

Returns on Investments in Recidivism-reducing Programs

The Council of Economic Advisers
May 2018



Executive Summary

May 2018

Crime imposes a significant burden on Americans' well-being and tax-financed resources. These costs are amplified by a cycle of crime that results in re-arrest rates for released American prisoners in excess of 50 percent. Rigorous and evidence-based prison reforms are proposed to break the crime cycle, thereby reducing future crime and lowering incarceration expenditures by facilitating more successful re-entry to the workforce upon prison release. In this policy brief, CEA reviews the evidence on the underlying factors that determine the value of such prison programs and provides estimates on their rates of return.¹ There are numerous programs that have been tried in one form or another over many decades. We do not aim to cover the entire scope of prison reform programs but focus instead on three main categories: programs that address mental health, substance abuse, or education and that are delivered inside correctional facilities.²

We find that there is great variation in the effectiveness across programs such that reallocation of budgets from poorly to well performing programs may both lower spending and improve results. In addition, CEA finds evidence that certain individual programs can reduce crime as well as reduce spending by lowering long-run incarceration costs. Programs that save at least one dollar in crime and incarceration costs for every dollar spent are deemed cost effective. More specifically, with a focus on rigorous studies of the programs that have been previously implemented, CEA finds that, on average, programs that address the prisoner's mental health or substance abuse problems may reduce the cost of crime by about \$0.92 to \$3.31 per taxpayer dollar spent on prison reform and long-run incarceration costs by \$0.55 to \$1.96, for a total return of \$1.47 to \$5.27 per taxpayer dollar.

Despite these positive returns, there are many programs—such as those in which the primary focus is education—for which the evidence base is inconsistent and rates of return more uncertain. Given this uncertainty, CEA estimates by how much rates of recidivism would have to be reduced in order for the programs to break even given their costs. We calculate that

¹ CEA thanks Jennifer L. Doleac for providing us with help in reviewing the literature on the effectiveness of recidivism programs by supplying us with her 2018 presentation “Strategies to successfully reintegrate formerly-incarcerated youth into their communities: A review of the evidence.”

² There is one exception. Some mental health treatments are provided outside of the prison post release and we use these studies when appropriate.

educational programming needs only to achieve a modest impact on recidivism rates (about a 2 percent reduction) in order to be cost effective.

Overall, increased investment in better evidence is needed to guide future investments into programs to reduce recidivism. Many programs, even if they are found to be cost effective may have small sample sizes or unique characteristics that may be difficult to replicate or scale up, and some studies with high-quality research designs are too dated to provide needed insight. Carefully designed, broad-based national programs that target a wide variety of offenders in conjunction with carefully designed empirical evaluations would improve the ability of policymakers to allocate criminal justice funds to achieve the greatest possible social benefits.

1. Introduction

Crime imposes a high fiscal burden as well as large social costs. In 2016, the United States spent over \$270 billion (1.4 percent of GDP) funding the criminal justice system and maintaining prisons while real spending on prisons has grown by 70 percent over the last 20 years (CEA 2016). In addition, victims and society at large have incurred significant costs from crime in terms of pain and suffering, reduced quality of life, property losses, medical costs, and loss of life. Communities often bear the cost of crime in the form of lower property values, reduced business investment, and lost economic opportunity. Altogether, the damages imposed upon society represented an additional 1.5 percent of GDP in 2014 (CEA 2016). The cost of funding the criminal justice system plus the costs imposed by crime are equivalent to 2.9 percent of GDP (roughly \$500 billion).

The large social costs of crime are partly attributable to the high probability that prisoners exiting State and Federal facilities will commit crimes after leaving prison. More than three-quarters of State offenders are re-arrested within five years of release (Bureau of Justice Statistics, 2016) and approximately 50 percent of released Federal prisoners will be re-arrested (United States Sentencing Commission, 2016) within 10 years of release.³ Thus, efforts to reduce the recidivism rate for former prisoners could substantially lower the burden of crime in the United States.

To address the high cost of crime, the Trump Administration has released principles on prison reform and re-entry programs, aiming to improve successful re-entry into society and reduce recidivism. The Administration intends to enact policies that:

- Evaluate existing incentives for re-entry program participation and develop improvements that tie successful program completion to incentives while incarcerated.
- Evaluate and implement evidence-based recidivism reduction and re-entry programs to promote the successful re-entry of Federal inmates.
- Ensure all inmates have access to recidivism reduction programs that meet their needs by enhancing tools to reduce existing risk.

³Based off of a sample of 25,431 prisoners who are U.S. citizens, discharged in 2005, with valid FBI numbers that allow them to be located in criminal history repositories, and are not dead, escaped or detained in any way.

- Expand inmate access-to-work programs to enable all eligible inmates to gain job skills that prepare them for successful re-entry from prison.
- Evaluate and facilitate public and private partnerships aimed at improving employment opportunities for inmates before and after their release.
- Prioritize funding and support Federal programs that have proven to be effective at reducing State prison recidivism.

These principles focus on improving the lives of all Americans by using government resources to reduce crime, enhance public safety, and increase successful re-entry of former prisoners, while avoiding wasting taxpayer dollars on inefficient programs that do not meet their defined objectives.

This report focuses on recidivism. In the following analysis, recidivism is defined as re-incarceration, for the purposes of calculating return on investment.⁴ This report assesses the total return on prison reform investments aimed at reducing recidivism according to the Trump Administration's principles stated above. Prison reform, if properly designed and implemented, could lower spending and reduce recidivism in two ways. First, as we find that there is great variation in effectiveness across programs, reallocation of budgets from poorly- to well-performing programs may both lower spending and improve overall results. In addition, certain individual programs may result in both lower damages to potential victims and communities from crimes avoided, as well as reductions in future costs of incarceration. Increased spending on programs during an initial prison stay can be offset by lower long-run prison costs if these programs lower the probability that a person will return to prison in the future.

This report reviews the literature on programs that address prisoners' mental health and substance abuse problems. While these programs are not applicable to all prisoners, it is estimated that over 60 percent of prisoners contend with drug or alcohol addiction. In addition, 76 percent of prisoners with mental health problems are estimated to be dependent upon drugs (compared to 53 percent of inmates who experience addiction but do not experience documented mental health problems) (BJS 2006). Given the Administration's priority of

⁴ Our literature review includes estimates of recidivism that are based on a diverse set of recidivism definitions, including return to criminal behavior, re-arrest, and re-incarceration. Under the assumption that any percent reduction in any recidivism measure leads to the same percent reduction in re-incarceration, the treatment effects from all studies can be used to estimate reductions in re-incarceration. We do not include recidivism measures that consider a return to illegal drug usage, for example.

identifying on evidence-based reforms, we focus on rigorous studies that evaluate mental health and substance abuse programs. In addition, we discuss educational programs and the lack of credible evidence to date that would allow us to evaluate them.

Reviewing the evidence base, CEA finds that, on average, mental health treatment—specifically cognitive behavioral therapies—and substance abuse treatments can generate net social benefits. CEA does not recommend or endorse a particular program, as the success or failure of a given program may depend upon details beyond the scope of this report. However, we point out that a number of mental health and substance abuse programs can reduce crime and incarceration costs simultaneously.⁵ We find that these programs can reduce crime when undertaken by an inmate suitable to the intended intervention. The reduction in crime constitutes a value of about \$0.92 to \$3.31 per taxpayer dollar spent. The reduction in long-run incarceration costs constitutes a value of about \$0.55 to \$1.96 per taxpayer dollar spent, for a total return of \$1.47 to \$5.27 per taxpayer dollar spent for mental health and drug treatments, respectively. In addition to these programs, there is a large set of programs with insufficient evidence to be evaluated properly. One area particularly lacking in sufficient evidence is prison education programs, such as GED completion. The empirical studies that do exist on educational programs should be interpreted cautiously due to methodological issues such as selection biases in and out of programs. In the face of this uncertainty, CEA estimates what the recidivism effects would have to be in order for these educational programs to break even, given their costs. We estimate that education programs need only reduce recidivism by about 2 percent in order to recover costs—a modest reduction. Greater investment in research to broaden the evidence base of these programs’ effectiveness would enable more rigorous evaluation.

