



LIFE STATUS AND FINANCIAL OUTCOMES OF NURSE-FAMILY PARTNERSHIP IN CALIFORNIA

The Nurse-Family Partnership (NFP) uses a series of prenatal and postnatal home visits by registered nurses to increase the parenting and life skills of low-income mothers bearing their first child. The outcomes of NFP on the lives of mothers and children have been evaluated in randomized controlled trials in Denver, Elmira, Memphis, Orange County, CA, and Louisiana and with weaker evaluation designs in large-scale replication in New York City, Ohio, Oklahoma, and Pennsylvania.¹ This fact sheet describes the statistically significant life status and financial changes documented in the evaluations. The range of life status and financial measures evaluated was much broader in Denver, Elmira, and Memphis than elsewhere. Those three sites also have tracked outcomes longitudinally.

We systematically reviewed 30 NFP evaluations. Based on statistically significant life status and financial changes they documented, this fact sheet estimates NFP outcomes as implemented in California.

Evaluations reveal 19 life status and financial outcomes of NFP. Table 1 summarizes these outcomes. They affect health behaviors, health status, education, criminal offending, and public safety net reliance. The text describes the size of each outcome and evidence supporting it.

We conservatively assume effectiveness declines in proportion to the decline in visits per family from randomized trials to wide-scale replication. Therefore we multiply effectiveness in trials times a 73.1% replication effectiveness reduction factor.

As Table 2 shows, in California, enrolling 1000 low-income families in NFP will prevent 59 preterm births, 64 second births to young mothers, 199 child maltreatment incidents, 309 violent crimes and 2,048 property and public order crimes (e.g., vandalism, loitering) by youth, 161 youth arrests, 184 person-years of youth substance abuse, and 3.2 infant deaths. These estimates, although robust, are based on conservative assumptions.

METHODS

This section presents evidence supporting each estimate in Table 1 and describes the rationale for our choices. All effects listed are statistically significant at 95% confidence limit or greater unless otherwise stated.

¹ Louisiana trial data are less reliable than data from other trials because of heavy early dropout and loss to follow-up. Its documentation is incomplete, simply a list of significant findings. The Orange County trial had too few adverse birth outcomes to support sound statistical testing of significance of observed differences. Its birth-outcome evaluation was conducted early, before some pregnancies reached term.

Table 1. Expected Life Status and Financial Outcomes When First-Time Low-Income Mothers Receive Nurse-Family Partnership Home Visitation Services in California

Outcome	Change
Smoking During Pregnancy	23% reduction in tobacco smoked
Complications of Pregnancy	26% reduction in pregnancy-induced hypertension
Preterm First Births	26% reduction in births below 37 weeks gestation (34.8 fewer preterm births per 1,000 families served)
Infant Deaths	56% reduction in risk of infant death (3.2 fewer deaths per 1,000 families served)
Closely Spaced Second Births	29% reduction in births within 2 years postpartum
Very Closely Spaced Births	22% reduction in births within 15 months postpartum
Subsequent Birth Rate	29% reduction in second teen births (68.7 fewer children per 1,000 families served within 2 years postpartum & lifetime)
Subsequent Preterm Births	35.1 fewer subsequent preterm births per 1,000 families served
Breastfeeding	14% increase in mothers who attempt to breastfeed
Childhood Injuries	35% reduction in injuries treated in emergency departments, ages 0-2
Child Maltreatment	29% reduction in child maltreatment through age 15
Language Development	37% reduction in language delay; 0.14 fewer remedial services by age 6
Youth Criminal Offenses	43% reduction in crimes and arrests, ages 11-17
Youth Substance Abuse	50% reduction in alcohol, tobacco, & marijuana use, ages 12-15
Immunizations	21% increase in full immunization, ages 0-2
TANF Payments	7% reduction through year 9 post-partum; no effect thereafter
Food Stamp Payments	8% reduction through at least year 10 post-partum
Person-months of Medicaid Coverage Needed	7% reduction through at least year 15 post-partum due to reduced births and increased program graduation
Costs if on Medicaid	11% reduction through age 18
Subsidized Child Care	Caseload reduced by 3.3 children per 1,000 families served

- **Reduced Smoking During Pregnancy:** NFP mothers smoke 22.7% less tobacco during their pregnancy.

