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La Follette School of Public Affairs

at the University of Wisconsin-Madison

Working Paper Series

La Follette School Working Paper No. 2015-003

<http://www.lafollette.wisc.edu/publications/workingpapers>

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

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March 2015



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Public Affairs 881: Cost Benefit Analysis
Fall 2014



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March 2015

Prepared for:
Illinois Sentencing Policy Advisory Council

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Acknowledgments

We would like to extend our sincere gratitude to Nate Inglis Steinfeld, Research Director for the Illinois Sentencing Policy Advisory Council 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 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, who taught the fall 2014 Cost-Benefit Analysis course at the La Follette School of Public Affairs, led and guided our group throughout the project and provided ideas and support over the semester.

Executive Summary

We present a cost-benefit analysis of the Illinois Department of Corrections (IDOC) implementing a risk assessment system for offenders who are leaving prison and being put on Mandatory Supervised Release 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 residents of Illinois. Overall, we found that the implementation of risk assessment resulted in net benefits for the IDOC and residents of Illinois.

We considered several categories of monetized and non-monetized costs and benefits. 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 sunk costs. 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 those services, better in-prison programming, and a better allocation of funds to address needs of the prison population.

To analyze the costs and benefits of implementing the risk assessment system for MSR, our group created several models. One of our models simulates the status quo in Illinois, which involves the Prisoner Review Board 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 would 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. The last limitation is that our benefits include benefits from avoided murder, which could be biasing benefits upward.

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 as more information becomes available, which would allow for a more complete analysis.

Problem Statement

The Illinois Crime Reduction Act of 2009 mandated the acquisition and use of a risk assessment tool to evaluate all state prisoners. The Illinois Sentencing Policy Advisory Council (SPAC) commissioned this analysis of the costs and benefits of utilizing a risk assessment tool. This project is intended to inform decisions about the tool. Through the implementation of a risk assessment and caseworks tool, the Illinois Department of Corrections (IDOC) intends to identify the risk of recidivism and other needs of prisoners to better allocate limited resources more efficiently and ultimately reduce recidivism. We focus on the benefits of implementing the tool at Mandatory Supervised Release (MSR); however, the tool will also be used at other stages of incarceration. 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.

Background

The Crime Reduction Act mandated the use of a risk assessment in Illinois state prisons. The IDOC purchased the Service Planning Instrument (SPI) to assess risk.

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 2009). The act was motivated by the understanding that the policy status quo of Illinois corrections—with its large prison population and high recidivism rates, at increasing expense to state taxpayers—was 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 ballooning prison costs 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 Illinois 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 (Adult

Redeploy Illinois Oversight Board 2014, p.2). Bipartisan support for prison reform has propelled Illinois's initiative.

A major part of the 2009 Crime Reduction Act was mandating the adoption, validation, and utilization of a standardized statewide risks and needs assessment tool. To do so, the law created the Illinois Risk Assets Needs Assessment (RANA) task force 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). Evaluating offender risk at various stages in the criminal justice system, including pretrial probation, prison, and MSR, supports corrections staff in determining the needs and strengths of each 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. IDOC purchased the Service Planning Instrument (SPIn) assessment instrument and case management tool 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), which considers factors that include age, gender, criminal record, history of drug use, employment status, family situation, and attitudes toward criminal behavior. These risk factors can 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 an individual 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 et al. 2011).

In 2015, IDOC bases decisions about MSR, community placement, treatment services, and institutional placement on the crime that the offender committed, criminal history, response to supervision, aggression level, and age for institutional determinations, according to IDOC presentation slides about SPIn Implementation.

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 et al. (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, 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 (National Conference of State Legislatures 2012). 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 other states, see Appendix B).

SPIn

To implement the Crime Reduction Act, the IDOC selected SPIn, a fourth generation risk assessment tool. SPIn 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 static and dynamic factors (Orbis Partners 2014). The responses for the 90 items are entered into a web-based platform, CaseWorks. The goal 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 re-entry 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 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, with mixed results. One study found poor predictive validity, while the other concluded the tool has excellent predictive validity (Meaden 2012; Desmarais and Singh 2013). No studies have evaluated the validity and reliability of the SPIn tool, but Orbis Partners plans to evaluate it, according to IDOC representatives.

