Washington State Institute for Public Policy

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CHEMICAL DEPENDENCY TREATMENT FOR OFFENDERS: *A REVIEW OF THE EVIDENCE AND BENEFIT-COST FINDINGS*

Summary

The Washington State Institute for Public Policy was directed by the 2012 Legislature to review whether chemical dependency treatment in the adult and juvenile justice systems reduces crime and substance abuse. The Institute was also asked to estimate the monetary benefits and costs of these programs.

We conducted a systematic review of research studies to determine if, on average, these programs have been shown to reduce crime. To narrow our review of this vast literature, we focused on the type of chemical dependency programs funded by Washington taxpayers.

We located 55 unique studies with sufficient research rigor to include in our review. Programs for adult offenders have been evaluated more frequently than for juveniles. Of the 55 studies, 45 evaluated treatments delivered to adults while only 10 were for juveniles.

Our findings indicate a variety of chemical dependency treatments are effective at reducing crime. Recidivism is reduced by 4-9%. Some programs also have benefits that substantially exceed costs.

We found that community case management for adult substance abusers has a larger effect when coupled with "swift and certain." This finding is consistent with an emerging trend in the criminal justice literature—that swiftness and certainty of punishment has a larger deterrent effect than the severity of punishment.

The Washington State Institute for Public Policy (Institute) was directed by the 2012 Legislature to review chemical dependency treatment in the adult and juvenile justice systems to determine whether the programs reduce crime and substance abuse.[1] The Institute was also asked to estimate monetary benefits and costs.

Substance abuse is prevalent among offender populations in Washington State. According to the Department of Corrections (DOC), over 50% of all offenders under its jurisdiction need chemical dependency treatment. Among juvenile offenders, the Juvenile Rehabilitation Administration (JRA) reports that 65% need chemical dependency treatment.[2]

The Institute has received assignments in the past to identify "what works?" for a variety of public policies including criminal justice.[3] This project updates and extends our work for chemical dependency programs for offenders. We focus on programs currently funded by Washington taxpayers to determine whether these programs cost-effectively reduce crime.

It is important to note that this study is not an outcome evaluation of whether specific chemical dependency programs in Washington State affect recidivism. Rather, we systematically review the national research to provide insight on the likely effectiveness of the general types of chemical dependency programs funded in Washington.

Systematic reviews have the benefit of informing policymakers quickly and at a lower cost than outcome evaluations. However, to ensure taxpayers are achieving at least the average effects we report here, we recommend conducting outcome evaluations of programs in Washington.

Section I of this report outlines our research approach to identifying evidence-based programs, and Section II discusses findings. Appendices contain detail on our findings and methods.

[1] 3ESHB 2127, Chapter 7, Laws of 2012, Section 606

[2] Correspondence with the DOC and JRA.

[3] Lee, S., Aos, S., Drake, E., Pennucci, A., Klima, T., Miller, M., Anderson, L., Mayfield, J., & Burley, M. (2012). *Return on investment: Evidence-based options to improve statewide outcomes* (12-04-1201). Olympia: Washington State Institute for Public Policy.

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I. BACKGROUND & RESEARCH APPROACH

The Washington State legislature began to enact statutes during the mid-1990s to promote an evidence-based approach to several public policies. "Evidence-based" has not been consistently defined in legislation, but it has been generally described as a program or policy supported by rigorous research clearly demonstrating effectiveness.

Since that time, the legislature also began to require benefit-cost analyses of certain state-funded programs and practices to determine if taxpayers receive an adequate return on investment. Benefit-cost analysis examines, systematically, the monetary value of programs or policies to determine whether the benefits from the program exceed its costs. In the criminal justice field, benefit-cost analysis can help policymakers identify budget options that save taxpayer dollars without compromising public safety.

Previous research conducted by the Institute on the adult and juvenile justice systems was part of an ongoing effort to improve Washington's criminal justice system by informing the budget and policymaking process, thereby facilitating the investment of state dollars in programs proven through research to be effective.[4]

ASSIGNMENT AND SCOPE OF REVIEW

To accomplish the current legislative assignment, we systematically reviewed the research literature on chemical dependency treatments delivered specifically to offender populations. A variety of chemical dependency interventions exist, which can generally be placed into two broad categories.[5]

Therapeutic interventions include "therapeutic communities," inpatient or residential treatment, outpatient treatment, cognitive behavioral therapy, individual and group counseling, and 12-step programs. These programs can be delivered in prison, jail, partial confinement facilities such as work release, or in the community.

System approaches for chemically dependent offenders include interventions such as drug courts, case management for offenders on probation or parole, drug sentencing alternatives (diversion from incarceration), and increased urinalysis testing. These approaches may or may not be incorporated with therapeutic interventions.

To narrow our review of this vast literature, we focused our work on policy-relevant programs funded by Washington State taxpayers.[6] For example, DOC delivers three broad chemical dependency services to its population: therapeutic communities, intensive outpatient, and outpatient treatment. These treatment modalities are available to offenders in prison and while on supervision in the community. We reviewed these types of interventions for our current assignment.

We also reviewed case management in the community for adult offenders with substance abuse problems. This topic is particularly relevant to DOC given recent changes in the way it supervises offenders in the community.[7] Under the new supervision model, DOC targets an offender's criminogenic factors—for example, substance abuse—with evidence-based interventions. Based on this new supervision approach, the 2012 Legislature allotted an additional $3.8 million for chemical dependency treatment in Fiscal Year (FY) 2013.[8]

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[4] See: Drake, E. (2010). *Washington State Juvenile Court Funding: Applying Research in a Public Policy Setting* (Document No.10-12-1201). Olympia: Washington State Institute for Public Policy; and Aos, S., Miller, M., & Drake, E. (2006). *Evidence-Based Public Policy Options to Reduce Future Prison Construction, Criminal Justice Costs, and Crime Rates* (Document No.06-10-1201). Olympia: Washington State Institute for Public Policy.

[5] Another broad category that could be considered for review is "substitution therapy"—illicit drugs are substituted, under the supervision of a doctor, with a medically prescribed drug intended to relieve the negative side effects (withdrawal and cravings) of the illicit drug. A relatively large literature exists on substitution therapy; however, due to time constraints, we did not include it in this review.

[6] We updated systematic reviews for all chemical dependency programs for offenders with the exception of adult and juvenile drug courts. We have reviewed the drug court literature extensively in the past and show our previous findings in this report.

[7] 2E2SSB 6204, Chapter 6, Laws of 2012. See also: Department of Corrections (May 2012). *Changing Community Supervision A Shift Towards Evidence Based Corrections.* Retrieved from: http://www.doc.wa.gov/aboutdoc/docs/2E2SSB6204WhitePaper.pdf

[8] The total chemical dependency treatment budget for FY 2013 is $22.7 million according to correspondence with the Department of Corrections on December 10, 2012.

For juvenile offenders, JRA delivers inpatient and outpatient treatment to youth in need of chemical dependency treatment. Inpatient services provide 24-hour care while outpatient services are approximately eight hours per week. Youth adjudicated by the juvenile courts who remain under the jurisdiction of the county also access inpatient and outpatient services.

METHODS

This research estimates the effectiveness of substance abuse treatment programs for offenders with chemical dependency issues.[9] The Institute's research approach to identifying evidence-based programs and policies has three main steps.[10]

- ✓ First, we determine "what works" (and what does not work) to reduce crime or substance abuse, using a statistical technique called meta-analysis.
- ✓ Second, we calculate whether the benefits of a program exceed its costs. This economic test demonstrates whether the monetary value of the program's benefits justifies a program's expenditures.
- ✓ Third, we estimate the risk of investing in a program by testing the sensitivity and uncertainty of our modeling assumptions. Risk analysis provides an indication of the likelihood that, when key estimates are varied, the benefits consistently exceed costs.

What works (and what does not)? We systematically reviewed the national literature and located all outcome evaluations of chemical dependency treatments within our scope of work that are delivered to adult and juvenile offenders. We reviewed and included studies regardless of whether or not the outcomes were favorable.

We assessed whether each study met minimum standards of research rigor. For example, to be included in our review, a study must have had a treatment and comparison group and demonstrated comparability between groups on important preexisting differences such as criminal history or level of substance abuse.

We did not include a study in our analysis if the treatment group consisted solely of program completers. We adopted this rule to avoid unobserved self-selection factors that distinguish a program completer from a program dropout. These unobserved factors are likely to significantly bias estimated treatment effects.[11]

Our primary outcome of interest is crime. Thus, to be included in our analysis, studies must have reported some measure of criminal recidivism. When provided, we also recorded substance abuse outcomes. In an effort to obtain internal consistency, when studies reported multiple outcomes, we followed a hierarchy of coding rules. For example, preference was given to the outcome with the longest follow-up period because we are interested in the longer term effects of programs on crime.[12]

A study had to provide the necessary information to calculate an *effect size*. An effect size measures the degree to which a program has been shown to change an outcome (such as recidivism) for program participants relative to a comparison group. The calculation of an effect size allows researchers to compare studies that use different measures of recidivism, such as arrests or convictions, or different follow-up periods.

[9] The draft of the Diagnostic and Statistical Manual-5 uses the terms "addiction" and "disorder." Its predecessor, the DSM-IV, uses the terms "dependence" and "abuse." These terms have clear distinctions for clinicians. For the purposes of this report, we do not differentiate between substance addiction, disorder, dependence, or abuse. The studies we reviewed for this report include a wide spectrum depending on the program and the intended population.

[10] Appendix C of this report describes our meta-analytic and benefit-cost methods.

[11] Lipsey, M. W., & Wilson, D. (2001). *Practical meta-analysis.* Thousand Oaks, CA: Sage Publications.

[12] The average follow-up period for the studies we reviewed was 23 months.

The individual effect sizes from each study are combined to produce a weighted average effect size for a topic (e.g., therapeutic communities).[13] The "average" effect size tells us whether and to what degree the program works. The effect size also provides a magnitude of the overall effectiveness when comparing different topics.

Chemical dependency programs in Washington may achieve more or less than the average effect from our review of the national literature. To test whether Washington's programs achieve these average effects, we recommend following up this systematic review with outcome evaluations of programs in Washington.

Benefit-Cost. The Institute's benefit-cost model generates standard summary statistics—net present value, benefit-cost ratio, and return on investment—that can be used to assess the program, and provide a consistent comparison with the benefit-cost results of other programs and policies.

In benefit-cost analyses of criminal justice programs, the valuation of benefits in monetary terms often takes the form of cost savings when crime is avoided. Crime can produce many costs, including those associated with the criminal justice system as well as those incurred by crime victims. When crime is avoided, these reductions lead to monetary savings or benefits. Thus, benefit-cost analysis requires estimating the number and types of crimes avoided, due to the evidence-based program, and determining the monetary value associated with that crime reduction.

For each of the programs included in this review, we collected program cost information from Washington State agencies. The sum of the estimated benefits, along with the program cost, provides a statewide view on whether a program produces benefits that exceed costs.

In addition to crime outcomes, we analyzed and coded effect sizes for substance abuse when available. For this report, however, we were unable to calculate monetary benefits of reductions in substance abuse. The Institute's benefit-cost model on substance abuse contains procedures to estimate the monetary value of changes in the disordered use of alcohol and illicit drugs according to the Diagnostic and Statistical Manual-IV (DSM-IV). The DSM-IV has become the standard for evaluating and diagnosing mental disorders.

However, none of the studies included in our systematic review reported disordered substance use as measured by the DSM-IV. The studies we reviewed for this report include a wide spectrum of substance abuse measures depending on the program and the intended population (e.g., self-reported substance use, abstinence, days used, or positive urinalysis screening). Although we code and display these effect sizes, we cannot calculate the benefit to taxpayers until our model can monetize these non-DSM-IV outcomes.

Risk. The third analytical step involves testing the robustness of our results. Any tabulation of benefits and costs involves some degree of speculation about future performance. To assess the riskiness of our conclusions, we perform a "Monte Carlo" simulation in which we vary the key factors of our calculations. The purpose of the risk analysis is to determine the odds that a particular policy option will at least break even.

[13] Following standard meta-analytic procedures, random effects inverse variance weights are used to calculate the weighted average effect size for each topic.

II. FINDINGS

In this section, we summarize the findings from our systematic review of the literature for chemical dependency interventions for adult and juvenile offenders. We found 55 unique evaluations with sufficient research rigor to be included in our meta-analysis, contributing 80 unique effect sizes.

