Economic Impact of Multisystemic Therapy With Juvenile Sexual Offenders

Charles M. Borduin and Alex R. Dopp
University of Missouri

This study investigated the economics of multisystemic therapy for problem sexual behaviors (MST-PSB), a family-based treatment that has shown promise with juvenile sexual offenders. We evaluated the cost and benefits of MST-PSB versus usual community services using arrest data obtained in an 8.9-year follow-up from a randomized clinical trial with 48 juvenile sexual offenders, who averaged 22.9 years of age at follow-up (Borduin, Schaeffer, & Heiblum, 2009). The net benefit of MST-PSB over usual community services was calculated in terms of (a) the value to taxpayers, which was based on measures of criminal justice system expenses (e.g., police and sheriff's offices, court processing, community supervision); and (b) the value to crime victims, which was based on measures of both tangible (e.g., property damage and loss, health care, lost productivity) and intangible (e.g., pain, suffering, reduced quality of life) losses. Lower rates of posttreatment arrests in the MST-PSB versus usual community services conditions were associated with lasting reductions in expenses for both taxpayers and crime victims, with an estimated total benefit of $343,455 per MST-PSB participant. Stated differently, every dollar spent on MST-PSB recovered $48.81 in savings to taxpayers and crime victims over the 8.9-year follow-up. These findings demonstrate that a family-based treatment such as MST-PSB can produce lasting economic benefits with juvenile sexual offenders. Policymakers and public service agencies should consider these findings when making decisions about interventions for this challenging clinical population.

Keywords: cost–benefit analysis, multisystemic therapy (MST), juvenile sexual offenders, evidence-based treatment, family-based services

There is a critical need for treatments that can prevent or attenuate criminal activity among juvenile sexual offenders. Indeed, youths under the age of 18 years account for approximately 17% of all arrests for sexual crimes, not including prostitution (Federal Bureau of Investigation, 2014). These crimes have devastating effects on victims (Chapman, Dube, & Anda, 2007; Letourneau, Resnick, Kilpatrick, Saunders, & Best, 1996) and are associated with risk for continued sexual offending into adulthood (Hagan, Gust-Brey, Cho, & Dow, 2001). Moreover, the financial consequences of sexual offenses in the United States are estimated at over $1 billion per year, including costs of law enforcement,

maintenance and expansion of the correctional system, and treatment of victims (Post, Mezey, Maxwell, & Wibert, 2002). Thus, the development of effective treatments for juvenile sexual offenders would likely carry social and economic benefits. Research findings that demonstrate such benefits would be useful for policymakers to consider in their funding decisions about mental health services.

The present study investigated the economic costs and benefits of multisystemic therapy (MST) in the treatment of juvenile sexual offenders. MST is an intensive family- and community-based treatment that has demonstrated significant effects on the criminal activity of juvenile offenders in general (see Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009) and has recently shown considerable promise in the treatment of juvenile sexual offenders. The adaptation of MST to the treatment of juvenile sexual offending is known as MST for Problem Sexual Behaviors (MST-PSB; Borduin, Letourneau, Henggeler, & Swenson, 2009). To date, the effects of MST-PSB on juvenile sexual offending have been evaluated in three separate randomized clinical trials with 2.0-year (Letourneau et al., 2013), 3.0-year (Borduin, Henggeler, Blaske, & Stein, 1990), and 8.9-year (Borduin, Schaeffer, & Heiblum, 2009) follow-ups. The latter study, which compared MST-PSB with usual community services, showed that MST-PSB participants had lower recidivism rates than did their usual services counterparts for sexual (8% vs. 46%, respectively) and nonsexual (29% vs. 58%, respectively) offenses almost a decade later in young adulthood.

Given evidence for the clinical effectiveness of MST-PSB, it seems likely that this treatment could also produce significant cost savings. Indeed, a recent economic analysis estimated that standard MST produced up to $37,987 in net benefits to taxpayers and crime victims over a 25-year follow-up period relative to individual therapy (Dopp, Borduin, Wagner, & Sawyer, 2014). Although there have not been any published studies examining the economic impact of MST-PSB, various methods are available that could be used to evaluate the financial benefits of this treatment. The most powerful of these methods is cost–benefit analysis (French, Salomé, Sindelar, & McLellan, 2002), which compares the costs of an intervention with its economic benefits by converting all costs and benefits to the same metric (i.e., dollars; Boardman, Greenberg, Vining, & Weimer, 2010). In contrast, methods such as cost-effectiveness analysis and cost-utility analysis evaluate outcomes using study-specific measures (e.g., quality-adjusted life years, improved marital satisfaction, reductions in partner violence) that are difficult to compare between studies (French et al., 2002).

The Washington State Institute for Public Policy (WSIPP) first provided evidence for the financial benefits of MST in general using a cost–benefit analysis model (hereafter referred to as the WSIPP model; see Aos, Phipps, Barnoski, & Lieb, 2001) that estimates the return on investment of intervention programs for offenders based on reductions in expenses for taxpayers and crime victims. Regarding MST, the WSIPP researchers reported net benefits ranging up to $131,918 for each participant, resulting in returns of up to $28.81 for each dollar spent. Although these findings demonstrated substantial economic benefits of MST, they are nevertheless limited in three main ways. First, the WSIPP calculated benefits based on a pooled estimate of MST effects across many clinical trials, most of which focused on juvenile nonsexual offenders. Given that long-term patterns of criminal behavior are likely to differ between targeted populations (e.g., higher rates of sexual assault among sexual offenders compared with nonsexual offenders), the WSIPP findings have limited applicability to MST-PSB. Second, the WSIPP studies focused on benefits related to felony offenses but not misdemeanor offenses, the latter of which are more common and result in considerable expenses for taxpayers and crime victims (e.g., police and court resources, damage to private property; McCollister, French, & Fang, 2010). An economic evaluation that includes a broader range of crimes (i.e., both misdemeanor and felony arrests) would more fully inform funding decisions related to the adoption of MST-PSB. Third, the WSIPP researchers estimated the per-youth cost of MST based on market rates for labor and services, a method that does not capture many of the costs that are involved in implementing an MST program (e.g., quality assurance procedures). In light of the growing dissemination of MST-PSB (Borduin, Munschy, Wagner, & Taylor, 2011), real-world program costs can now be calculated using actual budgets rather than estimated costs.

This article provides a cost–benefit analysis of criminal outcomes for a sample of juvenile sexual offenders, who participated on average 8.9 years earlier in a clinical trial (Borduin, Schaeffer, & Heiblum, 2009) of MST-PSB versus a comparison treatment condition that is typical of the services provided to juvenile sexual offenders in community settings (see McGrath, Cumming, Burchard, Zeoli, & Ellerby, 2010). We adapted the WSIPP model to investigate the benefits of MST-PSB in reducing (a) taxpayer (i.e., criminal justice system) expenses as well as (b) tangible and (c) intangible expenses to crime victims. We improved on the methods used in the WSIPP studies by incorporating data on a broad range of criminal court outcomes (i.e., felonies and misdemeanors) from a sample of juvenile sexual offenders as well as cost figures from a real-world MST-PSB program.

