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EVIDENCE-BASED PROGRAMS TO PREVENT CHILDREN FROM ENTERING AND REMAINING IN THE CHILD WELFARE SYSTEM: BENEFITS AND COSTS FOR WASHINGTON

Child abuse and neglect and the out-of-home placement of youth are concerns to both policymakers and society at large. As a result, the 2007 Washington State Legislature directed the Washington State Institute for Public Policy (Institute) to . . .

> . . . *study evidence-based, cost-effective programs and policies to reduce the likelihood of children entering and remaining in the child welfare system, including both prevention and intervention programs.*[1]

This report presents our findings. The "bottom line" goal of the study is to provide policy information to the legislature on well-researched and cost-beneficial programs and policies that can improve key child welfare outcomes.

We begin by providing background information on the child welfare system in the state of Washington. We then briefly explain the methods we use to determine which programs and policies are effective and we describe our approach to measuring costs and benefits. Next, we present results for individual programs and policies as well as estimates of the impact on Washington State if a "portfolio" of cost-effective programs were to be implemented more widely.

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[1] SHB 1128, Chapter 522, § 202 (17), Laws of 2007.

Summary

The Washington State Institute for Public Policy was directed by the 2007 Washington Legislature to estimate whether "evidence-based" programs and policies can *"reduce the likelihood of children entering and remaining in the child welfare system, including both prevention and intervention programs."* In this report, we study three basic questions. Is there credible evidence that specific programs "work" to improve these outcomes? If so, do benefits outweigh program costs? Finally, what would be the total net gain to Washington if these evidence-based programs were implemented more widely?

Methods

We conducted a systematic review of all research evidence we could locate to identify what works to improve child welfare outcomes. We found and analyzed 74 rigorous comparison group evaluations of programs and policies, most of which were conducted in the United States. We then estimated the monetary value of the benefits to Washington if these programs were implemented in the state. We examined factors such as reduced child welfare system expenditures, reduced costs to the victims of child maltreatment, and other long-term outcomes to participants and taxpayers, such as improved educational and labor market performance, and lower criminal activity.

Findings

1) **Some evidence-based programs work, some do not.** We reviewed credible research evidence and found a number of specific programs and policies that can produce statistically significant improvements in key child welfare outcomes.
2) **The economics look attractive.** Among the successful programs, we found several that can generate long-term monetary benefits well in excess of program costs.
3) **The potential for Washington appears significant.** We estimated the statewide benefits of implementing an expanded portfolio of evidence-based programs. We found that after five years of implementing such a strategy, Washington would receive long-term net benefits between $317 and $493 million (of which $6 million to $62 million would be net taxpayer benefits).

Background

In 2003, the Washington State Legislature directed the Institute to conduct a broad review of prevention and early intervention programs related to youth.[2] Our 2004 report found that some prevention and early intervention programs can produce positive returns to taxpayers, while others fail to generate more benefits than costs.

The 2004 study reviewed programs that impacted a wide array of outcomes, including rates of violence and crime, teen substance abuse, teen pregnancy, teen suicide attempts, educational outcomes, and child abuse and neglect.

The 2007 Legislature directed the Institute to update and extend our previous findings regarding programs that specifically focus on preventing involvement, or further involvement, of children and families in the child welfare system.

The majority of children in the child welfare system are referred for reasons of suspected child abuse or neglect. Preventing abuse and neglect can lead a better quality of life for children and lower child welfare system use. In addition, research evidence that we review in this study (see Appendix B) shows that children who are abused or neglected are more likely than their non-abused or non-neglected counterparts to experience other negative outcomes later in their lives. Abused and neglected children experience reduced rates of high school graduation, greater criminality, lower standardized test scores, increased grade repetition in grades K through 12, increased teenage pregnancy, and increased substance abuse.

The legislative directive for this study is to find tested and effective policies and programs that address the involvement of children and families in the child welfare system.[3]

The Child Welfare System in Washington State: A Statistical Snapshot

The mission of the Children's Administration of the Washington State Department of Social and Health Services is . . .

> *. . . first to protect abused and neglected children, to support the efforts of families to care for and parent their own children safely, and to provide quality care and permanent families for children in partnership with parents and kin, Tribes, foster parents and communities.*[4]

Before presenting the results of our current study, we highlight several "big-picture" statistics on Washington's child welfare system.

In Washington State, in fiscal year 2007:

- ✓ There were 1,566,400 children under age 18 living in Washington.[5]
- ✓ 42,300 children under age 18 were referred to the Children's Administration and accepted for investigation.[6] This is 2.7 percent of Washington State's child population.
- ✓ After a referral is accepted for investigation by the Children's Administration, some children are then placed in out-of-home care. In 2007, about 7,500 children were placed in out-of-home care at least once.
- ✓ On any given day during the year, the Children's Administration estimates that 10,000 children were living in out-of-home care in the custody of the state:
  - Of these, just over a third were living with relatives.
  - About two-thirds were living with non-relative foster families or other state-sponsored arrangements.
- ✓ About 2,500 children were in formal guardianships overseen by the Children's Administration. Guardianships are considered "permanent" placements, so they are not included in the "out-of-home" care numbers.
- ✓ In 2007, the Children's Administration estimates that 7,200 children left out-of-home care. They report that:
  - 4,630 children were reunified with their biological parents;
  - 1,283 were adopted;
  - 394 were placed in new guardianships, and;
  - 808 had "other" exits, which include those who reached age 18, those with a transfer of custody, those with no exit reason, and a very small proportion that died.

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[2] S. Aos, R. Lieb, J. Mayfield, M. Miller, & A. Pennucci. (2004). *Benefits and costs of prevention and early intervention programs for youth*. Olympia: Washington State Institute for Public Policy, Document No. 04-07-3901. Available at: <http://www.wsipp.wa.gov/pub.asp?docid=04-07-3901>.

[3] The funding for this study was provided by the 2007 Legislature with $50,000 of state funds and $100,000 of matching funds from Casey Family Programs.

[4] Washington State Department of Social and Health Services, Children's Administration. <http://www1.dshs.wa.gov/ca/general/index.asp>

[5] Total child population (ages 0 to 17) in Washington State in 2007 according to the November 2007 Forecast of the Office of Financial Management (OFM). Available at: <http://www.ofm.wa.gov/pop/stfc/stfc2007/stfc2007.xls>

[6] This is an unduplicated number of children. Washington Department of Social and Health Services (2008). *2007 Children's Administration Performance Report.* Olympia, WA: Author. <http://www1.dshs.wa.gov/CA/pubs/2007perfrm.asp>

The purpose of this study is to identify evidence-based programs and policies that can affect some of these statewide indicators.

Research Questions for This Study and Our Approach

We investigated four primary research questions in this study:

1. What well-researched programs and policies work to reduce the likelihood that children will enter and/or remain in the child welfare system?
2. What are the costs and benefits of these programs?
3. If Washington State were to implement a "portfolio" of the most cost-effective programs, how would Washington benefit overall?
4. What characteristics are common to effective programs?

In this section, we describe briefly our methods to answer these four research questions; readers interested in skipping to our results can go to page 6. Technical readers can find a detailed description of our methods in the appendices.

1) What works?

In recent years, public policy decision-makers throughout the United States have expressed interest in adopting "evidence-based" programs in a wide array of public policy areas.[7] The general goal is to improve existing systems by implementing programs and policies that have been well researched and shown to work. Just as important, research findings can be used to eliminate programs that fail to produce desired outcomes. Whatever the policy area, the evidence-based approach aims to create a discipline of outcome-based performance, rigorous evaluation, and a positive return on taxpayer investment.

The goal of our first research step is to answer a simple question: What works—and what does not—to reduce the likelihood that children will enter or remain in the child welfare system? Specifically, does rigorous evaluation evidence indicate that particular programs lower child abuse and neglect rates? Additionally, is there rigorous evidence that some programs reduce rates of out-of-home placements for at-risk children?

To answer these fundamental questions, we conducted a comprehensive statistical review of all program evaluations conducted over the last 40 years in the United States and other English-writing countries. As we describe, we located 74 evaluations of individual programs or policies with sufficiently rigorous research to be included in our statistical review.

What Does "Evidence-Based" Mean?

At the direction of the Washington State Legislature, the Institute has conducted a number of systematic reviews of evaluation research to determine what public policies and programs work, and which ones do not work. These evidence-based reviews include the policy areas of adult and juvenile corrections, child welfare, mental health, substance abuse, prevention, K–12 education, and pre-K education.

The phrase "evidence-based" is sometimes used loosely in policy discussions. When the Institute is asked to conduct an evidence-based review, we follow a number of steps to ensure a consistent and rigorous definition. These criteria include:

1. We consider all available studies we can locate on a topic rather than selecting only a few studies; that is, we do not "cherry pick" the studies to include in our reviews. We then use formal statistical hypothesis testing procedures—meta-analysis—to determine what the weight of the evidence tells us about effectiveness.
2. To be included in our review, we require that an evaluation's research design include control or comparison groups. Random assignment studies are preferred, but we allow quasi-experimental or non-experimental studies when the comparison group is well-matched to the treatment group, or when adequate statistical procedures are employed to guard against selection bias. Given the expected direction of selection biases, we discount the findings of less-than-randomized comparison-group trials by a uniform percentage.
3. We prefer evaluation studies that use "real world" samples from actual programs in the field. Evaluations of so-called "model" or "efficacy" programs are included in our reviews, but we discount the effects from these types of studies. Our presumption is that it is difficult to achieve, in actual large-scale operation, the results of model programs; hence, when we conduct our cost-benefit analyses, we discount the statistical results of such studies by a fixed amount.
4. If the researcher of an evaluation is also the developer of the program, we discount the results from the study. Sometimes it is difficult to duplicate the results achieved by highly motivated individuals who originate programs. There may also be potential conflicts of interest if developers evaluate their own programs.

Our additional criteria are listed in Appendix A.

[7] For example, the California Evidence-Based Clearinghouse for Child Welfare is a resource that researchers and policymakers might use to find reviews and ratings of relevant programs. See: <http://www.cachildwelfareclearinghouse.org/>

That is, while we read several hundred research studies, we found only 74 that used rigorous research methods. The accompanying sidebar "What Does 'Evidence-Based' Mean?" briefly describes the factors we consider in determining the applicability of a particular study for our systematic review.

It is important to note that only a few of these 74 studies were evaluations of policies or programs in Washington State; rather, almost all of the evaluations in our review were of programs conducted in other locations. Different states have different structures in place to address child welfare needs; a primary purpose of our study is to take advantage of all the rigorous evaluations across locations and, thereby, learn whether there are options that can allow policymakers in Washington to improve this state's child welfare system.

The research approach we employ in this first step is called a "systematic" review of the evidence. Systematic reviews are being used with increased frequency in medicine, education, criminal justice, and many other policy areas.[8]

In a systematic review, the results of *all* rigorous evaluation studies are analyzed to determine if, on average, it can be stated scientifically that a program achieves an outcome. A systematic review can be contrasted with a so-called "narrative" review of the literature where a writer selectively cites studies to summarize findings about a topic. Both types of reviews have their place, but systematic reviews are generally regarded as more rigorous and, because they assess all available studies and employ statistical tests, they have less potential for drawing biased or inaccurate conclusions.

For a study to be included in this review, the evaluation must measure objective outcomes directly relevant to the child welfare system. For this study, these outcomes are:

- Reported and/or substantiated child abuse or neglect
- Out-of-home placement (incidence, length of stay, or number of placements)
- Permanency (e.g., adoption, reunification, independent living)
- Stability (fewer placement moves)

These outcomes are clear measurements of children's experiences in the child welfare system.

Many studies rely on measures that are proxies for child welfare involvement, such as surveys of parental behavior (e.g., self-reported abusive or neglectful behaviors) or observed child behavior (e.g., teacher-reported anti-social or violent behavior). While these proxy measures can be meaningful, we believe they do not provide concrete information about the level of involvement in the child welfare system, so we do not include them in our analysis.

Researchers have developed a set of statistical tools to facilitate systematic reviews of the evidence. This set of procedures is called "meta-analysis," and we employ that methodology in this study.[9] In the Technical Appendix to this report (beginning on page 18) we list the specific coding rules and statistical formulas we use to conduct the analysis.

2) What are the benefits and costs of each option?

While the purpose of the first research question is to determine what works to improve child welfare outcomes, in the second research question, we ask: per dollar spent on a program, do the benefits of the program's impact on child welfare and other outcomes exceed its costs? Since all programs cost money, this additional economic test seeks to determine whether the amount of positive societal impact justifies the program's expenditures. A program may have demonstrated reduced rates of child abuse and neglect, but if the program costs too much, it may not be a good investment of public funds, especially when compared with equally effective but less expensive alternatives.

What outcomes do we monetize?

In our current benefit-cost model, we estimate the benefits of improving outcomes that might be directly measured in an evaluation. For this study, the outcomes of interest are:

- Child abuse and neglect
- Out-of-home placement
- Crime
- High school graduation
- Standardized K–12 test scores
- K–12 grade repetition
- K–12 special education
- Alcohol and drug abuse

[8] An international effort aimed at organizing systematic reviews is the Campbell Collaboration—a non-profit organization that supports systematic reviews in the social, behavioral, and educational arenas. See: <http://www.campbellcollaboration.org>.

[9] We follow the meta-analytic methods described in: M.W. Lipsey and D. Wilson. (2001). *Practical meta-analysis.* Thousand Oaks: Sage Publications.

As noted, our primary focus in this analysis concerns a program's impact on child welfare outcomes. We estimate that reductions in child abuse and neglect and in out-of-home placements lead to reductions in public spending for the child welfare system and in reduced medical, mental health, and other costs for victims. In addition, we estimate that programs that reduce child abuse and neglect also impact other longer-term outcomes that result in economic benefits to society.

In particular, we assess the research literature that links child abuse and neglect outcomes to adverse longer-term outcomes in children's lives, such as reduced high school graduation rates, greater criminality, lower standardized test scores, increased K–12 grade repetition, increased teenage pregnancy, and increased substance abuse. The Institute's cost-benefit model calculates the total benefits and costs of those outcomes for which we are able to estimate monetary impact.[10]

For some evidence-based programs, the research indicates no change in the particular child welfare outcomes measured in this study. Some of these programs, however, may still be economically attractive options when the cost of the program is more than offset by other up-front cost savings. For example, the evaluation of Minnesota's Family Assessment Response program reported the average total cost of administering the program was about $1,300 less (per family) than the cost of providing services as usual.[11] Even though the research conducted on this program indicated no significant increase or decrease in child abuse and neglect rates, it still represents a positive economic outcome; that is, its approach of structured assessment and alternative supports and services rather than full CPS investigations (in appropriate situations) is less expensive than usual services.

3) What impact would a "portfolio" of evidence-based and economically sound options have on Washington State?

Using the information from the first two research steps, combined with additional program and demographic information, we then project the total economic impact on Washington of an implementation scenario that would increase the state's investment in a portfolio of selected prevention and intervention programs. We use official statewide population data, along with information about program eligibility and the percentage of eligible populations already being served by these evidence-based programs.

At this stage of the analysis, we also review the degree of risk present in our estimates by testing how our bottom-line results are affected by the uncertainty in the study's key statistical parameters and assumptions.

4) What are the characteristics common to effective programs?

Finally, we examine the programs that are effective in improving child welfare outcomes and identify common characteristics. This type of information can be useful in reviewing programs currently funded, and particularly, in developing new strategies.

Applicability of Programs in Diverse Cultural Contexts

One common question about evidence-based programs concerns the context within which the evidence is derived. Specifically, some people question whether or not programs are appropriate for populations with various racial or cultural backgrounds.

The majority of the 14 programs in our review that impacted child welfare outcomes in a positive way (see Exhibit 1) were conducted in populations with diverse racial and ethnic characteristics. Twelve of the 14 programs had evaluations in which at least 30 percent of families were from an ethnic minority background.

More specifically, 10 programs had an evaluation in which 30 percent or more of the program participants were from African American families; five programs had evaluation populations composed of at least 30 percent Hispanic/Latino families. Of the evaluations we reviewed, people from Native American, Asian and Pacific Islander backgrounds were generally less well represented than those from Caucasian, African American and Hispanic/Latino backgrounds.

For example, the Nurse Family Partnership (NFP) has been evaluated within three very different populations. One trial of NFP was in Elmira, New York, a rural, low-income, primarily Caucasian community. The second trial occurred in Memphis, Tennessee, among a population of low-income, mostly African American women. The third trial was conducted in Denver, Colorado, where the sample was ethnically diverse: about half of the participants were Mexican-American, one-third were Caucasian, and about one in six were African American. These trials all produced positive outcomes.

Readers interested in learning more about the experiences of children from diverse racial and ethnic backgrounds in the child welfare system are directed to: M. Miller (2008). *Racial disproportionality in Washington State's child welfare system.* Olympia: Washington State Institute for Public Policy, Document No. 08-06-3901 <http://www.wsipp.wa.gov/rptfiles/08-06-3901.pdf>

[10] For details, see Appendix B.

[11] Institute of Applied Research. (2006). *Extended follow-up study of Minnesota's family assessment response: Final report.* St. Louis, MO: Author. <http://www.iarstl.org/papers/FinalMNFARReport.pdf>

Findings

What works?

As noted, we reviewed and meta-analyzed the findings of 74 comparison-group evaluations of programs and policies that measured at least one of the child welfare outcomes identified for this study. Several programs have been evaluated more than once. In all, there are 26 individual programs in our review. Exhibit 1 (see the following page) lists each of the reviewed programs and indicates the impact of each program on child welfare outcomes.

We have organized Exhibit 1 into three categories:

- Prevention programs that serve families not involved with the child welfare system;
- Intervention programs that serve families who are involved with the child welfare system;
- Administrative policies that are implemented on a larger level, such as the state level.

For each program, our results reflect the evidence-based effect we expect for the "average" implementation of the program. For example, the Nurse Family Partnership program has three separate evaluations of its performance; our statistical review estimates the *average effectiveness* of the program across these evaluations.

In Exhibit 1, arrows pointing up or down indicate a statistically significant effect on the indicated child welfare outcome. The international symbol for zero (⦸) indicates that the outcome was measured by an evaluation, but no statistically significant effect[12] was found.

Fourteen of the reviewed programs had at least one statistically significant impact on child welfare outcomes in the desired direction, represented by orange arrows (e.g., reduced child abuse and neglect, reduced out-of-home placement, increased placement permanence, or increased placement stability). For example, the Chicago Child Parent Centers resulted in a significant reduction in child abuse and neglect, indicated with an orange arrow pointing down. Blue arrows indicate significant impacts in the undesired direction.

It is important to note that many evaluations of these programs also measured other outcomes in addition to child welfare. Our cost-benefit analysis reflects many of these additional outcomes. In Exhibit 1, however, we display only the program effects for child welfare outcomes. For a full description of our meta-analysis and program impacts on various outcomes, see Exhibit A.1 in Appendix A.

Examples of Effective Evidence-Based Programs

Prevention programs.
One effective program in our review is the Chicago Child Parent Centers (CPCs), which provides preschool education and programming for low-income 3- and 4-year-old children and their parents. This program was implemented in an urban, primarily African American community, and has undergone a long-term evaluation of outcomes (the first children to go through the program were 21 years old at the last follow-up). Experiences of child abuse and neglect and out-of-home placements were significantly reduced for CPC participants compared with non-participants. In addition, this program demonstrated reductions in crime, increased high school graduation and standardized test scores, and decreased grade repetition and special education in grades K–12 (see Exhibit A.1 for these findings).

