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## Cost-Benefit Analysis of a Preventive Intervention for Divorced Families: Reduction in Mental Health and Justice System Service Use Costs 15 Years Later

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### Abstract

This cost-benefit analysis compared the costs of implementing the New Beginnings Program (NBP), a preventive intervention for divorced families to monetary benefits saved in mental healthcare service use and criminal justice system costs. NBP was delivered when the offspring were 9–12 years old. Benefits were assessed 15 years later when the offspring were young adults (ages 24–27). This study estimated the costs of delivering two versions of NBP, a single-component parenting-after-divorce program (Mother Program, MP) and a two-component parenting-after-divorce and child-coping program (Mother-Plus-Child Program, MPCP), to costs of a literature control (LC). Long-term monetary benefits were determined from actual expenditures from past-year mental healthcare service use for mothers and their young adult (YA) offspring and criminal justice system involvement for YAs. Data were gathered from 202 YAs and 194 mothers (75.4% of families randomly assigned to condition). The benefits, as assessed in the 15th year after program completion, were \$1630/family (discounted benefits \$1077/family). These

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**Conflict of Interest** Drs. Wolchik, Porter, and Sandler are partners in Family Transitions: Programs that Work, LLC that trains providers to deliver the New Beginnings Program.

1-year benefits, based on conservative assumptions, more than paid for the cost of MP and covered the majority of the cost of MPCP. Because the effects of MP versus MPCP on mental health and substance use problems have not been significantly different at short-term or long-term follow-up assessments, program managers would likely choose the lower-cost option. Given that this evaluation only calculated economic benefit at year 15 and not the previous 14 (nor future years), these findings suggest that, from a societal perspective, NBP more than pays for itself in future benefits.

## Keywords

Cost-benefit analysis; Divorce; Prevention

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## Introduction

Although rates of divorce in the USA have declined in recent years, 30–50 % of children and adolescents are likely to experience parental divorce (National Center for Health Statistics 2008). The high prevalence of divorce represents a significant public health concern as divorce confers risk for a wide range of problems in childhood and adolescence, including internalizing problems, such as depression and anxiety; externalizing problems, such as aggression and delinquency (Amato 2001; Fergusson et al. 1994); substance use problems (Paxton et al. 2007); and health problems (Fabricius and Luecken 2007). An increased risk for developing mental health and substances use disorders has also been found in adults whose parents divorced during their childhood or adolescence (Afifi et al. 2009; Kessler et al. 1997). Also, parental divorce has been related to poorer academic achievement and less occupational success (e.g., lower-level jobs, Biblarz and Gottainer 2004; lower socio-economic status, Biblarz and Raftery 1999), and marital instability, Amato 2001) in adult offspring.

These negative outcomes place a significant economic burden on society. In particular, internalizing (e.g., depression) and externalizing (e.g., delinquency, aggressive behavior) mental health problems and substance use problems have high societal costs. For example, youth externalizing behavior problems have been associated with a myriad of negative outcomes including unemployment and criminality in adulthood (Loeber and Hay 1997), the outcomes of which cost between \$335 and \$350 billion dollars each year in the USA (Miller 2004). Cohen and Piquero (2009) found that diverting just one high-risk 14-year-old youth from a life of crime can save approximately \$2.6–\$5.3 million dollars. Internalizing disorders, such as depression, also place a great economic strain on society; \$83.1 billion is spent each year on costs associated with depression (e.g., medical services, suicide, and loss of workplace productivity; Greenberg et al. 2003). Depression has been found to account for 48 % of lost productivity time at work; lost productivity costs for employers in the USA are \$44 billion per year versus \$13 among depressed and non-depressed workers, respectively (Stewart et al. 2003). Because of the high rate of divorce in this country and the significant economic burden associated with its negative outcomes, prevention programs that reduce problem outcomes for offspring of divorced parents have the potential to have a marked economic benefit to society.

The New Beginnings Program (NBP) is a group preventive intervention for divorced parents designed to target three modifiable family processes found to predict children's post-divorce mental health problems. Specifically, the NBP aims to improve parent-child relationship quality, teach the use of effective discipline, and reduce children's exposure to inter-parental conflict (Wolchik et al. 1993). Two randomized trials of this program have been conducted (Wolchik et al. 1993, 2000). The second trial replicated the positive effects of the parenting program on children's mental health problems and tested whether a concurrent child-coping component produced additive effects. No additive effects were found at post-test or 6-month, 6-year, or 15-year follow-ups (Wolchik et al. 2002, 2007, 2013). Compared to a literature control (LC) group, at post-test, youths in the mother program showed fewer externalizing problems (Wolchik et al. 2000) and mothers reported fewer depressive symptoms (Haine et al. 2003). As adolescents (i.e., at the 6-year follow-up), youths in the NBP (mother only or Mother-Plus-Child Program) as compared to those in the LC had a lower rate of diagnosed mental disorder; used less alcohol, marijuana, and other drugs; had fewer sexual partners; reported increased academic competence; and obtained higher GPAs (Wolchik et al. 2007). Also, at the 15-year follow-up, young adults in the NBP showed reduced incidence of depression and males who were in the NBP reported less substance use and fewer substance use disorders compared to those in the LC (Wolchik et al. 2013). The current study conducts a cost-benefit analysis to assess the net economic benefits to society of participation in the NBP using data collected at the 15-year follow-up.

