



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 by Colorado NFP cohort are noted in Figure 21.

Figure 21. Predominant Maternal Health Problems at Program Intake by Colorado NFP Cohort



N=6151

REASONS PARTICIPANTS DROPPED FROM THE PROGRAM

Table 23 notes the reasons participants dropped from the program during each program phase for both cohorts. In all program phases, the primary reason that Colorado NFP participants left the program was because they moved from their program service areas, a factor over which programs have little control. Table 23 compares, by reason, the percentages of Colorado NFP participants who left the program to percentages for national NFP participants; Colorado participants are excluded from the national NFP numbers in this table. Further analyses on participant attrition may be found in Appendix B: Additional Analyses.

Table 23. Reasons Participants Dropped by Cohort

	Cohort 1	Cohort 2
	(n =2348)	(n =3495) *
Pregnancy		
Declined further participation	4.7%	3.4% *
Excessive missed appointments	1.2%	0.5% *
Unable to locate	1.7%	2.3%
Moved out of service area	5.9%	3.5% *
Miscarry/death	2.3%	2.1%
Maternal death	0.0%	0.0%
Child not in custody	0.0%	0.0%
Unable to provide services	0.6%	0.1% *
No visits for ≥180 days	0.0%	0.0%
Total	16.3%	11.9%
Infancy	(n =2347)	(n =2107)
Declined further participation	8.8%	9.3%
Excessive missed appointments	3.4%	1.7% *
Unable to locate	5.3%	5.6%
Moved out of service area	11.9%	13.0%
Infant death	0.3%	0.3%
Maternal death	0%	0.0%
Child not in custody	0.5%	0.6%
Unable to provide services	0.7%	0.7%
No visits for ≥180 days	0.0%	0.0%
Total	30.8%	31.1%
Toddlerhood	(n =2347)	(n =999)
Declined further participation	3.5%	4.1%
Excessive missed appointments	1.5%	1.6%
Unable to locate	3.8%	3.5%
Moved out of service area	6.2%	6.3%
Infant death	0.0%	0.1%
Maternal death	0.0%	0.1%
Child not in custody	0.5%	0.6%
Unable to provide services	0.2%	0.5%
No visits for ≥180 days	0.0%	0.0%
Total	15.7%	16.8%

*Statistically significant difference at $p < .05$

Table 24. Reasons Colorado Participants Dropped compared to National NFP

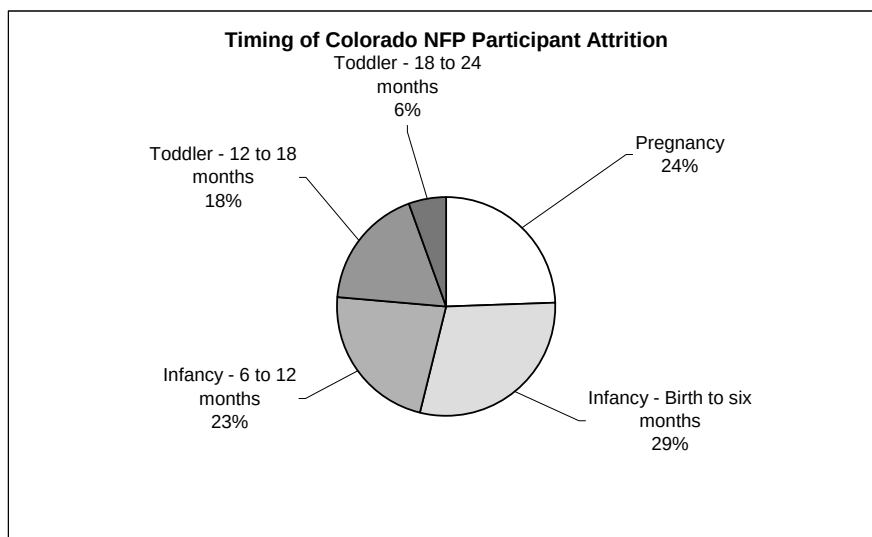
	Both Cohorts	
	Colorado NFP	National NFP
Pregnancy (n =5843)		*
Declined further participation	3.9%	4.7% *
Excessive missed appointments	0.8%	2.0% *
Unable to locate	2.0%	2.2%
Moved out of service area	4.5%	2.9% *
Miscarry/death	2.2%	1.9%
Maternal death	0.3%	†
Child not in custody	†	†
Unable to provide services	0.3%	0.2% *
No visits for ≥180 days	0.1%	1.5% *
Total	14.0%	15.4%
Infancy (n =4454)		*
Declined further participation	9.0%	10.1% *
Excessive missed appointments	2.6%	4.8% *
Unable to locate	5.4%	5.5%
Moved out of service area	12.4%	6.7% *
Infant death	0.3%	0.3%
Maternal death	0.1%	0.0%
Child not in custody	0.5%	0.5%
Unable to provide services	0.7%	0.4% *
No visits for ≥180 days	0.1%	2.2% *
Total	31.1%	30.5%
Toddlerhood (n =3346)		*
Declined further participation	3.7%	5.1% *
Excessive missed appointments	1.5%	2.7% *
Unable to locate	3.7%	2.9% *
Moved out of service area	6.3%	3.0% *
Infant death	0.0%	0.1%
Maternal death	0.0%	0.0%
Child not in custody	0.5%	0.3% *
Unable to provide services	0.3%	0.2%
No visits for ≥180 days	0.2%	1.0% *
Total	16.2%	15.3%

* Statistically significant difference at $p < .05$
Sample sizes presented are for Colorado NFP

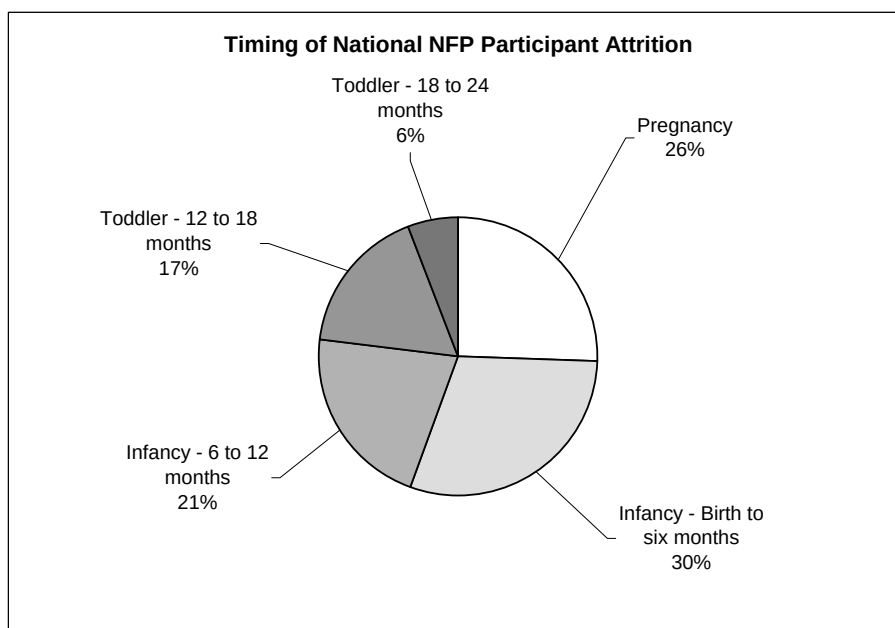
TIMING OF PARTICIPANT ATTRITION

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 Colorado NFP by June 30, 2006 but dropped out before completion, Table 25 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 25. *Timing of Participant Attrition*



Of 3,425 participants who could have graduated from the program by June 30, 2006, 2,029 (59%) dropped out before completion. There were 143 participants (4%) 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. 1,253 participants (37%) completed the program.



NUMBER AND DURATION OF COMPLETED NURSE HOME VISITS

Table 26 shows the number and duration of completed home visits for both cohorts as well as NFP Objectives. 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. This is the benchmark against which sites should compare their performance. Information also is presented in the table on the percentage of expected visits completed for those participants who actually did complete the program phase.

Table 26. Number and Duration of Completed Nurse Home Visits by Cohort

	Cohort 1		Cohort 2		National NFP		NFP
	Number	Average	Number	Average	Number	Average	Objective
Pregnancy							
Pregnancy Completed	2,348	-	3,495	-	51745	-	-
Completed Visits	20,805	8.9	29,203	8.4	426900	8.3	-
Expected Visits	28,662	-	38,251	-	629227	-	-
Percentage of Expected Visits Completed - All Participants**	-	77%	-	82%	-	74%	80%
Percentage of Expected Visits Completed - Phase Completers***	-	85%	-	87%	-	-	-
Attempted Visits [†]	2,514	1.1	3,262	0.9	55469	1.1	-
Average Visit Length (Minutes)	-	74.0	-	72.5	-	74.7	60
Average Total Contact Time (Minutes)	-	658	-	607	-	613	-
Infancy							
Infancy Completed	2,347	-	2,107	-	42907	-	-
Completed Visits	28,311	12.1	27,546	13.1	477341	11.1	-
Expected Visits	66,337	-	59,554	-	1210412	-	-
Percentage of Expected Visits Completed - All Participants**	-	43%	-	46%	-	39%	65%
Percentage of Expected Visits Completed - Phase Completers***	-	66%	-	66%	-	-	-
Attempted Visits [†]	4,600	2.0	4,075	1.9	82319	1.9	-
Average Visit Length (Minutes)	-	71.9	-	69.7	-	72.5	60
Average Total Contact Time (Minutes)	-	882	-	917	-	808	-
Toddlerhood							
Toddlerhood Completed	2,347	-	999	-	35,104	-	-
Completed Visits	14,911	6.4	6,791	6.8	181357	5.2	-
Expected Visits	48,006	-	20,390	-	715773	-	-
Percentage of Expected Visits Completed - All Participants**	-	31%	-	33%	-	25%	60%
Percentage of Expected Visits Completed - Phase Completers***	-	75%	-	71%	-	-	-
Attempted Visits [†]	2,911	1.2	1,195	1.2	35759	1.0	-
Average Visit Length (Minutes)	-	71.7	-	70.0	-	70.5	60
Average Total Contact Time (Minutes)	-	463	-	480	-	368	-

**Includes all participants who have – or should have based on the child's age – completed the program phase; this is the benchmark for the program objective and is comparable to data from the randomized control trials.

***Includes only participants who, as active program participants, did complete that program phase.

[†]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 or 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 the age of the child. Table 27 notes the time spent on each domain area by cohort and includes the NFP Objectives for percentage of time spent on different domains.

Table 27. Average Percent of Nurse Visit Time Spent on Each Domain by Phase and Cohort

	Cohort 1	Cohort 2	Both Cohorts	National NFP	NFP Objective
Pregnancy	(N = 2,318)	(N = 3,275)	(n = 5,593)		
Personal Health	37%	37%	37%	37%	35-40%
Environmental Health	9%	8%	8%	11%	5-7%
Life-course Development	13%	12%	13%	14%	10-15%
Maternal Role	25%	29%	27%	23%	23-25%
Friends & Family	15%	14%	14%	15%	10-15%
<i>Time on planned material</i>	<i>89%</i>	<i>91%</i>	<i>90%</i>	<i>93%</i>	-
Infancy	(N = 1,842)	(N = 1,743)	(n = 3,585)		
Personal Health	21%	19%	20%	21%	14-20%
Environmental Health	10%	9%	9%	12%	7-10%
Life-course Development	14%	13%	13%	14%	10-15%
Maternal Role	41%	47%	44%	38%	45-50%
Friends & Family	14%	13%	14%	15%	10-15%
<i>Time on planned material</i>	<i>86%</i>	<i>89%</i>	<i>87%</i>	<i>91%</i>	-
Toddlerhood	(N = 1086)	(N = 507)	(n = 1,593)		
Personal Health	16%	15%	16%	17%	10-15%
Environmental Health	10%	10%	10%	14%	7-10%
Life-course Development	16%	17%	17%	17%	18-20%
Maternal Role	43%	44%	43%	38%	40-45%
Friends & Family	15%	14%	14%	15%	10-15%
<i>Time on planned material</i>	<i>85%</i>	<i>89%</i>	<i>87%</i>	<i>90%</i>	-

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

Table 28. Change in Percent Smoking during Pregnancy by Cohort over Time

	Intake	36 Weeks of Pregnancy	Percent Changed
Cohort 1 (N = 1,642)			
Cigarette smoker	17%	13%	-25% *
Smoked 5+ cigarettes last 48 hrs.	7%	6%	-19% *
Cohort 2 (N = 2,637)			
Cigarette smoker	14%	12%	-16% *
Smoked 5+ cigarettes last 48 hrs.	6%	5%	-20% *
Both Cohorts (n = 4,279)			
Cigarette smoker	15%	12%	-20% *
Smoked 5+ cigarettes last 48 hrs.	6%	5%	-20% *

*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 29 provides this information by cohort.

Table 29. Change in Number of Cigarettes Smoked per Day during Pregnancy by Cohort

	Average Change
Cohort 1 (n = 113)	-3.3 *
Cohort 2 (n = 160)	-3.4 *
Both Cohorts (n = 273)	-3.4

*Statistically significant change at $P < .05$

CHANGE IN EXPERIENCE OF DOMESTIC VIOLENCE

Data on domestic violence are collected from participants at program intake and at 36 weeks of pregnancy. Change in the experience of physical abuse and in fear of a partner or other individual are presented in Table 30. Domestic violence data are based on self-reported information which may not be divulged until the nurse/client relationship has developed and is more trusting. The potential under-reporting of this information should be considered when looking at changes in domestic violence rates over time

Table 30. *Change in Experience of Domestic Violence between Program Intake and 36 Weeks of Pregnancy for Cohorts*

	N	Intake	36 Weeks of Pregnancy	Relative Change
Cohort 1				
Physical abuse during pregnancy	1377	85	58	-32% *
Fear of partner/other	1377	113	63	-44% *
Cohort 2				
Physical abuse during pregnancy	2576	140	72	-49% *
Fear of partner/other	2604	212	106	-50% *
Both Cohorts				
Physical abuse during pregnancy	3953	225	130	-42% *
Fear of partner/other	3981	325	169	-48% *
National NFP				
Physical abuse during pregnancy	20643	1409	822	-42% *
Fear of partner/other	20736	1406	749	-47% *

*Statistically significant at $p < .05$

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

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 22) and low birth weight (Figure 23). Birth outcomes by the mother's age may be found in Table 51 and Table 52 in Appendix B: Additional Analyses.