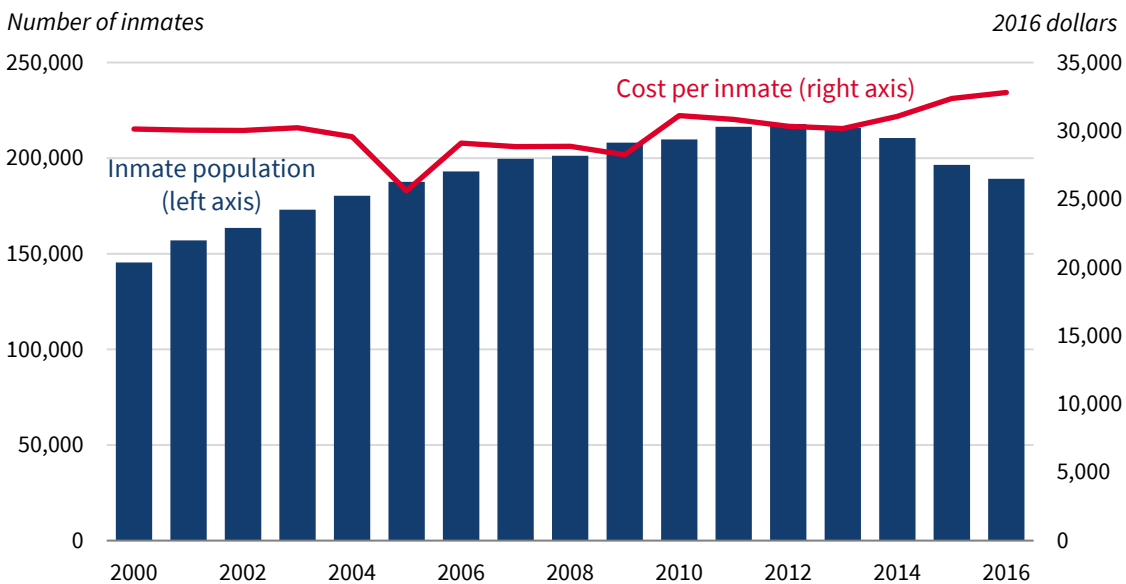
The report is briefly outlined as follows. Section 2 provides background data on crime and incarceration in the United States. Section 3 estimates the total cost of crime for a number of crime categories. Section 4 examines the literature on the effectiveness of in-prison programs in reducing recidivism. Section 5 calculates the return on investment to prison reforms. Section 6 concludes and discusses limitations of the analysis.

⁵ Other types of programs work as well. For example, there is growing evidence that reducing the amount of post-release supervision reduces criminal behavior. By its very nature, spending less on supervising prisoners reduces government expenditures on the criminal justice system. See Hennigan et al. (2010) or Barnes et al. (2012).

2. The Federal Prison Population

The Federal prison population has been declining since 2012 when it peaked at nearly 220,000 inmates. At the end of FY 2016, there were 192,170 Federal crime and 1.32 million State crime offenders held in correctional facilities. The average annual incarceration cost per Federal prisoner was \$32,805 in 2016, which in inflation-adjusted terms has increased only slightly since 2000 (Figure 1).

Figure 1. Federal Inmate Population and Cost per Inmate



Sources: Federal Bureau of Prisons (2003–2016); Bureau of Justice Statistics (2009, 2016).

In a 2016 report, the United States Sentencing Commission estimates that nearly 50 percent of released Federal prisoners will be re-arrested within eight years, and 32 and 25 percent will be re-convicted and re-incarcerated, respectively. The majority of these re-arrests will occur in the first 5 years following release.⁶

The estimated size of the 2017 Federal release class is 44,755, based on the population in 2017 and the historic average annual release rate. Although 50 percent of this class would be expected to be re-arrested, only 25 percent would be re-incarcerated. Under the assumption that there is no change in sentencing, we assume in the following analysis that lower recidivism translates into actual lower crime (not simply that crimes continue to be committed at the

⁶ These statistics are not generally collected past 10 years, thereby leading to an underestimate over the lifetime of a released inmate.

same rate without leading to arrest). Thus, as a hypothetical example, suppose we could reduce recidivism by 20 percent. This would result in over 1,000 fewer incarcerations among a one-year cohort of federal prisoners.

The analysis that follows first discusses how to measure the reduction in crime and prison costs from a given reduction in recidivism. Thereafter, we look at how effectively different programs have reduced recidivism. Using these data, we then estimate the reduction in crime and prison costs associated with a given prison program. A program's rate of return is then calculated as the value of these benefits relative to program costs.

3. The Cost of Crime and Incarceration

The crimes that lead to Federal and State imprisonment entail both tangible and intangible costs for Americans (Heaton, 2010). Tangible costs involve direct out-of-pocket expenditures by government, businesses and individuals, including any lost productivity. For example, direct costs include medical treatment for victims, property damage, installation of security measures such as alarms, wage losses to the victim due to injury and to the perpetrator due to punishment, and the costs of incarceration and public legal services for accused criminals. These costs are, in principle, measurable with sufficient data.

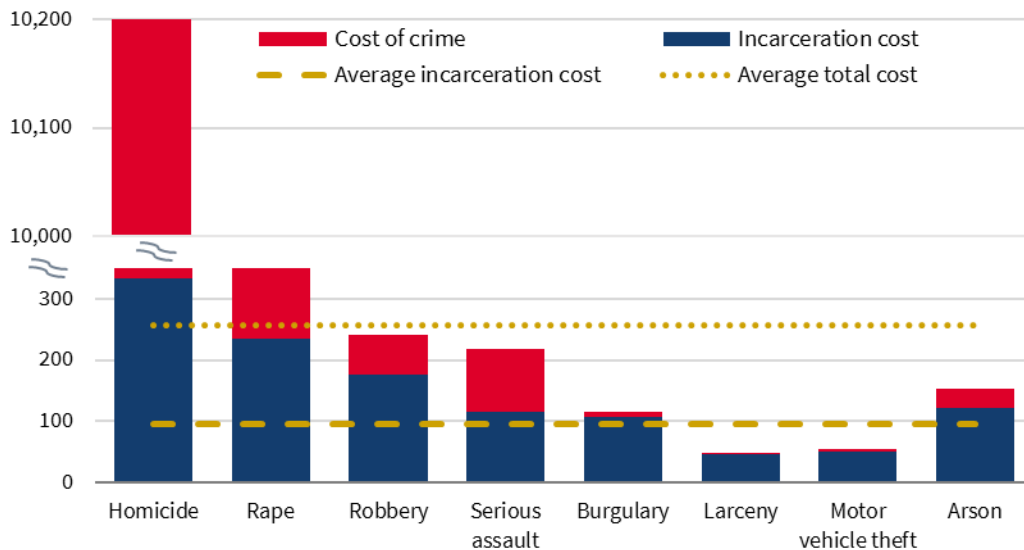
However, there are also intangible costs to both victims and non-victims. Intangible costs tend to be more case-specific, or lack an easily identifiable, market-based price. These include, for example, the psychological effects of victimization incurred by the victim, the victim's family, or society at large; loss in quality of life that may be physical or mental; and lost parenting opportunities due to incarceration. While difficult to measure, these costs are important to capture because, for some crimes, they represent the preponderance of the cost. For example, Miller et al. (1996) and French et al. (2004) estimate that at least 80 percent of the total cost of a serious assault is comprised of intangible costs. Thus, treating these costs as zero may lead to an underestimate the true cost of crime.

