



Oregon LS/CMI Assessment Final Report



June 28, 2019

Submitted to:
Oregon Criminal Justice Commission
885 Summer St. NE
Salem, OR 97301

Submitted by:
Abt Associates
6130 Executive Boulevard
Rockville, MD 20852

About This Report

Abt Associates conducted a predictive validation study of the Level of Service/Case Management Inventory (LS/CMI) risk assessment tool in the Oregon community supervision system. This study was commissioned by the Oregon Criminal Justice Commission. This report describes our approach and findings, which include stakeholder interviews and quantitative analysis of data on individuals undergoing community supervision in Oregon. The quantitative analyses include a predictive validation of the risk assessment, descriptive analyses of trends in scores, and quasi-experimental analyses studying the impact of treatment on recidivism and predicted risk scores.

Authors

Sharmini Radakrishnan, Walter Campbell, Molly Brune, Kevin Neary



Abt Associates | 6130 Executive Boulevard | Rockville, MD 20852

CONTENTS

Executive Summary	iii
1. Introduction	1
2. Background	2
3. Stakeholder Interviews on LS/CMI Implementation and Use.....	4
3.1. Initial Roll-out.....	4
3.2. Ongoing Implementation.....	4
Fidelity for conducting LS/CMI interviews.....	4
Circumstances where scores are overridden	5
Ongoing potential barriers to use	6
3.3. Scoring the LS/CMI.....	6
Family/Marital Domain	6
Companions Domain	7
Pro-criminal Attitudes Domain.....	7
Criminal History Domain	7
3.4. Case Planning based on LS/CMI	7
Ability to Access Treatment.....	8
3.5. Overall Perception of the LS/CMI.....	8
3.6. Summary	9
4. Data.....	11
4.1. Analysis Data Assembly	11
Selecting LS/CMI assessments	11
Selecting Treatment Referrals	12
5. Analysis	15
5.1. Sample of Offenders.....	15
5.2. How do the LS/CMI scores of people on supervision change throughout their period of supervision?.....	17
5.3. Are people on supervision receiving the treatment that corresponds to their highest need domain scores?	20
5.4. What populations (in terms of overall risk level, highest need domains, offense type, and criminal history) are most successful on supervision, as measured by improved LS/CMI overall and domain scores?.....	25
5.5. How well do LS/CMI scores predict recidivism in Oregon?.....	27
5.6. What is the impact of treatment on recidivism and LS/CMI overall and domain scores?.....	37
6. Discussion	45
References.....	47
Appendix A: Stakeholder Interview Guide	49
Appendix B: Probation Officer Focus Group Guide.....	52
Appendix C: Treatment Categories	54
Appendix D: Treatment Receipt Over Time by Domain.....	55
Appendix E: Additional Regressions.....	58
Appendix F: Treatment Referral Rates for Terms and Individuals	62

Executive Summary

The Oregon Criminal Justice Commission (CJC) selected Abt Associates to conduct a study of the Level of Service/Case Management Inventory (LS/CMI), a dynamic risk assessment tool used in Oregon’s community supervision system. The broad goals of this study are to assess the LS/CMI’s accuracy in predicting recidivism among Oregon offenders in community supervision, to understand how the LS/CMI is currently used in case planning, and to assess the impact of treatment on recidivism.

In Oregon’s community supervision system, offenders starting supervision are first assessed using a static risk assessment tool called the Public Safety Checklist (PSC.) Only offenders who score a “medium” or “high” on the PSC are assessed with the LS/CMI. This means that the group of offenders who receive an LS/CMI in Oregon have, on average, a higher risk of recidivism than the complete pool of all offenders who undergo supervision. This has implications for the LS/CMI’s ability to predict risk. Offenders are reassessed with the LS/CMI throughout their period of supervision, and the case plan is updated and the supervision level adjusted in response to reassessments.

We address the following five research questions using a combination of statistical data analyses and stakeholder interviews and focus groups:

1) How do offenders’ LS/CMI scores change over their period of supervision?

We find that the majority of offenders who are reassessed remain at the same LS/CMI level. Once offender demographics and criminal history are taken into account, scores decrease slightly over time, although these decreases are not large enough to lead to a lower risk level.

In general, the stakeholder interviews and focus groups indicate that probation officers are largely using the LS/CMI as intended and have a favorable impression of the tool. They report conducting the assessments and re-assessments within the recommended time periods. In the few instances where officers report overriding the LS/CMI risk level, they have clear justifications for doing so. Yet officers do note some challenges. Despite annual DOC trainings, officers noted that certain sections (pro-criminal attitudes, companions, family/marital) are consistently harder to score than others.

2) Are people on supervision receiving the treatment that corresponds to their highest need domain scores?

We find that high and very high risk offenders are more likely than low risk offenders to receive a treatment referral. Treatment referral rates also varied by county and gender, with women having higher rates of treatment referral. To further investigate, we also map treatments to domains to study how treatment rates varied by domains, and find that offenders with a “very high” score in the Alcohol/Drug, Pro-criminal Attitude, and Anti-social Pattern domains have higher rates of referrals to the associated treatments than other offenders.

Officers note that it is a challenge to incorporate the LS/CMI into case planning. While they report using LS/CMI domain scores to inform treatment referral decisions, they note that creating a complete electronic case plan is challenging as it requires entering data into multiple information systems. Some officers note that case planning takes up time that they could otherwise spend working with their clients on their challenges. Others express difficulty working with their clients to create short-term goals. From these interviews, it appears that incorporating the LS/CMI into case planning is an ongoing process in Oregon. It will likely require some time and effort to increase case plan completion rates.

3) What populations (in terms of demographics and criminal history) are most successful on supervision, as measured by improved LS/CMI scores?

We examine the characteristics of individuals with reductions in their LS/CMI scores. We find that offenders who have a reduction in their scores during their supervision term have less extensive criminal histories than those whose scores remain the same or increase.

4) How well do LS/CMI scores predict recidivism in Oregon?

We define recidivism as an arrest, conviction, or incarceration within 36 months of a completed LS/CMI assessment. To assess the LS/CMI's predictive ability, we used a metric known as the area under the Receiver Operating Characteristic (i.e., AUC). We compute the AUC scores for the LS/CMI as well as for the Public Safety Checklist (PSC), and two synthetic risk scores that we generate using the data provided to us. Typically, an AUC score of 0.7 or higher is considered to be evidence of good predictive ability, while 0.6-0.7 would be considered moderately good predictive power. We find that the LS/CMI has an AUC score of 0.63. The other models tested had similar AUC scores.

One likely reason the LS/CMI's AUC score is not higher is that the LS/CMI is administered only to those offenders who receive a "medium" or "high" on the PSC. This group has a higher risk of recidivism than the general pool of all offenders on supervision. This makes it harder for the tool to differentiate between offenders with different underlying risk levels. When the LS/CMI was developed, it was tested on a broader pool of offenders on supervision, and not specifically on higher risk offenders. Therefore, it is not surprising that the LS/CMI demonstrates only moderate predictive power. The fact that the other models tested showed similar results gives us confidence that the reason for this finding is the population the tool is used on, and not a problem with the tool itself.

5) What is the impact of treatment referral on recidivism and subsequent LS/CMI scores?

We look separately at the three standard recidivism measures used in Oregon: arrest, conviction, and incarceration. We compare offenders who received treatment to similar offenders who did not. We find that in general, referral to treatment reduced rates of all 3 recidivism outcomes, but had no significant impact on overall LS/CMI score. When we study domain-specific treatments, we find a drop in recidivism associated with treatments linked to the Alcohol/Drug and Pro-criminal Attitude domains. We also find a drop in LS/CMI scores associated with treatments linked to the Recreation, Companions, and Pro-criminal Attitude domains. Note that we are only able to study treatment referral, because the data on treatment progress and completion were unreliable or missing for most offenders.

We find that offenders' scores tend to decrease slightly over time, and that decreases in scores are linked to criminal history. We found that the LS/CMI has moderate predictive power, and other tools perform similarly. This is likely due to the fact that the offenders assessed with the LS/CMI are all higher risk offenders. We also find that treatment referral rates vary by county, gender, and LS/CMI domain. The differences in domain are likely due in part to differences in availability of treatment type. We find that treatment referral is associated with a drop in recidivism. Finally, we also find that a few logistical challenges still remain for probation officers' use of the LS/CMI. Specifically, certain domains are still difficult for officers to score and they have some lingering challenges associated with linking the LS/CMI to case planning.

1. Introduction

The Oregon Criminal Justice Commission’s (CJC) mission is to increase the effectiveness, efficiency, and legitimacy of the criminal justice system in Oregon. CJC has been working with counties in Oregon to develop and implement plans to help stabilize prison population growth while maintaining public safety in a cost-effective manner. Community supervision is a key component of the strategy to reduce prison use, reduce recidivism, maintain public safety, and increase offender accountability. In Oregon, community corrections use a validated dynamic risk-needs assessment—the Level of Service/Case Management Inventory (LS/CMI)—to identify the appropriate supervision level and create a case plan. The LS/CMI risk level corresponds to a predicted recidivism rate. Offenders under supervision are reassessed throughout their period of supervision, and the case plan is updated and the supervision level adjusted as necessary.

CJC selected Abt Associates to perform a predictive validation and quasi-experimental study of the impact and potential of the LS/CMI in Oregon. It is important for risk assessment tools to be independently validated, because assessments with systematic biases, poor predictive validity, and cultural inappropriateness do not classify offenders accurately. An inaccurate or inappropriate risk assessment results in an inefficient allocation of resources by criminal justice agencies, suboptimal offender outcomes, and reduced public safety. Abt is unaffiliated with any developers of risk assessments and could therefore provide an independent, unbiased assessment of the appropriateness of the LS/CMI for the state of Oregon. Abt also places high value on working collaboratively and believes that projects benefit immensely from client input throughout the lifecycle of the project. Collaboration and flexibility have guided our approach, and we solicited and integrated the CJC’s input throughout the project, through weekly project calls, an initial findings report, and a presentation of final results to stakeholders.

The broad goals of this study are to assess how accurate the LS/CMI is in predicting recidivism among Oregon offenders in community supervision, and to understand how the LS/CMI is used in case planning. Abt’s approach includes stakeholder interviews and focus groups to understand the implementation and use of the LS/CMI in Oregon and a predictive validation of the LS/CMI. We also completed descriptive analyses of trends in risk scores and recidivism over the period of supervision (for the full sample and subpopulations of interest), descriptive analyses of treatment receipt and its correlation with risk scores, and quasi-experimental approaches (matching, regression discontinuity) to assess the effect of supervision conditions on LS/CMI scores. In addition to this final report, Abt also presented on this project to the Oregon State Legislature.

This report presents findings on the five study research questions. The remainder of this report follows this outline: Section 2 provide background information on risk assessment, Section 3 summarizes findings from the stakeholder interviews and focus groups, Section 4 discusses the data provided by CJC for this study, Section 5 presents the analyses completed, and Section 6 discusses the results.

2. Background

The use of risk assessments as a means of identifying individuals at greater or lesser risk of committing crimes after release from jail or prison has been a part of criminal justice thinking since the early 1900s (Burgess, 1928). Since then, assessments have become a staple feature in the design and delivery of post-confinement supervision. From a public safety perspective, they provide a means of identifying offenders who require additional supervision, those who may benefit from additional treatment, and/or those who may benefit from other interventions designed to facilitate successful reintroduction into society. From a fiscal perspective, they allow agencies to target their resources toward the most effective uses and reduce ineffective spending. For these reasons, researchers are continually searching for better ways to identify and characterize offender risk and looking for ways to improve the predictive accuracy of risk assessment instruments used in that pursuit (Gendreau, Little, & Goggin, 1996).

At their core, most risk assessments are models that weigh factors associated with risk to stratify offenders into ordinal “risk categories” roughly corresponding to the probability of reoffending. Most risk assessment models use some (or all) of the following factors as predictors: offending history, substance abuse, family relations, and peer delinquency (Schwalbe, 2008). Early assessments (also called first generation risk assessments) placed a heavy emphasis on intuitive judgments from law enforcement officers and correctional experts of the time (Bonta & Andrews, 2007). Assessments rooted in clinical judgment making had some appeal in that they were driven by the opinions of experienced professionals whose subjective judgment is relatively informed. In that sense, assessments had a sort of informal credibility and flexibility in their design and application. However, a significant drawback to this approach more generally was that it frequently lacked accuracy and reproducibility (Dawes, Faust, & Meehl, 1989). Conversely, researchers have found that actuarial models based on quantitative and statistical principles consistently outperform models based on clinical judgment (Gottfredson & Moriarty, 2006). Over time, the use of first generation tools gave way to a second generation of actuarial instruments, emphasizing evidence over intuition.

Actuarial models of risk assessments have proven to have several advantages to practitioners. First, they can be consistently applied over time and over offenders by a large set of individuals administering an assessment. They also tend to be significantly less resource intensive. Although clinical tools require highly trained individuals to administer and evaluate the results of an assessment, actuarial tools typically have a shallower learning curve and require less time to administer and score (Dawes et al., 1989). In terms of implementation cost and predictive utility, actuarial instruments are functionally superior and more economically viable, though implementation itself may be also vulnerable to sources of error in certain settings and circumstances (Lowenkamp, Holsinger, Brusman-Lovins, & Latessa, 2004; Lowenkamp, Latessa, & Holsinger, 2004). At the same time, second generation instruments rely exclusively on risk factors that are static in nature—that is, factors that are immutable such as criminal history and substance abuse history. And although static factors of risk are extremely useful in the overall prediction of risk, they do not take advantage of information as it is changing over time, where those changes are also associated with the risk of reoffending (Bonta & Andrews, 2007).

The introduction of dynamic factors (i.e., factors changing over time—employment status, treatment status, etc.) into actuarial models of risk assessment has led to the development of a third generation of instruments. These instruments not only emphasize the changing needs and circumstances of offenders in predicting risk, they are intended to act as a vehicle for correctional staff to actively reduce risk by tailoring supervision efforts to meet the needs of offenders. In that way, the application of these third generation instruments reflects a larger, more general movement toward the risk-need-responsivity (RNR) model as an approach to supervision (Andrews, Bonta, & Hoge, 1990).

Finally, and most recently, a fourth generation of instruments has emerged, the aim of which has been to improve upon third generation instruments by expanding the breadth of factors used to measure the risks,

needs, and responsivity of offenders and allowing officers to tailor interventions based on an offender’s learning styles and abilities (Bonta & Andrews, 2007; Johnson, Lowenkamp, VanBenschoten, & Robinson, 2011; Lowenkamp, Johnson, Holsinger, VanBenschoten, & Robinson, 2013). In addition, these instruments integrate an offender’s criminogenic needs and responsivity factors into a probation officer’s case management system, allowing for more efficient implementation of supervision or treatment (Andrews, Zinger, et al., 1990). Although this expansion improves on methods that rely entirely on risk prediction, current research is also considering what statistical trade-offs (if any) are made in risk prediction between instruments that emphasize static vs. dynamic factors (Yang, Wong, & Coid, 2010). Moreover, the supervision objectives driving these expansions suggest a rationale for periodic reassessments (also growing in popularity) that provides independently useful simple prediction (i.e., reassessments are a way to monitor treatment needs and offender status).

The LS/CMI is an example of a fourth generation risk assessment tool. It was developed in 2004 by Canadian researchers (Andrews, Bonta, and Wormith, 2004) as a replacement for the LSI-R, a third generation risk assessment. It comprises of one scored section with 43 items, and ten non-scored sections of varying lengths, and requires a structured interview to complete. The scored section covers eight domains: criminal history, education/employment, family, recreation, companions, substance abuse, procriminal attitude, and antisocial patterns, as are described in Exhibit 1-1.

Exhibit 1-1: LS/CMI Domains

Domain	Description
Family/Marital:	Relationship with parents and siblings, marital relationship status and satisfaction, and relationship with children (if any)
Education/Employment	Level of education (ongoing and completed) and current and previous employment status
Leisure/Recreation	Activities undertaken during free time.
Companions	Friends and associates, and their criminal status or background.
Alcohol/Drug Problems	Use of alcohol and drugs, and any alcohol or drug treatments undertaken.
Procriminal Attitude/Orientation	Attitude towards committing crimes.
Antisocial Pattern	Childhood anti-social behavior, pro-criminal attitude, and patterns of generalized trouble
Criminal History	This is a static domain based on the offender’s full history of criminal offenses.

The LS/CMI is currently used in Oregon for the prison, jail, and probation populations. To our knowledge, Nebraska and West Virginia are the only other US states currently using the LS/CMI across the entire state. Many states continue to use the LSI-R.

A handful of validations of the LS/CMI have been published. Andrews et al. (2012) assess the predictive validity of the LS/CMI overall and domain scores among samples of Canadian men and women separately. They find that the total score is strongly correlated with both male and female recidivism. The domain scores apart from the criminal history domain are individually not as highly predictive, although the substance abuse domain score specifically is highly predictive of recidivism among women. Note that some of the authors of that study are part of the group that originally developed the instrument. Gigure and Lussier (2016) find that the total LS/CMI score shows modest-to-good predictive accuracy, but also find that domain scores are not as highly predictive. Jimenez et al. (2018) examine the LS/CMI’s validity among use in Nebraska probation and find that it demonstrates moderate predictive validity, and differences in predictive power for minorities vs. non-minorities.

3. Stakeholder Interviews on LS/CMI Implementation and Use

The Abt team conducted one interview with a Department of Corrections Coordinator and four interviews with County Community Corrections Directors and staff to provide context on the roll-out and use of the LS/CMI assessment, and to better understand ongoing challenges that may impact LS/CMI use and the role the LS/CMI plays in determining treatments. The survey protocol developed for the Community Corrections Directors interviews can be found in Appendix A.

In addition to informing the evaluation design, these interviews provide context for our findings. We also conducted three focus groups with probation officers from four counties, including officers from one county in the greater Portland area, two counties in central Oregon, and one county in the Southwestern part of the state. The three focus groups each included between 2 and 9 officers. We asked probation officers about their experience administering and scoring the LS/CMI assessment, as well as how they applied it to case planning and treatment referrals. The survey protocol developed for the focus group interviews can be found in Appendix B.

3.1. Initial Roll-out

Oregon began piloting the LS/CMI in 2005, soon after the tool was first developed, and began operationalizing it at that time. Some counties, such as Clackamas, started implementing the LS/CMI in 2007, years before the LS/CMI was officially adopted in Oregon in 2010. However, many counties did not officially adopt and implement it until after Oregon officially adopted the tool, and conversations with CJC staff indicated that full adoption and implementation likely occurred across the state by 2013.

Most respondents said that community supervision officers initially found that the LS/CMI took much longer to administer than the previous risk tools they had used, so there was some resistance to using the new tool. The prior method of assessing risk took only a few minutes, while the LS/CMI requires interviews that often last an hour or longer. Most believed, though, that this resistance diminished over time as officers realized the benefits of the LS/CMI.

In addition, some respondents reported the LS/CMI was initially very subjective and difficult to score correctly, with low inter-rater reliability. One county director reported that when they first adopted the tool, the wording of some questions confused officers and offenders – often they found themselves selecting the response choice “yes” when the answer should have been “no”. However, the tool was improved, and these issues were resolved by the tool creators in response to these concerns. The Oregon DOC has also provided annual comprehensive trainings, which have improved inter-rater reliability and buy-in from officers.

3.2. Ongoing Implementation

Fidelity for conducting LS/CMI interviews

Official state guidance requires that the LS/CMI be used for offenders that receive a score of medium or high on the Public Safety Checklist (PSC), which is used as a triage tool to identify low risk and medium/high risk offenders when they begin probation or post-incarceration supervision. Respondents reported following this guidance with offenders, except in cases where other risk assessments were used instead. For example, special cases required the use of specialized risk assessment tools, such as The Ontario Domestic Assault Risk Assessment (ODARA) for domestic violence cases and the STATIC-99, STABLE-2007, and ACUTE-2007 for sex offense cases. When such assessments are used, they are used either in place of the LS/CMI or they override the results of the LS/CMI. In addition, the Women’s Risk Needs Assessment (WRNA) was adopted two years ago for use with female offenders in place of the LS/CMI as it allows for a more nuanced understanding of trauma and trauma-informed case planning.

For probation, statewide policy requires officers to conduct LS/CMI assessments within 60 days of being assigned an offender. In Marion County, the LS/CMI used to be completed right at the time of release.

SECTION 3: STAKEHOLDER INTERVIEWS

Now, the LS/CMI is supposed to be conducted within 60 days after the start of supervision to give officers time to get to know offenders so the information collected will be more accurate. In Clackamas county, they reported the biggest challenge they faced to completing them on time was when offenders abscond, which the interviewee reported happens often. As an exception, the LS/CMI is conducted almost immediately for those in prison diversion programs.

In cases of post-incarceration supervision, counties reported that for those leaving prison, the LS/CMI is conducted by the release counselor while the individual is still in prison, whereas there is no pre-release LS/CMI for those leaving jail.

Probation officers reported following these policies unless they were unable to. Some officers reported that offenders with mental health issues had a particularly difficult time completing the LS/CMI because it required a lot of concentration. If an offender was in a mental state un conducive to sitting through a long interview, such as psychosis, then it was not feasible to complete the assessment.