The results are displayed in a Consumer Reports-like list of what works and what does not. As displayed in **Exhibit 1**, there are a number of evidence-based options that can help policy makers achieve desired outcomes, as well as offer taxpayers a good return on their investment, with low risk of failure. Washington is already investing in several of these options.

Column (2) in **Exhibit 1** displays our estimates of the total benefits—the sum of the taxpayer and non-taxpayer benefits in columns (3) and (4)—for each program reviewed. The annual program cost, per participant, is shown in column (5). Program costs were obtained from DOC or JRA when possible.

Financial summary statistics are displayed in columns (6) through (9). The risk analysis results are shown in column (9). As previously mentioned, we estimate the risk of investing in a program by testing the sensitivity and uncertainty of our estimates. Risk analysis provides an indication of the likelihood that, when key assumptions vary, the return on investment consistently demonstrates that benefits exceed costs. Appendix B displays the detail of our benefit-cost analysis for each type of treatment.

The main findings that emerge from our analysis include:

1) Substance abuse treatment appears to be effective. We found that recidivism was reduced between 4% and 9%. We also found that a variety of treatments have benefits that exceed costs.

2) Drug treatment for adults during incarceration is more effective than drug treatment delivered in the community.

3) Outpatient treatment for adults during incarceration has approximately the same effect as inpatient or intensive outpatient treatment.

4) Community case management for adult offenders that uses "swift and certain" or "graduated sanctions" has a larger effect on crime than case management alone. Swift and certain sanctions provide quick responses when an offender violates the terms of supervision. This finding is consistent with an emerging trend in the criminal justice literature—that swiftness and certainty of punishment has a larger deterrent effect than the severity of punishment.[14]

5) Lastly, 45 of the 55 studies included in this review were chemical dependency treatments delivered to adults. Less is known about chemical dependency treatments for youth in the juvenile justice system. Thus, we were not able to determine the effectiveness of as many various treatment modalities for juvenile offenders as we could with chemical dependency treatment for adults.

The Institute was also directed by the Legislature to investigate the effect of the duration of treatment and aftercare on outcomes. To address this question, we conducted a regression analysis of the 80 unique effect sizes from our systematic review. Unfortunately, this group of studies did not allow us to reliably estimate whether the duration of treatment, or the provision of aftercare, affects recidivism.

Thus, while this analysis allows us to conclude that a variety of chemical dependency programs lower recidivism and save money, the existing research literature does not enable us to peer into the "black box" to determine whether treatment dosage or aftercare are key elements of effective chemical dependency programs. To test these two additional legislative questions, we recommend conducting a detailed outcome evaluation of programs in Washington.

[14] See: Durlauf, S. N., & Nagin, D. S. (2011). *The Deterrent Effect of Imprisonment*. In PJ Cook, J Ludwig, and J McCrary (eds.) *Controlling Crime: Strategies and Tradeoffs* Chicago: University of Chicago Press; and Hawken, A., & Kleiman, M. (2009). Managing drug involved probationers with swift and certain sanctions: Evaluating Hawaii's HOPE. Malibu, CA: Pepperdine University, School of Public Policy.

Exhibit 1

Monetary Benefits and Costs of Chemical Dependency Treatment for Offenders

As of December 2012

Topic Area/Program Benefits and costs are life-cycle present-values per participant, in 2011 dollars. See Appendix C for program-specific details.	Last Updated	Monetary Benefits			Costs	Summary Statistics		
		Total Benefits	Taxpayer	Non-Taxpayer		Benefits Minus Costs (net present value)	Benefit to Cost Ratio	Odds of a Positive Net Present Value
Adult Offenders								
Drug treatment during incarceration	Dec. 2012	$13,311	$3,415	$9,896	($2,781)	**$10,531**	$4.79	100%
1) Therapeutic communities	Dec. 2012	$11,075	$2,841	$8,234	($4,280)	**$6,795**	$2.59	100%
2) Other drug treatment (non-therapeutic communities)	Dec. 2012	$16,547	$4,232	$12,315	($841)	**$15,706**	$19.68	100%
Inpatient or intensive outpatient	Dec. 2012	$16,462	$4,189	$12,274	($1,186)	**$15,276**	$13.88	100%
Outpatient or non-intensive	Dec. 2012	$15,975	$4,083	$11,892	($580)	**$15,395**	$27.55	100%
Drug treatment delivered in the community	Dec. 2012	$8,748	$2,247	$6,501	($1,604)	**$7,143**	$5.45	100%
1) Therapeutic communities	Dec. 2012	$10,782	$2,708	$8,075	($2,423)	**$8,359**	$4.45	100%
2) Other drug treatment (non-therapeutic communities)	Dec. 2012	$3,887	$970	$2,918	($783)	**$3,104**	$4.96	69%
Inpatient or intensive outpatient (community)	Dec. 2012	$3,419	$856	$2,563	($930)	**$2,489**	$3.68	87%
Outpatient or non-intensive	Dec. 2012	$5,734	$1,437	$4,297	($580)	**$5,154**	$9.89	99%
Case management for substance-abusing offenders	Dec. 2012	$8,528	$2,144	$6,384	($4,757)	**$3,770**	$1.79	91%
1) Swift & certain sanctions	Dec. 2012	$18,810	$4,738	$14,072	($4,756)	**$14,054**	$3.95	100%
2) Other case management (not swift & certain)	Dec. 2012	$5,377	$1,357	$4,021	($4,767)	**$610**	$1.13	55%
Therapeutic communities for offenders with a co-occurring disorders	Dec. 2012	$25,247	$6,455	$18,793	($3,575)	**$21,672**	$7.06	100%
Drug courts	April 2012	$7,391	$1,935	$5,456	($4,183)	**$3,208**	$1.77	100%
Juvenile Offenders								
Drug treatment for juvenile offenders	Dec. 2012	$7,868	$1,883	$5,985	($3,646)	**$4,222**	$2.16	87%
1) Therapeutic communities (incarceration or community)	Dec. 2012	$11,028	$2,262	$8,766	($4,461)	**$6,567**	$2.47	77%
2) Other drug treatment (non-therapeutic communities)	Dec. 2012	$4,922	$1,154	$3,768	($3,150)	**$1,772**	$1.56	65%
Multidimensional Family Therapy (MDFT) for substance abusers	Dec. 2012	$23,660	$5,586	$18,074	($5,712)	**$17,948**	$4.14	84%
Drug courts	April 2012	$13,861	$3,206	$10,656	($3,088)	**$10,773**	$4.49	94%

APPENDIX A: EFFECT SIZES BY TREATMENT TYPE

In this appendix, we present a summary of our meta-analytic findings of chemical dependency treatments on crime and substance abuse. The individual effect sizes from each study are combined to produce a weighted average effect size for each treatment. The average effect size tells us whether and to what degree the program works. The effect size also provides a magnitude of the overall effectiveness when comparing different treatments.

Exhibit A1

Summary of Meta-Analytic Findings of Chemical Dependency Treatments: Crime Outcomes

Treatment	Adjusted Effect Size	Standard Error	Number Studies	p-value
Adult Offenders				
Drug treatment during incarceration	-0.142	0.022	32	0.000
1) Therapeutic communities	-0.118	0.029	18	0.000
2) Other drug treatment (non-therapeutic communities)	-0.177	0.031	14	0.000
Inpatient or intensive outpatient	-0.172	0.054	6	0.001
Outpatient or non-intensive	-0.173	0.047	8	0.000
Drug treatment delivered in the community	-0.085	0.031	17	0.006
1) Therapeutic communities	-0.147	0.045	8	0.001
2) Other drug treatment (non-therapeutic communities)	-0.048	0.039	9	0.221
Inpatient or intensive outpatient	-0.048	0.106	5	0.649
Outpatient or non-intensive	-0.076	0.046	4	0.099
Case management for substance-abusing offenders	-0.114	0.051	20	0.005
1) Swift & certain sanctions	-0.232	0.078	7	0.003
2) Other case management (not swift & certain)	-0.074	0.073	13	0.457
Therapeutic communities for offenders with co-occurring disorders	-0.270	0.097	4	0.002
Juvenile Offenders				
Drug treatment for juvenile offenders	-0.070	0.052	10	0.120
1) Therapeutic communities (incarceration or community)	-0.060	0.075	4	0.131
2) Other drug treatment (non-therapeutic communities)	-0.046	0.075	6	0.457
Multidimensional Family Therapy (MDFT) for substance abusers	-0.217	0.277	1	0.030

Note: The standard errors reported in this table are inverse variance effects. See Appendix B for more detailed findings and Appendix C for our methods and procedures.

Exhibit A2

Summary of Meta-Analytic Findings of Chemical Dependency Treatments: Substance Use Outcomes

Treatment type	Adjusted Effect Size	Standard Error	Number Studies	p-value
Adult Offenders				
Drug treatment during incarceration	-0.012	0.022	5	0.882
Therapeutic communities	-0.012	0.082	5	0.882
Drug treatment in the community	-0.474	0.207	3	0.022
Therapeutic communities	-0.474	0.207	3	0.022
Case management for substance-abusing offenders in the community	-0.021	0.101	4	0.936
Therapeutic communities for offenders with a co-occurring disorder	-0.179	0.158	2	0.104
Juvenile Offenders				
Drug treatment for juvenile offenders	-0.097	0.156	8	0.221
1) Therapeutic communities (incarceration or community)	0.099	0.255	3	0.515
2) Other drug treatment (non-therapeutic communities)	-0.257	0.086	5	0.000
Multidimensional Family Therapy (MDFT)	-0.282	0.107	4	0.000

Note: The main substance abuse measure reported by these studies was typically self-reported substance use or a positive urinalysis screening.

APPENDIX B: DETAILED RESEARCH FINDINGS BY TREATMENT TYPE

CONTENTS

Adult Offenders

Juvenile Offenders

All studies used in the meta-analyses are listed for each treatment type. Studies marked with an asterisk (*) were used in the effect size for substance abuse.

Drug Treatment During Incarceration

Program description:

This broad category includes a variety of substance abuse treatment modalities delivered during incarceration including therapeutic communities, residential treatment, outpatient, cognitive behavioral treatment, drug education, and relapse prevention. Treatment can be delivered in individual or group settings.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	32	-0.14	0.02	0.00	-0.14	0.02	32	-0.14	0.02	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$3,415	$8,173	$1,723	$13,311	-$2,781	$4.80	36%	$10,531	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$3,415	$8,173	$1,723	$13,311

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$2,826	1	2012	$0	1	2012	$2,782	10%

Source: This cost estimate is weighted by treatment modality within the meta-analysis. Costs were provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Drug Treatment During Incarceration

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*Van Stelle, K. R., & Moberg, D. P. (2004). Outcome data for MICA clients after participation in an institutional therapeutic community. *Journal of Offender Rehabilitation, 39*(1), 37-62.

*Welsh, W. (2007). A multisite evaluation of prison-based therapeutic community drug treatment. *Criminal Justice and Behavior, 34*(11), 1481-1498.

Wexler, H. K., Falkin, G. P., & Lipton, D. S. (1990). Outcome evaluation of a prison therapeutic community for substance abuse treatment. *Criminal Justice and Behavior, 17*(1), 71-92.

Zhang, S. X., Roberts, R. E. L., & McCollister, K. E. (2011). Therapeutic community in a California prison: Treatment outcomes after 5 years. *Crime & Delinquency, 57*(1), 82-101.

Therapeutic Communities During Incarceration

Program description:

Therapeutic communities are the most intensive form of substance abuse treatment. These residential living units are highly structured using a hierarchical model among peers within the community. Offenders gain responsibility as they progress through the stages of treatment. Depending on the level of dependency and the program, therapeutic communities can range from 6 to 18 months.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	18	-0.12	0.03	0.00	-0.12	0.03	32	-0.12	0.03	42

Benefit-Cost Summary

	Program Benefits					Costs	Summary Statistics			
	Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012	$0	$2,841	$6,819	$1,416	$11,075	-$4,280	$2.30	23%	$6,795	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$2,841	$6,819	$1,416	$11,075

Detailed Cost Estimates

	Program Costs			Comparison Costs			Summary Statistics	
	Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.	$4,359	1	2012	$0	1	2013	$4,291	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Therapeutic Communities During Incarceration

Eisenberg, M., Arrigona, N., & Bryl, J. (1999). *Three year recidivism tracking of offenders participating in substance abuse treatment programs*. Texas Criminal Justice Policy Council.

Eisenberg, M., Riechers, L., & Arrigona, N. 2001. *Evaluation of the performance of the Texas Department of Criminal Justice Rehabilitation Tier Programs*. Austin, TX: Criminal Justice Policy Council.