Method

Participants

Participants were the full sample of 48 youths who participated in a randomized clinical trial (Borduin, Schaeffer, & Heiblum, 2009). In the original study, juvenile sexual offenders and their families were referred consecutively by juvenile court personnel and randomly assigned to MST-PSB ($n = 24$) or Usual Community Services (UCS; $n = 24$). Families were eligible to participate in the study if the youth (a) had been arrested for a serious sexual offense (i.e., rape/sexual assault or molestation of younger children) with a subsequent order for outpatient sexual offender counseling, (b) was currently living with at least one caregiver, and (c) showed no evidence of psychosis or serious intellectual disability. The arrest histories of the youths demonstrated their serious criminal involvement, as is standard for the population served by MST-PSB (Borduin, Letourneau, et al., 2009): The youths averaged 4.33 previous arrests ($SD = 4.81$) for sexual ($M = 1.62$) and nonsexual ($M = 2.71$) felonies. The mean age of the youths was 14.0 years ($SD = 1.9$); 95.8% were boys; 72.9% were White and 27.1% were Black, and among all youths, 2.1% indicated Hispanic ethnicity; and 31.3% lived with only one caregiver (always a biological parent). The primary caregiver of the youths included biological mothers (91.7%), biological fathers (6.3%), or stepmothers (2.1%). Families averaged 3.3 children ($SD = 1.3$), and 54.8% of the families were of lower socioeconomic status (Class IV or V; Hollingshead, 1975). Analyses of variance and chi-square tests showed no differences in pretreatment criminal histories or demographic characteristics of MST-PSB and UCS participants.

Treatment Conditions

The mean length of treatment was 30.8 weeks ($SD = 12.3$) for the MST-PSB participants and 30.1 weeks ($SD = 18.0$) for the UCS participants; these means were not significantly different, $t(46) = 0.02$, $p > .05$. Treatment completers and dropouts (i.e., two youths in the UCS condition who were placed in Department of Youth Services residential facilities) were included in each condition to provide an intent-to-treat analysis of MST-PSB effects. Details about the therapists, supervision practices, and treatment fidelity in each condition are provided in Borduin, Schaeffer, and Heiblum (2009).

MST-PSB. Standard MST interventions for youth antisocial behavior are described in a clinical volume (Henggeler & Borduin, 1990) and treatment manual (Henggeler et al., 2009). The treatment emphases of MST fit closely with findings from studies of the correlates of serious antisocial behavior, including juvenile sexual offending (e.g., Becker, 1998; Ronis & Borduin, 2007). MST targets a comprehensive set of identified risk factors (e.g., across individual, family, peer, school, and neighborhood domains) through individualized interventions. These interventions

integrate empirically supported clinical techniques from behavioral and cognitive–behavioral therapies and structural/strategic family therapy, which have historically focused on a limited aspect of the youth's social ecology (e.g., individual youth, family), into a broad-based ecological framework.

The MST-PSB approach, an adaptation of standard MST for use with juvenile sexual offenders, is described in detail elsewhere (Borduin, Letourneau, et al., 2009). The MST-PSB model is guided by the same principles and uses many of the same evidence-based techniques as in standard MST but focuses on aspects of the youth's ecology that are functionally related to the problem sexual behavior. At the family level, MST-PSB interventions often aim to (a) reduce caregiver and youth denial about the sexual offenses and their sequelae; (b) remove barriers to effective parenting; (c) help caregivers develop plans for risk reduction, relapse prevention, and victim safety; and (d) promote affection and communication among family members. At the peer level, interventions are conducted by the youth's caregivers, with the guidance of the therapist, and often consist of active support and encouragement of relationship skills and associations with non-problem peers, as well as substantive discouragement of associations with deviant peers (e.g., applying significant sanctions). Likewise, at the school level, the therapist helps caregivers to develop strategies for monitoring and promoting the youth's academic performance (e.g., establishing improved communication between caregivers and teachers, restructuring afterschool hours to promote academic efforts). Finally, in some cases, individual interventions are used with a youth or caregiver to modify the individual's social perspective-taking skills, belief system, or attitudes that contributed to sexual offending.

As with standard MST, clinical services in the present study were provided in home, school, and/or neighborhood settings at times convenient to the family. Youths and their families received multiple contacts each week (about 3 hr of intervention per week across family, school, peer, and individual systems). Therapists were available to respond to clinical problems 24 hr a day, 7 days a week. Given the clinical complexity of many cases involving juvenile sexual offenders, the MST-PSB condition had a higher average length of treatment (i.e., 7 months) and smaller therapist caseloads (i.e., four or five families) compared with standard MST; these parameters are consistent with quality assurance standards for MST-PSB (see Borduin et al., 2011).

UCS. All of the offenders in this condition received cognitive–behavioral group and individual treatment through the treatment services branch of the local juvenile court. The therapy provided in this condition represented the usual community (i.e., outpatient) treatment for juvenile sexual offenders in our judicial district and in the vast majority of other judicial districts as well (see McGrath et al., 2010). Interventions in the UCS group were provided by licensed therapists, each of whom had a master's degree in counseling psychology, clinical psychology, or social work and had been certified as a juvenile sexual offender counselor through a university-based training program. Youths attended group treatment for 90 min twice a week and individual treatment for 60–90 min once a week. Group treatment (with four to six youths, all of whom were juvenile sexual offenders and participants in the clinical trial) focused on having each youth (a) accept personal responsibility for his or her sexual offense(s), (b) eliminate deviant cognitions, (c) learn new social skills (including anger management), (d) develop victim awareness and empathy, and (e) engage in behaviors and thoughts that prevent relapse. Individual treatment was provided by a different therapist from the group leader and was designed to address barriers and reinforce progress in meeting group treatment goals.

Procedures

All procedures and measures were approved by the Institutional Review Board of the University of Missouri. Those relevant to the present study are described below.

Original study. Families were contacted by phone or home visit and asked to participate in a research assessment shortly before treatment began and after treatment had ended (see Borduin, Schaeffer, & Heiblum, 2009). Family members provided written consent or assent for the pretreatment/posttreatment research assessments and follow-up.

Data from the present study were drawn from an 8.9-year follow-up that was part of the original clinical trial. To conduct the follow-up, we obtained participants' juvenile and adult criminal records within the state of Missouri. Juvenile criminal arrest data were obtained yearly from juvenile office records by research assistants who were uninformed as to each participant's treatment condition. Adult criminal arrest data were obtained from a computerized database by a state police employee (also uninformed as to treatment condition) who conducted a search by participant name. A search of criminal records in other states was not possible because participants' fingerprints would have been required to conduct a national criminal records check, and these were not obtained at the time of consent to participate. Each arrest was coded as having taken place during the follow-up period if the arrest occurred after the date of the posttreatment assessment (or, for the two youths in the UCS condition who did not complete treatment, then after the date of termination from treatment). Furthermore, an arrest was recorded only if it (a) could be matched to the individual based on full name and date of birth or, when those indicators were absent for a specific case, on similarities to cases that met the first search criterion (e.g., previously recorded addresses, names of other individuals listed on the court docket); and (b) resulted in a conviction. Thus, the data for the present study provided a conservative estimate of criminal activity in the state of Missouri.