In recent decades, interest in assessing the cost-effectiveness of prevention programs has increased, likely due to a more limited funding and the need for a greater accountability for programs prior to dissemination (Foster et al. 2003). As a result, a number of economic evaluations of preventive interventions have been conducted, using a variety of methods to account for costs and estimate monetary benefits. For example, O'Neill, McGilloway, Donnelly, Bywater, and Kelly (2010) estimated the cost of the Incredible Years (IY) Program and used this figure to first estimate the cost per one point increase in self-report measures of intervention effectiveness (e.g., Eyberg intensity score measuring depression) at 6 months post-intervention. The authors then used the economic benefits reported for other similar programs to estimate the long-run rate of return of the IY program. Foster and Jones (2006) used similar methodology to first estimate the upfront cost of the fast track program and compare it to the outcomes achieved and then to estimate the potential value of those outcomes (using data from other studies). Other researchers have used various modeling techniques, which combine the results of a number of studies, to predict the economic benefits of preventive interventions for children and adolescents (Bonin et al. 2011; Kuklinski et al. 2012; Spoth et al. 2002). Using a decision analytic Markov model, Bonin and colleagues (2011) estimated the costs saved by preventing the development of conduct disorder at age 5 using a hypothetical *evidence-based* parenting intervention (based on several existing programs) and found significant savings over a 25-year period. Kuklinski et al. (2012) estimated the lifetime cost-benefit of reducing cigarette use and delinquency in 5th to 8th grade students who participated in Communities that Care intervention by multiplying actual program outcomes, in terms of reduced smoking and delinquency initiation, by the results of models (based on other studies) that estimated the benefits of these outcomes. Similarly, Spoth and colleagues (2002) estimated the lifetime monetary

benefits of the Iowa Strengthening Families Program and Preparing for Drug-Free Years interventions by multiplying the number of children who had initiated alcohol use at each age (the program's measured outcome) by the proportion of future alcohol use disorders expected for each group of initiators (using an estimate from another study) and then by the estimated benefits, derived from another study, for each case of alcohol use disorders avoided.

A few cost-benefit evaluations have incorporated directly measured as well as secondary source data to capture the long-term economic benefits of prevention programs. For example, Reynolds and his colleagues (2002) used both actual and projected monetary benefit data to demonstrate that involvement in the Title 1 Chicago Child-Parent Centers, which provided services to low-income families with children ages 3 to 9, reduced public expenditures for remedial education and criminal justice involvement when the youth were 21 (Reynolds et al. 2002) and 26 years old (Reynolds et al. 2011). They also calculated cost-savings from avoiding the criminal justice system (based on actual expenditures associated with arrests, payments to victims, etc.). Similar to the economic modeling approaches described above, the authors projected monetary benefits associated with graduating from high school (based on lifetime earnings, tax revenues, etc.).

The results of these studies suggest that prevention programs for at-risk groups can have net economic benefits, yet there are no published economic evaluations of prevention programs for divorced families. Further, the vast majority of these studies have used lifetime estimations or projections from secondary sources to build cost-effectiveness cases for their interventions (e.g., Bonin, et al. 2011; Kuklinski et al. 2012; Spoth et al. 2002). Additional cost-benefit evaluations, based on *actual* rather than projected cost and benefit data, are needed to more strongly support and increase confidence in the cost-effectiveness of preventive interventions for children, adolescents, and their families (Flay et al. 2005; Romeo et al. 2005).

The current study presents the findings of an economic evaluation conducted to determine cost-benefit of the NBP. Specifically, this study examined the long-term benefits of avoiding individual and societal costs associated with mothers' and young adult offsprings' mental health service use and prescription drug use, and young adults' encounters with the adult justice system using data collected 15 years after program completion. In contrast to the most previous studies, this cost-benefit analysis is based entirely on measured service use data. It was hypothesized that the monetary benefit per family for a 1-year period 15 years after the intervention would more than offset the per-family cost of implementing the NBP. Although this approach measures only one small slice of the likely benefits of the program, if this subset of benefits equals or exceeds the program's costs, it is a strong evidence of the NBP's overall positive net economic benefit to society.