The criminology literature has attempted to estimate the total cost of crime for a number of major crime categories. Tangible costs, while more straightforward, nonetheless require a number of assumptions; for example, one must decide how to calculate the opportunity cost of the offender—that is, what he or she is sacrificing by being imprisoned—and how to attribute the cost of the criminal justice system over a multitude of crimes. Once an assumption is made to use the minimum wage as the opportunity cost, calculating lost wages and any taxes the offender would have paid on those wages during incarceration is straightforward. Intangible costs are measured in a number of ways, none of which is perfect. Questionnaire data collected

from victims are used to measure the loss in mental and physical quality of life. Other studies use the portion of a jury award that is used to compensate for pain, suffering, and loss of quality of life (the amount of the award above and beyond the portion that is awarded to deal directly with actual measurable damages). Ultimately, these are estimates of a cost that is inherently difficult to measure and are likely highly dependent upon the individual circumstances of the crime.

Figure 2. 2017 Average Total Cost per Crime

Thousands of dollars



Sources: Cohen and Piquero (2009); Heaton (2010); McCollister, French and Fang (2010); NIH Public Access (2009); National Corrections Reporting Program (2009); Bureau of Justice Statistics; Federal Bureau of Prisons.

Using an average of these estimates from the academic literature on tangible and intangible costs of a wide variety of crimes (Figure 2), combined with CEA estimates on incarceration costs, we estimate a weighted average total cost of crime of about \$258,000 per crime.⁷ Furthermore, we estimate that \$96,000 of this cost is due solely to incarceration costs (estimated by the annual incarceration cost times the average length of imprisonment by crime, adjusted to present value using a 3 percent discount rate).⁸ The estimates beyond

⁷ The weights used are the probabilities that a released Federal prisoner recidivates for a particular crime. For example, conditional upon recidivating, the probability that the crime is assault is 24.4 percent. We use Federal average costs per prisoner to value the incarceration costs but note that State and Federal costs per prisoner are similar.

⁸ The Vera Institute of Justice, an advocacy organization, suggests that overlooked costs such as employee benefits or hospital care for inmates would add an additional 13.9 percent to incarceration costs, on average.

incarceration costs capture various costs that are particular to the crime. For example, in instances of homicide, a large fraction of the cost is the statistical value of a life. In cases of larceny, it is the actual dollar value of goods or money stolen. Figure 2 below illustrates the total costs of a subgroup of crime categories used to derive the weighted average.⁹

4. The Evidence Base for Prison Programs and Recidivism

Many prisoners in the United States have access to correctional programming, including a broad array of interventions including substance abuse treatment, education, and mental health treatment. Duwe (2017) notes that the literature tends to use four outcome metrics to assess the efficacy of correctional programming provided during incarceration: (1) prison misconduct, or the lack of adherence to prison regulations, (2) recidivism, (3) post-release employment, and (4) cost avoidance, or the monetary benefit that accrues through the prevention of crime. Of these, recidivism is the most common outcome used to assess the effectiveness of treatment programs.

Based on the literature, the most successful treatment programs are those that address the mental health and substance abuse problems of prisoners.¹⁰ Using the treatment estimates from the literature, we conclude that mental health programs reduce recidivism by approximately 21 percent and substance abuse programs by 17 percent. Educational programs, while common, have shown inconclusive results and require better-designed studies to adequately evaluate expected outcomes. In line with the principles of the Administration's push for evidence-based intervention, there is need for additional work to

⁹ There are a limited number of crime categories for which we have reliable estimates of tangible and intangible costs. In cases where this information is missing, we use an estimate of incarceration costs only. The main categories where non-incarceration costs are missing are trafficking and possession of drugs, and possession of weapons.

¹⁰ We primarily make use of a comprehensive list of rigorous studies from Doleac (2018). In addition, we supplement this search with research papers from The National Justice Institute's (NIJ) Crimesolutions.gov database as a particularly useful catalog of studies that is designed to be a single, credible, online resource to inform practitioners and policymakers about what works, what doesn't, and what's promising in criminal justice, juvenile justice, and crime victim services. The programs that NIJ analyzes are identified and selected through a continual, comprehensive search of the literature. This includes searches through relevant databases, peer-reviewed journals, other publications, federal agencies' websites (such as NIJ and the Office of Juvenile Justice and Delinquency Prevention (OJJDP)), and program nominations from the field. Programs are prioritized by Senior Researchers based on several factors, such as study design, year of publication, and type of program. Prioritized programs are submitted to NIJ and OJJDP program officers for final approval. There is a regular updating process of programs included in Crime Solutions to incorporate any significant new research.

improve evaluation methodologies in this area.¹¹ Any prison reform agenda should include efforts to (a) base reforms on the best data available and (b) consistently measure results. For example, the Report of the Commission on Evidence-Based Policymaking recommends that up to 1 percent of program administration resources be set aside to support evidence-building activities including data collection, program evaluation, and policy-relevant research (CEP 2017).

In the analysis that follows, we group the literature into two broad categories: (1) rigorous program evaluations, whether or not they find positive recidivism effects and (2) programs for which the evidence base is incomplete or poorly designed. “Rigorous” is defined as studies with a solid empirical design—typically randomized control trials (RCTs)—and those that have addressed sample selection issues. The random selection into treatment and control groups is often quite important in these studies where otherwise self-selection into treatment would provide highly biased findings. For example, an offender who is motivated to change his or her life is more likely to volunteer for treatment and less likely to engage in crime in the future. Thus, researchers risk overstating the importance of the treatment because the captured result is the impact of the treatment *plus* the impact of the offender’s motivation. Randomized selection for treatment, along with careful attention to attrition, can minimize such biases. We focus on more recent studies (all studies post-2010), supplementing these studies with some earlier literature when relevant and which serve to fill out areas lacking in current studies. Finally, we restrict our review to people with extant criminal records (and not initial crime prevention).

A. Rigorous Evaluations of Mental Health and Substance Abuse Programs

In the sections below, we review the rigorous studies that evaluate mental health and substance abuse programs. To date, some of the rigorous studies have examined the implementation of these programs on youth up to age 25, with fewer studies completed on adults. Unlike State facilities, Federal prisons hold very few juvenile inmates, and for the purposes of calculating an ROI, we assume a similar recidivism reduction among Federal inmates targeted for treatment. To the extent that Federal actions on prison reform also spur additional investments in mental health reform by States, these returns are relevant for those investments as well.

¹¹ This is also consistent with the Ryan-Murray *Foundations for Evidence-Based Policymaking Act* that calls for a more transparent and efficient data system that will allow various Federal agencies to better judge the effectiveness of Federal programs.

i. Mental Health Programs

Mental health programs, specifically cognitive behavioral therapy (CBT) and multisystemic therapy (MST) programs, have been shown to be effective in several rigorous evaluations, most definitively for juvenile participants. CBT programs use psychotherapy to change individuals' behavior by modifying dysfunctional patterns of behavior and thought. The goal of treatment is to help individuals internalize these new ways of thinking and apply them to a variety of different circumstances to make it easier for them to re-enter society. CBT can be used for substance abuse, mental health, and other prison-specific programming needs, as it is used to treat disorders including anxiety, depression, and obsessive-compulsive disorder. Duwe (2017), in reviewing research on CBT, finds that this therapy technique has been shown to reduce recidivism by 20 to 30 percent, and CBT programs are potentially the most effective intervention for reducing recidivism. However, these treatments can be expensive. In the subsequent paragraphs, we discuss the findings from rigorous studies on the effectiveness of CBT and other mental health treatments.

