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A Cost-Savings Analysis of a Statewide Parenting Education Program in Child Welfare

Erin J. Maher [a]
Tyler W. Corwin [b]
Rhenda Hodnett [c]
Karen Faulk [c]

[a] Casey Family Programs, 2001 Eighth Avenue, Suite 2700, Seattle, WA, USA 98121
Author's email: emaher@casey.org
[b] Northwest Social Research Group, 700 Broadway East, Unit 119, Seattle, WA, USA 98102
Author's email: corwin@northwestsocialresearchgroup.com
[c] Louisiana Office of Community Services, Department of Social Services, 627 N. Fourth Street 3-228, Baton Rouge, LA, USA 70802
Author's email: Rhenda.Hodnett@la.gov and Karen.Faulk@la.gov

Correspondence concerning this article should be addressed to Erin J. Maher, Casey Family Programs, 2001 Eighth Avenue, Suite 2700, Seattle, WA, USA 98121. Phone: (206) 378-3317. Fax: (866) 519-3884. Email: emaher@casey.org

Abstract

This article presents a cost-savings analysis of the statewide implementation of an evidence-informed parenting education program. Between the years 2005 and 2008, the state of Louisiana used the Nurturing Parenting Program (NPP) to impart parenting skills to child welfare-involved families. Following these families' outcomes through August 2010, increased program attendance was associated with significant reductions in substantiated incidences and re-reports of child maltreatment (Maher, Marcynyszyn, Corwin, & Hodnett, 2011). Program costs and benefits (cost savings) were calculated using program, workforce, and administrative data. The benefit-cost ratio of 0.87 demonstrates that the NPP approaches cost neutrality in a short time period, without the consideration of long-term benefits or benefits to other systems. A review of current cost analyses in child welfare and a framework for conducting this type of analysis in a child welfare setting are provided.

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Like many fields, child welfare is facing a demand for greater accountability. Funders, policy makers, advocates, program directors, and program participants want interventions with demonstrated effectiveness. Thus, evaluations that assess impact are needed (Wilson & Alexandra, 2005; Partnership to Protect Children and Strengthen Families, 2007). In addition, coupling program costs with effectiveness data to calculate savings is increasingly part of this demand for accountability and serves as a valuable tool for public policy and decision-making (Lee & Aos, 2011). Federal agencies, including the Centers for Disease Control and the Administration for Children and Families Children's Bureau are requiring or including cost analyses in the maltreatment prevention evaluations they fund (Brodowski & Filene, 2009; Corso & Filene, 2009). Yet, in the social work field, and especially child welfare, these analyses remain relatively rare (Mullen & Shuluk, 2010). This article outlines a *cost-savings* approach stemming from a previous evaluation that accounts for the real-world constraints of conducting this type of research, while still providing valuable and valid information for the field and a state child welfare agency. Similar case studies are emerging in child welfare that address the constraints, trade-offs, and challenges of cost analyses in this field (e.g., Boulatoff & Jump, 2007; Brodowski & Filene, 2009; Corso & Filene, 2009).

Definitions of Cost Analyses

After a program has demonstrated effectiveness in producing an outcome of interest, such as reducing child maltreatment, cost analyses are used to describe the program costs in relation to benefits. Two types of cost analyses are typically used—cost-benefit or cost-effectiveness. While both types of analysis monetize program costs, only cost-benefit studies analyze outcomes monetarily. For many child welfare programs, benefits can be difficult to

quantify and covert to a monetary benefit (e.g., improvements in parenting skills), and thus, cost-benefit studies are challenging to conduct (Lee & Aos, 2011; Selameab & Yeh, 2008). Instead, many studies perform cost-effectiveness analyses (see DeSena et al., 2005; Sharac, McCrone, Rushton, & Monck, 2011, for examples), which compare the costs and non-monetized outcomes of a program to the status quo or an alternative program (Corso & Lutzker, 2006).

Within each of these two types of cost analyses, a continuum of analyses are possible ranging from direct and immediate calculations of program costs and benefits from a limited perspective (such as an agency or program) to the economic modeling of costs and long-term societal benefits of an intervention over the lifetime of participants. This article presents the application of a form of cost-benefit analysis, called a cost-savings analysis, to a parenting program:

> Cost-savings analysis is restricted to the costs and benefits realized by the government as a whole or a particular funding agency. Only the costs to the government are taken into account, and the benefits are those expressible as dollar savings somewhere in the government. This kind of analysis is used to determine whether a publicly provided program "pays for itself" and is thus justified not only by whatever human services it may render but also on financial terms alone. (Karoly, Kilburn, Bigelow, Caulkins, & Cannon, 2001, p. xv)

Cost-Savings Analysis Approach

Despite the dearth of cost data and long-term impact studies for parenting education programs, evidence exists that these programs yield positive child outcomes and, in some cases, demonstrate cost-effectiveness (McGroder & Hyra, 2009). The cost-savings analysis approach used for this study is built upon an existing evaluation of a statewide implementation of an evidence-informed parenting program for all child welfare-involved families referred to

parenting education in Louisiana (Maher, Marcynyszyn, Corwin, & Hodnett, 2011). This evaluation was conducted in collaboration with Louisiana's Department of Social Services, Office of Community Services (DSS OCS).

The NPP for Infants, Toddlers, and Preschoolers (Bavolek, 2005) is a parenting education program designed to prevent maltreatment by developing positive parenting skills for caregivers of young children. The program was delivered statewide in Louisiana to parents referred by child welfare to parenting education with the goal of preventing maltreatment and foster care placement. The evaluation documented significant reductions in repeat maltreatment associated with higher levels of participation in the NPP. Specifically, caregivers who attended the average number of group or home sessions (18) of the NPP had a 35% lower likelihood of a substantiated maltreatment incident within two years of program participation compared to participants attending only three sessions (the bottom decile), controlling for other characteristics of caregivers that might be associated with participation or likelihood of repeat maltreatment (Maher et al., 2011). This cost-savings analysis calculates the savings associated with these reductions over time. Taking the perspective of savings to the child welfare agency providing the program, state administrative, service, and workforce data are used to monetize savings associated with this difference in the repeat maltreatment likelihood for a time period of up to four and a half years after participation in the program.