All county directors interviewed reported that offenders must be reassessed annually, in accordance with statewide requirements. In Clackamas County, reassessments were supposed to be conducted semi-annually until the past two or three years. All counties interviewed also reported that probation officers may reassess early if they notice an offender is facing new issues that are likely to impact the risk score, or if there have been new events that may necessitate additional treatments. We examine reassessment patterns in section 4.2.

Probation officers reported conducting annual reassessments, but reports on their utility and reliability varied. Some officers reported that, because the offenders knew which answers would get them lower scores and less supervision, they were more likely to answer dishonestly in reassessments, making responses less reliable. While we did not directly address this issue in our quantitative analyses, those analyses do not indicate LS/CMI scores dropping consistently across supervisees. Thus to the extent that this occurs, it does not appear to be a pervasive aspect of supervision in Oregon.

Other officers reported conducting reassessments more often when they could because, if they knew an offender had taken a step that would decrease their score, they would receive a lower score and need less supervision. This would allow officers to meet with them less frequently, and would effectively decrease their caseloads.

Circumstances where scores are overridden

The DOC reported that score override practices varied across counties. One county community corrections director reported LS/CMI scores are often overridden in cases where an offender is doing well in all areas but their past criminal history is making them a high or medium risk case. In these cases, officers often lower the risk levels. In another county, officers reported that they may also increase the score of offenders that sequentially have a drug offense and then a sex offense to at least a medium risk. Some counties, though, reported that officers never overrode scores.

Some probation officers reported being able to change static scores, like criminal history, to lower the overall rating if that score is disproportionately affecting their overall score (with a supervisor's permission). In one county, officers reported that someone completing drug treatment was a trigger to decrease drug-related criminal history, for example. Other probation officers mentioned occasionally increasing scores if they have a low score in an area but really need treatment for it, such as domestic violence. Other probation officers interviewed reported not being able to conduct score overrides. When overrides were not allowed, officers said that they occasionally changed scores in the interview to get the overall risk rating they thought was appropriate.

SECTION 3: STAKEHOLDER INTERVIEWS

In summary, while it appears that various forms of overrides do exist in Oregon, their use is inconsistent. In some counties, they are never used, and where they are used, they often take different forms or even multiple forms within the same county.

Ongoing potential barriers to use

Overall, counties reported high levels of use and buy-in for the LS/CMI among probation officers. They also mentioned a few ongoing barriers. One county community corrections director reported that officers sometimes have trouble completing the LS/CMI because they are required to use multiple information systems that do not always talk to each other, which may lead to a delay in when information is entered into the system.

Another county reported that when caseloads increase for probation officers, officers still conduct initial assessments but often fall behind on conducting LS/CMI reassessments, and supervisors also provide less oversight for the reassessments. However, some probation officers reported conducting more reassessments when caseloads were high in order to decrease their caseloads by decreasing visits with offenders who had become less vulnerable. Officers interviewed reported having caseloads between 50 and 75 offenders.

3.3. Scoring the LS/CMI

The Oregon Department of Corrections has been working on an ongoing basis to improve the reliability of scoring on the LS/CMI. As part of this, they have administered trainings on scoring the LS/CMI. They have also conducted inter-rater reliability tests, where they ask each officer to score a video and use that to train officers to score more consistently. Officers reported that the videos could be hard to score at times or difficult, but that generally inter-rater reliability exercises helped officers understand how to score the LS/CMI.

Overall, both probation officers and community corrections directors found that offenders did not always answer honestly, and incorporating prior knowledge about an offender into the LS/CMI could be difficult. Some officers reported that they felt they had to score based on what the offender told them and not based on prior knowledge. Others said as they got to know offenders better, they often found errors about what offenders had said about their companions, for example. These officers reported updating the scores during their next reassessment.

We asked probation officers about their experiences completing the LS/CMI, whether they found some sections to be more subjective than others, and how accurate they found the scoring of specific sections. Officers brought up the following domains when addressing challenges.

Family/Marital Domain

Some probation officers thought this domain was straightforward to score. However, many officers noted that the family/marital section could be frustrating because the offender receives a more positive score when they have a relationship with their parents, but often offenders may be negatively affected by their parents because they use drugs or have been abusive. In those cases, staying away from their parents may be healthier for the individuals. Officers often mentioned that individuals whose parents are both deceased get a more negative score than those whose parents are not deceased, which seemed “unfair”, especially to older adults.

Additionally, one individual told us that the score on marriage and relationships could be highly subjective. Some officers might think an offender without a spouse would always be unsatisfied even if they reported being happily single, and others might assume a non-traditional relationship was troubled when it may in fact bring the offender happiness.

SECTION 3: STAKEHOLDER INTERVIEWS

Companions Domain

Officers in one county reported the companions domain could be difficult to score because some individuals had a mix of “anti-social” and “pro-social” companions, and they were not sure how to score that. Others mentioned that, if someone lives in clean and sober living, they may be surrounded by people who are positive forces in their life, but because those people have a criminal background, those relationships are considered risky in the LS/CMI. Another person reported that the person might report having pro-social relationships in the initial assessment, but it becomes clear during home visits that those friends are anti-social.

Other officers found the questions in this section difficult for both the offender and the officer to understand. Another officer mentioned that she found almost all offenders scored 1 or 2, so there was little variance and it usually was one of the highest domains for an individual.

Pro-criminal Attitudes Domain

Officers reported that scoring the pro-criminal attitudes domain could be difficult because the offenders often say one thing and do something else. For example, they might say they were opposed to committing crimes, but their criminal history showed they had a long track record of crimes. However, one officer noted that the addition of a box that notes the individuals’ claims are different than their actions has helped officers find scores more reliable.

Additionally, some respondents mentioned the wording of these questions could be difficult to understand. For example, some questions asked double negatives, or if some “did not” do something, which made it harder to provide an accurate response.

Criminal History Domain

Officers reported that criminal history was the easiest section to score, in part because much of the information comes from officers. However, they also often found it frustrating that criminal history continued to affect overall scores when an individual was improving in all other aspects, since the criminal history score does not change with time.

3.4. Case Planning based on LS/CMI

While probation officers have created case plans in various forms over time, the introduction of case plans that need to be entered electronically is relatively new across the state of Oregon. Community corrections directors reported that they were still working on both ensuring the case planning process was useful, and training and building buy-in among probation officers.

All counties reported using the LS/CMI to inform case plans. However, they also reported that it took them some time to start using the assessment for this purpose after they adopted the LS/CMI as a risk assessment tool. This was due to both a slow start up and concerns about Oregon’s case planning system.

Some counties did not originally use the LS/CMI for case plans through the Effective Practices in Community Supervision (EPICS) system because they thought EPICS was a relatively weak tool, but over time have adopted it. Specifically, five counties initially did not use the LS/CMI as part of the EPICS supervision plan – Multnomah, Umatilla, Klamath, Columbia, and Marion.

In most counties, the community corrections directors reported that high risk domain scores drove case plans. For example, if the overall score on the LS/CMI is not high, but alcohol use score is high, the probation officer will always refer the offender to treatment. Before the LS/CMI, these case plans were highly subjective and based on probation officers’ discretion or court records. Officers in three counties said they used LS/CMI scores to target the top 3 criminogenic categories on the LS/CMI.

According to the DOC, only about 20 percent of high and medium risk offenders have case plans in the system, which represents an increase from previously years. However, almost all treatments offenders

SECTION 3: STAKEHOLDER INTERVIEWS

receive are entered in the system, as officer performance is tied to this entry. However, these data entries may not include when offenders finish treatment or do not show up at all.

Probation officers reported that they were still adjusting to the case planning process more generally, and noted frustrations they had in the process. Some probation officers felt that case planning took away from the time they could spend working with offenders on their challenges. Others reported struggling to create short-term goals with offenders.

Officers understood why the LS/CMI guided the case planning process, and some found it helpful. Other officers thought it took away from an officer's ability to make treatment decisions or recommendations based on their knowledge of the offenders and their own judgement, and instead felt like they were "checking the boxes". One officer gave an illustrative example, stating "Sometimes that's the big issue and if it's not in the top 3 what do we do? Let's say their biggest problems are their family and not working in 5 years, but what I see on my list is that pro-criminal attitudes has the biggest need." Officers who were already struggling to create short-term goals with offenders also noted that offenders' personal goals, such as getting a car or finding a job, did not necessarily align with their highest-risk domains.

Ability to Access Treatment

Once officers created case plans and identified offenders' treatment needs using the LS/CMI scores, they reported that getting their offenders access to treatment and tracking their progress in treatment could be a challenge.

Some officers reported difficulty finding recovery housing because of strict rules regarding sex offenders or reluctance to accept individuals with severe mental illness. Similarly, other officers reported challenges getting offenders into inpatient care, and officers at two out of three counties reported sending offenders to other counties in order to receive inpatient services. Many officers also reported that finding mental health resources was particularly difficult, and offenders could not necessarily move forward with other parts of their treatment programs if they did not receive mental health resources. Substance abuse resources were also limited, leading officers to sometimes use treatment providers with whom they had had little past success.

Once officers identify providers and make referrals, the treatment providers receive LS/CMI scores along with the referral. Probation officers in one county reported that providers used the LS/CMI in setting up their treatment plans, but officers in other counties found providers just received the LS/CMI scores as a way to check a box, and did not use them in a meaningful way. Additionally, many officers reported that communications with treatment counselors could be difficult and inconsistent, and that turnover in counselor positions made ongoing coordination particularly tricky.

Some probation officers had also received training on different techniques to help offenders meet their goals, and officers mentioned using techniques such as cognitive behavioral therapy (CBT). The fact that officers use these techniques to address offender goals and risks is noteworthy because these techniques are not captured in the treatment referral data. Thus, to the extent that these techniques help reduce recidivism and improve LS/CMI scores, their contribution was not something that could be analyzed in our quantitative analyses. Depending on the risks and domains under review, these techniques may be differentially important. For example, cognitive behavioral therapy during an office or field contact may be used more often and be more beneficial for individuals who score highly on the pro-criminal attitudes or antisocial domains.

3.5. Overall Perception of the LS/CMI

Overall, community corrections directors found the LS/CMI to be a useful tool to help officers conduct more evidence-based risk assessments and to create treatment plans directly tied to the needs of offenders. Officers' overall perceptions of the LS/CMI varied, but generally officers reported that they were a useful way to find out information about an offender towards the beginning of their relationship.

SECTION 3: STAKEHOLDER INTERVIEWS

Officers reported that they found the LS/CMI to be a better predictor of recidivism than other tools such as the WRNA and the PSC. They reported that the PSC often gave offenders lower risk scores than were appropriate, and that the WRNA gave almost all offenders a score of medium.

However, both community corrections directors and officers noted that the LS/CMI fails to capture information about mental health and past trauma offenders have faced. The WRNA does capture this information through interviews with female offenders. Officers noted that this was particularly important for offenders with mental illness, but would be valuable information to have on all offenders to provide them with better supervision.

3.6. Summary

Since 2013, probation officers across the state of Oregon have been using the LS/CMI to conduct risk assessments on offenders within the first two months of supervision. Many officers conduct the LS/CMI during their second visit with offenders, and find it useful to learn basic information about offenders and their needs.

Officers initially found the LS/CMI could be difficult to complete, but the DOC has since rolled out trainings and inter-rater reliability exercises to help officers better understand how they should be conducting LS/CMI assessments. Despite these trainings and a reported improvement in inter-rater reliability scores over time, officers still reported that some domains could be challenging to fill out accurately. Additionally, they reported that sometimes, the way the LS/CMI scored certain responses to questions did not necessarily accurately reflect the risk level of that factor. For example, a 60-year-old offender was not more at risk because his parents had both passed away. Despite some of these drawbacks, officers reported that they found the LS/CMI's assessment of risk more accurate than other assessments they used, such as the PSC and WRNA.

The DOC and community correction directors across the state of Oregon have been working together to improve the case planning process probation officers use, which includes more detailed case plans that are entered into an electronic system and are based on LS/CMI scores. As of 2019, a DOC staff member reported only 20 percent of cases had case plans in the system. Probation officers reported they were still adjusting to using the new case planning system, and to using the LS/CMI to create treatment plans. While some officers said using LS/CMI domains made it more difficult for them to cater case plans to the actual needs and goals of offenders, others understood the reasoning behind using the LS/CMI case plans, and thought it could be useful. However, both community corrections directors and probation officers reported that the LS/CMI did not effectively capture mental health issues and trauma, especially when compared with the WRNA. This limitation of the LS/CMI could make referring offenders to mental health treatment more difficult, as the tool relies on other domains to identify mental health issues.

Once officers made case plans, they reported referring offenders could be challenging because of limited resources or options for treatment, especially for mental health issues. In particular, they often struggled to find inpatient care and had to refer offenders to inpatient treatment facilities in other counties. When officers make referrals to treatment providers, those providers receive copies of the LS/CMI, though not all providers make use of the assessment. Officers reported that communication with treatment providers could be difficult and inconsistent, which made it harder for officers to know how well treatment was working or whether offenders were attending treatment. This was reflected in offenders' records, where treatment referrals were recorded consistently but completion of treatment was not necessarily recorded.

In general, our qualitative analyses point to three key findings. First, the LS/CMI as a risk assessment tool is valued. However, officers and directors believe it could be improved by the addition of trauma-informed questions, tools to address the difficulty of using the LS/CMI with mentally ill supervisees, and greater clarity, and sometimes, flexibility, around subjective questions. Second, one of the primary values of the LS/CMI is that it provides an avenue through which officers can get to know their clients early into

SECTION 3: STAKEHOLDER INTERVIEWS

their supervision sentence. And finally, while the link between the LS/CMI and case planning can be helpful, greater flexibility may improve this process, allowing officers to be guided both by LS/CMI results and other supervisee issues that arise.

4. Data

The CJC provided the Abt research team with several pre-cleaned data sets for use in this study. Some of the data provided has been used by CJC in their annual recidivism analyses, and all originate from three primary sources: the Oregon Department of Corrections (DOC), the Oregon Judicial Department (OJD), and the Oregon State Police. The data include individuals observed for CJC's recidivism analyses, and consist of all felony probation admissions between 2010 and 2015, as well as all felony prison and local control releases during the same period, for convictions pertaining to driving, drug, and/or property crimes. These individuals were linked by unique study identifiers to CJC's recidivism outcome data as well as risk assessment and treatment records.

For this universe of offenders, the CJC provided the following five datasets:

- A cohort file with admission and release dates, demographic characteristics, and sentencing information of offenders included in our analysis;
- A recidivism outcomes dataset which matches to the cohort file, and includes the number of days until first arrest, conviction, and/or incarceration;
- Public Safety Checklist (PSC) scores with static risk assessment and criminal history data;
- LS/CMI scores and sub-scores for all LS/CMI assessments conducted between 2005 and 2018 on offenders included in our analysis; and
- Community treatment records for all offenders included in our study cohort.

By combining and sequencing these datasets utilizing the unique identifier (*reckey*: *record key*) provided by the CJC, the study team was able to build flexible analytic files to address the key research questions.

4.1. Analysis Data Assembly

To create the analytic files, we first joined the cohort and recidivism outcome datasets, as well as the revised race dataset, to enable the analysis of recidivism outcomes across various offender characteristics. Then we established a basic offender timeline from entry to eventual re-entry success/failure, which was an essential step to be able to add risk assessment and treatment records to our analytic file. In a small number of cases, where an individual had two or more cohort records with identical recidivism analysis start dates, we preserved record details for the record containing the most serious offense. We made the determination of "most serious" offense using input from CJC, by prioritizing records via supervision type selected in the following order: post-prison supervision, post-jail supervision, and straight probation.

Next, we sequenced PSC scores using the unique identifier and the recidivism start date included in the PSC data. These data represent the static risk assessment and criminal history information known when the offender entered our observation cohort, which is either the date of the admission to probation or the incarceration release. These data allowed us to recreate the initial sorting of offenders into low versus the medium/high risk category pools eligible for subsequent LS/CMI assessments.

Selecting LS/CMI assessments

With our pool of LS/CMI eligible offenders identified, we sequenced LS/CMI assessments utilizing the combination of the unique person identifier specific to the LS/CMI study (*reckey*) and assessment dates. First, we had to identify which assessment for an offender would be considered the initial assessment informing that period of supervision. In order to do this, after a many to many merge on *reckey*, we ranked each assessment for each supervision term based on the span of time between the start date for

recidivism tracking¹ (*recidstart*) date and the assessment date, as shown in Exhibit 3-1. We assigned the highest possible ranking to assessments completed between 30 days before the start of supervision and 30 days after the start of supervision, followed by those conducted between 30 and 60 days after supervision². We then assigned rankings for all cases where the LS/CMI was conducted between 60 days and 1,095 days in order of proximity to the start date, followed by rankings for assessments completed more than thirty days before the release date. We then sequenced subsequent assessments for that supervision period following the initial period. We assigned assessments conducted more than 395 days after the start of supervision a ranking of eight or greater. We assigned the highest ranked assessment for each supervision term as the initial assessment for that term because it had the lowest span of time between the *recidstart* date and the assessment date out of all options.

Exhibit 3-1. Rank Ordering for selecting LS/CMI Assessments based upon span of time from Recidstartdate and Assessment Date

Time span between Recidstartdate and Assessment Date	Rank Order
Between 30 days before — 30 days after	1
Between 31 — 60 days after	2
Between 61 — 90 days after	3
Between 91 days — Six months after	4
Between Six months — 1 year after	5
Between 1 year — 1 year and 3 months after	6
Between 31 days before — 1 year before	7
Between 1 year and 3 months after — 2 years after	8
Between 2—3 years after	9
Beyond 1 year before	98
More than 3 years after	99

Having identified the initial assessments per each period of supervision, we sequenced the remaining LS/CMI assessments by assessment date and preserved subsequent LS/CMI assessment records over the observation period. For individuals with multiple supervision periods, we preserved all intervening LS/CMI assessments from their earliest identified initial assessment through all subsequent LS/CMI assessments and supervision periods.

Selecting Treatment Referrals

To determine whether any treatment was received during a supervision term, we looked at whether any treatment referral or entry dates occurred within that term. For this purpose, we used treatment records provided by the CJC, and consisting of the following data elements:

- Reckey;
- Subfile Key – a count of community treatment admissions;

¹ This is the admissions date for probation admissions, and the release date for incarceration admissions.

² Our understanding is that typically in many jurisdictions, LS/CMI's are conducted either within 60 days of admission to probation, or for those being released from incarceration, in a small window of time prior to release (for example, <20 days). For those individuals in local control, LS/CMI assessments may predate their release, and reassessments may not occur until a year following release. We used these operational timelines to inform our process for determining and selecting initial LS/CMI assessments versus subsequent re-assessments.

- Treatment Program ID – a descriptive code for treatment program;
- Referral date;
- Entry date;
- Exit date;
- Exit code; and,
- Last update location – a four letter county code describing the county last updating the treatment record.

To use treatment records in our analysis, the study team needed to develop a standardized categorization for various types of treatment. The data provided by CJC included an initial list of treatment categories, and Abt and CJC together expanded upon the list to develop a final list of treatment categories. The study team assessed the types of treatment program IDs recorded across the various counties. See Appendix C for a coding list of treatment types, and how these were eventually mapped to the LS/CMI domains.

To classify treatments, the study team employed the following approach: First, we grouped treatment program IDs by county and reviewed program IDs in regards to their share of the overall frequency within the records provided. In the treatment data, treatment program IDs were commonly provided in a format consisting of a 4 letter county code provided by a shorthand code for the treatment provider (e.g. MULT- AA). We were therefore able to separate the county codes from program ID, and review provider codes by county groupings.

As Multnomah County contributed over 25 percent of treatment records provided, we focused our initial categorization efforts on the treatment program IDs for Multnomah County. We identified and coded a set of treatment program IDs that together comprised the IDs used for 95 percent of Multnomah County treatment records. Next, we reviewed treatment program IDs occurring across the four Oregon counties next most represented in the treatment data. For these 4 counties—Marion, Clackamas, Washington, and Umatilla—we aimed to categorize the most common program IDs. To do so, we sorted the program ID codes for these 4 counties by frequency of occurrence, and selected the program IDs that were collectively associated with over 90% of the treatment records for the 4 counties.

To aid in categorizing treatment program types, the study team utilized both guidance from CJC staff, as well as county-specific Google searches. In particular, the team identified a listing of treatment providers grouped by county and treatment type, published by the State of Oregon, which greatly aided the study team’s categorization efforts.³ Typically, treatment program IDs only identified service providers, and these providers were categorized according to their grouping on the State list, and/or by the treatment types listed on public websites found by the study team. Frequently, a listed treatment provider offered a range of treatments. In such cases, we categorized the offender as receiving all categories of treatments we knew were administered by the provider.

Lastly, to categorize any remaining uncategorized treatment program IDs that were associated with at least 100 treatment records, we sorted treatment program IDs alphabetically across all counties and manually reviewed them. We chose this alphabetical approach as many treatment types and providers may be entered similarly, albeit with slight variations across differing counties. For example, Alcohol and Drug treatment may be represented as “A/D” in one county, “A&D” in another, “A-D” in another, or even “AD”. We also looked over cases where a treatment provider in one county may also appear in the records of another county, especially if that county had geographic proximity. Alphabetical grouping

³ <http://docpub.state.or.us/Treatment/showTreatments.jsp>

allowed the study team to identify such commonalities amongst the treatment program IDs and resolve them across multiple counties.