## Methods

This section focuses on the methods used for the economic evaluation. More detail on the design of the experimental trial, complete inclusion and exclusion criteria, and clinical outcomes can be found in previous reports by Wolchik and her colleagues (2000; 2002;

2007; 2013). In brief, recently divorced women living in the Phoenix metropolitan area with at least one cohabitating child between 9 and 12 years old were recruited and randomly assigned during 1992/1993 to one of the two versions of the NBP (Mother Program, MP,  $n=81$  or Mother-Plus-Child Program, MPCP,  $n=83$ ) or a literature control condition (LC,  $n=76$ ). The MP consisted of a parenting-focused program that included 11 group sessions and two individual sessions, and the MPCP consisted of the MP plus an 11-session coping-focused program for children. Both the MP and MPCP included didactic presentations, videotapes, leader modeling, role plays, and home practice to help teach the program skills. Mothers and children in the LC condition received three books on children's post-divorce adjustment.

Groups were co-led by two master's-level counselors. Leaders participated in initial training (30 h) prior to the start of the groups' and weekly training (1.5 h) and supervision (1.5 h/group) during the program. To reduce barriers to participation, groups were scheduled in the evenings on weekdays and free childcare was provided.

Intervention costs for each version of the NBP and the LC were developed following procedures recommended by Foster, Porter, Ayers, Kaplan and Sandler (2007). The costs for the two version of the NBP (MP and MPCP) are reported separately due to expected variations in resource use and associated costs. Based on previous findings that the effects of the MP and MPCP on mental health, substance use, and competence outcomes did not differ (Wolchik et al. 2002, 2007, 2013), preliminary analyses examined differences in service use, medication, and justice system costs between the two groups to determine whether benefits should be examined in each group separately or the combined groups. Analyses revealed no significant differences. Thus, the two active intervention conditions were combined for the primary analysis of benefits and referred to jointly as the NBP.

Assessments occurred at pretest; post-test; and 3-month, 6-month, 6-year, and 15-year follow-ups. At the 15-year followup, trained project staff, blinded to the family's intervention condition, interviewed YAs in person (usually at home) and their mothers by phone. This economic evaluation compares the implementation cost of the intervention (MP, MPCP, or LC) to the economic benefits (NBP versus LC) during a 1-year period 15 years after program completion. The benefits consist of reduced use of mental health services and medications by YAs and mothers and reduced costs to the criminal justice system from YA encounters.

## Measures

Mothers and YAs reported on mental/behavioral healthcare use and medication use, and YAs answered questions about their encounters with the criminal justice system using an adapted version of the Services Assessment for Children and Adolescents (SACA; Stiffman et al. 2000). The SACA has shown an excellent test-retest reliability for service use in the past year and has good validity (Horowitz et al. 2001). Adaptations were made by the research team with consultation with M. Foster who had an extensive experience with the SACA (Foster and Jones 2005; Pelham et al. 2007). During the 15-year follow-up interviews, mental/behavioral healthcare service use and encounters with the criminal justice system in the past year were reported. Mothers and YAs endorsed service use in the past year in three

areas: outpatient visits (e.g., behavioral/mental health medication check with a medical doctor), counseling visits (e.g., psychologist or psychiatrist counseling), and spiritual visits (e.g., counseling administered by a member of the clergy). YAs reported on court visits, probations, and jail time in the past year. All participants who endorsed service use and/or adult justice system involvement were asked to consent to allow the research staff to obtain their mental/behavioral health providers' records and/or arrest records for the past year.

The staff time and materials required for the two versions of the NBP and the LC interventions were obtained from study records. Records included grant/budget proposals, billing records, and time sheets. Staff time was adjusted to exclude research-specific time, such as the time required for study data collection and for consenting participants. Staff time is reported at the staff level for each major task (e.g., initial training, running the groups). Staff time costs were also divided into one-time upfront costs and ongoing costs. Onetime upfront costs mainly consisted of training of the leaders. Note that in this study these costs were spread across the number of families in each group, even though the cost was independent of the number of families participating. Note also that these costs for future programs will vary on a per family basis depending on whether future groups include more or fewer families.

Ongoing costs were dependent on the number of groups running at any time. One of these cost categories (i.e., time to recruit families for groups) was dependent only on the number of groups; the rest were also dependent on the number of weekly sessions per group (weekly session leader training on that week's session topic, session preparation time, time to run each session, supervision after each session, and childcare staff time). Group leaders were involved in preparing for the sessions and running the groups. Weekly trainings and supervision for the leaders were led by doctoral-level supervisors. Recruitment and childcare were done by other research staff. Hours for each component were a function of the number of staff leading or supervising a session, or teaching or attending a training; the number of sessions (11); the number of groups (9 mother groups for MP, and 9 mother groups, and 9 child groups for MPCP); the number of cohorts of groups recruited (4 cohorts [3 cohorts of 2 MP and 2 MPCP groups and 1 cohort of 3 MP and 3 MPCP groups]); and the amount of time required for each activity. NBP participant travel costs were estimated as a 20-mile round trip per session.