The purpose is two-fold. First, the intent of this cost-savings analysis is to illustrate both the value and practical considerations of conducting cost analyses in child welfare. As such, the cost-savings analysis faces many of the evaluation challenges documented by Bamberger, Rugh, and Mabry (2006) in terms of data, time, and resource constraints. These constraints and limitations in the approach are outlined later. In addition, a substantive contribution is made regarding the savings associated with a particular evidence-informed parent education program

and the use of such models in child welfare. The implications of these savings have relevance to federal finance reform for child welfare, which is also discussed.

A Review of Cost Studies in Child Welfare

Child welfare lacks extensive information on the societal costs of maltreatment as well as a rich menu of evidence-based programs that can prevent it (Corso & Fertig, 2010; Lee, Aos, & Miller, 2008; Plotnick & Deppman, 1999). Though estimates of societal costs are underdeveloped, the best available data provide a sense of the extensive national costs resulting from child maltreatment. A handful of studies have estimated the economic burden of maltreatment by examining the impact on many sectors of society over the lifetime of the victims: short-term medical costs, long-term medical costs, productivity losses, child welfare costs, special education, criminal justice costs, and/or quality of life costs (see Corso & Fertig, 2010 for a review of these studies). These cost estimates range from $7 billion (i.e., Daro, 1988) to $103.7 billion (i.e., Wang & Holton, 2007) annually. Corso and Fertig (2010) suggest that a more precise estimate of the annual societal cost of maltreatment is somewhere around $64.4 billion in 2007 dollars.

A few states have taken a similar societal approach to estimate the costs of maltreatment and savings from prevention for their respective states. Studies in Alabama (Watters, Odom, Ferguson, Boschung, & Edwards, 2007), Colorado (Gould & O'Brien, 1995), and Michigan (Caldwell, 1992; Noor & Caldwell, 2005) all concluded that given child maltreatment costs, even with conservative intervention cost estimates, prevention programs can be highly cost-effective. In Colorado, for instance, Gould and O'Brien (1995) estimated that over $400 million is spent annually by the state on child abuse and neglect, and that if a local home-visiting program was able to reduce child maltreatment expenses by only 6%, the program would pay for itself. In Michigan, Noor and Caldwell (2005) estimated that delivering a program where *every* family in Michigan having their first child received either a parenting

education or a home-visiting program, child maltreatment costs would only need to be offset by 2.7% to be cost-effective. Finally, Zerbe et al. (2009) found that a private model of foster care services, which provided longer-term, more intensive services, though more expensive to implement, could generate billions of dollars in savings for Oregon and Washington State compared to the respective state models of services.

Focusing on analyses of particular interventions, a recent review by Lee et al. (2008) on maltreatment prevention programs with monetizable outcomes, found that while some programs (e.g., Parent-Child Interaction Therapy) exhibit positive benefit-to-cost ratios, which indicate the savings are greater than the cost, others exhibit benefit-to-cost ratios that are negative (e.g., Healthy Families America) or inconclusive (e.g., Project KEEP). Nonetheless, measuring and monetizing the costs associated with interventions and societal savings from reductions in child maltreatment is an ambitious undertaking, which is why so few studies have done so.

Additionally, a handful of studies in child welfare have taken a more limited approach to conducting cost analyses. These studies either included only program costs and not benefits (e.g., Foster, Porter, Ayers, Kaplan, & Sandler, 2007) or the benefits are non-monetized (e.g., Foster, Jones, & the Conduct Problems Prevention Research Group, 2006; Goldfine, Wagner, Branstetter, & Mcneil, 2008; Sharac et al., 2011). One study, similar to the analysis presented here, examined the service costs of different types of out-of-home service models in relationship to children's length and number of placements to assess the value of a short-term group care program called SAFE Homes (findings indicated SAFE Homes was not cost-effective) (DeSena et al., 2005). These types of program-level studies reflect the growing demand for information on program costs and provide important information on maltreatment prevention.

This study expands on these by including program costs and monetized benefits from the perspective of the child welfare agency. As stated previously, the purpose is two-fold—to contribute to the literature on the cost-benefit of parenting education in child welfare for the

prevention of maltreatment and to provide a detailed summary of one approach to cost analysis. First, the evaluation on which the cost-savings analysis is based is described. Next, the steps taken to conduct the analysis are outlined in detail, with limitations identified along the way. Then, the benefit-cost ratio of the NPP is calculated and sensitivity analyses are conducted. Finally, the implications of this work, the contributions it makes to decision-making within child welfare, and appropriate cautions about relying on a cost perspective alone are discussed.

Methods

Economic cost modeling can be expensive and requires significant resources both in terms of cost and technical capacity. Ideally, cost analyses should be planned in advance so that the requisite data can be collected and limitations can be minimized. This approach highlights some of the limitations faced in terms of time and data, stemming from limited resources and the lack of initial plans for a cost analysis. In this section and the next, each step in the cost-savings analysis is outlined, the considerations and limitations, and the data sources used (similar to an approach taken by Farnham, Ackerman, & Haddix, 1996). These steps include:

Step 1. Determine the perspective of the cost analysis
Step 2. Define the sample and study population
Step 3. Describe the intervention
Step 4. Establish the outcome measure(s) for estimating savings
Step 5. Determine the data sources needed/available to conduct the cost analysis
Step 6. Calculate program costs
Step 7. Calculate costs associated with outcomes for estimating cost savings
Step 8. Calculate cost savings
Step 9. Calculate the benefit-cost ratio(s)
Step 10. Conduct sensitivity analyses for estimates

Step One: Determine the Perspective of the Cost Analysis

The perspective taken in a cost analysis will guide the next set of choices that need to be made. Resource constraints, in part, determined the perspective taken for this cost analysis – a short-term time horizon from the perspective of the child welfare agency. The results of the outcome evaluation, which found an inverse association with level of participation in the NPP

and the likelihood of repeat maltreatment, are supplemented with this cost-benefit analysis. Given the limited outcome data available, the perspective of the child welfare agency is taken in calculating program costs and savings for the time period which data were available. In other words, a simple and conservative approach to estimating the savings is used since costs associated with maltreatment to other systems are excluded, as were the longer-term enduring consequences of abuse and neglect. This more limited perspective, which is, in part, dictated by resources of budget, time, data, and foresight, has practical value to a child welfare agency, whose decision-making is often focused on the direct impact to their agency and short-term legislative budget cycles. Nonetheless, the choice of perspective taken (societal vs. agency), and the time horizon chosen, can result in cost-benefit findings that vary substantially (Plotnick & Deppman, 1999). For example, reductions in a social program, such as TANF or Medicaid, represent an immediate savings, or benefit, to the taxpayers (i.e., societal perspective) but a cost to recipients of welfare (i.e., individual perspective) (Foster & Holden, 2002). Similarly, if the effects of an intervention on only one segment of society are included, when there may be effects of equal magnitude on another segment, a benefit-cost ratio could greatly increase.