Figure 22. Percentage of Premature Infants by Ethnicity and Cohort

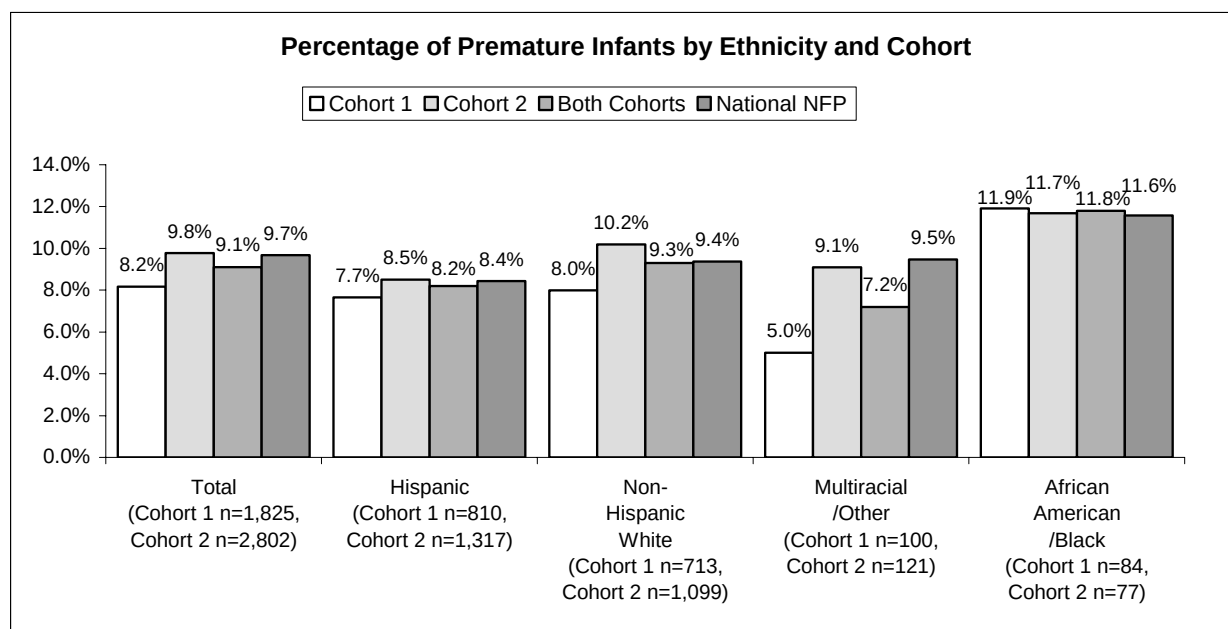
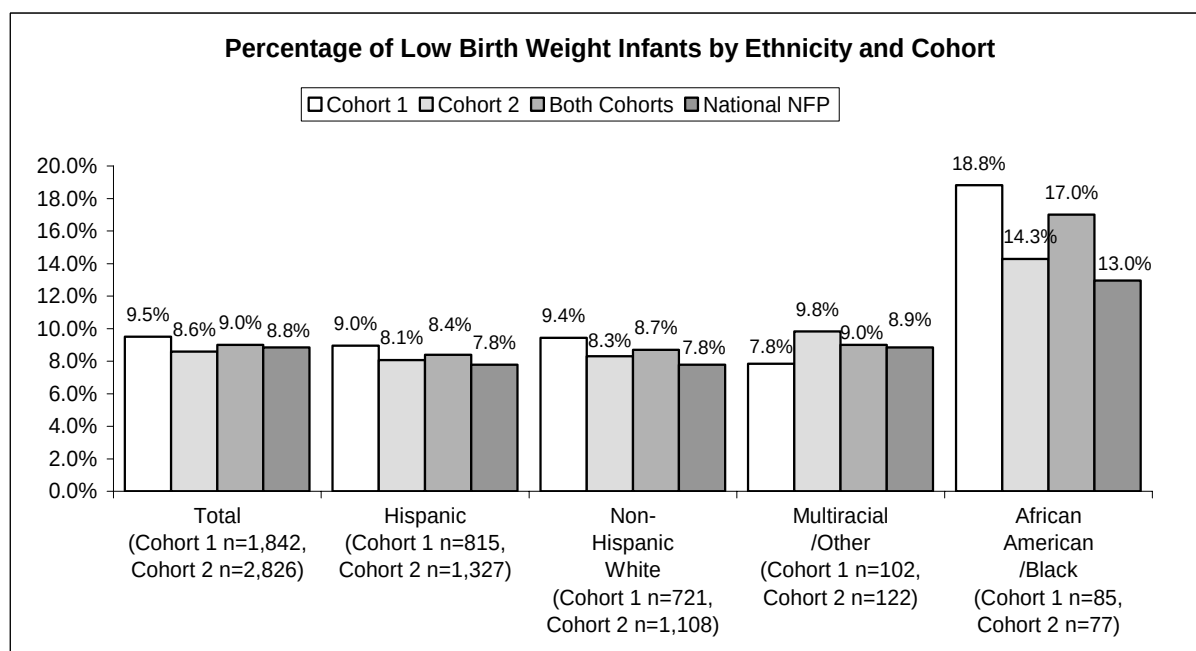


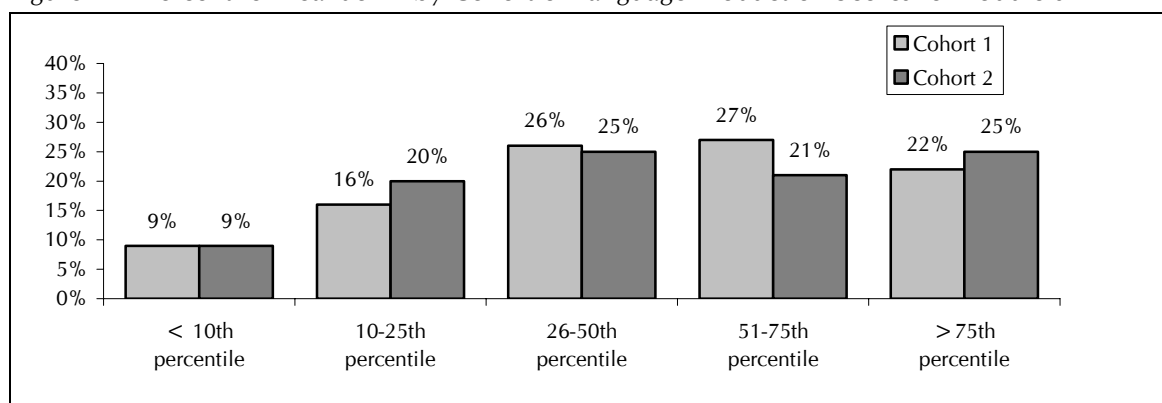
Figure 23. Percentage of Low Birth Weight Infants by Ethnicity and Cohort



LANGUAGE DEVELOPMENT

The *Language Assessment Form* (i.e., MacArthur CDI Short Form) is administered when toddlers are approximately 21 months of age.⁸ Figure 24 shows the percentile breakdown of language scores for toddlers of Colorado NFP participants shown by cohort. The NFP Objective for this measure is to have 25% or fewer toddlers scoring below the 10th percentile.

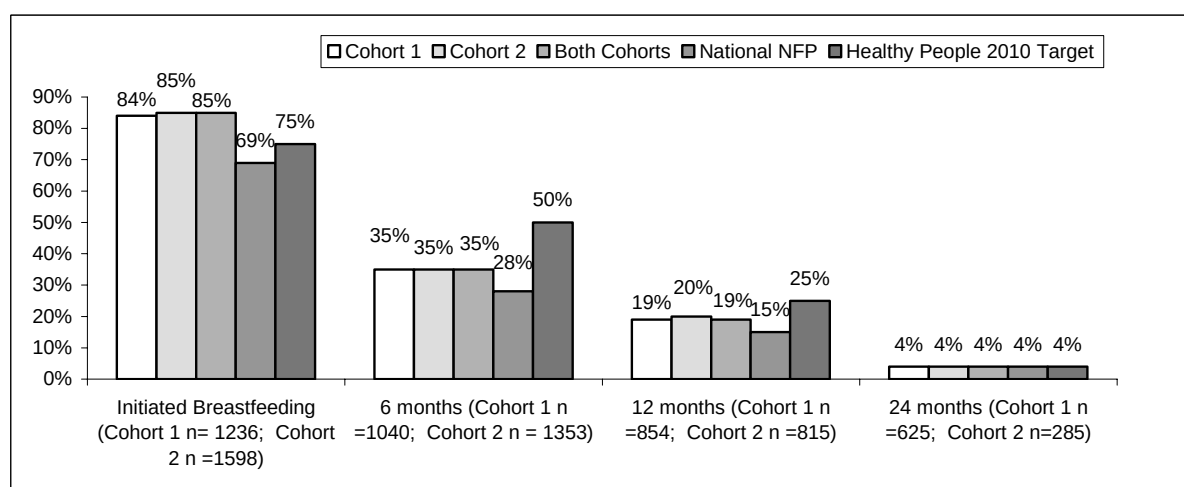
Figure 24. Percentile Breakdown by Cohort of Language Production Scores for Toddlers



BREASTFEEDING

Figure 25 illustrates breastfeeding rates reported at 6, 12, and 24 months of infant age for both cohorts.

Figure 25. Occurrence of Breastfeeding



IMMUNIZATIONS

Figure 26 notes the 12-month immunization rates for both cohorts, whereas Figure 27 provides 24-month immunization rates. Completion rates of the HIB and DTP/DTaP immunizations could be biased toward an underestimation because of differences in pharmaceutical products.

A lower completion rate of DTP/DTaP at 24 months may reflect also 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 children.

Figure 26. Summary of Immunization Rates at 12 Months of Infant Age by Cohort

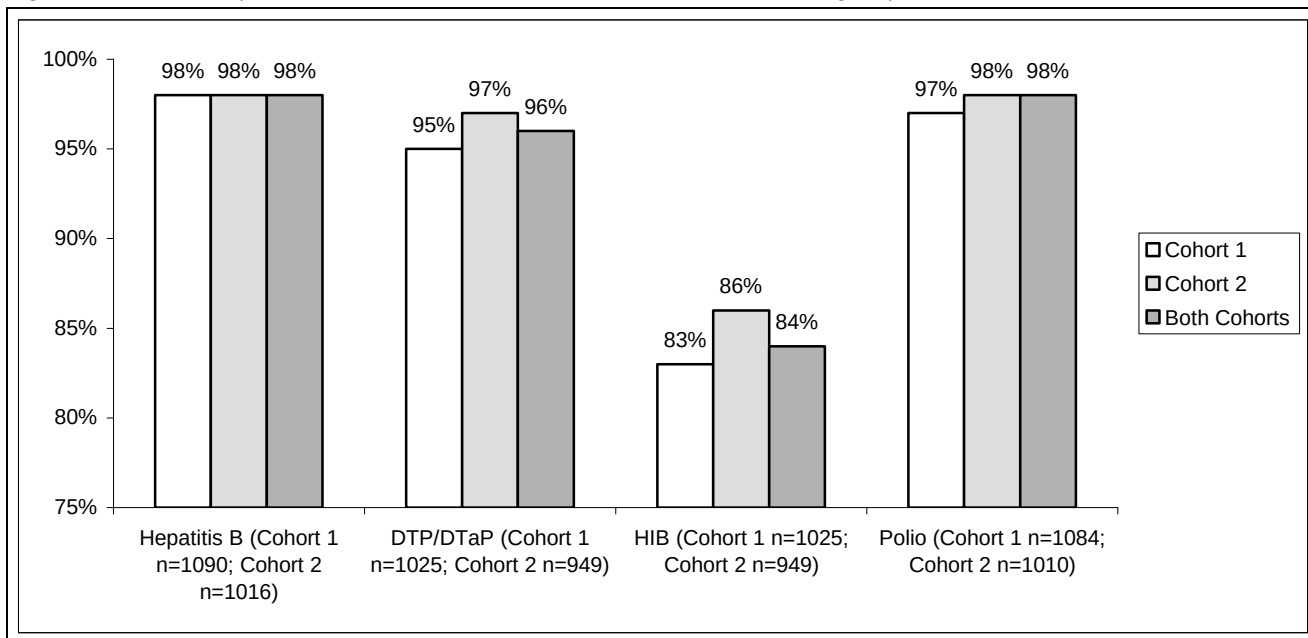
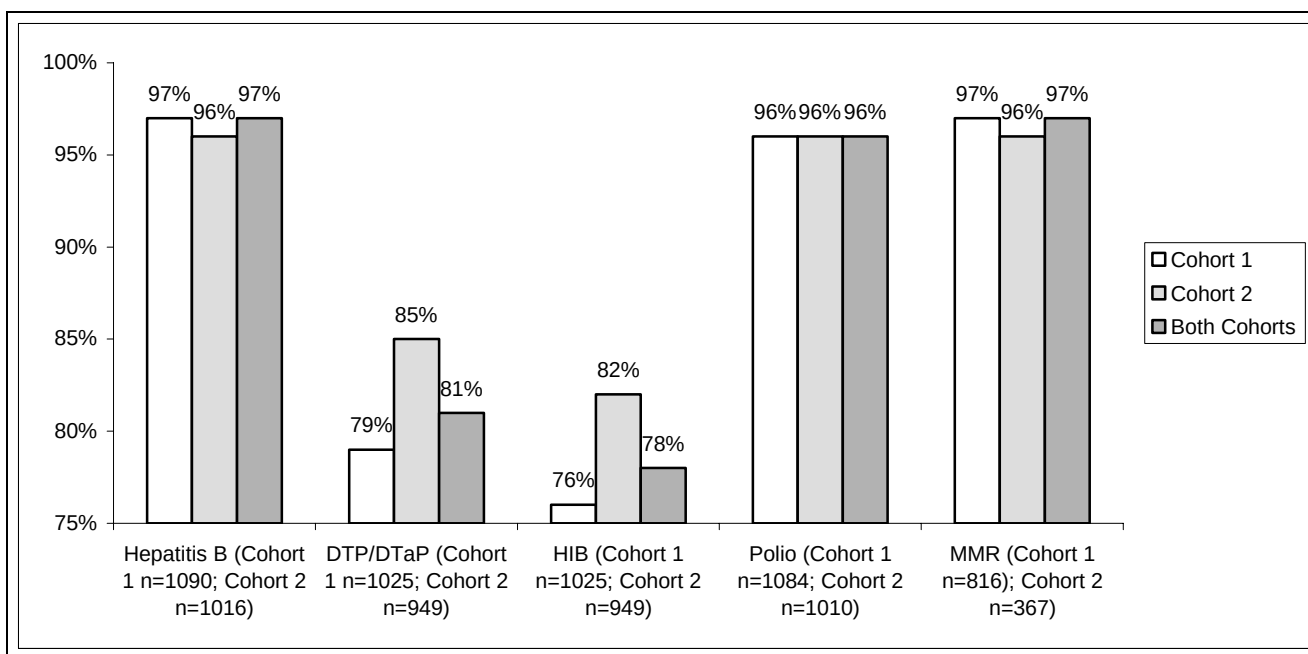


