Cost-Benefit Analysis of Implementing the SPIn Risk Assessment Tool at the Point of Release for Illinois Prisoners

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Illinois Sentencing and Policy Advisory Council

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Executive Summary

We present a cost-benefit analysis of implementing a risk assessment system for the Illinois Department of Corrections (IDOC). This system will be put in place for offenders who are leaving prison and being put on mandatory supervised release (MSR), and is intended to reduce recidivism. We calculated the net present value of the benefits and costs associated with this implementation, which has implications for the prison population, the IDOC, and the residents of Illinois. Overall, we found that the implementation of risk assessment resulted in positive net benefits for the IDOC and the residents of Illinois.

We considered several categories of costs and benefits, both monetized and non-monetized. The monetized costs included: hiring new staff, training new staff, and the acquisition of the Service Planning Instrument (SPIn) and CaseWorks tools. However, we counted the 2014 and 2015 acquisition costs of the SPIn and CaseWorks tool as a sunk cost. The non-monetized costs included: potential client support fees, any costs associated with a new computer system, and implementation by current staff. Monetized benefits included: reduced criminal justice system costs, reduced victim costs, and better targeting of programming. The non-monetized benefits included: concentration of services in facilities that are better equipped to provide them, better in-prison programming, and a better allocation of funds in terms of addressing the needs of the prison population.

In order to properly analyze the costs and benefits of implementing the risk assessment system for mandatory supervised release, our group created several models. One of our models simulates the status quo in Illinois, which involves the Prisoner Review Board (PRB) making decisions for parole based on committing offense, criminal history, response to supervision and
aggression level. Our other models examine parole decisions utilizing a risk assessment and case management tool to target programming to the highest risk offenders.

Our analysis has several limitations. The first limitation is the distribution of prisoners according to risk level. We are unable to predict exactly how prisoners will be distributed in terms of risk. The second limitation is that the SPIn tool has not been validated, and we do not know the accuracy of the tool. Another limitation is that the implementation of risk assessment has been delayed several times. If another delay occurs, then our calculations would have to be altered. The last limitation is that our benefits include benefits from avoided murder, which biases benefits upwards.

Our analysis indicates a positive net benefit to implement the risk assessment in Illinois. The scenario we modeled indicates that the implementation of the risk assessment will produce from $95.4 to $235.3 million in net benefits over five years. We found a reduction in the rate of recidivism and monetized the decline, which accounts for net benefits over the years. The limitations of our report may be overcome in the future as more information becomes available, which would allow for a more complete analysis.
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tr>
<td>IDOC</td>
<td>Illinois Department of Corrections</td>
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<td>MSR</td>
<td>Mandatory Supervised Release</td>
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<td>PRB</td>
<td>Prisoner Review Board</td>
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<td>RANA</td>
<td>Illinois Risk Assets Need Assessment</td>
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<td>SPAC</td>
<td>Illinois Sentencing and Policy Advisory Council</td>
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<td>SPIn</td>
<td>Service Planning Instrument</td>
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<td>WSIPP</td>
<td>Washington State Institute for Public Policy</td>
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Acknowledgments

We would like to extend our sincere gratitude to Nate Inglis Steinfeld for his guidance and assistance throughout the course of this project. In addition to supplying information specific to Illinois, Nate connected us to numerous other individuals who were invaluable to the completion of our project. Gladyse Taylor, the Assistant Director of the Illinois Department of the Corrections, instilled her passion, knowledge, and optimism for risk assessment tools and helped to direct our project. Similarly, Adam Monreal, Chairman of the Prisoner Review Board, also gave his time and expertise throughout the course of our research on supervision in Illinois. Finally, Professor David Weimer led and guided our group throughout the project and provided ideas and support over the semester.
Problem Statement

The Crime Reduction Act of 2009 mandated the acquisition and use of a risk assessment tool to evaluate all state prisoners. The Illinois Sentencing and Policy Advisory Council (SPAC) commissioned this analysis of the costs and benefits of utilizing this tool. This project is intended to inform future decisions about the tool. Through the implementation of a risk assessment and caseworks tool, the IDOC intends to identify the risk and needs of prisoners in order to better allocate limited resources more efficiently and ultimately reduce recidivism. We focus on the benefits of implementing the tool at MSR; however, the tool will also be used at other stages of incarceration in the future. If there is a positive net benefit from introducing the assessment and planning tool at only the parole level, then implementing use at other points should further increase net benefits.

Introduction

The Crime Reduction Act

The Illinois Crime Reduction Act was signed into law by Governor Pat Quinn on August 25, 2009 and took effect on January 1, 2010 (Illinois General Assembly, 2010). The act was motivated by the understanding that the status quo of Illinois corrections policy—with its large prison population and high recidivism rates, at ever-increasing expense to state taxpayers—was both ineffective and unsustainable. Through the passage of a comprehensive reform bill, the State aimed to break the cycle of recidivism, especially of non-violent offenders, and address the ballooning costs of the system by directing resources toward better understanding and addressing the reasons that individuals commit crimes. (For more information regarding corrections in Illinois, see Appendix A.)
Elected officials in Illinois are increasingly looking to save money and produce better outcomes for offenders. Illinois’s alternative approach to prison and supervision may achieve both of these goals. For instance, it costs about $7,363 to imprison a low-level drug offender for a typical 120-day sentence. It would cost $4,425 to provide community-based drug treatment to the same offender, according to the Illinois Consortium on Drug Policy at Roosevelt University’s Institute for Metropolitan Affairs (2009). According to Senate President John Cullerton, “fiscal constraints create an opportunity to make smarter decisions about spending money up front rather than spending it on more expensive services later” (Jaeger, 2009). In addition, Governor Pat Quinn has stated his support for community-based programs because they are more cost-effective and produce better results in rehabilitating non-violent offenders (The Adult Redeploy Illinois Oversight Board, 2014, p.2). Bipartisan support for prison reform has propelled Illinois’s initiative.

As part of the Crime Reduction Act of 2009, the Illinois Risk Assets Needs Assessment (RANA) task force was created to select a risk assessment tool and design a computer system for implementing it. Research has shown that “implementation of a RANA-like system can lead to more efficient use of programming and security resources, reduce recidivism, and ultimately decrease the costly number of people under state correctional supervision” (John Howard Association of Illinois, 2012, p.4). A major part of the Crime Reduction Act was mandating the adoption, validation, and utilization of a standardized statewide risks and needs assessment tool. Evaluating offender risk at various stages in the criminal justice system, including pretrial probation, prison and MSR, is intended to support corrections staff in determining the needs and strengths of each individual offender so strategies and treatments, such as substance abuse programming and job placement, can be better targeted. The overall goal is to improve offenders’
outcomes at the conclusion of MSR or prison exit, thereby reducing recidivism. The SPIn assessment instrument and case management tool was purchased from Orbis Partners in January 2013 after a two-year procurement period.

**Risk Assessments**

Risk assessment tools are used to predict and manage offender risk of future crime. A risk assessment tool classifies offenders by risk level (e.g. low, medium, and high) considering a variety of factors, including age, gender, criminal record, history of drug use, employment status, family situation, and even attitudes towards criminal behavior. These risk factors can either be static, which means they are historical and unchangeable, or dynamic, which are current and changeable. The factors are based upon research that has empirically demonstrated they increase the likelihood of committing a crime. Risk assessments are used at various stages in the criminal justice decision-making process—including at sentencing, prison classification, and conditional release (Casey, Warren, and Elek, 2011).

Prior to the use of evidence-based tools to assess offender risk, professional judgment by correctional staff and clinical professionals informed these decisions. Professional judgment, considered the “first generation approach,” gave way to a more evidence-based practice, such as determining actuarial risk, which considers individual historic items like age at first arrest that are correlated with increases in the likelihood an individual will commit another crime. The third generation or “structured professional judgment” considers not only static items such as history but dynamic risk factors such as employment status, friends, and relationships. A structured professional judgment tool allows the clinician to consider details of each individual’s case. This approach provides prison officials with areas to address for rehabilitation and allows analysis of the effectiveness of interventions. More recently, the fourth generation of risk assessment tools
integrates systematic intervention and monitoring with a much broader range of offender risk
factors (Casey, Warren, and Elek, 2011).

Currently, decisions about MSR, community placement, treatment services, and
institutional placement are based on the crime that the offender committed, criminal history,
response to supervision, aggression level, and age for institutional determinations, according to
the IDOC SPIn Implementation PowerPoint.

Theory Behind Risk Assessments

The Risk-Needs-Responsivity Model incorporates three core principles that are essential
in creating a risk assessment system that will reduce recidivism. Casey, Warren, and Elek (2011)
define the Risk principle as “supervision and treatment levels should match the offender’s level
of risk” (p.4). The Needs principle holds “treatment services should target an offender’s
criminogenic needs—those dynamic risk factors most associated with criminal behavior” (Casey
et al., 2011, p.4). This principle puts the focus on risk factors that can change rather than factors
such as age of first offense or criminal offense history. The Responsivity principle suggests that
“treatment interventions should use cognitive social learning strategies and be tailored to the
offender’s specific learning style, motivation, and strengths” (Casey et al., 2011, p. 5). According
to Casey et al., research has shown that if a risk assessment plan has all three of these principles,
then the recidivism rate can be significantly reduced (pp. 4-5).

In addition, beyond theory, research has shown that using risk and needs assessments to
inform case management reduces recidivism (Council of State Governments Justice Center, 2014,
p. 4). Research has also shown that “the identification of risk and needs is a critical step, because
supervision and programs are most effective at reducing future crime when they are specific to
an offender’s individual profile” (Pew Center on the States, 2011, p. 29). Another advantage of
using a risk assessment is creating consistency. For example, before the creation of the risk assessment system in Ohio, counties were using different ways of assessing offenders, which is neither efficient nor equitable. The new risk assessment system provides consistent and objective assessments for the entire state of Ohio (Latessa, 2009, p. 9).

State legislatures around the country have required courts, correction agencies, and release authorities to use offender risk and needs assessments. In 2011 alone, six states, including Arkansas, Colorado, Kentucky, Louisiana, North Carolina, and New York adopted various offender risk and needs assessments (NCSL, 2012). There has been an effort nationwide to implement risk assessments. The momentum of risk assessments is moving quickly because the use of risk assessments theoretically saves money and produces better outcomes for offenders (for more information on the implementation of risk assessment tools in the United States, see Appendix B).