Multiple sources (e.g., arrest records, driver's license records, caregivers) were used to determine whether each individual had lived in Missouri and thus was available to have an arrest record during the follow-up period. Overall, 100% ($N = 48$) of the sample was located and determined to have lived in the state during the follow-up period.

Present study. This study applied the WSIPP model (see Aos et al., 2001) to the arrest records of participants in the MST-PSB and UCS conditions. The WSIPP model, which operates using Microsoft Excel, is an integrated set of estimates and computational routines designed to produce internally consistent benefit–cost ratios. The model provides monetary estimates of a vast range of costs associated with criminal offenses; these costs can be broadly categorized as pertaining to (a) taxpayer expenses, (b) tangible losses to victims, and (c) intangible losses to victims. Furthermore, the model provides formulas for comparison of the relative costs and benefits of treatment programs with each other

(i.e., based on treatment effect size). All computational routines from the original application of the WSIPP model (Aos et al., 2001) were retained in the present study.

The year 2013 was used as the baseline year for all monetary values. All values were adjusted to 2013 values using the Consumer Price Index (Bureau of Labor Statistics, 2013) to account for inflation. In addition, for crime expenses that were originally derived in other states, the values were adjusted to reflect the cost of living in the state of Missouri using the American Chamber of Commerce Researchers Association (ACCRA, n.d.) Cost of Living Index. We also used economic discounting to express any benefits of one treatment over another that accrued into the future (in the present case, over the 8.9 years following treatment) in terms of their present value. Discounting adjusts benefits to reflect the fact that the value of a dollar today is always greater than the value of the same dollar in a future year, independent of inflation, because the opportunity to use the dollar or invest it to earn additional income is deferred (Hargreaves, Shumway, Hu, & Cuffel, 1998). We used a 3% annual discount rate, derived from the average interest rate on federal bonds (i.e., the government's expected return on investment; see Gold, Siegel, Russell, & Weinstein, 1996).

Measures

Effectiveness. For verified criminal records, all arrests that resulted in convictions were coded by crime classification (i.e., felony vs. misdemeanor) and date of arrest. Felonies and misdemeanors were further classified into 11 offense categories. Felony offense categories were retained from the WSIPP model (Aos et al., 2001) and included (a) murder/manslaughter, (b) sexual (e.g., sexual assault, molestation), (c) robbery (e.g., armed, attempted), (d) assault (e.g., with intent to kill, with a deadly weapon), (e) property (e.g., auto theft, property damage), and (f) drug (e.g., distribution of controlled substance, driving under the influence—persistent offender). Misdemeanor offense categories were based on other pertinent cost–benefit studies (see McCollister et al., 2010; McCollister, French, Sheidow, Henggeler, & Halliday-Boykins, 2009; Nores, Belfield, Barnett, & Schweinhart, 2005) and included (g) theft/larceny (e.g., theft of under $500, nonpayment of child support), (h) stolen property (e.g., receiving stolen property from another person), (i) fraud (e.g., bad check, credit fraud), (l) misdemeanor assault (e.g., third degree, domestic), and (k) misdemeanor drug (e.g., drug possession, public intoxication).

MST-PSB costs. The operating costs of an MST-PSB program differ from those of UCS for juvenile sexual offenders in two key ways. First, MST-PSB programs are funded by state or local public service agencies (i.e., mental health, juvenile justice, social welfare) or Medicaid and typically are implemented by private service organizations. These organizations contract with MST Associates, the organization that provides training to MST-PSB teams nationally and ensures that programs are implemented with fidelity to the MST-PSB model. To maintain this fidelity, MST Associates employs a number of quality assurance mechanisms (i.e., staff training, organizational support, and tracking and feedback systems). Second, MST-PSB program budgets capture the costs associated with service delivery (e.g., family therapy, school meetings) and related activities (e.g., travel to homes, participation in training, supervisory meetings). These costs also differ from those associated with delivering MST-PSB in a university research setting (i.e., as was done in the original clinical trial), the latter of which is less expensive in terms of personnel (e.g., faculty provided supervision without additional fees) and quality assurance (e.g., fidelity was maintained by direct supervision from a program developer rather than weekly clinical consultation and quarterly booster training provided by a second-generation MST-PSB expert).

We used an annual budget of a private service organization in St. Louis, Missouri, in 2013 to estimate the full operating costs of an MST-PSB program in a community setting. This program was operating within its budget (i.e., actual expenditures did not exceed the budget) and is representative of financially sustainable MST-PSB programs nationwide. The budget included personnel costs (e.g., therapist salaries, supervisor salaries, payroll taxes, employee health insurance, professional fees), nonpersonnel expenditures (e.g., supplies, rent, utilities, maintenance, parking, depreciation), training and licensing costs, cell phone service contracts, and mileage reimbursement to therapists for travel related to providing services. All expenses involved in operating the MST-PSB program were summed (for a total of $407,840) and divided by the number of youths who received services through the program in 2013 (i.e., 32) to calculate the cost per youth. This cost was then adjusted for the difference in cost of living between St. Louis, Missouri, and Columbia, Missouri (i.e., the site of the original clinical trial) using the ACCRA Cost of Living Index (ACCRA, n.d.), resulting in an estimate of $12,745 per youth. This estimate is on the high end for MST-PSB programs nationally (i.e., $10,000 to $13,000 per youth; R. J. Munschy, Director, MST Associates, personal communication, September 30, 2014) and, as such, provides a conservative estimate of the net benefits of treatment.

UCS costs. In contrast to MST-PSB, usual community outpatient services for juvenile sexual offenders do not involve licensing or quality assurance costs (i.e., because treatments are selected and implemented at providers' discretion) and use a fee-for-service model in which therapist salaries, therapist supervision, and operating expenses (e.g., supplies, utilities) are captured through hourly session rates. We estimated the cost of UCS using information provided by a counseling center in Columbia, Missouri, that delivers individual and group therapy services to youths and families. Specifically, three steps were used to calculate the cost of UCS per youth. First, we obtained the hourly Medicaid reimbursement rates (including state match) for individual and group therapy as provided by master's-level clinicians in 2013; these rates were $99.26 per hour for individual therapy and $20.22 per hour for group therapy. Second, the weekly average hours of treatment for individual (i.e., 1.25 hr) and group (i.e., 3.0 hr) therapy were multiplied by the respective reimbursement rates, and the resulting values were summed to obtain the weekly cost of UCS per youth (i.e., $184.74). Finally, the weekly cost of UCS was multiplied by the average number of weeks in treatment (i.e., 30.1) to obtain an average total cost of $5,561 per youth receiving UCS.