Figure 27. Summary of Immunization Rates at 24 Months of Toddler Age by Cohort



EMERGENCY ROOM VISITS AND HOSPITALIZATIONS

Table 31 displays information on the frequency of and reasons for emergency department visits and hospitalizations reported at 6, 12 and 24 months of infant age for each Colorado NFP cohort.

Table 31. *Emergency Room Visits and Hospitalizations*

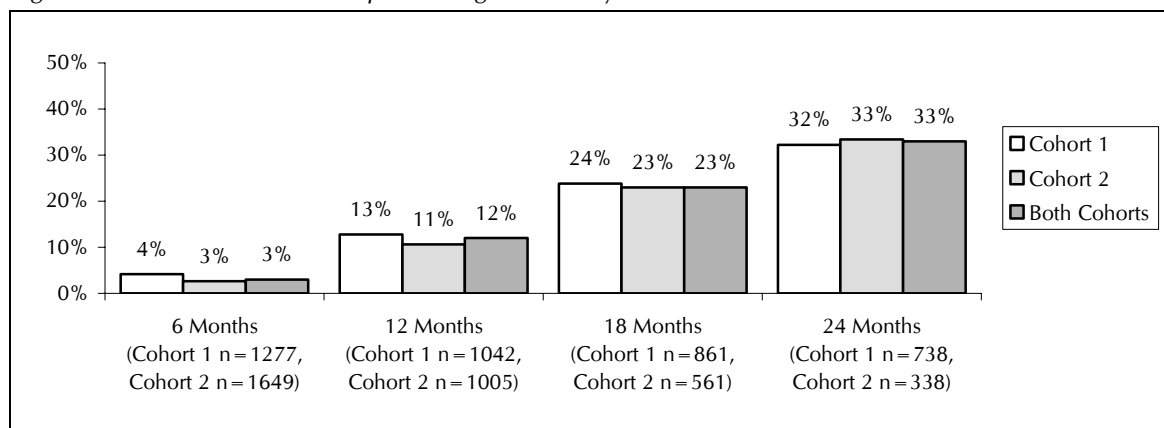
Emergency Room Visits				Hospitalizations			
	Cohort 1	Cohort 2	Both Cohorts		Cohort 1	Cohort 2	Both Cohorts
6 months	(n = 1234)	(n = 1583)	(n=2817)	6 months	(n = 1199)	(n = 1559)	n=(2758)
0 vis its	59%	59%	59%	0 vis its	91%	89%	90%
1 vis it	23%	24%	24%	1 vis it	7%	9%	8%
2 vis its	9%	11%	10%	2 vis its	2%	1%	2%
3 + vis its	9%	7%	8%	3 + vis its	0%	1%	0%
Reasons	(n = 925)	(n = 1103)	(n=2028)	Reasons	(n = 160)	(n = 237)	(n=397)
Illness	93%	93%	93%	Illness	96%	94%	95%
Injury	6%	6%	6%	Injury	5%	6%	5%
Ingestion	1%	1%	1%	Ingestion	0%	0%	0%
12 months	(n = 1022)	(n = 963)	(n=1985)	12 months	(n = 1007)	(n = 950)	(n=1957)
0 vis its	55%	50%	53%	0 vis its	93%	90%	91%
1 vis it	25%	27%	26%	1 vis it	7%	9%	8%
2 vis its	10%	12%	11%	2 vis its	0%	1%	1%
3 + vis its	10%	11%	10%	3 + vis its	0%	0%	0%
Reasons	(n = 849)	(n = 890)	(n=1739)	Reasons	(n = 83)	(n = 117)	(n=200)
Illness	91%	93%	92%	Illness	93%	87%	89%
Injury	7%	6%	7%	Injury	7%	11%	10%
Ingestion	2%	1%	2%	Ingestion	0%	2%	1%
24 months	(n = 748)	(n = 335)	(n=1083)	24 months	(n = 739)	(n = 332)	(n=1071)
0 vis its	61%	50%	58%	0 vis its	91%	90%	91%
1 vis it	20%	23%	21%	1 vis it	7%	8%	7%
2 vis its	9%	12%	10%	2 vis its	1%	2%	1%
3 + vis its	9%	16%	11%	3 + vis its	0%	0%	0%
Reasons	(n = 587)	(n = 370)	(n=957)	Reasons	(n = 76)	(n = 44)	(n=120)
Illness	85%	91%	88%	Illness	93%	91%	92%
Injury	12%	8%	10%	Injury	4%	5%	4%
Ingestion	3%	1%	2%	Ingestion	3%	5%	3%

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, educational attainment, and participation in the workforce are outcomes that address life course development.

Rates of subsequent pregnancies for Colorado NFP cohorts are shown in Figure 28 below. The NFP Objective for the rate of subsequent pregnancies is 25% or less by the child's second birthday.

Figure 28. Cumulative Subsequent Pregnancies by Cohort



Home visitors work with participants to set educational and career goals, including completion of a high school diploma or GED. Figures 29 and 30 track those participants who entered the program *without* a high school diploma or GED in terms of diploma/GED completion and school enrollment.

Figure 29. Education Status over Time by **Cohort One** For Participants with No High School Diploma or GED at Intake

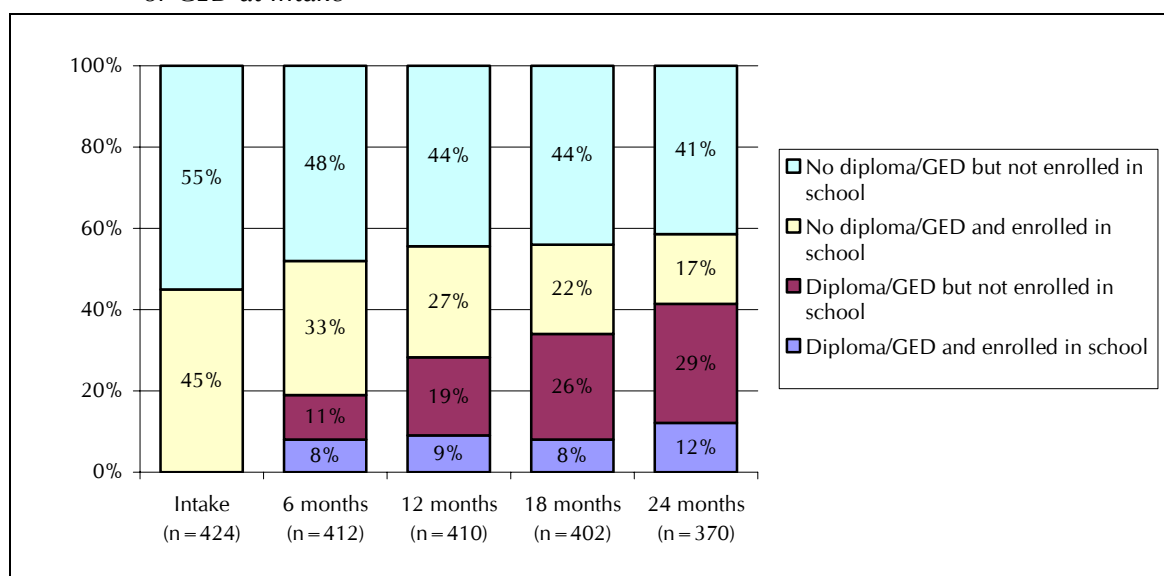


Figure 30. Education Status over Time by **Cohort Two** For Participants with No High School Diploma or GED at Intake

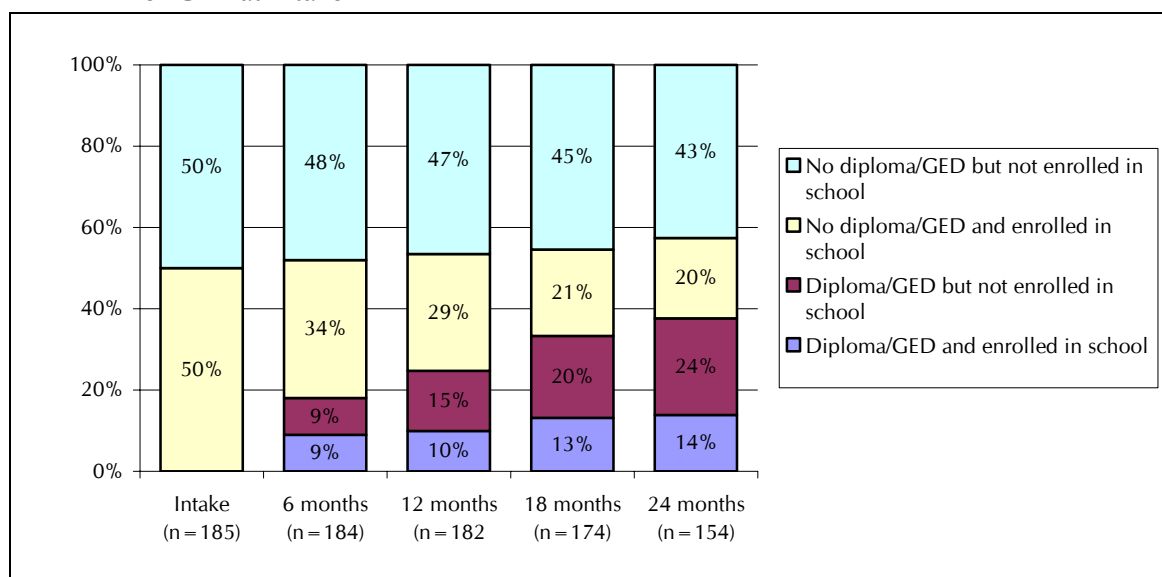
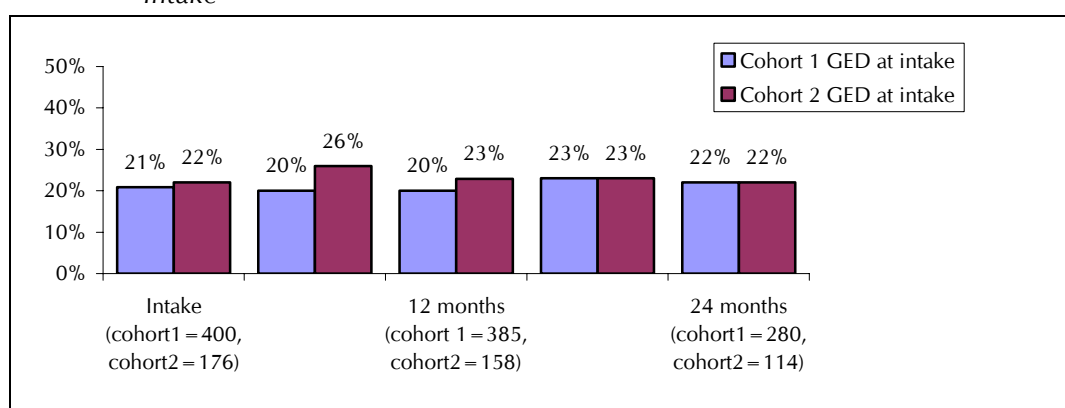


Figure 31 tracks enrollment in schooling beyond high school by cohort for those who entered the program with a high school diploma or GED.

Figure 31. Cohort Enrollment in School over Time for those with a High School Diploma or GED at Intake



Sample sizes presented are for Colorado NFP

Figure 32 and Figure 33 show the percentages of participants working over time for both cohorts by age at intake.