Another effective program in our review, which is often cited as an "evidence-based" or "model" program, is the Nurse Family Partnership (NFP). This program provides young, first-time, low-income mothers with individual home visits from nurses from pregnancy until the child is up to two years old. As shown in Exhibit 1, NFP significantly decreased child abuse and neglect among the children of participating mothers. In addition, NFP demonstrated significant reductions in future crime and substance abuse among program children, as well as significant improvements in their standardized test scores (see Exhibit A.1).

Intervention programs.
One effective intervention program is Intensive Family Preservation Services (Homebuilders-model); it provides short-term, on-call, in-home services to families in crisis. The goal is to prevent an at-risk child from being removed from home, or to bring a removed child back home as quickly as possible. This program demonstrates significant reductions in re-occurrences of child abuse and neglect as well as out-of-home placements.

Another effective intervention program is Parent-Child Interaction Therapy (PCIT), in which parents are individually coached and trained on how to interact with their children in everyday situations. PCIT participants were significantly less likely than those in a comparison group to abuse or neglect their children.

Administrative policies.
Each of the administrative policies in our review has at least one positive impact on child welfare outcomes. One example is the Structured Decision-Making model in Michigan. This method of systematic assessments and meticulous decision-making in the child welfare system demonstrated significant reductions in out-of-home placement and significant increases in placement permanency.

[12] When a program has a "statistically significant" effect, that means we are 90% confident that the result is not due to chance alone.

Exhibit 1
Institute Calculated Program Effects for Child Welfare Outcomes

Up and down arrows indicate a statistically significant effect on the indicated child welfare outcome. Orange arrows indicate effects in the desired direction; blue arrows indicate effects in the undesired direction. The international symbol for zero indicates no statistically significant effect.	Child Abuse and Neglect Outcome	Out-of-Home Placement Outcome	Placement Permanency Outcome	Placement Stability Outcome
PREVENTION PROGRAMS (For families not involved in the child welfare system)				
Chicago Child Parent Centers:	↓	↓	*Not measured*	*Not measured*
Early Hospital Discharge and Intensive In-Home Follow-Up for Low Birthweight Infants (Pennsylvania):	⊘	⊘	*Not measured*	*Not measured*
Healthy Families America:	↓	*Not measured*	*Not measured*	*Not measured*
Iowa Family Development and Self Sufficiency Program:	⊘	*Not measured*	*Not measured*	*Not measured*
LEARN (Local Efforts to Address and Reduce Neglect):	⊘	*Not measured*	*Not measured*	*Not measured*
Nurse Family Partnership for Low-Income Families:	↓	*Not measured*	*Not measured*	*Not measured*
Other Home Visiting Programs for At-Risk Mothers and Children:	↓	⊘	*Not measured*	*Not measured*
Parents as Teachers:	⊘	*Not measured*	*Not measured*	*Not measured*
Triple-P Positive Parenting Partnership (South Carolina):	↓	↓	*Not measured*	*Not measured*
INTERVENTION PROGRAMS (For families already involved in the child welfare system)				
Abuse-Focused Cognitive Behavioral Therapy (AF-CBT):	⊘	*Not measured*	*Not measured*	*Not measured*
Dependency (Family Treatment) Drug Court (California, Arizona, New York):	↑	↓	↑	*Not measured*
The Family Connections Study (Canada):	⊘	*Not measured*	*Not measured*	*Not measured*
Family to Family (New Mexico):	*Not measured*	⊘	*Not measured*	*Not measured*
Family Group Conferences:	↑	*Not measured*	*Not measured*	*Not measured*
Family Group Decision Making (California):	⊘	*Not measured*	*Not measured*	⊘
Family Therapy:	⊘	*Not measured*	*Not measured*	*Not measured*
Intensive Case Management for Emotionally Disturbed Youth:	*Not measured*	⊘	↑	↑
Intensive Family Preservation Service Programs (All) (Homebuilders® model):	↓	↓	*Not measured*	*Not measured*
Intensive Family Preservation Services for Out of Home Placement Prevention (Homebuilders® model):	⊘	↓	*Not measured*	*Not measured*
Intensive Family Preservation Services for Increased Reunification (Homebuilders® model):	⊘	↓	*Not measured*	*Not measured*
Other Family Preservation Services (non-Homebuilders®):	⊘	↑	*Not measured*	*Not measured*
Parent-Child Interaction Therapy (Oklahoma):	↓	*Not measured*	*Not measured*	*Not measured*
Project KEEP (San Diego):	*Not measured*	*Not measured*	↑	*Not measured*
SAFE Homes (Connecticut):	⊘	↑	*Not measured*	*Not measured*
ADMINISTRATIVE POLICIES				
Family Assessment Response (Minnesota):	⊘	↓	*Not measured*	*Not measured*
Flexible Funding (Title IV-E Waivers in North Carolina and Oregon):	*Not measured*	↓	*Not measured*	*Not measured*
Structured Decision Making (Michigan):	↓	*Not measured*	↑	*Not measured*
Subsidized Guardianship (Illinois):	*Not measured*	*Not measured*	↑	⊘

WSIPP, 2008

What are the benefits and costs of each option?

We describe our benefit-cost estimates in Exhibits 2 and 3. Exhibit 2 provides a detailed example of our estimates for a single program, and Exhibit 3 (pages 10–11) gives summary information for each program in our analysis.

Example of program benefits and costs

One program in our review is the Nurse Family Partnership (NFP), which is currently operating in 11 of Washington's 39 counties. Exhibit 2 below shows a detailed breakdown of the benefits and costs for NFP (see Appendix C for comprehensive tables of benefits and costs for all of the programs in our cost-benefit analysis).

The first set of rows in the table displays the estimated amount of lifetime benefits we would expect for each child participating in NFP, grouped by outcome and by perspective.

The row highlighted in red below, for example, displays the average benefits, per participant, from the program's reduction in child abuse and neglect (CAN) that will accrue to the participant (via reduced health care costs and improved quality of life) and to the taxpayer (via reduced child welfare system costs).

Although benefits from reductions in CAN account for a significant portion of the total benefits of NFP, two other outcomes contribute more benefits. The effect of NFP on crime reduction leads to savings for taxpayers (in lower criminal justice system costs) and non-taxpayers (in reduced crime victim costs). In addition, NFP provides benefits to program participants via increased test scores (due to higher wages earned as an adult), to taxpayers (from increased taxes and fringe benefits on those earnings), and to non-taxpayers (from non-market benefits such as reduced medical costs).

Finally, although two educational outcomes are displayed below (high school graduation and test scores), we only include the highest value in our total net benefits. High school graduation and test scores are closely correlated; to count both in our benefit total would risk "double counting" and over-estimating the benefit of this program.

Exhibit 2 shows the total present value benefits for NFP to be $26,986 and costs to be $8,931. Therefore the net benefits are $18,054, and the benefit-to-cost ratio is $3.02 of benefits for each dollar invested.

Exhibit 2

Nurse Family Partnership for Low-Income Families
— Summary of Estimated Benefits and Costs —

Benefits by Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$4,877	$8,533	$13,410
High School Graduation	$672	$299	$169	$1,141
Test Scores	$5,572	$2,480	$1,403	$9,454
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$11	$0	$11
Child Abuse and Neglect	$3,212	$661	$0	$3,873
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$107	$57	$2	$167
Illicit Drugs (disordered use)	$44	$26	$0	$70
Total Benefits*	$8,936	$8,112	$9,938	**$26,986**
Program Costs	$0	-$8,931	$0	**-$8,931**
Net Benefit (NPV)	$8,936	-$819	$9,938	**$18,054**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) =				**$3.02**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non-participant benefits divided by taxpayer costs				$2.02

Exhibit 3 (see next page) summarizes our estimates of the benefits and costs of each program in our analysis. The first section of Exhibit 3 displays our estimates of the total benefits of the programs to Washingtonians if a program were to operate in the state. Different people in the state would receive these benefits. Some benefits would be received directly by program participants, while others would accrue, for example, to taxpayers.

For instance, we estimate the long-term labor market benefits that accrue to participants in the Chicago Child Parent Centers (an early childhood education program found to improve academic performance, among other outcomes). In addition to improved long-term academic performance and labor market earnings received directly by the participant, there is evidence that the Chicago Child Parent Centers also result in lower crime rates among the participants in their later lives. This result generates benefits to non-participants by lowering the amount of money taxpayers have to spend on the criminal justice system and reducing the costs that crime victims would otherwise have to endure. Thus, we provide estimates for each of the three perspectives:

- program participants,
- non-participants as taxpayers, and
- non-participants in other non-taxpayer roles.

In columns (1), (2), and (3) of Section 1 on Exhibit 3, we provide our estimates of benefits from these three perspectives for programs that have an evidence-based ability to impact child welfare outcomes. We provide estimates of the benefits for these different perspectives because many policymakers want to know rate-of-return information from the single perspective of the taxpayer, while other decision-makers want to know the broader societal implications of their options. Our estimates are disaggregated to provide results for both views.

Column (4) displays the total benefits from all perspectives. Of course, a program that does not achieve a statistically significant reduction in child welfare outcomes will not produce any benefits associated with reduced involvement in the child welfare system.

In Section 2 of Exhibit 3, we show our cost estimates of programs, as well as the estimated costs of services provided to a comparison group as implemented in the program evaluation. For some programs, such as Intensive Case Management for Emotionally Disturbed Youth, the costs represent the added cost of the program compared to treatment as usual. For several programs, we have not been able to secure reliable estimates of program costs; for these programs, we are unable to provide a complete benefit-cost analysis at the present time.

Finally, we provide two summary measures of the economic "bottom lines" for these programs in Section 3 of Exhibit 3 (on page 11). The first column displays the ratio of total benefits to total costs for the programs in our analysis. A ratio greater than one indicates that the benefits of a program exceed the program's cost, whereas a value less than one indicates that the economic benefits of a program do not outweigh the costs.

In the second column of Section 3, we show these same bottom-line estimates expressed as total net benefits per program participant. These figures are the net present values of the long-run benefits minus the net costs of the program. This statistic provides our best overall measure of the economic attractiveness of the program.

In Section 4 of Exhibit 3, we also list a number of programs for which the research evidence, in our judgment, is inconclusive at this time. Some of these programs have only one or two rigorous (often small sample) evaluations that do not allow us to draw general conclusions. Others, as mentioned above, did not have reliable program cost data that we could use. Still other programs have several evaluations, but the program category is too diverse or too general to allow meaningful conclusions at this time. Subsequent research on these types of programs is warranted.

Note to Exhibit 3. The total benefits presented in this exhibit are estimates of the economic outcomes we would expect to accrue given a program's impact on outcomes we can monetize, namely: child abuse and neglect, out-of-home placement, crime, education, substance abuse, teen pregnancy, and public assistance. Many of these programs have achieved outcomes in addition to those for which we are currently able to estimate monetary benefits.

Exhibit 3
Evidence-Based Options for Reducing Involvement in the Child Welfare System: What Works, and Benefits & Costs

SECTION 1: BENEFITS

Washington State Institute for Public Policy Estimates as of July 2008	Benefits (Per Participant, Present Value, 2007 Dollars)			
	Benefits to Program Participants	Benefits to Taxpayers	Benefits to Others	Total Benefits
PREVENTION PROGRAMS				
Chicago Child Parent Centers	$13,427	$12,041	$13,692	$39,160
Nurse Family Partnership for Low-Income Families	$8,936	$8,112	$9,938	$26,986
Parents as Teachers	$3,153	$1,403	$794	$5,350
Other Home Visiting for At-Risk Mothers and Children (see description, p. 16)	$2,016	$666	$327	$3,009
Healthy Families America	$1,697	$520	$220	$2,437
Iowa Family Development and Self Sufficiency Program	$0	$0	$0	$0
INTERVENTION PROGRAMS				
Intensive Family Preservation Service Programs (Homebuilders® model)*	$2,059	$4,883	$932	$7,875
Parent-Child Interaction Therapy (Oklahoma)	$4,105	$1,297	$567	$5,968
Dependency (or Family Treatment) Drug Court (CA, NV, NY)	$704	$1,653	$444	$2,801
Intensive Case Management for Emotionally Disturbed Youth	$0	$0	$0	$0
Other Family Preservation Services (non-Homebuilders®)	$0	$0	$0	$0
SAFE Homes (Connecticut)	$0	$0	$0	$0
ADMINISTRATIVE POLICIES				
Family Assessment Response (Minnesota)	$817	$419	$190	$1,425
Flexible Funding (Title IV-E Waivers in North Carolina and Oregon)	$545	$277	$125	$947
Subsidized Guardianship (Illinois)	$0	$0	$0	$0

SECTION 2: PROGRAM COSTS

Washington State Institute for Public Policy Estimates as of July 2008	Program Costs (per participant, present value, 2007 dollars)	Costs for Comparison Group (per participant, present value, 2007 dollars)
PREVENTION PROGRAMS		
Nurse Family Partnership for Low-Income Families	$8,931	$0
Chicago Child Parent Centers	$8,124	$0
Other Home Visiting for At-Risk Mothers and Children (see description, p. 16)	$5,368	$0
Healthy Families America	$4,267	$0
Parents as Teachers	$3,841	$0
Iowa Family Development and Self Sufficiency Program^	$0	$448
INTERVENTION PROGRAMS		
SAFE Homes (Connecticut)	$15,631	$9,910
Dependency (or Family Treatment) Drug Court (California)	$3,772	$0
Intensive Family Preservation Service Programs (Homebuilders® model)*	$3,484	$385
Other Family Preservation Services (non-Homebuilders®)	$3,164	$350
Parent-Child Interaction Therapy (Oklahoma)	$2,240	$1,234
Intensive Case Management for Emotionally Disturbed Youth	$2,120	$0
ADMINISTRATIVE POLICIES		
Flexible Funding (Title IV-E Waivers in North Carolina and Oregon)	$0	$0
Family Assessment Response (Minnesota)^	$3,823	$5,149
Subsidized Guardianship (Illinois)^	$29,773	$34,727

^These programs cost less up front than services as usual

Exhibit 3 (continued)
Evidence-Based Options for Reducing Involvement in the Child Welfare System: What Works, and Benefits & Costs

SECTION 3: BENEFITS AND COSTS

Washington State Institute for Public Policy Estimates as of May 2008	Total Benefit-to-Cost Ratio (per participant)	Total Benefits Minus Costs (per participant)
PREVENTION PROGRAMS		
Chicago Child Parent Centers	$4.82	$31,036
Nurse Family Partnership for Low-Income Families	$3.02	$18,054
Parents as Teachers	$1.39	$1,509
Iowa Family Development and Self Sufficiency Program	Not computed	$448
Healthy Families America	$0.57	–$1,830
Other Home Visiting for At-Risk Mothers and Children (see description, p. 16)	$0.56	–$2,359
INTERVENTION PROGRAMS		
Intensive Family Preservation Service Programs (Homebuilders® model)*	$2.54	$4,775
Parent-Child Interaction Therapy (Oklahoma)	$5.93	$4,962
Dependency (or Family Treatment) Drug Court (CA, NV, NY)	$0.74	–$970
Intensive Case Management for Emotionally Disturbed Youth	Not computed	–$2,120
Other Family Preservation Services (non-Homebuilders®)	Not computed	–$2,814
SAFE Homes (Connecticut)	Not computed	–$5,721
ADMINISTRATIVE POLICIES		
Subsidized Guardianship (Illinois)	Not computed	$4,954
Family Assessment Response (Minnesota)	Not computed	$2,751
Flexible Funding (Title IV-E Waivers in North Carolina and Oregon)	Not computed	$947

SECTION 4: OTHER PROGRAMS FOR WHICH BENEFIT-COST FINDINGS WERE NOT ESTIMATED FOR THIS REPORT

Program	Comment
Abuse-Focused Cognitive Behavioral Therapy (AF-CBT)	This program has only one rigorous evaluation that was based on a very small treatment group (n=25).
Circle of Security	To date, this program has not undergone a rigorous evaluation.
Early Hospital Discharge and Intensive In-Home Follow-Up for Low Birthweight Infants (Pennsylvania)	This program has only one rigorous evaluation that was based on a very small treatment group (n=39). The authors found no significant effects that we could monetize, although the program itself saves money over standard treatment.
Early Intervention Foster Care (MTFC-P)	This program has only one rigorous evaluation, and we are unable to estimate the cost of its implementation at this time.
Family Connections (Maryland)	No rigorous evaluations of this program have been published to date, although a randomized trial is currently underway.
The Family Connections Study (Canada)	This program has only one rigorous evaluation, and we are unable to estimate the cost of its implementation at this time.
Family to Family (New Mexico)	We were able to code outcomes for only one evaluation of this program, and we are unable to estimate the cost of its implementation at this time. However, a randomized trial is currently underway.
Family Group Conferences	This program was evaluated in two very different settings, and we are unable to estimate its cost at this time.
Family Group Decision Making (California)	This program has only one rigorous evaluation, and we are unable to estimate the cost of its implementation at this time.
Family Therapy	This program has only one rigorous evaluation that was based on a very small treatment group (n=18).
LEARN (Local Efforts to Address and Reduce Neglect)	This program has only one rigorous evaluation, and we are unable to estimate the cost of its implementation at this time.
Mockingbird Family Model (Constellations)	No rigorous evaluations of this program have been published to date.
Multidimensional Treatment Foster Care (MTFC)	Although several evaluations have measured the impact of MTFC on future crime, no evaluations have been published on the program's impact on objective child welfare outcomes.
Multisystemic Therapy (MST)	Although MST has been evaluated with respect to its effects on crime, child welfare outcomes have not been measured. However, a randomized controlled trial with physically abused adolescents and their families is currently underway.
Project KEEP	This program has only one rigorous evaluation, and we are unable to estimate the cost of its implementation at this time.
Project SafeCare/Project 12 Ways	No rigorous evaluations of this program have been published to date, although a randomized trial is currently underway.
Promoting First Relationships	No rigorous evaluations of this program have been published to date, although a randomized trial is currently underway.
Structured Decision Making (Michigan)	This program has only one rigorous evaluation, and we are unable to estimate the cost of its implementation at this time.
Triple-P Positive Parenting Partnership (South Carolina)	This program has only one rigorous evaluation, and we are unable to estimate the cost of its implementation at this time.

*We have presented a single benefit-cost analysis for Homebuilders®-style Intensive Family Preservation Service Programs here. In our meta-analytic table, we presented effect size estimates in three ways: (1) for IFPS programs focused on reunification of children already placed out of home, (2) for programs focused on preventing children from being removed from home, and (3) for all IFPS programs. The benefit-cost estimates were nearly identical for the reunification and prevention programs, so we have summarized them here.

How would a "portfolio" of evidence-based and economically sound options impact Washington State?

In Exhibit 3, we listed our program-by-program estimates of benefits and costs. In this section, we estimate the *total potential* impact that an expanded evidence-based strategy could have for Washington State. That is, if Washington were to increase funding for a particular set of programs, what would be the total benefit to the state?