Taxpayer benefits. Taxpayer benefits of avoided felony crimes (i.e., the cost offset to taxpayers) are defined in the WSIPP model for murder/manslaughter, sexual, robbery, assault, property, and drug offense categories. These values are based on estimates of the annual marginal capital and operating expenses for the following six public agencies: (a) police and sheriffs' offices, (b)

superior courts and county prosecutors (for court processing), (c) jail and community supervision for adult felons, (d) juvenile detention and supervision (average daily populations and lengths of stay, facility construction), (e) state juvenile rehabilitation, and (f) adult detention (average daily populations and lengths of stay, facility construction).

The values for taxpayer benefits of avoided misdemeanor crimes for theft/larceny, stolen property, and fraud offenses were based on McCollister et al. (2010). The value for misdemeanor assault offenses was taken from McCollister et al. (2009), and the value for misdemeanor drug offenses was taken from Nores et al. (2005). In all cases, these values are based on estimates of similar expenses to those used in the WSIPP model (i.e., police, court processing, and corrections costs).

Crime victim tangible benefits. Tangible benefits to crime victims (M. A. Cohen & Miller, 1998; Miller, Cohen, & Wiersema, 1996) in the WSIPP model are defined in terms of avoided expenses in the following six areas: (a) property damage or loss (including insurance claim processing expenditures), (b) medical care (e.g., hospital and physician costs, emergency transport, rehabilitation, prescriptions), (c) mental health care, (d) police and fire services, (e) victim services (e.g., legal advocacy, safe housing), and (f) lost productivity (i.e., wages, fringe benefits, and school days lost by victims; productivity lost by coworkers and supervisors). Miller et al. (1996) originally estimated the values for each offense category based on data from the National Crime Victimization Survey (Bureau of Justice Statistics, 1993).

Crime victim intangible benefits. Intangible (i.e., quality of life) benefits in the WSIPP model provide a more expansive assessment of avoided expenses by placing a monetary value on the pain and suffering of victims of fatal and nonfatal crimes. For fatal crimes, victim intangible benefits were based on more than 50 technically sound "willingness to pay" studies (Miller, Fisher, & Cohen, 2001) that estimated the amount of money that people spend to reduce risks of death. For nonfatal crimes, including sexual crimes, Miller et al. (1996) estimated intangible benefits by subtracting tangible expenses associated with the crime from the amount of compensatory damages awarded by a jury. Overall, intangible benefits estimate the intrinsic value that individuals attach (beyond tangible benefits) to avoiding victimization from crimes.

Analytic Strategy

Arrest data were analyzed to capture the incremental benefit to MST-PSB participants relative to UCS participants. Analyses were based on three sets of measures: (1) effectiveness (i.e., reductions in arrests during the 8.9-year follow-up for youths in the MST-PSB vs. UCS conditions), (2) costs (i.e., resources used to provide MST-PSB vs. UCS), and (3) benefits to taxpayers and crime victims (i.e., for MST-PSB vs. UCS). Results of the analyses were expressed in terms of a net benefit estimate and a benefit–cost ratio. MST-PSB was considered cost-beneficial relative to UCS if the net benefit was positive and the benefit–cost ratio exceeded 1.00, following standard economic decision rules (see Boardman et al., 2010).

All benefits were calculated based on the number of arrests made by police (i.e., actual rearrest rates). In addition, crime victim benefits were calculated using an assumption of multiple victimizations per arrest, based on the recommendations of leading

researchers (Aos et al., 2001; Miller et al., 1996) as well as a large body of evidence (e.g., Bureau of Justice Statistics, 2013; Elliott, 1995) suggesting that the actual numbers of offenses that are committed across various types of crimes are much greater than the numbers of arrests for such offenses. For example, the ratio of self-reported to adjudicated sexual crimes by juveniles is estimated at 25:1 (Elliott, 1995). Criminologists use lambda, an estimate of how many offenses an individual commits per arrest for a given type of crime, to calculate the number of crime victims in multiple victimization analyses (see J. Cohen, 1986). For the present study, lambdas for the pertinent offense categories were taken from Aos et al. (2001) and are as follows: murder/manslaughter, 0.01; sexual, 0.12; robbery, 0.69; assault, 1.05; property, 19.70. Furthermore, as part of the multiple victimization analyses, we used a distribution of expected crimes (from Aos et al., 2001) to account for the varying frequencies of undetected crimes in different offense categories (e.g., sexual crimes are less likely than property crimes).

For all analyses, we assumed that (a) all categories of offenses (i.e., murder/manslaughter, sexual, robbery, assault, property, drug, theft/larceny, stolen property, fraud, misdemeanor assault, misdemeanor drug) resulted in taxpayer expenditures and (b) property crimes resulted in tangible, but not intangible, losses to victims. We did not include any crime victim tangible or intangible losses for six categories of offenses because (a) two of the categories (i.e., felony and misdemeanor drug) were assumed to be victimless and (b) a distribution of expected crimes was not available from any source (including Aos et al., 2001) for four other categories (i.e., theft/larceny, stolen property, fraud, misdemeanor assault).

Finally, we conducted sensitivity analyses (see Briggs & Gray, 1999) to examine how the cumulative net benefit would be influenced by variations in values of three key parameters of the WSIPP model: (a) crime victim intangible benefits, which are the largest component of benefits in the model; (b) discount rates, which were used to express benefits over the 8.9-year follow-up period; and (c) posttreatment arrest rates, which provide the basis for estimating the benefits of MST-PSB. We evaluated whether the model was robust to influence from each parameter by examining whether the balance (i.e., positive or negative) of net benefits changed across the range of minimum and maximum plausible values that were examined (see Boardman et al., 2010).

Results

Rearrests

We calculated the percentages (i.e., recidivism rates), means, standard deviations, and relative odds of total (i.e., across all offense categories) and felony rearrests in the MST-PSB group versus the UCS group. As noted earlier, treatment completers and treatment dropouts were collapsed in each group. Odds ratios greater than 1.0 indicated higher odds for youths in the UCS condition relative to their MST-PSB counterparts. Confidence intervals for the means and odds ratios that did not include 0.0 or 1.0, respectively, indicated that results were unlikely to occur by chance (J. Cohen, 1994).

As described in Table 1, 41.67% of MST-PSB participants ($M = 1.38$ total crimes) versus 75% of UCS participants ($M =$

Table 1

Descriptive Statistics for Rearrests During Follow-Up by Therapy Condition

Variable	%	M	SD	M 95% CI	OR	OR 95% CI
Total crimes					4.20	[1.23, 14.37]
MST-PSB	41.67	1.38	2.55	[0.36, 2.40]		
UCS	75.00	5.04	7.80	[1.92, 8.16]		
Felony crimes					5.90	[1.70, 20.48]
MST-PSB	29.17	0.83	1.74	[0.13, 1.53]		
UCS	70.83	3.83	6.95	[1.05, 6.61]		

Note. Sample sizes for therapy conditions are MST-PSB ($n = 24$) and UCS ($n = 24$). MST-PSB = multisystemic therapy for problem sexual behaviors; UCS = usual community services; CI = confidence level.