### Unit Costs

All costs are reported in 2007 US dollars (USD). Where needed, costs were adjusted to 2007 USD using the Consumer Price Index (2007 Consumer Price Index Detailed Report). Costs for the benefits were calculated in 2007 USD, and costs associated with the intervention, which occurred in 1992/1993, were adjusted to 2007 USD. Unit costs for mental/behavioral healthcare service use, criminal justice components, and travel are shown in Table 1. Because the cost per visit for mental/behavioral health services varied across participants, 2007 Arizona Medicaid rates for each type of service were used to value service use. This represents a conservative calculation of mental health service costs. Several different Current Procedural Terminology (CPT) codes could be used to characterize outpatient and counseling visits, thus, we used an average across the Medicaid rates for each of the

appropriate CPT codes weighted by the actual use of these codes in participants' billing records. The average wholesale price (AWP) from the 2007 Drug Topics Red Book was used to price medications. We used local (Maricopa County or Arizona) unit costs for criminal justice encounters when these were available. Otherwise, we used published estimates (Aos et al. 2001). Participant travel costs were estimated using the Internal Revenue Service's medical mileage rate for 2007 of 20.0 cents per mile. Averages of actual salary and benefits for the staff that performed each task were used to value staff time. These values are shown in Table 2 next to each category of intervention costs. Staff costs associated with child program (CP) leaders were lower due to leaders with lower salaries leading this group. Actual purchase costs were used in Table 2 for the books provided to families in the LC, audiovisual equipment used in the sessions, and other materials and supplies used for the sessions and childcare. The cost estimates for the audiovisual equipment (durable goods) assume that the NBP groups consumed the useful life of this equipment.

### Analytic Approach

The cost-benefit analysis was calculated from the societal perspective. Economic evaluation using this perspective is recommended by the US Public Health Service's Panel on Cost Effectiveness in Health and Medicine because it captures costs and benefits to all parties and "is the only perspective that never counts as a gain what is really someone else's loss" (Gold et al. 1996, p. 7). The incremental cost of the NBP is the cost of each of the NBP minus the cost of the LC. This analysis compares the cost of the program to the benefits that can be monetized and for which we had data at the 15-year follow-up: reductions in the annual mental/behavioral healthcare service use for mothers and YAs and criminal justice system costs for YAs. To make this comparison, the benefits were discounted over 15 years using a 3 % real discount rate (Gold et al. 1996) so that they would better represent the value of those future benefits to agencies considering implementing the NBP.

This analysis follows intent-to-treat principles in that participants are analyzed in the groups to which they were originally randomly assigned (Hollis and Campbell 1999). Over the 15-year follow-up period, some participants were lost to follow-up. Due to the lack of sufficient data by which to reasonably impute missing values, we instead tested to see if the baseline similarity across the randomized groups remained at the 15-year follow-up. Baseline between-group differences were analyzed using *t* tests (continuous variables) and  $\chi^2$  tests (frequencies). Attrition analyses (Jurs and Glass 1971), using analyses of variance (continuous variables), or  $\chi^2$  tests or logistic regression (dichotomous variables), were conducted to examine whether attrition rates differed across condition and whether attrition or attrition-by-group effects were related to demographic or child functioning baseline variables.

Because cost and resource use data tend to be highly skewed, bias-corrected and accelerated bootstrap estimates (1000 replications) were used to determine confidence intervals comparing resource use and costs between groups (Barber and Thompson 2000; Efron and Tibshirani 1994). Statistical significance (i.e., when the resource use significantly differed between groups) occurred when the 95 % confidence intervals of the differences between groups did not include zero. Due to low rates of participant permission to view records

(range 32–50 %), YA and mother self-reports of service use and adult justice system involvement were used for the primary analyses. Records were used in sensitivity analyses to check the accuracy of the results. Based on the interest in costs and benefits *per family*, primary analyses focused on families where both mother and young adult participated in the 15-year follow-up assessment. Sensitivity analyses were conducted to examine the effects of using records data where they were available (rather than all self-report data) and of including all available mother and YA data—i.e., not restricting data inclusion to families in which both YAs mothers participated in the 15-year follow-up. All calculations used Excel 2010 (Microsoft Corporation, Redmond, WA) or SPSS Statistics 17.0 (SPSS, Inc., Chicago, IL).

