



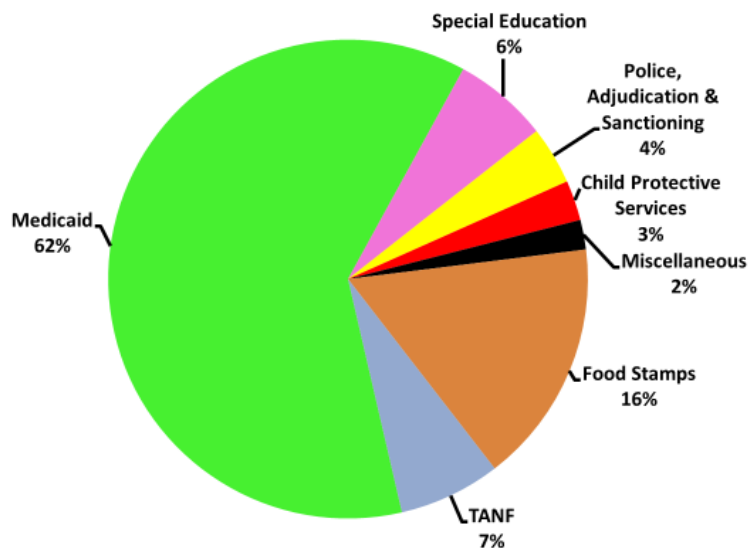
COST SAVINGS OF NURSE-FAMILY PARTNERSHIP IN MONTANA

When Nurse-Family Partnership (NFP) serves a family in Montana, state, local, and Federal governments all benefit.

NFP saves governments money. NFP costs average \$8,200 per family served (present value at a 3% discount rate, \$8,061). As Figure 1 shows, the \$26,536 (\$18,475 net of program costs) in offsetting government savings includes savings in Medicaid, criminal justice, and special education plus transfers of spending from government to families who need less government assistance. NFP also improves quality of life of participating families. By the child's 18th birthday, state and local government savings total \$13,407 (present value \$10,372) (Table 1). Federal savings are large too: \$20,189 (present value \$16,164). Medicaid savings alone total \$21,297 per family served (Table 2). All estimates in this fact sheet are in 2015 dollars.

If Medicaid fully funded NFP, each level of government would reap Medicaid savings that exceed its share of NFP costs when the child was age 5. By the child's 18th birthday, Medicaid would recoup \$2.60 per dollar invested (undiscounted). Adding TANF, criminal justice, and other cost savings, State and local government would save 3.7 times the \$2,802 in state costs (computed from present values). Federal savings would be 3.1 times Federal costs of \$5,259 per family served. State and federal government each would fully recoup their costs when the child was age 4. If Medicaid were braided with other NFP funding streams, governments would recoup their costs even faster and get a larger return on investment.

Figure 1. Distribution of Federal, State, and Local Government Cost Savings per Family Served by NFP Nationwide (Present Value at a 3% Discount Rate)



**Table 1 Cost Savings to Montana within 18 Years of the Birth of a First Child Whose Mother Received Any Nurse-Family Partnership Services and Corresponding Savings to the Federal Government (in 2015 dollars)
Offsetting NFP Costs Average \$8,200 (Present Value \$8,061) per Family Served in Montana**