5.04 total crimes) had recidivated by the end of the 8.9-year follow-up period; the odds of being arrested for any crime during follow-up were 4.20 times higher for UCS participants than for MST-PSB participants. In addition, 29.17% of MST-PSB participants versus 70.83% of their UCS counterparts committed at least one felony, with the odds of arrest for felonies 5.90 times greater in the UCS group than in the MST-PSB group. Other statistics describing clinical outcomes (e.g., survival analyses, regression coefficients) are reported in Borduin, Schaeffer, and Heiblum (2009).

Taxpayer Benefits

We initially calculated the average present (i.e., 2013) value expense to taxpayers for a single arrest in each treatment condition. As illustrated in Table 2, we began by multiplying the expense (listed in Column 2) associated with each offense category by the distribution of that crime (i.e., the percentage of arrests that fell into that category) among MST-PSB (Column 3) and UCS (Column 5) recidivists, respectively, to calculate the expected taxpayer expense per arrest category for each treatment condition (Columns 4 and 6, respectively). For example, the expense associated with

one sexual offense (i.e., $85,170) was multiplied by the respective percentages of arrests for that crime in the MST-PSB (9.09%) and UCS (22.31%) conditions to derive expected taxpayer expenses of $7,743 (MST-PSB) and $19,005 (UCS). Next, we summed the expected taxpayer expenses for all offense categories to calculate the total taxpayer expense (i.e., average present value expense) for one arrest in the MST-PSB ($17,335) and UCS ($27,549) conditions.

We then took several steps to calculate the benefit to taxpayers of providing MST-PSB over UCS. First, we multiplied the average taxpayer expense for one arrest in each treatment condition (derived in Table 2) by the average number of posttreatment arrests in each condition (i.e., 1.38 for MST-PSB, 5.04 for UCS; see Table 1). Next, we multiplied each product by the constant 0.9 to obtain the expected taxpayer expense in MST-PSB ($21,453) and UCS ($125,002). Aos et al. (2001) recommend this 10% reduction to avoid the chance that taxpayer benefits could be overstated, given that criminal justice system expenditures increase with workload but may not decrease as fast (or at all) when workload decreases (e.g., facilities remain open, staff continue to be employed). Finally, we subtracted the expected expense in MST-PSB from the expected expense in UCS to calculate the relative benefits of MST-PSB over UCS per participant (i.e., $103,550).

Crime Victim Benefits

Tangible benefits. To calculate crime victim tangible benefits of MST-PSB over UCS, we used the distribution of expected crimes from Aos et al. (2001) to account for criminal behaviors that were undetected (i.e., did not result in an arrest). We began by subtracting the mean number of felony offenses per MST-PSB participant from the mean number of felony offenses per UCS participant (Ms = 0.83 and 3.83 felonies, respectively; see Table 1) to calculate the expected change in felonies for MST-PSB relative to UCS (i.e., 3.00 felonies). Next, as illustrated in Table 3, we derived the expected tangible benefits (i.e., avoided expenses) to crime victims per participant. We first calculated avoided tan-

Table 2

Taxpayer Expenses per Arrest Category by Therapy Condition

		Therapy condition			
		MST-PSB		UCS	
Arrest category	Arrest expense ($)	Arrest distribution (%)	Expected taxpayer expense ($)[a]	Arrest distribution (%)	Expected taxpayer expense ($)[a]
Murder/manslaughter	333,826	0.00	0	0.00	0
Sexual	85,170	9.09	7,743	22.31	19,005
Robbery	87,155	3.03	2,641	0.00	0
Felony assault	53,391	0.00	0	4.96	2,647
Felony property	10,246	33.33	3,415	44.63	4,572
Felony drug	15,119	15.15	2,290	4.13	625
Theft/larceny	2,385	9.09	217	3.31	79
Stolen property	5,667	0.00	0	0.83	47
Fraud	3,622	3.03	110	2.48	90
Misdemeanor assault	2,483	12.12	301	14.05	349
Misdemeanor drug	4,080	15.15	618	3.31	135
Total		100.00	17,335	100.00	27,549

Note. All expenses are expressed in 2013 dollars. Sample sizes for therapy conditions are MST ($n = 24$) and UCS ($n = 24$); MST-PSB = multisystemic therapy for problem sexual behaviors; UCS = usual community services.
[a] Product of arrest expense/loss and arrest distribution for therapy condition.

Table 3

Crime Victim Tangible and Intangible Expenses Avoided for Multisystemic Therapy for Problem Sexual Behaviors

Arrest category	Arrest expense ($)	Distribution of expected offenses (%)[a]	Avoided expense/loss ($)[b]
Murder/manslaughter			
Tangible	977,117	0.01	49,513
Intangible	1,813,119	0.01	91,876
Sexual			
Tangible	5,913	0.07	2,098
Intangible	78,364	0.07	27,796
Robbery			
Tangible	2,235	0.41	4,644
Intangible	5,532	0.41	11,494
Felony assault			
Tangible	1,387	0.62	4,357
Intangible	7,529	0.62	23,655
Felony property			
Tangible	536	11.66	31,656
Intangible	0	11.66	0
Total			
Tangible		100.00	92,268
Intangible		100.00	154,821

Note. All expenses are expressed in 2013 dollars.
[a] From Aos et al. (2001). [b] Product of lambda, expected change in felony offenses (3.00), arrest expense/loss, and distribution of expected offenses.

gible expenses for each offense category by taking the product of (a) lambda, (b) the expected difference between MST-PSB and UCS in rates of felonies, (c) the crime victim tangible expense for the offense category, and (d) the frequency of the offense under the expected distribution. We then summed the products across offense categories to calculate the expected tangible benefits (i.e., avoided expenses) to crime victims of providing MST-PSB over UCS per participant (i.e., $92,268).

Intangible benefits. We used the same procedures as those described for tangible benefits to calculate the total avoided intangible expense to crime victims. Table 3 presents the calculation of expected intangible benefits (i.e., avoided expenses) to crime victims of providing MST-PSB over UCS per participant (i.e., $154,821).

Cumulative Benefits

We summed the benefits to taxpayers and crime victims to calculate the total expected benefits per participant. We then subtracted the value of a given expected benefit for MST-PSB (i.e., taxpayer, crime victim tangible, crime victim intangible, and total) from the value of the corresponding expected benefit for UCS to calculate each incremental expected benefit of MST-PSB (i.e., avoided costs to taxpayers and crime victims). Next, we subtracted the present value cost of providing UCS per youth ($5,561) from the present value cost of providing MST-PSB per youth in a representative community setting (i.e., $12,745) to calculate the incremental treatment cost of MST-PSB over UCS (i.e., $7,184). We then subtracted the incremental treatment cost of MST-PSB from each incremental expected benefit to obtain the net benefit of MST-PSB over UCS per participant. Finally, we divided each incremental expected benefit by the incremental treatment cost to calculate the respective benefit–cost ratios (i.e., taxpayer, crime

victim tangible, crime victim intangible, and cumulative) of MST-PSB per participant.