Following these processes, the study team categorized 91 percent of provided treatment records into one or more of the broad treatment categories provided by the CJC⁴.

The study team then matched categorized treatment records to the cohort records and sequenced treatments by the count of community treatment admissions (*subfile_key*). We then selected any treatment records referred or begun between the recidivism tracking start date and the end of the supervision sentence. For the purposes of our analysis, we created a binary indicator per supervision term from these records for whether or not the client received any treatment during the observation period.

We also developed an additional analysis file, which concatenated selected treatment records matched to cohort records as well as selected LS/CMI assessments occurring during the recidivism observation period per offender. The resulting long file was then sorted within an individual's recidivism observation period by LS/CMI assessment and treatment referral dates, so we could examine the sequence of LS/CMI assessments and any subsequent treatment referrals chronologically during supervision.

We applied two additional exclusion criteria as part of the analysis. LS/CMI assessments that were conducted more than 3 months (91 days) prior to the start of supervision were removed from the analysis because those records may not indicate a true "initial assessment", or may be linked to another period. We also dropped a small number of individuals who were below 18 years of age at the start of supervision⁵.

⁴ The study team reviewed an additional 1 percent of treatment records but were ultimately unable to classify them. The leftover eight percent were not reviewed, as those treatment program IDs were infrequent (associated with less than 100 observations each). While further review may have somewhat increased the proportion of classified treatment types, the study team decided that the categorization accomplished to date provided ample coverage and further coding would only marginally impact analyses.

⁵ We dropped 153 assessments as they were for individuals under age 18, and 3,397 assessments as they occurred greater than 91 days prior to the start of supervision. As these are relatively small numbers compared with the total number of assessments in the analytic file, we do not think these exclusions impacted the findings.

5. Analysis

CJC wanted to learn how risk scores changed over time under supervision, and how scores and recidivism were impacted by treatment. An ideal approach to evaluating the causal impact of treatment on outcomes is the randomized controlled trial (RCT). However RCTs are often difficult and costly to implement in criminal justice settings, and they are necessarily prospective. As CJC was seeking to answer these questions with retrospective data, this required the application of quasi-experimental evaluation tools to observational data. There are several reasons why it is challenging to complete an impact evaluation of supervision practices with observational data. High risk offenders are usually more likely to be given a risk reassessment. Therefore when looking at trends in scores, we may find that scores worsen over the period of supervision simply because the higher risk offenders receive multiple assessments. Also, high risk offenders receive longer supervision sentences, and for that reason we might observe that risk scores worsen over time under supervision. However, high risk offenders are also more likely to recidivate earlier and drop out of the sample after only one assessment. In that case we might see that risk scores improve over time as offenders who remain under supervision longer have lower risk profiles. We kept these empirical challenges in mind as we completed the analyses. We also flagged offenders who dropped out of the sample after receiving only one assessment, and limited some of the analyses described below to those who had at least two assessments.

We address the five research questions through a combination of descriptive analyses, predictive validation methods, and quasi-experimental techniques. We first present descriptive analyses on trends in LS/CMI scores (overall and for subgroups), treatment referral rates by high need domains, and descriptive statistics on offenders who had a reduction in risk scores during their supervision terms. For the reasons described above—likelihood of assessment and sentence lengths varying by offender risk level—the descriptive results do not provide a causal estimate of the effect of supervision time on risk scores. However they provide useful descriptive information about how scores change over time. Then we conduct a predictive validation of the LS/CMI. Finally, we conduct a quasi-experimental assessment of treatment impact by using a matching technique to estimate the causal impact of treatment referral on recidivism and subsequent risk scores.

5.1. *Sample of Offenders*

Our analytic sample is comprised of 106,750 total LS/CMIs administered to 38,292 unique offenders across 49,701 individual terms of supervision. Approximately 72% of the terms in our sample involve an arrest, 66% involve a conviction, and 31% involve an incarceration. The median time observed until an arrest was 0.75 years (SD=1.34), until a conviction was 0.91 years (SD=1.33), and until an incarceration was 1.68 years (SD=1.63). Exhibit 5-1 below shows descriptive statistics for all terms in the sample. Each observation is a term of supervision.

Exhibit 5-1. Descriptive Statistics for Analytic Sample of Supervision Terms (N=49,701)

Covariate	Percent or Mean
Age	33.7
Male	74.28%
Black	6.90%
Hispanic	9.60%
White	80.26%
Other race	3.24%
Offenders with 3+ Person Felonies ¹	6.08%
Offenders with 2 Person Felonies ¹	6.62%
Offenders with 1 Person Felony and 1 non-Person Felony ¹	10.40%
Offenders with 1 Person Felony ¹	4.59%
Offenders with 4+ Adult Non-Person Felonies ¹	13.02%
Offenders with 2-3 Adult Non-Person Felonies ¹	9.79%
Offenders with 4+ Adult Misdemeanor or 1 Adult Non-Person Felony or 3+ Juvenile Non-Person Felonies ¹	11.72%
Offenders with 3 or Fewer Adult Misdemeanors or 2 or Fewer Juvenile Non-Person felonies ¹	10.91%
Offenders with No Felonies or Adult Misdemeanors ¹	17.91%
Crime Severity Score ²	3.00
Current driving offense	4.24%
Current drug offense	55.33%
Current property offense	40.43%
Prior supervision sentences	22.96%
Prior incarceration sentence	4.22%
Prior driving offenses	0.55%
Prior drug offenses	13.96%
Prior property offenses	9.64%
N	49,701

Note: Each observation is a supervision term.

¹ The offender person felonies categories are based on the criminal history scale from sentencing guidelines

² The crime severity score is based on the sentencing guidelines grid. Due to missing data, sample size is reduced for the crime severity score (treatment: 26,162, comparison: 22,762, total: 48,924)

The mean age of offenders in the full sample of terms is 34 years. Most offenders are male (74%) and white (80%). Most offenders have a drug offense as their current offense⁶ (55%), while 40% have a current property offense and 4% have a current driving offense. Twenty-three percent of offenders have a prior supervision sentence and 4% have a prior incarceration sentence. The crime severity score from the sentencing guidelines grid ranges from 0-11, with a mean of 3.00.

⁶ In cases where an offender has multiple offenses, the current offense is the most serious offense.

5.2. How do the LS/CMI scores of people on supervision change throughout their period of supervision?

To understand how LS/CMI scores change over time under supervision, we first stratified the analysis by grouping LS/CMI assessments together according to when they were administered within a supervision term. This analysis was done at the assessment level, i.e., every observation is an assessment. We used six groupings: LS/CMIs administered (a) within 3 months of supervision start, (b) between 3 and 6 months, (c) between 6 and 12 months, (d) between 12 and 24 months, (e) between 24 and 36 months, and (f) over 36 months after supervision start. Note that the “within 3 months” window includes assessments completed up to 90 days prior to the start of supervision.

We first tabulated the data, as depicted in Exhibit 5-2, to show descriptively how LS/CMI scores varied over the period of supervision. Each observation is an LS/CMI assessment. Note that because multiple LS/CMI assessments can be administered to the same offender over time, and because the analysis is stratified by the window of time the assessment was given, the same offender may be represented in multiple columns.

Exhibit 5-2. Number and Proportion of Offenders, by Risk Level and Time LS/CMI was Administered during Supervision (n=106,750)

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Very High	5,954 (21%)	2,395 (23%)	4,286 (24%)	3,665 (25%)	2,340 (27%)	3,746 (30%)	4,520 (31%)
High	12,355 (44%)	3,756 (36%)	6,079 (34%)	5,104 (35%)	3,129 (36%)	4,564 (37%)	5,699 (39%)
Medium	7,722 (27%)	3,120 (30%)	5,388 (30%)	4,274 (29%)	2,455 (28%)	3,204 (26%)	3,682 (25%)
Low	1,896 (7%)	1,012 (10%)	1,902 (11%)	1,427 (10%)	720 (8%)	791 (6%)	667 (5%)
Very Low	370 (1.31%)	116 (1%)	174 (1%)	103 (1%)	60 (1%)	48 (0%)	27 (0%)
Total	28,297	10,399	17,829	14,573	8,704	12,353	14,595

Note: Each observation is an LS/CMI assessment. Column % in parentheses.

In the table above, we see that the distribution of offenders across risk groups changes over time. For LS/CMIs administered within the first 3 months of supervision, 21% of offenders were classified as being very high risk, 44% were classified as high risk, and 27% as medium risk. The proportion of very high risk offenders increases over time under supervision, to 31% in for LS/CMIs administered over 36 months after supervision. This may be because higher risk offenders are more likely to receive reassessments, and also more likely to receive longer supervision sentences.

As is shown in Exhibit 5-3, we estimated linear regression models of the LS/CMI overall score on indicators for the six time periods described above, also adjusting for offender demographics (age, race, gender), sentence length, and offense type (full regression output can be found in Appendix E). The dataset for this analysis is at the assessment level. This provides more detailed information on trends in scores over the period of supervision, while adjusting for offender characteristics. The first column shows results of the regression of scores on the time indicators only, with the “within 3 months” window as the reference group. This shows that on average, raw scores decline (indicated by negative sign) in the first 12 months of supervision before increasing slightly. Despite this small increase, scores for LS/CMIs

conducted between 3 months to 24 months after supervision start are still lower on average than scores for assessments done within 3 months. After adjusting for the offender and crime characteristics described above (second column), we see that the declines in scores are larger. Looking separately at men and women (third and fourth columns), we find that women have much larger declines in scores over the period of supervision after adjusting for covariates.

Exhibit 5-3. Regression coefficients from models of raw LS/CMI score on time period indicators

LS/CMI Window	All – Unadjusted	All – Adjusted	Men - Adjusted	Women - Adjusted
> 3 to 6 Months	-0.58 (0.07)***	-0.60 (0.07)***	-0.58 (0.09)***	-0.65 (0.15)***
> 6 to 12 Months	-0.70 (0.06)***	-0.74 (0.06)***	-0.56 (0.07)***	-1.30 (0.12)***
> 12 to 18 Months	-0.48 (0.06)***	-0.56 (0.06)***	-0.27 (0.07)***	-1.44 (0.12)***
> 18 to 24 Months	-0.19 (0.08)*	-0.29 (0.08)***	0.03 (0.09)	-1.35 (0.16)***
> 24 to 36 Months	0.22 (0.07)**	0.05 (0.07)	0.37 (0.07)***	-1.23 (0.15)***
> 36 Months	0.60 (0.07)***	0.42 (0.07)***	0.65 (0.07)***	-0.74 (0.18)***

Note: Each observation is an LS/CMI assessment. +p<.10, * p<.05, ** p<.01, *** p<.001

To better understand changes offenders face between initial assessment and reassessment, we also include Exhibits 5-4 and 5-5 below, which show the initial assessment risk level each offender receives and their reassessment score, if they had one. Exhibit 5-4 shows us how LS/CMI risk levels change over time, as well as which individuals assessed received a reassessment. However, this table does not tell us why or when the reassessment occurred. Note that if the initial assessment for a given supervision occurred more than 3 months before the start of supervision, all assessments in that term are excluded from this analysis. We see that about two-fifths of offenders did not receive a reassessment. Given that Oregon only requires reassessments every 12 months, this is to be expected. Offenders in the medium to very high risk groups were more likely to receive a reassessment.

Exhibit 5-4. Number and Proportion of Offenders, by Risk Level of Initial LS/CMI Assessment and Initial Reassessment, including Offenders with No Reassessment (n=48,955)

Risk Level of Initial Assessment	Risk Level of First Reassessment						Total
	Very High	High	Medium	Low	Very Low	No Reassessment	
Very High	4742 (40%)	1523 (13%)	546 (5%)	28 (0%)	0 (0%)	5125 (43%)	11,964
High	2322 (11%)	6443 (31%)	3421 (17%)	555 (3%)	11 (0%)	7725 (38%)	20,477
Medium	409 (3%)	1996 (16%)	3976 (31%)	1629 (13%)	91 (1%)	4529 (36%)	12,630
Low	33 (1%)	225 (7%)	581 (17%)	539 (16%)	51 (2%)	1914 (57%)	3,343
Very Low	2 (0%)	15 (3%)	37 (6%)	52 (9%)	65 (11%)	410 (71%)	581
Total	7,508 (15%)	10,202 (21%)	8,561 (17%)	2,803 (6%)	218 (0%)	19,703 (40%)	48,955

Note: Each observation is a supervision term. Row % in parentheses.

Those who did receive a reassessment (see Exhibit 4-5) were most likely to be given the same risk level as in their first assessment, which was the case for 69% of very high risk offenders and about half of high

and medium risk offenders. Of offenders who had a reassessment, scores decreased for about 30 percent of offenders with initial risk levels of both very high risk and high risk, and about 20 percent of those with medium risk. Scores increased for about 20 percent of those with high risk assessments, and about 30 percent of those with medium risk assessments.

Exhibit 5-5. Number and Proportion of Offenders, by Risk Level of Initial LS/CMI Assessment and Initial Reassessment, Excluding Offenders with No Reassessment (n=29,292)

Risk Level of Initial Assessment	Risk Level of First Reassessment					Total
	Very High	High	Medium	Low	Very Low	
Very High	4742 (69%)	1523 (22%)	546 (8%)	28 (0%)	0 (0%)	6,839
High	2322 (18%)	6443 (51%)	3421 (27%)	555 (4%)	11 (0%)	12,752
Medium	409 (5%)	1996 (25%)	3976 (49%)	1629 (20%)	91 (1%)	8,101
Low	33 (2%)	225 (16%)	581 (41%)	539 (38%)	51 (4%)	1,429
Very Low	2 (1%)	15 (9%)	37 (22%)	52 (30%)	65 (38%)	171
Total	7,508 (26%)	10,202 (35%)	8,561 (29%)	2,803 (10%)	218 (1%)	29,292

Note: Each observation is a supervision term. Row % in parentheses.

As shown in Exhibit 5-6, we also estimated regression models restricted to only those offenders who have received at least two LS/CMI assessments and included the initial LS/CMI score as a covariate in the model (full regression output can be found in Appendix E). As before, we also adjusted for offender demographics (age, race, gender), sentence length, and offense type. This reduced the sample size significantly, but better addressed the issue of selection by adjusting for each offender's baseline risk level. In all models, the initial LS/CMI score was highly predictive of subsequent scores. For the time indicator variables, the "within 3 months" window again served as the reference group. When controlling for the initial score, we find that for men, the scores increase slightly over time under supervision, but there was no significant increase in scores for women.

Exhibit 5-6. Regression coefficients from models of raw LS/CMI score on time indicators

	All – Unadjusted	All - Adjusted	Men - Adjusted	Women - Adjusted
LS/CMI First Score	0.75 (0.01)***	0.70 (0.01)***	0.70 (0.01)***	0.69 (0.01)***
LS/CMI Window				
> 3 to 6 Months	0.50 (0.11)***	0.48 (0.11)***	0.55 (0.12)***	0.10 (0.22)
> 6 to 12 Months	0.68 (0.11)***	0.61 (0.11)***	0.60 (0.13)***	0.48 (0.24)*
> 12 to 18 Months	0.68 (0.18)***	0.68 (0.18)**	0.60 (0.20)***	0.72 (0.41)
> 18 to 24 Months	-0.33 (0.27)	-0.23 (0.27)	-0.20 (0.31)	-0.55 (0.59)
> 24 to 36 Months	-0.23 (0.28)	-0.06 (0.28)	-0.35 (0.30)	0.80 (0.67)
> 36 Months	-0.38 (0.31)	-0.18 (0.31)	-0.23 (0.34)	-0.49 (0.73)

Note: Each observation is a supervision term. +p<.10, * p<.05, ** p<.01, *** p<.001

5.3. *Are people on supervision receiving the treatment that corresponds to their highest need domain scores?*

To address this research question, we assessed whether the domain score was predictive of receiving the treatment/programming that corresponds to a high need in that domain. Because the data on completion of treatment may be incomplete (as described by the stakeholders interviewed), this section only includes analysis of treatment referrals, and not progress or completion. There are several reasons why the treatment rates observed in the data may be lower than actual rates. For example, some probation officers trained in cognitive behavioral therapy reported using this technique with their supervisees during office visits. This would not be captured in treatment referral data. The interviews also indicated that treatment availability was lower for certain counties or treatment types, which would lead to low referral rates as well.

Our first step for this analysis was to generate a mapping of treatments to LS/CMI domains, which can be found in Appendix C.

The tables below show, for each time period and risk level, the proportion of offenders who received the relevant treatment/programming after an LS/CMI assessment. If offenders were referred to the appropriate treatment, we would expect to see that offenders at the highest risk levels had the highest rates of treatment receipt. We present the results for the overall LS/CMI score and separately for the individual domains. Each observation in this analysis is an assessment. We define treatment receipt as being referred to the relevant treatment (according to the treatment-domain mapping) after the assessment was completed and within our data observation window. Each treatment referral was linked to the most proximate assessment completed before that referral. If a treatment referral occurred after two assessments, it would be linked only to the more recent of the two. The denominator for each table cell includes all assessments for which treatment has not occurred at some point previously in the current supervision term. We excluded assessments where treatment referral occurred previously in the same term, because it is unclear whether subsequent treatments should be linked to the first assessment (as a continuation of the first treatment) or the most proximate assessment. Note that for the Leisure/Recreation domain, only three risk levels are displayed (“High,” “Medium,” and “Very Low.”) because in the data the raw score also had only three levels.

A general trend observed for all domains and all risk levels is that treatment referrals occur early in a supervision term, as evidenced by the decline in the rate of treatment receipt over time under supervision. The rate of referrals also varies by domain/treatment type. Looking at the rate of receipt of any type of treatment (Exhibit 5-7) stratified by the overall LS/CMI risk level and time of assessment, we see that for assessments received up to 24 months after the start of supervision, high and very high risk offenders are more likely to receive a treatment referral than lower risk offenders. When we analyze rates of treatment receipt by domain (Exhibit 5-8), rates of referral for treatments relevant to the family, education, leisure, and companion domains are relatively low (1-4%). Offenders with high risk scores for the alcohol/drug, pro-criminal attitude, and antisocial pattern domains have relatively higher rates of treatment referral (20-27%).

Exhibit 5-7: Rate of Treatment Referral Following an LS/CMI Assessment, by Overall Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
All Treatment							
Very High	33%	16%	11%	11%	6%	4%	1%
High	36%	19%	14%	15%	10%	7%	2%
Medium	30%	16%	11%	10%	7%	6%	1%
Low	27%	11%	8%	6%	5%	3%	2%
Very Low	20%	13%	9%	1%	2%	6%	0%
Overall	33%	17%	12%	12%	8%	6%	1%

Note: Each observation is an LS/CMI assessment.

Exhibit 5-8: Rate of Domain-Specific Treatment Referral Following an LS/CMI Assessment within Three Months of the Start of Supervision, by Domain Risk Level

	Domains						
	Family/ Marital	Education/ Employment	Leisure / Recreation	Companions	Alcohol / Drug Problem	Pro-criminal Attitude	Anti-social Pattern
Very High	4%	3%	N/A	4%	27%	26%	20%
High	4%	2%	1%	4%	28%	30%	17%
Medium	3%	1%	1%	4%	26%	32%	16%
Low	3%	1%	N/A	3%	20%	30%	13%
Very Low	3%	1%	1%	2%	13%	28%	11%
Overall	3%	2%	1%	4%	25%	29%	14%

Note: Each observation is an LS/CMI assessment.

We also stratified this analysis by gender and county to see if rates of treatment varied across these groups. In the following tables, assessments were collapsed across the full time span of the observation period (instead of showing rates by the seven time windows), and again, past referrals are accounted for. So if, for example, two high/very high assessments came up in the same supervision term, the second assessment would only count in the denominator if treatment didn't occur after the first assessment. Exhibit 5-9 shows the rate of treatment receipt for assessments with a high or very high score in that domain (or overall for the first column), by gender. Female offenders have a higher rate of treatment receipt than male offenders for treatment generally, and for many domain-specific treatments.

Exhibit 5-9: Rate of Treatment Receipt by Sex of Offender and Domain, for Assessments with High/Very High Domain score only

	Domains							
	Treatment (General)	Family/ Marital	Education/ Employment	Leisure/ Recreation	Companions	Alcohol/ Drug Problem	Pro-criminal Attitude	Anti-social Pattern
Female	24%	3%	1%	0%	2%	19%	19%	11%
Male	16%	1%	1%	0%	2%	12%	11%	7%

Note: Each observation is an LS/CMI assessment.

SECTION 5: ANALYSIS

Exhibit 5-10 shows the rate of treatment referral by county. We find that some counties (Hood River, Multnomah, Morrow, Polk, Sherman, Umatilla, Union, Wheeler) have higher rates of treatment referrals. A number of factors could contribute to these differences, including different population densities, availability of treatment providers, and proximity to neighboring states.