Burraston et al (2016) examine whether recidivism was reduced among juvenile offenders on probation following a mental health treatment program that used cell phone technology in CBT training sessions. Controlling for gender, prior arrests, and risk scores, results show that the treatment group had a 51 percent lower re-arrest rate within the first year. Heller et al. (2016) carried out three large-scale randomized controlled trials (RCTs) on youth in Chicago to analyze the effects of a mental health program that offered participants a chance to perform rational self-analysis. The treatment was found to reduce recidivism by 21 percent. Barnes et al. (2017) examine the effects of a CBT treatment program in a probation correctional environment for adult offenders in Philadelphia. Using an RCT to evaluate the effects of a classroom program designed by experienced psychologists, but conducted by probation officers, the authors find that the treatment group was significantly less likely to recidivate by 17 percent. The results were only significant for nonviolent crimes, however. Finally, De Vries et al. (2018) examine the effects of the New Perspectives program, an intensive community-based program for youth offenders. They use a randomized control trial to find an insignificant effect of the program on recidivism.

Multi-systemic therapy (MST), an alternative mode of treatment to CBT, is generally more cost-effective and involves the families and communities of targeted individuals. Butler et al. (2011) analyze the effects of MST treatments where trained MST professionals were recruited to visit the families of juvenile offenders several times each week and were always available on-call. In a randomized controlled trial setting, the authors find that the treatment group was

significantly less likely to recidivate by 70 percent. Sawyer and Borduin (2011) examine the long-run impact of MST on recidivism, using a sample of 176 juvenile offenders who were randomly assigned to MST treatment or individual therapy. The program resulted in a 36 percent statistically significant reduction in recidivism for the treatment group. In contrast to these successful approaches, Olsson (2008) finds no statistical difference between a more expensive MST therapy and the baseline standard therapy among juvenile offenders in Sweden.

Taking these findings all together, CEA estimates a median treatment effect of 21 percent for programs addressing mental health problems during incarceration. For comparison, CEA notes that as part of its benefit-cost analysis of Washington state programs in criminal justice, education, and other policy areas, the Washington Institute of Public Policy (WSIPP) has conducted a meta-analysis of adult CBT programs based on a literature review through December 2016. WSIPP's estimated unadjusted effect size of program participation on crime (recidivism) is -.147, corresponding to a reduction in the recidivism rate of 17.1 percent. After adjusting for the methodological quality and other characteristics of the underlying studies, WSIPP's adjusted effect size falls (in absolute value) to -.109, implying a recidivism reduction of 12.9 percent. In addition, WSIPP's analysis of MST programs serving juveniles and their families suggests that program participation results in an (adjusted) 11.4 percent reduction in recidivism.

ii. Substance Abuse Programs

Drug-related offenses constitute approximately half of overall crimes at the Federal level in the United States. It is estimated that 60 percent of prisoners have alcohol or drug related problems. Only 24 percent of Federal prisoners, however, are formally diagnosed with a substance abuse disorder; all of whom receive substance abuse treatment while incarcerated. At the State level, fewer than 10 percent of prisoners receive drug treatment even though more than half of prisoners meet the criteria for substance abuse (Zarkin et al. 2012). Substance abuse treatment participants engage in specific services or behavioral change techniques, such as aversion therapy, drug testing, drug counseling, or relapse-prevention training.

In early studies, Wexler et al. (1999a, 1999b) evaluate the effectiveness of the Amity In-Prison Therapeutic Community, a program that provides substance abuse treatments for male offenders. The authors use randomly assigned treatment and control groups and find that the treatment group was significantly less likely to recidivate by around 32 and 35 percent over follow-up periods of a year and two years respectively, but this difference became statistically insignificant by three years post release. A 2016 revision in regulations by the Bureau of Prisons

(BOP) to use therapeutic community treatments for the Residential Drug Abuse Treatment Program (RDAP) was based on similar research by Wexler et al (1990). The BOP estimates RDAP leads to a reduction in recidivism by males and females of 16 and 18 percent respectively (FBOP 2000).

Sacks et al. (2012a) evaluate the efficacy of a therapeutic community program targeted at male offenders who had issues with both drug abuse and mental illness. Using a randomized controlled trial, results indicate that the modified therapeutic community decreased recidivism rates by 50 percent. Sacks et al. (2012b) analyze the impact of a therapeutic community program on the recidivism tendencies of female offenders with substance abuse disorders. The authors conducted a longitudinal study at the Denver Women's Correctional Facility. The authors find that the therapeutic community program significantly decreased recidivism by 19 percent for the individuals in the study.

Inciardi et al. (2004) evaluated the effectiveness of the CREST program, a multi-stage substance abuse treatment program implemented in Delaware prisons. Key findings for this program include that it significantly reduced re-arrest at 42 and 60 months post-release by approximately 70 and 60 percent, respectively. A more recent summary of the rigorous studies on substance abuse programs by the Washington State Institute for Public Policy (WSIPP 2018) estimates a 12 percent reduction in recidivism for inpatient or intensive outpatient drug treatment. Kilmer et al. (2013) evaluates the effectiveness of South Dakota's 24/7 Sobriety Project that made twice-a-day breathalyzer tests a requirement for bail eligibility for individuals who had been re-arrested for driving while under the influence of alcohol. Using a cross sectional data from South Dakota counties, the authors find that the program resulted in a statistically significant reduction in recidivism of 12 percent for repeat DUI arrests.

Ayoub and Pooler (2015) examined the impact of the Harlem Parole Reentry Court engagement program on recidivism. Using a randomized controlled trial design, the program resulted in a statistically significant reduction in revocation (the failure to comply with a condition of probation) of 45 percent for the treatment group within 18 months of release. Finally, Hawken and Kleiman (2011) analyzed the effects of the Washington Intensive Supervision Program, a project designed to determine whether the principles of effective community supervision reduced recidivism. Obtained through a randomized controlled trial, their results demonstrate a statistically significant result of a decrease in recidivism of 64 percent in the 6 months following release.

There are some studies that have shown no impact on recidivism. For example, Grommon et al. (2013) examine the effects of a drug treatment program with appropriate punishment based

on the results from drug tests taken at random times. The authors use a randomized control trial, which requires frequent drug-testing for both groups and is focused on parolees who return to urban locations. Their results show no significant difference in recidivism between the control and treatment groups 18 months post-release. In addition, O’Connell et al. (2016) evaluate the impact of a program which incorporates principles of deterrence, graduated sanctions, and coerced abstinence on recidivism rates for 400 high-risk parolees. Using a randomized controlled trial, the authors find no statistically significant reduction in recidivism for program participants. In a similar vein, Cook et al. (2015) evaluates the impact of so-called wrap-around, reach-in service programs, multi-faceted programs that aim to address a variety of needs after release such as housing, employment and substance abuse, on recidivism rates. Using an RCT research design with a sample of 236 high-risk offenders in Milwaukee, these programs yield minimal evidence of causing a significant decrease in re-incarceration. Programs that use treatment such as intensive management services have also not succeeded in reducing recidivism. Scott and Dennis (2012) analyzed the effects of the Cook County, Illinois Recovery Management Checkup Program, an intensive management program focused on assisting adult female participants with substance abuse disorders. Using an RCT research design, the authors found no effects at 90 days post-release. The program was not effective in reducing recidivism.

Taken together, CEA estimates a median treatment effect from substance abuse programs of 17 percent. In comparison, WSIPP has also analyzed programs intended to address substance abuse problems. Three programs in particular seem most relevant in the current context. The first, which WSIPP terms “therapeutic communities (during incarceration) for individuals with substance use disorders,” implies a 10.6 percent reduction in recidivism based on WSIPP’s estimated adjusted effect size. The other programs provide drug treatment services during incarceration. Programs providing inpatient or intensive outpatient services reduce recidivism by an estimated 14.4 percent (adjusted), while those providing outpatient or non-intensive treatments reduce recidivism by an estimated 11.6 percent (adjusted).