This estimate first involved selecting several programs to include in a representative portfolio; we took the four programs with the highest returns from Section 3 in Exhibit 3.[13] These are:

- Chicago Child Parent Centers
- Nurse Family Partnership
- Intensive Family Preservation Services (Homebuilders® model)
- Parent-Child Interaction Therapy

Next, we estimated the number of children in Washington who would be eligible to participate in each program. We then subtracted an estimate of the number of children in Washington already participating in each of these programs.[14] To provide a more realistic perspective, we further restricted the size of the potential participant population by assuming that only a portion of those who are eligible for a program (and are not currently participating) would ultimately be served.

Under these assumptions, with five years of effective implementation of this portfolio, we estimate that the total net benefits to Washington would be about $405 million over the lifetimes of the participating children. From the narrower taxpayer-only perspective, the net benefits would be about $34 million.[15] These same estimates, expressed as a benefit-to-cost ratio, are equivalent to $4.31 of benefits per dollar of cost for Washington. More narrowly, for the fiscal standpoint of taxpayers, the benefit-to-cost ratio for the portfolio is equivalent to $1.26 of benefits per dollar of cost. Of the total benefits from this portfolio, about 60 percent are derived from the enhanced early childhood education program represented in the portfolio by the Chicago Child Parent Center model. The remaining 40 percent stem from home-visiting programs (represented by the Nurse Family Partnership), and the two child welfare system interventions of intensive family preservation services (represented by the Homebuilders® model) and behavioral therapy (represented by Parent-Child Interaction Therapy).

How much uncertainty exists in these estimates of benefits and costs? In any estimation of the outcomes of complex human behavior and human service delivery systems, there is uncertainty. In our analysis, we estimated the degree to which our bottom-line estimates could be influenced by this range of uncertainty. As described in Appendix B (page 37), we performed an analysis called "Monte Carlo" simulation. We randomly varied the key factors in our calculations and then re-estimated the results of our analysis. We did this re-estimation process 10,000 times, each time testing the range of uncertainty in our findings.

We found that after five years of implementing such a strategy, Washington would receive long-term net benefits between $317 and $493 million (of which $6 million to $62 million would be net taxpayer benefits).[16]

We also calculated the probability that our estimates would produce a contrary finding. That is, we tested to see how often our positive economic results would turn negative—that money would be lost rather than gained. From the perspective of all of Washington, we found that the chance an expansion of evidence-based programs would actually lose money (rather than generate benefits) was virtually zero. From the narrower taxpayer-only perspective, we found that the chance that an evidence-based strategy would lose money was approximately 11 percent. That is, about 11 times out of 100, an evidence-based strategy would end up costing taxpayers more money than it saves taxpayers.

[13] We excluded Subsidized Guardianship from our portfolio, as it is a policy rather than a program. The structures of the agencies underlying such a policy may be vastly different in Illinois than in Washington; therefore, we do not believe we can include such a policy in our portfolio at this time.

[14] Data about cost and program populations in Washington were provided by local agencies. Data for Nurse Family Partnership were provided by the Northwest Regional Office of NFP, data for Parent Child Interaction Therapy and Homebuilders were provided by the Children's Administration, and data about early childhood education (as currently implemented in WA, to inform our inclusion of the Chicago Child Parent Center model) were provided by the Department of Early Learning.

[15] The sums reported here are present value benefits (over the lifetimes of the children in the programs) minus the present value of the program costs, after five years of implementing the programs.

[16] These ranges represent plus and minus one standard deviation from the mean result in the 10,000 case simulation. These ranges would encompass about 67 percent of the cases in the simulation.

What are the characteristics common to effective programs?

Unlike some other policy areas, there are very few interventions related to child welfare that have been rigorously evaluated multiple times. This lack of well-researched programs makes it difficult to statistically generalize conclusions about why some programs work and others do not.[17] Therefore, while we could not conduct a formal analysis of program factors at this time, the characteristics listed below are those that we observed most frequently in our readings of the evaluations of effective programs. While we offer these as tentative observations, we recommend a more formal statistical analysis be conducted as an important next step in this process.

In this review, we found some programs that showed a significant reduction in either child abuse and neglect or out-of-home placements. Without considering the cost of program implementation, the following programs showed statistically significant reductions in at least one of the two key child welfare outcomes above:

- Chicago Child Parent Centers (IL)
- Family Assessment Response (MN)
- Healthy Families America
- Intensive Family Preservation Services (Homebuilders® model)
- Nurse Family Partnership
- Other Home Visiting Programs for At-Risk Mothers and Children
- Parent-Child Interaction Therapy (OK)
- Structured Decision Making (MI)
- Triple-P Positive Parenting Program (SC)

In addition, the following programs showed statistically reliable evidence of increasing placement permanency and/or stability measures for children placed out-of-home:

- Dependency Drug Courts (CA, NV, NY)
- Intensive Family Preservation Services (Homebuilders® model)
- Intensive Case Management for Emotionally Disturbed and/or Maltreated Youth
- Project KEEP
- Subsidized Guardianship
- Structured Decision Making (MI)

There appear to be five broad characteristics shared among the majority of these effective programs.

1) **Targeted populations.** Successful programs tend to be targeted toward a specific group of people who might be expected to benefit the most from the services provided. For example, the Nurse Family Partnership (NFP) targets low-income, first-time, unmarried mothers; trials of NFP with other populations have not been successful.

2) **Intensive services.** Programs with strong impacts on child welfare outcomes tend to provide intensive services, meaning a high number of service hours, often coupled with a requirement for a high level of engagement from participants. For example, the Homebuilders® model of intensive family preservation services provides 24-hour staff availability to families in crisis, small staff caseloads, home-based counseling and services, and short program duration (four to six weeks) with a high number of service hours.

3) **A focus on behavior.** The effective programs on our list are likely to take a behavioral approach (as opposed to an instructional approach), such as coaching parents one-on-one during play sessions with their children as in Parent-Child Interaction Therapy (PCIT). This observation is consistent with studies of psychosocial interventions; one meta-analysis of psychotherapeutic treatments for children concluded that "Behavioral treatments proved more effective than non-behavioral treatments regardless of client age, therapist experience, or treated problem."[18]

4) **Inclusion of both parents and children.** Many of these successful programs take an approach that acknowledges the central role of the parent-child relationship in child outcomes. For example, in addition to PCIT, the Chicago CPCs focus on educating pre-school age children and preparing them for kindergarten, but the Centers also work with parents to increase positive involvement and healthy interaction with their children.

5) **Program fidelity.** Several of the successful programs on our list have demonstrated the importance of maintaining adherence to the program model. For example, an earlier

[17] With a larger database, a formal meta-analysis could be undertaken to investigate those factors that seem to influence program effectiveness.

[18] J.R. Weisz, B. Weiss, M.D. Alicke, & M.L. Klotz. (1987). Effectiveness of psychotherapy with children and adolescents: A meta-analysis for clinicians. *Journal of Consulting and Clinical Psychology. 55(4)*: 542-549.

Institute analysis[19] of Intensive Family Preservation programs found that those that maintained fidelity to the Homebuilders® model[20] significantly reduced subsequent child maltreatment and out-of-home placements. However, other types of family preservation services with much looser criteria around service provision did not significantly impact either CAN or out-of-home placement.

Next Research Steps

In completing this report, we were able to make substantial analytical progress in providing Washington with information on the long-run impacts of evidence-based resources that improve child welfare outcomes. There are, however, two additional steps that could be taken to enhance these efforts.

1) **Evaluate Washington's Programs.** In this study, we relied on the outcomes of 74 rigorous evaluations of prevention and intervention programs that impact child welfare outcomes. Unfortunately, only a few of these evaluations were of programs in Washington State. Therefore, we recommend that the legislature initiate efforts to evaluate key programs in Washington related to child welfare. For example, the Nurse Family Partnership program is now operating in 11 counties in Washington, but has yet to be evaluated in this state. The three evaluations of NFP that we included in this analysis were conducted in New York, Tennessee, and Colorado. It is also important to keep in mind there are some programs in Washington that have never been rigorously evaluated, either locally or nationally. If the evaluations are conducted with rigorous and independent research designs, then policymakers in Washington will be able to ascertain whether taxpayers are receiving positive rates of return on their dollars.

2) **Monitor Ongoing Research.** Many evaluations we included in this review were conducted in recent years. New evaluations will emerge in the years ahead. There is a need to monitor this research literature so that the results of new evaluations can be made available to Washington policymakers. We recommend the legislature periodically commission an update of this review of evidence-based programs.

[19] M. Miller. (2006). *Intensive family preservation programs: Program fidelity influences effectiveness—revised*. Olympia: Washington State Institute for Public Policy, Document No. 06-02-3901, <http://www.wsipp.wa.gov/rptfiles/06-02-3901.pdf>

[20] Programs with Homebuilders® fidelity were those that strictly adhered to 13 or more of the 16 essential Homebuilders® features identified by Miller, such as contacting families within 24 hours of referral, having specially-trained providers with small caseloads, single service providers for each family, and 24-hour staff availability, to name a few.

Brief Description of the Programs in Our Review

PROGRAMS WITH BENEFIT-COST ESTIMATES. The programs identified in Sections 1 to 3 of Exhibit 2 are described below. We measure effectiveness of these programs in terms of costs and benefits. Note, however, that some programs produce additional benefits for which we are currently unable to estimate a dollar value.

Chicago Child Parent Centers. These school-based centers provide educational and family support services for families living in high poverty neighborhoods. The centers aim to provide a stable learning environment from preschool through the early elementary school years and provide support to parents so that they can be involved in their children's education.

Dependency (or Family Treatment) Drug Court (California, Nevada and New York). Dependency Drug Courts provide frequent court hearings for substance abusing parents involved in the child welfare system. These courts offer intensive monitoring, substance abuse treatment, and a system of rewards and sanctions for treatment compliance. The goal is to bridge the gap between child welfare and criminal justice for families with substance abuse problems, and increase the probability of family stability.

Family Assessment Response (Minnesota) is an alternative response system for families referred to child welfare who do not warrant an immediate investigation. This strategy provides support and services to families without an incident-focused investigation of harm.

Flexible Funding (Title IV-E Waivers in Oregon and North Carolina). The Title IV-E waivers allowed states flexibility in spending federal dollars previously earmarked for foster care maintenance. States were encouraged to expand existing services or implement new services with the aim of improving outcomes for children in the child welfare system. The new services were required to be "cost-neutral."

Healthy Families America[21] is a network of programs that grew out of the Hawaii Healthy Start program. At-risk mothers are identified and enrolled either during pregnancy or shortly after the birth of a child. The intervention involves home visits by trained paraprofessionals who provide information on parenting and child development, parenting classes, and case management.

Intensive Case Management for Emotionally Disturbed and/or Maltreated Youth.[22] Programs under this heading include some that have been referred to as "Wraparound" or "Systems of Care." These programs emphasize providing individualized coordinated services among a variety of agencies and organizations and allow the child to remain in the community. This approach is considered more flexible and tailored to individual circumstances than usual services. For this analysis, emphasis was placed on programs directed toward children with serious emotional disturbances who are in foster care or referred by the child welfare system.

Intensive Family Preservation Services Programs[23] are short-term, home-based crisis intervention services that emphasize placement prevention. The original program, Homebuilders®, was developed in 1974 in Federal Way, Washington. The program emphasizes contact with the family within 24 hours of the crisis, staff accessibility round the clock, small caseload sizes, service duration of four to six weeks, and provision of intensive, concrete services and counseling. These programs are intended to prevent removal of a child from his or her biological home (or to promote his or her return to that home) by improving family functioning. For this analysis, we have presented the effects of all such programs together. We have also separated these programs into two categories: (1) those that serve families with children at imminent risk of being removed from home, and (2) those that serve families with a child already placed out of home.

Iowa Family Development and Self Sufficiency Program (FaDSS). This program is targeted to women at risk of long-term welfare dependence. Families who volunteered for FaDSS were then randomly assigned to treatment or regular welfare-to-work programs. The intervention involves home visits, assessment, goal-setting, support services and service referral, advocacy, funds for special needs, and group activities.

[21] <http://www.healthyfamiliesamerica.org>
[22] <http://cecp.air.org/promisingpractices>
[23] <http://www.institutefamily.org/>

Nurse Family Partnership for Low Income Families[24] provides intensive visitation by nurses during a woman's pregnancy and the first two years after birth; the program was developed by Dr. David Olds. The goal is to promote the child's development and provide support and instructive parenting skills to the parents. The program is designed to serve low-income, at-risk pregnant women bearing their first child.

"Other" Family Preservation Services Programs are those with the same goals as the "intensive" family preservation services programs described above, but without the rigorous criteria for implementation as defined by the Homebuilders® model.

"Other" Home Visiting Programs for At-risk Mothers and Children focus on mothers considered to be at risk for parenting problems, based on factors such as maternal age, marital status and education, low household income, lack of social supports, or in some programs, mothers testing positive for drugs at the child's birth. Depending on the program, the content of the home visits consists of instruction in child development and health, referrals for service, or social and emotional support. Some programs provide additional services, such as preschool.

Note to reader: In our 2004 prevention report, we found this group of programs to produce a net benefit of $6,077 per participant. The sources of the benefits were from reductions in child abuse and neglect and increases in test scores. In the current report, we still found positive benefits from the child abuse outcomes; however, the increases in test scores we previously reported were no longer statistically significant. On further exploration, we found that we had incorrectly coded the findings of one of the five studies for children's test scores in the 2004 study. All of these studies had small sample sizes, so after correcting this error, the effect size for test scores was no longer statistically significant.

Parent-Child Interaction Therapy[25] aims to restructure the parent-child relationship and provide the child with a secure attachment to the parent. Parents are treated with their children, skills are behaviorally defined, and all skills are directly coached and practiced in parent-child sessions. Therapists observe parent-child interactions through a one-way mirror and coach the parent using a radio earphone. Live coaching and monitoring of skill acquisition are cornerstones of the program.

Parents as Teachers[26] is a home visiting program for parents and children with a main goal of having children ready to learn by the time they go to school. Parents are visited monthly by parent educators with some college education. Visits typically begin during the mother's pregnancy and may continue until the child enters kindergarten.

SAFE Homes (Connecticut) are group foster homes designed to serve as short-term placements while appropriate, longer term foster placements are found. SAFE Homes aims to keep siblings together and maintain children in their home communities when they are first removed from home.

Subsidized Guardianship (Illinois) is a strategy for increasing placement permanency by offering legal, subsidized guardianships for kin or foster care providers. These guardianships differ from formal adoption in that they do not require the legal severance of the relationship between the child and his or her biological family.

PROGRAMS WITHOUT BENEFIT-COST ESTIMATES. As mentioned in the section on study limitations, some studies did not have sufficient information on costs, or used measures that could not be monetized, but the available research offered sufficient information on outcomes for some measurements of effect (see Section 4 of Exhibit 2).

Abuse-Focused Cognitive Behavioral Therapy (AF-CBT) is an intervention for abused children and their parents. Children receive individual therapy, learning social skills, how to cope with difficult emotions resulting from abuse, and techniques for avoiding aggressive behavior. In parent therapy, parents learn how to manage anger and stress, deal with difficult child behavior, and skills for communicating and problem solving.

Early Hospital Discharge and Intensive In-Home Follow-Up for Low Birthweight Infants (Pennsylvania). Low birth weight infants are at risk for developmental delays. This program was based in a hospital, and allowed low-birthweight infants and their mothers to leave the hospital more quickly than usual after birth. Families were

[24] <http://www.nccfc.org/nurseFamilyPartnership.cfm>. The results reported here are for the program as delivered by nurses; an evaluation of the program delivered by paraprofessionals produced smaller effects that rarely achieved statistical significance.
[25] <http://www.pcit.org>
[26] < http://www.parentsasteachers.org>

frequently visited in their homes after hospital discharge to help parents learn parenting skills and ways to encourage development of their infants. Due to the very small sample size in the single evaluation of this program, we are unable to estimate the costs and benefits at this time.

The Family Connections Project (Canada) provided a home visiting program with public health nurses (similar to the Nurse Family Partnership service model [see description on page 16]) in a sample of families who had a history of child abuse or neglect.

Family to Family (New Mexico) is a grant-to-states foster care reform program funded by the Annie E. Casey Foundation. The program aims to establish a neighborhood resource for reducing unnecessary placement, returning children from group care to their neighborhoods, and involving foster families in reunification. States have considerable leeway in implementing changes; although the evaluation of Family to Family involved five states, only the project in New Mexico met our criteria for inclusion.

Family Group Conferences, Family Group (or Team) Decision Making[27] are interventions emphasizing the use of meetings among family members and professionals where family members develop their own plan to overcome identified problems and respond to concerns of child protection professionals. The meetings are commonly used as a decision-making apparatus when a child has been placed out of the home. We have divided this group of programs in our analysis; the standard "Group Conference" approach allows the family to develop their plan without input from child welfare professionals (although the plan must be approved by a professional after the conference), whereas the "Team Decision Making" approach incorporates professionals as an integral part of the planning meeting.

Family Therapy (FT) provides therapy for the whole family, teaching the family to communicate better and solve problems together. The therapist first assesses each family member's role and interaction style, then works with the family to reframe situations and increase cooperation. Families practice new skills at home and build alternative routines to solve conflict.

Local Efforts to Address and Reduce Neglect (LEARN) (California) is an in-home assistance program specifically targeted toward reducing physical neglect. The program aims to improve family functioning, increase parenting skills, and reduce poverty by providing in-home and school assistance, support groups for parents, and counseling for families and/or parents.

Project KEEP (San Diego) is a training program for foster parents. The program seeks to increase stability for children in foster care by training foster parents to track child behavior and implement a contingency system for compliance. Better management of difficult behavior is expected to lead to fewer placement changes for the children.

Structured Decision Making (Michigan) is a systematic approach to assessing the needs of families in the child welfare system. After a referral has been accepted, social workers use structured assessment tools in the decision-making process. Structured Decision Making is designed to remove some subjectivity from the child welfare process.

Triple-P Positive Parenting Program[28] **(South Carolina)** is a universal prevention program that aims to increase the skills and confidence of parents in order to prevent the development of serious behavioral and emotional problems in their children. Triple-P has five levels of intensity; the base level is a media campaign that aims to increase awareness of parenting resources and inform parents about solutions to common behavioral problems. Levels two and three are primary health care interventions for children with mild behavioral difficulties, whereas levels four and five are more intensive individual- or class-based parenting programs for families of children with more challenging behavior problems. The evaluation in this study was a population-based trial that provided all levels of the program.

[27] <http://www.pppncjfcj.org/html/technical_assistance_ref-famlygrp_decis.html>, <http://www.americanhumane.org/site/PageServer?pagename=pc_fgdm_research_psu>
[28] <http://www.triplep-america.com/>

Technical Appendices

Appendix A: Meta-Analytic Procedures

To estimate the benefits and costs of prevention and intervention programs that affect child welfare outcomes, we conducted separate analyses of a number of key statistical relationships. In Appendix A, we describe the procedures we employed and the results we obtained in estimating the causal linkage between program participation and child welfare outcomes. To estimate these key relationships, we conducted reviews of the relevant research literature. In recent years, researchers have developed a set of statistical tools to facilitate systematic reviews of evaluation evidence. This set of procedures is called "meta-analysis" and we employ that methodology in this study.[29] In Appendix A, we describe these general procedures, the unique adjustments we made to them, and the results of our meta-analyses.