SECTION 5: ANALYSIS

Exhibit 5-10: Rate of Treatment Referral by County and Domain

	Treatment (General) (%)	Treatment (General) (N)	Domains						
			Family / Marital	Education / Employment	Leisure / Recreation	Companions	Alcohol / Drug Problem	Pro- criminal Attitude	Anti- social Pattern
Baker	19%	194	0%	0%	0%	1%	13%	9%	1%
Benton	17%	920	0%	0%	0%	3%	11%	12%	5%
Clackamas	17%	6093	1%	1%	1%	1%	11%	11%	7%
Clatsop	17%	1113	0%	0%	0%	2%	12%	11%	4%
Columbia	16%	448	1%	1%	0%	2%	13%	12%	7%
Coos	10%	603	0%	0%	0%	1%	9%	5%	4%
Crook	13%	139	2%	0%	2%	1%	9%	8%	2%
Curry	18%	200	0%	0%	0%	1%	17%	14%	3%
Deschutes	12%	2164	5%	0%	0%	1%	10%	10%	2%
Douglas	9%	2800	0%	0%	0%	1%	9%	6%	6%
Gilliam	20%	32	8%	0%	0%	7%	10%	15%	7%
Grant	11%	68	0%	0%	0%	0%	8%	11%	0%
Harney	14%	82	0%	0%	0%	0%	8%	11%	3%
Hood River	27%	157	3%	1%	0%	3%	16%	13%	14%
Jackson	14%	3656	1%	0%	0%	1%	13%	9%	2%
Jefferson	18%	421	0%	0%	0%	2%	13%	11%	4%
Josephine	15%	1859	0%	1%	0%	1%	12%	9%	2%
Klamath	15%	1292	0%	0%	0%	4%	8%	8%	4%
Lake	17%	152	0%	0%	2%	6%	5%	11%	9%
Lane	6%	4743	0%	0%	0%	0%	4%	4%	2%
Lincoln	13%	837	0%	0%	0%	0%	8%	9%	5%
Linn	13%	3653	0%	0%	0%	1%	11%	9%	2%
Malheur	15%	476	0%	0%	0%	3%	11%	11%	12%
Marion	19%	7091	1%	0%	1%	2%	17%	10%	6%
Morrow	27%	102	0%	0%	0%	4%	15%	20%	4%
Multnomah	24%	16203	4%	3%	0%	2%	19%	18%	15%
Polk	24%	1006	1%	0%	1%	7%	11%	13%	8%
Sherman	24%	64	4%	3%	0%	0%	20%	14%	3%
Tillamook	17%	219	1%	1%	0%	1%	14%	10%	15%
Umatilla	33%	2305	0%	0%	0%	7%	19%	24%	7%
Union	33%	438	0%	0%	0%	5%	20%	23%	9%
Wallowa	14%	32	0%	0%	0%	6%	6%	19%	0%
Wasco	21%	486	1%	1%	0%	4%	15%	10%	7%
Washington	18%	6142	0%	1%	0%	1%	16%	13%	4%
Wheeler	50%	2	0%	0%	0%	0%	25%	0%	0%
Yamhill	22%	1381	0%	1%	0%	4%	15%	15%	4%

Note: This is an assessment-level table, limited to assessments that have a risk level of high or very high. The rate of treatment referral is calculated as the proportion of assessments with a high/or very high risk level where the offender is referred to treatment after the assessment. The domain-specific treatment rates are calculated based on those assessments which have a high or very high domain risk level.

We also estimated multivariate logistic regression models of treatment receipt with the LS/CMI domain score as the key predictor while controlling for demographic and criminal history variables (gender, age, race/ethnicity, criminal history score, crime category severity score, crime type, and indications of past incarcerations, past driving offenses, past drug offenses, and past property offenses). For the model of general treatment referral, the key predictor was the overall raw LS/CMI score. For the domain-specific treatment models, the key predictor was the domain score. We estimated these models for each domain and time period separately, and report the correlations of the domain scores with treatment receipt in Exhibit 5-11 below. Each table cell shows the result from a separate regression model. We report the odds ratio and standard errors for the key predictor (the LS/CMI score variable) in each model. We clustered standard errors at the individual offender level.

These results indicate the correlation between the LS/CMI score (or domain score) and treatment receipt after controlling for demographics and criminal history; meaning, how much the non-static components of the LS/CMI are correlated with treatment receipt across time. It appears that, in the first two years, they are correlated, but the strength varies by domain/treatment type.

Exhibit 5-11: Odds Ratios for LS/CMI Scores (Overall and Domain) Predicting Treatment Receipt by Months Into Supervision when LS/CMI is Administered

	Months into Supervision When LS/CMI is Administered		
	0-12 Months	13-24 Months	>25 Months
Treatment (General)	1.02 (0.001)***	1.03 (0.003)***	1.01 (0.005)
Family / Marital Subdomain	1.06 (0.026)**	1.17 (0.087)**	0.98 (0.117)
Education / Employment Subdomain	1.16 (0.022)***	1.20 (0.055)***	1.23 (0.085)***
Leisure / Recreation Subdomain	1.18 (0.093)**	1.08 (0.273)	1.55 (0.877)
Companions Domain	1.12 (0.023)***	1.16 (0.062)***	1.13 (0.112)
Alcohol / Drug Problem Subdomain	1.11 (0.006)***	1.15 (0.015)***	1.10 (0.022)***
Pro-criminal Attitude Subdomain	1.03 (0.008)***	1.06 (0.019)***	0.98 (0.030)
Anti-social Pattern Subdomain	1.20 (0.016)***	1.18 (0.040)***	1.09 (0.061)

Note: Each observation is an LS/CMI assessment.

Note that the tables above all show analysis of treatment referral as it relates to LS/CMI assessments. Appendix F provides tables of treatment referral rates at the supervision term and individual offender levels.

5.4. *What populations (in terms of overall risk level, highest need domains, offense type, and criminal history) are most successful on supervision, as measured by improved LS/CMI overall and domain scores?*

In this section we define “successful” offenders as those who had a reduction in their overall LS/CMI score. Those offenders whose scores remained the same or increased were considered “unsuccessful” for the purposes of this analysis. Exhibit 5-12 below presents descriptive statistics on successful and unsuccessful offenders, with each observation representing a unique term of supervision. We limited this analyses to terms where at least two LS/CMIs were completed. The change in score was computed based on the first two LS/CMIs completed, i.e., the change between the first assessment and the first reassessment. Significant differences between successful and unsuccessful offenders are indicated by asterisks.

The table below indicates that successful offenders were more likely to be white or Hispanic, more likely to have a current driving offense, less likely to have a current property offense, less likely to have a past incarceration or term of supervision, and less likely to have past drug or property offenses. We also completed this analysis for each domain specifically and found very similar results. Offenders who were successful on supervision tend to have less extensive criminal histories than those who are not successful on supervision.

Exhibit 5-12: Descriptive Statistics for Supervisees by Change in Overall LS/CMI Score

Covariate	Percent or Mean		
	Reduction in LS/CMI Score	Lack of Reduction in LS/CMI Score	Total
Age	33.40	33.35	33.37
Male***	73.60%	78.17%	76.16%
Black***	5.89%	8.36%	7.28%
Hispanic***	10.65%	9.27%	9.88%
White***	80.62%	78.89%	79.65%
Other race**	2.84%	3.48%	3.20%
Offenders with 3+ Person Felonies ^{1***}	6.03%	7.09%	7.17%
Offenders with 2 Person Felonies ¹	6.85%	7.42%	7.17%
Offenders with 1 Person Felony and 1 non-Person Felony ^{1**}	10.55%	11.62%	11.15%
Offenders with 1 Person Felony ¹	4.60%	4.57%	4.57%
Offenders with 4+ Adult Non-Person Felonies ¹	13.18%	13.54%	13.38%
Offenders with 2-3 Adult Non-Person Felonies ^{1*}	10.27%	9.50%	9.84%
Offenders with 4+ Adult Misdemeanor or 1 Adult Non-Person Felony or 3+ Juvenile Non-Person Felonies ¹	11.42%	11.61%	11.53%
Offenders with 3 or Fewer Adult Misdemeanors or 2 or Fewer Juvenile Non-Person felonies ¹	10.55%	10.48%	10.51%
Offenders with No Felonies or Adult Misdemeanors ¹	0.00%	0.00%	0.00%
Crime Severity Score ^{2***}	3.31	3.18	3.23
Current driving offense***	5.19%	3.87%	4.45%
Current drug offense	53.33%	52.57%	52.90%
Current property offense***	41.48%	43.57%	42.65%
Past supervision***	29.20%	32.54%	31.07%
Past incarceration***	5.26%	6.38%	5.89%
Past driving offense	0.73%	0.79%	0.76%
Past drug offense***	18.42%	20.05%	19.33%
Past property offense***	12.37%	14.21%	13.40%
N	12,899	16,393	29,292

Note: Each observation is a supervision term. Significant differences are represented by asterisks. +p<.10, * p<.05, ** p<.01, *** p<.001

¹ The offender person felonies categories are based on the criminal history scale from sentencing guidelines

² The Crime severity score is based on the sentencing guidelines grid. Due to missing data, sample size is reduced for the crime severity score (treatment: 26,162, comparison: 22,762, total: 48,924)

5.5. *How well do LS/CMI scores predict recidivism in Oregon?*

We used three measures of recidivism in this report. These are defined as 1) an arrest within 36 months of the date the LS/CMI was administered, 2) a conviction within 36 months of the LS/CMI date, and 3) an incarceration within 36 months of the LS/CMI date. These mirror Oregon’s standard recidivism definitions of an arrest/conviction/new prison sentence within 36 months of the start of supervision. Because this analysis is assessing the accuracy of the LS/CMI assessment in predicting recidivism, we chose recidivism definitions that were based on the assessment date rather than the supervision start date.

Note that offenders in the sample started supervision between 2010 and 2015, and the recidivism outcomes are current as of 2018, so most offenders in the analyses would have been observed for 3 years or more. Given the length of this observation period, the 36-month definition seems appropriate.

To assess the accuracy of the LS/CMI in predicting recidivism in Oregon, we first present the following tables (Exhibits 5-13a, 5-13c, and 5-13f), which show arrest, conviction, and incarceration rates by risk level and time the LS/CMI was administered. Each observation is an LS/CMI assessment. These analyses only include LS/CMIs that were completed before the recidivistic event, as we would not want to predict recidivism using assessments completed after the event. For each time period, we calculated the area under the Receiver Operating Characteristic (i.e., the AUC) with a 95% confidence interval. The AUC has become a key measure of the predictive validity of risk assessment instruments.

Exhibits 5-13a and 5-13b – which show the 36-month arrest rate by risk level and time of assessment – indicate that the LS/CMI does differentiate between offender risk levels. For LS/CMIs administered in the first 3 months of supervision, offenders labeled as very high risk have a higher rate of recidivism (72%) than offenders in the high risk (60%), medium risk (49%), low risk (36%), and very low risk (22%) groups. However the predictive accuracy of the LS/CMI in this population is moderate, as evidenced by an AUC score of 0.62. Typically, an AUC score of 0.7 or higher is considered to be evidence of good predictive ability, while 0.6-0.7 would be considered moderately good predictive power.

One likely reason the LS/CMI’s AUC score is not higher is that the LS/CMI is administered only to those offenders who receive a “medium” or “high” on the PSC. This group has a higher risk of recidivism than the general pool of all offenders on supervision. This makes it harder for the tool to differentiate between offenders with different underlying risk levels. When the LS/CMI was developed, it was tested on a broader pool of offenders on supervision, and not specifically on higher risk offenders. Therefore, it is not surprising that the LS/CMI demonstrates only moderate predictive power.

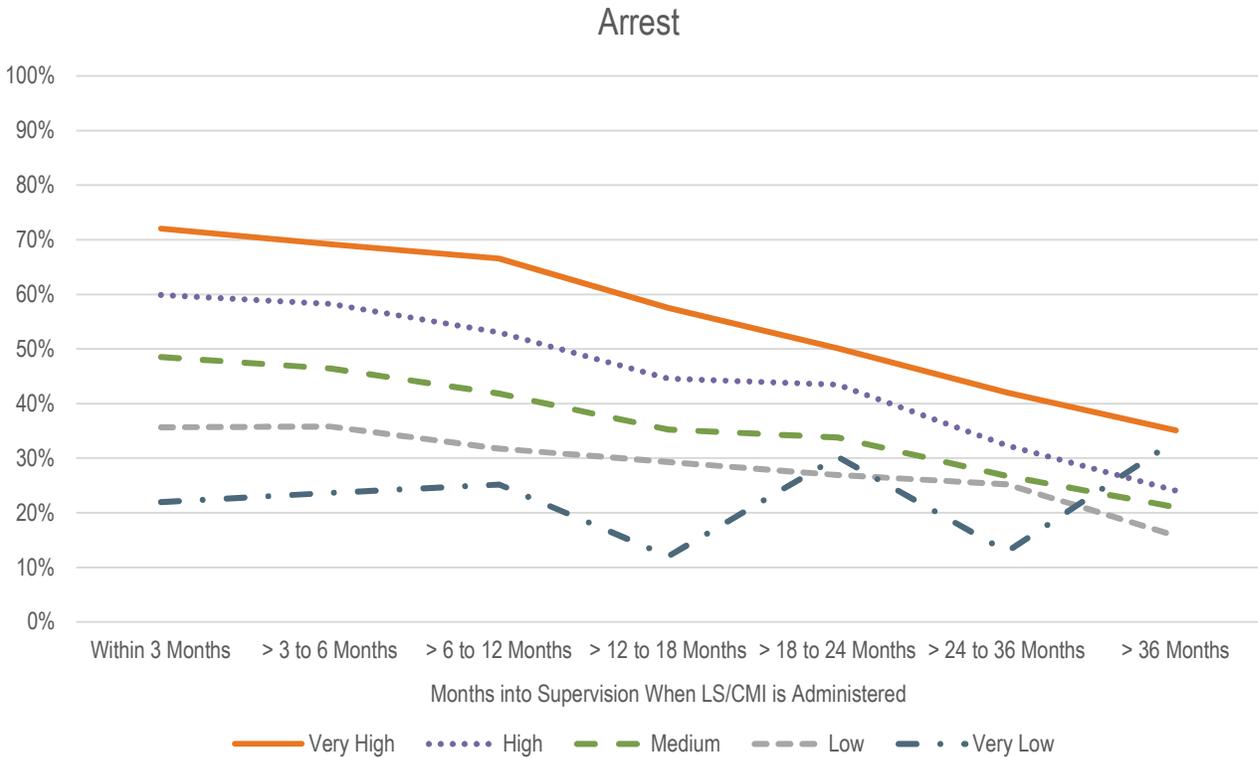
The AUC scores for the arrest rate decline as time under supervision continues, with assessments administered over 12 months into supervision having lower AUC scores. Note that arrest rates are also lower in later time windows, which may make it more difficult for the LS/CMI to discriminate between risk groups. The decline in scores may also be due to the changing composition of the sample. Specifically, the pool of offenders assessed later in their supervision may include a higher concentration of high risk offenders. Because the LS/CMI was developed based on a population of Canadian offenders and has not been calibrated to generate predictions for different populations of offenders, it is not surprising that its predictive accuracy is better for some groups than others.

Exhibit 5-13a. Rate of Arrest Over a 36-Month Period Following an LS/CMI Assessment, by Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Arrest							
Very High	72%	69%	67%	58%	50%	42%	35%
High	60%	58%	53%	45%	43%	32%	24%
Medium	49%	46%	42%	35%	34%	27%	21%
Low	36%	36%	32%	29%	27%	25%	16%
Very Low	22%	24%	25%	12%	30%	13%	33%
AUC	0.62	0.62	0.62	0.60	0.58	0.58	0.57
95% CI	[0.61, 0.62]	[0.61, 0.63]	[0.61, 0.63]	[0.59, 0.61]	[0.57, 0.6]	[0.55, 0.59]	[0.53, 0.61]

Note: Each observation is an LS/CMI assessment.

Exhibit 5-13b. Rate of Arrest Over a 36-Month Period Following an LS/CMI Assessment, by Risk Level and Time LS/CMI was Administered During Supervision



Exhibits 5-13c to 5-13f show the 36-month conviction and incarceration rates by risk level and time of assessment, and has a similar pattern of results as the earlier table. Conviction and incarceration rates are lower than the arrest rate, and decline over time under supervision. The predictive accuracy of the

LS/CMI is similar under this definition, with an AUC score of 0.62 for LS/CMIs completed within the first 3 months of supervision.

Exhibit 5-13c. Rate of Conviction Over a 36-Month Period Following an LS/CMI Assessment, by Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Conviction							
Very High	69%	69%	65%	58%	52%	43%	25%
High	54%	56%	51%	40%	41%	29%	15%
Medium	43%	39%	36%	30%	26%	20%	14%
Low	30%	30%	25%	22%	17%	18%	11%
Very Low	19%	20%	18%	7%	25%	14%	8%
AUC	0.62	0.64	0.65	0.63	0.64	0.62	0.58
95% CI	[0.61, 0.63]	[0.63, 0.66]	[0.64, 0.66]	[0.62, 0.64]	[0.62, 0.66]	[0.6, 0.64]	[0.54, 0.62]

Note: Each observation is an LS/CMI assessment.

Exhibit 5-13d. Rate of Conviction Over a 36-Month Period Following an LS/CMI Assessment, by Risk Level and Time LS/CMI was Administered During Supervision

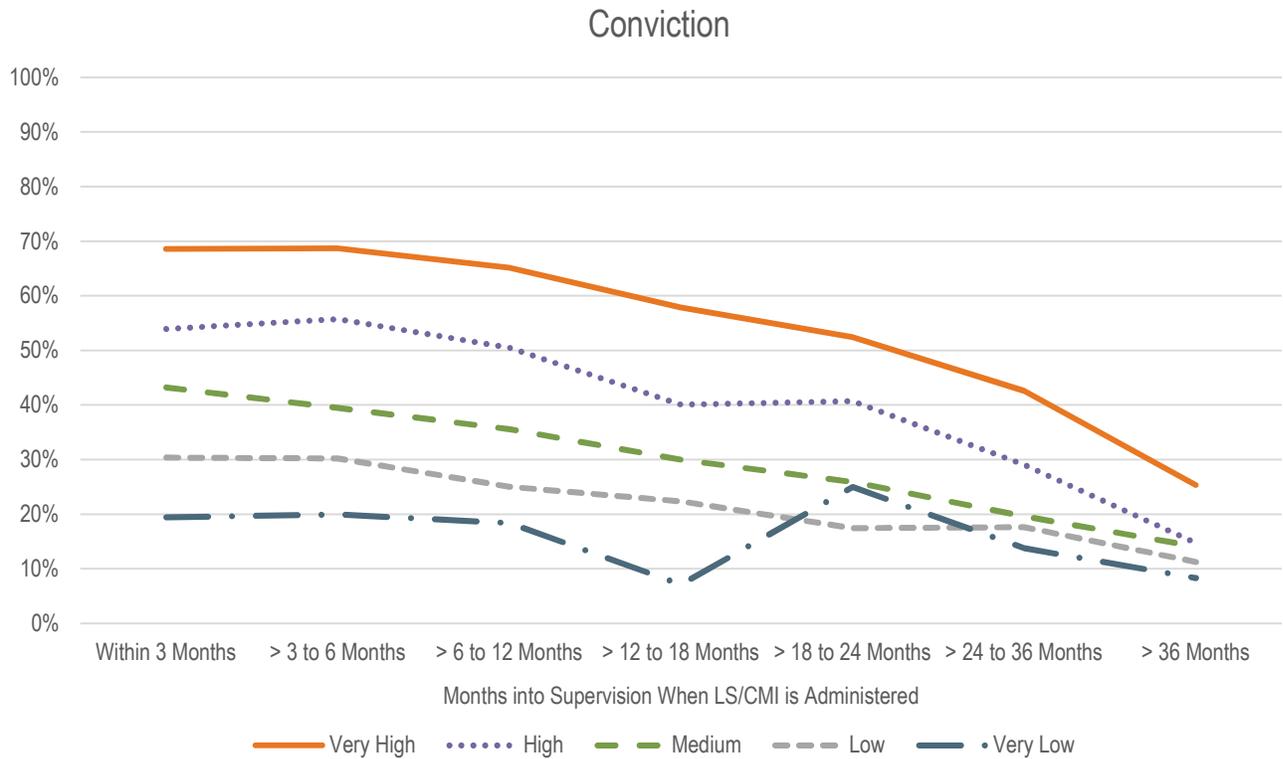
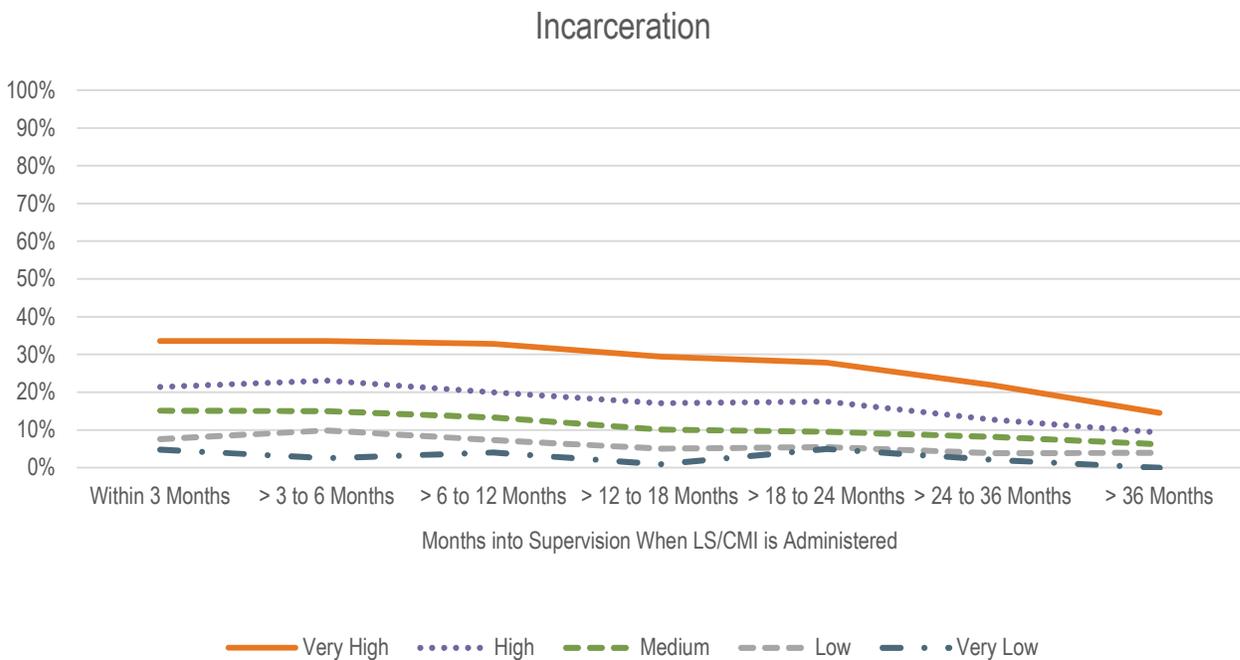


Exhibit 5-13e: Rate of Incarceration Over a 36-Month Period Following an LS/CMI Assessment, by Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Incarceration							
Very High	34%	34%	33%	29%	28%	22%	15%
High	21%	23%	20%	17%	18%	13%	9%
Medium	15%	15%	13%	10%	10%	8%	6%
Low	8%	10%	7%	5%	6%	4%	4%
Very Low	5%	3%	4%	1%	5%	2%	0%
AUC	0.62	0.63	0.65	0.66	0.65	0.64	0.61
95% CI	[0.61, 0.63]	[0.62, 0.64]	[0.64, 0.66]	[0.65, 0.67]	[0.64, 0.67]	[0.62, 0.66]	[0.59, 0.63]

Note: Each observation is an LS/CMI assessment.