Implementation of SPIn

According to IDOC representatives, six corrections facilities and adult transition centers will implement the tool initially. The second implementation phase will include institutional assessments at all facilities, and the third phase will add reception and classification. Within two years, 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 was delayed (Troyer 2014). According to a 2014 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 and according to agency representatives, the IDOC plans to hire new staff to take on the role of administering the risk assessment.

Cost-Benefit Analysis

A cost-benefit analysis can assist policymakers in evaluating policies and programs in terms of their social benefits and costs by calculating 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 this

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. We considered several possible additional benefits for inclusion in a future analysis post-implementation. We also looked at a Washington State Institute for Public Policy cost-benefit analysis for a reduction in recidivism that found positive net benefits (see Appendix C for more on this and other cost-benefit analyses on risk assessments).

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 example, increased community quality due to lower crime rates and potential increased job prospects for formerly incarcerated individuals are excluded. However, we included expenditures to operate the tool and costs to house an individual in prison. 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 State of Illinois has a vested interest in avoiding these costs and increasing the safety its citizens; 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 a return to prison for technical violations of MSR or for new offenses. The most recent data on recidivism in Illinois come from the 2011 Pew Center on the States study "State Recidivism: The Revolving Door of America's Prisons," which notes the United States had an average overall recidivism rate of 43.3 percent and Illinois had a recidivism rate of 51.7 percent in 2004-2007 (Pew Center on the States 2011, pp. 10-11).

Benefits

Benefits can be analyzed by monetizing reduced recidivism, system and victim costs, plus savings due to programs being better targeted.

Reduced 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 Prisoner Review Board to assign more appropriate 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 Prisoner Review Board 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 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 the system does not incur 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. The Illinois Sentencing Policy Advisory Council utilizes estimates from Washington State Institute for Public Policy, 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. We calculated average prison stay using Illinois Sentencing Policy Advisory Council reports. The council also estimated administrative costs of \$1,238 for felony property and drug crimes. We added this number to estimated prison costs to estimate crime costs that were not included in the McCollister, French, and Fang study.

We used the McCollister et al. (2010) study on the cost of crime to society 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 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 tangible and intangible costs to the victim of the crime. Tangible costs are those losses to the victim that are easily monetized, such as medical costs, lost income, and lost property. The intangible costs of crime refer to pain, 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 tangible and intangible victim costs, crime career costs contribute to economic cost of a crime. Crime career costs are opportunity costs associated with a criminal's choice to engage in illegal rather than legal and productive activities (McCollister et al., 2010).

Programming Better Targeted

“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

The costs of implementation include the costs of the tool, new staff, and training.

Tool Acquisition

The IDOC incurred upfront and ongoing costs with the acquisition of the SPIn risk assessment tool. 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) n.d.).

The IDOC obtained the SPIn risk assessment tool 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 (Illinois Comptroller, Contracts). To estimate future costs of SPIn per year, we average the yearly costs for 2014 and 2015, yielding 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 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 master 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 n.d). 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 U.S. Bureau of Labor Statistics. In 2014, the Bureau of Labor Statistics estimates that benefits make up 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 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 the assessment's 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 Prisoner Review Board will 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 more than 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 2013) and about \$103,000 per year with benefits (Bureau of Labor Statistics 2014). Thus, the average marginal cost of one hour of an IDOC employee \$49.60. We estimate that more than 3,600 hours of training at a cost of \$49.60 per hour equates to training costs of \$178,560 per year.

Estimated Total Yearly Cost

Combining the costs of SPIn, staffing, and training, we estimate the total cost per year to be almost \$13.4 million.