Gransky, L. A., & Jones, R. J. (1995, September). *Evaluation of the post-release status of substance abuse program participants*. Chicago: Illinois Criminal Justice Information Authority.

Hall, E. A., Prendergast, M. L., Wellisch, J., Patten, M., & Cao, Y. (2004). Treating drug-abusing women prisoners: An outcomes evaluation of the Forever Free program. *The Prison Journal, 84*(1), 81-105.

Hanson, G. (2000, October). *Pine Lodge intensive inpatient treatment program*. Tumwater: Washington State Department of Corrections, Planning and Research Section.

Klebe, K. J., & O'Keefe, M. (2004, October). *Outcome evaluation of the Crossroads to Freedom House and Peer I therapeutic communities* (Document No. 208126). Washington, DC: National Institute of Justice.

Knight, K., Simpson, D. D., & Hiller, M. L. (1999). Three-year reincarceration outcomes for in-prison therapeutic community treatment in Texas. *The Prison Journal, 79*(3), 337-351.

Messina, N., Burdon, W., & Prendergast, M. (2006). Prison-based treatment for drug-dependent women offenders: Treatment versus no treatment. *Journal of Psychoactive Drugs, 38*(sup3), 333-343.

*Miller, J. M., & Miller, H. V. (2011). Considering the effectiveness of drug treatment behind bars: Findings from the South Carolina RSAT evaluation. *Justice Quarterly, 28*(1), 70-86.

Pealer, J. A. (2004). *A community of peers—promoting behavior change: The effectiveness of a therapeutic community for juvenile male offenders in reducing recidivism*. Unpublished doctoral dissertation, University of Cincinnati, Ohio.

Pelissier, B., Rhodes, W., Saylor, W., Gaes, G., Camp, S. D., Vanyur, S. D., & Wallace, S. (2000, September). *TRIAD drug treatment evaluation project final report of three-year outcomes: Part 1*. Washington, DC: Federal Bureau of Prisons, Office of Research.

*Prendergast, M. L., Hall, E. A., Wexler, H. K., Melnick, G., & Cao, Y. (2004). Amity prison-based therapeutic community: 5-year outcomes. *The Prison Journal, 84*(1), 36-60.

*Sullivan, C. J., Sullivan, C. J., McKendrick, K., Sacks, S., & Banks, S. (2007). Modified therapeutic community treatment for offenders with MICA disorders: Substance use outcomes. *The American Journal of Drug and Alcohol Abuse, 33*(6), 823-832.

Taxman, F. S. & Spinner, D. L. (1997). *Jail addiction services (JAS) demonstration project in Montgomery County, Maryland: Jail and community based substance abuse treatment program model.* College Park, MD: University of Maryland.

Tunis, S., Austin, J., Morris, M., Hardyman, P., & Bolyard, M. (1996, May*). Evaluation of drug treatment in local corrections* (Document No. NCJ 159313). Washington, DC: National Institute of Justice.

*Van Stelle, K. R., & Moberg, D. P. (2004). Outcome data for MICA clients after participation in an institutional therapeutic community. *Journal of Offender Rehabilitation, 39*(1), 37-62.

*Welsh, W. (2007). A multisite evaluation of prison-based therapeutic community drug treatment. *Criminal Justice and Behavior, 34*(11), 1481-1498.

Wexler, H. K., Falkin, G. P., & Lipton, D. S. (1990). Outcome evaluation of a prison therapeutic community for substance abuse treatment. *Criminal Justice and Behavior, 17*(1), 71-92.

Zhang, S. X., Roberts, R. E. L., & McCollister, K. E. (2011). Therapeutic community in a California prison: Treatment outcomes after 5 years. *Crime & Delinquency, 57*(1), 82-101.

Other Drug Treatment (Non-Therapeutic Communities) During Incarceration

Program description:

This broad category includes a variety of treatment modalities delivered during incarceration including inpatient, outpatient, cognitive behavioral therapy, group counseling, drug education, or relapse prevention. Therapeutic communities were excluded from this category of treatment.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	14	-0.18	0.03	0.00	-0.18	0.03	32	-0.18	0.03	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$4,232	$10,207	$2,108	$16,547	-$841	$19.72	2213%	$15,706	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$4,232	$10,207	$2,108	$16,547

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$854	1	2012	$0	1	2012	$0	10%

Source: This cost estimate is weighted by the treatment types included in the meta-analysis. Treatment costs were provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Other Drug Treatment (Non-Therapeutic Communities) During Incarceration

Daley, M., Love C. T., Shepard D. S., Petersen C. B., White K. L., & Hall F. B. (2004). Cost-effectiveness of Connecticut's in-prison substance abuse treatment. *Journal of Offender Rehabilitation, 39*(3), 69-92.

Drake, E. K. (2006). *Washington's drug offender sentencing alternative: An update on recidivism findings* (Document No. 06-12-1901). Olympia: Washington State Institute for Public Policy.

Dugan J. R., & Everett, R. S. (1998). An experimental test of chemical dependency therapy for jail inmates. *International Journal of Offender Therapy and Comparative Criminology, 42*(4), 360-368.

Duwe, G. (2010). Prison-based chemical dependency treatment in Minnesota: An outcome evaluation. *Journal of Experimental Criminology, 6*(1), 57-81.

Gransky, L. A., & Jones, R. J. (1995, September). *Evaluation of the post-release status of substance abuse program participants*. Chicago, IL: Illinois Criminal Justice Information Authority.

Hughey, R., & Klemke, L. W. (1996). Evaluation of a jail-based substance abuse treatment program. *Federal Probation*, 60(4), 40-45.

Peters, R. H., Kearns, W. D., Murrin, M. R., Dolente, A. S., & May, R. L. (1993). Examining the effectiveness of in-jail substance abuse treatment. *Journal of Offender Rehabilitation, 19*(3/4), 1-39.

Porporino, F. J., Robinson, D., Millson, B., & Weekes, J. R. (2002). An outcome evaluation of prison-based treatment programming for substance users. *Substance Use & Misuse, 37*(8-10), 1047-1077.

Porter, R. (2002). *Breaking the cycle: Technical report*. New York: Vera Institute of Justice.

Tunis, S., Austin, J., Morris, M., Hardyman, P., & Bolyard, M. (1996, May). *Evaluation of drug treatment in local corrections* (Document No. NCJ 159313). Washington, DC: National Institute of Justice.

Wexler, H. K., Falkin, G. P., & Lipton, D. S. (1990). Outcome evaluation of a prison therapeutic community for substance abuse treatment. *Criminal Justice and Behavior, 17*(1), 71-92.

Inpatient or Intensive Outpatient During Incarceration

Program description:

This grouping of programs includes inpatient or intensive outpatient treatment delivered during incarceration.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	6	-0.17	0.05	0.00	-0.17	0.05	32	-0.17	0.05	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012	Program Benefits					Costs	Summary Statistics			
	Participants	Tax-payers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
	$0	$4,189	$10,170	$2,103	$16,462	-$1,186	$13.90	495%	$15,276	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$4,189	$10,170	$2,103	$16,462

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.	Program Costs			Comparison Costs			Summary Statistics	
	Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
	$1,208	1	2012	$0	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Inpatient or Intensive Outpatient During Incarceration

Drake, E. K. (2006). *Washington's drug offender sentencing alternative: An update on recidivism findings* (Document No. 06-12-1901). Olympia: Washington State Institute for Public Policy.

Duwe, G. (2010). Prison-based chemical dependency treatment in Minnesota: An outcome evaluation. *Journal of Experimental Criminology, 6*(1), 57-81.

Peters, R. H., Kearns, W. D., Murrin, M. R., Dolente, A. S., & May, R. L. (1993). Examining the effectiveness of in-jail substance abuse treatment. *Journal of Offender Rehabilitation, 19*(3/4), 1-39.

Porter, R. (2002). *Breaking the cycle: Technical report*. New York: Vera Institute of Justice.

Outpatient or Non-intensive Drug Treatment for During Incarceration

Program description:

This broad category includes less intensive treatment modalities delivered during incarceration. These treatments were generally less intensive outpatient, group counseling, drug education, and relapse prevention.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	8	-0.17	0.05	0.00	-0.17	0.05	32	-0.17	0.05	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012	Program Benefits					Costs	Summary Statistics			
	Participants	Tax-payers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
	$0	$4,083	$9,816	$2,076	$15,975	-$580	$27.60	3471%	$15,395	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Tax-payers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$4,083	$9,816	$2,076	$15,975

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.	Program Costs			Comparison Costs			Summary Statistics	
	Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
	$589	1	2012	$0	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Outpatient or Non-Intensive Drug Treatment During Incarceration

Daley, M., Love C. T., Shepard D. S., Petersen C. B., White K. L., & Hall F. B. (2004). Cost-effectiveness of Connecticut's in-prison substance abuse treatment. *Journal of Offender Rehabilitation, 39*(3), 69-92.

Dugan J. R., & Everett, R. S. (1998). An experimental test of chemical dependency therapy for jail inmates. *International Journal of Offender Therapy and Comparative Criminology, 42*(4), 360-368.

Duwe, G. (2010). Prison-based chemical dependency treatment in Minnesota: An outcome evaluation. *Journal of Experimental Criminology, 6*(1), 57-81.

Gransky, L. A., & Jones, R. J. (1995, September). *Evaluation of the post-release status of substance abuse program participants*. Chicago: Illinois Criminal Justice Information Authority.

Hughey, R., & Klemke, L. W. (1996). Evaluation of a jail-based substance abuse treatment program. *Federal Probation, 60*(4), 40-45.

Porporino, F. J., Robinson, D., Millson, B., & Weekes, J. R. (2002). An outcome evaluation of prison-based treatment programming for substance users. *Substance Use & Misuse, 37*(8-10), 1047-1077.

Tunis, S., Austin, J., Morris, M., Hardyman, P., & Bolyard, M. (1996, May). *Evaluation of drug treatment in local corrections* (Document No. NCJ 159313). Washington, DC: National Institute of Justice.

Wexler, H. K., Falkin, G. P., & Lipton, D. S. (1990). Outcome evaluation of a prison therapeutic community for substance abuse treatment. *Criminal Justice and Behavior, 17*(1), 71-92.

Drug Treatment Delivered in the Community

Program description:

This broad category includes a variety of substance abuse treatment modalities delivered to offenders in the community including therapeutic communities, residential treatment, outpatient, cognitive behavioral treatment, drug education, and relapse prevention. Treatment can be delivered in individual or group settings.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	17	-0.09	0.03	0.01	-0.09	0.03	32	-0.10	0.03	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$2,247	$5,402	$1,099	$8,748	-$1,604	$5.46	47%	$7,143	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$2,247	$5,402	$1,099	$8,748

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$1,603	1	2011	$0	0	2011	$1,603	10%

Source: This cost estimate is weighted by the treatment types included in the meta-analysis. Treatment costs were provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Drug Treatment Delivered in the Community

Alemi, F., Taxman, F., Baghi, H., Vang, J., Thanner, M., & Doyon, V. (2006). Costs and benefits of combining probation and substance abuse treatment. *The Journal of Mental Health Policy and Economics, 9*(2), 57-70.

Baird, C., Wagner, D., Decomo, B., & Aleman, T. (1994). *Evaluation of the effectiveness of supervision and community rehabilitation programs in Oregon*. San Francisco: National Council on Crime and Delinquency.

*Butzin, C. A., Martin, S. S., & Inciardi, J. A. (2005). Treatment during transition from prison to community and subsequent illicit drug use. *Journal of Substance Abuse Treatment, 28*(4), 351-358.

California Department of Corrections. (1997). *Los Angeles Prison Parole Network: An evaluation report*. CA: Author.

Drake, E. K. (2006). *Washington's drug offender sentencing alternative: An update on recidivism findings* (Document No. 06-12-1901). Olympia: Washington State Institute for Public Policy.

Eisenberg, M., Arrigona, N., & Bryl, J. (1999). *Three year recidivism tracking of offenders participating in substance abuse treatment programs.* Texas Criminal Justice Policy Council.

Eisenberg, M., Riechers, L., & Arrigona, N. 2001. *Evaluation of the performance of the Texas Department of Criminal Justice Rehabilitation Tier Programs.* Austin, TX: Criminal Justice Policy Council.

Hiller, M. L., Knight, K., & Simpson, D. D. (2006). Recidivism following mandated residential substance abuse treatment for felony probationers. *The Prison Journal, 86*(2), 230-241.

*Inciardi, J. A., Martin S. S., & Butzin, C. A. (2004). Five-year outcomes of therapeutic community treatment of drug-involved offenders after release from prison. *Crime & Delinquency, 50*(1), 88-107.