Exhibit 5-13f: Rate of Incarceration Over a 36-Month Period Following an LS/CMI Assessment, by Risk Level and Time LS/CMI was Administered During Supervision



The AUC for a given risk assessment is not necessarily comparable across different samples/states, and is also impacted by the number of risk levels and the distribution of offenders across those risk levels (Howard, 2016). This somewhat limits the comparisons we can make between the results of this study to the literature on validation of the LS/CMI and other similar risk assessments. Therefore, to gauge the appropriateness of the LS/CMI for Oregon, we synthesized two alternative risk scores using a logistic regression model of recidivism with variables in the administrative data (age, gender, criminal history) as predictors.

We use generic techniques for determining the right risk severity cut point in the absence of more detailed qualitative information about the level of inaccurate predictions on either side that we are willing to accept.

Both scores use the same model, with the difference being where we draw the cut point. For the first score, we draw the cut point where sensitivity and specificity equal each other or the closest they come to that. The probability associated with that value is the cut point for being likely to recidivate. For the second synthetic scores, the cut point is where the Youden’s index (sensitivity + specificity -1) is greatest.

We also compute the AUC of the PSC risk assessment for our analytic sample. The AUCs for these synthetic risk scores and the PSC for all three recidivism measures are presented in Exhibit 5-14 below. We find that the synthetic scores and the PSC all have similar AUC scores as the LS/CMI for our analytic sample, and none of these alternative scores do a better job than the LS/CMI at predicting recidivism.

Exhibit 5-14: AUCs for Synthetic Scores and PSC

	Arrest	Conviction	Incarceration
Synthetic Score - Sensitivity Equals Specificity	0.61 [0.61,0.62]	0.61 [0.6,0.61]	0.63 [0.62,0.63]
Synthetic Score - Youden's Index	0.61 [0.61,0.62]	0.61 [0.61,0.62]	0.63 [0.62,0.63]
PSC	0.64 [0.64,0.65]	0.63 [0.62,0.63]	0.65 [0.64,0.65]

Note: Each observation is an LS/CMI assessment.

For each time period, we also estimated multivariate logistic regressions of recidivating within 3 years of an assessment with the LS/CMI score as the key predictor, while also adjusting for offender demographics, offense types, and year of assessment. The correlations between the LS/CMI score and recidivism rates among the Oregon offender population for each time period are reported in Exhibit 5-15 below. Each cell shows results from a different regression model. We find that in every time period and for both measures of recidivism, the overall LS/CMI score is significantly associated with recidivism even after adjusting for offender demographics, offense types, and year of assessment. For example, for LS/CMIs conducted within 3 months of starting supervision, a one point increase in the overall score is associated with 5% higher odds of the offender having an arrest within 36 months of the assessment, holding demographics, criminal history, and the year of assessment constant. This indicates that the LS/CMI score has predictive ability beyond the variables also available in the administrative data.

Exhibit 5-15: Logistic Regression Models of Recidivism within 36 months of Assessment on LS/CMI Score

LS/CMI Window	Arrest Odds Ratio (SE)	Conviction Odds Ratio (SE)	Incarceration Odds Ratio (SE)
0- 3 Months	1.05 (0.002)***	1.05 (0.002)***	1.05 (0.002)***
> 3 to 6 Months	1.04 (0.003)***	1.06 (0.003)***	1.05 (0.004)***
> 6 to 12 Months	1.05 (0.003)***	1.06 (0.003)***	1.06 (0.003)***
> 12 to 18 Months	1.05 (0.003)***	1.06 (0.003)***	1.07 (0.003)***
> 18 to 24 Months	1.04 (0.005)***	1.06 (0.005)***	1.07 (0.005)***
> 24 to 36 Months	1.04 (0.006)***	1.06 (0.006)***	1.07 (0.005)***
> 36 Months	1.04 (0.011)***	1.07 (0.012)***	1.06 (0.006)***

Note: Each observation is an LS/CMI assessment. +p<.10, * p<.05, ** p<.01, *** p<.001

To assess how well the LS/CMI score predicts recidivism for specific offense types, we present the below tables (Exhibit 5-16a, 5-16b, and 5-16c), which shows recidivism rates by risk level and offense types for the assessments administered within 3 months of supervision.

Exhibit 5-16a: Rate of Arrest Over a 36-Month Period Following LS/CMI Assessment, by Risk Level and Offense Type, for LS/CMIs Administered within the First 6 Months of Supervision Start

	Drug (n=18,179)	Property (n=14,369)	Driving (n=1,571)
Risk Level			
Very High	72%	72%	56%
High	59%	61%	47%
Medium	48%	50%	38%
Low	36%	36%	33%
Very Low	24%	21%	31%
AUC	0.62	0.62	0.57
95% CI	[0.61, 0.62]	[0.61, 0.63]	[0.54, 0.6]
Total Recidivated Across All Risk Groups	10,269	8,185	643

Note: Each observation is an LS/CMI assessment.

Exhibit 5-16b: Rate of Conviction Over a 36-Month Period Following LS/CMI Assessment, by Risk Level and Offense Type, for LS/CMIs Administered within the First 6 Months of Supervision Start

	Drug (n=18,677)	Property (n=14,740)	Driving (n=1,607)
Risk Level			
Very High	69%	68%	51%
High	55%	54%	39%
Medium	43%	43%	33%
Low	31%	30%	28%
Very Low	22%	19%	8%
AUC	0.62	0.63	0.57
95% CI	[0.62, 0.63]	[0.62, 0.63]	[0.54, 0.59]
Total Recidivated Across All Risk Groups	9,909	7,477	563

Note: Each observation is an LS/CMI assessment.

Exhibit 5.16c: Rate of Incarceration Over a 36-Month Period Following LS/CMI Assessment, by Risk Level and Offense Type, for LS/CMIs Administered within the First 6 Months of Supervision Start

	Drug (n=20,384)	Property (n=15,654)	Driving (n=1,644)
Risk Level			
Very High	32%	36%	24%
High	20%	24%	21%
Medium	13%	17%	15%
Low	7%	9%	11%
Very Low	3%	5%	0%
AUC	0.62	0.63	0.58
95% CI	[0.62, 0.64]	[0.61, 0.63]	[0.55, 0.62]
Total Recidivated Across All Risk Groups	4,073	3,597	273

Note: Each observation is an LS/CMI assessment.

For all three measures of recidivism, the AUC scores are slightly higher for drug and property offenses than for driving crimes. This indicates that the LS/CMI may be better at predicting recidivism among offenders who had drug and property offenses.

To further explore differences by offense type, we computed AUC scores for finer offense subcategories for LS/CMIs conducted within 6 months of supervision start (drugs: possession, other drug offenses, property: burglary, motor vehicle theft, theft, other property). These are reported in Exhibits 5-17a, 5-17b, and 5-17c below. For both measures of recidivism, the AUC score ranges from 0.58 to 0.63. This is similar to the results found for overall recidivism and for the broader subgroups (drug, property and driving.)

Exhibit 5-17a: Rate of Arrest Over a 36-Month Period Following LS/CMI Assessment, by Risk Level and Specific Property and Drug Crime Type, for LS/CMIs Administered within the First 6 Months of Supervision Start

	Drug Possession (n=12,769)	Other Drug Offenses (n=5,410)	Burglary (n=4,347)	Motor Vehicle Theft (n=2,046)	Theft (n=6,307)	Other Property Offenses (n=807)
Risk Level						
Very High	74%	64%	71%	78%	69%	74%
High	62%	52%	63%	70%	57%	60%
Medium	53%	39%	51%	60%	46%	53%
Low	41%	28%	40%	57%	32%	39%
Very Low	35%	9%	36%	13%	18%	21%
AUC	0.63	0.59	0.60	0.62	0.62	0.62
95% CI	[0.62, 0.64]	[0.56, 0.61]	[0.59, 0.62]	[0.61, 0.64]	[0.59, 0.61]	[0.61, 0.63]
Total Recidivated Across All Risk Groups	7,761	2,508	2,550	1,409	3,233	462

Note: Each observation is an LS/CMI assessment.

Exhibit 5-17b: Rate of Conviction Over a 36-Month Period Following LS/CMI Assessment, by Risk Level and Specific Property and Drug Crime Type, for LS/CMIs Administered within the First 6 Months of Supervision Start

	Drug Possession (n=13,171)	Other Drug Offenses (n=5,506)	Burglary (n=4,458)	Motor Vehicle Theft (n=2,102)	Theft (n=6,444)	Other Property Offenses (n=829)
Risk Level						
Very High	72%	59%	65%	75%	66%	68%
High	59%	47%	54%	64%	50%	53%
Medium	49%	34%	43%	51%	40%	45%
Low	37%	22%	36%	43%	25%	34%
Very Low	30%	11%	36%	13%	16%	5%
AUC	0.64	0.61	0.60	0.62	0.61	0.62
95% CI	[0.62, 0.65]	[0.59, 0.64]	[0.58, 0.61]	[0.61, 0.64]	[0.6, 0.62]	[0.58, 0.66]
Total Recidivated Across All Risk Groups	7,629	2,280	2,305	1,327	2,938	421

Note: Each observation is an LS/CMI assessment.

Exhibit 5-17c: Rate of Incarceration Over a 36-Month Period Following LS/CMI Assessment, by Risk Level and Specific Property and Drug Crime Type, for LS/CMIs Administered within the First 6 Months of Supervision Start

	Drug Possession (n=14,624)	Other Drug Offenses (n=5,760)	Burglary (n=4,700)	Motor Vehicle Theft (n=2,274)	Theft (n=6,846)	Other Property Offenses (n=876)
Risk Level						
Very High	33%	29%	35%	39%	36%	30%
High	20%	20%	24%	33%	21%	22%
Medium	13%	13%	19%	23%	15%	18%
Low	7%	7%	13%	14%	8%	6%
Very Low	5%	1%	9%	0%	5%	0%
AUC	0.64	0.58	0.60	0.62	0.63	0.62
95% CI	[0.62, 0.65]	[0.56, 0.6]	[0.58, 0.61]	[0.6, 0.64]	[0.62, 0.64]	[0.59, 0.66]
Total Recidivated Across All Risk Groups	3,050	1,023	1,125	719	1,342	178

Note: Each observation is an LS/CMI assessment.

Finally, we considered alternative LS/CMI cutoff scores for different risk/need levels for Oregon offenders under supervision. To do this, we studied the distribution of risk scores and how they were correlated with recidivism rates to see if there were clear cutoffs (e.g., a step function) that we could observe in the data. The graphs in Exhibits 5-18a, 5-18b, and 5-18c plot the 3-year arrest, conviction, and incarceration rates against the overall LS/CMI score. These graphs include all assessments within our data window, not just the initial assessments. Different colors are used to indicate the different LS/CMI score ranges. The distribution of the scores do not indicate any clear cutoffs, and the cutoffs prescribed by the LS/CMI seem reasonable for use in this population.

Exhibit 5-18a: Three-Year Arrest Rate by LS/CMI Risk Score

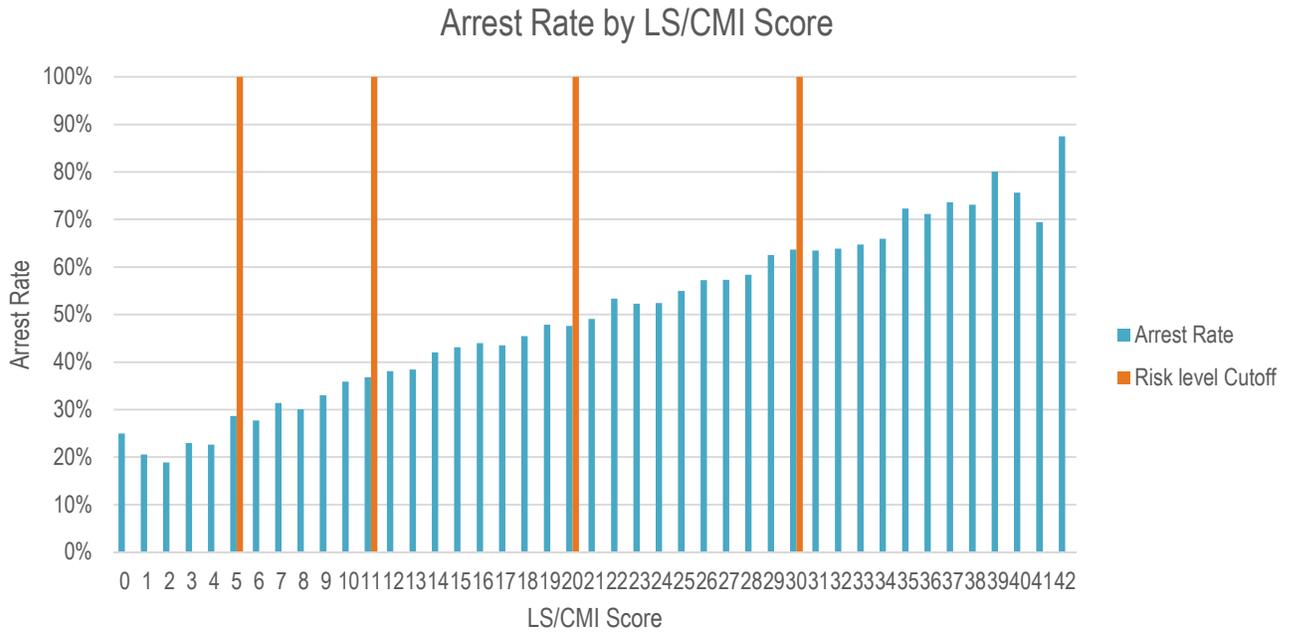


Exhibit 5-18b: Three Year Conviction Rate by LS/CMI Risk Score

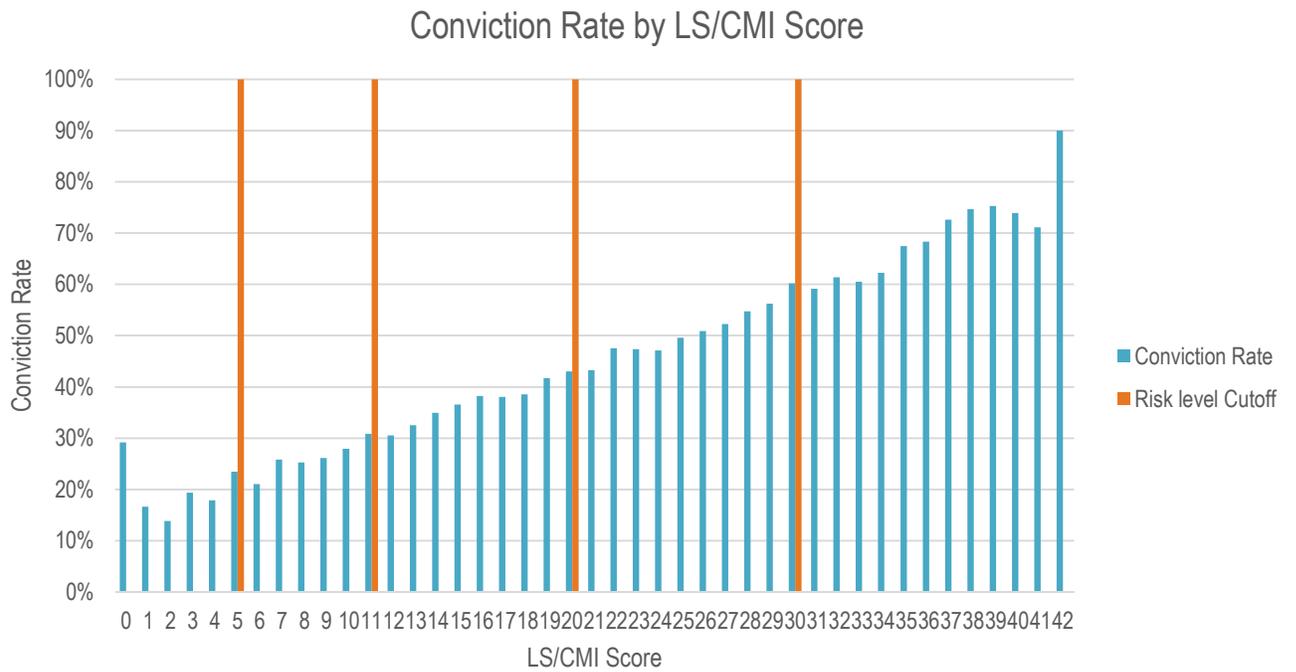


Exhibit 5-18c: Three Year Incarceration Rate by LS/CMI Risk Score



5.6. What is the impact of treatment on recidivism and LS/CMI overall and domain scores?

Exhibit 5-19 below shows descriptive statistics for supervision terms where 1) the offender was referred to some type of treatment, and 2) where the offender did not receive any treatment referrals. These two groups are referred to as “Treatment” and “Comparison” groups in the table below. Each observation is a term of supervision. Statistically significant differences in the means of the treatment and comparison groups are indicated with asterisks

Exhibit 5.19: Descriptive Statistics for Analytic Sample of Supervision Terms – Treatment vs Comparison Groups (N=49,701)

Covariate	Percent or Mean	
	Treatment	Comparison
Age***	33.2	34.2
Male***	70.93%	78.09%
Black***	6.38%	7.50%
Hispanic	9.63%	9.56%
White*	80.69%	79.78%
Other race	3.30%	3.17%
Offenders with 3+ Person Felonies ^{1**}	5.75%	6.45%
Offenders with 2 Person Felonies ¹	6.50%	6.75%
Offenders with 1 Person Felony and 1 non-Person Felony ^{1*}	10.11%	10.73%
Offenders with 1 Person Felony ^{1**}	4.82%	4.32%
Offenders with 4+ Adult Non-Person Felonies ^{1***}	12.11%	14.05%
Offenders with 2-3 Adult Non-Person Felonies ¹	9.67%	9.93%
Offenders with 4+ Adult Misdemeanor or 1 Adult Non-Person Felony or 3+ Juvenile Non-Person Felonies ¹	11.96%	11.46%
Offenders with 3 or Fewer Adult Misdemeanors or 2 or Fewer Juvenile Non-Person felonies ^{1***}	11.39%	10.36%
Offenders with No Felonies or Adult Misdemeanors ^{1***}	18.97%	16.70%
Crime Severity Score ^{2***}	3.21	2.76
Current driving offense***	4.63%	3.79%
Current drug offense***	54.51%	56.26%
Current property offense*	40.86%	39.95%
Prior supervision sentences***	19.14%	27.29%
Prior incarceration sentence***	3.53%	4.99%
Prior driving offenses*	0.48%	0.62%
Prior drug offenses***	11.16%	17.13%
Prior property offenses***	8.49%	10.95%
N	26,432	23,269

+p<.10, * p<.05, ** p<.01, *** p<.001

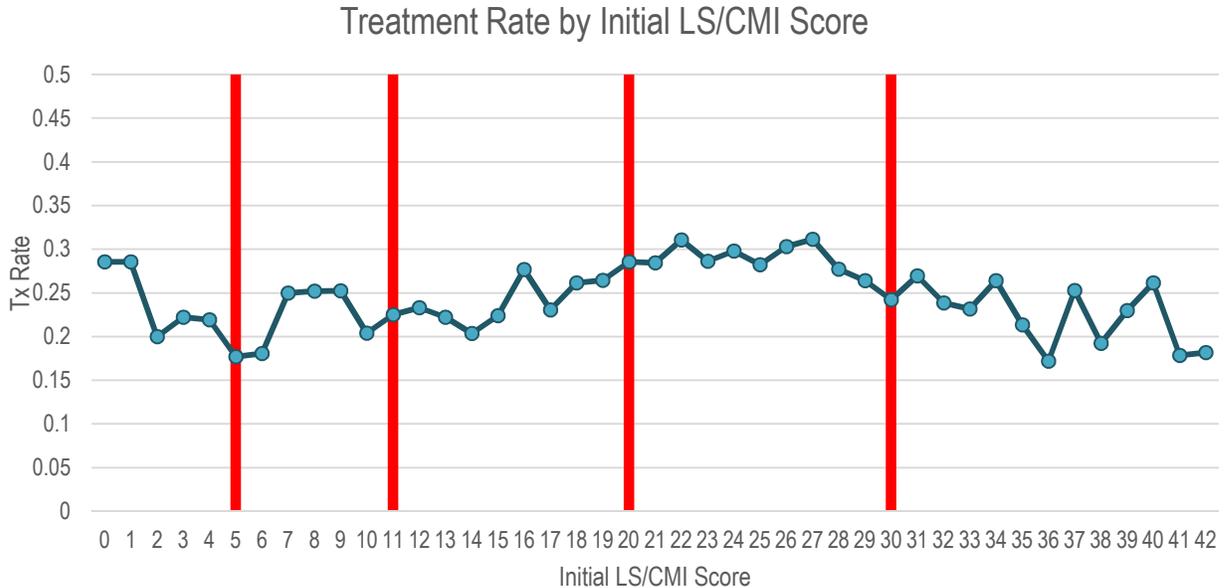
Note: Each observation is a supervision term. Significant differences are represented by asterisks.