Figure 32. Percentage Working over Time among those 18 Years or Older at Intake

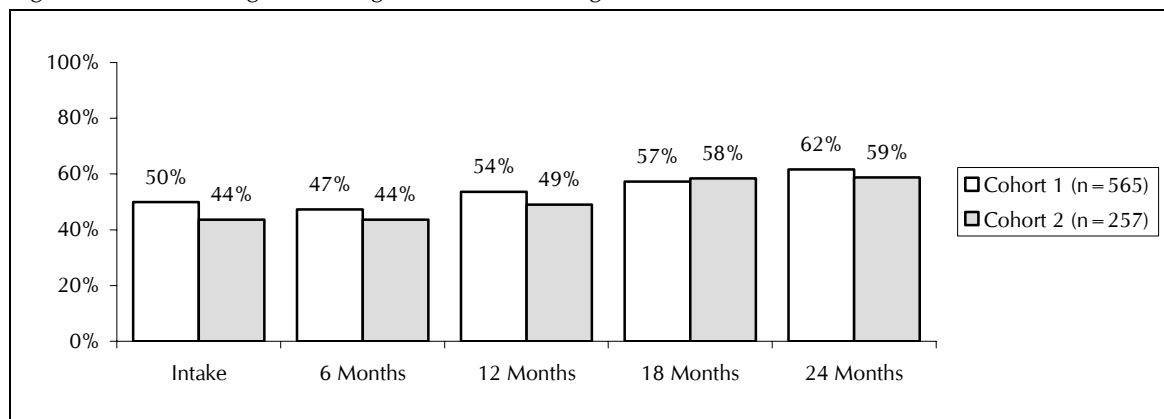
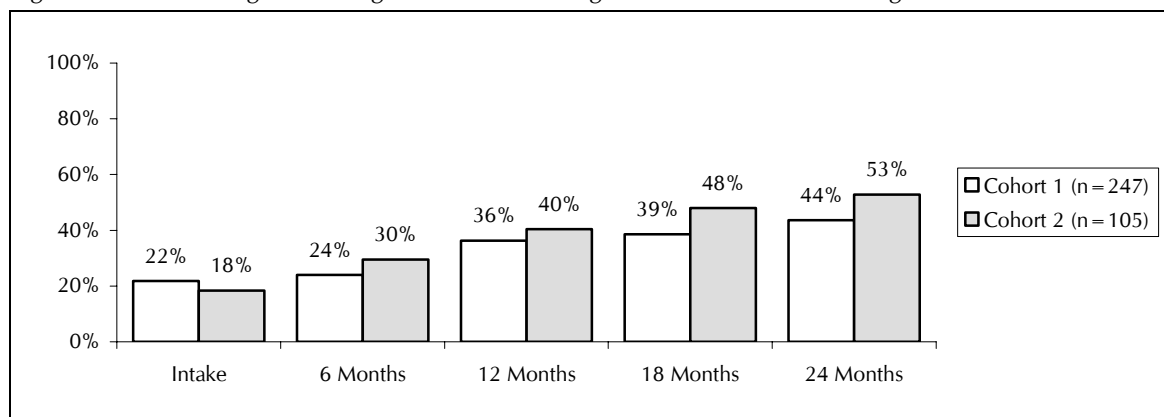
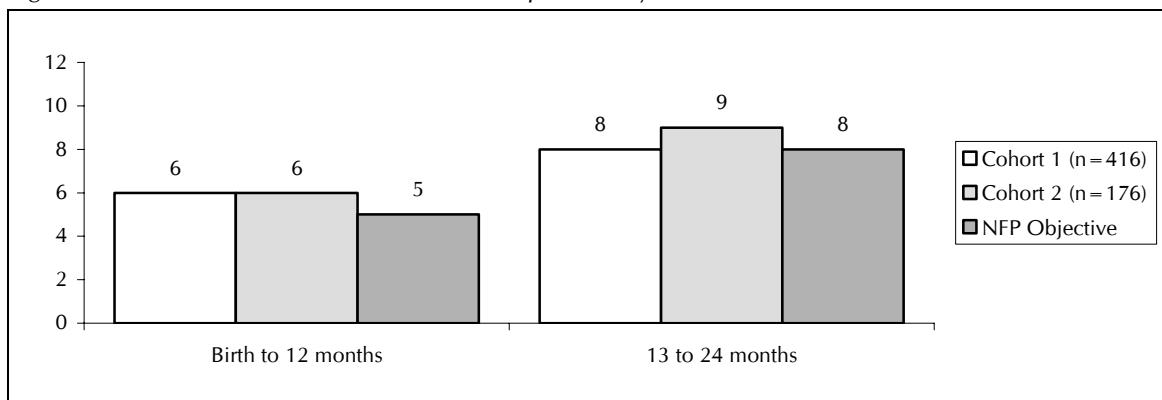


Figure 33. Percentage Working over Time among those 17 Years or Younger at Intake



Another consideration for the mother's life course is the number of months she works per year after the delivery of her baby. Figure 34 provides this information by cohort.

Figure 34. Number of Months Worked Postpartum by Cohort



CONTACTS

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APPENDIX A: COLORADO NFP DATA BY INDIVIDUAL SITE

Table 32 Participant Status by Year of Enrollment

Site	Current Status	Enrolled in 1999	Enrolled in 2000	Enrolled in 2001	Enrolled in 2002	Enrolled in 2003	Enrolled in 2004	Enrolled in 2005	All year Total
Boulder PH	Active	0	0	0	0	6	31	54	91
	Attrition	0	0	0	59	24	34	10	127
	Graduated	0	0	0	25	22	0	0	47
	Total	0	0	0	84	52	65	64	265
Denver Health BB	Active	0	0	0	0	6	36	44	86
	Attrition	43	51	109	45	22	27	24	321
	Graduated	11	30	41	22	18	2	0	124
	Total	54	81	150	67	46	65	68	531
El Paso County DHE	Active	0	0	0	1	9	34	125	169
	Attrition	0	21	66	18	38	59	34	236
	Graduated	0	9	38	14	16	0	0	77
	Total	0	30	104	33	63	93	159	482
Family Visitor Program	Active	0	0	0	0	11	19	51	81
	Attrition	0	0	0	21	58	27	7	113
	Graduated	0	0	0	9	13	1	0	23
	Total	0	0	0	30	82	47	58	217
Jefferson Cty DHE	Active	0	0	0	0	22	49	78	149
	Attrition	0	54	19	57	64	55	22	271
	Graduated	0	43	32	30	26	0	0	131
	Total	0	97	51	87	112	104	100	551
Larimer County DHE	Active	0	0	0	0	15	96	97	208
	Attrition	0	49	42	39	35	50	18	233
	Graduated	0	27	20	30	21	0	0	98
	Total	0	76	62	69	71	146	115	539
Mesa Health Dept	Active	0	0	0	0	14	47	120	181
	Attrition	0	64	55	49	27	74	38	307
	Graduated	0	15	25	20	9	0	0	69
	Total	0	79	80	69	50	121	158	557
Montrose County HHS	Active	0	0	0	0	5	23	35	63
	Attrition	0	8	52	51	44	25	17	197
	Graduated	0	1	18	22	12	1	0	54
	Total	0	9	70	73	61	49	52	314
Northeast CO Health	Active	0	0	0	0	2	13	35	50
	Attrition	0	0	0	31	30	27	13	101
	Graduated	0	0	0	8	4	1	0	13
	Total	0	0	0	39	36	41	48	164

[†] Participants not enrolled in this fiscal year until January 2000.

Table 32 (continued)

Site	Current Status	Enrolled in 1999	Enrolled in 2000	Enrolled in 2001	Enrolled in 2002	Enrolled in 2003	Enrolled in 2004	Enrolled in 2005	All year Total
Northwest CO VNA	Active	0	0	0	0	7	13	26	46
	Attrition	0	9	29	15	10	10	2	75
	Graduated	0	6	8	16	10	0	0	40
	Total	0	15	37	31	27	23	28	161
Prowers County PHN	Active	0	0	0	0	7	19	30	56
	Attrition	0	0	25	9	19	18	9	80
	Graduated	0	0	26	15	4	0	0	45
	Total	0	0	51	24	30	37	39	181
Pueblo Community Health	Active	0	0	1	0	15	23	65	104
	Attrition	0	27	40	30	34	32	6	169
	Graduated	0	16	40	27	19	1	0	103
	Total	0	43	81	57	68	56	71	376
San Juan Basin HD	Active	0	0	0	0	10	26	73	109
	Attrition	31	51	50	43	45	53	24	297
	Graduated	14	33	19	33	14	0	0	113
	Total	45	84	69	76	69	79	97	519
St. Anthony	Active	0	0	0	0	0	0	99	99
	Attrition	0	0	0	0	0	0	13	13
	Graduated	0	0	0	0	0	3	0	3
	Total	0	0	0	0	0	3	112	115
Summit County PHN	Active	0	0	0	0	9	47	39	95
	Attrition	0	17	47	42	41	30	9	186
	Graduated	0	9	26	20	14	0	0	69
	Total	0	26	73	62	64	77	48	350
Tri County Health Dept	Active	0	0	0	0	18	63	92	173
	Attrition	12	43	52	75	48	66	30	326
	Graduated	1	17	33	40	18	1	0	110
	Total	13	60	85	115	84	130	122	609
Valley Wide Health	Active	0	0	0	0	11	47	45	103
	Attrition	0	2	40	34	19	20	7	122
	Graduated	0	9	34	22	15	1	0	81
	Total	0	11	74	56	45	68	52	306
Weld DHE	Active	1	1	0	0	10	53	79	144
	Attrition	0	5	42	21	25	41	14	148
	Graduated	0	5	35	19	15	0	0	74
	Total	1	11	77	40	50	94	93	366

[†] Participants not enrolled in this fiscal year until January 2000.

Table 33. Comparison of All Colorado Sites' Participants' Demographic Characteristics at Program Intake

Site	Number enrolled	Age (Median years)	Maternal education (Median years)	Annual household income (Median)	Number in household (median people)	Completed high school	Unmarried	Unemployed
Boulder County Public Health	265	23	12	\$13,500	3	66%	67%	57%
Denver Health: Best Babies	531	17	10	\$13,500	5	19%	89%	73%
El Paso County DHE	482	19	11	\$10,500	3	46%	86%	64%
Family Visitor Program	217	20	10	\$13,500	4	36%	70%	75%
Jefferson County DHE	551	19	12	\$17,500	3	51%	82%	58%
Larimer County DHE	539	19	11	\$13,500	3	50%	85%	56%
Mesa County HD	557	19	12	\$10,500	3	51%	77%	53%
Montrose County HHS	314	19	12	\$10,500	3	52%	74%	63%
Northeast CO HD	164	17	10	\$13,500	3	30%	78%	74%
Northwest CO VNA	161	20	12	\$13,500	2	65%	71%	53%
Prowers County PHN	181	19	11	\$10,500	3	48%	79%	61%
Pueblo Community Health	376	18	10	\$10,500	3	25%	91%	74%
San Juan Basin HD	519	20	12	\$13,500	3	59%	81%	55%
St. Anthony Hospital - Co	115	19	11	\$17,500	4	37%	90%	63%
Summit County PHN	350	22	12	\$13,500	3	56%	64%	58%
Tri - County HD	609	19	11	\$15,500	4	44%	87%	71%
Valley Wide Health	306	19	11	\$10,500	3	48%	79%	69%
Weld County DHE	366	17	10	\$7,500	4	25%	85%	85%

Table 34. Comparison of All Colorado Sites' Participants' Race/Ethnicity at Program Intake

Site	Non-Hispanic White	Hispanic	African American	Native American	Others/mixed	Asian
Boulder County Public Health	41%	49%	1.2%	0.0%	2.9%	5.3%
Denver Health: Best Babies	5.9%	74%	13%	1.0%	5.3%	0.6%
El Paso County DHE	46%	33%	12%	1.1%	6.3%	1.3%
Family Visitor Program	21%	77%	0.0%	0.5%	0.5%	0.5%
Jefferson County DHE	50%	34%	2.3%	2.1%	8.0%	3.1%
Larimer County DHE	64%	26%	0.4%	1.6%	7.1%	1.0%
Mesa County HD	63%	28%	1.1%	2.9%	4.4%	0.8%
Montrose County HHS	59%	33%	0.0%	1.8%	4.8%	1.5%
Northeast CO HD	47%	51%	0.8%	0.0%	0.8%	0.8%
Northwest CO VNA	59%	32%	1.3%	2.6%	2.6%	1.9%
Prowers County PHN	40%	53%	0.6%	1.1%	4.5%	0.6%
Pueblo Community Health	27%	62%	3.2%	2.4%	5.0%	0.3%
San Juan Basin HD	56%	28%	0.0%	11%	3.6%	0.8%
St. Anthony Hospital - Co	23%	64%	4.4%	1.1%	5.6%	1.1%
Summit County PHN	42%	52%	0.0%	0.9%	4.0%	1.2%
Tri - County HD	33%	46%	11%	1.7%	6.3%	2.8%
Valley Wide Health	19%	75%	0.0%	1.4%	4.7%	0.0%
Weld County DHE	21%	76%	0.0%	1.5%	1.8%	0.0%

Table 35. Comparison of All Colorado Sites' Participants' Household Composition at Program Intake