Evidence:

- 28% fewer cigarettes smoked in Elmira based on self-report and cotinine (an accurate measure of nicotine intake) (Olds et al. 1986)
- 31% less cotinine in Denver (Olds et al. 2002)
- Self-reported smoking declined slightly in Memphis but the difference did not approach statistical significance (personal communication with Dennis Luckey, April 2012)
- In NFP scale-up in PA, 2.1% to 3.5% more NFP mothers than controls reported on birth certificates that they quit smoking during pregnancy in communities with medium smoking levels roughly a 10% reduction in smokers); no differences in smoking rates were reported in heavy-smoking and light-smoking quintiles of communities (Rubin et al. 2009)

Rationale for Percentage Chosen: We chose the Denver trial's value (times the 73.1% replication factor) because the early Elmira paper reported the relationship between self-reported smoking and cotinine level but did not report effect on cotinine level. The PA study analyzed number of smokers rather than quantity smoked. It drew this information from birth certificates which are an unreliable source of smoking data (Northam & Knapp 2006).

Table 2. Cases Prevented by NFP per 1000 Enrolled Pregnancies in California, by Age of the Child in Months

	Prenatal	0-11	12-23	24-35	36-47	48-59	60-71	72-83	84-95	96-107	108-119	120-131	132-143	144-155	156-167	168-179	180-191	192-203	204-215	Total
Smokers Abstaining While Pregnant	12																			12
Reduced Preeclampsia	56																			56
Fewer Preterm First Births	31																			31
Fewer Subsequent Births			64																	64
Fewer Subsequent Preterm Births			18		5	5														28
Reduced Infant/Child Mortality		3.2																		3.2
Fewer Child Maltreatments						15	15	18	18	18	17	17	17	17	17	17	13			199
Confirmed Incidents						3	3	4	4	4	4	4	4	4	4	4	3			45
Other Incidents						12	12	14	14	14	13	13	13	13	13	17	10			154
Fewer Child Injuries		64	64																	128
Fewer Remedial School Services								148												148
Fewer Youth Crimes																				
Arrests													11	19	24	23	29	32	23	161
Crimes													157	276	276	330	432	474	340	2,357
Less Youth Substance Abuse														46	46	46	46			184
Increased Immunizations			131																	131

Table 3. Adjusters Used to Estimate California Incidence Rate from National Incidence Rate

	State-Specific Adjusters (ratio state to US value)	Source
Smoking During Pregnancy	% smoking in the last trimester	C-PONDER (2011)
Preterm First Births	Preterm birth rate	Henry J Kaiser Family Foundation (2009)
Subsequent Births	Repeat birth rate for teenaged mothers	Child Trends (2011)
Subsequent Preterm Births	Preterm birth rate; repeat birth rate for teenaged mothers	Henry J Kaiser Family Foundation (2009); Child Trends (2011)
Child Maltreatment	Substantiated child maltreatment cases/1000 children	Children's Bureau (2011)
Youth Criminal Offenses	Arrests/1000 youth	Federal Bureau of Investigation (2010)

- **Reduced Pregnancy-Induced Hypertension:** Pregnancy-induced hypertension (PIH) declined by .

Evidence:

- 42% reduction in PIH in Elmira, but not statistically significant (Olds et al. 1986)
- 35% reduction in PIH in Memphis (Kitzman et al. 1997)

Rationale for Percentage Chosen: We chose the estimate that was statistically significant (times 73.1% expected in replication) over the higher average across the two trials.

- **Fewer Preterm First Births:** NFP reduces prematurity by 25.6%.