**SPI**

In order to implement the Crime Reduction Act, the IDOC selected SPI, a fourth generation risk assessment tool. SPI is an actuarial risk assessment tool to assess risk and protective factors to determine an adult offender’s risk of recidivism and to assist with service planning. The tool is modeled after the Youth Assessment and Screening Instrument, which is used in many jurisdictions throughout the country. Counselors complete the assessment using “interviews, case records and collateral contacts” that include both static (historical, unchangeable) and dynamic (fluctuating) factors (Orbis Partners, 2014). The responses for the 90-items are entered into a web-based platform, CaseWorks. The goal of the tool is to assist workers in case planning and service provision.
According to a report released by the John Howard Association of Illinois (Troyer, 2014), the tool can help:

1. Appropriately modify or individualize parole conditions based on the risk of the individual inmate, creating more reentry success;
2. Create more awareness of the needs of the population for both reentry and programming;
3. Give needed information for changes to Illinois law (p. 9)

The IDOC will implement the SPIn tool and CaseWorks case management system at four points in the corrections system: reception and classification, institutional stay, pre-release, and during MSR.

Some of the domains of the SPIn are tailored to support SPIn-W for the assessment of female offenders. The assessment is essentially the same, with a few modifications and additional questions. The validity of the SPIn-W has been evaluated in two studies, both on non-U.S. samples. The results of the studies were mixed, with one study finding poor predictive validity, while the other study concluding the tool has excellent predictive validity (Meaden 2012, Desmarais & Singh 2013). There have not been any studies evaluating the validity and reliability of the SPIn tool, but Orbis Partners plans to evaluate it.

**Implementation of SPIn**

Six corrections facilities and adult transition centers will implement the tool initially. The second phase of implementation will include institutional assessments at all facilities and the third phase will additionally include reception and classification. Within two years of the initial phase, the tool should be fully implemented.

Training for the SPIn tool was scheduled to begin in December 2013 at five pilot sites (Robinson, Decatur, Pontiac Medium Security Unit, Taylorville, and Vandalia), but the implementation has been delayed (Troyer 2014). According to a report by the John Howard
Association, the delay results from training required and implementation of a new Offender 360 computer system to replace an outdated system. Additionally, a “lack of confidence in IDOC’s staffing levels/resources and training to properly pilot the program” postponed implementation (Troyer, 2014, p.6). As a result, the IDOC plans to hire new staff to take on the role of administering the risk assessment.

**Cost-Benefit Analysis**

A cost-benefit analysis assists policymakers in evaluating policies and programs in terms of social benefits and costs to calculate net benefits. Non-fiscal benefits and costs that accrue are included in the calculation of net benefits; therefore, projects that do not have fiscal net benefits may result in positive net social benefits in a cost-benefit analysis. For the purposes of the current project, we consider the main benefit of using the risk assessment tool, reduced recidivism resulting from more appropriate MSR supervision levels, minus the acquisition, administrative, and implementation costs. This analysis uses a Monte Carlo simulation to address the many uncertainties in the parameters needed to make our estimates. Additionally, we consider several possible additional benefits for inclusion in a future analysis post-implementation. We also looked at a report done by the Washington State Institute for Public Policy (WSIPP), which conducted a prior cost-benefit analysis for a reduction in recidivism and found positive net benefits (Appendix C).

**Standing**

Standing determines whose benefits and costs are counted when calculating net benefits. At the direction of our client, we only consider the benefits and costs accruing to the Illinois government. Therefore, we exclude costs and benefits that do not affect government revenues or expenditures for the fiscal analysis. For example, increased community quality due
to lower crime rates and potential increased job prospects for former incarcerated individuals are excluded. However, expenditures to operate the tool and costs to house an individual in prison are included. While not a fiscal cost or benefit to the government, we also include victim costs, or the cost accruing to the person victimized because of the crime, in our social analysis. The Illinois Government has a vested interest in avoiding these costs and increasing the safety for citizens of the State; therefore, saving an individual’s life or protecting their property is a benefit to the State as well as to the victim.

**Recidivism**

Recidivism definitions vary by state. Illinois classifies recidivism as re-incarceration within three years of release from a secure facility. Re-incarceration includes both returning to prison for technical violations of MSR or for new offenses. The most recent data on recidivism in Illinois comes from the 2011 Pew study, “State Recidivism: The Revolving Door of America’s Prisons.” In this report, the United States had an average overall recidivism rate of 43.3 percent (2004-2007). Illinois had a recidivism rate of 51.7 percent over this period (Pew Center on the States, 2011, pg. 10-11).

**Benefits**

**Benefits of Reducing Recidivism**

Implementing risk and needs assessments with fidelity at the time of MSR can help reduce the chances that a person on MSR will reoffend by enabling the IDOC and the PRB to assign more appropriately MSR supervision and programming. Reliable assessments of risk would allow for assignment of more intense supervision to individuals assessed to be higher risk and less intense supervision to individuals assessed to be lower risk, rather than a determination based primarily on the individual’s offense and other static factors, such as criminal history,
response to supervision, and previous aggression level. Similarly, the assessment allows for better assignment of programming services to people on MSR. The ability to alter the conditions of MSR based on an objective likelihood that an individual will re-offend upon release is the mechanism by which risk assessments reduce recidivism. Crimes incur a cost to the corrections system and to its victims, so using risk assessments to guide PRB decisions has the potential to reduce recidivism and its costs.

Reduced system Costs

System costs refer to administrative costs of the legal process---police, courts, public defenders, and prosecutors---and prison or facility costs. These costs vary depending on the type of violation and its severity. New crime incurs both administrative and prison costs. In the case of a technical violation of parole, the offender often returns to a correctional institution, but does not go through the full legal administrative process and therefore does not incur its full costs. In 2014, the IDOC estimated that the average annual cost of incarcerating an individual in an IDOC facility is $22,655. Administrative costs including policing, courts, and prosecutors vary according to type of crime. SPAC utilizes estimates from WSIPP, adjusted to reflect Illinois’ relatively larger police force, to derive administrative costs for each type of crime. These estimates were used to help determine cost of crimes where there was not a clear victim. Average prison stay was calculated using SPAC reports. SPAC also estimated administrative costs of $1,238 for felony property and drug crimes. This number was added to estimated prison cost to estimate crime costs that were not included in the McCollister et al. study.

McCollister and colleagues’ 2010 study on the cost of crime to society was used as a model to determine the average costs associated with each crime. The study used victim costs,
system costs, career costs, and intangible costs to determine the economic cost of a single crime. Even though the McCollister et al. study is not adjusted to reflect unique characteristics of Illinois, the inclusion of all four cost categories made using the McCollister et al. study a logical choice (see Appendix D for a chart summarizing total cost of crime, adjusted for inflation).

Reduced victim costs

Victim costs include both tangible and intangible costs to the victim of the crime. Tangible costs are those losses to the victim, which are easily monetized, such as medical costs, lost income, and lost property. The intangible costs of crime refer to pain and suffering and other quality of life losses imposed on the victim or victims as a result of the crime.

In addition to criminal justice system and victim (both tangible and intangible) costs, an additional metric used to determine economic cost of a crime is crime career costs. Crime career costs are opportunity costs associated with a criminal’s choice to engage in illegal rather than legal and productive activities (McCollister, French and Fang, 2010).

Better Targeting Programming

According to the CSG Justice Center, “Research shows that correctional programs with the greatest impact on recidivism sort individuals based on their risk of reoffending” (Council of State Governments Justice Center, 2014, p. 4). The IDOC has limited resources, so better targeting of programming can increase the effectiveness of treatment by prioritizing services for higher risk inmates (for more on the impact of targeted programming, see Appendix E.)
Costs of Implementation

Tool Acquisition

The IDOC incurred costs with the acquisition of the SPIn risk assessment tool, which includes both upfront and ongoing costs. Upfront costs include purchasing the tool and conducting the tailored validity testing. Ongoing costs of the SPIn tool include possible annual fees to Orbis Partners such as client support fees. Client support services can include tools for supervisor training, quality assurance assessment data workshops, refresher training, and on-site technical support (Orbis Partners, Adult Assessment (SPIn)).

The SPIn risk assessment was obtained in 2013 after a two-year procurement process under a five-year contract. After an initial payment of $87,000 in 2013, the IDOC paid almost $330,000 in 2014 and is scheduled to pay nearly $370,000 in 2015 (IL Comptroller, Contracts). To estimate future costs of SPIn per year, we average the yearly costs for 2014 and 2015. This average yields nearly $350,000 per year, which we use as a conservative estimate of the ongoing, annual cost of SPIn. (We are not including prior costs of acquiring SPIn and are instead counting them as sunk costs.)

Staff salaries and benefits

Implementing risk assessments effectively in Illinois requires a new skills and knowledge base for current staff and expansion of capacity through hiring of new staff. New staff will administer the assessment tool, provide case management for offenders, and assist in coordinating re-entry planning prior to an offender's release. The IDOC estimates the need for 197 new staff members in total, starting with an initial 125 new hires, all of whom must be paid salaries and benefits. We are only modeling implementation of SPIn at MSR and the 125 staff
will cover more points of use of the risk assessment (such as assessment at entry and during prison); therefore, we are overestimating the cost of staff time for the use at MSR.

The IDOC intends to hire individuals with Masters of Social Work degrees to conduct risk assessments at approximately the average salary rate of $65,830 for individuals in Illinois with that classification (Social Work License Map, Illinois Social Work Salary). The cost of fringe benefits is estimated using the average breakdown of salary costs relative to benefit costs for state and local government employees according to the Bureau of Labor Statistics. In 2014, the Bureau of Labor Statistics estimates that benefits comprise 36 percent of the total employee costs (salary plus benefits). Thus, estimated benefit costs are approximately $36,829 per new hire. On average, total benefits and salary would sum to $102,659 for each new hire with these qualifications. If the IDOC is successful in hiring 125 new social workers, the new staff cost associated with risk assessments is approximately $12.8 million annually.

Training

The costs for implementing risk assessments also include training for staff whose work will be affected by its use. For new staff members, training for SPIn is conducted in two phases of two days each, totaling four days, with the focus of the first phase being conducting assessments and the focus of the second phase being case planning (Orbis, 2014). The costs of training new staff are included in the cost of employing the new employees.

In addition to the newly hired staff, the IDOC’s reception and classification staff, clinical services staff, reentry services staff, MSR staff, and the PRB will also receive training on risk assessment. Orbis Partners also has an e-training system available as a separate package from the SPIn system. As a conservative estimate, we included the costs of providing over 900 employees with four hours of training per year. In 2013, the average IDOC salary is almost
$63,000 per year (State Journal-Register, Salaries - State of Illinois) and over $103,000 per year with benefits (BLS 2014). Thus, the average marginal cost of one hour of an IDOC employee $49.60. We estimate that over 3600 hours of training at a cost of $49.60 per hour equates to training costs of nearly $180,000 per year.