Krebs, C. P., Strom, K. J., Koetse, W. H., & Lattimore, P. K. (2009). The impact of residential and nonresidential drug treatment on recidivism among drug-involved probationers: A survival analysis. *Crime and Delinquency, 55*(3), 442-471.

Lattimore, P. K., Krebs, C. P., Koetse, W., Lindquist, C., & Cowell, A. J. (2005). Predicting the effect of substance abuse treatment on probationer recidivism. *Journal of Experimental Criminology, 1*(2), 159-189.

Mitchell, O., & Harrell, A. (2006). Evaluation of the breaking the cycle demonstration project: Jacksonville, FL and Tacoma, WA. *Journal of Drug Issues, 36*(1), 97-118.

*Robbins, C. A., Martin, S. S., & Surratt, H. L. (2009). Substance abuse treatment, anticipated maternal roles, and reentry success of drug-involved women prisoners. *Crime and Delinquency, 55*(3), 388-411.

Sacks, S., Chaple, M., Sacks, J. Y., McKendrick, K., & Cleland, C. M. (2012). Randomized trial of a reentry modified therapeutic community for offenders with co-occurring disorders: Crime outcomes. *Journal of Substance Abuse Treatment, 42*(3), 247-259.

Sacks, S., Sacks, J. Y., McKendrick, K., Banks, S., & Stommel, J. (2004). Modified TC for MICA offenders: Crime outcomes. *Behavioral Sciences and the Law, 22*(4), 477-501.

Therapeutic Communities Delivered in the Community

Program description:
Therapeutic communities are the most intensive form of substance abuse treatment. These residential living units are highly structured using a hierarchical model among peers within the community. Offenders gain responsibility as they progress through the stages of treatment. Depending on the level of dependency and the program, therapeutic communities can range from 6 to 18 months.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	8	-0.15	0.05	0.00	-0.15	0.05	32	-0.15	0.05	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$2,708	$6,760	$1,314	$10,782	-$2,423	$4.46	35%	$8,359	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$2,708	$6,760	$1,314	$10,782

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$2,463	1	2012	$0	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Therapeutic Communities Delivered in the Community

*Butzin, C. A., Martin, S. S., & Inciardi, J. A. (2005). Treatment during transition from prison to community and subsequent illicit drug use. *Journal of Substance Abuse Treatment, 28*(4), 351-358.

Eisenberg, M., Riechers, L., & Arrigona, N. 2001. *Evaluation of the performance of the Texas Department of Criminal Justice Rehabilitation Tier Programs*. Austin, TX: Criminal Justice Policy Council.

Hiller, M. L., Knight, K., & Simpson, D. D. (2006). Recidivism following mandated residential substance abuse treatment for felony probationers. *The Prison Journal, 86*(2), 230-241.

*Inciardi, J. A., Martin S. S., & Butzin, C. A. (2004). Five-year outcomes of therapeutic community treatment of drug-involved offenders after release from prison. *Crime & Delinquency, 50*(1), 88-107.

*Robbins, C. A., Martin, S. S., & Surratt, H. L. (2009). Substance abuse treatment, anticipated maternal roles, and reentry success of drug-involved women prisoners. *Crime and Delinquency, 55*(3), 388-411.

Sacks, S., Chaple, M., Sacks, J. Y., McKendrick, K., & Cleland, C. M. (2012). Randomized trial of a reentry modified therapeutic community for offenders with co-occurring disorders: Crime outcomes. *Journal of Substance Abuse Treatment, 42*(3), 247-259.

Sacks, S., McKendrick, K., Sacks, J. A. Y., Banks, S., & Harle, M. (2008). Enhanced outpatient treatment for co-occurring disorders: Main outcomes. *Journal of Substance Abuse Treatment, 34*(1), 48-60.

Sacks, S., Sacks, J. Y., McKendrick, K., Banks, S., & Stommel, J. (2004). Modified TC for MICA offenders: Crime outcomes. *Behavioral Sciences and the Law, 22*(4), 477-501.

Other Drug Treatment in the Community (Non-Therapeutic Communities)

Program description:

This broad category includes a variety of substance abuse treatment modalities delivered to offenders in the community including therapeutic communities, residential treatment, outpatient, cognitive behavioral treatment, drug education, and relapse prevention. Treatment can be delivered in individual or group settings.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	9	-0.05	0.11	0.22	-0.05	0.11	32	-0.05	0.11	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$970	$2,442	$476	$3,887	-$783	$4.98	445%	$3,104	69%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$878	$2,262	$439	$3,579

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$797	1	2012	$0	1	2012	$785	10%

Source: This cost estimate is weighted by the treatment types included in the meta-analysis. Treatment costs were provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Other Drug Treatment (Non-Therapeutic Communities) in the Community

Baird, C., Wagner, D., Decomo, B., & Aleman, T. (1994*). Evaluation of the effectiveness of supervision and community rehabilitation programs in Oregon*. San Francisco: National Council on Crime and Delinquency.

California Department of Corrections. (1997). *Los Angeles Prison Parole Network: An evaluation report*. CA: Author.

Drake, E. K. (2006). *Washington's drug offender sentencing alternative: An update on recidivism findings* (Document No. 06-12-1901). Olympia: Washington State Institute for Public Policy.

Eisenberg, M., Arrigona, N., & Bryl, J. (1999). *Three year recidivism tracking of offenders participating in substance abuse treatment programs*. Texas Criminal Justice Policy Council.

Eisenberg, M., Riechers, L., & Arrigona, N. 2001*. Evaluation of the performance of the Texas Department of Criminal Justice Rehabilitation Tier Programs*. Austin, TX: Criminal Justice Policy Council.

Krebs, C. P., Strom, K. J., Koetse, W. H., & Lattimore, P. K. (2009). The impact of residential and nonresidential drug treatment on recidivism among drug-involved probationers: A survival analysis. *Crime and Delinquency, 55*(3), 442-471.

Lattimore, P. K., Krebs, C. P., Koetse, W., Lindquist, C., & Cowell, A. J. (2005). Predicting the effect of substance abuse treatment on probationer recidivism. *Journal of Experimental Criminology, 1*(2), 159-189.

Inpatient or Intensive Outpatient Drug Treatment in the Community

Program description:

This grouping of programs includes inpatient or intensive outpatient treatment delivered to offenders who are supervised in the community.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Second-ary Partici-pant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	5	-0.05	0.04	0.65	-0.05	0.04	32	-0.05	0.04	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012	Program Benefits					Costs	Summary Statistics			
	Partici-pants	Tax-payers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Invest-ment	Benefits Minus Costs	Probability of a positive net present value
	$0	$856	$2,139	$424	$3,419	-$930	$3.68	35%	$2,489	87%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Partici-pants	Tax-payers	Other	Other In-direct	Total Benefits
From Primary Participant					
Crime	$0	$856	$2,139	$424	$3,419

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.	Program Costs			Comparison Costs			Summary Statistics	
	Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
	$945	1	2012	$0	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Inpatient or Intensive Outpatient Drug Treatment in the Community

California Department of Corrections. (1997). *Los Angeles Prison Parole Network: An evaluation report.* CA: Author.

Drake, E. K. (2006). *Washington's drug offender sentencing alternative: An update on recidivism findings* (Document No. 06-12-1901). Olympia: Washington State Institute for Public Policy.

Eisenberg, M., Arrigona, N., & Bryl, J. (1999). *Three year recidivism tracking of offenders participating in substance abuse treatment programs.* Texas Criminal Justice Policy Council.

Eisenberg, M., Riechers, L., & Arrigona, N. 2001. *Evaluation of the performance of the Texas Department of Criminal Justice Rehabilitation Tier Programs*. Austin, TX: Criminal Justice Policy Council.

Krebs, C. P., Strom, K. J., Koetse, W. H., & Lattimore, P. K. (2009). The impact of residential and nonresidential drug treatment on recidivism among drug-involved probationers: A survival analysis. *Crime and Delinquency, 55*(3), 442-471.

Outpatient or Non-Intensive Drug Treatment in the Community

Program description:

This broad category includes less intensive treatment modalities delivered in the community. These treatments were generally less intensive outpatient, group counseling, drug education, and relapse prevention.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	4	-0.08	0.05	0.10	-0.08	0.05	32	-0.08	0.05	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012	Program Benefits					Costs	Summary Statistics			
	Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
	$0	$1,437	$3,571	$726	$5,734	-$580	$9.89	277%	$5,154	99%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$1,437	$3,571	$726	$5,734

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.	Program Costs			Comparison Costs			Summary Statistics	
	Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
	$589	1	2012	$0	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Outpatient or Non-Intensive Drug Treatment in the Community

Baird, C., Wagner, D., Decomo, B., & Aleman, T. (1994). *Evaluation of the effectiveness of supervision and community rehabilitation programs in Oregon*. San Francisco: National Council on Crime and Delinquency.

Krebs, C. P., Strom, K. J., Koetse, W. H., & Lattimore, P. K. (2009). The impact of residential and nonresidential drug treatment on recidivism among drug-involved probationers: A survival analysis. *Crime and Delinquency, 55*(3), 442-471.

Lattimore, P. K., Krebs, C. P., Koetse, W., Lindquist, C., & Cowell, A. J. (2005). Predicting the effect of substance abuse treatment on probationer recidivism. *Journal of Experimental Criminology, 1*(2), 159-189.

Case Management for Substance-Abusing Offenders in the Community

Program description:
This broad category includes studies using a case management approach to offender supervision and transition from incarceration. A variety of case management models (e.g., brokerage or intensive) are included within this category. The primary goals of case management is to improve collaboration between correctional and treatment staff and to increase participation in substance abuse treatment.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	20	-0.14	0.05	0.01	-0.11	0.05	32	-0.11	0.05	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$2,144	$5,335	$1,050	$8,528	-$4,757	$1.80	7%	$3,770	91%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$2,144	$5,335	$1,050	$8,528

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$4,756	1	2011	$0	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Case Management for Substance-Abusing Offenders in the Community

Alemi, F., Taxman, F., Baghi, H., Vang, J., Thanner, M., & Doyon, V. (2006). Costs and benefits of combining probation and substance abuse treatment. *The Journal of Mental Health Policy and Economics, 9*(2), 57-70.

Anglin, M. D., Longshore, D., & Turner, S. (1999). Treatment alternatives to street crime: An evaluation of five programs. *Criminal Justice and Behavior, 26*(2), 168-195.

Baird, C., Wagner, D., Decomo, B., & Aleman, T. (1994). *Evaluation of the effectiveness of supervision and community rehabilitation programs in Oregon.* San Francisco: National Council on Crime and Delinquency.

California Department of Corrections. (1996). *Parolee Partnership Program: A parole outcome evaluation*. Sacramento: California Department of Corrections; Evaluation, Compliance, and Information Systems Division; Research Branch.

Guydish, J., Chan, M., Bostrom, A., Jessup, M. A., Davis, T. B., & Marsh, C. (2011). A randomized trial of probation case management for drug-involved women offenders. *Crime and Delinquency, 57*(2), 167-198.

Hanlon, T. E., Nurco, D. N., Bateman, R. W., & O'Grady, K. E. (1999). The relative effects of three approaches to the parole supervision of narcotic addicts and cocaine abusers. *The Prison Journal, 79*(2), 163-181.

Harrell, A., Mitchell, O., Hirst, A., Marlow, D., & Merrill, J. (2002). Breaking the cycle of drugs and crime: Findings from the Birmingham BTC demonstration. *Criminology and Public Policy, 1*(2), 189-216.

Harrell, A., Roman, J., Bhati, A., & Parthasarathy, B. (2003*). The impact evaluation of the Maryland Break the Cycle initiative*. Washington, DC: The Urban Institute.

Hawken, A., & Kleiman, M. (2009, December). *Managing drug involved probationers with swift and certain sanctions: Evaluating Hawaii's HOPE*. Malibu, CA: Pepperdine University, School of Public Policy.

*Longshore, D., Turner, S., & Fain. T. (2005) Effects of case management on parolee misconduct. *Criminal Justice and Behavior, 32*(2), 205-222.

Mitchell, O., & Harrell, A. (2006). Evaluation of the breaking the cycle demonstration project: Jacksonville, FL and Tacoma, WA. *Journal of Drug Issues, 36*(1), 97-118.

Owens, S. J., Klebe, K. J., Arens, S. A., Durham, R. L., Hughes, J., Moor, C. J., ... & Stommel, J. (1998). The Effectiveness of Colorado's TASC Programs. *Journal of Offender Rehabilitation*, *26*(1-2), 161-176.