Evidence:

- In Elmira, preterm births to NFP clients decreased by 79% among smokers but did not change among younger non-smokers and increased among older non-smokers; preterm births were eliminated among girls under age 17 (Olds et al. 1986)
- In Memphis spontaneous preterm delivery declined by 15% and low birth-weight babies rose by 7% but incidence was too low for these differences to approach significance (Kitzman et al. 1997)
- Conversely, in Denver, although low birth weight declined by 50%, preterm delivery rose by 36%; again incidence was too low for these differences to approach significance (Olds et al. 2000)
- In Orange County CA's all-Latina study, 4.3% of NFP mothers and 8.2% of mothers in a randomly assigned control group that received the health department's standard 3 home visits delivered preterm, a 48% reduction (Nguyen et al. 2003). Birth weight below 2500 grams was reduced by 47%, from 10.6% to 5.6%
- Among unmarried mothers in Oklahoma, NFP participation by 5,239 women was associated with 29% fewer preterm deliveries and 23% fewer very low birth weight babies (Carabin et al. 2005)
- In central Ohio, relative to a comparison group that was not described, NFP mothers had 37%-45% fewer preterm deliveries and 30%-40% fewer neonatal intensive care unit (NICU) days; the statistical significance of these changes was not stated but the samples were small (Allen et al. 2010)
- NFP National Service Office tracking data for 2005-2007 show that nationally 9.3% of births were premature (less than 37 weeks gestation) for mothers in NFP at the time of delivery in 2005-2007.² By comparison, the age-matched national average was 13.3%, a 30% difference (Health Data Interactive 2011). For mothers under age 18, the difference was 39% (9.2% vs. 15.0%). For mothers ages 18 and over, it was 19% (9.3% vs. 12.7%). NFP prematurity rates by maternal age group were lower than national averages for black, Hispanic, non-Hispanic white, and Native American mothers. Too few clients were Asian to assess their prematurity rate. The 30% prematurity rate difference is conservative. It would be even larger if the non-NFP group could be restricted to mothers on Medicaid or to first births (Behrman & Butler 2007)

Rationale for Percentage Chosen: Data from scale-up suggest the expected reduction in preterm births was less than 1 per randomized trial – and indeed, percentage differences in

² These data include 89% of all live births to NFP enrollees who resided in NFP catchment areas at the time of birth. Nationwide, one fourth of NFP mothers are under age 18 at the time of delivery.

trials reported above are 1 to 2 birth differences. Thus trial findings probably were mixed because samples were too small to detect differences in prematurity reliably. Scale-up typically targets higher-risk families but those at highest risk may refuse participation. Nevertheless, because comparison groups in scale-up were not restricted to higher-risk first births or Medicaid births, the 30% reduction observed in Oklahoma and in National Services Office data probably is conservative. We multiplied it times a 87% replication factor that represents the ratio of lifetime visits per family in California to lifetime visits per family in well-established NFP programs during 1996-2001.

- **Fewer Infant Deaths.** NFP participation reduces infant deaths by 55.7%.

Evidence: Modest numbers of adverse birth outcomes make it difficult to detect differences in these outcomes in randomized trials. Although designs are much weaker, these outcomes are more appropriately assessed with analyses of programs operating at scale that have served thousands of families.

- In the Memphis trial through age 9, NFP youth experienced a 77.6% decline in mortality from preventable causes (Olds et al. 2007). Multiplying times the 73.1% replication factor suggests a 56.7% decline through age 9 in replication or 4.81 deaths per 1,000 live births
- Among unmarried mothers in Oklahoma, NFP participation by 5,239 women was associated with a 64% reduction in odds of neonatal mortality within 28 days (Carabin et al. 2005) – a reduction of 3.64 deaths per 1,000 live births to similar mothers. Among all 8,598 first-time mothers served, the reduction was 47.5% or 2.64 deaths per 1,000 live births. This reduction persisted as children aged
- Through 2005, odds of death among 15,102 NFP babies born in Oklahoma in 1997-2004 were 46% below odds among other Oklahoma first-born children (Cox 2007)
- In Cincinnati, more than 1,665 women enrolled in NFP or a second home visitation program experienced 59%-62% lower odds of infant mortality than other women (Donovan et al. 2007). These three rates are suspect because the comparison groups are not equivalent. Program targeting means NFP mothers are at higher risk than most comparison mothers, but they probably are at lower risk than the roughly 50% of mothers offered NFP services who decline them