Estimated Total Yearly Cost

Combining the costs of SPIn, staffing, and training, we estimate the total cost per year to be almost $13,360,000.

Table 1: Cost Summary

<table>
<thead>
<tr>
<th>Yearly Implementation Costs (in dollars)</th>
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<tbody>
<tr>
<td><strong>Tool Acquisition Costs</strong></td>
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<tr>
<td>Average Yearly Cost of SPIn</td>
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<tr>
<td><strong>Total Tool Acquisition Costs</strong></td>
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<tr>
<td><strong>Staff Salaries and Benefits Costs</strong></td>
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<tr>
<td>New Hire Salary</td>
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<td>New Hire Benefits</td>
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<tr>
<td>New Hire Total Salary &amp; Benefits</td>
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<tr>
<td><strong>Total Salaries and Benefits Costs (for 125 New Hires)</strong></td>
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<tr>
<td><strong>Training Costs</strong></td>
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<tr>
<td>Average Marginal Hourly Wage for Other IDOC Staff</td>
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<tr>
<td><strong>Total Training Costs (for 900 staff for 4 days/year)</strong></td>
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<td><strong>Total Annual Cost</strong></td>
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Omitted Cost and Benefit Categories

Because the tool has not been fully implemented or validated yet, there are a number of benefits we expect to accrue in the future but that cannot yet be monetized. First, the IDOC hopes to concentrate services in certain facilities thereby producing cost savings by having all prisoners who need a certain service together rather than have that service at every prison center. This benefit is expected to have some administrative costs associated with the
reorganization of services to concentrate them appropriately, but ultimately would result in positive net benefits (see Appendix F for a more in-depth discussion).

Second, we anticipate that assigning prisoners to appropriate in-prison programming will result in decreased recidivism and potential cost savings to the prisons. Decreased recidivism will result because prisoners will receive treatments specific to the reasons they commit the offense, which will give them a better chance of success once released. Additionally, the IDOC may realize cost savings if it is currently offering programs that do not address the needs of any prisoners and will better able to allocate budgetary funds to provide the programming necessary to address the needs of the population (see Appendix G for a more in-depth discussion).

Third, there is a debate over whether risk assessments are color-blind or exasperate racial disparities in the criminal justice system. Risk assessments have the ability to analyze individuals based on dynamic factors and static factors. This decreases the amount of bias in assigning MSR based solely on static factors. Classification may result in benefits that will accrue through more fairness in the system. However, assessments also rely heavily on criminal history, which at this time is also correlated to race. Therefore, we are uncertain whether or not racial fairness will increase or decrease. (Appendix H provides further discussion of this debate.)

Fourth, Illinois recently invested in a new computer system, some percentage of which will be utilized for and could be assigned to risk assessment implementation. As we do not have estimates of the acquisition or annual maintenance or the percent of the cost attributable to risk assessments for the computer system, Offender360, we are not including this cost in our calculations. Additionally, some portion of existing staff time will be directed to the implementation and ongoing use of risk assessments; however, we are not including the opportunity cost of this time in the calculations of total costs. In addition, there may be other
costs associated with additional support services and providing training from Orbis Partners that we do not include. For example, Orbis Partners also has an e-training system available as a separate package from the SPIn system (Orbis Partners, e-Training).

Finally, ongoing costs will also include quality assurance (implementation) review by the John Howard Association of Illinois, which the IDOC is not directly funding. The IDOC received two federal Department of Justice Second Chance Act Grants. In FY 2013, the IDOC received $100,000 to create its Recidivism Reduction Strategic Plan, and in FY 2014, the IDOC received $1,000,000 to begin its Statewide Adult Recidivism Reduction Strategic Plan Implementation Program. The IDOC plans to use the grant to fund its quality assurance review of SPIn’s implementation. A notable aspect of the FY 2014 grant is its inclusion of several targets of reducing recidivism: “this implementation program will make system wide improvements to achieve recidivism reduction goals of 15 percent for the target population and 2 percent statewide in two years, and 40 percent for the target population and a 6 percent statewide reduction in five years” (DoJ Second Chance Act Grant).

**Assumptions**

Our analysis rests on a number of important assumptions that if varied would alter our results. First, we assume that presently supervision levels are randomly assigned. This assumption is questionable because decisions are based on assessments made by members of the PRB. The members of this board develop expertise in making supervision determinations, thereby reducing the randomization of assignment. However, each member also includes subjective aspects to their decisions as well. Additionally, members are not bound to a common system to make decisions. We believe that the risk assessment tool will serve as a common basis upon which to base supervision decisions resting on that individual’s needs level. However,
determining how supervision levels are allocated currently is not feasible within the scope of this project. Therefore, we assume random assignment under the current system.

Second and similarly, we assume that the results from the tool will inform programming decisions once the individual is released into supervision. If the tool is not fully incorporated into determining supervision levels, then our hypothesized results will not be realized. Additionally, the tool will fail to accomplish the basis for its adoption: better allocation of resources. Those receiving the results from the assessments must be faithful to the results; otherwise the current practice of decision making, which we have assumed to be random, will not change. Although there is currently no mandate to follow the results, we assume that supervision level decisions are made faithfully to what the tool suggests in order to isolate the possible benefits resulting from using the tool.

Third, we assume that those administering the tool will be diligent in administering the assessments to prisoners. The IDOC will have to undergo a culture shift to see the value of the tool and incorporate it as part of the system. However, the IDOC has sought to mitigate any cultural shift issues by hiring new staff to administer it. We therefore assume that these new employees will be successfully trained on the tool and faithfully administer the survey to give accurate results.

Fourth, our results assume that prisoners are faithful to the programming they receive after release. The PRB assigns individuals to supervision level and programming. Working with the assumption that the tool will inform supervision levels, we also assume that once assigned to a program, the individual will follow the assigned program. We therefore assume 100 percent fidelity to the case management plan produced by the tool by the individual on supervision in our initial model; however we attempt to relax this assumption in subsequent models.
Fifth, we utilize 29.8 percent as an estimate for the percent of prisoners receiving the highest supervision level. The PRB does not currently have a breakdown for how supervision levels are distributed. As a result, we utilized 29.8 percent because this mirrors the percentage of individuals committing the most severe felonies in Illinois. We make this assumption because we require a basis for determining those highest at risk for reoffending. We recognize that just because an individual commits a severe felony does not mean that he or she is at a higher risk for reoffending. The percentage is a convenience estimate that should be updated as future information becomes available.

Sixth, we assigned a slightly skewed normal distribution for the percentage likelihood that an offender on MSR will recidivate. In order to model the influence of current intensive supervision at MSR, the normal distribution is slightly skewed right. The influence of prison on future outcomes, such as employment and social relationships, has been shown to be negative, indicating that very few offenders would have very low likelihoods of reoffending, which is reflected in the slightly right skew. Researchers have not attempted to estimate a “true” underlying risk of recidivism, especially as many factors influence the offender population’s overall risk pattern. We choose a normal distribution because it yields a more conservative estimate than a uniform distribution, most data points will be near the mean risk rather than the extreme ends, and many other populations follow a normal distribution.

Seventh, we utilize the average cost of prison rather than the long-term marginal costs. In criminological cost-benefit analyses, it is not customary to utilize the average cost of housing someone in prison because this number takes into account fixed investments, such as facilities. It is often unlikely that one policy or program will cause a physical building to close so using this assumption biases cost estimates upward. There are two estimates for marginal
costs: short-run marginal costs and long-run marginal costs. Short-run marginal costs are the estimate for how much it costs to have one additional person in prison and generally includes costs for items such as food and clothing. Long-run marginal costs also take into account staff changes and are used if there is an expected substantial impact on the prison populations (Henrichson & Galgano, 2013). For this analysis, however, we utilize average costs because the theory upon which avoided benefits are calculated uses average costs. McCollister, French, and Fang incorporated criminal justice system costs as a whole but without further information, we could not parse out the specific prison costs (McCollister, French, and Fang, 2010). In addition, the cost estimates available to us at the time of the writing of the report were either average costs or short-term marginal costs. We were unable at this time to separate out the cost of prison from other system costs to derive the long-term marginal costs. We used average costs to mirror the McCollister estimates, and because we felt the average cost estimate is a closer approximation to the long-run marginal costs than the short-run marginal costs available.

**Demonstration Specification**

The demonstration is intended to simulate a reduction in recidivism rates resulting from more targeted programming at mandatory supervised release from using the SPIn and CaseWorks tools. We modeled two scenarios, one in which intensive supervision is randomly assigned to people on MSR and one in which intensive supervision is assigned to people on MSR with the highest risk, simulating better assessment from the SPIn risk assessment tool. The first model, representing the status quo, is intended to reflect current intensive supervision assignment, which is primarily determined by crime committed. Therefore, intensive supervision at MSR is currently not based solely on risk level and can be assumed to be random in relation to risk of
recidivism. The second model, implementing SPIIn, is intended to demonstrate the impact of targeting resources at individuals the SPIIn tool identifies as with the highest risk levels.

First, we draw a random sample of one thousand offenders with risks of recidivism between 0 and 1. This draw simulates the MSR population’s risk of recidivism with no programming. The risk level is drawn from a normal distribution with a mean of 0.55 and a standard deviation of 0.20 as shown in Chart 1.

**Chart 1: Sample Random Draw of Risk of Recidivism**

We then assign programming to slightly less than 30 percent of this population, which is the current number of people on MSR committing offenses in classes murder, class X, and class 1 (IDOC FY13 Annual Report). We took a random selection of 298 of the 1000 people on MSR in our model and reduced their recidivism rate by the effect size of intensive supervision and programming, as found by the WSIPP (see Appendix I). This first model is a simulation of current recidivism rates with current allocation of intensive supervision for people on MSR.
Our next model simulates the change in the risk of recidivism when the risk assessment and case management tool are utilized to better target intensive supervision to the highest risk offenders. Currently, MSR terms are mostly granted based on offense type, but when SPIn is implemented, the intention is that people on MSR with highest risk of recidivism will be targeted for intensive supervision and other programming. For this model, we sort the initial random sample of 1000 parolees’ risk levels from highest to lowest. We use the same percentage, 29.8 percent, that we assume are currently receiving services. (Using the same level of services means this model shows the change in recidivism from better targeting existing resources.) However, instead of randomly applying reductions in recidivism rates, we target the highest risk people on MSR. We use the effect size of utilizing a risk and needs assessment as found by the WSIPP to apply a reduction in recidivism risk to the 298 people on MSR with the highest risk of recidivism (see Appendix I). We then do a Monte Carlo simulation to address uncertainty and increase robustness of our model. We repeat this simulation 1000 times for each model and average the mean recidivism rates for each model.