**Table 1:
Summary of Year Implementation Costs**

Tool Acquisition Costs	
Average Yearly Cost of SPIn	\$347,395
Total Tool Acquisition Costs	\$347,295
Staff Salaries and Benefits Costs	
New Hire Individual Salary	\$65,830
New Hire Individual Benefits	\$36,829
New Hire Individual Total Salary and Benefits	\$102,659
Total Salaries and Benefits Costs (for 125 Hires)	\$12,832,423
Training Costs	
Average Marginal Hourly Wage for Other IDOC Staff	\$49.60
Total Training Costs (for 900 Staff for Four Hours per Year)	\$179,935
Total Annual Cost	\$13,359,653

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 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 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 exacerbate racial disparities in the criminal justice system. Risk assessments have the ability to analyze individuals based on dynamic factors and static factors. This ability 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 racial fairness will increase or decrease. (Appendix H provides further discussion of this debate.)

Fourth, in 2013, Illinois invested in a new computer records 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 percentage 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. 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, No date. e-Training).

Finally, ongoing costs will 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 fiscal year 2013, the IDOC received \$100,000 to create its Recidivism Reduction Strategic Plan, and in fiscal year 2014, the IDOC received \$1 million 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 2014 grant is its inclusion of several targets of reducing recidivism: "[T]his 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" (Second Chance Act 2013).

Assumptions

Our analysis rests on a number of important assumptions that if varied would alter our results. First, we assume that current supervision levels are randomly assigned. This assumption is questionable because decisions are based on assessments made by Prisoner Review Board members who develop expertise in making supervision determinations, which reduces the randomization of assignment. However, decisions by each member include subjective aspects. 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 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 an 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 no mandate to follow the results, we assume that supervision level decisions made faithfully to what the tool suggests 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 Prisoner Review Board assigns individuals to supervision level and programming. Working with the assumption that the tool will inform supervision levels, we 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 percentage of prisoners receiving the highest supervision level. The Prison Review Board does not have a breakdown for how supervision levels are distributed. As a result, we utilized 29.8 percent because this figure 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 information becomes available.

Sixth, we assigned a slightly skewed normal distribution for the percentage likelihood that an offender on MSR will recidivate. To model the influence of intensive supervision at MSR, the normal distribution is slightly skewed right. The influence of prison on post-release 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 and Galgano 2013). For this analysis, however, we utilize average costs because the theory upon which avoided benefits are calculated uses average costs. McCollister et al. (2010) incorporated criminal justice system costs as a whole but without further information, we could not parse the specific prison costs. In addition, the cost estimates available to us at the time of the writing of this report (fall 2014) were average costs or short-term marginal costs. We were unable 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 et al. (2010) 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.