Table 4 summarizes the costs and benefits (i.e., net benefits and benefit–cost ratios) of providing MST-PSB relative to UCS. The cumulative net benefits of MST-PSB were $343,455 per participant. The cumulative incremental benefit of MST-PSB per dollar of cost was $48.81.

Sensitivity Analyses

To conduct the sensitivity analyses, we first calculated the minimum and maximum plausible values for each parameter. For crime victim intangible benefits, we followed Miller et al. (1996) to establish minimum and maximum values for each offense category, with (a) a confidence interval of ±$1.95 million for avoided murders (i.e., when adjusted to 2013 dollars using the Consumer Price Index [Bureau of Labor Statistics, 2013]) and (b) a standard error of ±39% for avoided nonfatal crimes. For discount rates, the minimum and maximum plausible values were set at 2% and 5%, respectively, based on the typical range of interest rates on federal bonds (i.e., the values used to estimate the discount rate; see Gold et al., 1996). For posttreatment arrest rates, we took the limits of the 95% confidence intervals for the mean felony and total rearrests in the MST-PSB and UCS conditions (shown in Table 1) to represent the minimum and maximum plausible values for each group. We then calculated the cumulative net benefit of MST-PSB by successively substituting the minimum and maximum plausible values of each parameter into the model. Table 5 presents the cumulative net benefits and associated benefit–cost ratios per participant. Net benefits were robust (i.e., remained positive) across the minimum and maximum values of crime victim intangible benefits (i.e., $227,030 to $466,907), discount rates (i.e., $288,295 to $375,261), and posttreatment arrest rates (i.e., $110,577 to $576,093).

Discussion

Policymakers are under increasing pressure to address public concerns about juvenile sexual offending with interventions that not only improve public safety but also are cost-beneficial to

Table 4

Cumulative Benefit of MST-PSB to Taxpayers and Crime Victims

Benefit	Analyses	
	Net present value ($)[a]	Benefit–cost ratio[b]
Taxpayer	96,366	14.41
Crime victim tangible	85,084	12.84
Crime victim intangible	147,637	21.55
Cumulative	343,455[c]	48.81

Note. All expenses are expressed in 2013 dollars.
[a] The difference between the benefit and the incremental cost of providing multisystemic therapy for problem sexual behaviors (MST-PSB) over usual community services (UCS), that is, $7,184. [b] The benefit divided by the incremental cost of providing MST-PSB over UCS. [c] Because taxpayer, crime victim tangible, and crime victim intangible net present values each include the incremental cost of MST-PSB over UCS, the cumulative value is not the simple sum of these benefits and has been adjusted to reflect a single incremental cost of MST-PSB.

Table 5

Cumulative Benefit of MST-PSB Based on Maximum and Minimum Plausible Values of Model Parameters

Model parameter	Maximum plausible value		Minimum plausible value	
	Net present value ($)[a]	Benefit–cost ratio[b]	Net present value ($)[a]	Benefit–cost ratio[b]
Crime victim intangible benefits	466,907	65.99	227,030	32.60
Discount rates[c]	288,295	41.13	375,261	53.24
Posttreatment arrest rates	576,903	81.19	110,577	16.39

Note. All expenses are expressed in 2013 dollars. [a] The difference between the cumulative benefit and the incremental cost of providing multisystemic therapy for problem sexual behaviors (MST-PSB) over usual community services (UCS), that is, $7,184. [b] The cumulative benefit divided by the incremental cost of providing MST-PSB over UCS. [c] Higher values for discount rates are associated with lower future benefits and, thus, with smaller net present values and benefit–cost ratios.

taxpayers and crime victims. The present study examined whether an empirically supported family-based treatment (i.e., MST-PSB) can successfully reduce the financial consequences of criminal activity perpetrated by juvenile sexual offenders. The study had several methodological strengths, including (a) a comprehensive and well-validated cost–benefit model designed for juvenile offender populations, (b) measurement of a broad range of criminal outcomes encompassing both felony and misdemeanor crimes, (c) continuous data on rearrests over a follow-up period that extended into early adulthood, and (d) actual (rather than estimated) treatment costs from real-world MST-PSB and UCS programs.

The findings demonstrate that MST-PSB produced lasting benefits to both taxpayers and crime victims when compared with a commonly used outpatient treatment for juvenile sexual offenders. In terms of taxpayer benefits, providing MST-PSB to a single juvenile sexual offender returned $96,366 to taxpayers over an average follow-up period of 8.9 years. In other words, $1 spent on MST resulted in savings of $14.41 in this domain. In addition, MST-PSB resulted in tangible benefits to crime victims (i.e., fewer property and medical expenses, greater productivity) of $85,084, with a benefit–cost ratio of $12.84 per dollar spent. When these cost offsets are considered along with taxpayer benefits, the combined savings to taxpayers and crime victims ranged up to $188,633, with a return of $27.26 per dollar spent. Moreover, MST-PSB resulted in intangible benefits to crime victims (i.e., reduced pain and suffering) of $147,637, with a benefit–cost ratio of 21.55. Taken together, the total net benefit (i.e., combining taxpayer and crime victim benefits) of providing MST-PSB was $343,455 per youth, with a return of $48.81 per dollar spent. These findings are consistent with those of other cost–benefit studies of evidence-based interventions for youth antisocial behavior, such as Communities That Care (benefit–cost ratios of 5.30 to 10.33 at a 4-year follow-up; Kuklinski, Briney, Hawkins, & Catalano, 2012), the Nurse–Family Partnership (benefit–cost ratio of 4.00 at a 15-year follow-up; Karoly et al., 1998), and the Perry Preschool Program (benefit–cost ratios of 5.67 to 12.90 at a 36-year follow-up; Nores et al., 2005). Furthermore, sensitivity analyses indicated that the estimated net benefits produced by the WSIPP model were robust to variations in key model parameters (i.e., crime victim intangible benefits, discount rates, and posttreatment arrest rates).

The economic benefits of MST-PSB observed in the present study have important implications regarding the design of treat-

ment programs for juvenile sexual offenders. More specifically, our findings highlight two key advantages of comprehensive treatment models such as MST-PSB. First, MST-PSB interventions target key social–ecological risk factors (e.g., ineffective parenting practices, negative family socialization processes, social skill and problem-solving deficits) that are related to problem sexual behaviors and that place youths on a developmental pathway (or pathways) for sexual offending. We suggest that a major limitation of typical treatments for juvenile sexual offending, such as the UCS condition in the present study, is their relatively narrow focus and failure to account for the multidetermined nature of problem sexual behaviors and other serious antisocial behaviors. Second, MST-PSB interventions are provided in natural community contexts (e.g., home, school, recreation center), which helps to diminish barriers to service access and allows for the acquisition of more accurate data regarding the assessment of identified problems and the results of interventions. Thus, MST-PSB has the capacity to produce clinical and economic benefits beyond those observed in treatments that have little bearing on the natural ecology of juvenile sexual offenders.