Category of Savings/ Child Age	Prenatal	0-11 Mos	12-23 Mos	24-35 Mos	36-47 Mos	48-59 Mos	60-71 Mos	72-83 Mos	84-95 Mos	96-107 Mos
State Savings by Category										
TANF Payments		\$103	\$195	\$152	\$335	\$85	\$162	\$128	\$91	\$92
Medicaid Graduation		\$175	\$170	\$153	\$190	\$181	\$151	\$88	\$68	\$72
Reduced Costs if on Medicaid	\$408	\$42	\$64	\$23	\$20	\$85	\$58	\$71	\$71	\$71
Fewer Closely Spaced 2nd Births on Medicaid			\$531	\$191	\$305	\$259	\$188	\$186	\$185	\$185
Child Care, 2nd Births			\$5	\$5	\$5	\$5				
Special Education			\$8	\$20	\$15	\$42	\$38	\$131	\$42	\$41
Confirmed Maltreatment *						\$54	\$54	\$66	\$66	\$66
Other Maltreatment						\$1	\$1	\$1	\$1	\$1
Intimate Partner Violence	\$15	\$23	\$23	\$23	\$23	\$23				
Youth Arrests										
Youth Crime										
Youth Substance Abuse										
State Savings by Year	\$423	\$351	\$996	\$567	\$893	\$735	\$652	\$671	\$524	\$528
Federal Savings by Year	\$769	\$498	\$1,753	\$987	\$1,518	\$1,648	\$1,437	\$1,100	\$997	\$993
Total Government Savings by Year	\$1,192	\$849	\$2,749	\$1,554	\$2,411	\$2,383	\$2,089	\$1,771	\$1,521	\$1,521
Cumulative Federal & State Medicaid Savings	\$1,174	\$1,799	\$3,999	\$5,056	\$6,539	\$8,050	\$9,194	\$10,186	\$11,118	\$12,062
Cumulative State Savings (Present Value)	\$423	\$769	\$1,721	\$2,248	\$3,054	\$3,698	\$4,252	\$4,806	\$5,226	\$5,637
Cumulative Federal Savings (Present Value)	\$769	\$1,260	\$2,937	\$3,854	\$5,223	\$6,666	\$7,887	\$8,795	\$9,594	\$10,366
Total Government Savings (Present Value)	\$1,192	\$2,029	\$4,658	\$6,102	\$8,277	\$10,364	\$12,139	\$13,601	\$14,820	\$16,003

* Confirmed maltreatment includes substantiated and other indicated maltreatment, i.e., cases child welfare investigations concluded involved maltreatment.

Category of Savings/ Child Age	108-119 Mos	120-131 Mos	132-143 Mos	144- 155 Mos	156– 167 Mos	168- 179 Mos	180- 191 Mos	192-203 Mos	204- 215 Mos	Total
State Savings by Category										
TANF Payments	\$130	\$119	\$532	\$106	\$113	\$0				\$2,343
Medicaid Graduation	\$173	\$224	\$68	\$133	\$69	\$162	\$57	\$67	\$151	\$2,352
Reduced Costs if on Medicaid	\$64	\$64	\$64	\$65	\$64	\$66	\$49	\$2	\$2	\$1,356
Fewer Closely Spaced 2nd Births on Medicaid	\$185	\$185	\$185	\$185	\$185	\$185	\$185	\$185	\$2	\$3,695
Child Care, 2nd Births										\$20
Special Education	\$38	\$38	\$38	\$37	\$37	\$37	\$31	\$11	\$11	\$623
Confirmed Maltreatment	\$60	\$60	\$60	\$58	\$58	\$58	\$45			\$705
Other Maltreatment	\$1	\$1		\$1	\$1	\$1	\$1			\$12
Intimate Partner Violence										\$130
Youth Arrests			\$28	\$28	\$154	\$154	\$285	\$358	\$405	\$1,450
Youth Crime			\$14	\$14	\$77	\$77	\$142	\$179	\$202	\$724
Youth Substance Abuse				\$0.07	\$0.07	\$0.07	\$0.07			\$0.28
State Savings by Year	\$666	\$733	\$990	\$627	\$758	\$740	\$795	\$802	\$956	\$13,407
Federal Savings by Year	\$1,337	\$1,302	\$788	\$968	\$883	\$1,043	\$821	\$587	\$760	\$20,189
Total Government Savings by Year	\$2,003	\$2,035	\$1,778	\$1,595	\$1,641	\$1,783	\$1,616	\$1,389	\$1,716	\$33,596
Cumulative Federal & State Medicaid Savings	\$13,277	\$14,639	\$15,551	\$16,654	\$17,570	\$18,758	\$19,595	\$20,325	\$21,297	\$21,297
Cumulative State Savings (Present Value)	\$6,140	\$6,678	\$7,383	\$7,816	\$8,325	\$8,807	\$9,310	\$9,802	\$10,372	\$10,372
Cumulative Federal Savings (Present Value)	\$11,376	\$12,331	\$12,892	\$13,561	\$14,153	\$14,832	\$15,351	\$15,711	\$16,164	\$16,164
Total Government Savings (Present Value)	\$17,516	\$19,009	\$20,275	\$21,377	\$22,478	\$23,639	\$24,661	\$25,513	\$26,536	\$26,536

If Medicaid fully funded NFP, at current matching rates, state share would be \$2,802 and Federal share would be \$5,259.