¹ The offender person felonies categories are based on the criminal history scale from sentencing guidelines

² The crime severity score is based on the sentencing guidelines grid. Due to missing data, sample size is reduced for the crime severity score (treatment: 26,162, comparison: 22,762, total: 48,924)

To investigate how treatment referrals impacted recidivism and risk scores, we first tested if it was possible to use a regression discontinuity design (RDD) model. This approach relies on the use of scores to assign offenders to different treatment/programming options. We planned to use the initial LS/CMI score as the running variable in an RDD model to study the impact of treatment receipt on subsequent LS/CMI scores, similar to approach demonstrated in Rhodes and Jalbert (2013). The RDD approach requires that the probability of receiving treatment be discontinuous at some critical value of the risk score. To test this, we generated the following graph in Exhibit 5-20 below.

Exhibit 5-20: Treatment Rate by LS/CMI Score for Drop in Subsequent Risk Score Outcome



This graph shows the rate of treatment by LS/CMI initial score. The LS/CMI risk levels are indicated with red vertical lines. We don't observe any large discontinuities in the scores except between the "Very Low" and "Low" risk groups. Even in that case, there is not much continuity on either side of the cutoff. Further, at all the score cutoffs between risk levels, the differences between scores on either side of the cutoff is small. Moving from the "Very Low" to "Low" risk levels, we see about a 5 percentage point jump in the treatment rate. For a fuzzy RDD model to work, we would want a much larger jump in the rate of treatment in order to have sufficient statistical power to detect the impact of treatment on subsequent scores and recidivism. Given this finding, we decided to use matching techniques instead of the RDD approach to answer this research question. Note that this is a supervision term-level analysis, unlike the previous analyses presented in this report that are at the assessment level.

We chose to use coarsened exact matching (CEM) (Blackwell et al, 2009) over propensity score matching (PSM), as we had a sufficiently large sample to do so, and because PSM can generate greater imbalance (and variance) than CEM (Iacus et al, 2012). We used CEM for both the overall and domain specific analyses. Note that the specific variables used in matching varied slightly across each domain as the treatment type varied across each. CEM measures imbalance through the L1 statistic, which is a measure of global imbalance based on the L1 difference between the multidimensional histogram of all pretreatment covariates in the treated group and that in the comparison group (Iacus et al, 2012). Perfect global balance is indicated by L1=0, and larger values indicate greater imbalance between the treatment and comparison groups, with a maximum of L1=1. The L1 statistic is not useful on its own, but rather as a point of comparison for pre- vs post matching.

For treatment in general (not domain-specific treatments), we produced the below tables (Exhibit 5-21a to 5-21d) that summarize the multivariate and univariate LI statistics both before and after matches. We see a good reduction in imbalance after matching. Most of the remaining imbalance is on age because it is a continuous outcome with such a wide range (18-82). All other variables have small differences in means after matching, and the imbalance in age is much improved. We used the full sample of offenders with at least two LS/CMIs (in order to detect a drop in the score), including those with scores in the “Very Low” range. It is possible to score “Very Low” overall but still score “High” or “Very High” in a domain, so it seems reasonable to assume that some offenders with a “Very Low” overall score would still be eligible for treatment.

Exhibit 5-21a: Balance for Treatment (General) - Drop in LS/CMI Score

	Before Matching			After Matching		
	Multivariate L1	Univariate L1	Mean Difference across Groups	Multivariate L1	Univariate L1	Mean Difference across Groups
Multivariate Balance	0.99			0.51		
Univariate Imbalance						
LS/CMI Score		0.08	0.26	0.00	0.00	
Male		0.04	-0.04	0.00	0.00	
Black		0.01	0.01	0.00	0.00	
Hispanic		0.01	0.01	0.00	0.00	
White		0.02	-0.02	0.00	0.00	
Age		0.04	-0.39	0.08	-0.01	
Criminal History Level		0.05	0.24	0.00	0.00	
Crime Severity Score		0.02	0.09	0.00	0.00	
Supervision Year		0.04	0.12	0.00	0.00	
Past Drug Offenses		0.06	-0.06	0.00	0.00	

Note: Each observation is a supervision term.

SECTION 5: ANALYSIS

Exhibit 5-21b: Balance for Treatment (General) - Re-Arrest within Three Years

	Before Matching			After Matching		
	Multivariate L1	Univariate L1	Mean Difference across Groups	Multivariate L1	Univariate L1	Mean Difference across Groups
Multivariate Balance	0.99			0.46		
Univariate Imbalance						
LS/CMI Score		0.09	-0.35		0.00	0.00
Male		0.05	-0.05		0.00	0.00
Black		0.01	0.01		0.00	0.00
Hispanic		0.01	0.01		0.00	0.00
White		0.02	-0.02		0.00	0.00
Age		0.04	0.14		0.07	0.03
Criminal History Level		0.05	0.21		0.00	0.00
Crime Severity Score		0.05	0.28		0.00	0.00
Supervision Year		0.02	0.02		0.00	0.00
Past Drug Offenses		0.07	-0.07		0.00	0.00

Note: Each observation is a supervision term.

Exhibit 5-21c: Balance for Treatment (General) - Re-Conviction within Three Years

	Before Matching			After Matching		
	Multivariate L1	Univariate L1	Mean Difference across Groups	Multivariate L1	Univariate L1	Mean Difference across Groups
Multivariate Balance	0.99			0.49		
Univariate Imbalance						
LS/CMI Score		0.09	-0.26		0.00	0.00
Male		0.05	-0.05		0.00	0.00
Black		0.00	0.00		0.00	0.00
Hispanic		0.01	0.01		0.00	0.00
White		0.02	-0.02		0.00	0.00
Age		0.04	0.05		0.06	0.03
Criminal History Level		0.04	0.20		0.00	0.00
Crime Severity Score		0.04	0.27		0.00	0.00
Supervision Year		0.03	0.04		0.00	0.00
Past Drug Offenses		0.07	-0.07		0.00	0.00

Note: Each observation is a supervision term.

SECTION 5: ANALYSIS

Exhibit 5-21d: Balance for Treatment (General) - Re-Incarceration within Three Years

	Before Matching			After Matching		
	Multivariate L1	Univariate L1	Mean Difference across Groups	Multivariate L1	Univariate L1	Mean Difference across Groups
Multivariate Balance	0.99			0.51		
Univariate Imbalance						
LS/CMI Score		0.08	0.18	0.00	0.00	
Male		0.04	-0.04	0.00	0.00	
Black		0.01	0.01	0.00	0.00	
Hispanic		0.01	0.01	0.00	0.00	
White		0.02	-0.02	0.00	0.00	
Age		0.04	-0.35	0.08	0.00	
Criminal History Level		0.05	0.25	0.00	0.00	
Crime Severity Score		0.02	0.09	0.00	0.00	
Supervision Year		0.03	0.11	0.00	0.00	
Past Drug Offenses		0.06	-0.06	0.00	0.00	

Note: Each observation is a supervision term.

For the domain specific treatments, we created the below table (Exhibit 5-22) with the multivariate before and after L1s. We matched on slightly different variables for the domains, because they have different treatments. We only used the crime severity variable for pro-criminal attitudes and antisocial; only used current and past drug offenses for alcohol/drugs; and instead of matching on LS/CMI raw score, we matched on the LS/CMI overall level and the domain specific level. Unlike the overall treatment analysis, we retained only those with a High or Very High score on that domain to create a more localized comparison group, because in theory only those offenders *should* get that treatment. For all domains, balance is noticeably improved after matching.

Exhibit 5-22: Balance for Domain-Specific Treatment Types: Multivariate L1 Statistics

Domain	Drop in LS/CMI Score		Re-Arrest		Re-Conviction		Re-Incarceration	
	Before Matching	After Matching	Before Matching	After Matching	Before Matching	After Matching	Before Matching	After Matching
Family/Marital	0.97	0.42	0.98	0.35	0.98	0.36	0.97	0.33
Education/ Employment	0.99	0.38	0.99	0.33	0.99	0.31	0.99	0.38
Leisure/ Recreation	0.98	0.49	0.98	0.40	0.98	0.39	0.98	0.43
Companions	0.96	0.52	0.96	0.51	0.96	0.50	0.96	0.53
Alcohol/Drug	0.93	0.57	0.95	0.57	0.94	0.58	0.93	0.57
Pro-criminal Attitude	0.95	0.36	0.97	0.33	0.97	0.37	0.95	0.37
Anti-social Pattern	0.96	0.45	0.97	0.37	0.97	0.37	0.96	0.45

Note: Each observation is a supervision term.

After matching, we used a mixed effects logit model with robust standard errors, and a random effect for the county, given that the outcomes and our primary independent variable are likely to vary by county. We controlled for the same variables used in matching to account for any remaining imbalances, and added a few additional covariates, namely past incarceration, past driving offenses, and past property offenses. We did not include these in matching because a) we thought they were unlikely to be strongly linked to treatment and b) there was enough overlap with the criminal history variable that including them severely limited the number of matches. In the domain-specific models, we include all of these variables as controls except a) in place of LS/CMI score, we used the LS/CMI level and the domain score and b) we dropped the race variable, because with the sample reduced, after matching the models had trouble converging with race in the model (very little racial variation).

For any treatment, Exhibit 5-23 below shows the odds ratios for all the variables, including covariates. Exhibit 5-24 shows the results of the domain specific analyses. We found that treatment in general was associated with a decline in the likelihood of arrest, conviction, and incarceration. We did not find a significant effect of referral on subsequent LS/CMI scores.

SECTION 5: ANALYSIS

Exhibit 5-23: Output for Mixed Effects Logistic Regression of Recidivism and a Drop in LS/CMI Score on a Referral to Treatment (General) after Matching, Clustering by County

	Drop in LS/CMI Overall Score Odds Ratio (SE)	Re-Arrest within Three Years Odds Ratio (SE)	Re-Conviction within Three Years Odds Ratio (SE)	Re-Incarceration within Three Years Odds Ratio (SE)
Treatment Referrals (General)	1.15 (0.12)	0.45 (0.06)***	0.58 (0.05)***	0.67 (0.07)***
LS/CMI Score	1.05 (0.01)***	1.04 (0.01)**	1.03 (0.01)***	1.08 (0.02)***
Age	0.85 (0.16)	0.35 (0.07)***	0.37 (0.08)***	0.45 (0.12)**
Male	0.81 (0.09)	1.39 (0.22)*	1.31 (0.19)	2.48 (0.60)***
Race ¹				
Black	0.17 (0.21)	7.86 (8.43)	0.83 (0.81)	0.93 (1.02)
Hispanic	0.86 (0.92)	2.36 (2.40)	1.20 (1.09)	0.61 (0.48)
White	0.90 (0.96)	2.09 (1.87)	1.41 (1.28)	0.66 (0.52)
Criminal History Score ²				
2 Person Felonies	0.42 (0.15)*	0.95 (0.31)	0.92 (0.34)	1.96 (0.58)*
1 Person Felony and 1 non-Person Felony	0.40 (0.14)**	1.22 (0.46)	1.36 (0.53)	2.11 (0.66)*
1 Person Felony	0.34 (0.19)*	1.21 (0.81)	1.36 (0.72)	1.73 (1.19)
4+ Adult Non-Person Felonies	0.46 (0.17)*	0.92 (0.29)	0.83 (0.22)	2.00 (0.58)*
2-3 Adult Non-Person Felonies	0.56 (0.21)	0.91 (0.33)	0.63 (0.17)	0.96 (0.36)
4+ Adult Misdemeanor or 1 Adult Non-Person Felony or 3+ Juvenile Non-Person Felonies	0.53 (0.16)*	0.72 (0.23)	0.9 (0.31)	1.12 (0.26)
3 or Fewer Adult Misdemeanors or 2 or Fewer Juvenile Non-Person felonies	0.61 (0.17)	0.66 (0.27)	0.87 (0.31)	1.10 (0.41)
No Felonies or Adult Misdemeanors	0.52 (0.13)**	0.68 (0.20)	0.69 (0.29)	0.95 (0.36)
Crime Severity Score ³				
1	1.05 (0.29)	2.62 (0.82)**	2.67 (0.96)**	0.93 (0.29)
2	1.42 (0.37)	1.29 (0.40)	1.13 (0.44)	0.52 (0.18)
3	1.16 (0.42)	1.11 (0.34)	0.85 (0.34)	0.72 (0.35)
4	2.49 (1.09)*	0.59 (0.26)	0.57 (0.25)	0.27 (0.14)*
5	4.86 (3.33)*	0.39 (0.18)*	0.67 (0.39)	0.37 (0.20)
6	1.47 (0.63)	0.95 (0.29)	1.49 (0.65)	1.37 (0.36)
7	1.06 (0.29)	1.41 (0.51)	1.14 (0.57)	0.57 (0.31)
8	2.35 (0.61)**	1.02 (0.31)	0.93 (0.33)	0.61 (0.23)
9	0.19 (0.21)	1.34 (0.98)	0.35 (0.36)	0.26 (0.30)
Offense Type ⁴				
Driving	3.21 (1.24)**	0.88 (0.38)	0.62 (0.22)	0.72 (0.29)
Drug	1.05 (0.24)	0.59 (0.14)*	0.57 (0.13)*	0.52 (0.07)***
Supervision Start Year ⁵				
2011	0.96 (0.15)	1.01 (0.15)	1.09 (0.18)	0.84 (0.14)
2012	0.84 (0.17)	1.01 (0.17)	1.06 (0.18)	1.04 (0.26)

SECTION 5: ANALYSIS

	Drop in LS/CMI Overall Score Odds Ratio (SE)	Re-Arrest within Three Years Odds Ratio (SE)	Re-Conviction within Three Years Odds Ratio (SE)	Re-Incarceration within Three Years Odds Ratio (SE)
2013	1.25 (0.25)	0.68 (0.14)	0.91 (0.17)	0.73 (0.16)
2014	1.36 (0.19)*	0.71 (0.15)	0.99 (0.20)	1.00 (0.20)
2015	1.02 (0.21)	0.84 (0.16)	1.05 (0.18)	1.01 (0.16)
Past Incarceration	0.75 (0.13)	1.76 (0.53)	1.42 (0.60)	0.82 (0.16)
Past Driving Offense	2.48 (3.23)	0.85 (1.06)	0.89 (0.86)	2.88 (2.62)
Past Drug Offense	0.82 (0.10)	1.25 (0.25)	1.33 (0.22)	1.11 (0.14)
Past Property Offense	0.80 (0.14)	1.41 (0.31)	1.03 (0.19)	1.71 (0.25)***

Note: Each observation is a supervision term.

¹Reference category: other race/ethnicity.

²Reference category: 3+ Person Felonies.

³Reference category: 0.

⁴Reference category: Property.

⁵Reference category: 2010.

For the domain-specific analyses shown in Exhibit 5-24, we find that some treatment referrals (for the Leisure/Recreation, Companions, and Procriminal Attitude domains) result in drop in LS/CMI domain scores. Treatments associated with the Alcohol/Drug, Procriminal Attitude, Antisocial Pattern, Companions, Leisure, and Family/Marital domains were each linked to a decrease in odds of at least one of the three recidivism measures.

Exhibit 5-24: Output for Mixed Effects Logistic Regression of Recidivism and a Drop in Domain-Specific LS/CMI Score on a Referral to Domain-Specific Treatment Type of Treatment after Matching, Clustering by County

Treatment/Domain Type	Drop in LS/CMI Overall Score Odds Ratio (SE)	Re-Arrest within Three Years Odds Ratio (SE)	Re-Conviction within Three Years Odds Ratio (SE)	Re-Incarceration within Three Years Odds Ratio (SE)
Family / Marital Treatment	0.83 (0.18)	0.68 (0.14)	0.59 (0.09)**	0.61 (0.14)*
Education / Employment Treatment	0.66 (0.10)**	0.56 (0.26)	0.49 (0.22)	0.79 (0.17)
Leisure / Recreation Treatment	1.55 (0.34)*	0.89 (0.18)	0.63 (0.07)***	1.20 (0.20)
Companions Treatment	1.30 (0.18)*	0.80 (0.12)	0.70 (0.08)***	0.96 (0.13)
Alcohol / Drug Treatment	1.03 (0.09)	0.49 (0.04)***	0.66 (0.08)***	0.58 (0.05)***
Pro-criminal Attitude Treatment	1.39 (0.19)*	0.34 (0.08)***	0.65 (0.14)*	0.38 (0.08)***
Anti-social Pattern Treatment	0.89 (0.12)	0.61 (0.16)	0.87 (0.17)	0.52 (0.10)***

Note: Each observation is a supervision term.

6. Discussion

We find that the majority of offenders who are reassessed remain at the same LS/CMI level. Once offender demographics and criminal history are taken into account, scores decrease slightly over time, although these decreases are not large enough to lead to a lower risk level. Patterns are similar for men and women, although women show even larger reductions in LS/CMI score over time.

In general, the stakeholder interviews and focus groups indicate that probation officers are largely using the LS/CMI as intended and have a favorable impression of the tool. They report conducting the assessments and re-assessments within the recommended time periods. In the few instances where officers report overriding the LS/CMI risk level, they have clear justifications for doing so. Yet officers do note some challenges. Despite annual DOC trainings, officers note that certain sections (pro-criminal attitudes, companions, family/marital) are consistently harder to score than others.

We analyze patterns in treatment referral rates, and find that treatment referrals tend to occur early in a supervision term. High and very high risk offenders are more likely than low risk offenders to receive a treatment referral. Female offenders have higher rates of treatment referral than men.

We also find that certain counties had higher rates of referral. The geographic variation likely depends on several factors, including different population densities and needs, availability of treatment providers, county-specific referral practices, and proximity to other states. These findings align with what we learned through the interviews and focus groups. While all county directors interviewed mentioned having to refer supervisees to treatment out of county, this theme was more prominent in rural counties where resources were more limited. Rurality, though, is not the only explanation for low treatment rate referrals. Other reasons for county-level variation may include different referral practices and different rates of accurate data entry across counties.

To study how treatment referral rates vary by domains, we map treatments to domains and find that offenders with a “very high” score in the Alcohol/Drug, Pro-criminal Attitude, and Anti-social Pattern domains have higher rates of referrals to the associated treatments than other offenders. Some probation officers note that there is greater availability of treatment programs for drugs and alcohol (e.g., substance abuse programs) and pro-criminal attitudes and anti-social patterns (e.g., cognitive behavioral therapy, dialectical behavioral therapy), which is likely a factor driving these findings. Regardless of the reason for these differences, they are likely to impact supervisees’ success, as supervisees with risks in those three domains are more likely to be referred to treatment than are supervisees with high risks in the other domains. For example, a supervisee with familial issues is less likely to have those issues addressed by treatment during supervision. We note that we study treatment referrals specifically because the data provided did not capture treatment progress or completion. We might find different results if we analyze treatment progress or treatment completion.