Many policymakers and government entities are interested in the implementation of evidence-based interventions for juvenile sexual offenders; for example, several states (e.g., Colorado, Illinois) have created Sex Offender Management Boards whose recommendations pertaining to evidence-based treatments have become legally enforced standards of care. These individuals and groups would benefit from considering the financial savings identified in the present study, given that the high initial cost of providing a family-based treatment such as MST-PSB (i.e., $12,745 per youth in 2013) may otherwise seem formidable when compared with the cost of less comprehensive services. Indeed, decision makers need to be able to compare the economic costs and benefits of an intervention on a common metric (e.g., dollars) because long-term benefits may be less salient than are the immediate costs of implementation (e.g., intensive training, rigorous quality assurance procedures, therapist travel to homes and other community settings). However, in addition to the long-term economic benefits of MST-PSB, it should be noted that financial savings are likely to exceed the cost of intervention in the first few years after starting a program. Indeed, supplementary analyses with our sample revealed that the avoided expenses that accrued in the first year after the delivery of MST-PSB resulted in a net total

benefit of $164,048 per youth, with an associated benefit–cost ratio of 23.84. Thus, it seems likely that communities that invest in a cost-beneficial treatment such as MST-PSB would recoup the initial costs within a few years and save a considerable amount of money for taxpayers and crime victims over the long term.

The present study has several methodological limitations. First, individuals may not have continuously resided in Missouri throughout the follow-up period. As a result, it is possible that a portion of the sample committed crimes in other states. However, it seems unlikely that residency length in Missouri or crimes committed outside the state would vary systematically across treatment conditions. Second, MST-PSB and UCS treatment costs were each generated from a single provider site and may not generalize to other service providers. Even so, our estimate of the cost of MST-PSB ($12,745) is high in the context of other MST-PSB programs and thus provides a conservative estimate of MST-PSB net benefits. Third, although this study included a broad range of benefits for MST-PSB, it is likely that other benefits (e.g., reduced use of social welfare services, higher income tax revenue resulting from increased employment; see Karoly et al., 1998; Nores et al., 2005) were not captured because resources were not available to track all possible outcomes associated with MST-PSB. Fourth, our study did not explore cost shifting to other sectors (e.g., mental health, primary care), although there is some evidence that MST-related reductions in out-of-home placements (e.g., psychiatric hospitalizations) are not offset by increased use of other services (Schoenwald, Ward, Henggeler, & Rowland, 2000). Fifth, the estimates of MST-PSB and UCS treatment costs used in the present study did not incorporate startup costs (e.g., program development, staff training) that are only incurred in the first year of program operation. Nevertheless, these costs are nearly equivalent in MST-PSB and UCS programs in most cases and represent a small proportion (i.e., < 10%) of a program's first-year budget. Finally, replication of our findings is necessary given the small sample size in the present study. Nevertheless, even with a small sample, the results of our sensitivity analyses suggest that the estimated net benefits were robust to uncertainty in posttreatment arrest rates.

In conclusion, the cost savings identified in this study demonstrate long-term economic benefits of implementing MST-PSB and create a persuasive argument for increased funding of this treatment model. When considered along with cost–benefit studies of standard MST (e.g., Aos et al., 2001; Dopp et al., 2014) and recommendations from professional organizations (e.g., Miner et al., 2006), the present findings suggest that comprehensive family-based treatments hold considerable promise in reducing the financial and social consequences of juvenile sexual offending. Of course, less comprehensive treatments are often cheaper and more profitable for providers to implement. Thus, funding for effective family-based treatments must be competitive to ensure their adoption within the provider community. Furthermore, because family-based treatments such as MST-PSB often require substantial changes in the organizational structure (e.g., a shift to community-based services) and culture (e.g., a continuous quality assurance and improvement system) of provider organizations, public service agencies must develop strong partnerships with providers if such programs are to achieve positive outcomes.

References

American Chamber of Commerce Researchers Association. (n.d.). *ACCRA cost of living index*. Retrieved from http://www.coli.org/

Aos, S., Phipps, P., Barnoski, R., & Lieb, R. (2001). *The comparative costs of and benefits of programs to reduce crime*. Olympia, WA: Washington State Policy Institute; Retrieved from http://www.wsipp.wa.gov/pub.asp?docid=01-05-1201

Becker, J. V. (1998). What we know about the characteristics and treatment of adolescents who have committed sexual offenses. *Child Maltreatment, 3*, 317–329. http://dx.doi.org/10.1177/1077559598003004004

Boardman, A. E., Greenberg, D. H., Vining, A. R., & Weimer, D. L. (2010). *Cost–benefit analysis: Concepts and practice* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

Borduin, C. M., Henggeler, S. W., Blaske, D. M., & Stein, R. J. (1990). Multisystemic treatment of adolescent sexual offenders. *International Journal of Offender Therapy and Comparative Criminology, 34,* 105–113. http://dx.doi.org/10.1177/0306624X9003400204

Borduin, C. M., Letourneau, E. J., Henggeler, S. W., & Swenson, C. C. (2009). *Treatment manual for multisystemic therapy with problem sexual behavior youths and their families* (2nd ed.). Unpublished manuscript, Department of Psychological Sciences, University of Missouri.

Borduin, C. M., Munschy, R. J., Wagner, D. V., & Taylor, E. K. (2011). Multisystemic therapy with juvenile sexual offenders: Development, validation, and dissemination. In D. P. Boer, R. Eher, L. A. Craig, M. H. Miner, & F. Pfafflin (Eds.), *International perspectives on the assessment and treatment of sexual offenders: Theory, practice, and research* (pp. 263–285). New York, NY: Wiley. http://dx.doi.org/10.1002/9781119990420.ch13

Borduin, C. M., Schaeffer, C. M., & Heiblum, N. (2009). A randomized clinical trial of multisystemic therapy with juvenile sexual offenders: Effects on youth social ecology and criminal activity. *Journal of Consulting and Clinical Psychology, 77,* 26–37. http://dx.doi.org/10.1037/a0013035

Briggs, A. H., & Gray, A. M. (1999). Handling uncertainty in economic evaluations of healthcare interventions. *British Medical Journal, 319,* 635–638. http://dx.doi.org/10.1136/bmj.319.7210.635

Bureau of Justice Statistics. (1993). *Criminal victimization in the United States, 1992*. Washington, DC: U. S. Department of Justice.

Bureau of Justice Statistics. (2013). *Criminal victimization in the United States, 2012*. Washington, DC: U. S. Department of Justice.