A1. Study Selection and Coding Criteria

A meta-analysis is only as good as the selection and coding criteria used to conduct the study.[30] Following are the key choices we made and implemented.

Study Selection. As described in this report, the current study is a follow-up to the 2004 prevention report from Washington State Institute for Public Policy (Institute).[31] We used the prevention programs described in the 2004 report as our starting point, re-reviewing all studies with child abuse and neglect outcomes from that analysis.

We used five primary means to locate new studies for the meta-analysis of prevention and intervention programs: (a) we reviewed new studies that had cited research included in the 2004 Institute report ; (b) we consulted the study lists of other systematic and narrative reviews of the child welfare research literature; (c) we examined the citations in the individual studies themselves; (d) we conducted independent literature searches of research databases using search engines such as Google, Proquest, Ebsco, ERIC, and SAGE; and (e) we contacted authors of primary research to learn about ongoing or unpublished evaluation work. As we will describe, the most important criteria for inclusion in our study was that an evaluation have a control or comparison group. Therefore, after first identifying all possible studies via these search methods, we attempted to determine whether the study was an outcome evaluation that had a comparison group. If a study met these criteria, we then secured a paper copy of the study for our review.

Peer-Reviewed and Other Studies. We examined all program evaluation studies we could locate with these search procedures. Many of these studies were published in peer-reviewed academic journals while many others were from government reports obtained from the agencies themselves. It is important to include non-peer reviewed studies, because it has been suggested that peer-reviewed publications may be biased to show positive program effects. Therefore, our meta-analysis includes all available studies regardless of published source.

[29] We follow the meta-analytic methods described in: M.W. Lipsey, and D. Wilson. (2001). *Practical meta-analysis*. Thousand Oaks: Sage Publications.

[30] All studies used in the meta-analysis are identified in the references beginning on page 27 of this report. Many other studies were reviewed, but did not meet standards set for this analysis.

[31] Aos et al., *Benefits and costs of prevention and early intervention programs for youth*.

Control and Comparison Group Studies. Our analysis only includes studies that had a control or comparison group. That is, we did not include studies with a single-group, pre-post research design. This choice was made because it is only through rigorous comparison group studies that causal relationships can be reliably estimated.

Exclusion of Studies of Program Completers Only. We did not include a comparison study in our meta-analytic review if the treatment group was made up solely of program completers. We adopted this rule because there are too many significant unobserved self-selection factors that distinguish a program completer from a program dropout, and these unobserved factors are likely to significantly bias estimated treatment effects. Some comparison group studies of program completers, however, also contain information on program dropouts in addition to a comparison group. In these situations, we included the study if sufficient information was provided to allow us to reconstruct an intent-to-treat group that included both completers and non-completers, or if the demonstrated rate of program non-completion was very small (e.g. under 10 percent). In these cases, the study still needed to meet the other inclusion requirements listed here.

Random Assignment and Quasi-Experiments. Random assignment studies were preferred for inclusion in our review, but we also included non-randomly assigned control groups. We only included quasi-experimental studies if sufficient information was provided to demonstrate comparability between the treatment and comparison groups on important pre-existing conditions such as age, gender, and pre-treatment characteristics such as prior out-of-home placements or reports to Child Protective Services.

Enough Information to Calculate an Effect Size. Following the statistical procedures in Lipsey and Wilson (2001), a study had to provide the necessary information to calculate an effect size. If the necessary information was not provided, the study was not included in our review.

Mean-Difference Effect Sizes. For this study, we coded mean-difference effect sizes following the procedures in Lipsey and Wilson (2001). For dichotomous measures, we used the D-cox transformation to approximate the mean difference effect size, as described in Sánchez-Meca, Marín-Martínez, and Chacón-Moscoso[32] We chose to use the mean-difference effect size rather than the odds ratio effect size because we frequently coded both dichotomous and continuous outcomes (odds ratio effect sizes could also have been used with appropriate transformations).

Multivariate Results Preferred. Some studies presented two types of analyses: raw outcomes that were not adjusted for covariates such as age, gender, or pre-intervention characteristics; and those that had been adjusted with multivariate statistical methods. In these situations, we coded the multivariate outcomes.

Outcome Measures of Interest. Our primary outcome of interest was involvement in the child welfare system; for these outcomes, we only recorded measures that reflected direct involvement in the system. Relevant child welfare outcomes include, for example, substantiated child abuse or neglect, out-of-home placements, permanency of placement, and stability of placement. We did not record process and quality measures such as client satisfaction, quality of services, etc. In addition to child welfare outcomes, we were also interested in other measures we could include in our economic analysis; namely, criminal involvement, indicators from the education system, use of public assistance, rates of teenage pregnancy and birth, and disordered use of alcohol and drugs. When studies that measured child welfare outcomes also included data on these other outcomes, we coded these as well.

Averaging Effect Sizes for Similar Outcomes. Some studies reported similar outcomes: e.g., a variety of delinquency measures in the case of crime measurement, or a number of different measures of substance use for an alcohol or drug use outcome. In such cases, we calculated an effect size for each measure and then took a simple average. As a result, each study coded in this analysis is associated with a single effect size for a given outcome.

Dichotomous Measures Preferred Over Continuous Measures. Some studies included two types of measures for the same outcome: a dichotomous (yes/no) outcome and a continuous (mean number) measure. In these situations, we coded an effect size for the dichotomous measure. Our rationale for this choice is that in small or relatively small sample studies, continuous measures of treatment outcomes can be unduly influenced by a small number of outliers, while dichotomous measures can avoid this problem. Of course, if a study only presented a continuous measure, we coded the continuous measure.

Longest Follow-Up Periods. When a study presented outcomes with varying follow-up periods, we generally coded the effect size for the longest follow-up period. The longest follow-up period allows us to gain the most insight into the long-run benefits and costs of various treatments. Occasionally, we did not use the longest follow-up period if it was clear that a longer reported follow-up period adversely affected the attrition rate of the treatment and comparison group samples.

Some Special Coding Rules for Effect Sizes. Most studies in our review had sufficient information to code exact mean-difference effect sizes. Some studies, however, reported some, but not all the information required. We followed the following rules for these situations:

- **Two-tail p-values.** Some studies only reported p-values for significance testing of program outcomes. When we had to rely on these results, if the study reported a one-tail p-value, we converted it to a two-tail test.
- **Declaration of significance by category.** Some studies reported results of statistical significance tests in terms of categories of p-values. Examples include: p<=.01, p<=.05, or non-significant at the p=.05 level. We calculated effect sizes for these categories by using the highest p-value in the category. Thus, if a study reported significance at p<=.05, we calculated the effect size at p=.05. This is the most conservative strategy. If the study simply stated a result was non-significant, we computed the effect size assuming a p-value of .50 (i.e. p=.50).

A2. Procedures for Calculating Effect Sizes

Effect sizes measure the degree to which a program has been shown to change an outcome for program participants relative to a comparison group. There are several methods used by meta-analysts to calculate effect sizes, as described in Lipsey and

[32] J. Sánchez -Meca, F. Marín-Martínez, & S. Chacón-Moscoso. (2003). Effect-size indices for dichotomized outcomes in meta-analysis. *Psychological Methods*, *8*(4): 448-467.

Wilson (2001). We use the standardized mean difference effect size for continuous measures and the D-cox transformation as described in Sánchez-Meca, Chacón-Moscoso, and Marín-Martínez[33] to approximate the mean difference effect size for dichotomous outcome variables.

A(1): $$d_{Cox} = \ln\left(\frac{p_e(1-p_c)}{p_c(1-p_e)}\right)/1.65$$

In Equation 1, d_{cox} is the estimated effect size, which is derived by dividing the log odds ratio by the constant 1.65. *Pe*, represents the percentage outcome for the experimental or treatment group and, *Pc*, is the percentage outcome for the control group.

For continuous outcome measures, we use the standardized mean difference effect size statistic[34].

A(2): $$ES_m = \frac{M_e - M_c}{\sqrt{\frac{SD_e^2 + SD_c^2}{2}}}$$

In the second equation, ES_m is the estimated standardized mean effect size where M_e is the mean outcome for the experimental group, M_c is the mean outcome for the control group, SD_e is the standard deviation of the mean outcome for the experimental group, and SD_c is the standard deviation of the mean outcome for the control group.

Often, research studies report the mean values needed to compute ES_m in (A2), but they fail to report the standard deviations. Sometimes, however, the research will report information about statistical tests or confidence intervals that can then allow the pooled standard deviation to be estimated. These procedures are also described in Lipsey and Wilson (2001).

Adjusting Effect Sizes for Small Sample Sizes
Since some studies have very small sample sizes, we follow the recommendation of many meta-analysts and adjust for this. Small sample sizes have been shown to upwardly bias effect sizes, especially when samples are less than 20. Following Hedges,[35] Lipsey and Wilson[36] report the "Hedges correction factor," which we use to adjust all mean difference effect sizes (N is the total sample size of the combined treatment and comparison groups):

A(3): $$ES'_m = \left[1 - \frac{3}{4N-9}\right] \times \left[ES_m\right]$$

Computing Weighted Average Effect Sizes, Confidence Intervals, and Homogeneity Tests. Once effect sizes are calculated for each program effect, the individual measures are summed to produce a weighted average effect size for a program area. We calculate the inverse variance weight for each program effect and these weights are used to compute the average. These calculations involve three steps. First, the standard error, SE_m of each mean effect size is computed with:[37]

A(4): $$SE_m = \sqrt{\frac{n_e + n_c}{n_e n_c} + \frac{(ES'_m)^2}{2(n_e + n_c)}}$$

In equation (A4), n_e and n_c are the number of participants in the experimental and control groups and ES'_m is from equation (A3).

For dichotomous outcomes, the standard error, SEd_{cox}, is computed with:[38] (Sánchez-Meca et al., 2003, Equation 19):

A(5): $$SE_{d_{Cox}} = \sqrt{0.367\left[\frac{1}{O_{1E}} + \frac{1}{O_{2E}} + \frac{1}{O_{1C}} + \frac{1}{O_{2C}}\right]}$$

In Equation (A5), O_{1E} and $O_{1C,}$ represent the success frequencies of the experimental and control groups. O_{2E} and $O_{2C,}$ represent the failure frequencies of the experimental and control groups.

Next, the inverse variance weight w_m is computed for each mean effect size with:[39]

A(6): $$w_m = \frac{1}{SE_m^2}$$

The weighted mean effect size for a group of studies in program area i is then computed with:[40]

A(7): $$\overline{ES} = \frac{\sum(w_{m_i} ES'_{m_i})}{\sum w_{m_i}}$$

Confidence intervals around this mean are then computed by first calculating the standard error of the mean with:[41]

A(8): $$SE_{\overline{ES}} = \sqrt{\frac{1}{\sum w_{m_i}}}$$

Next, the lower, ES_L, and upper limits, ES_U, of the confidence interval are computed with:[42]

A(9): $$\overline{ES_L} = \overline{ES} - z_{(1-\alpha)}(SE_{\overline{ES}})$$

A(10): $$\overline{ES_U} = \overline{ES} + z_{(1-\alpha)}(SE_{\overline{ES}})$$

In equations (A9) and (A10), $z_{(1-\alpha)}$ is the critical value for the z-distribution (1.96 for α = .05).

The test for homogeneity, which provides a measure of the dispersion of the effect sizes around their mean, is given by:[43]

[33] Sánchez -Meca, et al., *Effect-size indices for dichotomized outcomes in meta-analysis,* equation 18.
[34] Lipsey and Wilson, *Practical meta-analysis*, Table B.10, equation 1.
[35] L.V. Hedges. (1981) Distribution theory for Glass's estimator of effect size and related estimators. *Journal of Educational Statistics, 6*: 107-128.
[36] Lipsey and Wilson, *Practical meta-analysis*, 49, equation 3.22.
[37] Ibid., 49, equation 3.23.
[38] Sánchez -Meca, et al., *Effect-size indices for dichotomized outcomes in meta-analysis,* equation 19.
[39] Lipsey and Wilson, *Practical meta-analysis*, 49, equation 3.24.
[40] Ibid., 114.
[41] Ibid.
[42] Ibid.
[43] Ibid., 116.

A(11): $$Q_i = (\sum w_i ES_i^2) - \frac{(\sum w_i ES_i)^2}{\sum w_i}$$

The Q-test is distributed as a chi-square with k-1 degrees of freedom (where k is the number of effect sizes).

Computing Random Effects Weighted Average Effect Sizes and Confidence Intervals. When the p-value on the Q-test indicates significance at values of p less than or equal to .05, a random effects model is performed to calculate the weighted average effect size. This is accomplished by first calculating the random effects variance component, v.[44]

A(12): $$v = \frac{Q_i - (k-1)}{\sum w_i - (\sum wsq_i / \sum w_i)}$$

This random variance factor is then added to the variance of each effect size and then all inverse variance weights are recomputed, as are the other meta-analytic test statistics.

A3. Institute Adjustments to Effect Sizes for Methodological Quality, Outcome Measure Relevance, and Researcher Involvement

In Exhibit A.1 we show the results of our meta-analyses calculated with the standard meta-analytic formulas described in Appendix A2. In the last columns in each exhibit, however, we list "Adjusted Effect Sizes" that we actually use in our benefit-cost analysis. These adjusted effect sizes, which are derived from the unadjusted results, are always smaller than or equal to the unadjusted effect sizes we report in the same exhibit.

In Appendix A3, we describe our rationale for making these downward adjustments. In particular, we make three types of adjustments that are necessary to better estimate the results that we are more likely to achieve in real-world settings. We make adjustments for: (a) the methodological quality of each study we include in the meta-analyses; (b) the relevance or quality of the outcome measure that individual studies used; and (c) the degree to which the researcher(s) who conducted a study were invested in the program's design.

A3.a. Methodological Quality. Not all research is of equal quality, and this greatly influences the confidence that can be placed in the results of a study. Some studies are well designed and implemented, and the results can be viewed as accurate representations of whether the program itself worked. Other studies are not designed as well, and less confidence can be placed in any reported differences. In particular, studies of inferior research design cannot completely control for sample selection bias or other unobserved threats to the validity of reported research results. This does not mean that results from these studies are of no value, but it does mean that less confidence can be placed in any cause-and-effect conclusions drawn from the results.

To account for the differences in the quality of research designs, we use a 5-point scale as a way to adjust the reported results. The scale is based closely on the 5-point scale developed by researchers at the University of Maryland.[45] On this 5-point scale, a rating of "5" reflects an evaluation in which the most confidence can be placed. As the evaluation ranking gets lower, less confidence can be placed in any reported differences (or lack of differences) between the program and comparison or control groups.

On the 5-point scale as interpreted by the Institute, each study is rated with the following numerical ratings.

- A **"5"** is assigned to an evaluation with well-implemented random assignment of subjects to a treatment group and a control group that does not receive the treatment/program. A good random assignment study should also indicate how well the random assignment actually occurred by reporting values for pre-existing characteristics for the treatment and control groups.
- A **"4"** is assigned to a study that employs a rigorous quasi-experimental research design with a program and matched comparison group, controlling with statistical methods for self-selection bias that might otherwise influence outcomes. These quasi-experimental methods may include estimates made with a convincing instrumental variables modeling approach, or a Heckman approach to modeling self-selection.[46] A level 4 study may also be used to "downgrade" an experimental random assignment design that had problems in implementation, perhaps with significant attrition rates.
- A **"3"** indicates a non-experimental evaluation where the program and comparison groups were reasonably well matched on pre-existing differences in key variables. There must be evidence presented in the evaluation that indicates few, if any, significant differences were observed in these salient pre-existing variables. Alternatively, if an evaluation employs sound multivariate statistical techniques (e.g., logistic regression) to control for pre-existing differences, and if the analysis is successfully completed, then a study with some differences in pre-existing variables can qualify as a level 3.
- A **"2"** involves a study with a program and matched comparison group where the two groups lack comparability on pre-existing variables and no attempt was made to control for these differences in the study.
- A **"1"** involves a study where no comparison group is utilized. Instead, the relationship between a program and an outcome, i.e., drug use, is analyzed before and after the program.

We do not use the results from program evaluations rated as a "1" on this scale, because they do not include a comparison group and, thus, no context to judge program effectiveness. We also regard evaluations with a rating of "2" as highly problematic and, as a result, do not consider their findings in the calculations of effect. In this study, we only considered evaluations that rated at least a 3 on this 5-point scale.

An explicit adjustment factor is assigned to the results of individual effect sizes based on the Institute's judgment concerning research design quality. This adjustment is critical and the only practical way to combine the results of a high quality study (e.g., a level 5 study) with those of lesser design

[44] Ibid., 134.

[45] L. Sherman, D. Gottfredson, D. MacKenzie, J. Eck, P. Reuter, and S. Bushway. (1998). *Preventing crime: What works, what doesn't, what's promising*. Prepared for the National Institute of Justice. Department of Criminology and Criminal Justice, University of Maryland. Chapter 2.

[46] For a discussion of these methods, see W. Rhodes, B. Pelissier, G. Gaes, W. Saylor, S. Camp, and S. Wallace. (2001). Alternative solutions to the problem of selection bias in an analysis of federal residential drug treatment programs. *Evaluation Review, 25*(3): 331-369.

quality (level 4 and level 3 studies). The specific adjustments made for these studies are based on our knowledge of research in other topic areas. For example, in criminal justice program evaluations, there is strong evidence that random assignment studies (i.e., level 5 studies) have, on average, smaller absolute effect sizes than weaker-designed studies.[47] Thus, we use the following "default" adjustments to account for studies of different research design quality:

- A level 5 study carries a factor of 1.0 (that is, there is no discounting of the study's evaluation outcomes).
- A level 4 study carries a factor of .75 (effect sizes discounted by 25 percent).
- A level 3 study carries a factor of .50 (effect sizes discounted by 50 percent).
- We do not include level 2 and level 1 studies in our analyses.

These factors are subjective to a degree; they are based on the Institute's general impressions of the confidence that can be placed in the predictive power of evaluations of different quality.

The effect of the adjustment is to multiply the effect size for any study, ES'_m, in equation (A3) by the appropriate research design factor. For example, if a study has an effect size of -.20 and it is deemed a level 4 study, then the -.20 effect size would be multiplied by .75 to produce a -.15 adjusted effect size for use in the benefit-cost analysis.

A3.b Adjusting Effect Sizes for Evaluations with Weak Outcome Measures. Some evaluations use outcome measures that may not be precise gauges of the ultimate outcome of interest. In these cases, we record a flag that can later be used to discount the effect. For example, one evaluation of a home visiting program for new mothers (Mulsow and Murray, 1996) used CPS reports to measure child abuse and neglect. If this measure is used to indicate substantiated child abuse and neglect, then a flag on this outcome measure can be used to reflect the probability that this measure may not be expected to have a one-to-one relationship with substantiated abuse and neglect and that a better outcome measure would have been substantiated cases from administrative child welfare data.

A3.c. Adjusting Effect Sizes for Research Involvement in the Program's Design and Implementation. The purpose of the Institute's work is to identify and evaluate programs that can make cost-beneficial improvements to Washington's actual service delivery system. There is some evidence that programs closely controlled by researchers or program developers have better results than those that operate in "real world" administrative structures.[48] In our evaluation of a real-world implementation of a research-based juvenile justice program in Washington, we found that the actual results were considerably lower than the results obtained when the intervention was conducted by the originators of the program.[49] Therefore, we make an adjustment to effect sizes, ES_m, to reflect this distinction. As a parameter for all studies deemed not to be "real world" trials, the Institute discounts ES'_m by .5, although this can be modified on a study-by-study basis.