In addition to these models, we conduct an additional simulation that is identical to the second model, but it doubles the percentage receiving programming from 29.8 percent to 59.6 percent. This model is intended to demonstrate what would happen if programming were extended and assigned based on information from the SPIn and CaseWorks tools. We also simulate the effects of varying the accuracy of the assessment by matching varying numbers of the 298 highest offenders to services and the remaining number of spots given to randomly selected offenders (see Appendix L).
Results of Demonstration

The mean recidivism rate was 54.5 percent for our model without any programming reflecting underlying risk. When applying randomized intensive supervision (our first model), the mean recidivism rate was reduced to 49.9 percent on average (range: 48.2 to 51.8 percent), which is very similar to the current recidivism rate in Illinois. Our demonstration with the targeted intensive supervision from the risk assessment further reduced the recidivism rate by 2.9 percent on average (range: 2.5 to 3.3 percent). In addition, we found that if funding for programming was extended to double the population served (59.6 percent of the MSR population) and a risk assessment tool was utilized, there could be an average 8.5 percent (range: 8 to 9 percent) reduction in recidivism in total. These results are summarized in Table 2.

Table 2: Results of Demonstration of Recidivism Rates

<table>
<thead>
<tr>
<th>Model</th>
<th>Mean Recidivism Rate</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No risk assessment or intensive parole</td>
<td>.545</td>
<td>.006</td>
</tr>
<tr>
<td>Random intensive parole (29.8%)</td>
<td>.499</td>
<td>.006</td>
</tr>
<tr>
<td>Targeted intensive parole with risk assessment (29.8%)</td>
<td>.470</td>
<td>.006</td>
</tr>
<tr>
<td>Increased targeted intensive parole with risk assessment (56.9%)</td>
<td>.414</td>
<td>.005</td>
</tr>
</tbody>
</table>
Monetizing Reducing Recidivism

Our model suggests that using the SPIn and CaseWorks tool at MSR will reduce recidivism in Illinois. Reducing recidivism creates a benefit through the reduction of victim costs, system costs, and incarceration costs. The average cost of crime, including tangible and intangible costs were monetized and stratified by the percentage of prisoners committing those crimes. In addition, the system costs of crime, which are the administrative costs of charging someone for a crime (including price of police officers, the court system etc.) were also monetized.

Recidivism includes technical violations, which are violations of MSR terms, and new offenses, which are convictions after release. Currently, 25 percent of offenders exiting prison violate their terms of probation, while 25 percent of offenders exiting prison are convicted of a new crime (Pew Center on the States, 2011). When monetizing the reduction in recidivism, we assumed a proportionate decrease in both prison violations and new crimes relative to their current proportions of recidivism. For a reduction in recidivism for technical violations, we only included the cost of incarceration when estimating the cost. Technical violators spend, on average, less than three months in prison after their violation, so we estimated the cost of one-fourth of a year of prison for this population (SPAC 2013b). New crime was monetized using cost of crime estimates, including fiscal, and for some crimes, social costs. For more information about the monetization, see Appendix J.

Phase-in, Time Horizon, and Discounting

All those reentering MSR receive a complete assessment in our model. As nearly two-thirds of those who recidivate, recidivate in the first year (La Vigne and Mamalian, 2003, p.22),
we modeled the gains of reducing recidivism to include two-thirds of the benefits accruing in the first year with the remaining one-third divided evenly between the remaining two years. This specification only affects the first two years as Year One sees 66 percent of the reductions in recidivism, Year Two sees 66.7 percent plus 16.7 percent for a total of 83.3 percent, and Year Three sees the full benefit (66.7 percent plus 16.7 percent plus 16.7 percent).

Our cost-benefit analysis assumes use of SPIn in the present. This assumption means that we do not include any prior or sunk costs for implementing SPIn, including the acquisition of the tool. The analysis is modeled for five years mirroring the current contract for SPIn. However, as benefits continue to accrue with the continued usage of risk assessments, we would predict added net benefits from the additional renewals of the tool contract with Orbis Partners. These benefits could include better assessments under the application of the tool, better coordination of services according to the case plan, and increasing institutional support with time. To determine the present value of future investments and returns, we applied a discount rate of 5 percent. We chose this discount rate as it is the one used by SPAC for its cost-benefit calculations. However, net benefits are largely insensitive to the choice of discount rate.

**Limitations**

In conducting an *ex ante* cost-benefit analysis before the IDOC implements the tool, our analysis has a number of limitations. First, due to the early stages of tool implementation, there is not a given distribution of how prisoners will be allocated to the eight risk levels. Without the individualized SPIn distribution for Illinois, we are limited in our ability to predict exactly how the tool will allocate prisoners to risk levels. It is unknown whether there will be a normal distribution across risk levels or whether offenders will disproportionately fall in some risk levels more often than other risk levels. We assumed a normal distribution of risk and that 29.8 percent
of individuals are high risk needing intensive supervision, but the tool, once validated, may reflect a different distribution thereby changing the allocation of supervision and programming.

Second, the Illinois Crime Reduction Act requires a full scale-up of the instruments within two years of the initial implementation. The anticipated phase-in includes using the tools initially at four prison facilities and two adult transition centers and expanding to all other facilities over a few years. Our cost-benefit analysis only examines tool implementation for offenders reentering under MSR. Although risk assessments are slated to cover the entire prison population after two years, we do not model the gradual expansion of using SPIn at prison entry and throughout the prison term. We assume that with more points of assessment of individuals, the IDOC will have more knowledge to tailor supervision and programming better to each individual prisoner’s strengths and needs, further strengthening the relationship found between SPIn and its impact on reducing recidivism.

Third, the chosen tool has not been validated or used on a U.S. population. Therefore, at this time there is uncertainty in how accurately the tool will assess risk and needs for Illinois. Three years after the implementation of SPIn, the Orbis Partners will conduct a validation of the SPIn tool. At this time, the tool will be modified to perform as accurately as possible and correctly predict the likelihood of recidivism. However, without this information, we are assuming that the tool works perfectly, even though this assumption is optimistic even after validation.

Fourth, the implementation of the tool has been stalled previously and if stalled again, the net benefits will be delayed and decreased through discounting. The mandate to implement the tool within three years of acquisition should help keep the project on track. However,
uncertainty at this point in the implementation timeline affects our model’s ability to project when benefits and costs will actually be incurred.

Additionally, we conducted this analysis under the assumption that funding for IDOC and the program would remain constant and that the newly elected officials would maintain support for the project. If IDOC’s budget is cut in any substantial way, they will need to shift funds from extraneous programs like this SPIn to ensure safety first. This program will not be able to meet its full potential net benefit if funding is not sustained. IDOC needs to hire at least 125 employees to administer the program and any change to that plan would affect the net benefits realized in this report.

Finally, in calculating net benefits, we included a proportional reduction in murder. Murder causes large costs due to the value of an individual’s life and the long length of sentences. Therefore, if the risk assessment tool does not help to reduce murder at all, the net benefits we find will not be realized. To examine this limitation, we conducted a sensitivity analysis. This analysis found that the realized net benefits are sensitive to having at least a small effect on murder. However, to see net positive benefits, the avoidance of homicides required is small: approximately three homicides over the five year period (see Appendix L for more information).

Results

Our demonstration indicates that if the risk assessment and case management tools were utilized on the MSR population, the effects of more targeted programming on high-risk offenders would reduce recidivism rates (for more detail of this analysis, see Appendices J and K). Additionally, to account for benefits accruing from including a reduction in murders and the
accuracy of and fidelity to the tool, we conducted a sensitivity analysis (see Appendix L for more information).

**Fiscal Analysis Results**

Our client was mainly interested in the costs and benefits accruing only to the government. These costs included all of the administrative costs of staff time, tool maintenance, and training costs, which totaled $13.4 million per year. Benefits accruing to the government are avoided system costs of processing offenders through the legal system and housing them in prison. Therefore, there was a net fiscal cost ranging from -$38.9 million to -$49.2 million over five years.

**Social Analysis Results**

However, we also assumed that the Illinois Government has a vested interest in protecting its citizens. Therefore, in addition to the fiscal benefits, social benefits accrue from reduced crime such as opportunity cost for the offender and avoided victim costs. We do not include any additional costs beyond what is included in the fiscal analysis. Over the course of five years, we estimate that social benefits will range from $95.4 million to $235.3 million depending on the accuracy of and fidelity to the tool.

**Break-Even Analysis Results**

Our client also asked us to assess when the State would begin seeing positive net benefits. We determined the percentage reduction in recidivism when the costs of implementing SPIn equal the benefits of reducing recidivism at MSR. We found that if recidivism was reduced by 0.53 percent there would be a “break-even” point between costs and benefits. If only fiscal benefits are taken into account, the “break-even” point would be a 7.23 percent reduction in recidivism.
Conclusion

A cost-benefit analysis calculates the efficiency of a policy by subtracting the costs of the policy from the monetized benefits. If the policy has a positive outcome (also known as a positive net benefit), then it is a worthy policy alternative. Our cost-benefit analysis examined the costs of implementing the SPIn and CaseWorks tools for the entire prison and MSR population in Illinois and estimated the benefits of reduced recidivism for just use of the tools for the Illinois MSR population. Therefore, our analysis could severely underestimate the benefits of the risk assessment and case management tools because their use on the in-prison population is not assessed. The benefit analysis should be viewed as a very conservative estimate of all the benefits of implementing the tool. Despite this limitation, our findings suggest that utilizing the SPIn tool and CaseWorks software at just MSR reduces recidivism by a large enough amount to outweigh the cost of implementation for the entire population.
Appendix A: State of Corrections

Established in 1970, the IDOC administers state prisons, boot camps, work camps and adult transition centers. In 2006, juvenile corrections moved from under the IDOC to the newly created Illinois Department of Juvenile Justice. The IDOC employs approximately 10,786 employees.