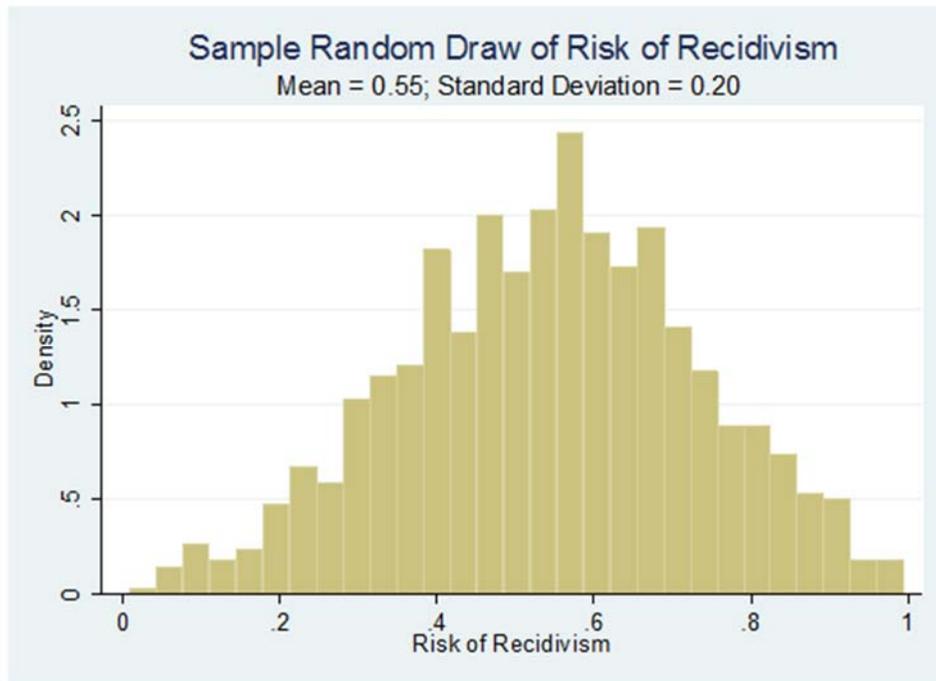
Demonstration Specification

The demonstration simulates a reduction in recidivism rates resulting from more targeted programming at MSR 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, reflects current intensive supervision assignment, which is primarily determined by crime committed. Therefore, intensive supervision at MSR is not based solely on risk level and can be assumed to be random in relation to risk of recidivism. The

second model, implementing SPIn, demonstrates the impact of targeting resources at individuals the SPIn tool identifies as with the highest risk levels.

First, we draw a random sample of 1,000 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.

Figure 1: Sample Random Draw of Risk of Recidivism



Source: Authors' calculations.

We then assign programming to slightly less than 30 percent of this population, which is the share of people on MSR committing offenses in classes murder, class X, and class 1 (Illinois Department of Corrections Annual Report 2013) as of October 2014. We took a random selection of 298 of the 1,000 people on MSR in our model and reduced their recidivism rates by the effect size of intensive supervision and programming, as found by the Washington State Institute for Public Policy (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 IDOC utilizes the risk assessment and case management tool to better target intensive supervision to the highest risk offenders. 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 1,000 parolees' risk levels from highest to lowest. We use the same percentage, 29.8 percent, of individuals on MSR whom we assume are receiving services, meaning

this model shows the change in recidivism from better targeting *existing* resources. However, instead of randomly applying reductions in recidivism rates, we target the people on MSR with the highest risk of recidivism. We use the effect size of utilizing a risk and needs assessment as found by the Washington State Institute for Public Policy to apply a reduction in recidivism risk to the 298 people on MSR with the highest risk of recidivism. We then do a Monte Carlo simulation to address uncertainty and increase robustness of our model. We repeat this simulation 1,000 times for each model and average the mean recidivism rates for each model.

In addition to these models, we conduct a 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 demonstrates 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.

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. Table 2 summarizes these results.

Table 2: Results of Demonstration for Recidivism Rates

Model	Mean Recidivism Rate	Standard Deviation
No risk assessment or intensive parole	54.5 percent	0.006
Random intensive parole (29.8 percent)	49.9 percent	0.006
Targeted intensive parole with risk assessment (29.8 percent)	47.0 percent	0.006
Increased targeted intensive parole with risk assessment (59.6 percent)	41.4 percent	0.005

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. We additionally monetized 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.).

Recidivism includes technical violations, which are violations of MSR terms, and new offenses, which are convictions after release. Twenty-five percent of offenders exiting prison violate their terms of probation, while another 25 percent are convicted of a new crime (Pew Center on the States 2011). When monetizing the reduction in recidivism, we assumed a proportionate decrease in prison violations and new crimes relative to the 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 violations, so we estimated the cost of one-fourth of a year of prison for this population (Illinois Sentencing Policy Advisory Council 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 K.

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 do so 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 83.4 percent, and Year Three sees the full benefit (66.7 percent plus 16.7 percent plus 16.7 percent¹).

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. We model the analysis 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 the Illinois Sentencing Policy Advisory Council uses 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, we encountered a number of limitations. First, due to the

¹ Calculations may not sum to 100 percent due to rounding.

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 and need 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 re-entering 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 validate 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 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 newly elected officials would maintain support for the project. If IDOC's budget is cut in any substantial way, the department will need to shift funds from extraneous programs like 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, which 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 during the five-year period (see Appendix J for more information).