Table 2. Undiscounted and Present Value Medicaid Savings per Family Served by Source of Savings, Prenatal to Age 18 (in 2015 dollars)

Source of Savings	Undiscounted	Present Value
Increased Child Graduation	\$6,764	\$5,387
Fewer Closely Spaced Second Births on Medicaid	\$10,627	\$8,380
Reduced Smoking While Pregnant	\$12	\$12
Reduced Preeclampsia	\$515	\$515
Reduced Prematurity	\$743	\$722
Fewer Injuries	\$114	\$110
Increased Immunization	\$75	\$69
Reduced Child Maltreatment	\$2,130	\$1,599
Reduced Intimate Partner Violence	\$294	\$276
Reduced Youth Substance Abuse	\$23	\$15
Total	\$21,297	\$17,085

This analysis is the first that separates savings to state and local versus Federal government. Prior cost-benefit analyses of the NFP model monetized savings to society or to government. Savings to society include government savings; costs paid by employers, insurers, and participating families; and the value of increased quality of life. Prior cost-benefit analyses also showed varied return on investment because they monetized different outcomes for different time periods. For example, studies by Washington State Institute for Public Policy (e.g., Aos et al. 2004) compared total program cost with state government and societal savings through age 15.

Our estimates, although robust, are based on conservative assumptions. They combine cost data for Montana with effectiveness data derived from five randomized trials of NFP (Denver, Elmira, and Memphis trials by David Olds and small independent trials in Louisiana and Orange County CA) plus evaluations of NFP effectiveness when scaled up in New York City, Ohio, Oklahoma, and Pennsylvania.

Categories of savings per family served by a Nurse-Family Partnership home visitation program are described below. Table 3 details the calculations. It shows three columns of factors. Multiplying these factors together would yield estimated state government savings from a randomized trial in Montana. Because outcomes tend to be better in randomized trials than in replication, that estimate is multiplied times 82.0% to estimate savings for an operational program. This percentage mirrors the decrease in the number of nurse visits per family in operational NFP programs compared to the number of visits in randomized controlled trials.

Reduced TANF Payments: Higher earnings and a reduced second birth rate reduce eligibility and payments per eligible mother. Savings continue through age 13. This estimate accounts for the downward shift in TANF participation following the 1996 overhaul of TANF. All TANF savings accrue to state government.

- **Reduced Food Stamp Payments:** Higher earnings and a reduced second-birth rate reduce eligibility and 100% federally funded food stamp payments per eligible mother. Savings continue at least through age 15.

- **Increased Medicaid Graduation:** Higher earnings and a reduced second birth rate increase Medicaid graduation of mothers and to a lesser extent, of first-born children (but the analysis recognizes that few children would fully graduate because Child Health Insurance Program has higher income eligibility thresholds). Savings continue until age 18.
- **Lower Costs if on Medicaid:** 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, and adherence to immunization schedules, thus reducing Medicaid claims costs of mothers and first-born children. Some savings continue through age 18.
- **Fewer Second Babies on Medicaid:** NFP mothers have a reduced rate of second births within two years of first birth and a reduced rate of closely spaced births that pose high risks of costly complications. More than two years after first birth, NFP neither raises nor lowers the birth rate, so net decrease in family size attributable to NFP equals decrease within two years of first birth. Savings include both birth-related costs and costs of continuing Medicaid participation of these second babies. Savings continue until age 18.
- **Reduced Child Care, Second Births:** Had additional babies been born, some would have used subsidized child care funded by Child Care Development Block Grant.
- **Reduced Child Maltreatment:** NFP reduces maltreatment and thus costs of investigation and intervention including foster care and judicial expenses. Savings start at age 4 and continue at least until age 15.
- **Reduced Intimate Partner Violence:** NFP reduces physical and sexual assault of women by their intimate partners prenatally and through age 5.
- **Reduced Language Delay:** NFP improves language skills, thus reducing need for early language development services at age 6.
- **Lower Criminal Justice Costs:** Reduced offending by youth served by NFP begins at age 11 and extends through age 17, saving state and local government police investigation, adjudication, and sanctioning costs, as well as reducing Medicaid spending and tax losses associated with crime victim earnings loss.
- **Lower Youth Substance Abuse Costs:** Youth served by NFP use less alcohol, tobacco, and marijuana from age 12 through age 15.