As of the end of May 2014, IDOC held 48,851 inmates in 25 correctional centers and 4 adult transition centers and supervises approximately 29,000 parolees. At this population level, the system is 97 percent at operational (bed space) capacity and 152 percent of designed (rated) capacity with 8 facilities over 200 percent of designed capacity. The IDOC projects that the population will increase to over 50,000 inmates by March 2015. Over the previous year period, the IDOC system had around 28,000 intakes and exits. In addition, for FY 2012, the recidivism rate for Illinois is 47.1 percent.

As of the end of June 2012, slightly more than 94 percent of prisoners were male and nearly 6 percent were female. The prison population was comprised of 57 percent African American, 29.5 percent non-Hispanic white, 13.1 percent Hispanic, 0.3 percent Asian American, and 0.1 percent American Indian individuals. In 2012, the US Census reports that Illinois’ overall population by race and ethnicity was 62.7 percent of non-Hispanic white, 14.7 percent African American, 16.5 percent Hispanic, 5.1 percent Asian American, and 0.6 percent American Indian.

The VERA Institute of Justice (2012) estimates that the total state cost of prisons for Illinois is over $1.7 billion, which includes prison-related costs not included in the IDOC budget (which was $1.22 billion for FY2013). The average annual cost per inmate is $38,268. (According to the latest FY2014 financial impact statement, the IDOC gives the annual cost of
incarcerating an individual as $22,665.) Because of limitations in prison capacity and severe budget constraints, states are looking to risk assessment tools to assist in better allocation of limited resources.

Illinois operates adult transition centers that act as the final stop before offenders fully re-enter society. These centers provide programming that help offenders adjust to society. For example, there are education programs, substance abuse programs, life skills programs, and other programs that are designed to help the offender be successful outside of prison. Governor Quinn’s FY 2013 Budget originally proposed closing six of the seven adult transition centers, but at the end of the budget process, only three adult transition centers were closed. This leaves a total of four adult transition centers (The State Journal Register, 2012).

Illinois prisons have recently struggled with overcrowding, which can have the potential to lead to dangerous conditions within state prisons. Research has shown that these conditions can actually make inmates more likely to reoffend when they are released (John Howard Association of Illinois, 2012, p.3).
Appendix B: Other States and Risk Assessment

Similar to Illinois’s Crime Reduction Act, Arkansas law requires the parole board to conduct a risk and needs assessment of all parole applicants. In addition, the Arkansas law requires that all probation and parole supervision features evidence-based practices. One of those evidence-based practices is using assessment to place offenders in treatment and programming that addresses an individual’s criminal risk factors.

Kentucky’s law requires the use of risk and needs assessment at nearly every stage of the criminal justice system. Assessment results in presentence investigation reports must be used to help determine an offender’s eligibility for alternatives to incarceration. In addition, courts may use an assessment to determine if certain drug offenders should receive treatment rather than incarceration. The law also orders the state Department of Rehabilitation to develop a validated risk and needs assessment for use at intake to state prison or community supervision.

Ohio law instructs the Department of Rehabilitation and Correction to select a single risk assessment tool to be used by all courts, probation departments, state and privately run correctional facilities, and the parole board. Colorado and North Carolina both require assessments be used to help determine each probationer’s risk of reoffending.

The Commonwealth of Virginia implemented a pre-trial risk assessment in 2007 for low-risk, prison-bound offenders. The assessment is used to reduce prison costs by keeping those low-risk offenders in community alternatives to prison. On the other end of the spectrum, Louisiana and New York, like Arkansas, require risk and needs assessments for parole.

Examples of Successes

There are several states where risk assessments have been successful. In Oregon, inmates receive risk and needs assessments at intake. They also receive targeted case management during
imprisonment, and transition planning begins six months before release. In addition, the consequences for violations do not vary across counties. The state created a sanctioning grid that produces certain consequences. Thus, parole and probation violators rarely go back to prison. Instead, they face sanctions in the community. In addition, a law was put into place that “required that any correctional program receiving state money be evidence-based in its design in delivery” (Pew Center on the States, 2011, p. 20). The Pew study (2011) was able to obtain data on 41 states in terms of the recidivism rate, and Oregon had the lowest at 22.8 percent. From 1999-2004, Oregon’s recidivism rate dropped almost 32 percent. The success of Oregon is not based solely on risk assessment; however, Oregon officials cite risk assessment as a key reason why the recidivism rate has declined significantly (Pew Center on the States, 2011, p.20).

Kansas has also had success with risk assessment. In the early 2000s, Kansas had significant budget issues and could no longer afford to increase prison capacity. As a result, the Offender Risk Reduction and Reentry Plan was created in 2006. Driven by risk containment and risk reduction, this plan “sought to implement targeted, cost-effective interventions focused on reintegrating parolees into the community and preserving public safety through more effective services and supervision” (John Howard Association of Illinois, 2012, p. 21). As a result of implementing this plan, “one-year parole recidivism rates decreased 25 percent between 2006 and 2010.” In addition, between 2004 and 2009, the State’s prison population dropped 6.2 percent. The recidivism rates in Kansas have remained stable, but recent legislation has put increased pressure on the prison system. The risk assessment plan did work, but now, new laws are increasing the prison population (John Howard Association of Illinois, 2012, p. 22).
Appendix C: Prior Cost-Benefit Analyses

To the best of our knowledge, this cost-benefit analysis is the first that analyzes a risk assessment tool used during release from prison. The National Center for State Courts and the Virginia Criminal Sentencing Commission included a cost-benefit analysis in a report on offender risk assessment in Virginia (2002). The Virginia cost-benefit analysis analyzed a risk assessment tool used to divert some offenders from prison. This analysis is unique in that it calculates potential benefits from using a risk assessment tool to guide release, rather than the Virginia diversion approach.

WSIPP looked at the potential costs and benefits that resulted from a 2003 law on recidivism that authorized the Washington Department of Corrections to release qualified offenders earlier if they showed good behavior in prison. Although this case does not deal with risk assessment, it is still useful to look at the potential benefits of reducing recidivism. According to this cost-benefit analysis, there were three categories of benefits. The recidivism effect, which measured future crime victim costs avoided and future taxpayer costs avoided, had benefits of $8,064. The prison costs saved from reduced length of stay provided benefits of $5,501. The increased labor market earnings provided benefits of $1,785. The total benefits were $15,359. The costs looked at the total increase in crime costs due to non-confinement. These costs totaled $8,179. The total net benefits per participant was $7,719, with a benefit-to-cost ratio of $1.88. Although this analysis does not deal specifically with risk assessment, it is helpful in showing the effects of a policy that tries to reduce recidivism.

Recidivism is a problem for every state, and every state is attempting to reduce the number of prisoners in each state’s prison system, which is why states are looking at reducing the recidivism rate. Risk assessment programs are a potential way of addressing the problem of recidivism. However, these risk assessment programs should be built in a way that truly
addresses all prisoners, rather than programs that only take the easiest cases where the risk of recidivism is really low. In addition, treatment programs, vocational training, and education programs are all options that can be done in prison, or while the offender is on parole. It is essential that the state gives each offender the opportunity to succeed when they reenter society. These programs help offenders, and if these programs can truly reduce the recidivism rate, then society will enjoy the benefits in terms of reduced prison costs, reduced victim costs, and an increase in labor market earnings.
Appendix D: Cost of Crime to Society

This table shows the costs of crime used to estimate benefits from reduced recidivism using fiscal cost calculations and the crimes listed in “The Cost of Crime to Society: New Crime-Specific Estimates for Policy and Program Evaluation” by McCollister et al. (2010). This study provides the most up to date figures and includes the widest range of crimes. The costs were calculated using crime career cost, cost to the victim, cost to the criminal justice system, including adjudication and prison costs, and intangible costs, which include pain and suffering for victims of these crimes. Using the CPI through the Bureau of Labor Statistics, the figures from research from McCollister et al. were updated to 2014 dollars. Items in parentheses are crimes that were not monetized in the McCollister et al. study and only accounted for fiscal costs. These costs are monetized by the average years in prison for the class of offense multiplied by the average cost of prison plus administrative costs (see Appendix J for more information).
Table 3: Fiscal and Total Costs by Type of Crime

<table>
<thead>
<tr>
<th>Type of Crime</th>
<th>Frequency (Percent)</th>
<th>Fiscal Costs for Parole Population (in dollars)</th>
<th>Total (Social and Fiscal) Costs for Parole Population (in dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Crime</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crimes Against Persons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criminal Homicide</td>
<td>3.4</td>
<td>98,256,937</td>
<td>2,249,592,993</td>
</tr>
<tr>
<td>Forcible Rape</td>
<td>3.2</td>
<td>6,241,118</td>
<td>56,750,698</td>
</tr>
<tr>
<td>Aggravated Battery/Assault</td>
<td>7.4</td>
<td>4,709,869</td>
<td>58,331,722</td>
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<tr>
<td>(Kidnapping)</td>
<td>0.4</td>
<td>1,007,935</td>
<td>1,007,935</td>
</tr>
<tr>
<td>(Armed Violence)</td>
<td>0.2</td>
<td>1,730,192</td>
<td>1,730,192</td>
</tr>
<tr>
<td>Crimes Against Property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Home Invasion)</td>
<td>0.9</td>
<td>7,785,864</td>
<td>7,785,864</td>
</tr>
<tr>
<td>Robbery</td>
<td>7.7</td>
<td>7,841,832</td>
<td>23,996,167</td>
</tr>
<tr>
<td>Theft</td>
<td>8.9</td>
<td>1,887,156</td>
<td>2,315,360</td>
</tr>
<tr>
<td>Fraud</td>
<td>1.7</td>
<td>547,461</td>
<td>630,083</td>
</tr>
<tr>
<td>Burglary/residential burglary</td>
<td>13.8</td>
<td>4,194,793</td>
<td>6,568,316</td>
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<tr>
<td>Arson</td>
<td>0.4</td>
<td>129,400</td>
<td>621,745</td>
</tr>
<tr>
<td>Motor Vehicle Theft</td>
<td>2.1</td>
<td>598,204</td>
<td>1,666,187</td>
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<tr>
<td>(Damage to Property)</td>
<td>0.7</td>
<td>1,763,886</td>
<td>1,763,886</td>
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<tr>
<td>Other</td>
<td></td>
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<tr>
<td>(Escape)</td>
<td>1.1</td>
<td>2,771,821</td>
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<td>(DUI)</td>
<td>5.3</td>
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<tr>
<td>(Drug)</td>
<td>30.0</td>
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<tr>
<td>(Weapons)</td>
<td>9.1</td>
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<tr>
<td>Disorderly Conduct</td>
<td>0.2</td>
<td>339,628</td>
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<tr>
<td>Vehicle Code Violation</td>
<td>3.6</td>
<td>6,113,306</td>
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<tr>
<td>Technical Violations</td>
<td>25</td>
<td>39,504,656</td>
<td>39,504,656</td>
</tr>
<tr>
<td>Sum Total (Technical &amp; New Offenses)</td>
<td>25</td>
<td>39,504,656</td>
<td>2,500,366,732</td>
</tr>
</tbody>
</table>

*Cost estimated by multiplying 2008 estimates by factor of 1.056 (CPI Bureau of Labor Statistics)

Items in parentheses are crimes that were not monetized in the McCollister et al. study and only accounted for fiscal costs. These costs are monetized by the average years in prison for the class of offense multiplied by the average cost of prison plus administrative costs (see Appendix J for more information).
Appendix E: Better Targeted Programming

In addition, investing in community-based treatment, promoting continuity of care from incarceration to the community, tailoring approaches to individual needs, and providing incentives for participation in programs designed to reduce likelihood of a person reoffending are all strategies that can contribute to reducing recidivism. These strategies were found to be successful in Colorado. Incentives are particularly interesting because these incentives are things like participating in educational classes or vocational training. By participating in these programs, offenders would have the chance to reduce their sentences. This participation in programming allows offenders to serve their time, but it also gives them some of the necessary tools to reenter society. Vocational programs and educational programs are two big things that can reduce the risk of recidivism for participants in these programs.