Rationale for Percentage Chosen: We chose the OK rate of 3.64 deaths per 1,000 live births (a 64% reduction) over the Cincinnati rate because results were not commingled with another program. We conservatively defined it as total mortality reduction over one year rather than 28 days and chose it over the longer-term (and therefore higher) reduction of 4.81 per 1,000 in Memphis. We multiplied it times the 87% replication factor.

- **Improved Birth Spacing:** NFP mothers have 29.2% fewer closely spaced second births within 24 months and 22.3% fewer very closely spaced births within 15 months, thus reducing risks of costly complications.

Evidence:

- 40% (11.2 percentage point) reduction in second births within 2 years of the first birth in pooled data from the Elmira, Memphis and Denver trials (Olds et al. 1988; Kitzman et al. 1997; Olds et al. 2002)
- 33% reduction in pregnancies within 14 months of the first birth in Louisiana (Sonnier 2007; not statistically significant, base level unstated)

- 13% (2.2 percentage point) reduction in second births within 2 years in Pennsylvania scale-up including a 27% (5.4 percentage point) reduction among mothers enrolled before age 19 (Rubin et al. 2011)
- 31% (10 percentage point) reduction in subsequent pregnancy within 18 months relative to other first-time mothers in New York City (NYC Nurse-Family Partnership E-News, September 2011)
- 31% (10 percentage point) reduction in pregnancies within 6 months of delivery over 4.5 years in Memphis (Kitzman et al. 2000)
- 30% (3 percentage point) reduction in second pregnancies within 7 months in Denver (Olds et al. 2002)

Rationale for Percentages Chosen: The pooled estimate of close spacing from the 3 robust randomized trials is of highest quality. Applying the 73.1% replication factor yields a 29.2% rate of closely spaced births in scale-up, close to the 27% rate for young mothers in PA and the 31% rate in New York City. The estimate of very close spacing comes from pooled Denver and Memphis data (30.5% times 73.1%). The strong evidence that close spacing is reduced increases our confidence that very close spacing is reduced.

- **Fewer Subsequent Births:** On average, NFP mothers bear 68.7 fewer subsequent children, with the decrease resulting solely from their reduced rate of second births within two years of first births (a 29% reduction in repeat teen births). In years 3-12 post-partum, NFP neither raises nor lowers the birth rate.

Evidence: Multiplying the 39.9% (11.2 percentage point) reduction in pooled longitudinal data from the Elmira, Memphis and Denver trials (special data run for this report) times the 2008 repeat teen birth rate of 0.2346 (Ikramullah et al. 2011) yields a 0.094 reduction.

Rationale for Percentages Chosen: The pooled 0.094 estimate is of high quality and updated to reflect recent birth rates. We multiplied it times the 73.1% replication factor.

- **Fewer Subsequent Preterm Births:** On average, NFP mothers have 0.0351 fewer subsequent preterm births.

Evidence: This is a computed estimate.

Computations: Of all births in 2009, 12.2% were preterm and 41.0% were to unmarried mothers (Martin et al. 2011). Being unmarried raises odds of preterm birth by 1.46 (Shah et al. 2011). So preterm birth rates are 10.3% ($.122 / (1.46 * .41 + .59)$) for married women and 15.0% ($1.46 * 10.3%$) for unmarried women. Of 136,609 clients enrolled in NFP nationally through 2011, 15.2% were married at intake (NFP National Services Office 2012). That suggests a 14.3% preterm birth rate for NFP clients absent NFP ($.152 * 10.3% + .848 * 15.0%$). The 14.3% rate applies to the 0.066 birth reduction, meaning 0.0135 preterm births are prevented.