Site	Lives alone	Lives with mother	Lives with husband/boyfriend	Lives with others
Boulder County Public Health	9.1%	15%	50%	26%
Denver Health: Best Babies	3.8%	54%	26%	16%
El Paso County DHE	7.8%	38%	36%	18%
Family Visitor Program	2.5%	17%	63%	18%
Jefferson County DHE	4.8%	35%	41%	19%
Larimer County DHE	4.8%	34%	45%	16%
Mesa County HD	5.5%	30%	50%	14%
Montrose County HHS	3.7%	30%	48%	18%
Northeast CO HD	2.4%	41%	43%	13%
Northwest CO VNA	5.8%	16%	67%	12%
Prowers County PHN	9.0%	38%	40%	13%
Pueblo Community Health	5.3%	46%	29%	19%
San Juan Basin HD	3.8%	29%	55%	12%
St. Anthony Hospital - Co	6.7%	44%	28%	21%
Summit County PHN	2.5%	20%	65%	13%
Tri - County HD	3.7%	45%	36%	16%
Valley Wide Health	5.1%	41%	43%	11%
Weld County DHE	0.9%	47%	38%	14%

Table 36. Comparison of All Colorado Sites' Participants' Use of Government Assistance at Program Intake

Site	WIC	Medicaid	Food Stamps	TANF
Boulder County Public Health	73%	65%	13%	5%
Denver Health: Best Babies	44%	54%	7%	2%
El Paso County DHE	74%	78%	13%	3%
Family Visitor Program	61%	64%	5%	1%
Jefferson County DHE	78%	76%	9%	2%
Larimer County DHE	56%	69%	7%	1%
Mesa County HD	69%	74%	9%	4%
Montrose County HHS	83%	79%	16%	3%
Northeast CO HD	81%	57%	16%	2%
Northwest CO VNA	49%	68%	14%	1%
Prowers County PHN	88%	80%	19%	2%
Pueblo Community Health	76%	83%	22%	3%
San Juan Basin HD	78%	82%	11%	3%
St. Anthony Hospital - Co	56%	68%	10%	1%
Summit County PHN	76%	57%	8%	2%
Tri - County HD	69%	80%	10%	3%
Valley Wide Health	79%	86%	24%	3%
Weld County DHE	67%	79%	6%	1%

Table 37. Comparison of All Colorado Sites' Participants' Psychological Resources at Program Intake

Site	Mental score (median)	Master score (median)
Boulder County Public Health	3.8	3.0
Denver Health: Best Babies	3.6	3.0
El Paso County DHE	3.6	3.1
Family Visitor Program	3.8	3.1
Jefferson County DHE	3.8	3.1
Larimer County DHE	3.8	3.1
Mesa County HD	3.8	3.1
Montrose County HHS	3.8	3.1
Northeast CO HD	3.8	3.1
Northwest CO VNA	3.8	3.1
Prowers County PHN	3.8	3.1
Pueblo Community Health	3.8	3.1
San Juan Basin HD	3.8	3.1
St. Anthony Hospital - Co	3.7	3.1
Summit County PHN	3.8	3.0
Tri - County HD	3.8	3.1
Valley Wide Health	3.8	3.1
Weld County DHE	3.8	3.0

Table 38. Comparison of All Colorado Sites' Participants' Maternal Health Characteristics at Program Intake

Site	Prenatal care began (Median Wks)	Gestational age at Program Intake (Median weeks)
Boulder County Public Health	8.0	21.0
Denver Health: Best Babies	9.0	20.0
El Paso County DHE	10.0	18.0
Family Visitor Program	8.0	20.0
Jefferson County DHE	8.0	15.0
Larimer County DHE	8.0	14.0
Mesa County HD	7.0	15.0
Montrose County HHS	8.0	18.0
Northeast CO HD	9.0	21.0
Northwest CO VNA	8.0	17.0
Prowers County PHN	8.0	17.0
Pueblo Community Health	8.0	16.0
San Juan Basin HD	8.0	17.0
St. Anthony Hospital - Co	8.0	22.0
Summit County PHN	8.0	19.0
Tri - County HD	8.0	20.0
Valley Wide Health	7.0	19.0
Weld County DHE	8.0	17.0

Table 39. *Number and Duration of Nurse Home Visits by Site during Pregnancy*

		Number	Average
Boulder PH	Pregnancy completed	232	n.a.
	# Completed visits during pregnancy	1887	8.1
	Expected # of visits during pregnancy	2297	n.a.
	Completed/Expected ratio	n.a.	89%
	# attempted visits during pregnancy	153	0.7
	Average minutes per home visits during pregnancy	n.a.	65.1
	Total minutes in HV during pregnancy	n.a.	524
Denver Health BB	Pregnancy completed	494	n.a.
	# Completed visits during pregnancy	4363	8.8
	Expected # of visits during pregnancy	5607	n.a.
	Completed/Expected ratio	n.a.	82%
	# attempted visits during pregnancy	877	1.8
	Average minutes per home visits during pregnancy	n.a.	72.7
	Total minutes in HV during pregnancy	n.a.	660
El Paso County DHE	Pregnancy completed	388	n.a.
	# Completed visits during pregnancy	2948	7.6
	Expected # of visits during pregnancy	4310	n.a.
	Completed/Expected ratio	n.a.	74%
	# attempted visits during pregnancy	424	1.1
	Average minutes per home visits during pregnancy	n.a.	77.8
	Total minutes in HV during pregnancy	n.a.	580
Family Visitor Program	Pregnancy completed	184	n.a.
	# Completed visits during pregnancy	1544	8.4
	Expected # of visits during pregnancy	2027	n.a.
	Completed/Expected ratio	n.a.	80%
	# attempted visits during pregnancy	88	0.5
	Average minutes per home visits during pregnancy	n.a.	81.1
	Total minutes in HV during pregnancy	n.a.	677

Table 39 (continued)

		Number	Average
Jefferson Cty DHE	Pregnancy completed	510	n.a.
	# Completed visits during pregnancy	4670	9.2
	Expected # of visits during pregnancy	6520	n.a.
	Completed/Expected ratio	n.a.	75%
	# attempted visits during pregnancy	488	1.0
	Average minutes per home visits during pregnancy	n.a.	70.3
	Total minutes in HV during pregnancy	n.a.	649
Larimer County DHE	Pregnancy completed	473	n.a.
	# Completed visits during pregnancy	4431	9.4
	Expected # of visits during pregnancy	6003	n.a.
	Completed/Expected ratio	n.a.	78%
	# attempted visits during pregnancy	441	0.9
	Average minutes per home visits during pregnancy	n.a.	75.7
	Total minutes in HV during pregnancy	n.a.	720
Mesa Health Dept	Pregnancy completed	474	n.a.
	# Completed visits during pregnancy	4457	9.4
	Expected # of visits during pregnancy	6117	n.a.
	Completed/Expected ratio	n.a.	78%
	# attempted visits during pregnancy	443	0.9
	Average minutes per home visits during pregnancy	n.a.	76.1
	Total minutes in HV during pregnancy	n.a.	714
Montrose County HHS	Pregnancy completed	280	n.a.
	# Completed visits during pregnancy	2078	7.4
	Expected # of visits during pregnancy	2922	n.a.
	Completed/Expected ratio	n.a.	75%
	# attempted visits during pregnancy	176	0.6
	Average minutes per home visits during pregnancy	n.a.	70.6
	Total minutes in HV during pregnancy	n.a.	524
Northeast CO Health	Pregnancy completed	140	n.a.
	# Completed visits during pregnancy	959	6.9
	Expected # of visits during pregnancy	1327	n.a.
	Completed/Expected ratio	n.a.	76%
	# attempted visits during pregnancy	120	0.9
	Average minutes per home visits during pregnancy	n.a.	63.9
	Total minutes in HV during pregnancy	n.a.	441

Table 39 (continued)

		Number	Average
Northwest CO VNA	Pregnancy completed	149	n.a.
	# Completed visits during pregnancy	1188	8.0
	Expected # of visits during pregnancy	1679	n.a.
	Completed/Expected ratio	n.a.	74%
	# attempted visits during pregnancy	110	0.7
	Average minutes per home visits during pregnancy	n.a.	73.4
	Total minutes in HV during pregnancy	n.a.	584
Prowers County PHN	Pregnancy completed	156	n.a.
	# Completed visits during pregnancy	1560	10.0
	Expected # of visits during pregnancy	1868	n.a.
	Completed/Expected ratio	n.a.	90%
	# attempted visits during pregnancy	144	0.9
	Average minutes per home visits during pregnancy	n.a.	70.0
	Total minutes in HV during pregnancy	n.a.	704
Pueblo Community Health	Pregnancy completed	340	n.a.
	# Completed visits during pregnancy	2936	8.6
	Expected # of visits during pregnancy	4039	n.a.
	Completed/Expected ratio	n.a.	80%
	# attempted visits during pregnancy	340	1.0
	Average minutes per home visits during pregnancy	n.a.	76.6
	Total minutes in HV during pregnancy	n.a.	661
San Juan Basin HD	Pregnancy completed	465	n.a.
	# Completed visits during pregnancy	3698	8.0
	Expected # of visits during pregnancy	5268	n.a.
	Completed/Expected ratio	n.a.	73%
	# attempted visits during pregnancy	429	0.9
	Average minutes per home visits during pregnancy	n.a.	69.8
	Total minutes in HV during pregnancy	n.a.	551
St. Anthony	Pregnancy completed	66	n.a.
	# Completed visits during pregnancy	392	5.9
	Expected # of visits during pregnancy	453	n.a.
	Completed/Expected ratio	n.a.	93%
	# attempted visits during pregnancy	39	0.6
	Average minutes per home visits during pregnancy	n.a.	82.4
	Total minutes in HV during pregnancy	n.a.	484

Table 39 (continued)

		Number	Average
Summit County PHN	Pregnancy completed	331	n.a.
	# Completed visits during pregnancy	2710	8.2
	Expected # of visits during pregnancy	3532	n.a.
	Completed/Expected ratio	n.a.	82%
	# attempted visits during pregnancy	351	1.1
	Average minutes per home visits during pregnancy	n.a.	74.3
	Total minutes in HV during pregnancy	n.a.	612
Tri County Health Dept	Pregnancy completed	560	n.a.
	# Completed visits during pregnancy	4576	8.2
	Expected # of visits during pregnancy	6082	n.a.
	Completed/Expected ratio	n.a.	79%
	# attempted visits during pregnancy	479	0.9
	Average minutes per home visits during pregnancy	n.a.	73.0
	Total minutes in HV during pregnancy	n.a.	600
Valley Wide Health	Pregnancy completed	285	n.a.
	# Completed visits during pregnancy	2558	9.0
	Expected # of visits during pregnancy	3028	n.a.
	Completed/Expected ratio	n.a.	92%
	# attempted visits during pregnancy	436	1.5
	Average minutes per home visits during pregnancy	n.a.	71.8
	Total minutes in HV during pregnancy	n.a.	638
Weld DHE	Pregnancy completed	316	n.a.
	# Completed visits during pregnancy	3053	9.7
	Expected # of visits during pregnancy	3834	n.a.
	Completed/Expected ratio	n.a.	86%
	# attempted visits during pregnancy	238	0.8
	Average minutes per home visits during pregnancy	n.a.	72.4
	Total minutes in HV during pregnancy	n.a.	698

Table 40. Number and Duration of Nurse Home Visits by Site during Infancy

	Label	Number	Average
Boulder PH	Infancy Completed	165	n.a.
	# Completed visits during infancy	2134	12.9
	Expected # of visits during infancy	4737	n.a.
	Completed/Expected ratio	n.a.	45%
	# attempted visits during infancy	207	1.3
	Average minutes per home visits during infancy	n.a.	62.5
	Total minutes in HV during infancy	n.a.	815
Denver Health BB	Infancy Completed	423	n.a.
	# Completed visits during infancy	4568	10.8
	Expected # of visits during infancy	11977	n.a.
	Completed/Expected ratio	n.a.	38%
	# attempted visits during infancy	1182	2.8
	Average minutes per home visits during infancy	n.a.	70.5
	Total minutes in HV during infancy	n.a.	784
El Paso County DHE	Infancy Completed	290	n.a.
	# Completed visits during infancy	3013	10.4
	Expected # of visits during infancy	8160	n.a.
	Completed/Expected ratio	n.a.	37%
	# attempted visits during infancy	556	1.9
	Average minutes per home visits during infancy	n.a.	70.2
	Total minutes in HV during infancy	n.a.	737
Family Visitor Program	Infancy Completed	135	n.a.
	# Completed visits during infancy	1826	13.5
	Expected # of visits during infancy	3915	n.a.
	Completed/Expected ratio	n.a.	47%
	# attempted visits during infancy	151	1.1
	Average minutes per home visits during infancy	n.a.	74.3
	Total minutes in HV during infancy	n.a.	998

Table 40 (continued)

		Number	Average
Jefferson Cty DHE	Infancy Completed	397	n.a.
	# Completed visits during infancy	5020	12.6
	Expected # of visits during infancy	11205	n.a.
	Completed/Expected ratio	n.a.	45%
	# attempted visits during infancy	749	1.9
	Average minutes per home visits during infancy	n.a.	69.5
	Total minutes in HV during infancy	n.a.	897
Larimer County DHE	Infancy Completed	334	n.a.
	# Completed visits during infancy	4038	12.1
	Expected # of visits during infancy	9200	n.a.
	Completed/Expected ratio	n.a.	44%
	# attempted visits during infancy	654	2.0
	Average minutes per home visits during infancy	n.a.	71.4
	Total minutes in HV during infancy	n.a.	876
Mesa Health Dept	Infancy Completed	316	n.a.
	# Completed visits during infancy	4248	13.4
	Expected # of visits during infancy	8794	n.a.
	Completed/Expected ratio	n.a.	49%
	# attempted visits during infancy	538	1.7
	Average minutes per home visits during infancy	n.a.	75.3
	Total minutes in HV during infancy	n.a.	1024
Montrose County HHS	Infancy Completed	232	n.a.
	# Completed visits during infancy	2810	12.1
	Expected # of visits during infancy	6612	n.a.
	Completed/Expected ratio	n.a.	42%
	# attempted visits during infancy	308	1.3
	Average minutes per home visits during infancy	n.a.	68.9
	Total minutes in HV during infancy	n.a.	840
Northeast CO Health	Infancy Completed	92	n.a.
	# Completed visits during infancy	851	9.3
	Expected # of visits during infancy	2668	n.a.
	Completed/Expected ratio	n.a.	32%
	# attempted visits during infancy	220	2.4
	Average minutes per home visits during infancy	n.a.	64.6
	Total minutes in HV during infancy	n.a.	602