*Prendergast, M., Frisman, L., Sacks, J. Y., Staton-Tindall, M., Greenwell, L., Lin, H. J., & Cartier, J. (2011). A multi-site, randomized study of strengths-based case management with substance-abusing parolees. *Journal of Experimental Criminology*, 7(3), 225-253.

*Rhodes, W., & Gross, M. (1997). *Case management reduces drug use and criminality among drug-involved arrestees: An experimental study of an HIV prevention intervention.* US Department of Justice, Office of Justice Programs, National Institute of Justice.

Swift & Certain Sanctions for Substance-Abusing Offenders

Program description:

"Swift and certain sanctions" is a strategy of supervision for substance-abusing offenders for offenders who violate the terms of supervision. Most of the studies included in this category also describe the use of graduated sanctions—sanctions that increase in severity—with continued violation behavior.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	6	-0.26	0.09	0.01	-0.26	0.09	32	-0.26	0.09	42

Benefit-Cost Summary

	Program Benefits					Costs	Summary Statistics			
	Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012	$0	$4,738	$11,750	$2,322	$18,810	-$4,756	$3.96	30%	$14,054	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$4,738	$11,750	$2,322	$18,810

Detailed Cost Estimates

	Program Costs			Comparison Costs			Summary Statistics	
	Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.	$4,756	1	2011	$1	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Swift & Certain Sanctions for Substance-Abusing Offenders

Alemi, F., Taxman, F., Baghi, H., Vang, J., Thanner, M., & Doyon, V. (2006). Costs and benefits of combining probation and substance abuse treatment. *The Journal of Mental Health Policy and Economics, 9*(2), 57-70.

Baird, C., Wagner, D., Decomo, B., & Aleman, T. (1994). *Evaluation of the effectiveness of supervision and community rehabilitation programs in Oregon.* San Francisco: National Council on Crime and Delinquency.

Harrell, A., Mitchell, O., Hirst, A., Marlow, D., & Merrill, J. (2002). Breaking the cycle of drugs and crime: Findings from the Birmingham BTC demonstration. *Criminology and Public Policy, 1*(2), 189-216.

Harrell, A., Roman, J., Bhati, A., & Parthasarathy, B. (2003*). The impact evaluation of the Maryland Break the Cycle initiative*. Washington, DC: The Urban Institute.

Hawken, A., & Kleiman, M. (2009, December). *Managing drug involved probationers with swift and certain sanctions: Evaluating Hawaii's HOPE*. Malibu, CA: Pepperdine University, School of Public Policy.

Mitchell, O., & Harrell, A. (2006). Evaluation of the breaking the cycle demonstration project: Jacksonville, FL and Tacoma, WA. *Journal of Drug Issues, 36*(1), 97-118.

Other Case Management in the Community (Not Swift and Certain/Graduated Sanctions)

Program description:

This broad category includes studies using a case management approach to offender supervision and transition from incarceration. A variety of case management models (e.g., brokerage or intensive) are included within this category. The primary goals of case management is to improve collaboration between correctional and treatment staff and to increase participation in substance abuse treatment. This category excludes studies that are based on the "swift and certain" approach.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	13	-0.07	0.07	0.46	-0.07	0.07	32	-0.07	0.07	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012	Program Benefits					Costs	Summary Statistics			
	Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
	$0	$1,357	$3,326	$695	$5,377	-$4,767	$1.13	1%	$610	55%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to:				
	Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$1,357	$3,326	$695	$5,377

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.	Program Costs			Comparison Costs			Summary Statistics	
	Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
	$4,756	1	2011	$0	1	2011	$4,756	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Other Case Management in the Community (Not Swift and Certain/Graduated Sanctions)

Anglin, M. D., Longshore, D., & Turner, S. (1999). Treatment alternatives to street crime: An evaluation of five programs. *Criminal Justice and Behavior, 26*(2), 168-195.

California Department of Corrections. (1996). *Parolee Partnership Program: A parole outcome evaluation*. Sacramento: California Department of Corrections; Evaluation, Compliance, and Information Systems Division; Research Branch.

Guydish, J., Chan, M., Bostrom, A., Jessup, M. A., Davis, T. B., & Marsh, C. (2011). A randomized trial of probation case management for drug-involved women offenders. *Crime and Delinquency, 57*(2), 167-198.

Hanlon, T. E., Nurco, D. N., Bateman, R. W., & O'Grady, K. E. (1999). The relative effects of three approaches to the parole supervision of narcotic addicts and cocaine abusers. *The Prison Journal, 79*(2), 163-181.

Longshore, D., Turner, S., & Fain. T. (2005) Effects of case management on parolee misconduct. *Criminal Justice and Behavior, 32*(2), 205-222.

Owens, S. J., Klebe, K. J., Arens, S. A., Durham, R. L., Hughes, J., Moor, C. J., ... & Stommel, J. (1998). The Effectiveness of Colorado's TASC Programs. *Journal of Offender Rehabilitation*, *26*(1-2), 161-176.

Prendergast, M., Frisman, L., Sacks, J. Y., Staton-Tindall, M., Greenwell, L., Lin, H. J., & Cartier, J. (2011). A multi-site, randomized study of strengths-based case management with substance-abusing parolees. *Journal of Experimental Criminology*, 7(3), 225-253.

Rhodes, W., & Gross, M. (1997). *Case management reduces drug use and criminality among drug-involved arrestees: An experimental study of an HIV prevention intervention.* US Department of Justice, Office of Justice Programs, National Institute of Justice.

Therapeutic Communities for Offenders with Co-occurring Disorders

Program description:
Therapeutic communities are the most intensive form of substance abuse treatment. This meta-analysis included only therapeutic communities for offenders with co-occurring substance use and mental disorders. These residential living units are highly structured using a hierarchical model among peers within the community. Offenders gain responsibility as they progress through the stages of treatment. Depending on the level of dependency and the program, therapeutic communities can range from 3 to 12 months.

Typical age of primary program participant: 30

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	4	-0.30	0.10	0.00	-0.27	0.10	32	-0.27	0.10	42

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$6,455	$15,548	$3,244	$25,247	-$3,575	$7.08	75%	$21,672	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$6,455	$15,548	$3,244	$25,247

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$3,626	1	2012	$1	1	2012	$0	10%

Source: Estimate provided by the Washington State Department of Corrections.

Studies Used in the Meta-Analysis: Therapeutic Communities for Offenders with Co-occurring Disorders

Sacks, S., Chaple, M., Sacks, J. Y., McKendrick, K., & Cleland, C. M. (2012). Randomized trial of a reentry modified therapeutic community for offenders with co-occurring disorders: Crime outcomes. *Journal of Substance Abuse Treatment, 42*(3), 247-259.

Sacks, S., McKendrick, K., Sacks, J. A. Y., Banks, S., & Harle, M. (2008). Enhanced outpatient treatment for co-occurring disorders: Main outcomes. *Journal of Substance Abuse Treatment, 34*(1), 48-60.

Sacks, S., Sacks, J. Y., McKendrick, K., Banks, S., & Stommel, J. (2004). Modified TC for MICA offenders: Crime outcomes. *Behavioral Sciences and the Law, 22*(4), 477-501.

*Sullivan, C. J., Sullivan, C. J., McKendrick, K., Sacks, S., & Banks, S. (2007). Modified therapeutic community treatment for offenders with MICA disorders: Substance use outcomes. *The American Journal of Drug and Alcohol Abuse, 33*(6), 823-832.

*Van Stelle, K. R., & Moberg, D. P. (2004). Outcome data for MICA clients after participation in an institutional therapeutic community. *Journal of Offender Rehabilitation, 39*(1), 37-62.

Drug Courts for Adult Offenders

Program description:

While each drug court is unique, they all share the primary goals of reducing criminal recidivism and substance abuse among participants. Drug courts use comprehensive supervision, drug testing, treatment services, and immediate sanctions and incentives in an attempt to modify the criminal behavior of certain drug-involved defendants.

Typical age of primary program participant: 28

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	67	-0.25	0.03	0.00	-0.25	0.03	30	-0.25	0.03	40

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$0	$1,935	$4,484	$972	$7,391	-$4,183	$1.77	6%	$3,208	100%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to:				
	Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$1,935	$4,484	$972	$7,391

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$11,227	1	2007	$7,335	1	2007	$4,187	10%

Source: Barnoski, R. & Aos, S. (2003). *Washington State's drug courts for adult defendants: Outcome evaluation and cost-benefit analysis* (Document No. 03-03-1201). Olympia: Washington State Institute for Public Policy.

Studies Used in the Meta-Analysis: Drug Courts Adults

Barnoski, R., & Aos, S. (2003, March). *Washington State's drug courts for adult defendants: Outcome evaluation and cost-benefit analysis* (Document No. 03-03-1201). Olympia: Washington State Institute for Public Policy.

Bavon, A. (2001). The effect of the Tarrant County drug court project on recidivism. *Evaluation and Program Planning, 24*(1), 13-24.

Breckenridge, J. F., Winfree, L. T., Jr., Maupin, J. R., & Clason, D. L. (2000). Drunk drivers, DWI 'drug court' treatment, and recidivism: Who fails? *Justice Research and Policy, 2*(1), 87.

Brewster, M. P. (2001). An evaluation of the Chester County (PA) Drug Court Program. *Journal of Drug Issues, 31*(1), 177-206.

Carey, S. M., Lucas, L. M., Waller, M. S., Lambarth, C. H., Linhares, R., Weller, J. M., & Finigan, M. W. (2009, January). *Vermont drug courts: Rutland County adult drug court process, outcome, and cost evaluation (Final Report)*. Portland, OR: NPC Research.

Craddock, A. (2002, May). *North Carolina Drug Treatment Court evaluation: Final report*. Raleigh: North Carolina Court System.

Crumpton, D., Brekhus, J., Weller, J., & Finigan, M. (2003, January). *Cost analysis of Baltimore City, Maryland Drug Treatment Court*. Portland, OR: NPC Research.

Deschenes, E. P., Cresswell, L., Emami, V., Moreno, K., Klein, Z., & Condon, C. (2001, September). *Success of drug courts: Process and outcome evaluations in Orange County, California (Final Report).* Long Beach: California State University Long Beach.

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Drug Treatment for Juvenile Offenders

Program description:

This broad category includes a variety of substance abuse treatment modalities delivered to youth who are involved in the juvenile justice system. These modalities include therapeutic communities, residential treatment, cognitive behavioral therapy, and Multidimensional Family Therapy.

Typical age of primary program participant: 15

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	1	-0.08	0.05	0.12	-0.07	0.05	16	-0.07	0.05	26

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$973	$1,883	$3,801	$1,212	$7,868	-$3,646	$2.16	9%	$4,222	87%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$1,381	$3,903	$678	$5,962
Earnings via high school graduation	$991	$365	$0	$466	$1,821
Health care costs via education	-$18	$137	-$102	$67	$85

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$3,703	1	2012	$0	1	2012	$0	10%

Source: This cost estimate is weighted by the treatment types included in the meta-analysis. Treatment costs were provided by the Washington State Juvenile Rehabilitation Administration.

Studies Used in the Meta-Analysis: Drug Treatment for Juvenile Offenders

Anglin, M. D., Longshore, D., & Turner, S. (1999). Treatment alternatives to street crime: An evaluation of five programs. *Criminal Justice and Behavior, 26*(2), 168-195.

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Pealer, J.A. (2004). *A community of peers—Promoting behavior change: The effectiveness of a therapeutic community for juvenile male offenders in reducing recidivism.* Unpublished doctoral dissertation, University of Cincinnati, Ohio.

Sealock, Miriam D., Gottfredson, Denise C., & Gallagher, Catherine A. (1997.) Drug treatment for juvenile offenders: Some good and bad news. *Journal of Research in Crime and Delinquency, 34*(2), 210-236.

Therapeutic Communities for Juvenile Offenders

Program description:
Therapeutic communities are the most intensive form of substance abuse treatment. These residential living units are highly structured using a hierarchical model among peers within the community. Youth gain responsibility as they progress through the stages of treatment. Depending on the level of dependency and the program, therapeutic communities can range from 5 to 10 months.