References. Please see the references fact sheet.

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Table 3. Source of Factors That When Multiplied Together and Then Multiplied Times the 82.0% Replication Effectiveness Factor Yield Estimated Cost Savings of Nurse-Family Partnership Services to Montana (in 2015 dollars) *

Category of Savings	Factor A	Factor B	Factor C
1. Reduced TANF	Mean \$ saved by year, Memphis NFP (Olds et al. 2016) times payments per recipient in (Montana/ Tennessee), 1996	% change in payments per recipient family in Montana, 1996 to 2015 (Floyd & Schott 2015)	% decrease in TANF recipients in Montana, 1996 to 2015 (Floyd & Schott 2015)
2. Increased Medicaid Graduation	Mean \$ saved by year, Memphis NFP (Olds et al. 2016)	Medicaid costs/child enrollee, Montana/ Tennessee (Henry J Kaiser Family Foundation 2016a)	Medicaid matching %age in Montana (Assistant Secretary for Planning and Evaluation 2016)
3. Lower Costs if on Medicaid	Multiply each of components 3 a to 3 f times	Council for Community and Economic Research (C2ER, 2015) medical price adjuster, Montana/US multiplied times	Medicaid matching %age in Montana
3 a. Reduced Smoking/Birth Complications	31% less cotinine (Denver, Olds et al. 2002) (by comparison, 28% less cigarettes in Elmira, Olds et al. 1986)	% of Montana births to unmarried mothers that involved smoking in the last trimester of pregnancy (2014 birth certificate data adjusted for under-reporting)	\$258/case (Adams & Melvin 1998)
3 b. Reduced Pregnancy-Induced Hypertension (PIH)	35% reduction in pooled data from the Elmira & Memphis trials (Miller 2015)	22% of first-time low-income births in NYC prior to NFP involved PIH (by comparison, 20% in the Memphis trial)	\$6,641/case exclusive of live birth costs (Pourat 2013)
3 c. Reduced Preterm Births	18% fewer preterm births among NFP mothers across 5 randomized trials (Miller 2015)	ratio of % of births that are preterm in Montana versus nationally (Henry J Kaiser Family Foundation 2016b)	\$32,420 extra medical cost/preterm birth (Philip et al. 2016)
3 d. Fewer Injuries	41.6% reduction in pooled data from the Elmira, Memphis, & Louisiana trials (Miller 2015)	22.56% incidence over 2 years in 2012 Healthcare Cost & Utilization Project Nationwide ED and Inpatient Samples multiplied times 95.83% still on Medicaid when the injury occurs	\$1,691 medical cost/injury, ages 0-4, Finkelstein et al. (2006)
3 e. Reduced Child Maltreatment	39.7% reduction at ages 4-15, Elmira (Eckenrode et al. 2000) times % of low income children maltreated (Sedlack et al. 2010)	Ratio of CPS investigation rates in 2014 for Montana and New York (Children's Bureau 2016)	\$3,929 in mental health care costs per victim + \$10,091 per victim for medical (Fang et al. 2012, Miller et al. 1996)
3 f. Reduced Intimate Partner Violence	16% reduction prenatally through age 4 in pooled longitudinal data from the Memphis, Denver, Louisiana, and Dutch trials (Miller 2015)	20.3% annual probability in the control groups across the three US trials	\$949 in medical and mental health care costs per case times 95.83% still on Medicaid when assaulted if after age 2
3 g. More Immunization	13% increase in full immunization at age 2 from Elmira (Olds et al. 1983)	\$895 net medical care savings in years 1-4 (Zhou et al. 2005)	95.83% still on Medicaid when ill