Results

Our demonstration indicates that if IDOC utilizes the risk assessment and case management tools with the MSR population, the effects of more targeted programming on high-risk offenders would reduce recidivism rates (for more detail of this analysis and tabulation of costs and benefits, see Appendix J and Appendix L, respectively). 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 J for more information).

Fiscal Analysis Results

Our client was mainly interested in the costs and benefits accruing 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, the net fiscal cost ranged from -\$38.9 million to -\$49.2 million over five years.

Social Analysis Results

We also assumed that the State of Illinois has a vested interest in protecting its citizens. Therefore, in addition to the fiscal benefits, reduced crime has social benefits that accrue, such as opportunity cost for the offender and avoided victim costs. We do not include any 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 SPI 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

SPIIn and CaseWorks tools for the entire prison and MSR population in Illinois and estimated the benefits of reduced recidivism for use of the tools for just the Illinois MSR population. Therefore, our analysis could severely underestimate the benefits of the risk assessment and case management tools because their use with 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 SPIIn tool and CaseWorks software only at MSR reduces recidivism by a large enough amount to outweigh the cost of implementation for the entire population.

Appendix A: State of Corrections

According to IDOC (No date), the IDOC administers state prisons, boot camps, work camps, and adult transition centers. IDOC was established in 1970. In 2006, juvenile corrections moved from the IDOC to the new Illinois Department of Juvenile Justice. The IDOC employs approximately 10,800 employees.

As of the end of May 2014, IDOC held 48,851 inmates in 25 correctional centers and four adult transition centers and supervises approximately 29,000 parolees (IDOC 2014a). At this population level, the system is 97 percent at operational (bed space) capacity and 152 percent of designed (rated) capacity with eight facilities at more than 200 percent of designed capacity. The IDOC projected that the population will increase to more than 50,000 inmates by March 2015. In July 2013-May 2014, the IDOC system had around 28,000 intakes and exits (IDOC 2014a). In addition, for July 2011-June 2012, Illinois' recidivism rate was 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 comprised 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 (IDOC 2014a). In 2012, the U.S. Census reported 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 more than \$1.7 billion in fiscal year 2010, which includes prison-related costs not included in the IDOC budget (which was \$1.2 billion for fiscal year 2010). The average annual cost per inmate is \$38,268. (According to the latest fiscal year 2014 financial impact statement, the IDOC gives the annual cost of incarcerating an individual in Illinois as \$22,665.) Because of limitations in prison capacity and severe budget constraints, Illinois and other 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 to help offenders adjust to society, including education programs, substance abuse programs, life skills programs, and other programs designed to help the offender be successful outside of prison. Governor Quinn's fiscal year 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 (State Journal Register 2012).

Illinois prisons have struggle with overcrowding, which can lead to dangerous conditions within state prisons. Research shows 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 uses assessment to place offenders in treatment and programming that addresses an individual's criminal risk factors.

Kentucky requires the use of risk and needs assessment at nearly every stage of the criminal justice system. Assessment results in presentence investigation reports must help determine an offender's eligibility for alternatives to incarceration. In addition, courts may use assessments 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 require assessments 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 offenders in community alternatives to prison. On the other end of the spectrum, Louisiana and New York, require risk and needs assessments for parole.

Examples of Successes

Several states have implemented risk assessments. 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. Further, 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 Center study includes 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 leading to less recidivism. 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.” From 2004 to 2009, the state’s prison population dropped 6.2 percent. The recidivism rates in Kansas have remained stable, but later legislation 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, while the analysis in this report calculates potential benefits from using a risk assessment tool to guide release.

Washington State Institute for Public Policy (2009) 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 per offender. 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 per offender. 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.

Appendix D: Cost of Crime to Society

Table D1 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” (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 Consumer Price Index calculated by the U.S. Bureau of Labor Statistics, we updated the figures from McCollister et al. to 2014 dollars.

Table D1: Fiscal and Total Costs by Type of Crime

The figures in the table based on the figures from McCollister et al. (2010), updated to 2014 dollars using the U.S. Consumer Price Index.