## Results

A total of 202 (84.2 % of those randomly assigned to group) mothers and 194 (80.8 % ) YAs participated in the 15-year follow-up. Full data (paired mothers' and YAs' self-reported behavioral/mental healthcare use) were available for 181 (75.4 %) of the families randomly assigned to condition (181 families; 126 NBP and 55 LC). No baseline variables were found to significantly predict missing data for mothers or YAs. However, baseline risk (a composite variable of baseline externalizing and environmental stressors) interacted with group to significantly predict missing YA data ( $F=3.9, p=.049$ ). Probing this interaction revealed that YAs in the LC were more likely to participate in the 15-year follow-up if they were at lower risk at baseline. Risk did not predict a 15-year follow-up participation in the NBP. This difference would have the effect of reducing the benefits of the NBP in this study.

Of those who endorsed mental/behavioral health service or medication use, 38 % (53 % NBP, 9 % LC) of mothers and 50 % (38 % NBP, 62 % LC) of YAs gave permission for access to their mental healthcare services use records; and 32 % (45 % NBP, 27 % LC) of mothers and 47 % (44 % NBP, 50 % LC) of YAs gave permission for access to their pharmacy records.

### Intervention Costs

Table 2 presents the cost of the MP, MPCP, and LC. The average number of families per group was 9.0 in the MP and 9.2 in the MPCP. As expected, because the MPCP involved two sets of sessions per family (i.e., both mother and child groups), its cost was about twice that of the MP overall and for almost all cost categories. The incremental cost (cost of the program minus the cost of the LC) of the MP and MPCP was \$633 and \$1381 per family, respectively. Given that the effects of the MP and MPCP on mental health, substance use, and competence outcomes at post-test and all follow-up assessments did not differ significantly (Wolchik et al. 2000, 2002, 2007, 2013), future implementation will likely utilize the more cost-effective MP.

### Benefits at 15-Year Follow-up

Because of their similar effect on mental health, substance use, and competence outcomes at post-test and all follow-up assessments, the lack of significant differences in service use, as well as to maximize the sample size for the cost outcomes estimate, the MP and MPCP were



combined in the analyses of benefits as assessed at the 15-year follow-up. Table 3 shows the average resource use per family by resource category and group. As shown, the NBP participants generally had less use of mental/behavioral healthcare services and criminal justice encounters in the past year. Significant differences were seen in YA outpatient visits (both self-report and records) and in YA self-reported number of days in jail during the last year for those in the NBP as compared to the LC.

Table 4 shows the benefits of the NBP in terms of the dollar value of 1-year reductions (15-year follow-up) in mental/behavioral healthcare and criminal justice system encounters by group. This table applies the unit costs from Table 1 to the difference in resource use shown in Table 3 and adds the cost of YA and mother medications. In general, participants in the LC had higher healthcare and criminal justice-related costs than those in the NBP. The largest benefits were reductions in medication costs and YA criminal justice costs. Overall, the NBP produced an average incremental (net) benefit of \$1630 per family. To account for the fact that these benefits occurred 15 years after program implementation, this number was discounted to allow for direct comparison to the cost of the NBP. The discounted incremental benefits are \$1077 per family, which more than offset the \$633 per family cost of the MP version of the NBP.

### Sensitivity Analysis

Using clinic records, when available, did not produce much difference in mother and YA mental/behavioral healthcare costs nor in overall net benefits. When clinic record data were included, undiscounted net benefits went up slightly from \$1630 to \$1661 per family and discounted net benefits went up from \$1077 to \$1098 per family. Thus, it seems that participant self-report cost data were slightly lower than those collected from records.

Including all available mothers' data and all available YAs' data, rather than only data from families where both the mother and YA provided data, led to about a 9 % drop in net benefits [analysis not shown]. This drop is due to the fact that the added mothers and YAs (21 mothers who participated in the 15-year follow-up without their YAs and 13 YAs who participated without their mothers) reported little mental/behavioral healthcare use and no criminal justice encounters, thus, diluting the net benefits of the program.

### Discussion

This cost-benefit analysis showed that the NBP resulted in an estimated \$1630 per family of incremental benefits from reduced mental/behavioral healthcare service use, prescription drug use, and criminal justice encounter costs during a single year 15 years after the program. Because of the time value of money (future dollars are not worth as much as dollars today), these incremental benefits would have been worth \$1077 per family at program entry. These benefits more than pay for the \$633 of the costs for the MP version of the NBP, which has been found to be equally effective as the more costly and resource-heavy MPCP version. These significant results remained after sensitivity analyses analyzed program benefits using records instead of self-report data. These findings suggest that agencies interested in running the NBP, in addition to the beneficial outcomes demonstrated in previous studies (e.g., Wolchik et al. 2000, 2002, 2007, 2013), can expect to generate

long-term societal monetary benefits that more than pay for the cost of program implementation, particularly if they choose to run the more cost-effective MP version of the intervention.