Step Two: Define the Sample and Study Population

To allow for valid inferential statements about program impact and the generalizability of the cost findings, the target population for the program and the sampling approach must be defined up front. This cost-savings analysis is based on the population of caregivers from the outcome evaluation, thus, a sample is not utilized. It includes all caregivers who attended the NPP between October 2005 and April 2008 in ten of the state's eleven family resource centers serving all of Louisiana's child welfare population. Caregivers served by the resource center in New Orleans were excluded because Hurricane Katrina required significant program modifications which limited comparability. With the exception of a very small number of families who were screened out across the state (approximately 50) for circumstances that prevented

constructive participation in the program (serious cognitive impairment, work barriers, substance abuse), all child welfare-involved families with infants, toddlers, or preschool-aged children in the state with child abuse or neglect allegations assessed as needing parent education were referred to the NPP at one of these resource centers. The study used data from 528 caregivers participating for the first-time in the NPP. Demographic characteristics of the population are summarized in Maher et. al. (2011). When a sampling approach is used, which is not the case for this study, the sample should adequately reflect the target population.

Step Three: Describe the Intervention

A detailed description of the intervention should accompany any cost analysis to logically link observed outcomes to the program and to capture all the program elements with implications for costs. The NPP (Bavolek, 2005) is based on social learning theory (Bandura, 1977; 1986) and the associated premise that most parenting patterns are learned during childhood and replicated later in life when the child becomes a parent. The program is designed to assess, prevent, and treat maltreatment by developing nurturing parenting skills as a counter to the key constructs of abusive and neglectful parenting including inappropriate expectations of the child, lack of empathy toward children's needs, use of corporal punishment as a means of discipline, reversal of parent-child role responsibilities, and oppressing children's power and independence (Bavolek, 2005). In particular, the NPP is built on the core principle that empathy is the foundation of responsive parenting, for which there is general agreement that promoting nurturing and empathic parenting practices is critical to the safety and well-being of children (Donald & Jureidini, 2004; Kochanska & Aksan, 1995; Laible, 2004). The NPP for Infants, Toddlers, and Preschoolers focuses on parental self-awareness and empowerment, the development of empathy, understanding child development and the role of discipline, emotional communication, behavior skills training, the importance of routines, and making good choices for child safety for parents of children birth to five years old (Bavolek & Dellinger-Bavolek, 1985).

The program is designed to be flexible in its application and involves lesson guides, DVDs, parent handbooks, assessment inventories, behavioral modeling, discussion, role playing, home visiting, and family activities to promote cognitive and affective learning. The NPP manual is written at the 5th grade level, and the state child welfare agency worked with the program developer to create an "Easy Reader" version of the materials for use with caregivers with more limited reading ability. Finally, the NPP is structured to involve children in the learning process where possible.

For the statewide implementation, Louisiana's DSS OCS provided funding to train Bachelor's or Master's level resource center staff to become NPP facilitators. In addition, front-line child welfare staff were also trained so they could become familiar with the program model. The NPP was administered as a 16-week group-based program, the minimum number of NPP sessions recommended for a child welfare population (S. Bavolek, personal communication, January 31, 2011). Group sessions lasted approximately two and a half hours. Home visits, averaging about an hour in length, were also used for multiple purposes. They were used as make-ups for missed group sessions in order to maximize participation, as compliments to the group sessions to reinforce concepts for parents who needed more time, and as supplemental sessions for parents who had other needs. To promote accessibility, the resource center staff were expected to assist caregivers in transportation plans to and from sessions as needed. Describing all of the features of the NPP program delivery is critical as how the program is delivered will affect the program costs.

Step Four: Establish the Outcome Measure(s) for Estimating Savings

The benefit portion of the cost-benefit ratio stems directly from the observed outcomes associated with the intervention. The outcomes selected for observation relate to the perspective taken for the cost analysis. Cost savings from an intervention are realized in one of two ways: the avoidance of future costs or the generation of monetary benefits. Savings are

calculated from the avoidance of the direct costs of child maltreatment to the child welfare agency. Indirect savings (e.g., reduced criminal justice involvement, greater educational attainment) and opportunity costs (e.g., foregone income for parents attending the intervention or lost lifetime earnings for maltreated children) are not included, but are typically recommended as part of a full economic analysis (Conrad, 2006; Lee & Aos, 2011; Wang & Holton, 2007).

Maher et al. (2011) demonstrated that greater participation in the NPP was associated with a reduction in short-term allegations and longer-term substantiated child maltreatment incidences – controlling for other characteristics of children and families that might be associated with participation or maltreatment (i.e., individual and household demographics, socioeconomic status, and risk factors for maltreatment, including prior maltreatment history for children and caregivers and parenting beliefs, such as the use of corporal punishment). For each additional session of the NPP, they found a significant decrease in both the likelihood of a maltreatment report within six months and the likelihood of a substantiated report within two years of completing the NPP. The more sessions caregivers attended, the more child safety improved. In other words, six months after the program's conclusion, caregivers were significantly less likely to be re-reported for child maltreatment for every additional NPP session attended. Two years after participating, caregivers who attended more sessions were significantly less likely to have a substantiated maltreatment incidence.

Post-estimation commands for logistic regression in Stata (Long & Freese, 2006) were used to produce predicted probabilities of repeat maltreatment for an 'average' caregiver at two illustrative levels of program attendance for each time period and type of report. The population average attendance (18 group and home sessions) was used in comparison to the lowest decile of attendance (3 sessions) from which predicted probabilities of repeat maltreatment were obtained. Attendance ranged from 1 to 32 group and home sessions. Figure 1 presents this information visually.

Step Five: Determine the Data Sources Needed/Available to Conduct the Cost Analysis

Once the perspective has been established, the study population defined, and the outcomes identified, data sources available or from which data can be collected to calculate program costs and savings needs to be determined. In this case, existing or easily obtainable data is relied on for calculating both the costs of administering the NPP (hereafter referred to as *program costs*) to Louisiana's child welfare population and the subsequent costs of maltreatment, which when averted, constitute the benefits (hereafter referred to as *cost savings*). A combination of existing data on program delivery, administrative maltreatment and service records, and workforce information is used to calculate the program costs and cost savings.