Type of Crime	Frequency (Percent)	Fiscal Costs for Parole Population (in Dollars)	Total Social and Fiscal Costs for Parole Population (in Dollars)
New Crimes			
Crimes Against Persons			
Criminal Homicide	3.4	98,256,937	2,249,592,993
Forcible Rape	3.2	6,241,118	56,750,698
Aggravated Battery/Assault	7.4	4,709,869	58,331,722
(Kidnapping)	0.4	1,007,935	1,007,935
(Armed Violence)	0.2	1,730,192	1,730,192
Crimes Against Property			
(Home Invasion)	0.9	7,785,864	7,785,864
Robbery	7.7	7,841,832	23,996,167
Theft	8.9	1,887,156	2,315,360
Fraud	1.7	547,461	630,083
Burglary/Residential Burglary	13.8	4,194,793	6,568,316
Arson	0.4	129,400	621,745
Motor Vehicle Theft	2.1	598,204	1,666,187
(Damage to Property)	0.7	1,763,886	1,763,886
Other			
(Escape)	1.1	2,771,821	2,771,821
(Driving Under the Influence)	5.3	13,355,138	13,355,138
(Drug)	30.0	2,590,515	2,590,515
(Weapons)	9.1	22,930,520	22,930,520
Disorderly Conduct	0.2	339,628	339,628
Vehicle Code Violation	3.6	6,113,306	6,113,306
Technical Violations	25	39,504,656	39,504,656
Total (Technical and New Offenses)			2,500,366,732

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 K for more information).

Appendix E: Better Targeted Programming

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 succeeded in Colorado.

By participating in incentive programs such as educational classes or vocational training, offenders have the chance to reduce their sentences. In addition, this participation gives offenders necessary tools to reenter society. No one program works perfectly for every offender who is reentering society, but examples of potential programming include electronic monitoring, drug treatment programs, vocational programs, and cognitive behavioral programs. Despite various factors contributing to the incidence of recidivism, offenders face many common challenges when reentering society that can be addressed through programming. Vocational programs and educational programs can reduce the risk of recidivism.

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 (1989, p. 1), recidivism rates are higher for offenders within the first year after being released from prison, which 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.), which is part of what the new risk assessment in Illinois would do.

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 who would benefit from that program being placed at that prison. Illinois' SPIn tool should help raise awareness for re-entry and programming for offenders.

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 at nine prisons as part of a federal pilot program that assesses the strengths and needs of offenders who served in the military within 18 months of release. 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 at two or three prisons rather than nine prisons.

Illinois' Sheridan Correctional Center illustrates avoided costs. In 2003, the center was re-designed as a substance abuse treatment facility to house 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 in the rest of the state. Officials reported \$2.1 million in savings from reductions in recidivism at the Sheridan facility (Jaeger 2009).

Appendix G: Future Benefit of Decreased Recidivism Stemming from Appropriate In-Prison Programming

Similar to the manner in which Illinois will utilize the risk assessment tool to concentrate prisoners with shared programming needs, Illinois will be able to more efficiently allocate prisoners to the programming they need to receive while in prison to ensure an easier re-entry into society. 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 (IDOC 2013). The risk assessment tool will allow for better case planning, including security placement. Inmates will be assessed on their 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. 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 why they ended up in prison. By receiving treatment and programming to mitigate these problems, the prisoner will 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.

Illinois may be able to realize further benefits from utilizing this tool if the appropriate programming results in more sentence credits authorized. Illinois awards sentence credits for "the successful completion of programming ... compliance with rules and regulations ... [and] service to the institution, community, or State" (Afeef, Bostwick, Kim, and Reichert 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, there is no evidence base that the tool will accrue these benefits; therefore, it cannot be added to the model at this time.