A4. Meta-Analytic Results—Estimated Effect Sizes and Citations to Studies Used in the Analyses

Exhibit A.1 provides technical meta-analytic results for the effect sizes computed for this analysis. Each table provides the unadjusted and adjusted effect sizes for evaluated prevention and intervention programs, and lists all of the studies included in each analysis. Exhibit A.2 lists the citations for all studies used in the meta-analyses.

[47] M.W. Lipsey. (2003). Those confounded moderators in meta-analysis: Good, bad, and ugly. *The Annals of the American Academy of Political and Social Science, 587*(1): 69-81. Lipsey found that, for juvenile delinquency evaluations, random assignment studies produced effect sizes only 56 percent as large as nonrandom assignment studies.

[48] Ibid. Lipsey found that, for juvenile delinquency evaluations, programs in routine practice (i.e., "real world" programs) produced effect sizes only 61 percent as large as research/demonstration projects. See also:
A. Petrosino, and H. Soydan. (2005). The impact of program developers as evaluators on criminal recidivism: Results from meta-analyses of experimental and quasi-experimental research. *Journal of Experimental Criminology, 1*(4): 435-450.

[49] R. Barnoski. (2004). *Outcome evaluation of Washington State's research-based programs for juvenile offenders*. Olympia: Washington State Institute for Public Policy, available at <http://www.wsipp.wa.gov/rptfiles/04-01-1201.pdf>.

How to read this table. Example: Healthy Families America's impact on child abuse and neglect outcomes.

Exhibit A.1 (continued)

Meta-Analytic Estimates of Standardized Mean Difference Effect Sizes for Child Welfare Programs

Many of these programs have evaluated other outcomes than those shown.
Except as noted, this table includes our analysis of only those outcomes directly related to our estimates of monetary benefits.

Type of Prevention or Intervention Program (and its effect on outcomes included in our cost-benefit analysis)	Number of Effect Sizes Included in the Analysis (Number of cases in the treatment groups)	*Meta-Analytic Results Before Applying Institute Adjustments*					**Adjusted Effect Size Used in the Benefit-Cost Analysis** (estimated effect after adjustments for the quality of the evidence, outcome measure relevance, and researcher involvement)	Notes to Table
		Fixed Effects Model			Random Effects Model			
		Weighted Mean Effect Size		Homogeneity Test	Weighted Mean Effect Size			
		ES	p-value	p-value	ES	p-value	ES	
Project KEEP (San Diego), and its effect on:								
Permanent placement	1 (852)	0.209			na			(7)
Structured Decision Making (Michigan), and its effect on:								
Out-of-Home Placements	1 (841)	-0.202	.00	na	na	na	-0.101	
Permanent placement	1 (841)	0.297	.00	na	na	na	0.148	
HOME VISITING PROGRAMS								
Healthy Families America - Mother outcomes, and its effect on:								
High School Graduation	2 (307)	-0.058	.56	0.629	na	na	0.000	
Public Assistance	1 (205)	-0.074	.54	na	na	na	0.000	
Alcohol (disordered use)	1 (326)	-0.153	.41	na	na	na	0.000	
Illicit Drugs (disordered use)	1 (205)	0.030	.76	na	na	na	0.000	
Healthy Families America - Child outcomes, and its effect on:								
Child Abuse and Neglect	8 (3353)	-0.233	.00	0.036	-0.186	.06	-0.160	
Test Scores	2 (256)	0.040	.65	0.404	na	na	0.000	
Nurse Family Partnership for Low-Income Mothers - Mother Outcomes, and its effect on:								
Crime	2 (229)	0.053	.51	0.000	-0.247	.58	0.000	(9)
High School Graduation	2 (401)	0.096	.27	0.713	na	na	0.000	
Public Assistance	3 (476)	-0.156	.01	0.030	-0.196	.12	0.000	
Illicit Drugs (disordered use)	3 (439)	-0.078	.51	0.091	na	na	0.000	(10)
Employment	2 (229)	0.040	.62	0.153	na	na	0.000	
Nurse Family Partnership for Low-Income Mothers - Child Outcomes, and its effect on:								
Child Abuse and Neglect	2 (438)	-0.218			na	na	-0.218	
Test Scores	2 (386)	0.115			na	na	0.115	
Child Behavior Problems	2 (438)	-0.441			na	na	-0.441	
Substance Abuse	2 (167)	-0.736			na	na	-0.736	
Parents as Teachers - Child outcomes, and its effect on:								
High School Graduation	1 (679)	-0.093	.63	na	na	na	0.000	
Teen Births/Pregnancy (under 18)	1 (77)	0.089					0.000	
Parents as Teachers - Child outcomes, and its effect on:								
Test Scores	5 (587)	0.145						
Child Abuse and Neglect	1 (149)	-0.377						
Other* Home Visiting Programs for At-risk Mothers and Children - Mot								
Contraceptive use	1 (62)	0.708						
Other* Home Visiting Programs for At-risk Mothers and Children - Child outcomes, and its effect on:								
Test Scores	2 (62)	0.088	.68	0.222	na	na		
K–12 Grade Repetition	1 (66)	-0.161	.56	na	na	na		
Child Abuse and Neglect	11 (667)	-0.182	.14	0.013	-0.332	.10		
Out-of-Home Placements	5 (266)	-0.146	.35	0.121	na	na		

1. The number of trials or separate studies used in the analysis of this outcome, and the total number of participants in the program groups.

2. The (weighted) average size of the program effect over the eight trials. The negative number means this program reduces child abuse and neglect.

3. The probability of this effect size occurring by mere chance. Probabilities of .10 or less are considered significant.

4. The probability that there were no significant differences among the four trials. Probabilities of .05 or less are considered significant.

5. Average size of the program effect after adjusting for significant differences among trials.

6. The probability of the adjusted effect size occurring by mere chance. Probabilities of .10 or less are considered significant.

7. Average effect size (e.g. reduced child abuse and neglect) after adjusting for study quality and the quality of outcome measures. This is the effect size used to calculate benefits of the program.

WSIPP 2008

Exhibit A.1
Meta-Analytic Estimates of Standardized Mean Difference Effect Sizes for Child Welfare Programs

Many of these programs have evaluated other outcomes than those shown.
Except as noted, this table includes our analysis of only those outcomes directly related to our estimates of monetary benefits.

Type of Program or Policy (and its effect on outcomes included in our cost-benefit analysis)	Number of Effect Sizes Included in the Analysis (Number of cases in the treatment groups)	*Meta-Analytic Results Before Applying Institute Adjustments*					**Adjusted Effect Size Used in the Benefit-Cost Analysis** (estimated effect after adjustments for the methodological quality of the evidence, outcome measure relevance, and researcher involvement)	Notes to Table
		Fixed Effects Model			Random Effects Model			
		Weighted Mean Effect Size		Homogeneity Test	Weighted Mean Effect Size			
		ES	p-value	p-value	ES	p-value	ES	
Abuse-Focused Cognitive Behavioral Therapy (AF-CBT), and its effect on:								
Child Abuse and Neglect	1 (25)	-0.800	.15	na	na	na	0.000	
Chicago Child Parent Centers, and its effect on:								
Crime	1 (911)	-0.303	.00	na	na	na	-0.257	
High School Graduation	1 (858)	0.260	.00	na	na	na	0.221	
Test Scores	1 (756)	0.159	.01	na	na	na	0.113	
K–12 Special Education	1 (841)	-0.401	.00	na	na	na	-0.341	
K–12 Grade Repetition	1 (841)	-0.446	.00	na	na	na	-0.379	
Child Abuse and Neglect	1 (913)	-0.394	.00	na	na	na	-0.335	(1)
Out-of-Home Placements	1 (888)	-0.403	.00	na	na	na	-0.343	
Dependency (or Family Treatment) Drug Court (California), and its effect on:								
Child Abuse and Neglect	1 (193)	0.284	.10	na	na	na	0.142	
Out-of-Home Placements	2 (1082)	-0.290	.00	0.061	na	na	-0.145	
Permanent placement	1 (197)	0.276	.01	na	na	na	0.138	(2)
Early Hospital Discharge and Intensive In-Home Follow-Up for Low Birthweight Infants (Pennsylvania), and its effect on:								
Child Abuse and Neglect	1 (39)	-0.432	.43	na	na	na	0.000	
Out-of-Home Placements	1 (39)	-0.840	.39	na	na	na	0.000	
Family Assessment Response (Minnesota), and its effect on:								
Child Abuse and Neglect	1 (2732)	-0.059	.16	na	na	na	0.000	
Out-of-Home Placements	1 (2810)	-0.108	.00	na	na	na	-0.081	
The Family Connections Study (Canada), and its effect on:								
Child Abuse and Neglect	1 (88)	-0.253	.21	na	na	na	0.000	
Family to Family (New Mexico), and its effect on:								
Out-of-Home Placements	1 (2777)	0.022	.65	na	na	na	0.000	(3)
Family Group Conferences, and its effect on:								(4)
Child Abuse and Neglect	2 (200)	0.285	.02	0.109	na	na	0.213	
Family Group Decision Making (California), and its effect on:								(5)
Child Abuse and Neglect	1 (105)	0.110	.50	na	na	na	0.000	
Placement stability	1 (105)	-0.110	.50	na	na	na	0.000	
Family Therapy, and its effect on:								
Child Abuse and Neglect	1 (18)	-0.675	.25	na	na	na	0.000	
Flexible Funding (Title IV-E Waivers in Oregon and North Carolina), and its effect on:								
Out-of-Home Placements	2 (37885)	-0.108	.00	na	na	na	-0.054	
Intensive Case Management for Emotionally Disturbed and/or Maltreated Youth, and its effect on:								(6)
Out-of-Home Placements	2 (129)	0.075	.66	0.656	na	na	0.000	
Permanent placement	1 (54)	0.418	.06	na	na	na	0.418	
Placement stability	1 (54)	0.366	.04	na	na	na	0.366	
Iowa Family Development and Self Sufficiency Program, and its effect on:								
Public Assistance	1 (899)	0.037	.53	na	na	na	0.000	
Iowa Family Development and Self Sufficiency Program - Child outcomes, and its effect on:								
Child Abuse and Neglect	1 (899)	0.022	.90	na	na	na	0.000	
LEARN (Local Efforts to Address and Reduce Neglect), and its effect on:								
Child Abuse and Neglect	1 (479)	-0.066	.64	na	na	na	0.000	
Parent-Child Interaction Therapy (Oklahoma), and its effect on:								
Child Abuse and Neglect	1 (42)	-0.846	.01	na	na	na	-0.423	

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Exhibit A.1 (continued)
Meta-Analytic Estimates of Standardized Mean Difference Effect Sizes for Child Welfare Programs

Many of these programs have evaluated other outcomes than those shown.
Except as noted, this table includes our analysis of only those outcomes directly related to our estimates of monetary benefits.

Type of Program or Policy (and its effect on outcomes included in our cost-benefit analysis)	Number of Effect Sizes Included in the Analysis (Number of cases in the treatment groups)	*Meta-Analytic Results Before Applying Institute Adjustments*					**Adjusted Effect Size Used in the Benefit-Cost Analysis** (estimated effect after adjustments for the methodological quality of the evidence, outcome measure relevance, and researcher involvement)	Notes to Table
		Fixed Effects Model			Random Effects Model			
		Weighted Mean Effect Size		Homogeneity Test	Weighted Mean Effect Size			
		ES	p-value	p-value	ES	p-value	ES	
Project KEEP (San Diego), and its effect on:								
Permanent placement	1 (359)	0.209	.01	na	na	na	0.156	(7)
SAFE Homes (Connecticut), and its effect on:								
Child Abuse and Neglect	1 (342)	-0.058	.72	na	na	na	0.000	
Out-of-Home Placements	1 (342)	0.194	.04	na	na	na	0.097	
Subsidized Guardianship (Illinois), and its effect on:								
Permanent placement	1 (3181)	0.160	.00	na	na	na	0.160	
Placement stability	1 (3181)	0.026	.43	na	na	na	0.000	
Structured Decision Making (Michigan), and its effect on:								
Out-of-Home Placements	1 (841)	-0.202	.00	na	na	na	-0.101	
Permanent placement	1 (841)	0.297	.00	na	na	na	0.148	
Triple-P (South Carolina), and its effect on:								
Child Abuse and Neglect								(8)
Out-of-Home Placements								
HOME VISITING PROGRAMS								
Healthy Families America - Mother outcomes, and its effect on:								
High School Graduation	2 (307)	-0.058	.56	0.629	na	na	0.000	
Public Assistance	1 (205)	-0.074	.54	na	na	na	0.000	
Alcohol (disordered use)	1 (326)	-0.153	.41	na	na	na	0.000	
Illicit Drugs (disordered use)	1 (205)	0.030	.76	na	na	na	0.000	
Healthy Families America - Child outcomes, and its effect on:								
Child Abuse and Neglect	8 (3353)	-0.233	.00	0.036	-0.186	.06	-0.160	
Test Scores	2 (256)	0.040	.65	0.404	na	na	0.000	
Nurse Family Partnership for Low-Income Mothers - Mother Outcomes, and its effect on:								
Crime	2 (229)	0.053	.51	0.000	-0.247	.58	0.000	(9)
High School Graduation	2 (401)	0.096	.27	0.713	na	na	0.000	
Public Assistance	3 (470)	-0.156	.01	0.030	-0.196	.12	0.000	
Illicit Drugs (disordered use)	3 (439)	-0.078	.51	0.091	na	na	0.000	(10)
Employment	2 (229)	0.040	.62	0.153	na	na	0.000	
Nurse Family Partnership for Low-Income Mothers - Child Outcomes, and its effect on:								
Crime	1 (38)	-0.436	.04	na	na	na	-0.218	
Test Scores	2 (386)	0.115	.08	0.518	na	na	0.115	
Child Abuse and Neglect	1 (38)	-0.883	.00	na	na	na	-0.441	
Substance Use	1 (167)	-0.736	.07	na	na	na	-0.736	
Parents as Teachers - Mother outcomes, and its effect on:								
High School Graduation	1 (79)	-0.093	.63	na	na	na	0.000	
Teen Births/Pregnancy (under 18)	1 (77)	0.089	.68	na	na	na	0.000	
Parents as Teachers - Child outcomes, and its effect on:								
Test Scores	5 (587)	0.145	.02	0.240	na	na	0.066	
Child Abuse and Neglect	1 (149)	-0.377	.48	na	na	na	0.000	
Other* Home Visiting Programs for At-risk Mothers and Children - Mother outcomes, and its effect on:								
Contraceptive use	1 (62)	0.708	.01	na	na	na	0.708	
Other* Home Visiting Programs for At-risk Mothers and Children - Child outcomes, and its effect on:								
Test Scores	2 (62)	0.088	.68	0.222	na	na	0.000	(11)
K–12 Grade Repetition	1 (66)	-0.161	.56	na	na	na	0.000	
Child Abuse and Neglect	11 (667)	-0.182	.14	0.013	-0.332	.10	-0.194	
Out-of-Home Placements	5 (266)	-0.146	.35	0.121	na	na	0.000	

Exhibit A.1 (continued)
Meta-Analytic Estimates of Standardized Mean Difference Effect Sizes for Child Welfare Programs

Many of these programs have evaluated other outcomes than those shown.
Except as noted, this table includes our analysis of only those outcomes directly related to our estimates of monetary benefits.

Type of Program or Policy (and its effect on outcomes included in our cost-benefit analysis)	Number of Effect Sizes Included in the Analysis (Number of cases in the treatment groups)	*Meta-Analytic Results Before Applying Institute Adjustments*					**Adjusted Effect Size Used in the Benefit-Cost Analysis** (estimated effect after adjustments for the methodological quality of the evidence, outcome measure relevance, and researcher involvement)	Notes to Table
		Fixed Effects Model			Random Effects Model			
		Weighted Mean Effect Size		Homogeneity Test	Weighted Mean Effect Size			
		ES	p-value	p-value	ES	p-value	ES	
FAMILY PRESERVATION PROGRAMS								
All Intensive Family Preservation Service Programs (Homebuilders® model), and its effect on:								(12)
Child Abuse and Neglect	2 (180)	-0.230	.04	0.889	na	na	-0.138	
Out-of-Home Placements	4 (337)	-0.588	.00	0.112	na	na	-0.346	
Intensive Family Preservation Services for Out of Home Placement Prevention (Homebuilders® model), and its effect on:								
Child Abuse and Neglect	1 (120)	-0.218	.13	na	na	na	0.000	
Out-of-Home Placements	3 (280)	-0.588	.00	0.050	na	na	-0.328	
Intensive Family Preservation Services for Increased Reunification (Homebuilders® model), and its effect on:								
Child Abuse and Neglect	1 (60)	-0.251	.18	na	na	na	0.000	
Out-of-Home Placements	1 (57)	-0.583	.02	na	na	na	-0.437	
Other* Family Preservation Services (non-Homebuilders®), and its effect on:								
Child Abuse and Neglect	6 (1860)	0.041	.46	0.083	na	na	0.000	
Out-of-Home Placements	10 (2373)	0.125	.01	0.105	na	na	0.095	

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* "Other" programs are groups of very similar programs that are not separately listed in our analysis.

(1) In this table, we have reported effect sizes for both child abuse and neglect and out-of-home placement, where the program evaluation reported measures of both outcomes. However, in our cost-benefit analysis, only one of these effects is monetized due to the sizeable overlap between the economic benefits of the two outcomes.

(2) At this time, we are unable to "monetize" the outcomes of permanent placement, placement stability, and contraceptive use for our cost-benefit analysis. However, the meta-analytic estimates are provided here to give additional context to our study.

(3) In this evaluation, "out-of-home placements" were measured by the proportion of children who did not re-enter care after one year.

(4) Due to some new evaluations of the "Family Team Decision Making" or "Family Group Decision Making" process, we have separated these programs from the standard "Family Group Conferences" heading. Family Group Conferences are unique in that they encourage a child's family group to create an action plan in a conference that does not include a child welfare professional. Team/Group Decision Making models include a child welfare participant or facilitator to help guide the family groups in the development of their action plan.

(5) This effect size is calculated for one study. In this evaluation of family group decision making, all of the participating children were already placed out of home. This is not always the case for these programs.

(6) This category includes programs sometimes referred to as "Wraparound" or "Systems of Care"; in our estimation, the common features among these programs are intensive case management and coordination of services.

(7) For this program, estimates of effects on "permanent placement" were calculated using a measure of "positive exits" from out-of-home care. As defined by the study authors, positive exits reflected adoptions, reunification with a biological parent, or placement with a relative.

(8) The rigorous evaluation of Triple-P we reviewed for this study was implemented on a different level of observation (at the whole-county level as opposed to individual children or families) than the other studies in this review. Outcomes were also measured at the county, rather than the individual level. Due to the different level of observation, and after consulting with a leading expert in meta-analysis, we concluded that, at this point in time, there is no scientific consensus on how to put county-level studies onto the same scale as studies that measure outcomes for individuals. That is, leading analysts who undertake systematic reviews are not yet clear on reasonable procedures to compare the magnitude of the effects of programs measured at these different levels of observation. Therefore, because we cannot yet calculate an effect size for Triple-P that would be comparable to the other effect sizes in this review, we have not provided an effect size statistic for that program in the present review. When methodologists propose solutions, we will incorporate the Triple-P results in subsequent reviews.