While officers do report using LS/CMI domain scores to inform treatment referral decisions, they note that it is a challenge to incorporate the LS/CMI into case planning. Some state that creating a complete electronic case plan is challenging as it requires entering data into multiple information systems. Some officers note that case planning takes up time that they could otherwise spend working with their clients on their challenges. Others express difficulty working with their clients to create short-term goals. From these interviews, it appears that incorporating the LS/CMI into case planning is an ongoing process in Oregon. It will likely require some time and effort to increase case plan completion rates.

We also study the LS/CMI’s predictive ability using AUC scores. The AUC scores we estimated – 0.63 for LS/CMIs administered in the first 3 months of supervision – indicate moderate predictive ability. We note that the LS/CMI does differentiate between risk groups, as indicated by the differences in recidivism rates between the groups. However many researchers agree that AUC scores of 0.74 are considered good

(Drew, Wiersma, & Huettmann, 2011; Hanley & McNeil, 1982), and by comparison, a score of 0.63 likely represents a material difference in the strength of prediction.

The predictive ability of the LS/CMI could be driven by a number of factors. First, in Oregon the LS/CMI is administered only to offenders who receive a “Medium” or “High” score on the PSC. This means that among offenders who do receive an LS/CMI, recidivism rates will be higher than in the general pool of offenders under supervision, and the distribution of risk is likely to have a smaller variance. This makes it harder for the LS/CMI to discriminate between risk groups. This is bolstered by the fact that we do not find appreciably better AUC scores when using the PSC or the two types of synthetic risk scores that we constructed. These assessments also have difficulty discriminating between risk groups in a sample with restricted risk variance. Also, when the LS/CMI was constructed, it may not have been calibrated to a group of higher risk offenders. This might result in poorer predictive accuracy in this particular population. Finally, interviews with stakeholders indicate that in the early years following the LS/CMI rollout, inter-rater reliability was low and also varied significantly by county. Stakeholders also note that certain sections of the instrument are harder to score accurately, and that training to improve scoring accuracy is ongoing. These factors likely contributed to the AUC score.

Finally, we investigate the effect of treatment on recidivism and reductions in risk scores. We look separately at the three standard recidivism measures used in Oregon: arrest, conviction, and incarceration. We compare offenders who received treatment referrals to similar offenders who did not. We find that in general, referral to treatment reduces rates of all 3 recidivism outcomes, but has no significant impact on overall LS/CMI score. When we study domain-specific treatments, we find a drop in recidivism associated with treatments linked to the Alcohol/Drug and Pro-criminal Attitude domains. We also find a drop in LS/CMI scores associated with treatments linked to the Recreation, Companions, and Pro-criminal Attitude domains. Note that we are only able to study treatment referral, because the data on treatment progress and completion were unreliable or missing for most offenders.

The results on the impact of treatment referral are encouraging, and also unsurprising given the literature on some of these interventions. The leisure/recreation domain is linked to job training, and there is some supportive evidence for job training in improving criminal justice-related outcomes and also for the general importance of education and employment during reentry (Finn, 1998; Lockwood, Nally, Ho, & Knutson, 2012; Uggen, 2000.) In addition, reductions in risk scores for pro-criminal attitudes are also likely a product of the specific treatments used to address those issues. Treatments for this domain include cognitive behavioral therapy and dialectical behavioral therapy, which evaluations suggest are effective in improving supervisee outcomes (Dimeff & Linehan, 2008; Jewell, Malone, Rose, Sturgeon, & Owens, 2013; Shelton, Kesten, Zhang, & Trestman, 2011).

While supervisees referred to substance abuse and educational treatments appear to see benefits simply from the referral, for other risk types, a longer stay in treatment may be necessary in order for real change to be observed. In addition, the effects of those treatments for which a change was observed (alcohol/drug, pro-criminal attitudes, leisure/recreation domains) may be larger when measured as progress or completion rather than just referral. Improvements to data systems to accurately record treatment referral, progress, completion, as well as treatment types and dates would greatly help future research on the impacts of treatment.

References

- Andrew, D. A., Bonta, J., & Hoge, R. D. (1990). Classification for Effective Rehabilitation: Rediscovering Psychology. *Criminal Justice and Behavior*, 17(1), 19-52.
- Andrews, D. A., Guzzo, L., Raynor, P., Rowe, R. C., Jill Rettinger, L., Brews, A., & Stephen Wormith, J. (2012). Are the Major Risk/Need Factors Predictive of Both Female and Male Reoffending?: A Test With the Eight Domains of the Level of Service/Case Management Inventory. *International Journal of Offender Therapy and Comparative Criminology*, 56(1), 113–133.
<https://doi.org/10.1177/0306624X10395716>
- Andrews, D. A., Zinger, I., Hoge, R. D., Bonta, J., Gendreau, P., & Cullen, F. T. (1990). Does Correctional treatment Work? A Clinically relevant and Psychologically Informed Meta-analysis. *Criminology*, 28(3), 369-404.
- Blackwell, M., Iacus, S., King, G., & Porro, G. (2009). cem: Coarsened exact matching in Stata. *Stata Journal*, 9(4), 524-546.
- Berk, R. A., & Bleich, J. (2013). Statistical Procedures for Forecasting Criminal Behavior. *Criminology & Public Policy*, 12(3), 513-544.
- Bonta, J., & Andrews, D. A. (2007). Risk-need-responsivity model for offender assessment and rehabilitation (User Report 2007-06). Ottawa, Ontario: Public Safety Canada.
- Burgess, E. W. (1928). Factors determining success or failure on parole. *The workings of the indeterminate sentence law and the parole system in Illinois*, 221-234.
- Cameron, A., and P. Trivedi. 2005. *Microeconometrics: Methods and Applications*. Cambridge, UK: Cambridge University Press.
- Cohen, T., Lowenkamp, C. T., & VanBenschoten, S. W. (2015). Does Change in Risk Matter? Examining Whether Changes in Offender Risk Characteristics Influences Recidivism Outcomes, forthcoming.
- Dawes, R. M., Faust, D., & Meehl, P. E. (1989). Clinical versus actuarial judgment. *Science*, 243(4899), 1668-1674.
- Drew, C. A., Wiersma, Y., & Huettmann, F. (2011). *Predictive species and habitat modeling in landscape ecology*. Springer, New York.
- Freund, Y., & Schapire, R. E. (1997). A decision-theoretic generalization of on-line learning and an application to boosting. *Journal of computer and system sciences*, 55(1), 119-139.
- Gendreau, P., Little, T., & Goggin, C. (1996). A Meta-analysis of the Predictors of Adult Offender Recidivism: What Works!. *Criminology*, 34(4), 575-608.
- Giguère, G. & Lussier, P. (2016). Debunking the psychometric properties of the LS\CMI: An application of item response theory with a risk assessment instrument, *Journal of Criminal Justice*, 46: 207-218.

- Gottfreson, S. D., & Moriarty, L. J. (2006a). Clinical versus actuarial judgments in criminal justice decisions: Should one replace the other. *Fed. Probation*, 70, 15.
- Hanley, J. A., & McNeil, B. J. (1982). The meaning and use of the area under a receiver operating characteristic (ROC) curve. *Radiology*, 143(1), 29-36.
- Iacus, S., King, G., & Porro, G. (2012). Causal Inference without Balance Checking: Coarsened Exact Matching. *Political Analysis*, 20(1), 1-24. doi:10.1093/pan/mpr013
- Johnson, J. L., Lowenkamp, C. T., VanBenschoten, S. W., & Robinson, C. R. (2011). Construction and Validation of the Federal Post Conviction Risk Assessment (PCRA), The. *Fed. Probation*, 75, 16.
- Jimenez, A. C., Hazel Delgado, R., Vardsveen, T. C., & Wiener, R. L. (2018). Validation and Application of the LS/CMI in Nebraska Probation. *Criminal Justice and Behavior*, 45(6), 863–884. <https://doi.org/10.1177/0093854818763231>
- Lowenkamp, C. T., Latessa, E. J., & Holsinger, A. M. (2004). Empirical evidence on the importance of training and experience in using the Level of Service Inventory-Revised. *Topics in Community Corrections*, 49-53.
- Lowenkamp, C. T., Holsinger, A. M., Brusman-Lovins, L., & Latessa, E. J. (2004). Assessing the inter-rater agreement of the Level of Service Inventory Revised. *Fed. Probation*, 68, 34.
- Lowenkamp, C. T., Johnson, J. L., Holsinger, A. M., VanBenschoten, S. W., & Robinson, C. R. (2013). The federal Post Conviction Risk Assessment (PCRA): A construction and validation study. *Psychological services*, 10(1), 87.
- Lowenkamp, C. T., Holsinger, A. M., & Cohen, T.H. (2015). PCRA Revisited: Testing the Validity of the Federal Post Conviction Risk Assessment (PCRA). *Psychological Services*, forthcoming.
- Mossman, D. (2013). Evaluating risk assessments using Receiver Operating Characteristic (ROC) Analysis: Rationale, advantages, insights, and limitations. *Behavioral Sciences and the Law*, 31: 23-39
- Rhodes, W., & Jalbert, S. K. (2013). Regression Discontinuity Design in Criminal Justice Evaluation: An Introduction and Illustration. *Evaluation Review*, 37(3–4), 239–273.
- Schwalbe, C. S. (2008). A Meta-Analysis of Juvenile Justice Risk Assessment Instruments Predictive Validity by Gender. *Criminal Justice and Behavior*, 35(11), 1367-1381.
- Yang, M., Wong, S. C., & Coid, J. (2010). The efficacy of violence prediction: a meta-analytic comparison of nine risk assessment tools. *Psychological bulletin*, 136(5), 740.
- Zara, G. & Farrington, D. P. (2015). *Recidivism: Explanation, prediction and prevention*. London, UK: Routledge

Appendix A: Stakeholder Interview Guide

My name is ____ and I am a researcher at Abt Associates. Abt Associates has been contracted by the Oregon Criminal Justice Commission to conduct a research study on the predictive validity of the LS/CMI risk assessment tool. Overall, the goal of this study is to better understand how and if the LS/CMI helps you supervise people on all forms of community supervision. Specifically, the study will look at trends in LS/CMI scores over time under supervision, whether the scores accurately predict recidivism, what populations are most successful under supervision, and what conditions of supervision are most effective at improving scores and recidivism. As part of our study activities we will be interviewing key stakeholders to understand how and when the tool is used, as well as any challenges officers may face with the LS/CMI risk assessment. We will also use this interview to understand how case plans are determined in your jurisdiction and how the LS/CMI fits into that determination.

This conversation is voluntary. You do not have to participate, and may choose to stop at any time. You can also choose to skip any question you do not wish to answer. Additionally, we want to let you know that because we are only conducted a small number of interviews, the CJC may be able to link responses back to you. If there is any information that you think is important to share with us to provide context, but would like us to exclude in the final report, please let us know.

Do you have any questions before we proceed?

Background

To start off, we have a few brief general questions for you about your background and your county office.

- 1) How long have you been working in this position? What was your background before taking on this position?
 - a. *Probe: Did you work in another county previously? If so, which county?*
- 2) Approximately how many probation officers and supervisors does your county employ?
 - a. What are the typical caseloads for your probation officers?
 - b. How are caseloads assigned to officers?
 - c. *Probe: Do they have specializations? Is the caseload of specialists exclusively that population or do they have a mix?*

Implementation of LS/CMI

As we mentioned, this evaluation focuses on the roll-out and implementation of the LS/CMI risk assessment tool. We first have a few questions for you about how you rolled out the Public Safety Checklist and the LS/CMI tool:

- 3) When did you first hear about the LS/CMI and what was your initial perception of it?
- 4) We are interested in learning about your process for implementing both the Public Safety Checklist and the LS/CMI. When did you start using the Public Safety Checklist?
- 5) When did you start employing the LS/CMI in your county?
 - a. When would you consider the LS/CMI fully rolled out in your county?
 - b. Do you see variation in how different officers use these assessments?
 - c. What tools did you use before you started using the Public Safety Checklist and LS/CMI?
 - i. Did you use it in a similar fashion to how you currently use the LS/CMI?
- 6) What challenges did you face when you started using the LS/CMI?
 - a. Did you see variation in how officers responded to this new risk assessment tool?

APPENDIX A: STAKEHOLDER INTERVIEW GUIDE

Use of LS/CMI

Now we have a few questions for you about how you and your officers are currently using the tools:

- 7) Could you walk us through how you use these tools in your county?
 - a. *Probe: What role does the PSC play relative to the LS/CMI in determining various aspects of supervision currently?*
 - b. How do you decide who is assessed using the LS/CMI?
 - i. *Probe: Does this vary at all?*
 - c. What percentage of medium / high risk offenders are assessed using the LS/CMI?
 - d. Do you ever conduct LS/CMI on low-risk offenders?
 - i. *Probe: If so, when and why?*
 - e. Has any of this changed as you have spent more time working with the LS/CMI?
- 8) How soon after the start of probation is the LS/CMI assessment conducted?
 - a. How often is the LS/CMI typically re-assessed?
 - b. What triggers a re-assessment of the LS/CMI?
- 9) Do you ever override or alter risk categorization based on your perception of the offenders in relation to the score?
 - a. If so, is this more likely to come at the beginning of supervision or as you have been supervising that individual for an extended period of time?
 - b. What behavior or events might lead an officer to override a score?
- 10) What challenges does your county face in conducting assessments using the LS/CMI on an ongoing basis now?

Determining Case Management Plan

Now we have a few questions about how you determine treatment plans for offenders on supervision and where the LS/CMI comes into this process.

- 11) How do you decide what case plan/treatments each offender will receive?
 - a. *Probe: How is the LS/CMI used in this process?*
 - b. *Probe: What challenges does your county face in using the LS/CMI to determine case management plans and treatments?*
 - c. *Probe: Do you use the scores on various LS/CMI domains to determine treatment?*
- 12) How do changes in LS/CMI scores influence changes in case management plans?
- 13) How were case plans determined before LS/CMI was implemented?
 - a. Are there any challenges that you faced before using the LS/CMI that the LS/CMI addresses/fixes?
 - b. Are there any challenges you were hoping it would address that it does not?

Closing Questions

- 14) What's your overall perception of the LS/CMI tool?
 - a. *Probe: Do you find it useful? How so?*
 - b. *Probe: Do you think it provides an accurate assessment of needs and risk?*
- 15) Those are all the questions we had for you today, but by now you probably have a good sense of what we're interested in. Is there anything that we didn't ask you that you think is important for us to know, either about the LS/CMI or about supervision in your county in general?

APPENDIX A: STAKEHOLDER INTERVIEW GUIDE

Thank you for taking the time to speak with us today. If we have any follow-up questions as we dig deeper into the data and our analyses, would it be okay if we reach out to you?

Appendix B: Probation Officer Focus Group Guide

My name is ____ and I am a researcher at Abt Associates. Abt Associates has been contracted by the Oregon Criminal Justice Commission to conduct a research study on the predictive validity of the LS/CMI risk assessment tool. Overall, the goal of this study is to better understand how and if the LS/CMI helps you supervise people on all forms of community supervision. Specifically, the study will look at trends in LS/CMI scores over time under supervision, whether the scores accurately predict recidivism, what populations are most successful under supervision, and what conditions of supervision are most effective at improving scores and recidivism. As part of our study activities we will be interviewing key stakeholders to understand how and when the tool is used, as well as any challenges officers may face with the LS/CMI risk assessment. We will also use this interview to understand how case plans are determined in your jurisdiction and how the LS/CMI fits into that determination.

This conversation is voluntary. You do not have to participate, and may choose to stop at any time. You can also choose to skip any question you do not wish to answer. Additionally, we want to let you know that because we are only conducted a small number of interviews, the CJC may be able to link responses back to you. If there is any information that you think is important to share with us to provide context, but would like us to exclude in the final report, please let us know.

Do you have any questions before we proceed?

Introduction

Can everyone please go around and state:

- a) Their name
- b) How long they have been a parole and probation officer
- c) Their specific role and current caseload

Conducting LS/CMIs

- 1) When do you initially conduct LS/CMIs? Why then? (probe first visit, second visit, etc)
 - a. Are there occasions when you are unable to conduct the assessment at that visit / within 60 days? If yes, what reasons?
 - b. How long does it take to conduct an LS/CMI assessment?
- 2) When do you conduct re-assessments?
 - a. Do you find re-assessments useful? Why or why not?
 - b. Can you give me an example of a time it was / wasn't particularly useful?
 - c. What triggers you to conduct an early re-assessments?
 - d. Overall, do you find that re-assessments usually lead to lower or higher risk scores? Why or why not?

LS/CMI Scoring

- 3) Which questions or subcomponent areas, if any, do you find particularly easy or straightforward to score? Why?
- 4) Which questions or subcomponent areas do you find particularly subjective or difficult to score? Why?
 - a. (*Probe: marital status, pro-criminal status*)
 - b. Have the inter-rater reliability tests and trainings helped you understand how to score these components better? Why or why not?

APPENDIX B: PROBATION OFFICER FOCUS GROUP GUIDE

- 5) How well do you think LS/CMI scores / sub-scores reflect the risks and needs of offenders you work with?
 - a. Are some sub-scores more or less reliable than others? If so, which?
- 6) Do you ever override LS/CMI scores or sub-component scores? Why or why not?
 - a. If yes, what is the process for overriding the score?
 - b. If not, have you ever wanted to?
 - c. Can you give an example of a time when you overrode / wanted to override a score?

Treatment Plans

Now we have a few questions about case plans and assigning treatment for offenders.

- 7) Do you create treatment plans for offenders? Why or why not?
 - a. If yes, do you enter the plan somewhere? If so, where?
- 8) What is your process for deciding what to include in your treatment plans?
 - a. Do you use LS/CMI sub-scores to inform your plans? If so, how?
 - b. Has your use of LS/CMI for treatment plans changed over time? If so, how?
- 9) Do you face any challenges in using the LS/CMI for creating treatment plans? If so, what are they?
- 10) How do you select treatment providers?
 - a. *Probe: Relationship with treatment providers, repeated relationships vs new relationships etc.*
 - b. Do you ever have difficulty finding treatment providers to meet your client's needs?
- 11) Do you ever use techniques or tools that put you in the role of treatment provider?
 - a. *Probe: CAREY guide, cognitive-behavioral therapy, motivational interviewing, etc*

Overall

- 12) Overall, what is your perception of the LS/CMI?
- 13) Can you list your two favorite and two least favorite things about the LS/CMI, if any?
- 14) That's all the questions we have for you. Do you have anything else you want to share with us?

Appendix C: Treatment Categories

Exhibit C-1 below shows the mapping of treatments to LS/CMI domains we created that incorporates feedback from CJC and stakeholders. Note that we did not map any treatment categories to the criminal history domain. Some treatment categories are mapped to multiple domains (e.g. mental health services mapped to both the Attitude and Antisocial domains.)