Program data.

Detailed knowledge about the components of an intervention and how it is implemented are necessary for estimating the costs of the intervention, as well as understanding how it is designed to work with the target population. These costs may be straightforward, such as the one-time purchase of training materials, or a bit more difficult to isolate, such as administrative costs or the cost of transportation, which may include time, the price of gas, bus fare, maintenance of a vehicle, and other considerations.

Researchers generally recommend using the "ingredient method," developed by Levin (1983) and enhanced by Chambers and Parrish (1983) to measure program costs (Corso & Lutzker, 2006; Plotnick & Deppman, 1999). Program costs are built up from all components and resources used to provide the service, including all personnel and non-personnel costs as well as donated, volunteer, and in-kind resources (Foster et al., 2007). Often, this involves primary data collection including time diaries from staff, which can be expensive, a burden to staff, and require significant engagement with program staff to identify all resources and time allocations (Brodowski & Filene, 2009).

Louisiana's DSS OCS collected information on program costs in 2008 from a convenience sample of five of the ten resource centers delivering the NPP. The centers provided estimates of staff time for group sessions and home visits (group and child facilitators, clerical support); associated salaries; expenses (transportation, supplies, food, photocopying); and, group size. Only one of the five agencies reporting cost information included supervision costs. DSS OCS also provided statewide contract amounts for ongoing training, technical assistance to the resource centers, and state oversight for quality assurance. This information is used to calculate an average per caregiver program cost. The start-up costs for training and infrastructure (e.g., "training the trainers") were not available and, thus, these costs are not included.

Another category of program costs that is not included in the calculation is overhead or non-personnel costs (e.g., governance and administration, rent, equipment; NPP material costs, which were donated; in-kind or volunteer resources; and, information systems or performance monitoring costs). To obtain precise estimates of the proportion of non-personnel costs dedicated to NPP, given that all centers provide other services as well, more in-depth interviews, data collection, and/or analysis of center budgets would be necessary.

While direct service personnel costs typically constitute the highest proportion of program delivery costs and are the bulk of costs included in this analysis, the extent to which the percent of program costs attributable to overhead could be estimated was examined, although the specific cost estimates (i.e., governance, administration, and other non-personnel costs such as facilities) were unavailable. Little direction was found in the child welfare services literature, other than two studies, which report that the proportion of non-personnel costs for service delivery of particular programs are about 24 – 26% (Corso & Filene, 2009; Foster et al., 2007). However, the budget categories in these studies do not directly align with this study, so they are not applied to the program costs. Thus, program costs in this study are

underestimated. (Overhead costs for the costs associated with maltreatment are not included either, and, if similar, these omissions on each side of the benefit-cost equation would cancel each other out. Those omissions are discussed next.)

Outcome data: Costs associated with maltreatment.

The data sources for the original outcome evaluation included NPP attendance data; the state child welfare Tracking and Information Payment System (TIPS), which is the state's administrative child welfare data system; and, the Adult-Adolescent Parenting Inventory-2 pre- and post-test surveys (Bavolek & Keene, 2001). Savings from reductions in maltreatment associated with level of participation in the NPP are measured in terms of the reduction in costs incurred following both maltreatment reports and substantiated incidences of child abuse and neglect. These costs include the daily costs of service (daily payment rates for foster care and personnel costs for social workers) and additional service costs stemming from a maltreatment incident. The TIPS administrative data from DSS OCS contained the duration of time children spent in foster care (to the day), the duration of in-home services provided, and the dates of investigations that resulted from both the reported incidences of maltreatment within six months and the substantiated incidences within two years following the NPP for every program participant.

DSS OCS provided the average daily payment rate for foster care per child. These costs are assigned to each day of service, for caregivers and children in the TIPS database. Average daily personnel costs for foster care, in-home services, and child protective investigations are calculated using the salary and caseload information for supervisors and case workers and applied to each service day and type. Finally, additional service expenditures are used for children in foster care or families receiving in-home services. For foster care, these include special board payments (for special needs children), clothing, respite care, transportation, evaluation, medical/treatment, school supplies, incidental expenses, and day care. For in-home

services and child protective investigations, service costs include payments from the preventive assistance fund and reunification assistance fund, transportation, evaluation, medical/treatment, and incidental expenses.

The expenditures for child welfare on behalf of families who received services with a repeat maltreatment incident are summed to calculate the aggregate cost for this population of caregivers since the first cohort completed the program to the time of the cost analysis (August 2010). The time frame for calculating service costs is not the same for all families, since the outcomes were from different cohorts of caregivers over the first two and a half years of program implementation. The window of opportunity for child welfare services receipt ranged from two years and four months for some families up to four and a half years for other families, depending on when they started and completed the NPP. If service costs were projected beyond the study time frame, the costs of maltreatment might be higher as services for some families extended beyond this cut-off point.

As mentioned previously, the costs associated with repeat maltreatment are underestimated due to the fact that only direct child welfare personnel and service expenditure costs are included. Costs to the state child welfare agency for governance, administration, and other non-personnel costs (rent, supplies, and equipment.) are excluded. If included, the total costs of service delivery may increase by approximately 25%. The savings from the prevention of maltreatment are further underestimated due to the unmeasured benefits associated with reductions in maltreatment excluded from this analysis, including: the cost of other services caregivers received through the resource centers (e.g., mentoring), service costs to other systems such as MEDICAID or education, and transportation costs incurred using state vehicles.

Results

In this section, the process of calculating program costs, costs associated with repeat maltreatment, cost savings, and benefit-cost ratios is outlined, as well as how sensitivity analyses are conducted.

Step Six: Calculate Program Costs

As stated previously, program data from five resource centers provided estimates of staff time (group and child facilitators, clerical support), expenses (transportation, supplies, food, photocopying), and group size, all of which are used to produce an average program cost per caregiver. Of course, program costs could vary significantly depending on staff qualifications, education, and compensation; differences in the numbers of group and home-visiting sessions administered; and, regional differences in cost. The average program cost per caregiver across all five centers in the sample is used to produce a statewide estimate. Sensitivity analyses are also conducted in a later step in order to demonstrate potential variation in these costs across the five centers.

For purposes of comparability, all program costs are adjusted to 2010 values using the CPI inflation calculator (U.S. Department of Labor, 2011). In 2010 dollars, the average program cost per caregiver amounts to approximately $1,258, which sums to an aggregate cost of $664,161 for all 528 caregivers who participated in the NPP between October 2005 and April 15, 2008. Program costs are not presented as an annual amount, as the number of participants varied each year. In addition, the estimated savings did not accrue at a constant annual rate during the study time frame.