(9) In earlier work by the Institute, our meta-analysis indicated that the Nurse Family Partnership program significantly reduced mothers' involvement in crime. This finding was based on a single study of mothers in New York. Since our last published meta-analysis, new evaluation outcomes were reported for this program showing no program effect on mothers' crime for a sample of women in Memphis. Including this additional study in our analysis led to a new, non-significant effect size estimate for the effect of Nurse Family Partnership on mothers' crime.

(10) In these studies, disordered illicit drug use was measured by self-reported behavioral problems (e.g., traffic tickets, missed work) due to substance use.

(11) In our 2004 prevention report, we found this effect size to be statistically significant, and this finding contributed greatly to our estimate that home visiting resulted in long-term benefits that outweighed program costs. Upon exploration, we found that we had incorrectly coded the findings of one of the key studies for children's test scores. After correcting this error, the effect size for test scores is no longer statistically significant.

(12) Earlier work by Miller (2006)[a] described the qualitative differences among "Family Preservation" programs. Most importantly, Miller identified a number of evaluations of intensive family preservation programs that strictly adhered to the Homebuilders® model[b], and separated them from more vaguely defined programs of family preservation. The Institute has further reviewed these programs, and divided the Homebuilders® programs into two categories: one for programs that focus on preventing children from being removed from home, and another for programs that focus on reunifying children who had already been removed from home. In addition, we present the meta-analytic findings for all Homebuilders®-based programs together.

[a] M. Miller. (2006). *Intensive family preservation programs: Program fidelity influences effectiveness—revised*. Olympia: Washington State Institute for Public Policy, Document No. 06-02-3901, available at <http://www.wsipp.wa.gov/rptfiles/06-02-3901.pdf>

[b] The Homebuilders® program was developed by the Institute for Family Development in Federal Way, WA. Key program elements are outlined on the Institute for Family Development website <http://www.institutefamily.org/programs_IFPS.asp>

Exhibit A.2
Citations to the Studies Used in the Meta-Analyses
(Some studies contributed independent effect sizes from more than one location)

Abuse-Focused Cognitive Behavioral Therapy (AF-CBT)

Kolko, D.J. (1996). "Individual cognitive behavioral treatment and family therapy for physically abused children and their offending parents: A comparison of clinical outcomes." Child Maltreatment 1(4), 322-342.

Chicago Child Parent Centers

Reynolds, A. J., & Robertson, D. L. (2003). School-based early intervention and later child maltreatment in the Chicago Longitudinal Study. Child Development, 74(1), 3-26.

Reynolds, A. J., Temple, J. A., Ou, S., Robertson, D. L., Mersky, J. P., Topitzes, J. W., et al. (2007). Effects of a school-based, early childhood intervention on adult health and well-being: A 19-year follow-up of low-income families. Archives of Pediatric and Adolescent Medicine 161(8), 730-739.

Reynolds, A. J., Temple, J. A., Robertson, D. L., & Mann, E. A. (2002). Age 21 cost-benefit analysis of the Title I Chicago child-parent centers. Educational Evaluation and Policy Analysis, 24(4), 267-303.

Dependency (or Family Treatment) Drug Court (California)

Boles, S. M., Young, N. K., Moore, T., DiPirro-Beard, S. (2007). The Sacramento Dependency Drug Court: Development and outcomes. Child Maltreatment, 12(2), 161-171.

Green, B. L., Furrer, C., Worcel, S., Burrus, S., & Finigan, M. W. (2007). How effective are family treatment drug courts? Outcomes from a four-site national study. Child Maltreatment, 12(1), 43-59.

Early Hospital Discharge and Intensive In-Home Follow-Up for Low Birthweight Infants (Pennsylvania)

Brooten, D., Kumar, S., Brown, L. P., Butts, P., Finkler, S. A., Bakewell-Sachs, S., et al. (1986). A randomized clinical trial of early hospital discharge and home follow-up of very-low-birth-weight infants. New England Journal of Medicine, 315(15), 934-939.

Family Assessment Response (Minnesota)

Institute of Applied Research. (2006). Extended follow-up study of Minnesota's family assessment response: Final report. St. Louis, MO: Author.

Family Group Conferences

Berzin, S.C. (2006). Using sibling data to understand the impact of family group decision-making on child welfare outcomes. Children and Youth Services Review, 28, 1449-1458.

Sundell, K., & Vinnerljung, B. (2004). Outcomes of family group conferencing in Sweden: A 3-year follow-up. Child Abuse & Neglect, 28, 267-287.

Family Group Decision Making (California)

Berzin, S.C. (2006). Using sibling data to understand the impact of family group decision-making on child welfare outcomes. Children and Youth Services Review, 28, 1449-1458.

Family Therapy

Kolko, D.J. (1996) "Individual cognitive behavioral treatment and family therapy for physically abused children and their offending parents: A comparison of clinical outcomes." Child Maltreatment 1(4), 322-342.

Family to Family (New Mexico)

Usher, L. (1998). Evaluation of Family to Family. Baltimore, MD: The Annie E. Casey Foundation.

Flexible Funding (Title IV-E Waivers in Oregon and North Carolina)

Lehman, C., Liang, S., & O'Dell, K. (2005). Impact of flexible funds on placement and permanency outcomes for children in child welfare. Research on Social Work Practice, 15(5), 381-388.

Usher, C. L., Wildfire, J. B., Duncan, D. F., Meier, A., Brown, E. L., Salmon, M. A. (2002). Evaluation of North Carolina's Title IV-E Waiver Demonstration. Chapel Hill: University of North Carolina, School of Social Work, Jordan Institute for Families.

Healthy Families America

Caldera, D., Burrell, L., Rodriguez, K., Crowne, S.S., Rohde, C., & Duggan, A. (2007). Impact of a statewide home visiting program on parenting and on child health and development. Child Abuse & Neglect 31(8), 829-852.

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Duggan, A. K., McFarlane, E. C., Windham, A. M., Rohde, C. A., Salkever, D. S., Fuddy, L., et al. (1999). Evaluation of Hawaii's Healthy Start Program. The Future of Children, 9(1), 66-90.

DuMont, K., Mitchell-Herzfeld, S., Greene, R., Lee, E., Lowenfels, A. & Rodriguez, M. (2006, June). Healthy Families New York (HFNY) randomized trial: Impacts on parenting after the first two years (Working Paper No. 1). Rensselear, NY: New York State, Office of Children & Family Services.

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Landsverk, J., Carrilio, T., Connelly, C. D., Ganger, W. C., Slymen, D. J., Newton, R. R., et al. (2002). Healthy Families San Diego clinical trial: Technical report. San Diego, CA: Child and Adolescent Services Research Center, San Diego Children's Hospital and Health Center.

Intensive Case Management for Emotionally Disturbed and/or Maltreated Youth

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Clark, H. B., Prange, M. E., Lee, B., Stewart, E. S., McDonald, B. B., & Boyd, L. A. (1998). An individualized wraparound process for children in foster care with emotional/behavioral disturbances: Follow-up findings and implications from a controlled study. In M. H. Epstein, K. Kutash, & A. Duchnowski (Eds.), Outcomes for children and youth with emotional and behavioral disorders and their families: Programs and evaluation best practices (pp. 513-542). Austin, TX: Pro-Ed.

Swenson, C. C., Randall, J., Henggeler, S. W., & Ward, D. (2000). The outcomes and costs of an interagency partnership to serve maltreated children in state custody. Children's Services, 3(4), 191-209.

Exhibit A.2 (continued)
Citations to the Studies Used in the Meta-Analyses
(Some studies contributed independent effect sizes from more than one location)

All Intensive Family Preservation Service Programs (Homebuilders® model)

Blythe, B., & Jayaratne, S. (2002, March 22). Michigan families first effectiveness study. Retrieved December 5, 2003, from http://www.michigan.gov/printerFriendly/0,1687,7-124--21887--,00.html

Feldman, L. H. (1991). Assessing the effectiveness of family preservation services in New Jersey within an ecological context. Trenton, NJ: Department of Human Services, Division of Youth and Family Services, Bureau of Research, Evaluation and Quality Assurance.

Fraser, M. W., Walton, E., Lewis, R. E., Pecora, P. J., & Walton, W. K. (1996). An experiment in family reunification: Correlates of outcomes at one-year follow-up. Children and Youth Services Review, 18(4/5), 335-361.

Mitchell, C., Tovar, P., & Knitzer, J. (1989). The Bronx Homebuilders Program: An evaluation of the first 45 families. New York: Bank Street College of Education.

Walters, B. (2006). Evaluating the efficacy of Michigan's Families First program. Unpublished doctoral dissertation, Boston College.

Walton, E. (1998). In-home family-focused reunification: A six-year follow-up of a successful experiment. Social Work Research, 22(4), 205-214.

Intensive Family Preservation Services for Increased Reunification (Homebuilders® model)

Fraser, M. W., Walton, E., Lewis, R. E., Pecora, P. J., & Walton, W. K. (1996). An experiment in family reunification: Correlates of outcomes at one-year follow-up. Children and Youth Services Review, 18(4/5), 335-361.

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Intensive Family Preservation Services for Out of Home Placement Prevention (Homebuilders® model)

Blythe, B., & Jayaratne, S. (2002, March 22). Michigan families first effectiveness study. Retrieved December 5, 2003, from http://www.michigan.gov/printerFriendly/0,1687,7-124--21887--,00.html

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Other Family Preservation Services (non-Homebuilders®)

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Other Family Preservation Services (non-Homebuilders®) (continued)

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Iowa Family Development and Self Sufficiency Program

Layzer, J. I., Goodson, B. D., Creps, C., Werner, A., & Bernstein, L. (2001). National evaluation of family support programs: Volume B: Research studies. Cambridge, MA: Abt Associates.

LEARN (Local Efforts to Address and Reduce Neglect)

Berrick, J. D., & Duerr, M. (1997). Preventing child neglect: A study of an in-home program for children and families. In J. D. Berrick, R. P. Barth, & N. Gilbert (Eds.), Child welfare research review, volume 2 (pp 63-83). New York: Columbia University Press.

Multi-Systemic Therapy (Hawaii)

Rowland, M. D., Halliday-Boykins, C. A., Henggeler, S. W., Cunningham, P. B., Lee, T. G., Kruesi, M. J. P., et al. (2005). A randomized trial of multisystemic therapy with Hawaii's Felix Class youths. Journal of Emotional and Behavioral Disorders, 13(1), 13-23.

Nurse Family Partnership for Low-Income Mothers

Olds, D. L. (2008, April 23). No title. Electronic mail message.

Olds, D. L., Eckenrode, J., Henderson, C. R., Jr, Kitzman, H., Powers, J., Cole, R., et al. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect. Journal of the American Medical Association, 278(8), 637-643.

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Other Home Visiting Programs for At-risk Mothers and Children

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Barth, R. P., Hacking, S., & Ash, J. R. (1988). Preventing child abuse: An experimental evaluation of the child parent enrichment project. Journal of Primary Prevention, 8(4), 201-217.

Black, M. M., Nair, P., Kight, C., Wachtel, R., Roby, P., & Schuler, M. (1994). Parenting and early development among children of drug-abusing women: Effects of home intervention. Pediatrics, 94(4), 440-448.

Exhibit A.2 (continued)
Citations to the Studies Used in the Meta-Analyses
(Some studies contributed independent effect sizes from more than one location)

Other Home Visiting Programs for At-risk Mothers and Children (continued)

Brayden, R. M., Altemeier, W. A., Dietrich, M. S., Tucker, D. D., Christensen, M. J., McLaughlin, F. J. et al. (1993). A prospective study of secondary prevention of child maltreatment. Journal of Pediatrics, 122, 511-516.

Caruso, G. L. (1989). Optimum Growth Project: Support for families with young children. Prevention in Human Services, 6, 123-139.

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Gray, J. D., Cutler, C. A., Dean, J. G., & Kempe, C. H. (1979). Prediction and prevention of child abuse and neglect. Journal of Social Issues, 35, 127-139.

Hardy, J. B., & Streett, R. (1989). Family support and parenting education in the home: An effective extension of clinic-based preventive health care services for poor children. Journal of Pediatrics, 115, 927-931.

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Quinlivan, J. A., Box, H., & Evans, S. F. (2003). Postnatal home visits in teenage mothers: A randomized controlled trial. The Lancet, 361, 893-900.

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Velasquez, J., Christensen, M., & Schommer, B. (1984). Part II: Intensive services help prevent child abuse. American Journal of Maternity and Child Nursing, 9, 113-117.

Parent-Child Interaction Therapy (Oklahoma)

Chaffin, M., Silovsky, J. F., Funderburk, B., Valle, L. A., Brestan, E. V., Balachova, T., et al. (2004). Parent-child interaction therapy with physically abusive parents: Efficacy for reducing future abuse reports. Journal of Consulting and Clinical Psychology, 2(3), 500-510.

Parents as Teachers

Pfannenstiel, J. C., & Seltzer, D. A. (1989). New parents as teachers: Evaluation of an early parent education program. Early Childhood Research Quarterly, 4(1), 1-18.

Wagner, M., Cameto, R., & Gerlach-Downie, S. (1996). Intervention in support of adolescent parents and their children: A final report on the Teen Parents as Teachers Demonstration. Menlo Park, CA: SRI International.

Wagner, M. M., & Clayton, S. L. (1999). The Parents as Teachers Program: Results from two demonstrations. The Future of Children, 9(1), 91-115.

Wagner, M., Spiker, D., Hernandez, F., Song, J., & Gerlach-Downie, S. (2001). Multisite parents as teachers evaluation: Experiences and outcomes for children and families (SRI Project P07283). Menlo Park, CA: SRI International.

Project KEEP (San Diego)

Price, J. M., Chamberlain, P., Landsverk, J., Reid, J., Leve, L., & Laurent, H. (2008). Effects of a foster parent training intervention on placement changes of children in foster care. Child Maltreatment, 13(1), 64-75.

SAFE Homes (Connecticut)

DeSena, A. D., Murphy, R. A., Douglas-Palumberi, H., Blau, G., Kelly, B., Horwitz, S. M., et al. (2005). SAFE Homes: Is it worth the cost? An evaluation of a group home permanency planning program for children who first enter out-of-home care. Child Abuse & Neglect, 29, 627-643.

Structured Decision Making (Michigan)

Johnson, K., & Wagner, D. (2005). Evaluation of Michigan's foster care case management system. Research on Social Work Practice, 15(5), 372-380.

Subsidized Guardianship (Illinois)

Testa, M. F. (2002). Subsidized guardianship: Testing an idea whose time has finally come. Social Work Research, 26(3), 145-158.

The Family Connections Project (Canada)

MacMillan, H. L., Thomas, B. H., Jamieson, E., Walsh, C. A., Boyle, M. H., Shannon, H. S., et al. (2005). Effectiveness of home visitation by public-health nurses in prevention of the recurrence of child physical abuse and neglect: A randomised controlled trial. The Lancet, 365: 1786-1793.

Triple-P (South Carolina)

Prinz, R. J., Sanders, M. R., Shapiro, C. J., Whitaker, D. J., Lutzker, J. R. (2008). Population-based prevention of child maltreatment: The U.S. Triple P system population trial. Prevention Science. Article in press.

Appendix B: Methods and Parameters to Model the Benefits and Costs of Evidence-Based Programs and Policies

To estimate the benefits and costs of programs and policies that aim to reduce the likelihood of children entering or remaining in the child welfare system, we employed an economic model that we have developed for previous assignments from the legislature. Appendix B describes the technical structure of the model as well as the data used with the model to produce the estimates for this study.

B1. General Model Parameters

The model uses a number of parameters pertinent to the costs and benefits estimated in this study. Exhibit B.1 lists some of these parameters.

The discount rate used in this study is shown on line 1 of Exhibit B.1.[50] The rate is the 3 percent real discount rate used by the Congressional Budget Office in a variety of analyses including its projections of the long-term financial position of Social Security.[51] Alternative discount rates can be entered into the model to test overall sensitivity of results.

Key parameters in our analysis are the level of earnings and the long-term expected rate of real (inflation-adjusted) growth in earnings. The level of earnings by age is taken from cross-sectional data from the 2007 Annual Social and Economic Supplement to the Current Population Survey (CPS), with data on earnings during 2006. The earnings are those for people with education levels between 9th grade through some college. The number of non-earners is included in the estimates so that the average earning level reflects earnings of all people at each age (earners and non-earners).[52]

Line 2 of Exhibit B.1 shows the long-run expected growth rate in real earnings. The estimate for the medium case is taken from the Congressional Budget Office (CBO) analysis of long-run Social Security.[53] We included the higher rate of growth and the lower rate of growth in our sensitivity analyses, described below.

Line 3 of Exhibit B.1 shows an estimate for the average fringe benefit rate for earnings. This estimate is from the Employment Cost Index as computed by the United States Bureau of Labor Statistics.[54] Line 4 shows the average tax rate applied to earnings.[55]

Line 5 of Exhibit B.1 indicates the year chosen for the overall analysis. All costs are converted to this year's dollars with an inflation index. The inflation index is taken from the Washington State Economic and Revenue Forecast Council, the official forecasting agency for Washington State government. The index is the chain-weight implicit price deflator for personal consumption expenditures.[56]

Exhibit B.1
The Benefits and Costs of Evidence-Based Programs: Model Parameters

Parameter	Distribution Type (@RISK)	Parameter		
		High	Medium	Low
1. Real Discount Rate	n/a	-	0.030	-
2. Real annual rate of growth in earnings	Triangular	0.023	0.013	0.003
3. Fringe benefit multiple for earnings	n/a	-	1.435	-
4. Tax rate for earnings	n/a	-	0.308	-
5. Year of dollars for the analysis	n/a	-	2007	-
6. Year of dollars for the Current Population Survey used in the study	n/a	-	2006	-
7. Real cost of capital (used in the crime sub-model)	n/a	-	0.025	-
8. Base rate (lifetime prevalence) for child abuse and neglect	Triangular	0.189	0.126	0.063
9. Odds ratio for low-income child abuse and neglect prevalence rate	Triangular	1.088	2.175	3.263
10. High school graduation causation coefficient	Triangular	1.000	0.750	0.500
11. Annual return on earnings for a one SD increase in test scores	Triangular	0.160	0.120	0.080
12. Child abuse and neglect: public costs for child welfare per case (2006 $)	Triangular	$6,478	$5,182	$3,887
13. Child abuse and neglect: victim and private mental health costs per case (1993 $)	Triangular	$29,873	$23,899	$17,923
14. Child abuse and neglect: public mental health costs per case (1993 $)	Triangular	$1,188	$951	$713

[50] For a general discussion of discount rates for applied public benefit-cost analyses, see: C. Bazelon, and K. Smetters. (1999). Discounting inside the Washington D.C. Beltway. *Journal of Economic Perspectives, 13*(4): 213-28. See also: H. Kohyama. (2006). *Selecting discount rates for budgetary purposes, Briefing Paper No. 29.* <http://www.law.harvard.edu/faculty/hjackson/DiscountRates_29.pdf>

[51] See Congressional Budget Office report: <http://www.cbo.gov/ftpdocs/ 72xx/doc7289/06-14-LongTermProjections.pdf>

[52] Current Population Survey data downloaded from the US Census Bureau site: <http://pubdb3.census.gov/macro/032007/perinc/new04_000.htm>

[53] See Congressional Budget Office data for the June 2006 report, Table W-5, at: <http://www.cbo.gov/ftpdocs/72xx/doc7289/06-14-SupplementalData.xls>

[54] United State Bureau of Labor Statistics, Employment Cost Index, June 11, 2008 release: <http://www.bls.gov/news.release/ecec.toc.htm>

[55] Tax Foundation Special Report, April 2008, Table 1, page 4: <http://www.taxfoundation.org/files/sr160.pdf>

[56] Washington State Economic and Revenue Forecast Council: <http://www.erfc.wa.gov/pubs/nov07.pub.pdf, Table A1.1, p. 82>

B.2 Valuation of Child Welfare Outcomes

The Institute's benefit-cost model includes estimates for the value of reducing a substantiated child abuse and neglect (CAN) case, and the value of reducing the placement of a child out-of-home. The benefits are derived by calculating the costs that are incurred with the incidence of a child abuse and neglect or placement case. CAN costs are a function of three principal components: the expected value of public costs associated with a substantiated CAN case; an estimate of the medical, mental health, and quality of life costs associated with the victim of CAN; and other long-term costs that are causally linked to the incidence of CAN. Each of these is discussed.