Table 40 (continued)

		Number	Average
Prowers County PHN	Infancy Completed	132	n.a.
	# Completed visits during infancy	2140	16.2
	Expected # of visits during infancy	3797	n.a.
	Completed/Expected ratio	n.a.	56%
	# attempted visits during infancy	300	2.3
	Average minutes per home visits during infancy	n.a.	67.3
	Total minutes in HV during infancy	n.a.	1104
Pueblo Community Health	Infancy Completed	277	n.a.
	# Completed visits during infancy	3304	11.9
	Expected # of visits during infancy	7772	n.a.
	Completed/Expected ratio	n.a.	43%
	# attempted visits during infancy	530	1.9
	Average minutes per home visits during infancy	n.a.	70.9
	Total minutes in HV during infancy	n.a.	875
San Juan Basin HD	Infancy Completed	387	n.a.
	# Completed visits during infancy	4803	12.4
	Expected # of visits during infancy	10891	n.a.
	Completed/Expected ratio	n.a.	44%
	# attempted visits during infancy	676	1.7
	Average minutes per home visits during infancy	n.a.	68.9
	Total minutes in HV during infancy	n.a.	861
St. Anthony	Infancy Completed	14	n.a.
	# Completed visits during infancy	30	2.1
	Expected # of visits during infancy	406	n.a.
	Completed/Expected ratio	n.a.	7%
	# attempted visits during infancy	10	0.7
	Average minutes per home visits during infancy	n.a.	84.1
	Total minutes in HV during infancy	n.a.	182
Summit County PHN	Infancy Completed	270	n.a.
	# Completed visits during infancy	3598	13.3
	Expected # of visits during infancy	7658	n.a.
	Completed/Expected ratio	n.a.	47%
	# attempted visits during infancy	501	1.9
	Average minutes per home visits during infancy	n.a.	75.7
	Total minutes in HV during infancy	n.a.	1015

Table 40 (continued)

		Number	Average
Tri County Health Dept	Infancy Completed	421	n.a.
	# Completed visits during infancy	5238	12.4
	Expected # of visits during infancy	11973	n.a.
	Completed/Expected ratio	n.a.	44%
	# attempted visits during infancy	830	2.0
	Average minutes per home visits during infancy	n.a.	69.9
	Total minutes in HV during infancy	n.a.	880
Valley Wide Health	Infancy Completed	222	n.a.
	# Completed visits during infancy	3242	14.6
	Expected # of visits during infancy	6179	n.a.
	Completed/Expected ratio	n.a.	52%
	# attempted visits during infancy	749	3.4
	Average minutes per home visits during infancy	n.a.	73.1
	Total minutes in HV during infancy	n.a.	1056
Weld DHE	Infancy Completed	222	n.a.
	# Completed visits during infancy	3353	15.1
	Expected # of visits during infancy	6409	n.a.
	Completed/Expected ratio	n.a.	52%
	# attempted visits during infancy	376	1.7
	Average minutes per home visits during infancy	n.a.	73.8
	Total minutes in HV during infancy	n.a.	1112

Table 41. Number and Duration of Nurse Home Visits by Site during Toddlerhood

		Number	Average
Boulder PH	Toddler Completed	118	n.a.
	# Completed visits during toddler	647	5.5
	Expected # of visits during toddler	2457	n.a.
	Completed/Expected ratio	n.a.	26%
	# attempted visits during toddler	102	0.9
	Average minutes per home visits during toddler	n.a.	62.4
	Total minutes in HV during toddler	n.a.	347
Denver Health BB	Toddler Completed	379	n.a.
	# Completed visits during toddler	2388	6.3
	Expected # of visits during toddler	7749	n.a.
	Completed/Expected ratio	n.a.	31%
	# attempted visits during toddler	532	1.4
	Average minutes per home visits during toddler	n.a.	74.5
	Total minutes in HV during toddler	n.a.	488
El Paso County DHE	Toddler Completed	197	n.a.
	# Completed visits during toddler	1081	5.5
	Expected # of visits during toddler	4042	n.a.
	Completed/Expected ratio	n.a.	27%
	# attempted visits during toddler	212	1.1
	Average minutes per home visits during toddler	n.a.	68.9
	Total minutes in HV during toddler	n.a.	393
Family Visitor Program	Toddler Completed	86	n.a.
	# Completed visits during toddler	489	5.7
	Expected # of visits during toddler	1799	n.a.
	Completed/Expected ratio	n.a.	27%
	# attempted visits during toddler	44	0.5
	Average minutes per home visits during toddler	n.a.	76.1
	Total minutes in HV during toddler	n.a.	442

Table 41 (continued)

		Number	Average
Jefferson Cty DHE	Toddler Completed	288	n.a.
	# Completed visits during toddler	2221	7.7
	Expected # of visits during toddler	5880	n.a.
	Completed/Expected ratio	n.a.	38%
	# attempted visits during toddler	398	1.4
	Average minutes per home visits during toddler	n.a.	71.5
	Total minutes in HV during toddler	n.a.	561
Larimer County DHE	Toddler Completed	239	n.a.
	# Completed visits during toddler	1370	5.7
	Expected # of visits during toddler	4763	n.a.
	Completed/Expected ratio	n.a.	29%
	# attempted visits during toddler	390	1.6
	Average minutes per home visits during toddler	n.a.	70.8
	Total minutes in HV during toddler	n.a.	403
Mesa Health Dept	Toddler Completed	243	n.a.
	# Completed visits during toddler	1357	5.6
	Expected # of visits during toddler	4914	n.a.
	Completed/Expected ratio	n.a.	28%
	# attempted visits during toddler	237	1.0
	Average minutes per home visits during toddler	n.a.	76.0
	Total minutes in HV during toddler	n.a.	427
Montrose County HHS	Toddler Completed	188	n.a.
	# Completed visits during toddler	931	5.0
	Expected # of visits during toddler	3864	n.a.
	Completed/Expected ratio	n.a.	24%
	# attempted visits during toddler	125	0.7
	Average minutes per home visits during toddler	n.a.	68.0
	Total minutes in HV during toddler	n.a.	336
Northeast CO Health	Toddler Completed	65	n.a.
	# Completed visits during toddler	229	3.5
	Expected # of visits during toddler	1365	n.a.
	Completed/Expected ratio	n.a.	17%
	# attempted visits during toddler	47	0.7
	Average minutes per home visits during toddler	n.a.	66.9
	Total minutes in HV during toddler	n.a.	238

Table 41 (continued)

		Number	Average
Northwest CO VNA	Toddler Completed	101	n.a.
	# Completed visits during toddler	694	6.9
	Expected # of visits during toddler	2058	n.a.
	Completed/Expected ratio	n.a.	34%
	# attempted visits during toddler	82	0.8
	Average minutes per home visits during toddler	n.a.	70.1
	Total minutes in HV during toddler	n.a.	478
Prowers County PHN	Toddler Completed	88	n.a.
	# Completed visits during toddler	816	9.3
	Expected # of visits during toddler	1806	n.a.
	Completed/Expected ratio	n.a.	45%
	# attempted visits during toddler	142	1.6
	Average minutes per home visits during toddler	n.a.	66.2
	Total minutes in HV during toddler	n.a.	626
Pueblo Community Health	Toddler Completed	218	n.a.
	# Completed visits during toddler	1776	8.1
	Expected # of visits during toddler	4452	n.a.
	Completed/Expected ratio	n.a.	40%
	# attempted visits during toddler	368	1.7
	Average minutes per home visits during toddler	n.a.	71.6
	Total minutes in HV during toddler	n.a.	588
San Juan Basin HD	Toddler Completed	314	n.a.
	# Completed visits during toddler	2050	6.5
	Expected # of visits during toddler	6363	n.a.
	Completed/Expected ratio	n.a.	32%
	# attempted visits during toddler	267	0.9
	Average minutes per home visits during toddler	n.a.	68.9
	Total minutes in HV during toddler	n.a.	447
St. Anthony	Toddler Completed	4	n.a.
	# Completed visits during toddler	47	11.8
	Expected # of visits during toddler	84	n.a.
	Completed/Expected ratio	n.a.	56%
	# attempted visits during toddler	7	1.8
	Average minutes per home visits during toddler	n.a.	89.8
	Total minutes in HV during toddler	n.a.	979

Table 41 (continued)

		Number	Average
Summit County PHN	Toddler Completed	197	n.a.
	# Completed visits during toddler	1126	5.7
	Expected # of visits during toddler	4053	n.a.
	Completed/Expected ratio	n.a.	28%
	# attempted visits during toddler	228	1.2
	Average minutes per home visits during toddler	n.a.	75.9
	Total minutes in HV during toddler	n.a.	435
Tri County Health Dept	Toddler Completed	301	n.a.
	# Completed visits during toddler	1727	5.7
	Expected # of visits during toddler	6216	n.a.
	Completed/Expected ratio	n.a.	28%
	# attempted visits during toddler	327	1.1
	Average minutes per home visits during toddler	n.a.	68.8
	Total minutes in HV during toddler	n.a.	398
Valley Wide Health	Toddler Completed	167	n.a.
	# Completed visits during toddler	1370	8.2
	Expected # of visits during toddler	3318	n.a.
	Completed/Expected ratio	n.a.	41%
	# attempted visits during toddler	386	2.3
	Average minutes per home visits during toddler	n.a.	70.7
	Total minutes in HV during toddler	n.a.	589
Weld DHE	Toddler Completed	153	n.a.
	# Completed visits during toddler	1383	9.0
	Expected # of visits during toddler	3213	n.a.
	Completed/Expected ratio	n.a.	43%
	# attempted visits during toddler	212	1.4
	Average minutes per home visits during toddler	n.a.	73.9
	Total minutes in HV during toddler	n.a.	684

Table 42. Preterm Rates by Site

Site	N infants preterm	# less than 37 wks	% less than 37 wks
Boulder PH	203	20	9.85%
Denver Health BB	372	32	8.60%
El Paso County DHE	307	28	9.12%
Family Visitor Program	165	13	7.88%
Jefferson Cty DHE	384	32	8.33%
Larimer County DHE	375	37	9.87%
Mesa Health Dept	355	23	6.48%
Montrose County HHS	218	26	11.93%
Northeast CO Health	110	17	15.45%
Northwest CO VNA	123	15	12.20%
Prowers County PHN	132	17	12.88%
Pueblo Community Health	254	24	9.45%
San Juan Basin HD	371	30	8.09%
St. Anthony	40	2	5.00%
Summit County PHN	273	21	7.69%
Tri County Health Dept	432	47	10.88%
Valley Wide Health	242	16	6.61%
Weld DHE	271	23	8.49%

Caution should be taken in interpreting variation in rates among sites because the sample size changes from site to site. Also, the sites associated with higher premature rates could be those that retained their higher risk participants.

Table 43. LBW Rates by Site

Site	N infants wt	# less than 1500 g	% less than 1500 g	# less than 2273 g	% less than 2273 g	# less than 2500 g	% less than 2500 g	N infants preterm	# less than 37 wks	% less than 37 wks
St. Anthony	41	0	0.00%	1	2.44 %	1	2.44%	40	2	5.00%
Northeast CO Health	118	1	0.85%	5	4.24 %	6	5.08%	110	17	15.45 %
Mesa Health Dept	360	5	1.39%	15	4.17 %	19	5.28%	355	23	6.48%
Family Visitor Program	165	1	0.61%	6	3.64 %	9	5.45%	165	13	7.88%
Boulder PH	203	3	1.48%	7	3.45 %	15	7.39%	203	20	9.85%
Pueblo Community Health	256	2	0.78%	15	5.86 %	20	7.81%	254	24	9.45%
Northwest CO VNA	126	1	0.79%	5	3.97 %	10	7.94%	123	15	12.20 %
Weld DHE	273	6	2.20%	13	4.76 %	23	8.42%	271	23	8.49%
El Paso County DHE	306	2	0.65%	9	2.94 %	26	8.50%	307	28	9.12%
Tri County Health Dept	447	5	1.12%	23	5.15 %	39	8.72%	432	47	10.88 %
Jefferson Cty DHE	385	5	1.30%	18	4.68 %	36	9.35%	384	32	8.33%
San Juan Basin HD	371	4	1.08%	21	5.66 %	36	9.70%	371	30	8.09%
Valley Wide Health	243	1	0.41%	9	3.70 %	24	9.88%	242	16	6.61%
Montrose County HHS	222	1	0.45%	16	7.21 %	23	10.36 %	218	26	11.93 %
Larimer County DHE	376	4	1.06%	20	5.32 %	40	10.64 %	375	37	9.87%
Denver Health BB	370	5	1.35%	20	5.41 %	41	11.08 %	372	32	8.60%
Summit County PHN	273	4	1.47%	19	6.96 %	31	11.36 %	273	21	7.69%
Prowers County PHN	133	1	0.75%	11	8.27 %	19	14.29 %	132	17	12.88 %

Caution should be taken in interpreting variation in rates among sites because the sample size changes from site to site. Also, the sites associated with higher LBW rates could be those that retained their higher risk participants.