Pregnancy spacing below 18 months raises risk of preterm birth by 1.92% per month less than 18 months (Conde-Agueldo et al. 2006). Applying the inter-pregnancy interval distribution for controls in Denver (Olds 2010), the 0.066 births reduced had an average excess probability of being preterm of 18.9%. Since only 0.025 very closely spaced second births were prevented, preventing 10 very closely spaced births over 4.5 years per 11.2 births in Memphis within 2 years means another 0.075 closely spaced births were prevented over the following 2.5 years. These births have a 23% preterm rate (Conde-Agueldo et al. 2006). Subsequent preterm births prevented per NFP family total 0.048

$(0.094 * (14.3\% + 18.9\%) + 0.075 * 23\%)$). Multiplying the 0.048 reduction times the 73.1% replication factor, the expected reduction is 0.0351 or 35.1 per 1,000 NFP families.

- **Increased Breastfeeding Attempts:** 9.1 percentage point (13.5%) increase in mothers who tried breastfeeding.

Evidence:

- 15 percentage point (88%) increase in mothers breastfeeding at 6 months in Elmira (Olds et al. 1983)
- 10 percentage point (62.5%) increase in initiation in Memphis with no change in average duration for initiators (Kitzman et al. 1997)
- 10 percentage point (33.3%) increase in infants breastfed exclusively for at least 2 months postpartum in New York City compared to other first-time Medicaid mothers citywide (NYC Nurse-Family Partnership E-News, May 2012).
- Nationally, among 13,490 mothers served by NFP at birth in 2009, 79.1% attempted breast-feeding. By comparison, 67.5% of WIC-eligible women attempted breast-feeding nationally in 2008, an 11.6 percentage point (17%) increase. Like in the trials, increased initiation did not affect breast-feeding rates at 6 months post-partum and beyond.

Rationale for Percentage Chosen: Our 9.1 percentage point estimate (a 14% increase over the WIC-eligible level) is the 12.5 percentage point average increase from randomized trials times 73.1%. It is lower than the observed 10-11.6 percentage point increase in scale-up so it should be conservative.

- **Fewer Childhood Injuries:** NFP babies have 35.3% fewer injuries treated in emergency departments (EDs) through age 2.

Evidence:

- 56% reduction in ED visits for injury in Elmira in year 2 and a 32% reduction in all ED use (Olds et al. 1986)
- 39% reduction in medically attended injuries in Memphis through age 2 (Kitzman et al. 1997)
- Similar administrative data were not collectable in Denver
- 50% reduction in all ED use through age 15 months in Louisiana (Sonnier 2007).
- In contrast, NFP client families in Pennsylvania used 15% more ED services for injury through age 2, with the increase attributable to more frequent treatment of minor injuries (Matone et al. 2011)

Rationale for Percentage Chosen: Multiplying the 48.3% average reduction across 3 trials times 73.1% suggests a 35.3% reduction in scale-up.

- **Fewer Child Maltreatments:** NFP reduces child abuse and neglect by 29.0% from birth through at least age 15.

Evidence:

- 39.7% reduction in cases substantiated by Child Protective Services (CPS) in Elmira (Eckenrode et al. 2000). Temporally, reductions are concentrated at ages 4-15 (Zielinski et al. 2009).
- Similar data were not collected at other sites.

Rationale for Percentage Chosen: We multiplied the 39.7% reduction times the 73.1% replication factor. Child maltreatment follows a severity distribution so we assume unconfirmed case counts will change as confirmed (substantiated or otherwise indicated) counts do. That assumption is conservative because NFP increases detection and evidence

required for confirmation (Olds et al. 1995), which should cause a larger decrease in unconfirmed than confirmed cases.

- **Better Language Development:** NFP reduces language delay by 36.6%, thus reducing the need for pre-school or school-based remedial services.