In order to have a greater impact on reduction of risk of recidivism, offenders must be active in programs after they are released back into society. According to Beck and Shipley, recidivism rates are higher for offenders within the first year after being released from prison (1989, p. 1). That is why it is important to address the needs of released inmates. The Center for Impact Research gives several examples of ways to address these needs. The first is to “[i]dentify prisoners at higher risk of recidivating and develop an appropriate service plan for them (McKean, 2004, p. 7.). This is part of what the new risk assessment in Illinois would do. There is no perfect program that works for every offender who is reentering society. Electronic monitoring, drug treatment programs, vocational programs, and cognitive behavioral programs are all examples of potential programming. There are many different factors that affect recidivism, but there many common problems that offenders face when reentering society. These problems sometimes lead to more involvement in criminal activity. Overall, the government needs to provide programming that helps offenders reenter society. If these programs are not provided, then these offenders have a higher risk of committing more crimes.
Appendix F: Future Benefit of Avoided Costs Due to Economies of Scale

In microeconomics, economies of scale are defined as the cost advantages that entities may obtain with increased output of a product. Put another way, the greater quantity of a good produced, the lower the per-unit fixed cost because the costs are shared over a larger number of goods. This economic principle applies to Illinois in-prison programming. Rather than operating a program across several prisons with fewer offenders participating, it would be more efficient and cost-effective if a program was run at one prison, with offenders that would benefit from that program being placed at that prison. The SPIn tool used by Illinois should help raise awareness for both re-entry and programming for offenders.

Some empirical research indicates that prisons, and in particular, educational and counseling programs can see benefits from economies of scale. A study conducted in California’s prisons found that costs regarding educational costs and counseling services “generally increase until a certain level of rehabilitative activities is provided and then decline thereafter” (Schmidt and White, 1984). Additionally, research conducted at the University of Victoria found that economies of scale apply to prisons in different ways, and economic analysis can play an important role in policy decisions regarding prisons (Avio, 1998).

Illinois operates an Incarcerated Veterans Transition Program as part of a federal pilot program that assesses the strengths and needs of offenders within 18 months of release. Currently, the program runs at 9 of Illinois’ prisons. If the pilot were to expand, placing veterans at just a few prisons would allow more efficient staff allocation to administer the program. As part of the program, Illinois Department of Employment Security employees visit prison facilities to update veterans on benefits and verification of service. Reduced travel costs
and potentially fewer staff could result from centralizing this program. Fewer staff would likely be needed to administer the program to 2-3 prisons rather than 9 prisons.

Evidence of avoided costs exists in Illinois through the Sheridan Correctional Center. In 2003, the Sheridan Correctional Center was re-designed as a substance abuse treatment facility (Jaeger, 2009). This facility houses offenders that were convicted of drug offenses and property crimes, both being correlated with support of drug habits. Offenders are offered vocational training as well as parenting, anger management, and adult education courses. The focused nature of this prison has led to lower recidivism rates than those found in the rest of the state. Officials reported $2.1 million in savings from reductions in recidivism at the Sheridan facility.

Illinois prisons can avoid costs due to economies of scale. Providing programming at designated facilities and placing certain offenders at these facilities can lead to cost savings in staffing and increased effectiveness. The Sheridan Correctional Facility provides an example of how efficiencies in allocation of programming can save millions of dollars. Offenders in Illinois’ prisons have a variety of needs to be addressed by in-prison programs. SPIn can help raise awareness for the needs of the prison population. Illinois, through efficient allocation of resources in location and implementation of different programs, can use the individual needs of offenders obtained through SPIn to operate more cost-efficient and effective programming.
Appendix G: Future Benefit of Decreased Recidivism Stemming from Appropriate In-Prison Programming

Similar to the manner in which Illinois will utilize the tool to concentrate prisoners with similar programming needs, Illinois will be able to also more efficiently allocate prisoners to the programming they need to receive while in prison to ensure an easier re-entry into society. Currently, Illinois utilizes a security assessment to determine the prison security level necessary for each prisoner. Illinois characterizes each facility on the following security levels from most to least secure: closed maximum security, maximum security, medium security, minimum security, and transitional security. Inmates are assessed at the point of intake and assigned to a security level; however, these assessments are based largely on self-report data (The Illinois Department of Corrections, 2012). The risk assessment tool will allow for better case planning including security placement. Inmates will be assessed on categories that are considered relevant to an individual’s likelihood to reoffend and then placed in programming designed to reduce such factors.

Illinois will be more informed on the needs of the prison population and therefore be able to more efficiently allocate programming to prisoners who need it. At that time, Illinois will be able to reassess the prisoners’ needs and security levels throughout their sentence rather than just at admittance. Additionally, the programming that the prisoner receives will more accurately reflect the reasons for why they ended up in prison, whether the reason is economic necessity, substance abuse, or any other reason. By receiving treatment and programming to mitigate these problems, the prisoner will therefore have a better chance of being successful once released. Thus, the tool provides the information necessary from individuals to create an
individualized response to crime rather than a case plan based on surface-level factors and primarily committing offense.

Additionally, Illinois may be able to realize further benefits from utilizing this tool if the appropriate programming results in more sentence credits authorized. Currently, Illinois awards sentence credits for “the successful completion of programming…compliance with rules and regulations… [and] service to the institution, community, or State” (Illinois Criminal Justice Information Authority, 2012). By offering prisoners programming more attuned to their needs, the prisoner may be more invested in the programming and persist to receive credit for completion. Additionally, if the prisoners are being rehabilitated for the reasons they committed a crime, they may also have more days of good behavior. However, currently there is no evidence that the tool will accrue these benefits so therefore, it cannot be added to the model at this time.

However, this theoretical benefit is unable to be monetized at this time due to the lack of information on how the tool will work once fully implemented. The above potential benefits represent the hopes behind the implementation of the tool, but there is no evidence on which to base estimates at this time. The IDOC hopes to be able to target programming to address prisoner needs based on risk levels; however, the infrastructure to do this is not set up currently. Therefore, there are no point or range estimates on current needs of prisoners or how programming will need to be allocated or changed. Once the tool is validated in three years and IDOC has information on the needs profiles of the prisoners on average, these estimates can be made.

Once the estimates on how much appropriate prison programming can reduce recidivism in Illinois are made, another consideration for projecting the success will be the length of
treatment individuals receive. Those who have longer sentences and consequently receive the necessary treatment for longer will see the effects delayed until those entering at the time of full implementation are released. However, those who have short-term sentences will be able to be assessed more quickly because the cohort that enters prison the year of full implementation will be released shortly after and information will be gathered on their success. This will likely form a theoretical basis for long-term sentences estimates as well.

The WSIPP presents estimates for various types of in-prison programming that can be used once the identity and needs of the Illinois prison population is better identified. These estimates generally show a positive return and therefore, we can assume that this benefit when realized will be positive. In the future, this benefit could be monetized by utilizing the estimates from WSIPP along with the realized percentages of the population that needs each program to predict decreased recidivism in the future.
Appendix H: Racial Disparity Concerns

Although advocates of risk assessment have said that risk assessment tools are color-blind, there are some concerns about risk assessment from within the justice system that it could cause greater racial disparity in corrections outcomes. For example, Attorney General Eric Holder opposes the use of data analysis in criminal sentencing, which is a significant part of many government agencies’ usage of risk assessment. Holder believes that education levels, socioeconomic backgrounds, and neighborhoods are useful in some areas of law enforcement, but these pieces of information should not be used in the prison system (Horowitz, 2014, p. 1). Holder also states that there are several bills moving through Congress, which would require risk assessment to be used in prison, not during sentencing. This kind of risk assessment is applicable to in-prison assessments and to future parole assignments (Calabresi, 2014). He believes that these “static factors and immutable characteristics may exacerbate unwarranted and unjust disparities that are already far too common in our criminal justice system and in our society” (Horowitz, 2014, p. 1). Holder’s main argument is that these static factors should not be used in the prison system, especially when it comes to sentencing, in-prison assessments, and parole assignments. This is because these static factors have a negative impact on poor offenders and minority offenders. Instead, dynamic factors, which are factors that can change, should be used as the main factors in evaluating offenders.