We cannot monetize this theoretical benefit due to the lack of information on how the tool will work once fully implemented. The above potential benefits represent the hopes behind implementation. The IDOC hopes to target programming to address prisoner needs based on risk levels; however, the infrastructure to do this is not set up. 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 longer periods of treatment will see the effects delayed until those entering at the time of full implementation are released. However, those prisoners 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 about their success. This will likely form a theoretical basis for long-term sentences estimates.

The Washington State Institute for Public Policy presents estimates for various types of in-prison programming that can be used once the identity and needs of the Illinois prison population are better identified. These estimates generally show a positive return. This benefit could be monetized by utilizing the estimates from Washington State Institute for Public Policy along with the realized percentages of the population that needs each program to predict decreased recidivism.

Appendix H: Racial Disparity Concerns

Although advocates of risk assessment have said that risk assessment tools are color-blind, there are some concerns within the justice system that risk assessment could cause greater racial disparity in corrections outcomes. For example, U.S. Attorney General Eric Holder opposed 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 stated that bills moving through Congress 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, because these static factors disproportionately affect poor and minority offenders. Instead, factors that can change should be used as the main factors in evaluating offenders.

Tools can also be validated and crafted to ensure equity. More importantly, tools provide an objective and written basis for decisions. Under the current system in Illinois, decisions are subjectively made without any explicit objective basis. Despite aspirations to be objective and racially blind, individual biases toward what may contribute to reoffending enters the equation. Professor Christopher Slobogin, of Vanderbilt University Law School, 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 Washington State Institute for Public Policy 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 = $e^{1.65 * \text{Effect Size}}$.

The institute 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). Our Stata code reflects these calculations.

Appendix J: Sensitivity Analysis

The results include benefits from avoided murder. These benefits include the value of the victim's life. Avoiding one murder results in \$9.5 million social benefits and \$400,000 in fiscal benefits (McCollister et al. 2010). Therefore, we conducted a sensitivity analysis to see how much the benefits would be affected if the recidivism rate for murder was unchanged by the use of 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.

However, we have no reason to believe that use of 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 J1. The difference equals \$5.9 million per year. McCollister et al. (2010) estimate that the average total cost of a homicide is \$9.5 million. Thus, use of 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 J1: Exclusion of Murders (in Dollars)

	Year 1	Year 2	Year 3	Year 4	Year 5
Costs	13,359,653	13,359,653	13,359,653	13,359,653	13,359,653
Phase-In Percentage	0.667	0.833	1	1	1
Benefits Yearly Estimate	7,500,303	7,500,303	7,500,303	7,500,303	7,500,303
Phased-In Benefits	5,002,702	6,247,752	7,500,303	7,500,303	7,500,303
Subtotal	-8,356,951	-7,111,901	-5,859,350	-5,859,350	-5,859,350
Discounting	1	1.05	1.1025	1.157625	1.21550625
Discounted Total	-8,356,951	-6,773,239	-5,314,603	-5,061,527	-4,820,502
Total					-30,326,822

Table J2 reflects a sensitivity analysis of 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 J2 varies the amount of perfectly targeted matching from 25 percent to 100 percent of the 29.8 percent receiving intensive supervision.

Table J2: Benefits from Reduced Recidivism

Model	Estimated Percent Reduction in Recidivism	Benefits from Reduced Recidivism Per Year (in Millions of Dollars)	Total Net Benefits of Reduced Recidivism in Five Years (in Millions of Dollars)^a
Benefits (29.8 percent) 100 percent perfectly matched	2.92	73.01	235.25
Benefits (29.8 percent) 75 percent perfectly matched, 25 percent random	2.55	63.76	197.74
Benefits (29.8 percent) 50 percent perfectly matched, 50 percent random	2.10	52.51	152.13
Benefits (29.8 percent) 25 percent perfectly matched, 75 percent random	1.54	38.51	95.37

^a Benefits discounted

Appendix K: 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. McCollister et al. (2010) 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 et al. 2010). Those figures 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. In some cases, however, 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 cost 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. (2010) 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.