B. Programs with an Inadequate Evidence Base

In this section, we discuss the adult population studies that are older, have weaker empirical designs, or point toward inconclusive evidence. We focus on educational programs as the broad evidence base of the efficacy of these programs is lacking. The criminology literature contains thousands of studies on numerous treatments— reviewing all of them is beyond the scope of this report. We do not aim to cover all of the studies that do not meet the requirements to be considered rigorous. Educational programming, in particular, is in need of stronger

empirical methodologies. The empirical studies documented here should be interpreted with caution due to selection biases and other issues with evaluation designs.

As more than 40 percent of jail inmates have an education level of less than high school and almost a fifth are estimated to suffer from some type of learning disability, the purpose of initial education treatments is to help prisoners approach high school level aptitude (Brazzell et al. 2009). Approximately 16,000 inmates are currently enrolled in GED programs in the Federal system, but the wait list for this programming is equally sized. More advanced education programs are also available, and inmates may be afforded the opportunity to continue learning through secondary and post-secondary education programs or to participate in vocational education programs where inmates can learn career-related skills (Dick et al. 2016).

Early studies from the 1990s often showed positive results regarding the impact of education programming on recidivism, but these findings are subject to methodological concerns, in addition to being nearly outdated.¹² More recent studies by Cho and Tyler (2013) and Duwe and Clark (2014) find that education programming does not have a significant effect on recidivism but these still face many of the methodological issues of the earlier literature. One exception to the previously mentioned studies is Lattimore et al. (1988, 1990). The authors used a random assignment experimental design to measure the impact of basic vocational educational programming and finds that the experimental group subjects were marginally significantly less likely to be arrested than control group subjects. This study is, however, three decades old, and we know of no other rigorous educational programming study since its publication. What makes educational programming harder to evaluate than other types of programming surveyed above, is the fact that prison systems may be statutorily required to provide certain educational programming, such as GED classes. Therefore, the inability to deny these programs to inmates often hinders any sort of RCT.

WSIPP figures imply recidivism reduction rates of 13.4% (basic), 19.2% (vocational), and 25.4% (post-secondary), based on adjusted effect sizes, but the research studies on which these estimates are based are quite dated as well.

Thus, even though the current evidence base is lacking to evaluate education programs, education is, perhaps, the one program for which a great evidence base exists outside of prison. Since Becker (1964), economists have studied the quantitative economic returns to

¹²Aos et al (2006), in reviewing these studies, report that basic education programs reduce recidivism by around 5 percent, and that vocational educational programs reduce recidivism by 12 percent. Three out of the five studies are from 1995 or years prior.

human capital investments outside prisons. They have generally found traditionally measured investment returns, using tuition and foregone earnings as the costs and increased wages as the benefits, to be around 10-12 percent per year of schooling (e.g., Lochner and Moretti 2004, and Harmon 2011). Adding other benefits to education, such as the improved health from greater education, raises those returns further. Another dimension outside traditionally measured returns is that legal earnings rise relative to illegal ones, which reduces incentives for illegal activities and crimes (Agan and Makowsky 2018). In addition, this literature suggests that an additional year of schooling for non-prisoners reduces the probability of eventual incarceration by 10 to 12 percent (Lochner and Moretti 2004).

Finally, in addition to the discussed social benefits of prison reform to non-prisoners facing less crime and lower tax-burdens for prison costs, we emphasize that education likely carries private returns for prisoners themselves. In general, the economic returns to non-prison education are positive and significant as discussed above. The economic returns to GED completion are perhaps less clear, and for the non-inmate population, the literature suggests the return is at best slightly positive and often close to zero.¹³ (See Heckman and LaFontaine, 2006; Jepsen, Mueser and Troske, 2016; and Heckman, Humphries and Mader, 2011.) However, holding other factors constant, the private individual returns to prison education may be larger than those of non-prison education. This is because the private costs to a prisoner of obtaining education while incarcerated, such as foregone earnings while being educated, are essentially zero. With close to zero traditionally measured private costs of an education, traditionally measured private returns to prison-education may be large relative to non-prison education. We do not attempt to value these additional private benefits due to lack of sufficient evidence.

5. Estimating the Returns to Prison Reform Investments

As mentioned above, based on the literatures on mental health and substance abuse programs, we assume median recidivism reduction rates of 21 and 17 percent, respectively. We arrive at these numbers by taking the median treatment effect from the rigorous studies described in the previous sections.¹⁴ As discussed, different studies of different programs produce a range of estimates, but CEA believes these figures are reasonable benchmarks, as they represent realized impacts from participation in past mental health and substance abuse programs. Related estimates by WSIPP are only somewhat lower than these medians of 21 and 17 percent, respectively. Table 1 (Appendix) reports estimated recidivism reductions from several programs as analyzed by WSIPP as part of its benefit-cost analysis for the state of

¹³ We note that the return to a GED may well include reduced criminality and incarceration probabilities.

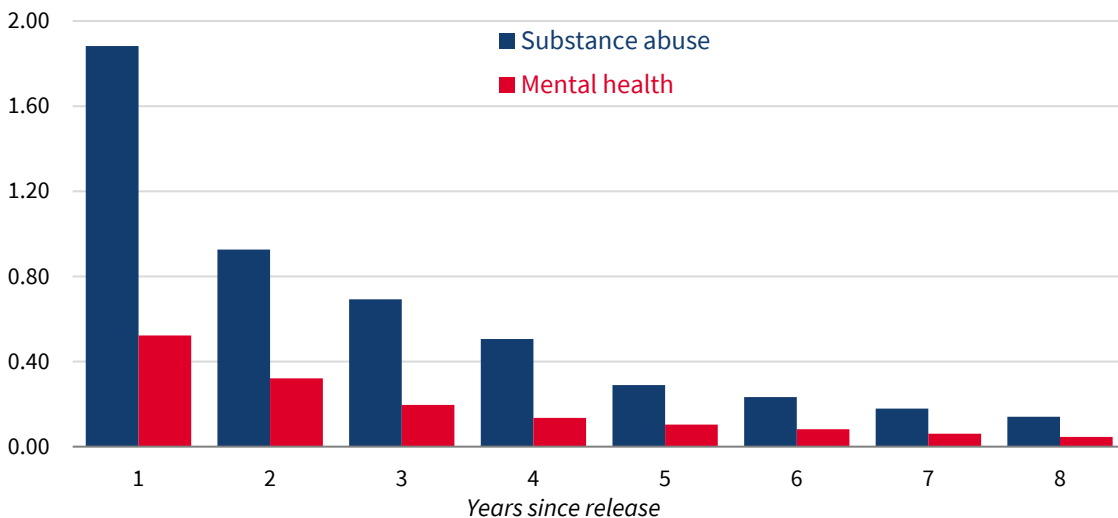
¹⁴ We exclude the one outlier of 70%.

Washington. For example, as discussed above, participation in CBT would be expected to reduce the recidivism rate by 12.9 (17.1) percent based on the program’s adjusted (unadjusted) effect size. Similarly, inpatient or intensive outpatient drug treatment during incarceration would be expected to reduce recidivism by 14.4 (17.5) percent based on adjusted (unadjusted) effect size.

While CEA’s assumed impact effects may seem large, recall the important statistic to consider from a policy perspective is the ROI. Many programs, particularly in mental health are expensive and so it is not obvious that the benefit from reduced recidivism is sufficient to offset the cost. The ROI to mental health treatments is lower than that for other programs precisely because the costs of administering mental health programs are relatively higher.¹⁵

Figure 3: Return on Investment Per Dollar Spent on Abuse and Mental health Programs

Return per dollar spent (\$)



Source: CEA calculations.