Tools can also be validated and crafted to ensure equity as well. More importantly, tools provide an objective and written basis for decisions. Under the current system, decisions are subjectively made without any explicit objective basis. Despite the hopes and aspirations to be objective and racially blind, individual biases toward what may contribute to reoffending enters the equation. Professor Christopher Slobogin argues for the use to tools at the point of
sentencing saying, “Race and class affect every disposition in the criminal justice system, but risk assessment instruments prevent explicit or implicit reliance on those factors, unlike seat-of-the-pants judgments by judges” (Patterson, 2014). Because there is not a consensus based on fact to either side of the argument, cautious optimism is encouraged and careful validation with attention to potential racial bias emphasized.
Appendix I: Effect Size Description

The WSIPP examined the effect size of intensive supervision and risk assessments on a reduction in recidivism. The formula utilized to convert the effect size to an odds ratio is: Odds Ratio = $e^{1.65 \times \text{Effect Size}}$. The WSIPP found the effect size for intensive supervision, both surveillance and treatment to be -0.205 (Washington State Institute for Public Policy, 2014a); programs that use risk-need responsivity in supervision were estimated to have an effect size of -0.267 (2014b). The Stata code reflects these calculations.
Appendix J: Monetizing Costs and Benefits

The demonstration found reduced recidivism with the use of a risk assessment at MSR, and we monetized the benefit of a risk assessment in terms of reduced crime costs. As discussed earlier in this paper, costs accrue to the victim, to society, and to the criminal justice system in terms of administrative costs (e.g., lawyers, judges, etc.) and costs to incarcerate a convicted offender. Kathryn McCollister and colleagues built on the work of several studies to estimate the total social costs, including both tangible, (e.g., items lost or destroyed or cost of medical care associated with injuries from a crime), and intangible costs of crime, which include pain, suffering, and reduced quality of life (McCollister, French, and Fang, 2010). McCollister and colleagues’ numbers were updated to 2014 dollars using the CPI obtained through the Bureau of Labor Statistics (United States Department of Labor, 2014).

McCollister et al.’s study uses the average total cost, including fixed costs. Using average costs rather than long-run marginal costs can be problematic because fixed capital costs may not change with a policy change. Therefore, using average costs to calculate benefits could overstate the benefits, as short- and long-term marginal costs can be significantly lower than average costs. We recognize our use of average costs may overestimate the benefits of a reduction in recidivism. There are some cases, however, where average costs equal marginal costs. If a state department of corrections pays a certain amount per day to house inmates in a contracted facility, and a new program or policy changes the contracted capacity, the marginal costs is the per-diem rate for these inmates. The reimbursement rate may be the average cost from the contractor’s perspective but from the purchasing agencies’ perspective (the state), these costs are marginal (Henrichson and Galgano, 2013). Therefore, average costs can be an adequate measure when the state is given standing, such as we have in this paper.
As a result of the limited data specific to Illinois, we needed to utilize existing national data on the cost of crime. The McCollister et al. study updated several cost estimate studies from the past two decades and since it was impossible to tease these numbers out to be marginal cost, we utilized average costs in this analysis. We contacted Kathryn McCollister, and if she provides more information in the future, we can reassess the benefits using long-term marginal costs. Accordingly, we feel that it is appropriate use average costs in this analysis.

There are several crimes in Illinois’ annual prison reports that were not analyzed in the McCollister et al. study. Since many of these crimes, which include escape, drug, weapons, disorderly conduct, and vehicle code violations, are considered “victimless” crimes, we estimated the administrative and prison costs associated with each crime. In sum, we did not calculate social costs for crimes not included in the McCollister et al. study; we solely used fiscal costs. SPAC published a document listing the average prison time served for each class of felony (e.g., X, 1, 2, 3, 4). We evaluated the class for each crime, then multiplied the average sentence of the crime by the yearly average cost of housing a prisoner ($22,655), also provided by SPAC. We then added this calculation to $1,238, SPAC’s figure for administrative costs associated with certain felonious property and drug crimes in Illinois (Jaeger, 2009). The sum reflects the fiscal costs of crime for crimes not included in the McCollister et al. study.

The IDOC publishes annual reports with data on its parole and prison population. The 2013 report put the parole population in Illinois at 27,900. We used 2013 data in our calculations to account for the new Supplemental Sentence Credit Program that allows up to 180 days of early parole for good conduct. This program began in early 2013 and could increase the number of parolees, so we used 2013 data to account for this program.

The report indicates that about half of the parole population is likely to recidivate. Of those, half will commit new crimes and half will commit technical violations. Therefore, we
used 6,975 as the number of parolees that will commit new crimes and also as the number who will have technical violations. For technical violations, offenders typically spend three months in prison (SPAC, 2013b). We multiplied the average cost of prison per year by one-fourth to reflect the cost of three months prison time for the entire violating parole population. We added $1,238 to account for the administrative cost for each violation. Then, we multiplied this number by the number of parolees committing technical violations. These calculations allowed us to estimate a total cost of crime for technical violations.

In order to calculate the benefits for a reduction in recidivism for new crime, we multiplied the distribution of the types of crimes committed in Illinois by the social and/or fiscal costs of those types of crime. We then multiplied this number by the number of parolees committing new crimes (6,975) to get the total cost of new crime committed by parolees. Drug charges (30 percent) made up the highest number of crimes and armed violence/disorderly conduct (0.2 percent) made up the lowest number of crimes (IDOC Annual Report FY2013). In addition to fiscal costs, there are large and significant social benefits also associated with reductions in recidivism. These consist of avoided pain and suffering, crime career costs (offenders working instead of committing crimes), avoided medical costs, and better quality of life and reduced fear among victims. The McCollister research provided estimates of costs for several crimes, which provided an opportunity to calculate social benefits, using the method described above. Any crimes noted in the McCollister et al. study included social and fiscal costs, while crimes that are not mentioned only used fiscal costs.

Finally, we added the total technical violation costs and new crime costs together. Our simulations suggest a reduction in recidivism between 1.5 and 2.9 percent. In order to estimate the benefits of reduced crime, we multiplied the total cost of crime by estimates in recidivism reduction.
Appendix K: Cost-Benefit Analysis In-Depth

The following four tables demonstrate the calculated benefits of 25 percent to 100 percent perfect matching of the 29.8 percent of parolees receiving intensive supervision over five years. These tables demonstrate the effects of varying the fidelity to and validity of the SPIn and CaseWorks tools. For example, Table 5 reflects the 29.8 percent receiving intensive supervision, 75 percent is targeted to the highest risk offenders as assessed by the SPIn tool and 25 percent applied randomly to the rest of the population.

Table 4: Benefits (29.8%), 100% perfectly matched (in dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>13,359,653</td>
<td>13,359,653</td>
<td>13,359,653</td>
<td>13,359,653</td>
<td>13,359,653</td>
</tr>
<tr>
<td>Phase-In Percentage</td>
<td>0.667</td>
<td>0.833</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Benefits Yearly Estimate</td>
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<td>73,010,709</td>
<td>73,010,709</td>
<td>73,010,709</td>
<td>73,010,709</td>
</tr>
<tr>
<td>Phased In Benefits</td>
<td>48,698,143</td>
<td>60,817,920</td>
<td>73,010,709</td>
<td>73,010,709</td>
<td>73,010,709</td>
</tr>
<tr>
<td>Total</td>
<td>35,338,490</td>
<td>47,458,267</td>
<td>59,651,058</td>
<td>59,651,056</td>
<td>59,651,056</td>
</tr>
<tr>
<td>Discounting</td>
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<td>1.050</td>
<td>1.1025</td>
<td>1.157625</td>
<td>1.21550625</td>
</tr>
<tr>
<td>Discounted Total</td>
<td>35,338,490</td>
<td>45,198,350</td>
<td>54,105,266</td>
<td>51,528,825</td>
<td>49,075,071</td>
</tr>
<tr>
<td>Grand Total</td>
<td>35,338,490</td>
<td>45,198,350</td>
<td>54,105,266</td>
<td>51,528,825</td>
<td>49,075,071</td>
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<tr>
<td>Grand Total</td>
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</table>

Table 5: Benefits (29.8%), 75% perfectly matched, 25% random (in dollars)

<table>
<thead>
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<th>3</th>
<th>4</th>
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<td>13,359,653</td>
<td>13,359,653</td>
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</tr>
<tr>
<td>Phase-In Percentage</td>
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<td>0.833</td>
<td>1.000</td>
<td>1.000</td>
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<tr>
<td>Benefits Yearly Estimate</td>
<td>63,759,352</td>
<td>63,759,352</td>
<td>63,759,352</td>
<td>63,759,352</td>
<td>63,759,352</td>
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<tr>
<td>Phased In Benefits</td>
<td>42,527,488</td>
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<td>63,759,352</td>
<td>63,759,352</td>
<td>63,759,352</td>
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<tr>
<td>Total</td>
<td>29,167,835</td>
<td>39,751,887</td>
<td>50,399,699</td>
<td>50,399,699</td>
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<td>1.1025</td>
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<td>1.21550625</td>
</tr>
<tr>
<td>Discounted Total</td>
<td>29,167,835</td>
<td>37,858,940</td>
<td>45,714,013</td>
<td>43,537,155</td>
<td>41,463,957</td>
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<tr>
<td>Grand Total</td>
<td>29,167,835</td>
<td>37,858,940</td>
<td>45,714,013</td>
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</table>
Table 6: Benefits (29.8%), 50% perfectly matched, 50% random (in dollars)

<table>
<thead>
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<th>Year</th>
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<th>3</th>
<th>4</th>
<th>5</th>
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<td>Benefits Yearly Estimate</td>
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<td>52,507,701</td>
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<tr>
<td>Phased In Benefits</td>
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<td>52,507,701</td>
<td>52,507,701</td>
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<td>Total</td>
<td>21,662,984</td>
<td>30,379,262</td>
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<td>39,148,049</td>
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<td>1.1025</td>
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<tr>
<td>Discounted Total</td>
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<td>28,932,631</td>
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<td>152,128,802</td>
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Table 7: Benefits (29.8%), 25% perfectly matched, 75% random (in dollars)

<table>
<thead>
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<th>Year</th>
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<th>3</th>
<th>4</th>
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<td>Phase-In Percentage</td>
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<td>1.157625</td>
<td>1.21550625</td>
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<td></td>
<td>95,365,836</td>
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</table>
Appendix L: Sensitivity Analysis

The results include benefits from avoided murder which includes the value of the person’s life that was murdered. Avoiding one murder results in $9.5 million social benefits and $400,000 in fiscal benefits (McCollister, French, and Fang, 2010). Therefore, we conducted a sensitivity analysis to see how much the benefits would be affected if the recidivism rate for murder was not affected by the risk assessment tool. If we completely remove any change in the murder rate and redistribute the reduction originally assumed to accrue to murder to other crimes, the net benefits are reduced to -$30.3 million.