APPENDIX B: ADDITIONAL ANALYSES

Home visitors report on the number and types of referrals made for families in the program. This information is collected whenever a referral is made. Seventy-one percent of Colorado NFP participants had at least one referral during their time in the program; the average number of referrals per client was 4.9.

Table 44. Referrals to Outside Services

	Pregnancy		Birth to 6 Months		6 to 12 Months		12 to 18 Months		18 to 24 Months		Total
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency*
TANF	403	4.2%	217	3.4%	80	2.7%	57	2.5%	39	2.7%	808
Medicaid	659	6.8%	415	6.5%	190	6.4%	152	6.6%	80	5.5%	1,519
Food Stamps	398	4.1%	192	3.0%	85	2.8%	60	2.6%	42	2.9%	783
WIC	1133	11.8%	418	6.5%	121	4.0%	91	4.0%	62	4.5%	1,868
Domestic Violence	60	0.6%	71	1.1%	40	1.3%	43	1.9%	20	1.4%	233
Child Abuse	8	0.1%	12	0.2%	10	0.3%	11	0.5%	6	0.4%	47
Mental Health	313	3.3%	278	4.3%	138	4.6%	127	5.5%	79	5.5%	942
Smoking Cessation	126	1.3%	24	0.4%	16	0.5%	17	0.7%	3	0.2%	188
Alcohol abuse/Illicit drugs	39	0.4%	16	0.2%	9	0.3%	10	0.4%	7	0.5%	81
Maternal Health Care	1112	11.5%	952	14.8%	413	14.4%	313	13.6%	185	12.8%	3,019
Child Health Care	189	2.0%	796	12.4%	331	11.1%	290	12.6%	183	12.7%	1,794
Developmental Problems	13	0.1%	45	0.7%	31	1.0%	25	1.1%	44	3.1%	158
Child Care	132	1.4%	239	3.7%	119	4.0%	76	3.3%	67	4.6%	636
Job Training	221	2.3%	127	2.0%	92	3.1%	66	2.9%	27	1.9%	538
Housing	735	7.6%	311	4.8%	172	5.8%	132	5.7%	62	1.3%	1,425
Transportation	150	1.6%	42	0.7%	31	1.0%	11	0.5%	5	0.3%	240
Injury Prevention	153	1.6%	77	1.2%	47	1.6%	17	0.7%	15	1.0%	310
Childbirth Education	961	10.0%	6	0.1%	13	0.4%	14	0.6%	13	0.9%	1016
Lactation Specialist	87	0.9%	177	2.8%	6	0.2%	6	0.3%	9	0.6%	285
Social Security	21	0.2%	34	0.5%	6	0.2%	8	0.4%	2	0.1%	71
Unemployment	18	0.2%	7	0.1%	6	0.2%	5	0.2%	3	0.2%	40
Other **	2,698	28.1%	1,975	30.7%	1015	34.0%	769	33.4%	486	33.7%	6,980
Total	9,629		6,431		2,971		2,300		1,439		22,981

* Includes referrals where the program phase was unknown

** The "other" referral category includes: medical, dental and, legal services; parenting and nutrition classes; client schooling; food and baby supplies providers.

FACTORS RELATED TO PROGRAM ATTRITION DURING PREGNANCY, INFANCY AND TODDLERHOOD

Participants drop out of the NFP for many reasons. The NFP allows nurses to record several categories of client attrition. Four of these categories are considered amenable to intervention: declined further participation; unable to locate; excessive missed appointments; and no visits in 180 days or more. Analyses were conducted to identify factors related to this type of attrition from the NFP in Colorado. Because of the mobile population Colorado serves, additional analyses were conducted to identify factors related to moving out of the service area.

Attrition amenable to change and moving out of the service area were analyzed separately for pregnancy, infancy, and toddlerhood phases. Colorado sites were eligible for pregnancy analysis if at least 50 participants had given birth or should have given birth by June 30, 2005. Additionally, sites were eligible for infancy analysis if at least 50 participants had or would have had one-year-old infants by June 30, 2005. Similarly, sites were eligible for toddlerhood analysis if at least 50 participants had or would have had two-year-old toddlers by June 30, 2005.

Several types of factors were included in these analyses. Analyses for attrition amenable to change included participant, nurse home visitor, and program characteristics. Analyses for moving out of the service area included only participant characteristics because this type of attrition is considered to be out of the control of the NFP. There was no significant difference between sites in either of these types of attrition.

Specific factors analyzed include:

- *Participant characteristics at enrollment:* age, race/ethnicity, work status, marital status, school participation, high school graduation or not, household composition, psychological ability to cope with life's stressors, mental health, cigarette, alcohol and substance use, government assistance (TANF, Medicaid, food stamps, WIC), and gestational age at enrollment.
- *Nurse home visitor characteristics:* months of NFP experience, prior experience in maternal and child health, educational level, nurse attrition, and age.
- *Program characteristics:* racial/ethnic match between participant and nurse home visitor, number of participants per nurse home visitor and supervisor, and number of attempted visits.

ATTRITION DURING PREGNANCY

All eighteen sites in Colorado were included in pregnancy attrition analyses.

Factors related to attrition during pregnancy include:

- Participants who did not receive Medicaid assistance for prenatal care, labor and delivery were 3 times more likely to drop out of the NFP during pregnancy as their counterparts who did receive Medicaid during pregnancy (see Table 45).
- If a participant was not enrolled in WIC during pregnancy, she was 1.6 times more likely to drop than those who were enrolled.
- Participants who did not graduate from high school and were not in school dropped 1.4 times more often than participants who were high school graduates and/or were enrolled in school.
- Cigarette smokers were 1.6 times more likely to drop during pregnancy than non-smokers.
- If a participant's nurse home visitor left the NFP either before or after the participant's last home visit, she was 1.7 times more likely to leave the program for a reason amenable to intervention during pregnancy.
- Fifteen percent of participant addressable attrition occurred within 30 days before the client's nurse left the program.

Table 45. Characteristics Associated with Participant Attrition during Pregnancy

Characteristics of participants and nurses	Attrition during pregnancy
Did not receive Medicaid for prenatal care, labor and delivery	+
Not enrolled in WIC during pregnancy	+
No high school diploma or GED and not enrolled in school	+
Cigarette smoker during pregnancy	+
Nurse left the NFP	+

N = 4,782

+ indicates association with more attrition

During pregnancy, household composition was associated with moving out of the service area.

- Participants who lived with other family members or friends rather than their own mothers were 2.8 times more likely to move during pregnancy (see Table 46).
- Participants who lived with their husband or boyfriend moved out of the NFP service area 1.9 times more often than participants who lived with their own mother.
- Participants who lived alone were 2.2 times more likely to move out of the NFP service area than those who lived with their own mother.

Government assistance was associated with moving out of the service area during pregnancy.

- If a participant received Food Stamps during pregnancy, she was 1.6 times more likely to leave the program by moving out of the service area.
- However, if she received TANF during pregnancy, she was 3.6 times less likely to move.
- Similarly, if a participant received WIC during pregnancy, she was 2.3 times less likely to move before the birth of her baby.
- If a participant was enrolled in school, she was 1.5 times less like to move out of the service area during her pregnancy.

Table 46. *Characteristics Associated with Participant Moving during Pregnancy*

Characteristics of participants	Moving during pregnancy
Lived with others vs. with own mother	+
Lived with husband/boyfriend vs. with own mother	+
Lived alone vs. with own mother	+
Received Food Stamps during pregnancy	+
Received TANF during pregnancy	-
Received WIC during pregnancy	-
Enrolled in school at program enrollment	-

N = 4,919

+ indicates association with more attrition

- indicates association with less attrition

ATTRITION DURING INFANCY

Examination of factors related to attrition during infancy incorporated all of the characteristics included in the pregnancy attrition analysis.

- Additional program characteristics were integrated including: average completed to expected pregnancy home visit ratio; average involvement of the mother in pregnancy visits; average percent of pregnancy home visit time spent on each program domain (personal health, maternal role, environmental health, life course development and friends and family); average time spent per pregnancy visit; and average duration of all home visits during pregnancy.

Seventeen of the eighteen Colorado sites included in pregnancy analyses were included in infancy attrition analyses. The new St. Anthony site was not included in infancy analyses because did not yet have enough clients eligible for these analyses.

Client attrition was impacted by nurse attrition.

Table 47 shows that participants whose nurse home visitors left the NFP either before or after their last home visit were more likely to drop during infancy than those whose nurses remained active.

- Participants were three times more likely to drop out if their nurse left the NFP at some point. Of the participants who dropped during infancy, 21% left the NFP within 30 days before their nurse home visitor left the NFP.
- Participants who had lower completed to expected visit ratios during pregnancy were 6.7 times more likely to drop out of the NFP during infancy.
- If a participant was unemployed at enrollment, she was more likely to leave the program during infancy for a reason amenable to intervention.

Table 47. *Characteristics Associated with Participant Attrition during Infancy.*

Characteristics of participants, nurses and program	Attrition during infancy
Nurse left the NFP	+
Lower completed to expected pregnancy visit ratio	+
Lived with husband/boyfriend vs. with own mother	-
Lived with others vs. with own mother	NS
Lived alone vs. with own mother	NS

N = 2502

+ indicates association with more attrition

- indicates association with less attrition

NS indicates not statistically significant

Household composition was associated with attrition due to movement out of the service area.

- Participants who lived with others rather than with their own mothers were 1.7 times more likely to move out of the service area in Colorado (see Table 48).
 - However, those who lived alone were not significantly more or less likely to move than participants who lived with their mother.
- Those who lived with their husband or boyfriend were 1.6 times more likely to move.
- Participants who were unemployed at enrollment were 1.4 times more likely to move during infancy as those who were employed.

Table 48. Characteristics Associated with Participant Moving during Infancy.

Characteristics of participants	Moving during infancy
Lived with others vs. with own mother	+
Lived with husband/boyfriend vs. with own mother	+
Lived alone vs. with own mother	NS
Unemployed at enrollment	+

N = 2,777

+ indicates association with more attrition

NS indicates not statistically significant

ATTRITION DURING TODDLERHOOD

Participant characteristics at enrollment included: age, race/ethnicity, psychological ability to cope with life's stressors, mental health and gestational age at enrollment. Participant characteristics at infant age 12 months included: marital status, school participation, high school graduation or not, household composition, cigarette, alcohol and substance use, and government assistance (TANF, Medicaid, Food Stamps, WIC). Program characteristics included: nurse supervisor or not, number of attempted visits, average completed to expected infancy home visit ratio, average involvement of the mother in infancy visits, average percent of infancy home visit time spent on each program domain, average time spent per infancy visit and average duration of all home visits during infancy.

The same 17 Colorado sites included in infancy analyses were included in toddlerhood attrition analyses.

- If a participant's nurse home visitor left the NFP either before or after the participant's last home visit, she was 2.4 times more likely to leave the program for a reason amenable to intervention during toddlerhood (see Table 49).
 - Nineteen percent of participant addressable attrition occurred within 30 days before their nurse left the program.
- Participants who had lower completed to expected visit ratios during infancy were 20 times more likely to drop out of the NFP during toddlerhood.

Table 49. Characteristics Associated with Participant Attrition during Toddlerhood.

Characteristics of participants, nurses and program	Attrition during toddlerhood
Nurse left the NFP	+
Lower completed to expected infancy visit ratio	+

N = 1,397

+ indicates association with more attrition

During the toddler phase, household composition was associated with attrition.

- During the toddler phase of the program, participants who lived with their husband/boyfriend, rather than with their own mothers, were twice as likely to move out of the service area in Colorado (see Table 50).
- Those who lived with others or alone were not significantly more or less likely to move than participants who lived with their mother.

Table 50. Characteristics Associated with Participant Moving during Toddlerhood.

Characteristics of participants	Moving during toddlerhood
Lived with husband/boyfriend vs. with own mother	+
Lived with others vs. with own mother	NS
Lived alone vs. with own mother	NS

*N = 1,319**+ indicates association with more attrition**NS indicates not statistically significant*

The above analyses cannot be viewed as definitive because there are many other variables that could impact this data. However, these factors may provide some clues about participants who are at higher risk of dropping from the NFP, particularly due to reasons amenable to change (declined further participation, excessive missed visits, home visitor unable to locate the participant) or moved out of the NFP service area.

During pregnancy, participants who dropped from the program for reasons amenable to change tended to be those who may be in better financial circumstances, those who smoked cigarettes, or those without a high school diploma or GED who were not enrolled in school. Enrollment in school probably contributes structure to a participant's life which may help her develop skills to arrange regular meetings with her nurse home visitor.

It was also found that participants whose nurse home visitors left the NFP dropped from the program during pregnancy more often than their counterparts whose home visitors remained active. Of the participants who dropped during pregnancy, nurse attrition was probably influential on 15% of them. Potentially, the home visitors were planning to leave the NFP and tried to prepare their clients, because these participants left the program within one month before their nurses left the NFP.

Composition of the household in which the participant was living while she was pregnant had an impact on whether she remained active in the NFP or moved out of its service area.

Government assistance also had an impact on moving during pregnancy.

- Those who received TANF and those who were enrolled in WIC during pregnancy tended to remain in the NFP service area before infant birth.
- However those who received Food Stamps were more likely to move, perhaps in search of employment or a more supportive living environment.

Program, nurse, and participant characteristics were associated with participant attrition during the year after the baby's birth. The observation that women who have lower completed to expected visit ratios during pregnancy are much more likely to drop out of the program during the first year of the infant's life than do participants who have higher completed to visit ratios may have alternative interpretations. First, one could speculate that women who eventually drop out of the program during infancy are those who demonstrate a pattern of lower engagement in the program during pregnancy and would have ultimately dropped from the program anyway over time. An alternative hypothesis is that higher completed to expected visit ratios during pregnancy facilitates the development of a working relationship between the home visitor and participant, fostering a mother's ongoing commitment to the program. Additionally, the establishment of intensive visits every two weeks may help participants develop skills in setting and keeping appointments that enable them to manage their time better following the birth of the infant, when competing role demands are greater.