Recidivism programs are investments, as they involve upfront spending for the purpose of a larger future gain. It is worth noting that some of this programming is provided by nongovernmental entities, such as religious groups, nonprofits, and corporations and some of the programming may occur after release from prison. To estimate the returns to prison reform investments, we estimate a per-prisoner public cost of recidivism, incorporating both the costs

¹⁵There is substantial variation in program costs that are highly dependent upon the scope of intervention. From Aos and Drake (2013) we estimate a mean cost (in 2017 dollars) for mental health and substance abuse programs of \$8,600 and \$1,950, respectively.

of newly committed crimes and the public costs (State and Federal) of incarceration for those who return to prison. These costs are spread out over the years after being released so that adding them up over time into a present value over those years is necessary. Figure 3 contains the cost savings from crimes for substance abuse (in blue) and mental health programs (in red) for each dollar spent on these programs. The costs of crime fall in all years shown in the Figure, with the biggest reductions in the early years when recidivism probabilities are highest.

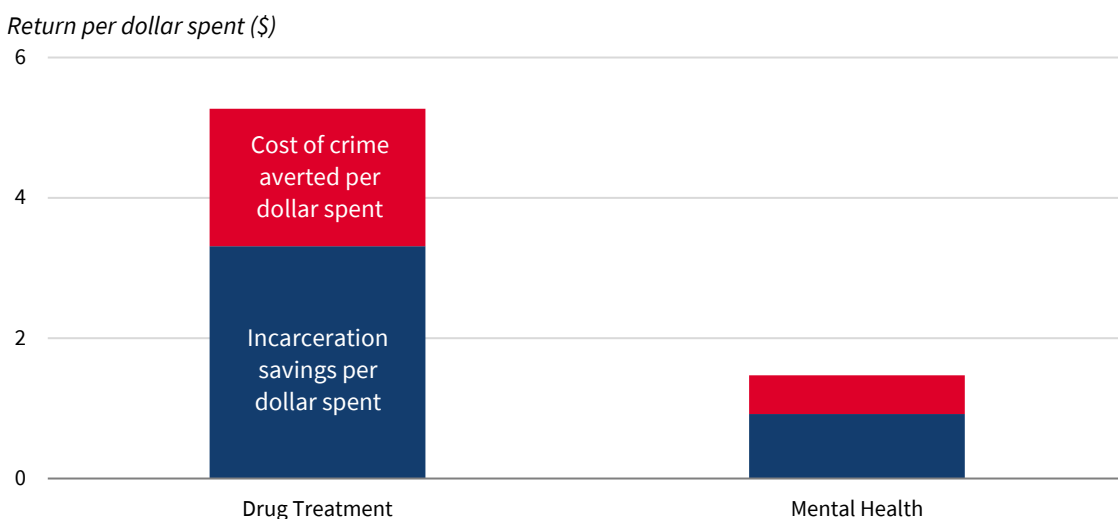
The difference in the present value of total costs with and without prison reform is the gross benefit of prison reform investments. Dividing by estimated intervention costs, we derive a total return to prison reform investment, hereafter prison reform return on investment or ROI. One should think of these measures as “per-capita”—that is, as lowering the predicted probability of an inmate who receives substance abuse treatment (if applicable) by 17 percent or mental health treatment (if applicable) by 21 percent. Again, we note that some potential benefits of prison reform may remain unvalued in our methodology. We further note that the estimates in this report apply to current in-prison programs offered by the BOP, as well as any new spending that might be put aside for these particular programs. We estimate the net present value of the returns to prison reforms for mental health and substance abuse treatments in Figure 4. These calculations use a discount rate of 3 percent (CEA 2017) and a 21 percent recidivism reduction for mental health and 17 percent for substance abuse treatment. We compute ROIs for the two treatment types explored in this report and offer a break-even calculation for educational programming. Our ROI estimates for mental health and substance abuse treatments are \$1.47 and \$5.27, respectively. Costs of crime savings are \$0.92 for mental health treatments and \$3.31 for substance abuse treatments. Estimated reductions in incarceration expenditures are \$0.55 for mental health treatments and \$1.96 per taxpayer dollar spent on substance abuse treatments.

Based on our calculations, we estimate that both mental health and drug treatments have the potential to reduce combined Federal and State budget expenditures on incarceration. If spending on these programs were to come from a reallocation of current funds, for example by reassessing the effectiveness of current programs and replacing those that have not been shown to generate returns, cost reductions could be achieved with fewer budgetary outlays, resulting in higher returns. We also find that educational programming needs only a modest impact on recidivism rates in order to be cost effective.

Our analysis provides an overall assessment of the returns to prison reform investments by relying on representative averages for the U.S. prison population to calculate the returns. For comparison, CEA notes that WSIPP (2018) estimates benefit-cost ratios of 6.33 for CBT, 5.03 for

therapeutic communities during incarceration, 10.18 for inpatient or intensive outpatient drug treatment, and 14.10 for outpatient or non-intensive drug treatment programs. The returns on drug treatment programs are far higher than those on mental health programs—not because program impacts are so different but because the costs of program delivery are so much greater for mental health programs such as CBT. We also note that CEA’s estimated returns are lower than WSIPP’s because the benefit-cost ratios in these studies typically capture the gain in benefits associated with increases in post-release productivity, in addition to the crime reducing effects and incarceration cost savings documented in Figure 4. Further, those returns also reflect adjustments made for research study quality, decay of impacts over time, and dead-weight losses associated with raising funds to pay for the programs.

Figure 4. Net Present Value of Return per Dollar Invested in Prison Reform



Source: CEA calculations.

Note: Assumes discount rate of 3 percent and treatment effects, social cost of crime as discussed in the text.

It is useful to look at our estimates from a different but complementary perspective. We have, until now, estimated the ROI for a particular reduction in recidivism based on our review of the literature. Given the selection and measurement problems with the educational programming studies described above, rather than calculate an ROI based upon the empirical studies, another approach is to flip the equation and ask: for a given ROI, what would be the required reduction in recidivism that would reach that particular ROI goal? For example, suppose we were to calculate a “break-even ROI,” that is, for every dollar invested in correctional programs, the total cost of crime would fall by one dollar. The required reduction in recidivism for education programs would be around 2 percent. We arrive at this number by using cost

estimates for standard educational programs and the cost of crime estimates from Section 3.¹⁶ Similar calculations for drug and mental health treatments would be 3.2 and 14.5 percent respectively (below their estimated impacts in reducing recidivism by 17 and 21 percent, respectively). Thus, even with the uncertainty surrounding the estimated treatment effects for educational programs in the literature, these programs could still provide positive results even with a very modest impact on recidivism. We note, nonetheless, that these break-even statistics depend significantly on our cost-of-crime estimates, which are averages across a wide variety of crimes from homicide to arson. More targeted values of this cost that result in higher (lower) values lower (raise) the break-even statistic.

6. Conclusion

Crime imposes a significant burden on American well-being and tax-financed resources. Rigorous and evidence-based prison programs have been proposed to break the crime cycle, reducing future criminal activity and lowering incarceration expenditures by facilitating more successful re-entry upon prison release. In this report, CEA provided methods and estimates assessing the rate of return on prison reforms aimed at lowering recidivism. Although programs vary in efficacy, CEA finds that there is an empirical evidence base to support programs that focus on the prisoner's mental health or substance abuse to prevent future crime. Selected programs may reduce the cost of crime by about \$0.92 to \$3.31 per taxpayer dollar spent on prison reform and long-run incarceration costs by \$0.55 to \$1.96, for a total return of \$1.47 to \$5.27 dollar spent on prison reform. Despite these positive returns, there are program types, most notably in education, where the evidence base is more incomplete and therefore rate of returns more uncertain. Given this uncertainty, CEA estimates how much recidivism would have to be reduced in order for the programs to break-even given their costs. CEA estimates a break-even effect of around 2 percent. Given the Administration's evaluation and evidence principles outlined above, in order to determine whether programs, both new and old, achieve such target effects, they would need to be rigorously evaluated and targeted to meet the specific needs of prisoners using validated assessment tools.