Several crimes in Illinois' annual prison reports were not analyzed in the McCollister et al. (2010) 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. (2010) study; we solely used fiscal costs. The Illinois Sentencing Policy Advisory Council (2013a) published a document listing the average prison time served for each class of felony (e.g., X, One, Two, Three, Four). 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 the council. We then added this calculation to \$1,238, the council'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 it.

The 2013 IDOC 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 who will commit new crimes and 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.

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 Fiscal Year 2013). In addition to fiscal costs, large and significant social benefits are 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 et al. (2010) research included 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. (2010) study included social and fiscal costs, while crimes that are not mentioned solely 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. To estimate the benefits of reduced crime, we multiplied the total cost of crime by estimates in recidivism reduction.

Appendix L: 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. Tables L1 and L2 demonstrate the effects of varying the fidelity to and validity of the SPIn and CaseWorks tools. For example, Table L2 reflects of 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 L1: Benefits (29.8 percent),
100 Percent Perfectly Matched (in Dollars)**

	Year 1	Year 2	Year 3	Year 4	Year 5
Costs	13,359,653	13,359,653	13,359,653	13,359,653	13,359,653
Phase-In Percentage	0.667	0.833	1	1	1
Benefits Yearly Estimate	73,010,709	73,010,709	73,010,709	73,010,709	73,010,709
Phased In Benefits	48,698,143	60,817,920	73,010,709	7,3010,709	73,010,709
Subtotal	35,338,4901	47,458,267	59,651,058	59,651,056	59,651,056
Discounting	1	1.05	1.1025	1.157625	1.21550625
Discounted Total	35,338,490	45,198,350	54,105,266	51,528,825	49,075,071
Total					235,246,002

**Table L2: Benefits (29.8 percent),
75 Percent Perfectly Matched, 25 Percent Random (in Dollars)**

	Year 1	Year 2	Year 3	Year 4	Year 5
Costs	13,359,653	13,359,653	13,359,653	13,359,653	13,359,653
Phase-In Percentage	0.667	0.833	1	1	1
Benefits Yearly Estimate	63,759,352	63,759,352	63,759,352	63,759,352	63,759,352
Phased In Benefits	42,527,488	53,111,540	63,759,352	63,759,352	63,759,352
Total	29,167,835	39,751,887	50,399,699	50,399,699	50,399,699
Discounting	1	1.05	1.1025	1.157625	1.21550625
Discounted Total	29,167,835	37,858,940	45,714,013	43,537,155	41,463,957
Grand Total					197,741,899

**Table L3: Benefits (29.8 Percent),
50 Percent Perfectly Matched, 50 Percent Random (in Dollars)**

	Year 1	Year 2	Year 3	Year 4	Year 5
Costs	13,359,653	13,359,653	13,359,653	13,359,653	13,359,653
Phase-In Percentage	0.667	0.833	1	1	1
Benefits Yearly Estimate	52,507,701	52,507,701	52,507,701	52,507,701	52,507,701
Phased In Benefits	35,022,637	43,738,915	52,507,701	52,507,701	52,507,701
Total	21,662,984	30,379,262	39,148,049	39,148,049	39,148,049
Discounting	1	1.05	1.1025	1.157625	1.21550625
Discounted Total	21,662,984	28,932,631	35,508,434	33,817,556	32,207,196
Grand Total					152,128,802

**Table L4: Benefits (29.8 Percent),
25 Percent Perfectly Matched, 75 Percent Random (in Dollars)**

	Year 1	Year 2	Year 3	Year 4	Year 5
Costs	13,359,653	13,359,653	13,359,653	13,359,653	13,359,653
Phase-In Percentage	0.667	0.833	1	1	1
Benefits Yearly Estimate	38,505,648	38,505,648	38,505,648	38,505,648	38,505,648
Phased In Benefits	25,683,267	32,075,205	38,505,648	38,505,648	38,505,648
Total	12,323,614	18,715,552	25,145,995	25,145,995	25,145,995
Discounting	1	1.05	1.1025	1.157625	1.21550625
Discounted Total	12,323,614	17,824,335	22,808,159	21,722,056	20,687,672
Grand Total					95,365,836

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