As in the infancy phase, program, nurse and participant characteristics were associated with addressable participant attrition between the child's first and second birthdays. Participants whose nurse home visitors left the NFP dropped from the program during infancy or toddlerhood for reasons amenable to change much more often than their counterparts whose home visitors remained active. This can tie in with the hypothesis that a working relationship between the participant and her nurse home visitor is important. When the working relationship is interrupted, because the home visitor is planning to leave the NFP and tries to prepare the participant, or because the nurse had to leave the NFP abruptly, it could put the participant in an emotionally difficult situation. Even if the participant remains in the program, she and her new home visitor need to invest time and effort to establish a bond. It is possible that some participants cannot easily establish a connection with a different home visitor, particularly if she and her previous home visitor had a strong working relationship, and a choice is made to leave the program.

It is likely that nurse attrition influenced 21% of the participants who dropped during infancy for reasons amenable to intervention. Similarly, 19% of the participants who dropped during the toddler phase were probably influenced by nurse attrition. These participants left the NFP within one month of their nurses leaving the program, and the participants dropped out before their nurses did. Unemployment was also associated with addressable attrition during infancy. Note that both household composition and unemployment were associated with participant attrition due to moving out of the service area after the birth of the baby.

Participants who have lower completed to expected home visit ratios during infancy are a great deal more likely to drop out of the program after their baby reaches one year of age than do participants who have higher completed to expected visit ratios. Alternative interpretations suggested for this finding during infancy also apply to the toddler phase. Perhaps women who drop out of the program sooner or later during toddlerhood are those who began to demonstrate a pattern of lower engagement in the program after the birth of the baby. On the other hand, higher completed to expected home visit ratios during infancy probably occur when a good working relationship between the nurse home visitor and the participant has been established.

Participants who lived with their husband/boyfriend when their infant was one year of age were more likely to move out of the service area in Colorado during toddlerhood than those who lived with their mothers. It is possible that the husband/boyfriend found a better job outside the service area and the family needed to relocate.

There might be other factors that have an effect on attrition that are not present in our data. However, these analyses of factors collected in these data offer an indication of characteristics that could serve as markers for future attrition. Program staff is encouraged to reflect and dialogue on findings presented in order to begin to identify strategies that they might want to try to reduce attrition amenable to change.

RISK FACTORS FOR LOW BIRTH WEIGHT (LBW) IN COLORADO NFP

This analysis addressed the relationship between selected risk factors and the occurrence of low birth weight. Risk factors analyzed were those identified by the Centers for Disease Control and Prevention: gestational age at birth, maternal age, infant gender, African American/Black descent, household income, marital status, pregnancy weight gain, cigarette smoking, trimester of entry into prenatal care, sexually transmitted disease, and chronic high blood pressure.

Because there is no information about the birth outcomes for participants who dropped from the Colorado NFP program before their infants were born, the data analyzed here represent the 4,668 participants who finished the pregnancy phase of the NFP.

As expected, premature birth was the most significant factor for having a low birth weight infant. After adjusting for the premature birth, three other predictive factors were identified:

- *Pregnancy weight gain:* Mothers who gained less than 25 pounds during pregnancy were 2.4 times more likely to deliver LBW infants.
- *Cigarette smoking:* Mothers who smoked during pregnancy were 1.9 times more likely to deliver a LBW infant.
- *Ethnicity:* African American/Black mothers were 2.5 times more likely to deliver LBW infants than mothers in other racial/ethnic groups.
- *Gender:* Female infants were no more likely to be LBW than male infants.

Tables with site-specific information on prematurity and low birth weight rates can be found in Appendix A: Colorado NFP Data By Individual Site.

BIRTH OUTCOMES BY AGE OF THE MOTHER

Table 51. *Percentage of Premature Infants by Age of the Mother at Infant Birth*

Mother age at infant birth	Number of infants	# less than 37 weeks	% less than 37 weeks
Less than 15 years	90	9	10.0%
15-17 years	1145	105	9.2%
18-19 years	1182	110	9.3%
20-24 years	1543	145	9.4%
25-29 years	428	38	8.9%
30 years or older	239	16	6.7%

Table 52. *Percentage of Low Birth Weight Infants by Age of the Mother at Infant Birth*

Mother age at infant birth	Number of infants	Less than 1500 g		Less than 2273 g		Less than 2500 g	
		Number	Percent	Number	Percent	Number	Percent
Less than 15 years	90	0	0.0%	1	1.1%	6	6.7%
15-17 years	1159	12	1.0%	56	4.8%	100	8.6%
18-19 years	1191	16	1.3%	62	5.2%	117	9.8%
20-24 years	1561	14	0.9%	79	5.1%	141	9.0%
25-29 years	428	5	1.2%	26	6.1%	39	9.1%
30 years or older	239	4	1.7%	9	3.8%	15	6.3%

RISK FACTORS FOR SUBSEQUENT PREGNANCIES

An analysis was conducted to investigate the timing of and factors associated with the occurrence of at least one subsequent pregnancy within two postpartum years.

Potential predictive factors include: race/ethnicity, age, desire for the pregnancy of the first child, household income, household composition, marital status, education level, enrollment in school, workforce participation, use of government assistance (WIC, Food Stamps, TANF, and Medicaid) and use of birth control.

The analysis for the first postpartum year included 2,044 participants. As expected, birth control had the largest effect on subsequent pregnancy. Four other predictive factors were also identified:

- *Age:* Mothers under 18 years of age at the time of enrollment were 1.6 times more likely to have a subsequent pregnancy within one year postpartum than those who were 20 years of age or older at enrollment. However, mothers under 18 years of age at the time of enrollment were no more or less likely to have a subsequent pregnancy within one year postpartum than those who were 18 to 19 years of age at enrollment.
- *Ethnicity:* African American/Black participants were 2.5 times more likely to have subsequent pregnancy than those in other racial/ethnicity groups.
- *Household composition:* Participants living with their mothers are 0.7 times less likely to have a subsequent pregnancy in the first year than those living with others.
- *Marital status:* Participants who were married at enrollment were 1.6 times more likely to have a subsequent pregnancy in the first year than those who were unmarried.

The analysis for subsequent pregnancy by 24 months included 1,076 participants who completed the NFP program. Table 53 shows the timing of subsequent pregnancies grouped by consecutive intervals of three months. Fourteen percent of participants had a subsequent pregnancy by the end of the first postpartum year and 32.5% by the end of two years.

Table 53. *Timing of Subsequent Pregnancy*

Interval (postpartum months)	Number not pregnant at the beginning of an interval	Number participants who become pregnant during an interval	Cumulative subsequent pregnancy rate by the end of an interval
1-3	1076	26	2.4%
4-6	1050	30	5.2%
7-9	1020	39	8.8%
10-12	981	57	14.1%
13-15	924	61	19.8%
16-18	863	62	25.6%
19-21	801	41	29.4%
22-24	760	34	32.5%

Table 54 shows the timing of subsequent pregnancies grouped by the age of the participant at time of enrollment into the Colorado NFP program.

Table 54. *Subsequent Pregnancies at 24 Months Postpartum by Age of the Mother at Enrollment*

Mother's Age at Enrollment	N	Number of Pregnancies within 2	Percent with subsequent
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	Years Postpartum		pregnancy*
Less than 16 years	91	25	27.5%
16-17 years	215	79	36.7%
18-19 years	262	95	36.3%
20-25 years	367	121	33.0%
26-34 years	116	25	21.6%
35 years or older	25	6	24.0%

*Statistically significant difference ($p < .05$) between age groups

Absence of birth control use was the most significant factor for predicting subsequent pregnancy over two postpartum years. After adjusting for this factor, only one other predictive factor was identified:

- **Workforce participation:** Participants who were unemployed at enrollment were 1.6 times more likely to have a subsequent pregnancy than those who were working.

APPENDIX C: 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:

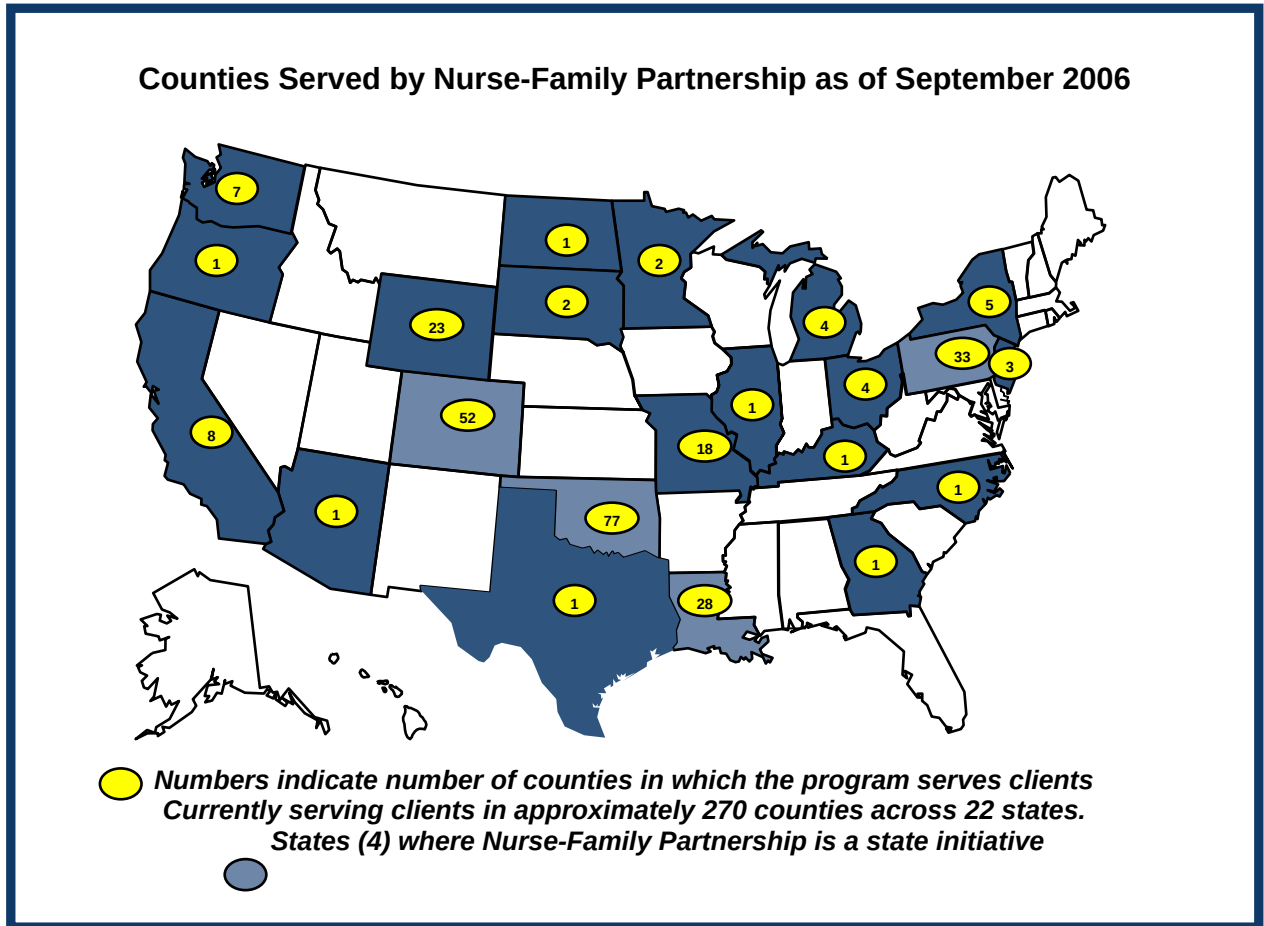
- Improve pregnancy outcomes by helping women alter their health-related behaviors, including reducing use of cigarettes, alcohol, and illegal drugs
- Improve child health and development by helping parents provide more responsible and competent care for their children
- Improve families' economic self-sufficiency 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 D: 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 = 6,603 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

APPENDIX E: COLORADO PRAMS DATA

To help state health departments establish and maintain a surveillance system of selected maternal behaviors, the Centers for Disease Control and Prevention (CDC) collaborated with several states to initiate the Pregnancy Risk Assessment Monitoring System (PRAMS) in 1987. This surveillance system was developed to supplement vital records data and to generate state-specific data about perinatal health.

In September of 1996, the Colorado Department of Public Health and Environment was awarded a grant from CDC to establish PRAMS in Colorado, and data collection began in the spring of 1997. The PRAMS questionnaire is mailed to a sample of Colorado women each month. Participants complete the surveys and return them to the health department where all answers are grouped to provide data for the entire state.

For this Colorado NFP report, the PRAMS sample data includes first-time, low income mothers. For this specific analysis, poor was defined as having an income below 200% of the Federal Poverty Level (FPL). FPL was calculated from the income and the number of people depending on this income question found within the PRAMS instrument. If the respondent's income or number of dependents were unknown, women were also considered to be poor if: (1) Medicaid paid for either prenatal care or labor and delivery; (2) they participated in WIC services during or after pregnancy; or (3) they were less than 25 and not married. By including this subset of the Colorado PRAMS data, the goal is to provide comparative data between NFP mothers and other low-income mothers in Colorado. Caution should be taken when comparing this subset of Colorado PRAMS data to Colorado NFP data; additional socio-demographic differences including mother's age and urban vs. rural place of residence may factor into outcomes.