Evidence:

- In Elmira, stimulation of language development rose significantly at 34 and 46 months of age (Olds et al. 1994)
- Language development (receptive vocabulary, coherent story-telling) at age 6 significantly improved in Memphis but remedial service use was not evaluated (Olds et al. 2004b)
- 50% reduction in language delay at age 2 (Olds et al. 2002) and at age 4 (Olds et al. 2004a) and 0.203 (35%) fewer remedial services/youth at age 6 (Olds 2010) in Denver
- Gains in language development occurred almost exclusively among children of mothers who were more psychologically vulnerable. At least in Memphis, those gains improved achievement test scores in reading and math during grades 1-6 (Olds et al. 2010)

Rationale for Percentage Chosen: We multiplied the 50% reduction times the 73.1% replication factor.

- **Fewer Youth Criminal Offenses:** NFP reduces youth arrests by 43.1% at ages 11 through 15, with a lower annual rate persisting through age 18. That self-reported reduction, in turn, saves state and local government police investigation, adjudication, and sanctioning costs, as well as reducing Medicaid spending and tax losses associated with crime victims' earnings losses.

Evidence:

- 59% reduction in Elmira (Eckenrode et al. 2010)

Rationale for Percentage Chosen: We multiplied the 59% reduction times the 73.1% replication factor. We assumed reduction in arrests mirrored reduction in crimes committed.

- **Reduced Youth Substance Abuse:** NFP reduces alcohol, tobacco, and marijuana use by 49.7% at age 12 until at least age 15.

Evidence:

- 67% reduction in 6-month-use of cigarettes, alcohol or marijuana at ages 12-15 in Elmira (Olds et al. 1998; reanalyzed as a combined estimate). Not sustained at age 19 (Eckenrode et al. 2010)
- 69% reduction in 30-day-use of cigarettes, alcohol or marijuana at age 12 in Memphis, with both days of use and number of substances used reduced (Kitzman et al. 2010)

Rationale for Percentage Chosen: We multiplied the 68% average reduction times the 73.1% replication factor.

- **Increased Immunizations:** NFP participation is associated with at least a 15.0 percentage point (21.4%) increase in probability that children covered by Medicaid will get all their immunizations through age 2.

Evidence:

- In New York City, at 24 months, 94% of NFP babies are fully immunized compared to 75% of other babies (personal communication, Lindsay Senter, New York City Department of Health and Mental Hygiene, August 9, 2010)
- Nationally, maternally reported immunization rates of infants born in 2009 who received NFP services at 6, 12, 18, and 24 months steadily rose from 86% of survey respondents at 6 months to 92% at 24 months (77% to 85% of all active participants, with 7%-8% not responding). By comparison, 70% of 24-month-olds served by Medicaid HMOs in 2010 were fully vaccinated (National Committee for Quality Assurance 2011)
- NFP, however, did not increase immunization rates from a 68% baseline in Memphis (Kitzman et al. 1997)

Rationale for Percentage Chosen: Although the 2 comparisons available found 19 and 22 percentage point differences in operational programs that were statistically significant at the 95% confidence level, neither was based on a carefully matched sample. We therefore reduced the 20.5% average effectiveness by the same 73.1% that we reduced effectiveness from trials.

- **Reduced TANF Payments:** NFP reduces Temporary Assistance for Needy Families (TANF) payments by 6.6% for 9 years post-partum. These savings result from the reduced second birth rate and differences in earning patterns that reduce TANF eligibility and payments per eligible family. Applying this percentage to current TANF data accounts for the downward shift in TANF participation following the 1996 overhaul of TANF.

Evidence:

- 33% reduction from 90 months to 60 months participation per family over 15 years in Elmira on the predecessor Aid to Families with Dependent Children program (Olds et al. 1997)
- 9% reduction in data tracked over time in Memphis (Olds et al. 2010)

Rationale for Percentage Chosen: We multiplied the 9% reduction times the 73.1% replication factor. We applied this percentage to the state-specific TANF utilization rate in 2009 multiplied times the state-specific change in payments per recipient family from 1996 to 2009.