There are several limitations of the reviewed literature on the effectiveness of programs and differences in studies that should be noted in interpreting our estimates. First, in many of the studies described in this report, treatments were deliberately targeted towards prisoners with the highest expected return. Some interventions target prisoners who are already believed to

¹⁶ Estimated education costs are based on Aos and Drake (2013) and updated to 2017 dollars. The costs reflect the average cost of correctional education in Washington State for both basic/post-secondary programs as well as vocational education.

be medium to low risk, that is, those with an already medium to low probability of re-offending (Lowenkamp and Latessa, 2004). Studies on low risk inmates often find a high reduction in recidivism while those that study high-risk inmates find low rates since the respective samples behave differently. Accordingly, a reduction in recidivism rates from these programs does not imply the same reduction in overall recidivism for a released cohort of Federal prisoners as there may be prisoners of different risk levels for whom no available intervention is appropriate. Reform initiatives will need to carefully consider the best targeting of these programs and their effectiveness.

Second, all of the studies that we cover are limited in the time period in which the released inmate is followed. When we conclude that a particular program is effective in reducing recidivism, it generally means in the few years after the inmate is released. It would be incorrect to conclude from these studies that recidivism never occurs over the lifetime of a released inmate. In some cases it may simply be delayed. Most recidivism occurs in the 5 years after release, with rates decreasing over time. For simplicity, we cap our analysis at 8 years post-release and assume no recidivism past this point. This may lead to a slight underestimate of the cost savings, making our estimates slightly more conservative.

Third, the issue of scalability is also important. There have been programs that work in small, particular settings but when an attempt is made to scale up, the program may not provide the same positive results that were experienced in the small scale setting. Thus, it is important to remember that there are a number of well-done studies that show success in reducing post-release recidivism, but it is not obvious that if we were to take these programs and attempt to replicate them on a national level would we obtain the same magnitude reduction in recidivism.

Fourth, many mental health programs are post-release community programs that tend to show higher treatment effects than those in prison. The mental health studies that we review are primarily focused on treatment post-prison. The WSIPP comparison studies that we reference focus exclusively on in-prison studies, which may partially explain why the typical treatment effect is slightly lower than we found in our literature review.

Lastly, due to constraints imposed by the literature, in order to evaluate the reduction in recidivism in the adult prisoner population, we must rely in part on measured effects for juveniles and those under the age of 21 due to the lack of sound studies in the adult population. Juveniles are defined as youth under the age of 18 by the U.S. Department of Justice. While initial crimes may be committed when young, recidivism may occur well into adulthood. Thus, by stemming the cycle of repeated recidivism while young, the social and taxpayer returns are

potentially larger than those for older released prisoners. Although there is potential for larger returns, our analysis may overstate a program's impact on the full age distribution of inmates as we apply the results from juvenile studies to the general population of prisoners. We acknowledge that it is not apparent that what may work for younger inmates necessarily works for older inmates.

Given these findings and limitations in evaluations, CEA concludes that returns on certain programs for which well-designed studies exist are high, but that an increased investment in research to provide better evidence is needed to guide future investments into programs to reduce recidivism.

References

Agan, A. and M. Makowsky. 2018. "The Minimum Wage, EITC, and Criminal Recidivism." SSRN Working Paper.

Aos, S., and E. Drake. 2013. "Prison, Police and Programs: Evidence-Based Options That Reduce Crime and Save Money." Doc. No. 13-11-1901. Washington State Institute for Public Policy.

Aos, S., M. Miller, and E. Drake. 2006. "Evidence-Based Adult Corrections Programs: What Works and What Does Not." Washington State Institute for Public Policy.

Ayoub, L., and T. Pooler. 2015. "Coming Home to Harlem. A Randomized Controlled Trial of the Harlem Parole Reentry Court." Center for Court Innovation.

Barnes, G., J. Hyatt, and L. Sherman. 2017. "Even a Little Bit Helps. An Implementation and Experimental Evaluation of Cognitive-Behavioral Therapy for High-Risk Probationers". *Criminal Justice and Behavior*.

Becker, G. 1964. "Human Capital." *Columbia University Press*.

Brazzell, D., A. Crayton, M. Lindahl, and A.L. Solomon. 2009. "From the Classroom to the Community: Exploring the Role of Education During Incarceration and Re-entry." The Urban Institute.

Bureau of Justice Statistics. 2006. "Mental Health Problems of Prison and Jail Inmates." NCJ 213600.

West, H., W. Sabol, and S. Greenman. 2011. "Prisoners in 2009." Bureau of Justice Statistics Bulletin.

Carson, E. 2018. "Prisoners in 2016." Bureau of Justice Statistics Bulletin.

Markman, J., M. Durose, R. Rantala, and A. Tiedt. 2016. "Recidivism of Offenders Placed on Federal Community Supervision in 2005: Patterns from 2005 to 2010." Bureau of Justice Statistics Special Report.

Burraston, B., D. Cherrington, and S. Bahr. 2012. "Reducing Juvenile Recidivism with Cognitive Training and a Cell Phone Follow-up: An Evaluation of the Real Victory Program." *International Journal of Offender Therapy and Comparative Criminology*.

Butler, S., G. Baruch, N. Hickey, and P. Fonagy. 2011. “A Randomized Controlled trial of Multisystemic Therapy and Statutory Therapeutic Intervention for Young Offenders”. *Journal of the American Academy of Child & Adolescent Psychiatry* 50, no. 12: 1220-1235.

Commission on Evidence Based Policy Making (CEP). 2017. “Report of the Commission on Evidence-Based Policymaking: The Promise of Evidence-Based Policymaking.”

Cho, R., and J. Tyler. 2013. “Does Prison-Based Adult Basic Education Improve Post-Release Outcomes for Male Prisoners in Florida.” *Crime & Delinquency* 59, no 7: 975-1005.

Cohen, M. and A. Piquero. 2009. “New Evidence on the Monetary Value of Saving a High Risk Youth.” *Journal of Quantitative Criminology* 25, no. 1: 25-49.

Cook, P., K. Songman, A. Braga, J. Ludwig, and M. O’Brien. 2015. “An Experimental Evaluation of a Comprehensive Employment-Oriented Prisoner Re-Entry Program.” *Journal of Quantitative Criminology* 31, no. 3: 355–382.

Council of Economic Advisers (CEA). 2016. “Economic Perspectives on Incarceration and the Criminal Justice System.”

---. 2017. “Discounting for Public Policy: Theory and Recent Evidence on the Merits of Updating the Discount Rate,” Issue Brief.

De Vries, L., M. Hoeve, M. Assink, G. Stams, and J. Asscher. 2018. “The Long-Term Effects of the Youth Crime Prevention Program ‘New Perspectives’ on Delinquency and Recidivism.” *International Journal of Offender Therapy and Comparative Criminology*.

Dick, A.J., Rich, W. and Waters, T., 2016. *Prison Vocational Education and Policy in the United States: A Critical Perspective on Evidence-Based Reform*. Springer.

Doleac, Jennifer. 2018 “Strategies to Successfully Reintegrate Formerly-Incarcerated Youth into their Communities: A Review of the Evidence.” Presentation Slides.

Duwe, G. 2017. “The Use and Impact of Correctional Programming for Inmates on Pre- and Post-Release Outcomes.” US Department of Justice, Office of Justice Programs, National Institute of Justice.