The current findings contribute to the research on the cost-benefit of preventive interventions for youths in several ways. Although there have been a number of cost-benefit studies of prevention programs targeting youths of various ages, this is the first cost-benefit analysis of preventive parenting-focused interventions for divorced families. The large number of children who experience parental divorce in the USA (National Center for Health Statistics 2008) and the societal costs of the mental and physical health problems associated with this experience (e.g., Greenberg et al. 2003) underscore the importance of the assessing whether preventive interventions can reduce the societal burden of parental divorce. Consistent with the findings of previous studies that estimated benefits across a variety of categories, including delayed smoking or drinking initiation, reductions in welfare benefit use, both increases (more students going to college) and decreases (lower need for remedial education) in education costs, education impacts on earnings and related tax revenues, decreases in use of health and mental health services, and reductions in criminal justice system involvement costs (e.g., Barnett 1993; Barnett and Masse 2007; Belfield et al. 2006; Bonin et al. 2011; Heckman et al. 2006; Kuklinski et al. 2012; Reynolds et al. 2002, 2011; Spoth et al. 2002; Temple and Reynolds 2007), a positive cost-benefit was demonstrated. It is important to note that the current study demonstrated positive cost-benefit by assessing only the last two listed, use of mental health services and criminal justice system involvement, and only during a 1-year period. Thus, this study's results represent a conservative estimate of the potential benefits of the NBP. Also, unlike the majority of previous studies which estimated future benefits, the current study based its conclusions on actual service use and criminal justice involvement only as opposed to using secondary source data to make projections about benefits. Thus, more confident conclusions can be made that the NBP has a positive economic benefit relative to program costs.

Although detailed data on the benefits that occurred as a result of the program for the 14 years between participation in the program and the 15-year follow-up were not collected, it is likely that benefits for this 1 year underestimate the total benefits of program participation. Previous studies of the NBP have shown that the youths in the NBP had consistently fewer mental health problems immediately after the intervention; at the 6-month, 6-year, and 15-year follow-ups (Wolchik et al. 2000, 2002, 2007, 2013); and lower substance use problems at the 6-year and 15-year follow-ups (Wolchik et al. 2007, 2013). Fewer mental health and substance use problems would likely translate into less use of outpatient and counseling services and lower criminal justice costs in the NBP group across all 15 years post-intervention. Additionally, previous large-scale cost-benefit studies of prevention programs for youth have demonstrated that benefits tend to continue and cumulate over time (Barnett 1993; Belfield et al 2006; Reynolds et al 2002, 2011).

A critical issue for agencies and stakeholders may be the \$633 cost per family associated with delivering the MP. It is likely that the cost per family of running the NBP in the present day would be less due to recent adaptations of the intervention and reduced costs of necessary supplies and equipment. For example, the program has been adapted to be led by

just one clinician, reducing the costs associated with training, supervision, preparation, and leading by one half. Further, costs of required equipment (e.g., DVD players) have decreased dramatically since the NBP was first delivered in the early 1990s. Thus, the actual required costs associated with delivering the NBP at the present time would be less than those computed in this study.

The current study has several limitations. The most significant limitation is that only 1 year of benefits was estimated, and these benefits occurred 15 years after program participation. The collection of data over a greater period of time following the program would have provided a more accurate picture of the benefits of the NBP. Nevertheless, the benefits assessed for this 1-year window were enough to more than offset the costs of the more efficient (yet equally effective) version of the program—the MP. This study also likely underestimated the benefits of the program in other ways. First, attrition analyses revealed a significant group by risk interaction, such that families in the LC were more likely to participate in the 15-year follow-up if they were lower risk. This may have resulted in an underestimation of costs associated with mental healthcare service use, prescription drug costs, and criminal justice involvement for families in the control group. Also, the 6-year follow-up showed that NBP youths had improved functioning in several areas that were not monetized in this cost-benefit analysis, such as higher GPAs (Wolchik et al. 2007). These educational achievements may translate into benefits such as higher initial or career wage rates and lower unemployment. The study also did not include other benefits such as the general benefit of an improved relationship between parents and the participating child (now, young adult), nor how enhanced parenting skills may have affected other children in the home. Although the sessions occurred on weekday evenings, it is possible that some mothers had to miss work to attend. We did not collect cost data related to lost salaries or productivity, which precluded including these opportunity costs, which would have lowered net benefits, in our analyses. A final limitation involves the nature of the sample, which consisted of predominantly middle class, non-Hispanic White families. Future studies should examine the cost-benefit of the NBP with more diverse and potentially higher risk families.

Given that children from divorced families are at increased risk for a wide range of problems including depression, delinquency, and substance use problems that place a considerable economic burden on society, effective preventive interventions with this population have the potential to have a positive economic benefit to society in addition to their personal benefit to families. Current findings demonstrate that the NBP more than paid for itself through reductions in mental health service use and criminal justice costs incurred in a 1-year period, 15 years post-intervention. Based on these findings, which used highly conservative methods to estimate program benefits, investment of public dollars to increase the availability of the NBP to divorcing families is justified as an investment that will yield economic benefits to society.