Step Seven: Calculate Costs Associated with Outcomes for Estimating Cost Savings

The service costs associated with repeat maltreatment occurred between 2006 and 2010. As mentioned earlier, these costs are summed across caregivers to obtain an aggregate estimate of savings. A discount rate is used for all service costs that were incurred more than

one year following completion of the NPP. Total substantiated maltreatment costs (after discounting) totaled $1,637,819 during the child welfare service period ending August 2010.

Discounting is necessary because immediate benefits are worth more than future benefits. In other words, prevention of a maltreatment incident immediately following an intervention is of more value than prevention of a maltreatment incident at a later date. Benefits occurring at different time periods need to be made directly comparable by adjusting them to their net present value through the application of a discount rate (Plotnick & Deppman, 1999). Because the value of costs associated with maltreatment prevented earlier are at a premium, costs incurred more than one year following the NPP, and the subsequent cost savings, are discounted (reduced) back to their net present value during the year immediately following the NPP. An inflation rate is not typically applied to benefits because the discount rate would be adjusted by the same inflation rate, and thus, would result in a net cancellation (Plotnick & Deppman, 1999). As Burgess and Zerbe (2011) point out, there is little agreement on what discount rate to apply when estimating net present values; however, a discount rate of 3.5% is used for these calculations because this rate is commonly used and recommended in similar studies (Karoly et al., 2001; Moore, Boardman, Vining, Weimer, & Greenberg, 2004; Zerbe et al., 2009). Sensitivity analyses are performed around this discount rate for robust results.

Step Eight: Calculate Cost Savings

Table 1 presents the total program costs for the evaluation period in relationship to the estimated savings from reductions in maltreatment. As mentioned previously, Maher et al. (2011) demonstrated that caregivers attending 18 program sessions were 39% less likely to have a reported incidence of maltreatment within six months following the NPP, and 35% less likely to have a substantiated incidence of maltreatment within two years following the NPP, compared to caregivers that attended only three sessions. Using the percent reduction in reported and substantiated incidences, respectively, the savings associated with these

reductions in maltreatment from different NPP attendance levels for this population was $580,027.

Step Nine: Calculate the Benefit-Cost Ratio(s)

The benefit-cost (B-C) ratio is calculated by dividing the cost savings (savings stemming from reductions in substantiated maltreatment: $573,237 and re-reports of maltreatment: $6,790) by the program cost ($664,161). The B-C ratio calculated in this analysis equals 0.87; in other words, from the first two and a half years of program implementation Louisiana's child welfare agency could recoup at least 87 percent of the program costs within four and a half years of the completion date for the first cohort of participants (assuming average attendance levels). In effect, the NPP approaches cost neutrality (i.e., a B-C ratio of 1.0) within a short time frame based on the observable and measurable benefits of reductions in maltreatment incidences.

Step Ten: Conduct Sensitivity Analyses for Estimates

Since most cost analyses are subject to several assumptions, sensitivity analyses are typically conducted to demonstrate how these assumptions can lead to changes in the B-C ratio (Merrifield, 1997). For the sensitivity analysis, the following are examined: (1) the low- and high-end program costs from the resource centers in case the actual population average is closer to one of these ends, (2) the low- and high-end of the confidence interval around the predicted reduction in the probability of maltreatment per additional NPP session attended for participants, and (3) alternative discount rates.

Sensitivity analyses are conducted on the program costs since these estimates are based on a convenience sample. Findings reveal that variation in the NPP program costs at the resource centers and in reductions in the probability of maltreatment substantially affect the B-C ratio, whereas variation around the discount rate does not. First, in relation to the program costs, providing the NPP cost $1,072 per caregiver at the low end of the range and $1,597 per

caregiver at the high end of the range. The total program costs of delivering the NPP using these values (after inflation) is estimated at $573,255 and $853,998, respectively. The statewide average used in this analysis, based on the five resource centers from whom cost data was collected, can be anywhere within this range. Resource center costs vary by staffing structure (the number of facilitators), credentials, salaries, etc. The five resource centers may not be representative of all ten resource centers in the state. Using the highest resource center program costs, the B-C ratio drops to 0.68; using the lowest program costs, the B-C ratio increases to 1.01. While the latter estimate yields a positive B-C ratio from the NPP, this should not be interpreted as a reason to spend less on NPP delivery as lower program costs may affect the efficacy of program delivery and, concomitantly, contribute to increased maltreatment.

The results of the logistic regression demonstrated a significant association between program attendance and repeat maltreatment (Maher et al., 2011); specifically, the odds ratio for attendance of 0.97 (with a standard error of 0.01) suggests that for every additional session of the NPP attended by a caregiver, the probability of substantiated maltreatment for that caregiver within two years of program participation declined by approximately 3.3%, controlling for other caregiver characteristics. The confidence interval around this estimate indicates that (with 95% confidence) this decline in probability ranged between 1.1% and 5.5%. Similarly, the estimate of 0.96 (with a standard error of 0.01) suggests that for every additional session of the NPP attended by a caregiver, the probability of a re-report of maltreatment for that caregiver within six months of program participation declined by approximately 3.8%, controlling for other caregiver characteristics. The confidence interval around this estimate ranged between a 1.3% and 6.3% reduction in re-reports of maltreatment. Using the low or high ends of the confidence intervals results in a B-C ratio of .32 or 1.30, respectively—a substantial difference in results.

A sensitivity analysis is also performed around the discount rate—3.5%. Discount rates of 2% and 5% are used for the sensitivity analysis. Using a discount rate of 2%, the total

maltreatment costs are calculated to be $1,686,658. Using a discount rate of 5%, the total maltreatment costs equal $1,625,094. Using the more conservative discount rate of 5% for the maltreatment costs and resultant savings, the B-C ratio drops to 0.86; using the less conservative discount rate of 2%, the B-C ratio increases to 0.89. The use of different discount rates would have a larger impact on the B-C ratio if a longer time horizon was available to estimate savings. For outcomes observed in shorter time periods, the discount rate does not make a substantial difference.

These sensitivity analyses are reported to show the range of impact varying assumptions have on the B-C ratio. As demonstrated, variations in the program costs per caregiver, the predicted reductions in maltreatment, and the discount rate substantially affect the estimated B-C ratio. However, given the use of the average program cost, the mid-range value of the confidence interval around predicted reductions in the probability of repeat maltreatment, and a discount rate based on prior social science research, the B-C ratio of 0.87 most accurately reflects the potential savings of the NPP for the time period examined.