The following list includes the treatment categories provided by CJC with additions by Abt Associates as was appropriate

Exhibit C-1: Mapping Treatments to Domains

Domains	Treatments
History	<ul style="list-style-type: none"> N/A
Family	<ul style="list-style-type: none"> Parenting Skills Youth Prevention Services Family Support Services
Education	<ul style="list-style-type: none"> Education Programs/Classes
Recreation	<ul style="list-style-type: none"> Jobs/Employment Related Programs
Associates	<ul style="list-style-type: none"> Cognitive Restructuring Programs
Drug	<ul style="list-style-type: none"> Substance Abuse Treatment Other Substance Use Services Drug Court
Attitude	<ul style="list-style-type: none"> Support Group Cognitive Restructuring Programs Anger Management Treatment Mental Health Treatment Domestic Violence Theft Offender Counseling Substance Abuse Treatment Other Substance Use Services
Antisocial	<ul style="list-style-type: none"> Anger Management Treatment Cognitive Restructuring Programs Mental Health Treatment
Unassigned Treatments	<ul style="list-style-type: none"> Transitional Programs Medical Services

APPENDIX D: TREATMENT RECEIPT OVER TIME BY DOMAIN

Appendix D: Treatment Receipt Over Time by Domain

Exhibit D-1: Rate of Treatment Receipt Following an LS/CMI Assessment, by Family/Marital Domain Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Family/Marital Subdomain							
Very High	4%	2%	1%	1%	0%	0%	0%
High	4%	2%	1%	1%	1%	0%	0%
Medium	3%	1%	1%	0%	1%	0%	0%
Low	3%	1%	1%	0%	0%	0%	0%
Very Low	3%	1%	1%	1%	1%	0%	0%

Exhibit D-2: Rate of Treatment Receipt Following an LS/CMI Assessment, by Education/Employment Domain Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Education/Employment Subdomain							
Very High	3%	1%	1%	1%	0%	0%	0%
High	2%	1%	1%	1%	0%	0%	0%
Medium	1%	1%	0%	1%	0%	0%	0%
Low	1%	0%	0%	0%	0%	0%	0%
Very Low	1%	0%	0%	0%	0%	0%	0%

Exhibit D-3: Rate of Treatment Receipt Following an LS/CMI Assessment, by Education/Employment Domain Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Leisure / Recreation Subdomain							
High	1%	0%	0%	0%	0%	0%	0%
Medium	1%	0%	0%	0%	0%	0%	0%
Very Low	1%	0%	0%	0%	0%	0%	0%

APPENDIX D: TREATMENT RECEIPT OVER TIME BY DOMAIN

Exhibit D-4: Rate of Treatment Receipt Following an LS/CMI Assessment, by Companions Domain Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Companions Domain							
Very High	4%	2%	1%	1%	1%	0%	0%
High	4%	2%	1%	1%	1%	0%	0%
Medium	4%	2%	2%	1%	1%	1%	0%
Low	3%	1%	1%	1%	1%	0%	0%
Very Low	2%	1%	1%	1%	0%	0%	0%

Exhibit D-5: Rate of Treatment Receipt Following an LS/CMI Assessment, by Alcohol/Drug Domain Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Alcohol / Drug Problem Subdomain							
Very High	27%	13%	9%	10%	5%	3%	1%
High	28%	14%	10%	10%	6%	4%	1%
Medium	26%	14%	9%	8%	6%	5%	1%
Low	20%	9%	6%	4%	3%	2%	1%
Very Low	13%	7%	3%	4%	3%	4%	1%

Exhibit D-6: Rate of Treatment Receipt Following an LS/CMI Assessment, by Pro-Criminal Attitude Domain Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
Pro-criminal Attitude Subdomain							
Very High	26%	14%	10%	9%	6%	3%	1%
High	30%	15%	10%	9%	7%	4%	1%
Medium	32%	16%	12%	12%	8%	6%	1%
Low	30%	15%	11%	13%	9%	4%	1%
Very Low	28%	13%	9%	8%	5%	4%	1%

APPENDIX D: TREATMENT RECEIPT OVER TIME BY DOMAIN

Exhibit D-7: Rate of Treatment Receipt Following an LS/CMI Assessment, by Antisocial Pattern Domain Risk Level and Time LS/CMI was Administered During Supervision

	Months into Supervision When LS/CMI is Administered						
	Within 3 Months	> 3 to 6 Months	> 6 to 12 Months	> 12 to 18 Months	> 18 to 24 Months	> 24 to 36 Months	> 36 Months
<i>Anti-social Pattern Subdomain</i>							
Very High	20%	9%	6%	7%	4%	3%	0%
High	17%	8%	5%	5%	3%	2%	1%
Medium	16%	8%	5%	5%	3%	2%	0%
Low	13%	6%	5%	4%	3%	2%	0%
Very Low	11%	5%	4%	3%	3%	1%	1%

APPENDIX E: ADDITIONAL REGRESSION OUTPUT

Appendix E: Additional Regressions

Exhibit E-1: Output for Mixed Effects Linear Regression of LS/CMI score on LS/CMI Window, Offender Demographics, and Offender Criminal History used to Create Adjusted LS/CMI Scores, Clustering by Term and Supervisee

	All (n=105,193) Coefficient (SE)	Men (n=80,591) Coefficient (SE)	Women (n=24,603) Coefficient (SE)
LS/CMI Window¹			
> 3 to 6 Months	-0.60 (0.07)***	-0.58 (0.09)***	-0.65 (0.15)***
> 6 to 12 Months	-0.74 (0.06)***	-0.56 (0.07)***	-1.30 (0.12)***
> 12 to 18 Months	-0.56 (0.06)***	-0.27 (0.07)***	-1.44 (0.12)***
> 18 to 24 Months	-0.29 (0.08)***	0.03 (0.09)	-1.35 (0.16)***
> 24 to 36 Months	0.05 (0.07)	0.37 (0.07)***	-1.23 (0.15)***
> 36 Months	0.42 (0.07)***	0.65 (0.07)***	-0.74 (0.18)***
Age	-0.09 (0.00)***	-0.08 (0.00)***	-0.12 (0.01)***
Race²			
Black	2.48 (0.14)***	2.39 (0.16)***	2.68 (0.33)***
Hispanic	-0.36 (0.12)**	-0.40 (0.14)***	-0.20 (0.25)
Asian, Native American, or Other	1.30 (0.20)***	1.11 (0.23)***	1.83 (0.41)***
Criminal History Score³			
3+ Person Felonies	7.34 (0.16)***	7.28 (0.18)***	6.20 (0.54)***
2 Person Felonies	6.22 (0.15)***	6.20 (0.17)***	5.48 (0.40)***
1 Person Felony and 1 non-Person Felony	5.66 (0.13)***	5.69 (0.16)***	4.98 (0.29)***
1 Person Felony	4.38 (0.17)***	4.43 (0.19)***	3.79 (0.40)***
4+ Adult Non-Person Felonies	4.51 (0.12)***	4.63 (0.15)***	4.06 (0.24)***
2-3 Adult Non-Person Felonies	3.49 (0.13)***	3.63 (0.15)***	3.08 (0.23)***
4+ Adult Misdemeanor or 1 Adult Non-Person Felony or 3+ Juvenile Non-Person Felonies	2.91 (0.12)***	3.06 (0.14)***	2.60 (0.21)***
3 or Fewer Adult Misdemeanors or 2 or Fewer Juvenile Non-Person felonies	2.11 (0.12)***	2.23 (0.15)***	1.76 (0.22)***
Crime Severity Score⁴			
1	-0.28 (0.14)*	-0.82 (0.17)***	1.04 (0.24)***
2	-1.64 (0.17)***	-2.04 (0.19)***	-0.48 (0.33)
3	-2.3 (0.19)***	-2.63 (0.22)***	-1.51 (0.38)***
4	-2.06 (0.18)***	-2.54 (0.21)***	-0.87 (0.38)***
5	-2.55 (0.22)***	-2.75 (0.25)***	-2.19 (0.45)***
6	-1.61 (0.18)***	-2.13 (0.21)***	-0.16 (0.37)
7	-2.14 (0.20)***	-2.7 (0.23)***	-0.72 (0.45)
8	-3.16 (0.16)***	-3.79 (0.19)***	-1.50 (0.32)***
9	-2.94 (0.26)***	-3.61 (0.29)***	-1.27 (0.65)
10	-3.20 (1.05)**	-3.92 (1.13)***	-1.00 (2.73)

APPENDIX E: ADDITIONAL REGRESSION OUTPUT

	All (n=105,193) Coefficient (SE)	Men (n=80,591) Coefficient (SE)	Women (n=24,603) Coefficient (SE)
11	3.20 (3.68)	2.61 (3.68)	#N/A
Offense Type ⁵			
Driving	-5.70 (0.21)***	-6.00 (0.23)***	-4.03 (0.54)***
Drug	-0.02 (0.12)	-0.11 (0.13)	0.41 (0.25)
Past Incarceration	0.31 (0.15)*	0.42 (0.16)***	-0.73 (0.39)
Past Driving Offense	0.58 (0.36)	0.31 (0.38)	2.43 (1.11)***
Past Drug Offense	1.98 (0.08)***	1.87 (0.09)***	2.25 (0.15)***
Past Property Offense	1.68 (0.10)***	1.64 (0.11)***	1.83 (0.21)***

Note: Each observation is a supervision term. +p<.10, * p<.05, ** p<.01, *** p<.001

1Reference category: Within 3 months.

2Reference category: White.

3Reference category: No Felonies or Adult Misdemeanors.

4Reference category: 0.

5Reference category: Property.

APPENDIX E: ADDITIONAL REGRESSION OUTPUT

Exhibit E-2: Output for Mixed Effects Linear Regression of First LS/CMI Reassessment on First LS/CMI Assessment, LS/CMI Window, Offender Demographics, and Offender Criminal History used to create Adjusted LS/CMI Scores, Clustering by Term and Supervisee

	All (n=28,885) Coefficient (SE)	Men (n=21,989) Coefficient (SE)	Women (n=6,821) Coefficient (SE)
LS/CMI First Score	0.70 (0.01)***	0.70 (0.01)***	0.70 (0.01)***
LS/CMI Window ¹			
> 3 to 6 Months	0.48 (0.11)***	0.55 (0.12)***	0.10 (0.22)
> 6 to 12 Months	0.61 (0.11)***	0.60 (0.13)***	0.48 (0.24)*
> 12 to 18 Months	0.68 (0.18)**	0.60 (0.20)***	0.72 (0.41)
> 18 to 24 Months	-0.23 (0.27)	-0.20 (0.31)	-0.54 (0.59)
> 24 to 36 Months	-0.06 (0.28)	-0.35 (0.30)	0.79 (0.67)
> 36 Months	-0.18 (0.31)	-0.23 (0.34)	-0.49 (0.73)
Age	-0.04 (0.00)***	-0.04 (0.00)***	-0.01 (0.01)
Race ²			
Black	1.41 (0.15)***	1.31 (0.16)***	1.71 (0.36)***
Hispanic	-0.27 (0.13)*	-0.31 (0.14)***	-0.30 (0.28)
Asian, Native American, or Other	0.87 (0.22)***	0.82 (0.24)***	1.00 (0.47)*
Criminal History Score ³			
3+ Person Felonies	2.77 (0.19)***	2.68 (0.21)***	1.81 (0.62)***
2 Person Felonies	2.24 (0.18)***	2.15 (0.20)***	1.81 (0.47)***
1 Person Felony and 1 non-Person Felony	1.97 (0.15)***	1.84 (0.17)***	1.94 (0.34)***
1 Person Felony	1.54 (0.20)***	1.58 (0.23)***	0.66 (0.47)
4+ Adult Non-Person Felonies	1.41 (0.15)***	1.48 (0.17)***	0.82 (0.29)**
2-3 Adult Non-Person Felonies	0.87 (0.15)***	0.92 (0.18)***	0.52 (0.27)
4+ Adult Misdemeanor or 1 Adult Non-Person Felony or 3+ Juvenile Non-Person Felonies	0.85 (0.14)***	0.83 (0.17)***	0.72 (0.26)***
3 or Fewer Adult Misdemeanors or 2 or Fewer Juvenile Non-Person felonies	0.54 (0.14)***	0.62 (0.17)***	0.16 (0.27)
Crime Severity Score ⁴			
1	0.74 (0.17)***	0.42 (0.20)*	1.54 (0.30)***
2	-0.07 (0.20)	-0.17 (0.23)	0.18 (0.40)
3	-0.24 (0.23)	-0.40 (0.26)	0.04 (0.46)
4	-0.08 (0.22)	-0.42 (0.25)	0.66 (0.45)
5	-0.64 (0.26)*	-0.72 (0.30)*	-0.58 (0.53)
6	0.22 (0.21)	0.02 (0.24)	0.51 (0.44)
7	-0.43 (0.24)	-0.69 (0.27)***	0.02 (0.52)
8	-0.52 (0.18)*	-0.91 (0.22)***	0.33 (0.37)
9	-0.33 (0.30)	-0.50 (0.33)	-0.58 (0.74)
10	0.54 (1.16)	0.22 (1.23)	0.22 (3.22)
11	-1.91 (3.25)	-2.42 (3.23)	#N/A

APPENDIX E: ADDITIONAL REGRESSION OUTPUT

	All (n=28,885) Coefficient (SE)	Men (n=21,989) Coefficient (SE)	Women (n=6,821) Coefficient (SE)
Offense Type ⁵			
Driving	-2.86 (0.25)***	-2.87 (0.27)***	-2.47 (0.64)***
Drug	-0.63 (0.14)***	-0.44 (0.16)***	-1.10 (0.30)***
Past Incarceration	0.59 (0.19)**	0.60 (0.20)***	0.19 (0.50)
Past Driving Offense	1.25 (0.47)**	1.16 (0.49)***	1.95 (1.44)
Past Drug Offense	0.63 (0.10)***	0.57 (0.12)***	0.72 (0.21)***
Past Property Offense	0.84 (0.13)	0.80 (0.14)	0.79 (0.29)

Note: Each observation is a supervision term. +p<.10, * p<.05, ** p<.01, *** p<.001

1Reference category: Within 3 months.

2Reference category: White.

3Reference category: No Felonies or Adult Misdemeanors.

4Reference category: 0.

5Reference category: Property.

APPENDIX F: TERM/INDIVIDUAL LEVEL TREATMENT RATES

Appendix F: Treatment Referral Rates for Terms and Individuals

Exhibit F-1: Rate of Treatment Referral during a Supervision Term, by Initial Overall or Domain Risk Level and Treatment Type

	Domains							
	Treatment (General)	Family/ Marital	Education/ Employment	Leisure / Recreation	Companions	Alcohol / Drug Problem	Pro-criminal Attitude	Anti-social Pattern
Very High	25%	3%	3%	N/A	3%	22%	20%	17%
High	32%	3%	2%	1%	4%	23%	23%	14%
Medium	29%	3%	1%	1%	4%	24%	28%	14%
Low	24%	2%	1%	N/A	3%	19%	27%	13%
Very Low	19%	3%	1%	1%	3%	14%	26%	10%
Overall	29%	3%	2%	1%	3%	22%	26%	13%

Note: Each observation is a supervision term. The risk levels displayed are for the first LS/CMI assessment conducted during the supervision term.

Exhibit F-2: Rate of Treatment Referral by Sex of Offender and Treatment Type during a Supervision Term, for Terms with High/Very High Initial Overall or Domain Risk Level

	Domains							
	Treatment (General)	Family/ Marital	Education/ Employment	Leisure/ Recreation	Companions	Alcohol/ Drug Problem	Pro-criminal Attitude	Anti-social Pattern
Female	34%	5%	2%	0%	4%	27%	28%	18%
Male	28%	2%	2%	1%	3%	21%	20%	13%

Note: Each observation is a supervision term. These rates are only for terms where the initial LS/CMI assessment had a high or very high overall or domain risk level.

APPENDIX F: TERM/INDIVIDUAL LEVEL TREATMENT RATES

Exhibit F-3: Rate of Treatment Referral by County and Domain during a Supervision Term

	Domains								
	Treatment (General) (%)	Treatment (General) (N)	Family / Marital	Education / Employment	Leisure / Recreation	Companions	Alcohol / Drug Problem	Pro-criminal Attitude	Anti-social Pattern
Baker	26%	117	0%	0%	0%	2%	20%	14%	2%
Benton	27%	510	1%	0%	1%	5%	18%	21%	10%
Clackamas	29%	2869	3%	3%	2%	3%	20%	20%	15%
Clatsop	28%	556	0%	1%	0%	4%	22%	18%	8%
Columbia	25%	244	2%	1%	0%	3%	21%	22%	14%
Coos	16%	345	0%	0%	0%	1%	15%	9%	6%
Crook	18%	85	3%	0%	3%	1%	12%	16%	3%
Curry	26%	128	0%	0%	0%	2%	25%	17%	5%
Deschutes	20%	1118	9%	0%	0%	2%	17%	17%	4%
Douglas	15%	1495	0%	0%	0%	1%	14%	10%	10%
Gilliam	33%	15	17%	0%	0%	14%	18%	20%	13%
Grant	21%	42	0%	0%	0%	0%	12%	17%	10%
Harney	23%	44	0%	0%	0%	0%	14%	25%	12%
Hood River	35%	94	6%	2%	0%	5%	24%	20%	21%
Jackson	23%	1798	3%	0%	0%	1%	21%	17%	5%
Jefferson	28%	224	0%	1%	0%	3%	20%	21%	8%
Josephine	25%	893	0%	2%	0%	3%	20%	17%	5%
Klamath	26%	606	1%	0%	0%	7%	15%	15%	7%
Lake	22%	78	0%	0%	1%	8%	11%	17%	7%
Lane	11%	2376	0%	0%	0%	0%	8%	7%	4%
Lincoln	21%	454	0%	0%	0%	1%	13%	14%	10%
Linn	24%	1677	0%	0%	0%	2%	20%	18%	4%
Malheur	24%	238	0%	0%	0%	5%	17%	19%	24%
Marion	33%	3331	2%	0%	3%	3%	29%	21%	13%
Morrow	38%	53	0%	0%	0%	6%	26%	29%	4%
Multnomah	39%	7577	8%	5%	0%	4%	30%	30%	27%
Polk	36%	531	2%	0%	1%	13%	17%	21%	15%
Sherman	35%	34	6%	4%	0%	0%	26%	20%	6%
Tillamook	22%	144	2%	1%	0%	2%	19%	16%	20%
Umatilla	51%	975	0%	0%	0%	15%	36%	40%	13%
Union	48%	228	0%	1%	0%	9%	32%	37%	17%
Wallowa	16%	19	0%	0%	0%	10%	11%	23%	0%
Wasco	31%	270	1%	1%	0%	7%	24%	21%	11%
Washington	29%	3129	1%	2%	0%	1%	26%	21%	8%
Wheeler	50%	2	0%	0%	0%	0%	33%	0%	0%
Yamhill	35%	703	0%	2%	0%	7%	23%	25%	8%

Note: This is a term-level table, limited to terms that have a risk level of high or very high on their initial assessment. The rate of treatment referral is calculated as the proportion of terms with a high/or very high risk level at their first assessment where the offender is referred to

APPENDIX F: TERM/INDIVIDUAL LEVEL TREATMENT RATES

treatment at some point during their supervision term. The domain-specific treatment rates are calculated based on those terms with initial assessments which have a high or very high domain risk level.

APPENDIX F: TERM/INDIVIDUAL LEVEL TREATMENT RATES

Exhibit F-4: Rate of Treatment Referral by Sex of Offender and Treatment Type across all Supervision Terms beginning between 2010 and 2015

	Domains							
	Treatment (General)	Family/ Marital	Education/ Employment	Leisure/ Recreation	Companions	Alcohol/ Drug Problem	Pro-criminal Attitude	Anti-social Pattern
Female	39%	5%	2%	1%	5%	30%	35%	18%
Male	34%	3%	2%	1%	4%	25%	30%	15%
All	35%	3%	2%	1%	4%	27%	31%	16%

Note: Each observation is an individual offender. The rate of treatment referral is calculated as the proportion of individuals who are referred to treatment during at least one of their supervision terms beginning between 2010 and 2015.

APPENDIX F: TERM/INDIVIDUAL LEVEL TREATMENT RATES

Exhibit F-5: Individual-level Rate of Treatment Referral by County and Treatment Type across all Supervision Terms beginning between 2010 and 2015

	Domains								
	Treatment (General) (%)	Treatment (General) (N)	Family / Marital	Education / Employment	Leisure / Recreation	Companions	Alcohol / Drug Problem	Pro-criminal Attitude	Anti-social Pattern
Baker	28%	134	1%	0%	0%	2%	18%	23%	10%
Benton	34%	587	1%	0%	1%	6%	21%	29%	11%
Clackamas	36%	3483	4%	3%	2%	4%	25%	30%	18%
Clatsop	37%	627	1%	1%	0%	5%	27%	32%	10%
Columbia	33%	362	1%	1%	0%	5%	25%	30%	12%
Coos	18%	415	0%	0%	0%	2%	15%	16%	8%
Crook	21%	117	2%	0%	2%	2%	17%	20%	6%
Curry	26%	149	0%	0%	0%	1%	23%	25%	5%
Deschutes	30%	1713	12%	1%	0%	3%	23%	28%	8%
Douglas	22%	1739	0%	0%	0%	1%	18%	19%	16%
Gilliam	50%	20	5%	0%	0%	10%	30%	40%	15%
Grant	14%	64	0%	0%	0%	0%	9%	11%	5%
Harney	18%	57	0%	0%	0%	2%	11%	12%	5%
Hood River	35%	162	2%	1%	0%	4%	24%	26%	9%
Jackson	31%	2506	3%	1%	0%	2%	28%	30%	6%
Jefferson	30%	260	1%	0%	0%	2%	23%	26%	8%
Josephine	31%	1158	0%	4%	0%	3%	22%	27%	11%
Klamath	32%	957	0%	0%	0%	12%	15%	27%	13%
Lake	33%	135	0%	0%	7%	10%	15%	24%	16%
Lane	13%	2873	0%	0%	0%	0%	9%	10%	6%
Lincoln	26%	557	1%	0%	0%	1%	17%	21%	15%
Linn	31%	1698	0%	0%	0%	3%	25%	28%	6%
Malheur	28%	310	0%	0%	0%	5%	17%	23%	20%
Marion	40%	3956	3%	0%	3%	4%	35%	37%	19%
Morrow	35%	68	0%	0%	0%	6%	29%	34%	6%
Multnomah	46%	6950	9%	6%	0%	5%	35%	41%	31%
Polk	43%	706	2%	0%	1%	15%	22%	40%	29%
Sherman	40%	45	7%	2%	0%	0%	31%	33%	11%
Tillamook	27%	186	1%	2%	1%	2%	20%	24%	19%
Umatilla	60%	1021	0%	0%	0%	18%	41%	54%	19%
Union	55%	291	0%	1%	0%	11%	35%	46%	18%
Wallowa	37%	27	0%	0%	0%	11%	22%	26%	11%
Wasco	40%	418	1%	1%	0%	10%	29%	33%	12%
Washington	37%	3633	1%	2%	0%	2%	31%	34%	10%
Wheeler	33%	3	33%	0%	0%	0%	33%	33%	0%
Yamhill	39%	905	1%	2%	0%	9%	28%	34%	13%

Note: This is an individual-level table. The rate of treatment referral is calculated as the proportion of individuals who are referred to treatment during at least one of their supervision terms beginning between 2010 and 2015.