Duwe, G., and V. Clark. 2014. “The Effects of Prison-based Educational Programming on Recidivism and Employment.” *The Prison Journal* 94: 454-478.

Federal Bureau of Prisons. 2000. TRIAD Drug Treatment Evaluation Project.

---. 2003-2016. Federal Register: Annual Determination of Average Cost of Incarceration.

French, M., K. McCollister, and D. Reznik. 2004. "The Cost of Crime to Society: New Crime Specific Estimates for Policy and Program Evaluation." *Drug & Alcohol Dependence* 108, no. 1: 98-109.

Grommon E., S. Cox, W. Davidson, and T. Bynum. 2013. "Program Evaluated: Instant-Result Drug Testing and Swift and Certain Sanctions on Parole."

Harmon, C. 2011. "Economic Returns to Education: What We Know, What We Don't Know, and Where We Are Going – Some Brief Pointers." IZA Policy Paper No. 29.

Hawken, A., and M. Kleiman. 2011. "Washington Intensive Supervision Program Evaluation Report."

Heaton, P. 2010. "Hidden in Plain Sight: What Cost of Crime Research Can Tell Us about Investing in Police." Rand Center on Quality Policing, Occasional Paper.

Heckman, J., J. Humphries, and N. Mader. 2011. "The GED." NBER Working Paper No. 16064.

Heckman, J., and P. LaFontaine. 2006. "Bias-Corrected Estimates of GED Returns." *Journal of Labor Economics* 24, no. 3: 661-700.

Heller S., A. Shah, J. Guryan, J. Ludwig, S. Mullainathan, and H. Pollack. 2016. "Thinking, Fast and Slow? Some Field Experiments to Reduce Crime and Dropout in Chicago." National Bureau of Economic Research, Working Paper Series.

Inciardi, J., S. Martin, and C. Butzin. 2004. "Five-Year Outcomes of Therapeutic Community Treatment of Drug-Involved Offenders after Release from Prison." *Crime and Delinquency* 50, no. 1: 88-107.

Jepsen, C., P. Mueser, and K. Troske. 2016. "Labor Market Returns to the GED Using Regression Discontinuity Analysis." *Journal of Political Economy* 124, no. 3: 621-649.

Kilmer, B., N. Nicosia, P. Heaton, and G. Midgette. 2013. "Efficacy of Frequent Monitoring with Swift, Certain, and Modest Sanctions for Violations: Insights from South Dakota's 24/7 Sobriety Project." *American Journal of Public Health*.

Lattimore, P., A. White, and J. Baker. 1988. "Sandhills Vocational Delivery System Experiment: An Examination of Correctional Program Implementation and Effectiveness." National Institute of Justice.

---. 1990. "Experimental Assessment of the Effect of Vocational Training on Youthful Property Offenders." *Evaluation Review* 55, no. 2: 115-133.

Lochner, L., and E. Moretti. 2004. "The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-reports." *American Economic Review* 94(1).

Lowenkamp, C., and E. Latessa. 2004. "Understanding the Risk Principle: How and Why Correctional Interventions Can Harm Low-Risk Offenders." *Topics in Community Corrections*: 3-8.

Martin, S., C. Butzin, and J. Inciardi. 1995. "Assessment of a Multistage Therapeutic Community for Drug-Involved Offenders." *Journal of Psychoactive Drugs* 27, no. 1: 109-16.

---. 1999. "Three-Year Outcomes of Therapeutic Community Treatment for Drug-Involved Offenders in Delaware: From Prison to Work Release to Aftercare." *The Prison Journal* 79, no. 3: 294-320.

McCollister, K., M. French, and H. Fang. 2010. "The Cost of Crime to Society: New Crime-Specific Estimates for Policy and Program Evaluation." NIH Public Access.

Miller, T., M. Cohen, and B. Wiersema. 1996. "Victim Costs and Consequences: A New Look." U.S. Department of Justice, Office of Justice Programs, National Institute of Justice.

O'Connell, D., J. Brent, and C. Visher. 2016. "Decide your Time. A Randomized Trial of a Drug Testing and Graduated Sanctions Program for Probationers." *American Society of Criminology and Public Policy*, no 15: 1073-1102.

Sacks, J., K. McKendrick, and Z. Hamilton. 2012a. "A Randomized Clinical Trial of a Therapeutic Community Treatment for Female Inmates: Outcomes at 6 and 12 Months after Prison Release." *Journal of Addictive Diseases*.

Sacks, S., M. Chaple, J. Sacks, K. McKendrick, and C. Cleland. 2012b. "Randomized Trial of a Reentry Modified Therapeutic Community for Offenders with Co-occurring Disorders: Crime Outcomes." *Journal of Substance Abuse Treatment*.

Sawyer, A., and C. M. Borduin. "Effects of Multisystemic Therapy through Midlife: A 21.9-Year Follow-Up to a Randomized Clinical Trial with Serious and Violent Juvenile Offenders." *Journal of Consulting and Clinical Psychology* 79, no. 5: 643-652.

Scott, C., and M. Dennis. "Four-Year Outcomes from the Early Re-Intervention (ERI) Experiment Using Recovery Management Checkups (RMC)." *Drug & Alcohol Dependence* 121, no. 1: 10-17.

United States Federal Bureau of Investigation. 2016. "Crime in the United States." Uniform Crime Reporting.

United States Federal Bureau of Prisons. 2018. "Inmate Statistics: Offenses."

United States Sentencing Commission. 2016. "Recidivism among Federal Offenders: A Comprehensive Overview."

Wexler, H., G. De Leon, G. Thomas, D. Kressel, and J. Peters. 1999a. "The Amity Prison TC Evaluation: Reincarceration Outcomes." *Criminal Justice and Behavior* 26 no. 2:147-67.

---. 1999b. "Three-Year Reincarceration Outcomes for Amity In-Prison Therapeutic Community and Aftercare in California." *The Prison Journal* 79, no. 3: 321-36.

Wexler, H., G. Falkin, and D. Lipton. 1990. "Outcome Evaluation of a Prison Therapeutic Community for Substance Abuse Treatment." *American Association for Correctional Psychology* 17 no.1: 71-92.

Washington State Institute for Public Policy (WSIPP). 2018. "Inventory of Evidence-Based, Research-Based, and Promising Programs for Adult Corrections."

Zarkin, G., A. Cowell, K. Hicks, M. Mills, S. Belenko, L. Dunlap, K. Houser, and V. Keyes. 2012. "Benefits and Costs of Substance Abuse Treatment Programs for State Prison Inmates: Results from a Lifetime Simulation Model." *Health Economics* 21, no. 6: 633-652.

Appendix 1

Table 1. Estimated Percent Change in Recidivism Rate for In-Prison Treatment Programs

Program	Based on Adjusted Effect Size (percent)	Based on Unadjusted Effect Size (percent)
Cognitive behavioral therapy (CBT) for individuals classified as high or moderate risk	-12.9	-17.1
Multisystemic therapy (juvenile)	-11.4	-27.8
Therapeutic communities (during incarceration) for individuals with substance use disorders	-10.6	-15.7
Inpatient or intensive outpatient drug treatment during incarceration	-14.4	-17.5
Outpatient or non-intensive drug treatment during incarceration	-11.6	-20.5

Sources: Washington State Institute of Public Policy (2018); CEA calculations.



ABOUT THE COUNCIL OF ECONOMIC ADVISERS

The Council of Economic Advisers, an agency within the Executive Office of the President, is charged with offering the President objective economic advice on the formulation of both domestic and international economic policy. The Council bases its recommendations and analysis on economic research and empirical evidence, using the best data available to support the President in setting our nation's economic policy.

www.whitehouse.gov/cea

May 2018