Discussion

In this article, the methods for conducting a cost-savings analysis in the context of real world constraints are showcased. Primarily, data readily available, or already collected, is relied on, and the analysis is built on previously published evaluation results. The NPP was delivered to all caregivers in Louisiana with prior maltreatment reports for whom parenting education was an appropriate intervention. Due to the large numbers of families served, the costs for program delivery were substantial. For the population of parents referred to parenting education in Louisiana, only a small percentage of caregivers had a second substantiated maltreatment incident (16.9%) and, among these, only a percentage resulted in foster care placements (40.4%). Yet, the NPP was provided to all families for whom parenting education was recommended. Thus, this cost-savings analysis was approached with the realization that it may

be difficult to observe statewide savings from maltreatment reductions for a small subset of families. However, the final B-C ratio, which approaches cost neutrality in a short time frame, is very promising.

The cost-benefit ratio of 0.87 is quite conservative for many reasons. First, it includes only one measurable outcome of maltreatment prevention – service and personnel costs avoided through reductions in maltreatment. If this outcome alone were tracked beyond the study period, the benefit-cost ratio would almost certainly exceed 1.0. Second, and most importantly, costs to other systems are excluded from the estimated savings stemming from other documented impacts associated with reductions in maltreatment for the children who experience it. These long-term savings could be substantial if reductions in repeat maltreatment result in fewer special education placements, higher educational attainment, less medical care use, less mental health therapy, greater earnings, or less incarceration. For instance, other state estimates of the costs of child abuse and neglect estimate that costs to child welfare may only account for between 29% (Noor & Caldwell, 2005) and 53% (Watters et al., 2007) of the total annual costs of child abuse and neglect to a state after taking into account impacts on other systems. If child welfare service and personnel costs comprise 29% to 53% percent of the total cost of child abuse and neglect in Louisiana, the B-C ratio would be somewhere between double and three and a half times greater than the current estimate.

Finally, other non-monetizable benefits such as increased parenting knowledge and skill, improved quality of parent and child interactions, and enhanced child development are not examined. These outcomes, while associated with child maltreatment, may result in other unmeasured benefits over time, some of which likely could be monetizable if resources were in place to track these relationships over time. A full economic analysis would include not only a full accounting of program costs, but an expansive range of benefits, not just in terms of costs

averted, but also intangible benefits – even those that are not easily monetizable (Foster, Dodge, & Jones, 2003).

Another limitation is the interpretation of the evaluation results, on which the cost-savings analysis are built, due to limitations in the study design. Economic analyses are considerably strengthened by the extent to which the research design can establish causation. The causal association between attendance and repeat maltreatment observed in the logistic regression models cannot be definitively determined due to the lack of a comparison group. Because the population database included all families referred to the NPP, no comparisons could be drawn between maltreatment outcomes for participants in the NPP and otherwise similar parents who received no parenting education. Given this, differences between average and low attendance levels were examined. While available factors that might be associated with attendance and repeat maltreatment were controlled for, it is possible that caregivers who attended more sessions may be qualitatively different than caregivers who attended fewer sessions in ways that were not accounted for.

The cost-savings approach detailed here is a reflection of the growing demand for greater accountability in terms of quality and effectiveness of service delivery and fiscal responsibility. The conservative, albeit limited, approach outlined here demonstrates that an evidence-informed parenting education program with a high level of participation will lead to realized savings for child welfare, and likely other systems in the short- and long-term. The B-C ratio approaches cost neutrality in a short period of time from the limited perspective of the child welfare agency despite the fact that, as Plotnick and Deppman (1999, p. 394) note, this method of calculating benefits “makes it much harder for an intervention to pass a fair benefit-cost test because most or all of the costs come up front, although benefits may accrue well into the future.” In contrast to a societal level economic analysis, this type of cost-savings approach may, however, have more immediate utility for a child welfare department.

Understanding the effectiveness and the associated costs and benefits of parenting education programs in child welfare is critical as they are a common component of services provided to child welfare-involved families (Barth et al., 2005; Huebner, 2002; Waldfogel, 2009). If prevention services can demonstrate that they reduce foster care caseloads, thus saving money, a strong case for finance reform strategies that allow for reinvestment of foster care savings into prevention activities can be made (Casey Family Programs, 2010). These types of results position the field to advocate for child welfare finance reform.

Conclusions

In summary, given the expenses associated with out-of-home placements and in-home services, Louisiana's child welfare department should be able to absorb all costs of statewide program delivery by observed reductions in repeat maltreatment. If the program could be targeted to those families most at risk for repeat maltreatment, more savings could be realized. This targeted approach would, however, require better measures of risk, and would also prevent other families not at risk for reoccurrence of maltreatment from realizing other program benefits. Strategies to encourage a high degree of participation and retention in the NPP are also warranted. Providing incentives or outreach to increase participation is apt to pay off.

Families likely experience other benefits from participation in effective parenting education. Unmeasured benefits could include improved parenting, enhanced child development, and thus, improved well-being for both children and families. These outcomes likely result in families and children utilizing fewer services from other public systems and increased productivity in terms of employment, earnings, and, thus, additional tax revenue. However, economic incentives should be only one framework to justify service delivery. Beyond monetary benefits alone, the short- and long-term well-being of families is both a moral and ethical imperative for social service institutions and society in general.

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References

Bamberger, M., Rugh, J., & Mabry, L. (2006). *RealWorld evaluation: Working under budget, time, data, and political constraints.* Thousand Oaks, CA: Sage.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1986). *Social foundation of thought and action: A social-cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Barth, R. P., Landsverk, J., Chamberlain, P., Reid, J. B., Rolls, J. A., Hurlburt, M. S., … Kohl, P. L. (2005). Parent-training programs in child welfare services: Planning for a more evidence-based approach to serving biological parents. *Research on Social Work Practice*, *15*(5), 353-373.

Bavolek, S. (2005). *Research and validation report of the Nurturing Parenting programs.* Retrieved from http://www.nurturingparenting.com/research_validation/a4_main_r&v_article.pdf

Bavolek, S., & Dellinger-Bavolek, J. (1985). *Increasing the nurturing parenting skills of families in Head Start: Validation of the Nurturing Parenting program for parents and children birth to five years*. Retrieved from http://www.nurturingparenting.com/research_validation/validation_b-5_program.pdf

Bavolek, S. J., & Keene, R. J. (2001). *Adult-Adolescent Parenting Inventory-2: Administration and Development Handbook*. Asheville, NC: Family Development Resources, Inc.