Typical age of primary program participant: 15

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	3	-0.11	0.08	0.13	-0.06	0.08	16	-0.06	0.08	26

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$744	$2,262	$6,670	$1,352	$11,028	-$4,461	$2.47	22%	$6,567	77%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$1,884	$6,745	$944	$9,572
Earnings via high school graduation	$757	$278	$0	$362	$1,397
Health care costs via education	-$13	$100	-$75	$47	$59

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$4,522	1	2012	$0	1	2012	$0	10%

Source: Estimate provided by the Washington State Juvenile Rehabilitation Administration

Studies Used in the Meta-Analysis: Therapeutic Communities for Juvenile Offenders

*Gordon, J. A. (2002, October). Barrett Juvenile Correctional Center: *Is it effective?: A comparison of youth released from a residential substance abuse treatment center to youth at a traditional juvenile correctional center*. Richmond, VA: Virginia Commonwealth University.

*Miller, J.M., & Miller, H.V. (2011). Considering the effectiveness of drug treatment behind bars: Findings from the South Carolina RSAT evaluation. *Justice Quarterly, 28*(1), 70-86.

*Morral, A. R., McCaffrey, D. F., & Ridgeway, G. (2004). Effectiveness of community-based treatment for substance-abusing adolescents: 12-month outcomes of youths entering Phoenix Academy or alternative probation dispositions. *Psychology of Addictive Behaviors, 18*(3), 257-68.

Pealer, J. A. (2004). *A community of peers—promoting behavior change: The effectiveness of a therapeutic community for juvenile male offenders in reducing recidivism*. Unpublished doctoral dissertation, University of Cincinnati, Ohio.

Other Drug Treatment for Juvenile Offenders (Non-Therapeutic Communities)

Program description:

This broad category includes a variety of substance abuse treatment modalities delivered to youth who are involved in the juvenile justice system. These modalities include residential treatment, cognitive behavioral therapy, and Multidimensional Family Therapy. Therapeutic communities were excluded from this meta-analysis.

Typical age of primary program participant: 15

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	6	-0.06	0.08	0.46	-0.05	0.08	16	-0.05	0.08	26

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$363	$1,154	$2,622	$782	$4,922	-$3,150	$1.57	14%	$1,772	65%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$949	$2,676	$552	$4,177
Earnings via high school graduation	$372	$137	$0	$192	$701
Health care costs via education	-$9	$68	-$53	$37	$43

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$3,157	1	2012	$0	1	2012	$3,108	10%

Source: This cost estimate is weighted by the treatment types included in the meta-analysis. Treatment costs were provided by the Washington State Juvenile Rehabilitation Administration.

Studies Used in the Meta-Analysis: Other Drug Treatment (Non-Therapeutic Communities) for Juvenile Offenders

Anglin, M. D., Longshore, D., & Turner, S. (1999). Treatment alternatives to street crime: An evaluation of five programs. *Criminal Justice and Behavior, 26*(2), 168-195.

Chassin, L., Knight, G., Vargas-Chanes, D., Losoya, S. H., & Naranjo, D. (2009, January). Substance use treatment outcomes in a sample of male serious juvenile offenders. *Journal of Substance Abuse Treatment, 36*(2), 183-194.

*Friedman, A.S., Terras, A., & Glassman, K. (2002). Multimodal substance use intervention program for male delinquents. *Journal of Child and Adolescent Substance Abuse, 11*(4), 43-65.

Kelly, W. R. (2001). *An outcome evaluation of the Texas Youth Commission's chemical dependency treatment program: Final report*. Austin, TX: University of Texas.

*Liddle, H. A., Rowe, C. L., Dakof, G. A., Henderson, C. E., & Greenbaum, P. E. (2009). Multidimensional family therapy for young adolescent substance abuse: Twelve-month outcomes of a randomized controlled trial. *Journal of Consulting and Clinical Psychology, 77*(1), 12-25.

Sealock, Miriam D., Gottfredson, Denise C., & Gallagher, Catherine A. (1997.) Drug treatment for juvenile offenders: Some good and bad news. *Journal of Research in Crime and Delinquency, 34*(2), 210-236.

Multidimensional Family Therapy (MDFT) for Substance Abusers

Program description:
Multidimensional Family Therapy (MDFT) is an integrative, family-based, multiple systems treatment for youth with drug abuse and related behavior problems. The therapy consists of four domains: 1) Engage adolescent in treatment, 2) Increase parental involvement with youth and improve limit-setting, 3) Decrease family-interaction conflict, and 4) Collaborate with extra-familial social systems. Youth are generally aged 11 to 15 and have been clinically referred to outpatient treatment. For this meta-analysis, only one study measured the effects of MDFT on delinquency and four measured the effects on subsequent substance use. All five studies included youth who were referred from the juvenile justice system as well as other avenues.

Typical age of primary program participant: 14

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	1	-0.60	0.28	0.03	-0.22	0.28	15	-0.22	0.28	25

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$3,024	$5,586	$11,447	$3,603	$23,660	-$5,712	$4.16	33%	$17,948	84%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$4,028	$11,765	$1,922	$17,715
Earnings via high school graduation	$3,079	$1,133	$0	$1,470	$5,682
Health care costs via education	-$55	$425	-$318	$211	$263

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$4,608	1	2001	$0	1	2001	$0	10%

Source: Zavala, S. K., French, M. T., Henderson, C. E., Alberga, L., Rowe, C., & Liddle, H. A. (2005). Guidelines and challenges for estimating the economic costs and benefits of adolescent substance abuse treatments. *Journal of Substance Abuse Treatment*, 29, 3, 191-205.

Studies Used in the Meta-Analysis: Multidimensional Family Therapy (MDFT) for Juvenile Offenders

*Henderson, C. E., Dakof, G. A., Liddle, H. A., & Greenbaum, P. E. (2010). Effectiveness of multidimensional family therapy with higher severity substance-abusing adolescents: Report from two randomized controlled trials. *Journal of Consulting and Clinical Psychology, 78*(6), 885-897.

*Liddle, H. A., Dakof, G. A., Parker, K., Diamond, G.S., Barrett, K., & Tejeda, M. (2001) Multidimensional family therapy for adolescent drug abuse: Results of a randomized clinical trial. *American Journal of Drug Abuse, 27*(4), 651-688.

*Liddle, H. A., Dakof, G. A., Turner, R. M., Henderson, C. E., & Greenbaum, P. E. (2008). Treating adolescent drug abuse: A randomized trial comparing multidimensional family therapy and cognitive behavior therapy. *Addiction, 103*(10), 1660-1670.

*Liddle, H. A., Rowe, C. L., Dakof, G. A., Henderson, C. E., & Greenbaum, P. E. (2009). Multidimensional family therapy for young adolescent substance abuse: Twelve-month outcomes of a randomized controlled trial. *Journal of Consulting and Clinical Psychology, 77*(1), 12-25.

Drug Courts for Juvenile Offenders

Program description:

While each drug court is unique, they all share the primary goals of reducing criminal recidivism and substance abuse among participants. Drug courts use comprehensive supervision, drug testing, treatment services, and immediate sanctions and incentives in an attempt to modify the criminal behavior of certain drug-involved defendants. These meta-analytic results were last updated in 2006.

Typical age of primary program participant: 15

Typical age of secondary program participant: N/A

Meta-Analysis of Program Effects

Outcomes Measured	Primary or Secondary Participant	No. of Effect Sizes	Unadjusted Effect Sizes (Random Effects Model)			Adjusted Effect Sizes and Standard Errors Used in the Benefit-Cost Analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Crime	P	15	-0.12	0.07	0.12	-0.11	0.07	15	-0.11	0.07	17

Benefit-Cost Summary

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2011). The economic discount rates and other relevant parameters are described in Lee et al., 2012

Program Benefits					Costs	Summary Statistics			
Participants	Taxpayers	Other	Other Indirect	Total Benefits		Benefit to Cost Ratio	Return on Investment	Benefits Minus Costs	Probability of a positive net present value
$1,340	$3,206	$7,318	$1,997	$13,861	-$3,088	$4.50	28%	$10,773	94%

Detailed Monetary Benefit Estimates

Source of Benefits	Benefits to: Participants	Taxpayers	Other	Other Indirect	Total Benefits
From Primary Participant					
Crime	$0	$2,518	$7,458	$1,264	$11,240
Earnings via high school graduation	$1,365	$502	$0	$642	$2,509
Health care costs via education	-$24	$185	-$140	$91	$113

Detailed Cost Estimates

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The uncertainty range is used in Monte Carlo risk analysis, described in Lee et al., 2012.

Program Costs			Comparison Costs			Summary Statistics	
Annual Cost	Program Duration	Year Dollars	Annual Cost	Program Duration	Year Dollars	Present Value of Net Program Costs (in 2011 dollars)	Uncertainty (+ or – %)
$2,645	1	2004	$0	1	2004	$3,094	10%

Source: Anspach, D. F., Ferguson, A. S., & Phillips, L. L. (2003). *Evaluation of Maine's statewide juvenile drug treatment court program*. Augusta, ME: University of Southern Maine.

Studies Used in the Meta-Analysis: Drug Courts for Juveniles

Anspach, D. F., Ferguson, A. S., & Phillips, L. L. (2003). *Evaluation of Maine's statewide juvenile drug treatment court program: Fourth year outcome evaluation report*. Augusta: University of Southern Maine.

Byrnes, E. C., & Hickert, A. O. (2004). *Process and outcome evaluation of the third district juvenile drug court in Dona Ana County, New Mexico*. Annapolis, MD: Glacier Consulting.

Carey, S. M. (2004, February). *Clackamas County Juvenile Drug Court outcome evaluation: Final report*. Portland, OR: NPC Research.

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Appendix C: Technical Methods

A principal objective of the Institute's research approach is to produce a "what works?" list of public policy options available to the Washington State legislature. We rank the list by estimates of return on investment. The ranked list can then help policy makers choose a portfolio of public policies that are evidence based and that have a high likelihood of producing more benefits than costs. For example, if the public policy objective is to reduce crime, then a portfolio of evidence-based policies can be selected from the list—from prevention policies, juvenile justice policies, and adult corrections policies—that together can improve the chance that crime is reduced and taxpayer money is used efficiently.

There are three basic steps to the analysis.

1. **What Works?** First, we conduct a systematic review of the research literature to identify policies and programs that have demonstrated an ability to improve the outcomes. The objective of the first step is to draw statistical conclusions about what works—and what does not—to achieve improvements in the outcomes, along with an estimate of the statistical error involved.
2. **What Makes Economic Sense?** The second basic step involves applying economic calculations to put a monetary value on the improved outcomes (from the first step). Using the Institute's benefit-cost model, the estimated benefits are then compared to the costs of programs to arrive at a set of economic bottom lines for the investments.
3. **How Risky are the Estimates?** Part of the process of estimating a return on investment involves assessing the riskiness of the estimates. Any rigorous modeling process, such as the one described here, involves many individual estimates and assumptions. Almost every step involves at least some level of uncertainty. The objective of the risk analysis is to access the odds that an individual return on investment estimate may offer the legislature the wrong advice. For example, if we conclude that, on average, an investment in a certain program has a ratio of three dollars of benefits for each dollar of cost, what are the odds, given the uncertainty in this estimate, that the program will not even generate one dollar of benefits for each dollar of cost?

Thus, our analytical goal is to deliver to the legislature two benefit-cost bottom-line measures: an expected return on investment and, given the uncertainty, the odds that the investment will at least break even.

This appendix presents the details of the Institute's technical work relevant to our current review of chemical dependency literature. For more information on the Institute's methods and research findings related to other policy areas, please see Lee, S., Aos, S., Drake, E., Pennucci, A., Klima, T., Miller, M., Anderson, L., Mayfield, J., & Burley, M. (2012). *Return on investment: Evidence-based options to improve statewide outcomes* (12-04-1201). Olympia: Washington State Institute for Public Policy.

I. Overview of the Benefit-Cost Model

The Institute's benefit-cost model is an integrated set of estimates and computational routines designed to produce four related benefit-cost summary statistics: net present value, benefit-to-cost ratio, internal rate of return on investment, and measure of risk associated with these bottom-line estimates. In its simplest form, the model implements a standard economic calculation of the expected worth of an investment by computing the net present value of a stream of estimated benefits and costs that occur over time, as described with equation (1).

$$(1)\quad NPV_{tage} = \sum_{y=tage}^{N} \frac{Q_y \times P_y - C_y}{(1+Dis)^y}$$

In this basic model, the net present value, *NPV*, of a program is the quantity of the outcomes achieved by the program or policy, *Q,* in year *y,* times the price per unit of the outcome, *P,* in year *y*, minus the cost of producing the outcome, *C*, in year *y*. The lifecycle of each of these values is measured from the average age of the person who is treated, *tage,* and runs over the number of years into the future over which they are evaluated, *N*. The future values are expressed in present value terms after applying a discount rate, *Dis*.