Table 8: Exclusion of Murders (in dollars)

<table>
<thead>
<tr>
<th>Year</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<td>13,359,653</td>
<td>13,359,653</td>
</tr>
<tr>
<td>Phase-In Percentage</td>
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<td>0.833</td>
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<td>1</td>
</tr>
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<td>Benefits Yearly Estimate</td>
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<td>7,500,303</td>
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<td>7,500,303</td>
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<tr>
<td>Phased In Benefits</td>
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<td>7,500,303</td>
<td>7,500,303</td>
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<td>Total</td>
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<td>-5,859,350</td>
<td>-5,859,350</td>
<td>-5,859,350</td>
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<td>1.1025</td>
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<td>1.21550625</td>
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</tbody>
</table>

However, we have no reason to believe that the risk assessment tool will have no effect on the recidivism rate for murder. To estimate an approximate break-even point with only a minimal effect on the recidivism rate for murder, the benefits of avoided homicide would only have to bridge the difference between costs and the estimated yearly benefits in Table 8. The difference equals $5.9 million per year. McCollister and colleagues (2010) estimate that the average total cost of a homicide is $9.5 million. Thus, the risk assessment tool would have to reduce homicide recidivism crimes by an average of slightly more than three homicides over five years to reach the break-even point.
Table 9 reflects a sensitivity analysis of both the fidelity and validity of the SPIn tool. We conduct this analysis because the tool may not predict risk of recidivism with full accuracy and if workers are not fully committed to the tool, then there may not be 100 percent accuracy. Therefore, Table 9 varies the amount of perfectly targeted matching from 25 percent to 100 percent of the 29.8 percent receiving intensive supervision.

### Table 9: Benefits from Reduced Recidivism

<table>
<thead>
<tr>
<th>Model</th>
<th>Estimated Percent Reduction in Recidivism</th>
<th>Benefits from Reduced Recidivism per year (in millions of dollars)</th>
<th>Total Net Benefits of Reduced Recidivism in five years (in millions of dollars)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits (29.8%) 100% perfectly matched</td>
<td></td>
<td>2.92</td>
<td>73.01</td>
</tr>
<tr>
<td>Benefits (29.8%) 75% perfectly matched, 25% random</td>
<td></td>
<td>2.55</td>
<td>63.76</td>
</tr>
<tr>
<td>Benefits (29.8%) 50% perfectly matched, 50% random</td>
<td></td>
<td>2.10</td>
<td>52.51</td>
</tr>
<tr>
<td>Benefits (29.8%) 25% perfectly matched, 75% random</td>
<td></td>
<td>1.54</td>
<td>38.51</td>
</tr>
</tbody>
</table>

¹Benefits discounted
References


Illinois Comptroller. Contracts. Retrieved from: https://www.wh1.ioc.state.il.us/?LinkServID=3AB57868-E0C7-3CE9-0CCF7CAB89F2BC7F


f


**Stata Coding**

set more off
capture log close
clear

*VA & SF, 12-17-14, IL Risk Assessment at Probation CBA

*log using "U:\CBA\CBA.log", replace

*set random observations to 1000
set obs 1000

*generate ID number
gen ID=_n

*generate variables to hold means from the Monte Carlo simulation
gen underlyingrisk=.

gen mean_treatNoRA=.
gen mean_treatRA_1=.
gen m87_treatRA_1=.
gen m75_treatRA_1=.
gen m62_treatRA_1=.
gen m50_treatRA_1=.
gen m37_treatRA_1=.
gen m25_treatRA_1=.
gen m12_treatRA_1=.
gen mean_treatRA_2=.

*Monte Carlo, 1000 draws
forval i=1/1000 {
    keep mean_treatNoRA mean_treatRA_1 m87_treatRA_1 m75_treatRA_1 m62_treatRA_1 m50_treatRA_1 m37_treatRA_1 m25_treatRA_1 m12_treatRA_1 mean_treatRA_2 underlyingrisk ID
    *generate 1000 random variables between 0 and 1
gen random = rnormal(.55,.2)
replace random=runiform() if random>1
replace random=runiform() if random<0
*move mean of random variable into underlying risk
egen underlyingrisk2=mean(random)
replace underlyingrisk= underlyingrisk2 if ID==`i'

***Treatment No RA

*generate variable where treatment but NO RA
gen treatNoRA=random if ID>298

*take first 298 of these #s and reduce risk by effect of IPS
*29.8% of parolees' committing offense class is murder, class x, and class 1
*we are assuming they currently receive intensive parole supervision
*WSIPP effect size of intensive supervision on crime: -.205
*SE=.071

*generating OR to determine effect size of intensive supervision
gen effectsize=exp(1.65*rnormal(-.205,.071))
replace treatNoRA=random*effectsize if ID<=298

*Means of treatment with no RA
egen meanTreatNoRA = mean(treatNoRA)
*Move means into rows for monte carlo
replace mean_treatNoRA=meanTreatNoRA if ID==`i'

***Treatment with RA, 29.8% & higher effect size (-.242)

*WSIPP effect size of RNA on crime: -.242
*SE=.044
*convert effect size to odds ratio
*OR = e^(1.65*ES)

*generating OR to determine effect size of RA
gen effectsize_ra1=exp(1.65*rnormal(-.242,.044))

*create variables to sort on for 75,50,25
  gen random87 = random
gen random75 = random
gen random62 = random
gen random50 = random
gen random37 = random
gen random25 = random
gen random12 = random
*create variable first with random
*then replace with random treatment to remaining percent
*drop treated numbers from variable to sort on


gen treat87RA_1 = random
replace treat87RA_1=random*effectsize_ra1 if ID<=37
replace random87=0 if ID<=37

gen treat75RA_1 = random
replace treat75RA_1=random*effectsize_ra1 if ID<=74
replace random75=0 if ID<=74

gen treat62RA_1 = random
replace treat62RA_1=random*effectsize_ra1 if ID<=112
replace random62=0 if ID<=112

gen treat50RA_1 = random
replace treat50RA_1=random*effectsize_ra1 if ID<=149
replace random50=0 if ID<=149

gen treat37RA_1 = random
replace treat37RA_1=random*effectsize_ra1 if ID<=186
replace random37=0 if ID<=186

gen treat25RA_1 = random
replace treat25RA_1=random*effectsize_ra1 if ID<=223
replace random25=0 if ID<=223

gen treat12RA_1 = random
replace treat12RA_1=random*effectsize_ra1 if ID<=261
replace random12=0 if ID<=261

*sort random highest to lowest risk
gsort -random

*create sort order
gen obs_1=_n

*generate variable where treatment with RA (targeted)
gen treatRA_1 =random if obs_1>298
    replace treatRA_1=random*effectsize_ra1 if obs_1<=298

    *repeat for top 87.5%
gsort -random87
gen obs87=_n
replace treat87RA_1 =random*effectsize_ra1 if obs87<=261
*repeat for top 75%
gsort -random75
gen obs75=_n
replace treat75RA_1 =random*effectsize_ra1 if obs75<=224
*repeat for top 62.5%
gsort -random62
gen obs62=_n
replace treat62RA_1 =random*effectsize_ra1 if obs62<=186
*repeat for top 50%
gsort -random50
gen obs50=_n
replace treat50RA_1 =random*effectsize_ra1 if obs50<=149
*repeat for top 37.5%
gsort -random37
gen obs37=_n
replace treat37RA_1 =random*effectsize_ra1 if obs37<=112
*repeat for top 25%
gsort -random25
gen obs25=_n
replace treat25RA_1 =random*effectsize_ra1 if obs25<=75
*repeat for top 12.5%
gsort -random12
gen obs12=_n
replace treat12RA_1 =random*effectsize_ra1 if obs12<=37
*take first 298, those w/ highest risk, and reduce by .242
*reduce application to highest to 75%, 50%, and 25%
*remaining treatment spots applied to random individuals
*of 298, 75%=224, 50%=149, 25%=75

sort ID

*Get means of treatment with RA
egen meanTreatRA_1 = mean(treatRA_1)
egen mean87TreatRA_1 = mean(treat87RA_1)
egen mean75TreatRA_1 = mean(treat75RA_1)
egen mean62TreatRA_1 = mean(treat62RA_1)
egen mean50TreatRA_1 = mean(treat50RA_1)
egen mean37TreatRA_1 = mean(treat37RA_1)
egen mean25TreatRA_1 = mean(treat25RA_1)
egen mean12TreatRA_1 = mean(treat12RA_1)

*Move means into rows for Monte Carlo
replace mean_treatRA_1= meanTreatRA_1 if ID==`i'
replace m87_treatRA_1= mean87TreatRA_1 if ID==`i'
replace m75_treatRA_1= mean75TreatRA_1 if ID==`i'
replace m62_treatRA_1= mean62TreatRA_1 if ID==`i'
replace m50_treatRA_1= mean50TreatRA_1 if ID==`i'
replace m37_treatRA_1= mean37TreatRA_1 if ID==`i'
replace m25_treatRA_1= mean25TreatRA_1 if ID==`i'
replace m12_treatRA_1= mean12TreatRA_1 if ID==`i'

*  
***Treatment with RA, 59.6% & higher effect size (-.242)  

*sort random highest to lowest risk
gsort -random

*create sort order
gen obs_2=_n

*generate variable where treatment with RA (targeted)
gen treatRA_2 =random if obs_2>596

*take first 596, those w/ highest risk, and reduce by -.242  
*WSIPP effect size of RNA on crime: -.242
*SE=.044
*generating OR to determine effect size of RA  
gen effectsize_ra2=exp(1.65*rnormal(-.242,.044))
replace treatRA_2=random*effectsizera2 if obs_2<=596

sort ID

*Get means of treatment with RA
gen meanTreatRA_2 = mean(treatRA_2)

*Move means into rows for monte carlo
replace mean_treatRA_2= meanTreatRA_2 if ID==`i'  
*  
}
*Create variables for the difference between the status quo and RA
gen diff100 =mean_treatNoRA-mean_treatRA_1
*hist diff100
gen diff87 = mean_treatNoRA - m87_treatRA_1
gen diff75 = mean_treatNoRA - m75_treatRA_1
gen diff62 = mean_treatNoRA - m62_treatRA_1
gen diff50 = mean_treatNoRA - m50_treatRA_1
gen diff37 = mean_treatNoRA - m37_treatRA_1
gen diff25 = mean_treatNoRA - m25_treatRA_1
gen diff12 = mean_treatNoRA - m12_treatRA_1

*Create summary tables of results
summ mean_treatNoRA mean_treatRA_1 m87_treatRA_1 m75_treatRA_1 m62_treatRA_1
m50_treatRA_1 m37_treatRA_1 m25_treatRA_1 m12_treatRA_1 mean_treatRA_2
underlyingrisk

sum diff100 diff87 diff75 diff62 diff50 diff37 diff25 diff12

*Break-even reduction of recidivism:
  *0.53% for IL parolee committing crimes - total benefits
  *7.23% for IL parolee committing crimes - fiscal benefits