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**Table 1**

## Non-staff unit costs (2007 USD)

	Unit cost	Source
Outpatient visits (per visit)	\$68.01	2007 Arizona Medicaid rate for outpatient visits <sup>a</sup>
Counseling visits (per visit)	\$84.76	2007 Arizona Medicaid rate for counseling visits <sup>a</sup>
Spiritual advisor (per visit)	\$ –	Given a zero cost for this analysis
Arrest costs (per misdemeanor arrest)	\$1031.98	Aos, et al. (2001) Table IV-D
Arrest costs (per drug arrest)	\$2553.09	Aos, et al. (2001) Table IV-D
Arrest costs (per robbery arrest)	\$16,953.42	Aos, et al. (2001) Table IV-D
Court costs (per misdemeanor conviction)	\$453.86	Aos, et al. (2001) Table IV-D
Court costs (per drug conviction)	\$2262.53	Aos, et al. (2001) Table IV-D
Court costs (per robbery conviction)	\$24,852.67	Aos, et al. (2001) Table IV-D
“Standard” probation (per year)	\$1514.75	Maricopa County Adult Probation Annual Report
One-time jail booking rate (per jail stay)	\$213.63	Maricopa County Arizona Jail Per Diem Study
Jail time (per day)	\$77.51	Maricopa County Arizona Jail Per Diem Study
Prison time (per day)	\$49.44	Arizona Department of Corrections
Travel costs to group sessions (per mile)	\$0.20	Internal Revenue Service medical mileage rate
Prescription medication (av. wholesale price)	$M=\$24.55$ , range= $\$2.25-\$65$	Drug Topic Red Book, 2007 Edition

<sup>a</sup>2007 Arizona Medicaid (known in the state as the Arizona Health Care Cost Containment System) rates were found at [www.azahcccs.gov](http://www.azahcccs.gov) and accessed in 2012. This rate is a weighted average of the Medicaid rates for the CPT codes actually used to bill for participants' care within each type of visit

**Table 2**

Intervention costs by group

	Unit cost	MP n=81		MPCP n=83		LC n=76	
		Hrs. per family	Cost per family	Hrs. per family	Cost per family	Hrs. per family	Cost per family
<b>Upfront staff costs</b>							
Initial training preparation	\$44.00	0.24	\$15.01	0.24	\$15.01		
Initial training—trainers (MP/CP)	\$53.81/\$81.61	0.73	\$39.37	0.73/2.17	\$39.37/\$176.98		
Initial training—leaders (MP/CP)	\$18.60/\$14.37	2.38	\$44.22	2.38/2.49	\$44.22/\$35.85		
Total upfront staff costs		3.35	\$98.61	8.01	\$311.44	0	\$0.00
<b>Ongoing staff costs</b>							
Weekly training—supervisors (MP/CP)	\$71.74/\$70.40	1.07	\$76.99	1.07/2.12	\$76.99/\$149.28		
Weekly training—leaders (MP/CP)	\$17.05/\$12.27	2.21	\$37.73	2.21/2.39	\$37.73/\$29.27		
Weekly supervision—supervisors (MP/CP)	\$67.08/\$75.81	1.81	\$121.48	1.81/1.79	\$121.48/\$135.64		
Weekly supervision—leaders (MP/CP)	\$17.05/\$12.27	3.62	\$61.74	3.62/3.58	\$61.74/\$43.90		
Weekly preparation—leaders	\$14.78	5.27	\$77.84	10.53	\$155.68		
Running the groups (MP/CP)	\$17.05/\$12.27	7.24	\$123.48	7.24/7.16	\$123.48/\$87.80		
Running the individual sessions (MP)	\$17.05	2.26	\$38.53	2.26	\$38.53		
Recruitment	\$14.78	1.67	\$24.63	1.67	\$24.63	1.67	\$24.63
Childcare costs	\$9.30	1.81	\$16.84	1.81	\$16.84		
Total ongoing staff costs		26.97	\$579.27	49.26	\$1102.99	1.67	\$24.63
<b>Other costs</b>							
Supplies/Equipment			\$53.40		\$53.40		\$117.30
Participants' travel			\$44.00		\$44.00		
Child group supplies					\$10.86		
Total other costs			\$97.40		\$108.26		\$117.30
Total hours and costs per family		30.32	\$775.27	57.27	\$1522.69	1.67	\$141.94