The first term in the numerator of equation (1), Q_y, is the estimated number of outcome "units" in year *y* produced by the program or policy. The procedures used to develop estimates of Q_y and P_y are described more fully in Lee et al., 2012.

Rearranging terms in (1), a benefit-to-cost ratio, *B/C,* can be computed with:

$$(2)\quad \frac{B}{C} = \sum_{y=tage}^{N} \frac{Q_y \times P_y}{(1+Dis)^y} \Bigg/ \sum_{y=tage}^{N} \frac{C_y}{(1+Dis)^y}$$

Additionally, since the model keeps track of the estimated annual cash flows of benefits and costs of a program, an internal rate of return on investment can be computed. The internal rate of return is the discount rate, in equation (1), that results in a zero net present value. In computations, the internal rate of return is calculated using Microsoft Excel's© IRR function. For some cash flow series, internal rates of return cannot be calculated.

II. General Approach and Characteristics of the Institute's Benefit-Cost Modeling Process

There are several features that are central to the Institute's benefit-cost modeling approach.

Internal Consistency of Estimates. Because the Institute's model is used to evaluate the benefits and costs of a wide range of public policies that affect many different outcomes, a key modeling goal is internal consistency. Any complex investment analysis, whether geared toward private sector or public sector investments, involves many estimates and uncertainties. Across all the outcomes and programs we consider, we attempt to be as internally consistent as possible. That is, within each topic area, such as therapeutic communities, our bottom-line estimates are developed so that a net present value for one program can be compared directly to that of another program. This is in contrast to the way most benefit-cost analyses are done, where one study conducts an economic analysis for one program and then another study performs a different benefit-cost analysis for another program—the result can often lead to apples and oranges comparisons. By adopting one modeling approach to assess all decisions, on the other hand, the consistency of results is enhanced, thereby enabling apples-to-apples benefit-to-cost comparisons.

Meta-Analytic Strategy. The first step in our benefit-cost modeling strategy produces estimates of policies and programs that have been shown to improve particular outcomes. We carefully analyze all high-quality studies from the United States and elsewhere to identify well-researched interventions that have achieved outcomes (as well as those that have not). We look for research studies with strong, credible evaluation designs, and we ignore studies with weak research methods. Our empirical approach follows a meta-analytic framework to assess systematically all relevant evaluations we can locate on a given topic. We focus the topics on those policies or programs that are the subject of budget or policy decisions facing the Washington legislature. By including all of the studies in a meta-analysis, we are, in effect, making an average statement about the effectiveness of all relevant studies on a particular topic. For example, in deciding whether therapeutic communities work to reduce crime, we do not rely on just one evaluation. Rather, we compute a meta-analytic average effect from all the credible studies we find on therapeutic communities.

Long-Run Benefits and Costs. We include estimates of the long-term benefits and costs of programs and policies. In most cases, this involves Institute projections well into the future. Projections are necessary, because most evidence about programs comes from evaluations with relatively short follow-up periods. It is rare to find longitudinal program evaluations. This problem, of course, is not unique to public programs. Most private investment decisions are based on past performance, and future results are projected by entrepreneurs or investment advisors based on certain assumptions. We adopt that private-sector investment approach in this model. We forecast, using a consistent and empirically based framework, the long-term benefits and costs of programs and policies. We then assess the riskiness of the projections.

Risk. Any tabulation of benefits and costs necessarily involves uncertainty and some degree of speculation about future performance. This is expected in any investment analysis. Therefore, it is important to understand how conclusions might change when assumptions are altered. To assess risk, we perform a "Monte Carlo simulation" technique in which we vary the key factors in our calculations. The purpose of the risk analysis is to determine the odds that a particular approach will at least break-even. We are interested in the expected rate of return on investment for any program, but we also want to calculate the odds that a particular program will not break even. This type of risk and uncertainty analysis is used by many businesses in investment decision making; we employ the same tools to test the riskiness of the public sector options considered in this report.

Three Perspectives on Benefits and Costs. We present these monetary estimates from three distinct perspectives: the benefits that accrue solely to program participants, those received by taxpayers, and any other measurable (non-participant and non-taxpayer) monetary benefits.

The sum of these three perspectives provides a "total Washington" view on whether a program produces benefits that exceed costs. Restricting the focus solely to the taxpayer perspective can also be useful for certain fiscal analysis and state budget preparation.

III. Benefit-Cost Analysis of the Criminal Justice System

Calculating the monetary value of benefits from a reduction in crime requires the estimation of several elements essential to conducting benefit-cost analysis. The four essential elements necessary for the Institute to conduct its benefit-cost analysis of criminal justice programs include the estimation of:

1. *Risk of reconviction.* We estimate the risk of being reconvicted of a crime for program participants relative to a base population of offenders who do not participate in the evidence-based program. These avoided crimes are estimated using criminal recidivism data from a base population of offenders who did not participate in the evidence-based

program. Combining the effect size with criminal recidivism information from the untreated offenders allows us to estimate and compare the cumulative recidivism rates of offenders who participated in the evidence-based program with offenders who did not participate.

2. *Criminal justice system response.* We estimate the criminal justice system's response to crime and the resources used when crime occurs. We estimate the volume of crime that comes to the attention of the criminal justice system. Then, in conjunction with the program effect size, we estimate how much crime is avoided and the monetary benefits to taxpayers that result from this avoidance. For criminal justice system resources, such as police, courts, and prison, we estimate the frequency and duration of utilization for each resource affected. For example, if a conviction occurs, we estimate the probability that a certain type of offense (e.g., rape) results in a certain type of sanction (e.g., prison or probation) and the average length of time the sanction will be used.
3. *Crimes in Washington.* We estimate the total crime that occurs in Washington State including both crimes reported and not reported to the police to estimate the true impact of evidence-based programs on crime. To do this, we estimate the total number of crimes that occur statewide in Washington. We scale-up statewide reported crimes to include crimes that do not necessarily result in a conviction, which thus included crimes that were not reported to the police. From this, we estimate the total number of crimes that occur per conviction. This number is used in conjunction with recidivism data from the offender base population described previously to estimate the total number of crimes per conviction.
4. *Costs.* Costs for each criminal justice system resource as well as victimization costs, and evidence-based program costs are estimated. The costs paid by taxpayers for each significant part of the local and state criminal justice system, such as police and sheriffs, superior courts and county prosecutors, local juvenile detention facilities, local adult jails, state juvenile rehabilitation, and state adult corrections agencies, were estimated. Marginal operating costs were estimated for these components as well as annualized capital costs, when applicable.

For more detail on our analytic methods used to compute the costs and benefits of crime, see Lee et al., 2012.

IV. Meta-Analytic Procedures to Compute Effect Sizes and Standard Errors

To estimate the effects of programs and policies on outcomes, we employ statistical procedures researchers have been developing to facilitate systematic reviews of evaluation evidence. This set of procedures is called "meta-analysis."[15] A meta-analysis is only as good as the selection and coding criteria used to conduct the study.[16] Following are the key choices we made and implemented.

Study Selection. We used four primary means to locate studies for meta-analysis of programs: (1) we consulted the bibliographies of systematic and narrative reviews of the research literature in the various topic areas; (2) we examined the citations in the individual studies themselves; (3) we conducted independent literature searches of research databases using search engines such as Google, Proquest, Ebsco, ERIC, PubMed, and SAGE; and (4) we contacted authors of primary research to learn about ongoing or unpublished evaluation work. As we will describe, the most important criteria for inclusion in our study was that an evaluation have a control or comparison group. Therefore, after first identifying all possible studies via these search methods, we attempted to determine whether the study was an outcome evaluation that had a comparison group. We also determined if each study used outcome measures that were standardized or well-validated. If a study met these criteria, we then secured a paper copy of the study for our review.

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

Control and Comparison Group Studies. Our analysis only includes studies that had a control or comparison group. We did not include studies with a single-group, pre-post research design. Only through rigorous comparison group studies can causal relationships can be reliably estimated.

Exclusion of Studies of Program Completers Only. We did not include a study in our meta-analytic review if the treatment group was made up solely of program completers. We adopted this rule because there are too many significant unobserved self-selection factors that distinguish a program completer from a program dropout, and these unobserved factors are likely to significantly bias estimated treatment effects. Some studies of program completers, however, also contain information on program dropouts in addition to a comparison group. In these situations, we included the study if sufficient information was provided to allow us to reconstruct an intent-to-treat group that included both completers and non-completers, or if the

[15] In general, we follow the meta-analytic methods described in: Lipsey, M. W., & Wilson, D. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage Publications.

[16] All studies used in the meta-analysis are identified in the references in Appendix A of this report. Many other studies were reviewed, but did not meet the criteria set for this analysis.

demonstrated rate of program non-completion was very small. In these cases, the study still needed to meet the other inclusion requirements listed here.

Random Assignment and Quasi-Experiments. Random assignment studies were preferred for inclusion in our review, but we also included non-randomly assigned comparison groups. We only included quasi-experimental studies if sufficient information was provided to demonstrate comparability between the treatment and comparison groups on important pre-existing conditions such as age, gender, and prior criminal history.

Enough Information to Calculate an Effect Size. Following the statistical procedures in Lipsey and Wilson,[17] a study had to provide the necessary information to calculate an effect size. If the necessary information was not provided, and we were unable to obtain the necessary information directly from the study author(s), the study was not included in our review.

Mean-Difference Effect Sizes. For this study, we coded mean-difference effect sizes following the procedures in Lipsey and Wilson.[18] For dichotomous measures, we used the D-cox transformation to approximate the mean difference effect size, as described in Sánchez-Meca, Marín-Martínez, and Chacón-Moscoso.[19] We chose to use the mean-difference effect size rather than the odds ratio effect size because we code both dichotomous and continuous outcomes (odds ratio effect sizes could also have been used with appropriate transformations).

Outcome Measures of Interest. The primary outcome of interest is crime. Our preference was to code convictions; however, if primary researchers did not report convictions, we coded other available measures of crime. Some studies reported multiple measures of the same outcome (e.g., arrest and incarceration). In such cases, we meta-analyzed the similar measures and used the combined effect size in the meta-analysis for that program. As a result, each study sample coded in this analysis is associated with a single effect size for a given outcome. In addition to crime, we coded substance abuse outcomes when available.

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

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

V. Procedures for Calculating Effect Sizes

Effect sizes summarize the degree to which a program or policy affects an outcome. In experimental settings this involves comparing the outcomes of treated participants relative to untreated participants. Analysts use several methods to calculate effect sizes, as described in Lipsey and Wilson.[20] The most common effect size statistic is the standardized mean difference effect size, and that is the measure we employ in this analysis.

Continuously Measured Outcomes. The mean difference effect size was designed to accommodate continuous outcome data, such as student test scores, where the differences are in the means of the outcome.[21] The standardized mean difference effect size is computed with:

$$(3)\ ES = \frac{M_t - M_c}{\sqrt{\frac{(N_t - 1)SD_t^2 + (N_c - 1)SD_c^2}{N_t + N_c - 2}}}$$

In this formula, ES is the estimated effect size for a particular program; M_t is the mean value of an outcome for the treatment or experimental group; M_c is the mean value of an outcome for the control group; SD_t is the standard deviation of the treatment group; and SD_c is the standard deviation of the control group; N_t is the number of subjects in the treatment group; and N_c is the number of subjects in the control group.

[17] Lipsey & Wilson, 2001.
[18] Ibid.
[19] Sánchez-Meca, J., Marín-Martínez, F., & Chacón-Moscoso, S. (2003). Effect-size indices for dichotomized outcomes in meta-analysis. *Psychological Methods*, *8*(4), 448-467.
[20] Lipsey & Wilson, 2001.
[21] Ibid, Table B10, equation 1, p. 198.

The variance of the mean difference effect size statistic in (3) is computed with:[22]

$$(4)\ ESVar = \frac{N_t + N_c}{N_t N_c} + \frac{ES^2}{2(N_t + N_c)}$$

In some random assignment studies or studies where treatment and comparison groups are well-matched, authors provide only statistical results from a t-test. In those cases, we calculate the mean difference effect size using:[23]

$$(5)\ ES = t\sqrt{\frac{N_t + N_c}{N_t N_c}}$$

In many research studies, the numerator in (3), M_t - M_c, is obtained from a coefficient in a regression equation, not from experimental studies of separate treatment and control groups. For such studies, the denominator in (3) is the standard deviation for the entire sample. In these types of regression studies, unless information is presented that allows the number of subjects in the treatment condition to be separated from the total number in a regression analysis, the total N from the regression is used for the sum of N_t and N_c, and the product term N_tN_c is set to equal $(N/2)^2$.

