



SOCIETAL RETURN ON INVESTMENT IN NURSE-FAMILY PARTNERSHIP SERVICES IN MONTANA

Nurse-Family Partnership (NFP) is a program of intensive prenatal and postnatal home visitation by nurses. It targets low-income mothers and their first-borns. Through 2015, NFP served 220,000 families.

NFP has three goals: (1) to improve pregnancy outcomes by helping women improve their prenatal health, (2) to improve child health and development by helping parents provide more sensitive and competent care, and (3) to improve parental life-course by helping parents plan future pregnancies, complete their educations, and find work. By design, NFP helps parents to understand how their behaviors influence their own health and their child's health and development. It enables them to change their lives in ways that protect themselves and their children more effectively.

The first fact sheet in this series summarized life status and financial outcomes of NFP in Montana. This fact sheet describes dollar benefits associated with those outcomes and estimates return on investment in NFP. A third fact sheet estimates government's savings.

In Montana, costs per NFP family would average \$8,200, with cost per visit of \$284, cost per day of participation (active enrollment) of \$16.05, and average cost to serve a family for a year of \$5,858. These costs are well below NFP costs in randomized trials. All cost estimates in this fact sheet are in 2015 dollars.

Some families participate in NFP for more than 2.5 years. Others drop out quickly. Of the costs, 31% would be incurred prenatally, 45% in the first year after birth, and the remaining 24% in the second year after birth. Because money earns interest, we applied a discount rate of 3% to estimate the present value of costs, \$8,061. That is the amount needed today to pay costs over time. Costs reflect average client participation of 510.9 days after enrollment and 28.9 visits. We based these on enrollment and service usage patterns of Fiscal Year 2012-2013 enrollees in NFP in the United States. We used 2010 cost data averaged across six states, then tailored to wages of nurses in Montana.

Benefits to society per NFP family served in Montana average \$52,970 (present value at a 3% discount rate). Dividing benefits by cost per family served yields a benefit-cost ratio of 6.6 to 1. Table 1 summarizes estimated benefits and costs of NFP per family served and associated economic return. Savings net of program costs are \$44,909 per family.

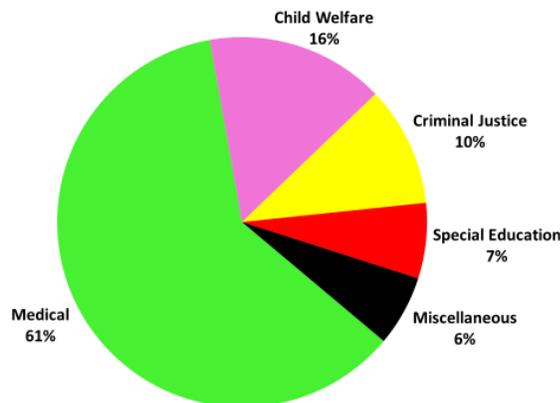
We split resource cost savings (out-of-pocket payments by government, insurers, and families including savings on medical care, child welfare, special education, and criminal justice) from less tangible savings (gains in wage work, household work, and quality of life of NFP families and of people who avoid becoming crime victims). Net of program costs, resource cost savings are \$1,881 (\$9,942 resource cost savings minus \$8,061 program costs). That means NFP saves

society money out of pocket. Less tangible savings total \$43,028. Figure 1 details the resource cost savings by cost category.

Table 1. Present Value of Benefits and Costs per Family Served by Nurse-Family Partnership, Montana, 2015

Benefits of NFP	Per Case
Reduced Smoking While Pregnant	\$12
Reduced Preeclampsia	\$515
Fewer Preterm First Births	\$903
Fewer Subsequent Pregnancies	\$716
Fewer Subsequent Preterm Births	\$1,663
Fewer Infant Deaths	\$24,427
Fewer Child Maltreatments	
Substantiated Cases	\$2,297
Indicated & Unreported Cases	\$4,447
Fewer Nonfatal Child Injuries	\$396
Fewer Intimate Partner Violence Incidents	\$5,076
Fewer Remedial School Services	\$72
Fewer Youth Crimes	
Arrests	\$913
Crimes	\$11,419
Reduced Youth Substance Abuse	\$45
More Immunizations	
Savings Net of Immunization Cost	\$69
Total Benefits	\$52,970
Resource Cost Savings	\$9,942
Intangible Savings (work, quality of life)	\$43,028
Cost of NFP	\$8,061
Net Cost Saving	\$44,909
Resource Cost Savings Net of Program Costs	\$1,881
Benefit-Cost Ratio	6.6