Boulatoff, C., & Jump, V. K. (2007). Blueprint of a cost analysis approach for early intervention: Application to a home visiting program to prevent child abuse and neglect. *Journal of Early Intervention, 30*(1), 73-84.

Brodowski, M. L., & Filene, J. H. (2009). Engaging program staff in economic evaluation: Lessons learned and recommendations for practice. *Protecting Children*, *24*(3), 70-77.

Burgess, D. F., & Zerbe, R. O. (2011). Appropriate discounting for benefit-cost analysis. *Journal of Benefit-Cost Analysis*, *2*(2), 1-18.

Caldwell, R. A. (1992). *The costs of child abuse vs. child abuse prevention: Michigan's experience*. East Lansing, MI: Michigan Children's Trust Fund and Michigan State University.

Casey Family Programs. (2010). *Ensuring safe, nurturing, and permanent families for children: The need for federal finance reform*. Seattle, WA: Casey Family Programs. Retrieved from http://www.casey.org/Resources/Publications/pdf/NeedForFinanceReform.pdf

Chambers, J. G., & Parrish, T. B. (1983). *The development of a resource cost model funding base for education finance in Illinois*. Stanford, CA: Associates for Education Finance and Planning.

Conrad, C. (2006). Measuring costs of child abuse and neglect: A mathematical model of specific cost estimations. *Journal of Health & Human Services Administration*, *29*(1), 103-123.

Corso, P. S., & Fertig, A. R. (2010). The economic impact of child maltreatment in the United States: Are the estimates credible? *Child Abuse & Neglect, 34*(5), 296-304.

Corso, P. S., & Filene, J. H. (2009). Programmatic cost analysis of the Family Connections program. *Protecting Children*, *24*(3), 78-88.

Corso, P. S., & Lutzker, J. R. (2006). The need for economic analysis in research on child maltreatment. *Child Abuse & Neglect*, *30*(7), 727-738.

Daro, D. (1988). *Confronting child abuse: Research for effective program design*. New York, NY: Macmillan, Inc.

DeSena, A. D., Murphy, R. A., Douglas-Palumberi, H., Blau, G., Kelly, B., Horwitz, S. M., & Kaufman, J. (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*(6), 627-643.

Donald, T., & Jureidini, J. (2004). Parenting capacity. *Child Abuse Review, 13*(1), 5-17.

Farnham, P. G., Ackerman, S. P., & Haddix, A. C. (1996). Study design. In A. C. Haddix, S. M. Teutsch, P. A. Shaffer, & D. O. Duñet (Eds.), *Prevention effectiveness: A guide to decision analysis and economic evaluation* (pp. 12-26). New York, NY: Oxford University Press.

Foster, E. M., Dodge, K. A., & Jones, D. (2003). Issues in the economic evaluation of prevention programs. *Applied Developmental Science*, *7*(2), 76 – 86.

Foster, E. M., & Holden, E. W. (2002). Benefit-cost analyses of the child welfare demonstration projects: Understanding the resource implications of the IV-E waivers. *Children and Youth Services Review*, *24*(6-7), 431-453.

Foster, E. M., Jones, D., & Conduct Problems Prevention Research Group. (2006). Can a costly intervention be cost-effective? An analysis of violence prevention. *Archives of General Psychiatry, 63*(11), 1284-1291.

Foster, E. M., Porter, M. M., Ayers, T. S., Kaplan, D. L., & Sandler, I. (2007). Estimating the costs of preventive interventions. *Evaluation Review, 31*(3), 261-286.

Goldfine, M. E., Wagner, S. M., Branstetter, S. A., & Mcneil, C. B. (2008). Parent-child interaction therapy: An examination of cost-effectiveness. *Journal of Early and Intensive Behavioral Intervention*, *5*(1), 119-142.

Gould, M. S., & O'Brien, T. (1995). *Child maltreatment in Colorado: The value of prevention and the cost of failure to prevent*. Denver, CO: Center for Human Investment Policy, University of Colorado at Denver.

Huebner, C. E. (2002). Evaluation of a clinic-based parent education program to reduce the risk of infant and toddler maltreatment. *Public Health Nursing*, *19*(5), 377-389.

Karoly, L. A., Kilburn, M. R., Bigelow, J. H., Caulkins, J. P., & Cannon, J. S. (2001). *Assessing costs and benefits of early childhood intervention programs: Overview and applications to the Starting Early, Starting Smart Program*. Santa Monica, CA: RAND.

Kochanska, G., & Aksan, N. (1995). Mother-child mutually positive affect: The quality of child compliance to requests, prohibitions, and maternal control as correlates of early internalization. *Child Development, 66*(1), 236-254.

Lee, S., & Aos, S. (2011). Using cost-benefit analysis to understand the value of social interventions. *Research on Social Work Practice, 21*(6), 682-688.

Lee, S., Aos, S., & Miller, M. (2008). *Evidence-based programs to prevent children from entering and remaining in the child welfare system: Benefits and costs for Washington.* Olympia, WA: Washington State Institute for Public Policy (08-07-3901).

Laible, D. (2004). Mother-child discourse in two contexts: Links with child temperament, attachment security, and socioemotional competence. *Developmental Psychology*, *40*(6), 979-992.

Levin, H. M. (1983). *Cost-effectiveness: A primer*. Beverly Hills, CA: Sage.

Long, J. S., & Freese, J. (2006). *Regression models for categorical outcomes using Stata* (2nd ed.). College Station, TX: Stata Press.

Maher, E. J., Marcynyszyn, L. A., Corwin, T. W., & Hodnett, R. (2011). Dosage matters: The relationship between participation in the Nurturing Parenting Program for infants, toddlers, and preschoolers and subsequent child maltreatment. *Children and Youth Services Review*, *33*(8), 1426-1434.

McGroder, S. M., & Hyra, A. (2009, February). *Developmental and economic effects of parenting programs for expectant parents and parents of preschool-age children* (Issue Paper No. 10). Washington, DC: Partnership for America's Economic Success. Retrieved from http://www.partnershipforsuccess.org/uploads/20090617_PAESParentingReport.pdf

Merrifield, J. (1997). Sensitivity analysis in benefit-cost analysis: A key to increased use and acceptance. *Contemporary Economic Policy*, *15*(3), 82-92.