Dichotomously Measured Outcomes. Many studies record outcomes not as continuous measures such as test scores, but as dichotomies; for example, high school graduation. For these yes/no outcomes, Sanchez-Meca, et al.[24] have shown that the Cox transformation produces the most unbiased approximation of the standardized mean effect size. Therefore, to approximate the standardized mean difference effect size for continuously measured outcomes, we calculate the effect size for dichotomously measured outcomes with:

$$(6)\ ES_{Cox} = \frac{\ln\left[\frac{\mathrm{P_t}(1-\mathrm{P_c})}{\mathrm{P_c}(1-\mathrm{P_t})}\right]}{1.65}$$

where P_t is the percentage of the treatment group with the outcome and P_c is the percentage of the comparison group with the outcome. The numerator, the logged odds ratio, is then divided by 1.65.

The ES_{Cox} has a variance of

$$(7)\ ESVar_{Cox} = .367\left[\frac{1}{\mathrm{O}_{1t}} + \frac{1}{\mathrm{O}_{2t}} + \frac{1}{\mathrm{O}_{1c}} + \frac{1}{\mathrm{O}2_{1c}}\right]$$

where O_{1t}, O_{2t}, O_{1C}, *and* O_{2C} are the number of successes (1) and failures (2) in the treatment, t, and control, c groups.

Occasionally when outcomes are dichotomous, authors report the results of statistical analysis such as Chi-Square (X^2) statistics. In these cases, we first estimate the absolute value of $ES_{arcsine}$ per Lipsey and Wilson[25], then based on an analysis we conducted, we multiply the result by 1.35 to determine ES_{Cox}.

$$(8)\ |ESCox| = 1.35 * 2\sqrt{\frac{\mathrm{X}^2}{N_t + Nc - \mathrm{X}^2}}$$

Similarly, we determined that in these cases, using (4) to calculate the variance underestimates $ESVar_{Cox}$ and over estimates the inverse variance weight. We conducted an analysis which showed that $ESVar_{Cox}$ is linearly related to *ESVar*. Our analysis indicated that by multiplying *ESVar* by 1.65 provides a very good approximation of $ESVar_{Cox}$.

Pre/Post Measures. Where authors report pre- and post-treatment measures without other statistical adjustments, first we calculate two between-groups effect sizes: (1) at pre-treatment and, (2) at post-treatment. Finally, we calculate the overall effect size by subtracting the post-treatment effect size from the pre-treatment effect size.

[22] Ibid, Table 3.2, p. 72.
[23] Ibid, Table B10, equation 2, p. 198
[24] Sánchez-Meca, J., Marín-Martínez, F., & Chacón-Moscoso, S. (2003). Effect-size indices for dichotomized outcomes in meta-analysis. *Psychological Methods*, 8(4), 448-467.
[25] Lipsey and Wilson, 2001, Table B10, equation 23, p. 200

Adjusting Effect Sizes for Small Sample Sizes

Since some studies have very small sample sizes, we follow the recommendation of many meta-analysts and adjust for this. Small sample sizes have been shown to upwardly bias effect sizes, especially when samples are less than 20. Following Hedges,[26] Lipsey and Wilson[27] report the "Hedges correction factor," which we use to adjust all mean-difference effect sizes, (where N is the total sample size of the combined treatment and comparison groups):

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

Computing Weighted Average Effect Sizes, Confidence Intervals, and Homogeneity Tests. Once effect sizes are calculated for each program effect, and any necessary adjustments for clustering are made, the individual measures are summed to produce a weighted average effect size for a program area. We calculate the inverse variance weight for each program effect and these weights are used to compute the average. These calculations involve three steps. First, the standard error, SE_T of each mean effect size is computed with:[28]

$$(10)\ SE_T = \sqrt{\frac{N_t + N_c}{N_t N_c} + \frac{ES^2}{2(N_t + N_c)}}$$

Next, the inverse variance weight w is computed for each mean effect size with:[29]

$$(11)\ w = \frac{1}{SE_T^2}$$

The weighted mean effect size for a group with i studies is computed with:[30]

$$(12)\ \overline{ES} = \frac{\sum(w_i ES_{T_i})}{\sum w_i}$$

Confidence intervals around this mean are then computed by first calculating the standard error of the mean with:[31]

$$(13)\ SE_{\overline{ES}} = \sqrt{\frac{1}{\sum w_i}}$$

Next, the lower, ES_L, and upper limits, ES_U, of the confidence interval are computed with:[32]

$$(14)\ \overline{ES_L} = \overline{ES} - z_{(1-\alpha)}\left(SE_{\overline{ES}}\right)$$

$$(15)\ \overline{ES_U} = \overline{ES} + z_{(1-\alpha)}\left(SE_{\overline{ES}}\right)$$

In equations (14) and (15), $z_{(1-\alpha)}$ is the critical value for the z-distribution (1.96 for α = .05).

The test for homogeneity, which provides a measure of the dispersion of the effect sizes around their mean, is given by:[33]

$$(16)\ Q_i = \left(\sum w_i\, ES_i^2\right) - \frac{\left(\sum w_i\, ES_i^2\right)}{\sum w_i}$$

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

[26] Hedges, L. V. (1981). Distribution theory for Glass's estimator of effect size and related estimators. *Journal of Educational Statistics, 6*(2), 107-128.
[27] Lipsey & Wilson, 2001, equation 3.22, p. 49.
[28] Lipsey & Wilson, 2001, equation 3.23, p. 49.
[29] Ibid., equation 3.24, p. 49.
[30] Ibid., p. 114
[31] Ibid.
[32] Ibid.
[33] Ibid., p. 116

Computing Random Effects Weighted Average Effect Sizes and Confidence Intervals. Next, a random effects model is used to calculate the weighted average effect size. Random effects models allow us to account for between-study variance in addition to within-study variance.[34]

This is accomplished by first calculating the random effects variance component, v[35]

$$(17)\ v = \frac{Q_i - (k-1)}{\sum w_i - (\sum wsq_i / \sum w_i)}$$

where wsq_i is the square of the weight of ES_i (11).

This random variance factor is then added to the variance of each effect size and finally all inverse variance weights are recomputed, as are the other meta-analytic test statistics. If the value of Q is less than the degrees of freedom (*k-1*), there is no excess variation between studies and the initial variance estimate is used.

VI. Institute Adjustments to Effect Sizes for Methodological Quality, Outcome Measure Relevance, Researcher Involvement, and Laboratory or Unusual Settings

In Appendices A and B, we show the results of our meta-analyses calculated with the standard meta-analytic formulas described in this technical appendix. In the last column of the exhibit in Appendix B, we list the "Adjusted Effect Size" that we actually use in our analysis. These adjusted effect sizes are derived from the unadjusted results and may be smaller, larger or equal to the unadjusted effect sizes.

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

A. Methodological Quality

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

To account for the differences in the quality of research designs, we use a 6-point scale (with values ranging from zero to five) as a way to adjust the reported results. On this scale, a rating of "5" reflects an evaluation in which the most confidence can be placed: a well-implemented random assignment study. Generally, as the evaluation ranking gets lower, less confidence can be placed in any reported differences (or lack of differences) between the program and comparison or control groups.[36] A rating of "0" reflects an evaluation that does not have a comparison group or has a comparison group that is not equivalent to the treatment group (for example, because individuals in the comparison group opted to forgo treatment).

On the 0-to-5 scale as interpreted by the Institute, each study is rated as follows.

- A **"5"** is assigned to an evaluation with well-implemented random assignment of subjects to a treatment group and a control group that does not receive the treatment/program. A good random assignment study should also indicate how well the random assignment actually occurred by reporting values for pre-existing characteristics for the treatment and control groups.
- A **"4"** rating is used to designate an experimental random assignment design that had problems in implementation. For example, there could be some crossover between the treatment and control groups or differential attrition rates (such as 10 percent study dropouts among participants versus 25 percent among non-participants).
- A **"3"** is assigned to an observational study that employs a rigorous quasi-experimental research design with a program and matched comparison group, controlling with statistical methods for self-selection bias that might

[34] Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2010). A basic introduction to fixed-effect and random-effects models for meta-analysis. *Research Synthesis Methods, 1*(2), 97-111.
[35] Ibid., p. 134
[36] In a meta-analysis of juvenile delinquency evaluations, random assignment studies produced effect sizes only 56 percent as large as nonrandom assignment studies. Lipsey, M. W. (2003). Those confounded moderators in meta-analysis: Good, bad, and ugly. *The Annals of the American Academy of Political and Social Science, 587*(1), 69-81.

otherwise influence outcomes. These quasi-experimental methods may include estimates made with a convincing instrumental variables modeling approach, or a Heckman approach to modeling self-selection.[37]

- A **"2"** indicates a non-experimental evaluation where the program and comparison groups were reasonably well matched on pre-existing differences in key variables. There must be evidence presented in the evaluation that indicates few, if any, significant differences were observed in these salient pre-existing variables. Alternatively, if an evaluation employs sound multivariate statistical techniques (e.g., logistic regression) to control for pre-existing differences, then a level "2" study with some differences in pre-existing variables can qualify as a level 3.
- A **"1"** is used when a level "3" or a "2" study design was less well implemented or didn't use many statistical controls.
- A **"0"** involves a study with program and comparison groups that lack comparability on pre-existing variables and no attempt was made to control for these differences in the study. A zero rating also is used in studies where no comparison group is utilized. Instead, the relationship between a program and an outcome, i.e., drug use, is analyzed before and after the program.

We do not use the results from program evaluations rated as a "0" on this scale, because they do not include a comparison group and, thus, no context to judge program effectiveness. In this study, we only considered evaluations that rated at least a 1 on this scale.

B. Adjusting Effect Sizes

An explicit adjustment factor (multiplier) is assigned to the results of individual effect sizes based on the Institute's judgment concerning research quality (study design), research involvement in program design and implementation, not "real-world" setting, and weak outcome measure. Adjustments are made by multiplying the effect size for any study, ES'm in equation (7) by the adjustment factors for the topic area. The resulting adjusted effect size is used in the benefit-cost analysis.

For areas with a limited number of studies, we use default multipliers. The default multipliers are subjective to a degree; they are based on the Institute's general impressions of the confidence that can be placed in the predictive power of evaluations of different quality, weak outcome measures, program developer involvement in evaluation, and unusual settings. Because we had sufficient number of studies from the criminal justice field coded,[38] we determined adjustment factors based on results of meta-regression techniques (multivariate linear regression analysis, weighting with random effects inverse variance weights). That is, the adjustment factors for the chemical dependency meta-analyses in this report are based on our empirical knowledge of the research in the criminal justice field. We performed a multivariate regression analysis of 96 effect sizes from evaluations of adult and juvenile justice programs. The analysis examined the relative magnitude of effect sizes for studies rated a 1, 2, 3, or 4 for research design quality, in comparison with a 5 (see above for a description of these ratings). We weighted the model using the random effects inverse variance weights for each effect size. The results indicated that research designs 1, 2, and 3 should have a multiplier greater than 1 and research design 4 should have a multiplier of approximately 1. Using a conservative approach, we set all the multipliers to 1. The adjustment factors are listed in ***Exhibit C1***.

In this analysis, we also found that effect sizes were statistically significantly higher when the program developer was involved in the research evaluation. Similar findings, although not statistically significant, indicated that studies using weak outcome measures (such as technical violations) were higher.

Exhibit C1
Adjustment Factors Applied to the Meta-Analysis

Type of Adjustment	Adjustment factor
Study Design	
1- Less well-implemented comparison group or observational study, with some covariates.	1.00
2- Well-implemented comparison group design, often with many statistical controls.	1.00
3- Well-done observational study with many statistical controls (e.g., IV, regression discontinuity).	1.00
4- Random assignment, with some RA implementation issues.	1.00
5- Well-done random assignment study.	1.00
Program developer = researcher	0.36
Unusual (not "real world") setting	0.50
Weak measurement used	0.50

[37] For a discussion of these methods, see Rhodes, W., Pelissier, B., Gaes, G., Saylor, W., Camp, S., & Wallace, S. (2001). Alternative solutions to the problem of selection bias in an analysis of federal residential drug treatment programs. *Evaluation Review, 25*(3), 331-369.
[38] See Lee et al., 2012. See also, Aos, S., Miller, M., & Drake, E. (2006). *Evidence-based public policy options to reduce future prison construction, criminal justice costs, and crime rates* (Document No. 06-10-1201). Olympia: Washington State Institute for Public Policy.

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