**Table 3**

Average resource use (95 % confidence interval) by family by group

	Control	NBP	Difference
Past-year average resource use (self-report)			
Mothers' outpatient visits	0.3 (0.1, 0.7)	0.3 (0.1, 0.8)	0.0 (-0.4, 0.5)
Mothers' counseling visits	0.7 (0.3, 1.5)	0.8 (0.4, 2.1)	0.1 (-0.6, 1.3)
Young adults' outpatient visits	1.3 (0.1, 5.3)	0.0 (0.0, 0.1) <sup>b</sup>	-1.3 (-5.3, -0.1)
Young adults' counseling visits	0.4 (0.1, 1.3)	0.3 (0.1, 0.7)	-0.1 (-0.9, 0.3)
Young adults' arrests	0.1 (0.0, 0.2)	0.0 (0.0, 0.1) <sup>c</sup>	-0.0 (-0.2, 0.0)
Young adults' court convictions	0.1 (0.0, 0.2)	0.0 (0.0, 0.0) <sup>d</sup>	-0.0 (-0.1, 0.0)
Young adults' probation	0.0 (0.0, 0.0) <sup>a</sup>	0.0 (0.0, 0.1) <sup>e</sup>	0.0 (0.0, 0.1)
Young adults' times sent to jail	0.1 (0.0, 0.3)	0.0 (0.0, 0.1) <sup>f</sup>	-0.0 (-0.2, 0.0)
Young adults' number of days in jail	7.0 (0.3, 39.8)	0.1 (0.0, 0.3)	-7.0 (-39.8, -0.2)
Past-year average resource use (records)			
Mothers' outpatient visits	0.4 (0.1, 0.7)	0.4 (0.2, 0.9)	0.0 (-0.4, 0.4)
Mothers' counseling visits	0.7 (0.3, 1.5)	0.7 (0.3, 2.0)	0.1 (-0.6, 1.3)
Young adults' outpatient visits	0.7 (0.1, 2.8)	0.0 (0.0, 0.1)	-0.7 (-2.8, -0.1)
Young adults' counseling visits	0.8 (0.2, 2.5)	0.3 (0.1, 0.7)	-0.5 (-2.0, 0.1)

All difference scores and confidence intervals for resource use are bias-corrected and accelerated bootstrap-generated 95 % confidence intervals. The differences are the second column minus the first column for each of the 1000 bootstrapped samples. Because bootstrapping was applied to each of the three numbers, they do not match perfectly

<sup>a</sup>One YA out of 55 reported probation

<sup>b</sup>Four YA out of 126 reported outpatient visits; one reported two

<sup>c</sup>Five YA out of 126 reported being arrested; one was arrested twice

<sup>d</sup>Four YA out of 126 reported court convictions

<sup>e</sup>Three YA out of 126 reported probation

<sup>f</sup>Four YA out of 126 reported being sent to jail; one went twice

**Table 4**

Benefits (95 % confidence interval) of the NBP in terms of 1-year mental/behavioral healthcare use and criminal justice encounters per family at the 15-year follow-up (2007 USD)

	Control	NBP	Difference
Mothers' medication costs	\$410 (184, 996)	\$182 (94, 351)	-\$227 (-836, 29)
Mothers' outpatient visits	\$23 (10, 45)	\$23 (8, 53)	-\$1 (-24, 31)
Mothers' counseling visits	\$57 (25, 129)	\$69 (31, 180)	\$12 (-51, 111)
Mothers' spiritual advisor visits	\$0 (0, 0)	\$0 (0, 0)	\$0 (0, 0)
Total mothers' mental/behavioral healthcare costs	\$490 (247, 1096)	\$274 (164, 481)	-\$216 (-811, 77)
Young adults' medications	\$177 (62, 395)	\$69 (29, 126)	-\$108 (-316, 18)
Young adults' outpatient visits	\$89 (10, 359)	\$3 (1, 6)	-\$87 (-360, -8)
Young adults' counseling visits	\$38 (9, 111)	\$26 (11, 60)	-\$12 (-77, 24)
Young adults' spiritual advisor visits	\$0	\$0 (0, 0)	\$0 (0, 0)
Total young adults' mental/behavioral healthcare costs	\$304 (103, 752)	\$98 (52, 169)	-\$206 (-655, -4)
Young adults' arrests	\$402 (65, 1887)	\$49 (16, 106)	-\$353 (-1825, 0)
Young adults' court costs for convictions	\$521 (49, 2736)	\$14 (4, 32)	-\$507 (-2711, -35)
Young adults' probation	\$27 (0, 55)	\$35 (0, 84)	\$9 (-47, 84)
Young adults' jail/prison time	\$371 (24, 2023)	\$16 (2, 47)	-\$356 (-2019, -5)
Total young adult criminal justice costs	\$1321 (165, 6674)	\$114 (47, 247)	-\$1207 (-6521, -35)
Total benefits	\$2115 (876, 7307)	\$485 (335, 724)	-\$1630 (-6633, -367)
Discounted total benefits	\$1398 (579, 4831)	\$321 (222, 479)	-\$1077 (-4517, -243)

All confidence intervals for benefits are bias-corrected and accelerated bootstrap-generated 95 % confidence intervals