Moore, M. A., Boardman, A. E., Vining, A. R., Weimer, D. L., & Greenberg, D. H. (2004). 'Just give me a number!' Practical values for the social discount rate. *Journal of Policy Analysis and Management*, *23*(4), 789-812.

Mullen, E. J., & Shuluk, J. (2010). Outcomes of social work intervention in the context of evidence-based practice. *Journal of Social Work*, *11*(1), 49-63.

Noor, I., & Caldwell, R. A. (2005). *The costs of child abuse vs. child abuse prevention: A multi-year follow-up in Michigan*. East Lansing, MI: Michigan Children's Trust Fund.

Partnership to Protect Children and Strengthen Families. (2007). *Changes needed in federal child welfare law to better protect children and ensure them nurturing families*. Retrieved from Child Welfare League of America website: http://www.cwla.org/advocacy/nurturingfamilies.pdf

Plotnick, R. D., & Deppman, L. (1999). Using benefit-cost analysis to assess child abuse prevention and intervention programs. *Child Welfare*, *78*(3), 381-407.

Selameab, T., & Yeh, S. S. (2008). Evaluating intangible outcomes: Using Multiattribute Utility Analysis to compare the benefits and costs of social programs. *American Journal of Evaluation*, *29*(3), 301-316.

Sharac, J., McCrone, P., Rushton, A., & Monck, E. (2011). Enhancing adoptive parenting: A cost-effectiveness analysis. *Child and Adolescent Mental Health*, *16*(2), 110-115.

U.S. Department of Labor. (2011). *CPI inflation calculator*. Washington, DC: Bureau of Labor Statistics. Retrieved from http://www.bls.gov/data/inflation_calculator.htm

Waldfogel, J. (2009). Prevention and the child protection system. *The Future of Children*, *19*(2), 195-210.

Wang, C., & Holton, J. (2007, September). *Total estimated cost of child abuse and neglect in the United States*. Chicago, IL: Prevent Child Abuse America.

Watters, A. J., Odom, R., Ferguson, C., Boschung, M., & Edwards, S. (2007). *The costs of child abuse vs. child abuse prevention: Alabama's experience*. Tuscaloosa, AL: Center for Business and Economic Research, The University of Alabama. Retrieved from http://ctf.alabama.gov/Archived%20Info/pdfs/Costs_Child_Abuse_vs_Child_Abuse_Prev.pdf

Wilson, C., & Alexandra, L. (2005). *Guide for child welfare administrators on evidence-based practice.* Washington, DC: National Association of Public Child Welfare Administrators.

Zerbe, R. O., Plotnick, R. D., Kessler, R. C., Pecora, P. J., Hiripi, E., O'Brien, K., … White, J. (2009). Benefits and costs of intensive foster care services: The Casey Family Programs compared to state services. *Contemporary Economic Policy*, *27*(3), 308-320.

Table 1

Summary of Program Costs, Costs Associated with Maltreatment, Cost Savings, and the Benefit-Cost Ratio[a]

Costs and Savings Calculations	
Program costs:	$664,161
Total daily costs of substantiated maltreatment incidences occurring within two years of program participation[b]:	
Foster care	$1,160,480
In-home services	$21,227
CPS investigations	$57,589
Total cost of additional services on behalf of children in foster care stemming from substantiated maltreatment incidences[c]:	
Foster care	$342,214
CPS investigations	$16,649
Family services	$13,209
Services to parents	$26,451
Subtotal of costs associated with substantiated maltreatment incidences within two years of program participation:	$1,637,819
Cost of CPS investigations stemming from re-reports of maltreatment within six months of program participation:	$17,411
Subtotal of costs associated with re-reports of maltreatment incidences within six months of program participation:	$17,411
Cost savings from 35% reduction in substantiated maltreatment within two years of participation in NPP:	$573,237
Cost savings from 39% reduction in re-reported maltreatment within 6 months of participation in NPP:	$6,790
Benefit-cost ratio:	*0.87*

[a] All costs are reported in 2010 dollars.

[b] The daily costs of foster care include the average daily payment rate for care per child and the average social worker and supervisor wages. Daily costs of in-home services include the average social worker and supervisor wages per household. The cost of CPS investigations includes average social worker and supervisor wages paid over the average length of time for an investigation.

[c] Additional service costs for children in foster care or their parents, families receiving in-home services, and families receiving investigations included special board payments (for children with special needs), clothing purchases, respite care for foster parents, preventative assistance and reunification assistance (including heating and cooling expenses for income-eligible households), transportation expenses, evaluation services (including psychological testing or legal consultation), medical treatment, school supplies, incidental expenses (e.g., foreign language interpreting, substance abuse screening), and day care.

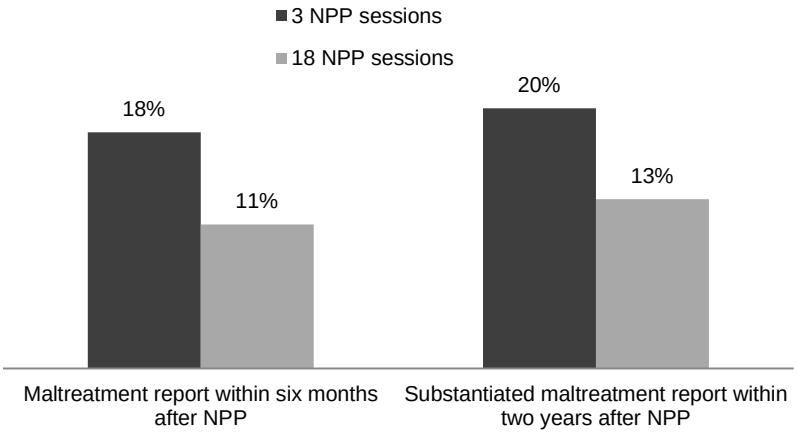

Figure 1. Likelihood of child maltreatment at two time periods by sessions attended. Adapted from "Dosage Matters: The Relationship between Participation in the Nurturing Parenting Program for Infants, Toddlers, and Preschoolers and Subsequent Child Maltreatment," by E. J. Maher, L. A. Marcynyszyn, T. W. Corwin, and R. Hodnett, 2011, *Children and Youth Services Review*, *33*(8), p. 1431. Copyright 2011 by Elsevier Ltd. Reprinted with permission.
Note. Eighteen sessions is the average number of group and home-visiting sessions attended. Three sessions is the lowest decile.