B.2.a Public Costs of a CAN Case. The public costs incurred as a result of a substantiated CAN case are estimated by modeling the child welfare system in Washington State. The expected present value cost of a youth for whom a child protective service case is accepted for investigation is a function of the expected number of public services that case will use, times the cost of each of these services. These services are modeled to include the investigative services of the child protective service agency, as well as involvement by police and the juvenile court for dependency cases. Some of the accepted and investigated child protective service cases, in turn, can be expected to use child welfare services including foster care, adoption support services, as well as additional involvement of the juvenile court for termination proceedings.

We model this process with case flow, probability, and cost data for 2006 and 2007 to estimate the total public cost of an accepted child abuse and neglect case in Washington. In the accompanying box, equation (B.2a) describes the process used to estimate the present value of the expected public costs of processing a child abuse and neglect case, *CANPUB*, as of the average age of a youth with an accepted case, *canage*. This value is converted to the base year dollars used in the overall benefit-cost analysis, IPD_{base}, relative to the year in which the *CANPUB* dollars are denominated, IPD_{canpub}. This value is then discounted to the age of the youth receiving a program, *progage*, at the rate of discount used in the analysis, *Dis*.

The parameter $CANPUB_{canage}$ for Washington State is estimated with data and procedures described in Table B.2. As shown in that table, costs that are expected to occur over several years are already estimated in present value terms as of the age of the youth who enters the child welfare system, *canage*.

B.2.b Medical, Mental Health, and Quality of Life Costs. Two other types of CAN costs are estimated in the model. The life-cycle per unit costs to the victims of child abuse and neglect are obtained from national cost estimates published by Miller, Fisher, and Cohen (2001).[57] The modeling of these two cost categories follows the same approach as described for equation (B.2a). In equations (B.2b) and (B.2c), the parameters $CANMedMH_{canage}$ and $CANQual_{canage}$ are estimated with data and procedures described in Table B.1.

B.2.c Public Costs of an Out-of-Home Placement. For programs that focus on preventing out-of-home placement for children who are considered at imminent risk of placement (e.g., they would be placed if they did not participate in the program), we do not estimate the benefit of preventing a case of CAN; rather, we focus strictly on the prevention of an out-of home placement. The calculation is shown on Table B.1; the estimate is the expected present value cost of an out-of-home placement, conditional on the occurrence of an out-of-home placement.

Exhibit B.2
Equations Used to Calculate the Present-Valued Costs of Child Abuse and Neglect Outcomes

(B.2a) $$PVCANPUB_{progage} = \frac{CANPUB_{canage} \times \frac{IPD_{base}}{IPD_{canpub}}}{(1+Dis)^{canage-progage}}$$

(B.2b) $$PVCANMedMH_{progage} = \frac{CANMedMH_{canage} \times \frac{IPD_{base}}{IPD_{canmedMH}}}{(1+Dis)^{canage-progage}}$$

(B.2c) $$PVCANQual_{progage} = \frac{CANQual_{canage} \times \frac{IPD_{base}}{IPD_{canmedMH}}}{(1+Dis)^{canage-progage}}$$

$CANPUB_{canage}$	=	The expected public costs of processing a CAN case, present valued to the age of the youth who enters the system (see Table B.1).
progage	=	The age of the youth who is the focus of the program under consideration.
$CANMedMH_{canage}$	=	The expected medical and mental health costs to the victim of a CAN case, present valued to the age of the youth who is victimized (see Table B.2).
$CANQual_{canage}$	=	The expected quality of life costs to the victim of a CAN case, present valued to the age of the youth who is victimized (see Table B.2).
IPD	=	The implicit price deflator to adjust the year in which the costs are estimated into the base year chosen for the analysis.
Dis	=	The real discount rate.

[57] T. R. Miller, D. A. Fisher, and M. A. Cohen. (2001) "Costs of Juvenile Violence: Policy Implications" *Pediatrics* 107(1): E3.

Table B.1
The Estimated Average Public Cost of a Child Protective Service Case Accepted for Investigation, State of Washington, Fiscal Year 2006

	Number of Children	Probability of Receiving This Service	Per Unit Costs in 2006 Dollars	Number and Type of Cost Units	Expected Cost per Accepted Case (2)*(3)*(4)
	(1)	(2)	(3)	(4)	(5)
Child Protective Services (CPS)					
Referrals (children) Accepted for Investigation	43,100				
Cases Handled by Alternative Response System	3,552	8.2%	$567	1 case	$47
CPS Investigations	39,548	91.8%	$567	1 case	$520
Police Involvement	6,810	15.8%	$322	1 case	$51
Juvenile Court Dependency Case Involvement	4,276	9.9%	$385	8.6 hearings	$328
Child Welfare Services					
Percent of protective custody placements that are CPS cases	75%				
Protective Custody (Foster Care)	7,900	18.3%	$36.80	524.7 days	$3,539
Adoption Support Services	811	1.9%	$77,999	1 case	$1,467
Juvenile Court Termination Case Involvement	1,843	4.3%	$770	3.2 hearings	$105
TOTAL: Expected present value cost of an accepted CPS case					**$5,183**
Addendum: Expected present value cost of an out-of-home placement, conditional on an out-of-home placement					**$27,887**

Table B.2
Medical, Mental Health, and Quality of Life Costs per Victim of Child Abuse and Neglect 1993 Dollars

	Medical and Mental Health Costs[1]	Quality of Life Costs[1]	Number of Victims[3]
	(1)	(2)	(3)
Type of Child Abuse and Neglect			
Sexual abuse	$6,327[2]	$94,506[2]	114,000
Physical abuse	$3,472[2]	$58,645[2]	308,000
Mental abuse	$2,683[2]	$21,099[2]	301,000
Serious physical neglect	$911[2]	$7,903[2]	1,236,000
Total	$1,901[4]	$22,948[4]	1,959,000
Distribution of Costs by Payer			
Percent incurred by taxpayer	50%[5]	0%[5]	
Percent incurred by victim	50%[5]	100%[5]	
Amount paid by taxpayer	**$951**	**$0**	
Amount paid by victim	**$951**	**$22,948**	

Sources
1. The source of the cost elements in this table is T. R. Miller, D. A. Fisher, and M. A. Cohen. (2001) "Costs of Juvenile Violence: Policy Implications." *Pediatrics* 107(1): E3.
2. *Ibid*., Table 1. We've assumed 80 percent urban and 20 percent rural costs on the Miller et al. Table 1.
3. The source for the total U.S. number of victims: T. R. Miller, M. A. Cohen, and B. Wiersema. (1996). *Victim costs and consequences: A new look*. Research report, Table 1. Washington, DC: National Institute of Justice.
4. These totals are weighted average sums using the victim numbers in column (3).
5. Institute assumptions.

B.2.c Other Outcomes Linked to Child Abuse and Neglect or Out-of-Home Placement. When a program affects the number of substantiated child abuse and neglect (CAN) cases, there can be directly and indirectly measured monetary results. As described in the previous two sections, the direct result of a reduction in CAN will be reduced public spending by those agencies that process CAN cases and a reduction in CAN victimization costs, as well. In addition to these direct benefits, however, a reduction in CAN can also be expected to have an indirect causal linkage to several other outcomes monetized in this benefit-cost analysis. For example, there is credible research showing a causal link between the incidence of CAN and subsequent criminality of the victimized youth when he or she is older. Thus, when a prevention program is able to demonstrate an effect on the rate of child abuse and neglect, it is important to measure both the direct and indirect benefits that can be expected as a result.

Table B.3 shows the linkages where we believe there is sufficient evidence to establish a causal relationship between a directly measured CAN outcome and another of the outcomes we monetize in this study. These relationships are expressed as effect sizes using the meta-analytic techniques we describe in Appendix A.

Table B.3
Meta-Analytic Estimates of Standardized Mean Difference Effect Sizes

Estimated Causal Links Between a Program Outcome and Other Outcomes	Number of Effect Sizes Included in the Analysis	*Results Before Adjusting Effect Sizes*					***Adjusted Effect Size Used in the Benefit-Cost Analysis***
		Fixed Effects Model			Random Effects Model		
		Weighted Mean Effect Size & p-value		Homogeneity Test	Weighted Mean Effect Size & p-value		
		ES	p-value	p-value	ES	p-value	ES
Child Abuse and Neglect, and its longitudinal effect on:							
Crime	10	0.400	.00	0.000	0.380	.00	0.205
High School Graduation	3	-0.475	.00	0.011	-0.492	.00	-0.215
K–12 Grade Repetition	2	0.461	.00	0.826	na	na	0.231
Teen Births/Pregnancy-Mothers(under age 18)	4	0.094	.09	0.296	na	na	0.044
Test Scores	7	-0.278	.00	0.057	na	na	-0.109
Illicit Drugs (disordered use)	4	0.225	.00	0.107	na	na	0.113
Alcohol (disordered use)	4	0.254	.00	0.000	0.213	.03	0.107

Studies Included in the Meta-Analytic Review of Outcomes

Study Author (Date)	Study Used to Assess This Outcome
Currie & Tekin, 2006	Crime
English et al., 2002	Crime
Fergusson and Lynskey, 1997	Crime
Lansford et al., 2007	Crime
Maxfield and Widom, 1996	Crime
Mersky & Reynolds, 2007	Crime
Stouthamer-Loeber et al., 2001	Crime
Stouthamer-Loeber et al., 2002	Crime
Thornberry et al., 2001	Crime
Zingraff et al., 1993	Crime
Lansford et al., 2007	High School Graduation
McGloin and Widom, 2001	High School Graduation
Thornberry et al., 2001	High School Graduation
Boden et al., 2008	Test Scores
Eckenrode et al., 1993	Test Scores
Fantuzzo & Perlman, 2007	Test Scores
Kurtz et al., 1993	Test Scores
Lansford et al., 2002	Test Scores
Slade & Wissow, 2007	Test Scores
Zolotor et al., 1999	Test Scores
Eckenrode et al., 1993	K–12 Grade Repetition
Perez and Widom, 1994	K–12 Grade Repetition
Lansford et al., 2007	Teen Births/Pregnancy-Mothers(under age 18)
Roosa et al., 1997	Teen Births/Pregnancy-Mothers(under age 18)
Thornberry et al., 2001	Teen Births/Pregnancy-Mothers(under age 18)
Widom and Kuhns, 1996	Teen Births/Pregnancy-Mothers(under age 18)
Fergusson and Lynskey, 1997	Alcohol (disordered use)
MacMillan et al., 2001	Alcohol (disordered use)
Thornberry et al., 2001	Alcohol (disordered use)
Widom et al., 2007	Alcohol (disordered use)
Fergusson and Lynskey, 1997	Illicit Drugs (disordered use)
MacMillan et al., 2001	Illicit Drugs (disordered use)
McGloin and Widom, 2001	Illicit Drugs (disordered use)
Thornberry et al., 2001	Illicit Drugs (disordered use)

Table B.3 provides a summary of the findings from these meta-analyses, along with citations to the studies we used to study the relationships. The table reports the number of effects included in each meta-analysis, the weighted mean effect size and its significance level, the significance of the Q-test for homogeneity where appropriate, and the results of a random effects weighted mean effect size and its significance level, also where appropriate.

The last column of Table B.3 shows the mean effect size after we make adjustments for the quality of the research design and other adjustment factors as described in Appendix A. These adjusted effect sizes are the estimates we use in the benefit-cost analysis to model the relationships between a CAN case and the other outcomes.

We found statistically significant relationships between the incidence of child abuse and neglect and seven subsequent outcomes of the children who were abused:

- Crime
- High School Graduation
- K–12 Grade Repetition
- K–12 Test Scores
- Teenage Pregnancy/Birth
- Alcohol Use
- Illicit Drug Use

As indicated in Table B.3, the effect sizes for some of these relationships are fairly small, but even small effect sizes can have economic significance for some types of outcomes.

We also found statistically significant relationships between the incidence of out-of-home placement and two subsequent outcomes of the children who were abused (see Table B.4):

- Crime
- High School Graduation

These effect sizes are used in the benefit-cost model to estimate the long-range economic effects on other outcomes caused by changes in CAN cases. The procedures used to monetize each of these effects are described in the separate sections of Appendix B.

An example illustrates the process used to calculate these economic values. Suppose that a rigorous evaluation of a prevention program finds the program has a mean difference effect size of -.15 on the incidence of child abuse and neglect. Further, suppose that the lifetime prevalence of child abuse and neglect among the target population for the program is 13.7 percent. Then we can solve for the change in the percent of lifetime CAN prevalence associated with the program.

$$\Delta P_{can} = P_{can} - ((e^{(EScanprog*1.65)} * P_{can}) / (1 - P_{can} + (P_{can} * e^{(EScanprog*1.65)}))$$

In the example, the change in the probability of CAN is:

$$.027 = .137 - ((e^{(-.15*1.65)} * .137) / (1 - .137 + (.137 * e^{(-.15*1.65)}))$$

Next, we observe from Table B.3 that the effect size of CAN on the probability of high school graduation is -.215. Given a base high school graduation rate of, say, 70 percent, the following equation solves for the change in the high school graduation percent given CAN.

$$\Delta P_{can} = P_{hsgrad} - ((e^{(EShsgrad|can*1.65)} * P_{hsgrad}) / (1 - P_{hsgrad} + (P_{hsgrad} * e^{(EShsgrad|can*1.65)}))$$

$$.079 = .70 - ((e^{(-.215*1.65)} * .70) / (1 - .70 + (.70 * e^{(-.215*1.65)}))$$

Multiplying these two values together, and then multiplying by the present value of lifetime earnings associated with high school graduation (for this example, we assume the present value is $175,000) produces the monetized benefit of the program on high school graduation.

$$Benefit_{hsgrad|prog} = \Delta Pcan \times \Delta P_{hsgrad} \times ValueHSGRAD$$

$$\$373 = .027 \times .079 \times \$175{,}000$$

Table B.4
Meta-Analytic Estimates of Standardized Mean Difference Effect Sizes

Estimated Causal Links Between a Program Outcome and Other Outcomes	Number of Effect Sizes Included in the Analysis	*Results Before Adjusting Effect Sizes*					***Adjusted Effect Size Used in the Benefit-Cost Analysis***
		Fixed Effects Model			Random Effects Model		
		Weighted Mean Effect Size & p-value		Homogeneity Test	Weighted Mean Effect Size & p-value		
		ES	p-value	p-value	ES	p-value	ES
Out-of-Home Placement, and its longitudinal effect on:							
Crime	1	0.419	.00	na	na	na	0.209
High School Graduation	1	-0.509	.00	na	na	na	-0.255
Studies Included in the Meta-Analytic Review of Outcomes							
Study Author (Date)		**Study Used to Assess This Outcome**					
Ryan & Testa, 2005		High School Graduation					
Burley & Halpern, 2001		High School Graduation					

B.2.d Lifetime Prevalence of Child Abuse and Neglect. The benefit-cost model requires an estimate of the lifetime probability of being a victim of child abuse or neglect. We calculate an estimate using two approaches. First, we gathered other research studies that have examined this question with longitudinal cohort data. Table B.5 summarizes these estimates. The studies measured child abuse and neglect with different definitions, for different populations, and at different times. Ignoring these variations, a simple weighted average of the studies produces an estimate of 10.6 percent lifetime prevalence of child abuse.

To test the reasonableness of this estimate, we use a second approach to estimate the lifetime prevalence. First, we calculate the one-year prevalence of new substantiated CAN cases reported to child welfare agencies. An estimate for this rate is .0106 for 2006.[58] This is the annual rate for children for all ages. In any given year, some of these cases are repeat cases from previous maltreatment episodes. We estimate this number, using national data for "first time victims," to be 25.3 percent.[59]

Using these two parameters to calculate the annual probability of a new substantiated child abuse or neglect case for a child from age one to age 18, the implied lifetime prevalence rate of child abuse or neglect for the general population of children is estimated to be 12.6 percent—a rate similar to the rate estimated from other studies, as shown in Table B.5.

Some of the populations that are the focus of prevention and early intervention programs are not the general population but are, instead, populations from higher risk populations, often from groups with lower socio-economic status. For the model, we estimate a parameter for this (an odds ratio to be applied to the lifetime prevalence rate for the general population) by taking a weighted average of the results of five studies that have examined this question with control groups (see Table B.6).

Table B.5
Lifetime Prevalence Estimates of Child Abuse and Neglect

Study	Number in study with abuse	Total number in sample	Percent with Child Abuse or Neglect	Notes
Total	**3,765**	**35,650**	**10.6%**	Weighted average of studies listed
Eckenrode et al., 1993	1,239	8,569	14.5%	General pop, NY, substantiated cases
Stouthamer-Loeber et al., 2001	52	506	10.3%	Inner city pop, Pittsburg, substantiated
Zingraff et al., 1993	10	387	2.6%	School sample, Mecklenburg, NC
Thornberry et al., 2001	213	1,000	21.3%	Rochester, NY, substantiated cases
Reynolds et al., 2003	69	595	11.6%	Chicago higher risk sample, CPS control
MacMillan et al., 1997	1,461	9,953	14.7%	General pop, Ontario, severe, self report
Brown et al., 1998	46	644	7.1%	General pop, non SES
Kelleher et al., 1994	378	11,662	3.2%	5 urban sites
Dodge et al., 1990	46	304	15.1%	General pop, physical abuse
Finkelhor et al., 2003	252	2,030	12.4%	One year rate

Table B.6
Odds Ratios for Child Abuse and Neglect: High Risk Populations

Study	Study n	Odds ratio	High risk population
Total	**53,969**	**2.18**	**(weighted average)**
Lealman et al., 1983	2,802	3.72	Mothers under 20 OR with late prenatal care OR unmarried
Murphey & Braner, 2000	29,291	2.45	Teen mothers OR eligible for medicaid
Kotch et al., 1999	708	1.36	Receiving income support
Hussey et al., 2006	10,262	1.06	Income less than $15,000
Brown, 1998	644	1.44	Low income

[58] Administration on Children, Youth and Families. (2006). *Child Maltreatment 2006,* Table 3-3: 776,758 / 73,393,682 (total substantiated cases divided by total child population). Report available at <http://www.acf.hhs.gov/programs/cb/pubs/cm06/index.htm>
[59] Ibid., Table 3-5: 1 – 74.7% (1 minus the percent of first-time victims).