- **Reduced Food Stamp Payments:** NFP reduces food stamp usage by 8.2% for at least 10 years post-partum. These savings result from the reduced second-birth rate and differences in earning patterns that reduce food stamp eligibility and payments per eligible family.

Evidence:

- 15% reduction in months on food stamps in Elmira over 15 years (Olds et al. 1997)
- 11.2% reduction in Memphis (Olds et al. 2010)

Rationale for Percentage Chosen: We multiplied the more recent 11.2% reduction times the 73.1% replication factor.

- **Reduced Need for Medicaid Coverage:** NFP reduces person-months on Medicaid by 6.5% for at least 15 years post-partum, with most of these savings expected to continue. The participation reductions have two causes. First, the reduced second birth rate resulting from NFP services and possibly differences in earning patterns increase Medicaid graduation of mothers and to a lesser extent, of first-born children (although few children would fully graduate today because the Child Health Insurance Program and subsequent health care reforms raised income eligibility thresholds). Second, as documented above,

NFP mothers bear an average of 0.112 fewer children. The births avoided are closely spaced ones at high risk of costly complications. Associated Medicaid cost savings include both birth-related costs and costs of continuing Medicaid participation of these second babies.

Evidence:

- 13% reduction in Medicaid spending in Elmira over 15 years post-partum (Olds et al. 1997)
- 8.9% reduction due to graduation from capitated managed care in Memphis over 10 years post-partum (Olds et al. 2010)
- Graduation from capitated managed care, however, did not increase in the Denver trial, which was launched during the economic boom of the mid-1990s, probably because within 4 years post-partum, 75% of all mothers in the trial earned too much for their babies to qualify for Medicaid

Rationale for Percentage Chosen: Medicaid eligibility has broadened since the Elmira trial, which could reduce program effectiveness. We therefore multiplied the 8.9% reduction from Memphis times the 73.1% replication factor.

- **Lower Costs if on Medicaid:** NFP reduces Medicaid spending per child recipient an estimated 12.4% from birth through age 18.

Evidence:

- As documented above, NFP reduces smoking during pregnancy and related prematurity, pregnancy-associated preeclampsia, child injury in the first two years of life, medical and mental health spending on victims of child abuse and physical neglect, adherence to immunization schedules, and second births with complications. Those health status improvements should reduce Medicaid claims costs of mothers and first-born children. Although data availability prevented direct evaluation of the savings in the randomized trials, we modeled the savings. Some cost reductions should continue for 18 years post-partum.

Rationale: The Government Cost fact sheet estimates the reduction in Medicaid costs. We divided that total by the sum of costs per Medicaid live birth (Institute of Medicine 2006; Machlin & Rohde 2007) plus the present value of annual Medicaid spending per child recipient from birth through age 18 (Henry J. Kaiser Family Foundation 2011).

- **Reduced Subsidized Child Care, Second Births:** An estimated 4.85% of the second babies who would have been born within two years of the first birth would have used subsidized child care funded by the Child Care Development Block Grant.

Evidence: This is a computed estimate.

Computations: 4.85% of Medicaid and SCHIP children use subsidized child care nationwide (Office of Child Care 2010). We multiplied that rate times the 0.0687 reduction in subsequent births (derived above).

Limitations. The reductions in child maltreatment and youth crime are less certain than other outcomes. Both come from a high-quality randomized trial but lack confirming evidence. No other study has reported on behavior of NFP youth beyond age 12 or on maltreatment rates of NFP youth. Because preterm births and child mortality are rare, we estimated reductions primarily with models or comparisons between NFP babies and other babies. These estimates are less certain than ones from randomized trials that compare NFP and well-matched control babies. The analysis assumes findings from Elmira, Denver, and Memphis apply nationwide. Despite

consistent evidence for selected effects in state programs, that seems questionable with Asian and Native American families and possibly in rural settings.

References. Please see the references fact sheet.

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