Figure 1. Distribution of Resource Cost Savings per Family Served by NFP Nationally (Present Value at a 3% Discount Rate)



Benefits are spread over 18 years and costs over 3 years. Because of reduced neonatal mortality, NFP breaks even within its first year of service to a family. It recoups its costs in resource cost savings alone when the child is age 15.

These estimates, although robust, are based on conservative assumptions. Return on investment is not overly sensitive to assumptions or to uncertainties about impacts. It is at least 6.4:1 under a broad range of lower-bound scenarios. Prior estimates of return on investment in NFP used costs in trials. They omitted outcomes documented in recent studies. Most did not adjust for reduced effectiveness in replication. We estimate the benefit-cost ratio for randomized trials is 5.2, at the low end of the range of 5 to 7 from earlier studies.

METHODS

Program costs are based on national average cost per NFP visit adjusted to prices in Montana using the ACCRA all-items price index. In states with operating NFP programs, average visits per family are state-specific. Elsewhere they are the national average in well-established NFP programs.

Benefits (cost savings) equal units of outcome (documented in the Outcomes Fact Sheet) times costs per unit of outcome.

Miller (2016) details how we valued cost-saving benefits nationally. Table 2 shows unit costs by outcome in Montana. The rightmost column in Table 2 shows primary sources for these costs.

With minor exceptions, benefits per unit of outcome came from published studies. Miller (2016) made or adjusted existing estimates for some minor crimes (e.g., vandalism) and for child abuse and neglect. We adjusted national estimates of benefits per outcome to prices in Montana using ACCRA all items and medical price adjusters and the ratio of state to national per capita income.

The benefit-cost analysis did not value increased breastfeeding initiation as breastfeeding did not persist.

References. Please see the references fact sheet.

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Table 2. Unit Costs of Harms Prevented in Montana by Cost Category and Primary Sources of Cost Estimates (#ErrCell AG1 dollars)

Harm	Medical/ Mental Health	Special Education	Adjudication & Sanctioning	Property Damage/ Funeral	Work	Quality of Life	Total	Primary Sources
Smoking While Pregnant	\$277						\$277	Adams & Melvin 1998
Preeclampsia	\$7,141						\$7,141	Pourat 2013
Premature Birth	\$41,063	\$6,640			\$3,620		\$51,323	Philip et al. 2016; Institute of Medicine 2006
Subsequent Pregnancy	\$6,143						\$6,143	Machlin & Rohde 2007; Institute of Medicine 2006
Infant/Child Death				\$1,500	\$758,596	\$7,545,660	\$8,305,756	Miller et al. 2012
Child Maltreatment								Miller 2012; Fang
Confirmed Case *	\$15,076	\$2,029	\$40,998	\$7	\$1,191	\$35,392	\$94,693	et al. 2012; &
Other Case	\$15,076	\$2,308	\$109	\$7	\$1,191	\$35,392	\$54,083	Miller et al. 1996
Nonfatal Child Injury	\$1,818				\$3,278	\$1,402	\$6,498	Miller et al. 2012
Intimate Partner Violence Incident	\$1,020		\$426	\$62	\$1,274	\$18,677	\$21,459	Miller 2012
Remedial School Service		\$524					\$524	Snell 2009
Youth Arrest								McCollister et al.
Youth Crime	\$360		\$8,857	\$478	\$0	\$0	\$8,857	2010; Miller 2012;
	\$77		\$190	\$478	\$437	\$4,399	\$5,864	& Miller et al. 1996
Youth Substance Abuse	\$77				\$44	\$106	\$227	Miller et al. 2006
Incomplete Immunization	\$962						\$962	

* Confirmed cases include substantiated and other indicated cases. All child welfare costs were allocated to the adjudication and sanctioning category for confirmed cases. That category includes \$2,882 in police, EMS, and victim services costs and \$38,116 in child protective services and foster care costs.