B3. Valuation of Other Outcomes

There are two ways in which we estimate a program's impact on other outcomes. Some evaluations of child welfare programs directly measure the program's impact on future participation in crime, educational outcomes, and substance abuse. However, if an evaluation doesn't directly measure these outcomes, we can estimate a program's impact on them via the program's impact on child welfare outcomes. First, we use meta-analyses to examine the existing research literature on the linkage between child welfare outcomes and these other outcomes (crime, education, and substance abuse, see Tables B.3 and B.4). Second, if the meta-analyses reveal a statistically significant relationship, we then use the Institute's economic model to estimate the effects of those other outcomes to taxpayers and other people. Then, to the degree that an evidence-based program reduces the incidence of child abuse and neglect or out-of-home placement, the estimated costs of these other outcomes are also reduced via this linkage.

The Institute's model of the costs of crime and substance abuse and the benefits of education has been described in detail elsewhere; the interested reader can find a full description of the formulae used to calculate costs in the earlier reports.[60]

Crime

We value the economic impact of crime on society by estimating the value of decreased levels of crime to taxpayers (who fund the criminal justice system) and crime victims (who suffer pain and suffering costs and out-of-pocket costs when they are victimized). Our estimates include detailed criminal justice system costs, as well as cost estimates for crime victims, some of whom lose their lives. Other victim costs include direct, out-of-pocket, personal or property losses. Psychological consequences also occur to crime victims, including feeling more vulnerable.

Education

Some education outcomes are human capital outcomes: graduation from high school and standardized test scores earned during the K–12 years. Other often-measured educational outcomes relate to higher than average K–12 resources: the use of special education and grade retention in the K–12 years.

Human Capital Outcomes. The model estimates the value of changes in high school graduation rates and achievement test scores during the K–12 years by estimating the expected change in lifetime earnings caused by a change in the human capital measure. Measuring the earnings' implications of these human capital variables is a commonly used approach in economics.[61]

K–12 Resource Outcomes. The model also calculates the value of two other K–12 educational outcomes often measured in certain types of prevention programs: years of special education and grade retention. The costs of these outcomes reflect the average expenditures for a child going through special education classes for a year, or going through regular education classes for an additional year.

Substance Abuse

Finally, for substance abuse outcomes, an estimate is made of monetized benefits tied to reductions in the disordered use of alcohol and illicit drugs. The general approach is to estimate the present value of future costs that can be causally linked to the disordered use of alcohol or illicit drugs. For the United States, the aggregate level of costs associated with alcohol abuse and illicit drug use has been estimated by Harwood (2000), and the Lewin Group (2001) respectively, using a cost-of-illness methodology.[62, 63] Our estimates of the costs of substance abuse include:

- treatment and medical costs;
- lost future earnings due to premature deaths;
- lost labor market productivity due to morbidity; and
- other costs related to motor vehicle crashes, fire destruction, and welfare administration.

Again, a reader interested in the technical calculations for these other values can consult the description in the Technical Appendix to the Institute's 2004 report.

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[60] For a full description of the way we model the costs of crime to society, see S. Aos, M. Miller, and E. Drake. (2006). *Evidence-Based Public Policy Options to Reduce Future Prison Construction, Criminal Justice Costs, and Crime Rates.* Olympia: Washington State Institute for Public Policy.
For descriptions of the way we model the costs of substance abuse and the benefits of education, see S. Aos, R. Lieb, J. Mayfield, M. Miller, and A. Pennucci. (2004). *Benefits and costs of prevention and early intervention programs for youth*. Olympia: Washington State Institute for Public Policy.

[61] See, for example, A. B. Krueger. (2003) "Economic considerations and class size." *The Economic Journal* 113(485): F34-F63., accessed from the author's website: <http://edpro.stanford.edu/eah/eah.htm>; and E. A. Hanushek. (2003, October) "Some Simple Analytics of School Quality," accessed from the author's website: <http://edpro.stanford.edu/eah/eah.htm>.

[62] H. Harwood. (2000) *Updating estimates of the economic costs of alcohol abuse in the United States: Estimates, update methods, and data*. Report prepared by The Lewin Group for the National Institute on Alcohol Abuse and Alcoholism. Based on estimates, analyses, and data reported in H. Harwood, D. Fountain, and G. Livermore. (1998) *The economic costs of alcohol and drug abuse in the United States 1992*. Report prepared for the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Department of Health and Human Services. NIH Publication No. 98-4327 Rockville, MD: National Institutes of Health.

[63] Executive Office of the President, Office of National Drug Control Policy. (2001, September) *The economic costs of drug abuse in the United States 1992-1998.* Washington, DC, available at <http://www.whitehousedrugpolicy.gov/publications/pdf/economic_costs98.pdf>.

Exhibit B.3
Benefits and Costs: Equations Used to Calculate the Net Present Value Of a Portfolio of Evidence-Based Child Welfare Programs

Benefits

(D.4.2a) $$TotBen_p = PVBen_p \times Dimret_p \times \left[\left(WAPop_p \times Eligpct_p\right) - Served_p\right] \times Expansionpct_p$$

(D.4.2b) $$TotCost_p = \left(PVCostT_p - PVCostCon_p\right) \times \left[\left(WAPop_p \times Eligpct_p\right) - Served_p\right] \times Expansionpct$$

(D.4.2c) $$PortfolioNPV = \sum_{p=1}^{P}\left(\frac{TotBen_p - TotCost_p}{YearsInCohort_p} \times YEARS\right)$$

(D.4.2d) $$Dimret_p = A + \frac{K - A}{\left(1 + Qe^{-B\left(\left(5 \times Expansionpct_p - 1\right) - M\right)}\right)^{1/v}}$$

Note: all dollar figures are denominated in the base year chosen for this study.

$TotBen_p$	=	Total prevent value benefits, for all monetized outcomes, for program p.
$PVBen_p$	=	Present value of benefits per program participant, for all monetized outcomes, for program p.
$Dimret_p$	=	A multiplicative factor to account for average diminishing returns at the portfolio expansion percentage, $Expansionpct_p$, for program p. The percentage is modeled with a generalized logistic function.
$WAPop_p$	=	The total population of residents in Washington State in the relevant age group for program p.
$Eligpct_p$	=	The estimated percentage of $WAPop_p$ that is eligible for program p.
$Served_p$	=	The number of people in Washington currently being served by program p.
$Expansionopct_p$	=	The percentage of the eligible unnerved population to be served by program p.
$TotCost_p$	=	Total prevent value cost for program p.
$PVCostT_p$	=	Present value cost of treatment program p.
$PVCostCon_p$	=	Present value cost of the control group for program p.
$YearsInCohort_p$	=	The number of single age groups (years) in the cohort of Washington residents for program p, $WAPop_p$.
YEARS	=	The number of years of treating successive cohorts with the portfolio of programs.
$PortfolioNPV_p$	=	The total net lifetime benefits of the portfolio of programs after treating successive (*YEARS*) cohorts of children.
A, K, B, v, Q, M	=	Parameters in a Generalized Logistic Function (aka "Richards' curve") representing, respectively: the lower asymptote, the upper asymptote (minus A), the growth rate, affects near which asymptote maximum growth occurs, Q is a function of the *Expansionpct* variable scaled to fit the curve between zero percent diminishing returns and 100 percent diminishing returns, and the time of maximum growth.

B4. Estimating Costs and Benefits for a Portfolio of Programs

Total benefits and costs of a portfolio of programs are estimated for Washington. The procedures to provide the estimates are specified in Exhibit B.3.

In general, the model takes the per participant present value of benefits and costs for a program, and then multiplies by an expanded number of children who could be served by a program. On the benefit side, adjustments are made to account for expected diminishing returns as programs are expanded. These benefits and costs are estimated for an average single age cohort for each program. The estimates are then calculated after assuming that the portfolio would be implemented over a fixed number of years. Finally, the net benefits of each program in the portfolio are summed over the implementation years to provide an estimate of the total benefits to Washington for the group of programs in the portfolio.

To make these estimates, we use information on the current number of children in different age groups in Washington; we obtain this information from Washington's Office of Financial Management. We also obtained information on the eligibility requirements for the particular programs chosen for the portfolio along with the current number of children per year who participate in the programs. This information is combined to provide an estimate of the total number of youth that could be served with the programs. To make the estimates realistic, we then select a relatively small percentage as an estimate of the expansion of the programs (to serve additional youth beyond those already being served. The specific steps of this process are described in Exhibit B.3.

B5: Sensitivity Analysis

The model as described in this Appendix produces a unique result given the set of inputs listed. As we describe, however, there is a significant amount of uncertainty around many of the inputs. For most inputs to the model, we determine the range of uncertainty with the standard errors or standard deviations from relevant statistics of the underlying data for each parameter. For a few other parameters, we hypothesized low and high ranges to place bounds on our estimates of uncertainty.

After we specified ranges of uncertainty on each of the inputs, we then used a simulation approach to determine how sensitive the final result is to these levels of uncertainty. To conduct the simulation, we used Palisade Corporation's *@RISK*® simulation software. Using a Monte Carlo approach

to the simulation, the software randomly draws from the user-designated input variables after a particular type of probability distribution and its parameters have been specified for the input. We ran a Monte Carlo simulation for 10,000 cases. Exhibit B.1 shows input variables along with the specified probability distributions that we used in the simulation.

Exhibit B.4
Citations to Studies Cited in Appendix B

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Appendix C: Program-Specific Estimates of Benefits and Costs

Chicago Child Parent Centers
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient: Program Participants	Non Program Participants As: Taxpayers	Non Program Participants As: Non-Taxpayers	Total
	Benefit and Costs From Different Perspectives			
Crime	$0	$6,282	$10,991	$17,273
High School Graduation	$10,723	$4,773	$2,699	$18,195
Test Scores	$5,913	$2,632	$1,489	$10,034
K–12 Special Education	$0	$168	$0	$168
K–12 Grade Repetition	$0	$216	$0	$216
Child Abuse and Neglect	$2,574	$530	$0	$3,103
Out-of-Home Placements	$1,518	$312	$0	$1,830
Alcohol (disordered use)	$92	$49	$2	$144
Illicit Drugs (disordered use)	$38	$23	$0	$60
Total Benefits*	$13,427	$12,041	$13,692	**$39,160**
Program Costs	$0	-$8,124	$0	**-$8,124**
Net Benefit (NPV)	$13,427	$3,917	$13,692	**$31,036**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$4.82**

* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.

Addendum: Non participant benefits divided by taxpayer costs $3.17

Dependency (Family Treatment) Drug Court (California, Nevada, New York)
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient: Program Participants	Non Program Participants As: Taxpayers	Non Program Participants As: Non-Taxpayers	Total
	Benefit and Costs From Different Perspectives			
Crime	$0	$136	$267	$403
High School Graduation	$704	$313	$177	$1,194
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$0	$1,204	$0	$1,204
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$704	$1,653	$444	**$2,801**
Program Costs	$0	-$3,772	$0	**-$3,772**
Net Benefit (NPV)	$704	-$2,119	$444	**-$970**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$0.74**

* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.

Addendum: Non participant benefits divided by taxpayer costs $0.56

Family Assessment Response (Minnesota)
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$156	$90	$247
High School Graduation	$394	$176	$99	$669
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$422	$87	$0	$509
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$816	$419	$190	**$1,425**
Program Costs	$0	$1,326	$0	**$1,326**
Net Benefit (NPV)	$816	$1,745	$190	**$2,751**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**n/a**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				n/a

Flexible Funding (Title IV-E Waivers in North Carolina and Oregon)
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$103	$59	$162
High School Graduation	$259	$115	$65	$440
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$286	$59	$0	$345
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$545	$277	$125	**$947**
Program Costs	$0	$0	$0	**$0**
Net Benefit (NPV)	$545	$277	$125	**$947**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**n/a**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				n/a

Healthy Families America
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$74	$145	$219
High School Graduation	$291	$130	$73	$494
Test Scores	$138	$62	$35	$235
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$5	$0	$5
Child Abuse and Neglect	$1,341	$276	$0	$1,617
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$47	$25	$1	$72
Illicit Drugs (disordered use)	$19	$11	$0	$30
Total Benefits*	$1,697	$520	$220	**$2,437**
Program Costs	$0	-$4,267	$0	**-$4,267**
Net Benefit (NPV)	$1,697	-$3,747	$220	**-$1,830**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$0.57**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				$0.17

Other Home Visiting Programs for At-Risk Mothers and Children
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$137	$239	$376
High School Graduation	$344	$153	$87	$584
Test Scores	$164	$73	$41	$278
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$5	$0	$5
Child Abuse and Neglect	$1,594	$328	$0	$1,922
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$55	$29	$1	$85
Illicit Drugs (disordered use)	$23	$13	$0	$36
Total Benefits*	$2,016	$666	$327	**$3,009**
Program Costs	$0	-$5,368	$0	**-$5,368**
Net Benefit (NPV)	$2,016	-$4,702	$327	**-$2,359**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$0.56**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				$0.19

Intensive Case Management for Emotionally Disturbed Youth
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient: Program Participants	Non Program Participants As: Taxpayers	Non Program Participants As: Non-Taxpayers	Total
	Benefit and Costs From Different Perspectives			
Crime	$0	$0	$0	$0
High School Graduation	$0	$0	$0	$0
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$0	$0	$0	**$0**
Program Costs	$0	-$2,120	$0	**-$2,120**
Net Benefit (NPV)	$0	-$2,120	$0	**-$2,120**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**n/a**

* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.

Addendum: Non participant benefits divided by taxpayer costs — n/a

Intensive Family Preservation Service Programs (Homebuilders® model)*
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient: Program Participants	Non Program Participants As: Taxpayers	Non Program Participants As: Non-Taxpayers	Total
	Benefit and Costs From Different Perspectives			
Crime	$0	$743	$430	$1,173
High School Graduation	$1,990	$886	$501	$3,376
Test Scores	$163	$72	$41	$276
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$5	$0	$5
Child Abuse and Neglect	$1,168	$240	$0	$1,408
Out-of-Home Placements	$0	$3,210	$0	$3,210
Alcohol (disordered use)	$49	$27	$1	$77
Illicit Drugs (disordered use)	$20	$12	$0	$32
Total Benefits*	$3,227	$4,883	$932	**$7,875**
Program Costs	$0	-$3,099	$0	**-$3,099**
Net Benefit (NPV)	$3,227	$1,784	$932	**$4,775**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$2.54**

* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.

Addendum: Non participant benefits divided by taxpayer costs — $1.88

Other Family Preservation Services (non-Homebuilders)
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$0	$0	$0
High School Graduation	$0	$0	$0	$0
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$0	$0	$0	**$0**
Program Costs	$0	-$2,814	$0	**-$2,814**
Net Benefit (NPV)	$0	-$2,814	$0	**-$2,814**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**n/a**

* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.

Addendum: Non participant benefits divided by taxpayer costs n/a

Iowa Family Development and Self Sufficiency Program
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$0	$0	$0
High School Graduation	$0	$0	$0	$0
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$0	$0	$0	**$0**
Program Costs	$0	$448	$0	**$448**
Net Benefit (NPV)	$0	$448	$0	**$448**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**n/a**

* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.

Addendum: Non participant benefits divided by taxpayer costs n/a

Nurse Family Partnership for Low-Income Families
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient: Benefit and Costs From Different Perspectives — Program Participants	Non Program Participants As: Taxpayers	Non Program Participants As: Non-Taxpayers	Total
Crime	$0	$4,877	$8,533	$13,410
High School Graduation	$672	$299	$169	$1,141
Test Scores	$5,572	$2,480	$1,403	$9,454
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$11	$0	$11
Child Abuse and Neglect	$3,212	$661	$0	$3,873
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$107	$57	$2	$167
Illicit Drugs (disordered use)	$44	$26	$0	$70
Total Benefits*	$8,936	$8,112	$9,938	**$26,986**
Program Costs	$0	-$8,931	$0	**-$8,931**
Net Benefit (NPV)	$8,936	-$819	$9,938	**$18,054**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$3.02**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				$2.02

Parent-Child Interaction Therapy (Oklahoma)
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient: Benefit and Costs From Different Perspectives — Program Participants	Non Program Participants As: Taxpayers	Non Program Participants As: Non-Taxpayers	Total
Crime	$0	$181	$356	$537
High School Graduation	$826	$368	$208	$1,401
Test Scores	$393	$175	$99	$666
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$13	$0	$13
Child Abuse and Neglect	$3,108	$639	$0	$3,747
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$122	$66	$3	$190
Illicit Drugs (disordered use)	$50	$30	$0	$80
Total Benefits*	$4,105	$1,297	$567	**$5,968**
Program Costs	$0	-$1,006	$0	**-$1,006**
Net Benefit (NPV)	$4,105	$291	$567	**$4,962**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$5.93**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				$1.85

Parents as Teachers
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$0	$0	$0
High School Graduation	$0	$0	$0	$0
Test Scores	$3,153	$1,403	$794	$5,350
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$3,153	$1,403	$794	**$5,350**
Program Costs	$0	-$3,841	$0	**-$3,841**
Net Benefit (NPV)	$3,153	-$2,437	$794	**$1,509**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**$1.39**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				$0.57

SAFE Homes (Connecticut)
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$0	$0	$0
High School Graduation	$0	$0	$0	$0
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$0	$0	$0	**$0**
Program Costs	$0	-$5,721	$0	**-$5,721**
Net Benefit (NPV)	$0	-$5,721	$0	**-$5,721**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**n/a**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				n/a

Subsidized Guardianship (Illinois)
— Summary of Estimated Benefits and Costs —

Benefits By Area	Primary Program Recipient			
	Benefit and Costs From Different Perspectives			
	Program Participants	Non Program Participants As:		Total
		Taxpayers	Non-Taxpayers	
Crime	$0	$0	$0	$0
High School Graduation	$0	$0	$0	$0
Test Scores	$0	$0	$0	$0
K–12 Special Education	$0	$0	$0	$0
K–12 Grade Repetition	$0	$0	$0	$0
Child Abuse and Neglect	$0	$0	$0	$0
Out-of-Home Placements	$0	$0	$0	$0
Alcohol (disordered use)	$0	$0	$0	$0
Illicit Drugs (disordered use)	$0	$0	$0	$0
Total Benefits*	$0	$0	$0	**$0**
Program Costs	$0	$4,954	$0	**$4,954**
Net Benefit (NPV)	$0	$4,954	$0	**$4,954**
Total Benefit-to-Cost Ratio (Dollars of Benefits per Dollar of Cost) **=**				**n/a**
* Note: total benefits may not equal the sum of the individual items because only one of the two human capital variables (high school graduation, test scores) is counted, and only one of the child welfare variables (child abuse and neglect, out-of-home placement) is counted.				
Addendum: Non participant benefits divided by taxpayer costs				n/a

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