Category of Savings	Factor A	Factor B	Factor C
4. Fewer Second Babies			
4 a. Fewer Infants Enrolled in Medicaid due to Fewer Pregnancies	Repeat teen birth rate in Montana (Ikramullah et al. 2011) multiplied times 39% reduction in pooled data from the Elmira, Memphis & Denver trials (Olds et al. 1986, Kitzman et al. 1997, Olds et al. 2002)	Medicaid cost/child/year in Montana (Henry J Kaiser Family Foundation 2016a)	Medicaid matching %age in Montana
4 b. Fewer Deliveries of Medicaid Babies	Multiply components 4 b i and ii times	C2ER (2015) medical price adjuster, (Montana/US) times	Medicaid matching %age in Montana
4 b i. Fewer Second Pregnancies within 24 Months	39.9% reduction in pooled data from the Elmira, Memphis & Denver trials (Olds et al. 1986, Kitzman et al. 1997, Olds et al. 2002);	Repeat teen birth rate in Montana (Ikramullah et al. 2011)	\$5,712 cost/pregnancy covered by Medicaid, excluding preterm delivery costs (IOM 2006; Machlin & Rohde 2007)
4 b ii. Fewer Preterm Second and Subsequent Births	% of births preterm in Montana in 2014 (Henry J Kaiser Family Foundation 2016b) multiplied times adjuster for higher expected preterm rate in the largely unmarried NFP population (based on the odds ratio of 1.46 in Shah et al. 2011)	10 percentage point increase in Memphis over 4.5 years (Kitzman et al 2000) (30% reduction for second births in Denver, Olds et al. 2000) multiplied times portion of preterm births attributable to close spacing(0.4/1.4; Conde-Agueldo 2006)	\$32,420 extra medical cost/preterm birth (Philip et al. 2016)
5. Less Subsidized Child Care, Second Births	39.9% fewer second births within 24 months (see 4 b i) multiplied times 2% of Medicaid mothers use child care subsidized by Child Care Development Block Grant (NYC)	Cost/child served in Montana (Office of Child Care 2010)	Montana matching fund percentage (Office of Child Care 2010)
6. Reduced Language Delay	50% reduction in Denver (Olds et al. 2002) (language development at age 6 also improved in Memphis, Olds et al. 2004b)	\$7,000 cost per case from New York City adjusted to state prices using C2ER (2015) all-item price index	70% state and local
7. Less Child Maltreatment	39.7% reduction, Elmira (Eckenrode et al. 2000) multiplied times % of low income children maltreated (Sedlack et al. 2010)	Ratio of CPS investigation rates in 2010 for Montana and nationwide (Children's Bureau 2011)	CPS cost/case multiplied times % non-Federal in Montana (DeVooght et al. 2008)
8. Less Youth Crime	59% reduction, through age 17, Elmira (Olds et al. 1998, Eckenrode et al. 2010)	Arrests per 1000 youth in Montana (Bureau of Justice Statistics 2016) multiplied times crimes per arrest (Miller 2012, Table 10)	Cost/crime (Miller 2012, Table 9) multiplied times price indices for Montana by cost category
9. Less Youth Substance Abuse	68% reduction, ages 12-15 – average of 67% reduction, ages 12-15, Elmira (Olds et al. 1998); 69% reduction, Memphis, age 12 (Kitzman et al. 2010)	Medical cost/abuser (from the societal cost estimates above) multiplied times C2ER (2015) medical price adjuster for Montana	Medicaid matching %age in Montana

* Factors across a row are multiplied together. Computing some costs requires multiplying factors across two rows as indicated. Each calculation incorporates an estimate of percentage of government savings that accrues to state government. Savings to Federal government are computed as total government savings minus state government savings. State government gets all TANF savings. Federal government gets all food stamp savings.