Bureau of Labor Statistics. (2013). *Inflation calculator*. Retrieved from http://www.bls.gov/data/inflation_calculator.htm

Chapman, D. P., Dube, S. R., & Anda, R. F. (2007). Adverse childhood events as risk factors for negative mental health outcomes. *Psychiatric Annals, 37,* 359–364.

Cohen, J. (1986). Research on criminal careers: Individual frequency rates and offense seriousness. In A. Blumstein, J. Cohen, J. A. Roth, & C. Visher (Eds.), *Criminal careers and "career criminals"* (Vol. 1, pp. 292–418). Washington, DC: National Academy Press.

Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist, 49,* 997–1003. http://dx.doi.org/10.1037/0003-066X.49.12.997

Cohen, M. A., & Miller, T. R. (1998). The cost of mental health care for victims of crime. *Journal of Interpersonal Violence, 13,* 93–110. http://dx.doi.org/10.1177/088626098013001006

Dopp, A. R., Borduin, C. M., Wagner, D. V., & Sawyer, A. M. (2014). The economic impact of multisystemic therapy through midlife: A cost–benefit analysis with serious juvenile offenders and their siblings. *Journal of Consulting and Clinical Psychology, 82,* 694–705. http://dx.doi.org/10.1037/a0036415

Elliott, D. S. (1995). *Lies, damn lies, and arrest statistics*. Boulder, CO: Center for the Study and Prevention of Violence.

Federal Bureau of Investigation. (2014). *Crime in the United States, 2013*. Washington, DC: U. S. Department of Justice.

French, M. T., Salomé, H. J., Sindelar, J. L., & McLellan, A. T. (2002). Benefit–cost analysis of addiction treatment: Methodological guidelines and empirical application using the DATCAP and ASI. *Health Services Research, 37,* 433–455. http://dx.doi.org/10.1111/1475-6773.031

Gold, M. R., Siegel, J. E., Russell, L. B., & Weinstein, M. C. (1996). *Cost-effectiveness in health and medicine.* New York, NY: Oxford University Press.

Hagan, M. T., Gust-Brey, K. L., Cho, M. E., & Dow, E. (2001). Eight-year comparative analyses of adolescent rapists, adolescent child molesters, other adolescent delinquents, and the general population. *International Journal of Offender Therapy and Comparative Criminology, 45,* 314–324. http://dx.doi.org/10.1177/0306624X01453004

Hargreaves, W. A., Shumway, M., Hu, T., & Cuffel, B. (1998). *Cost-outcome methods for mental health.* San Diego, CA: Academic Press.

Henggeler, S. W., & Borduin, C. M. (1990). *Family therapy and beyond: A multisystemic approach to treating the behavior problems of children and adolescents.* Pacific Grove, CA: Brooks/Cole.

Henggeler, S. W., Schoenwald, S. K., Borduin, C. M., Rowland, M. D., & Cunningham, P. B. (2009). *Multisystemic therapy for antisocial behavior in children and adolescents* (2nd ed.). New York, NY: Guilford Press.

Hollingshead, A. B. (1975). *The four-factor index of social status.* Unpublished manuscript, Yale University, New Haven, CT.

Karoly, L. A., Greenwood, P. W., Everingham, S. S., Hoube, J., Kilburn, M. R., Rydell, C. P., . . . Chiesa, J. (1998). *Investing in our children: What we know and don't know about the costs and benefits of early childhood interventions.* Santa Monica, CA: RAND Corporation.

Kuklinski, M. R., Briney, J. S., Hawkins, J. D., & Catalano, R. F. (2012). Cost–benefit analysis of Communities That Care outcomes at eighth grade. *Prevention Science, 13,* 150–161. http://dx.doi.org/10.1007/s11121-011-0259-9

Letourneau, E. J., Henggeler, S. W., McCart, M. R., Borduin, C. M., Schewe, P. A., & Armstrong, K. S. (2013). Two-year follow-up of a randomized effectiveness trial evaluating MST for juveniles who sexually offend. *Journal of Family Psychology, 27,* 978–985. http://dx.doi.org/10.1037/a0034710

Letourneau, E. J., Resnick, H. S., Kilpatrick, D. G., Saunders, B. E., & Best, C. L. (1996). Comorbidity of sexual problems and posttraumatic stress disorder in female crime victims. *Behavior Therapy, 27,* 321–336. http://dx.doi.org/10.1016/S0005-7894(96)80020-7

McCollister, K. E., French, M. T., & Fang, H. (2010). The cost of crime to society: New crime-specific estimates for policy and program evalua-

tion. *Drug and Alcohol Dependence, 108,* 98–109. http://dx.doi.org/10.1016/j.drugalcdep.2009.12.002

McCollister, K. E., French, M. T., Sheidow, A. J., Henggeler, S. W., & Halliday-Boykins, C. A. (2009). Estimating the differential costs of criminal activity for juvenile drug court participants: Challenges and recommendations. *The Journal of Behavioral Health Services & Research, 36,* 111–126. http://dx.doi.org/10.1007/s11414-007-9094-y

McGrath, R. J., Cumming, G. F., Burchard, B. L., Zeoli, S., & Ellerby, L. (2010). *Current practices and emerging trends in sexual abuser management: The Safer Society 2009 North American survey.* Brandon, VT: Safer Society Press.

Miller, T. R., Cohen, M. A., & Wiersema, B. (1996). *Victim costs and consequences: A new look.* Washington, DC: National Institute of Justice.

Miller, T. R., Fisher, D. A., & Cohen, M. A. (2001). Costs of juvenile violence: Policy implications. *Pediatrics, 107,* e3. http://dx.doi.org/10.1542/peds.107.1.e3

Miner, M., Borduin, C., Prescott, D., Bovensmann, H., Schepker, R., DuBois, R., . . . Pfäfflin, F. (2006). International Association for the Treatment of Sexual Offenders: Standards of care for juvenile sexual offenders. *Sexual Offender Treatment, 1,* 1–7.

Nores, M., Belfield, C. R., Barnett, W. S., & Schweinhart, L. (2005). Updating the economic impacts of the High/Scope Perry Preschool Program. *Educational Evaluation and Policy Analysis, 27,* 245–261. http://dx.doi.org/10.3102/01623737027003245

Post, L. A., Mezey, N. J., Maxwell, C., & Wibert, W. N. (2002). The rape tax: Tangible and intangible costs of sexual violence. *Journal of Interpersonal Violence, 17,* 773–782. http://dx.doi.org/10.1177/0886260502017007005

Ronis, S. T., & Borduin, C. M. (2007). Individual, family, peer, and academic characteristics of male juvenile sexual offenders. *Journal of Abnormal Child Psychology, 35,* 153–163. http://dx.doi.org/10.1007/s10802-006-9058-3

Schoenwald, S. K., Ward, D. M., Henggeler, S. W., & Rowland, M. D. (2000). Multisystemic therapy versus hospitalization for crisis stabilization of youth: Placement outcomes 4 months postreferral. *Mental Health Services Research, 2,* 3–12. http://dx.doi.org/10.1023/A:1010187706952