Massachusetts Department of Correction

Thomas A. Turco III, Commissioner

Carol A. Mici, Deputy Commissioner

GENERAL RECIDIVISM RISK SCORE LEVELS THREE-YEAR REVIEW ANALYSIS

Rhiana Kohl, Ph.D., Executive Director, Office of Strategic Planning and Research

Prepared by:
Jiqiang Rong, Research Statistician, and
Hollie Matthews, Deputy Director, Research and Planning Division
April 2018

INTRODUCTION

Recidivism, the tendency for inmates to become re-involved in criminal activity, is of great concern to the Correctional society, indeed, to society as a whole. In order to counteract this issue inmates participate in programs aimed at minimizing the risk of recidivism. These programs include education, counseling, and work training opportunity. While there are resources allocated to these programs, they are not limitless and thus need be allocated efficiently. A question of interest is how to establish the allocation of these resources.

On intake to the prison system, each inmate is given assessments to establish their Intake/Criminal History/Risk Scale Set. One component of the scale set is the General Recidivism Risk Score which may be used to predict recidivism risk. This risk score is based on a COMPAS Core scale which is a standard decile scale with 1 corresponding to the lowest risk of recidivism and 10 corresponding to the highest risk. Inmates scoring a moderate to high risk to recidivate in either the general or the violent recidivism scale are administered a Needs Assessment and the inmate referred for programming.

This brief seeks to take a statistical look at the three-level risk scale by examining the separation of the levels to establish their effectiveness in compartmentalizing the inmate risk levels. **For the purposes of this study, recidivism is considered to be a re-incarceration within three year of release from prison.**

ANALYSIS

Each inmate given a General Recidivism Risk Score is placed in a category ranging from 1 to 10 based on decile cut-points determined by a norm group. Each inmate is then placed into one of three recidivism risk categories, Low (score 1-4), Medium (score 5-7), and High (score 8-10). To test the validity of these categories the three-year recidivism rates for inmates released during 2013 were analyzed and compared. Between January 1, 2013 and December 31, 2013, 1,813 male, criminally sentenced inmates were released to the community from the Massachusetts Department of Correction and identified as having a completed and computed risk assessment. Due to the rollout of the COMPAS Assessment, inmates who were incarcerated at that time were administered a Standing Risk Assessment as a proxy to the Initial Risk or Core Risk Assessment. These scales were used interchangeably in the analysis.

Table I: Recidivism Rate by General Recidivism Risk Level					
			RECIDIVISM WITHIN THREE YEAR		
			NO	YES	Total
GENERAL RISK LEVEL	LOW	Count	427	67	494
		Percent (%)	86.4	13.6	100.0
	MED	Count	331	104	435
		Percent (%)	76.1	23.9.	100.0
	HIGH	Count	501	383	884
		Percent (%)	56.7	43.3	100.0
Total		Count	1,259	554	1,813
		Proportion (%)	69.4	30.6	100.0

Table I shows a breakdown of the recidivism rate for each of the three levels: Low, Medium, and High. It can be seen from the table that 13.6% Low risk, 23.9% of Medium risk, and 43.3% of high-risk inmates recidivated within three years of release. This translates to Medium risk having 1.76 times the risk of recidivism as Low risk inmates, and High risk having 1.82 times the risk of Medium risk inmates. One goal for the scale is to find that High-risk inmates have five times the risk as Low risk inmates; this cohort shows a relative risk for High to Low risk inmates of 3.18. While there did seem to be notable differences between the three levels several statistical tests were run in order to establish that these are significant.

Table II: Chi-Square Tests of Independence			
Test Used	**Test Statistic**	**df**	**P-value**
Mantel-Haenszel	141.001	1	0.000
Likelihood Ratio (Low- to Mid-risk)	16.511	1	0.000
Likelihood Ratio (Mid- to High-risk)	49.024	1	0.000

Table II shows the results of several chi-square tests of independence used to establish trends in the data. The Mantel-Haenszel Chi-square test, a linear-association test resulted in a p-value of 0.00, rejecting the hypothesis that the recidivism rates are independent and supporting the conclusion: that recidivism rate increases with an increase in risk level.

To confirm that there exists no overlap between the categories, i.e., Low- and Mid-risk inmates have a significant difference in their recidivism rates likelihood ratio chi-square tests for independence were run. These tests compared Low- to Mid-risk and Mid- to High-risk recidivism rates. The Low- to Mid-risk comparison resulted in a p-value of 0.00, and the Mid- to High-risk comparison had a p-value of 0.00; both resulting in the conclusion that there were significant differences between the levels of risk.

In addition to the analysis for the general risk level categories, a Receiver Operating Characteristic (ROC) curve was run to evaluate the predictive ability of the decile cut points. This was run using the general risk scores and resulted with an Area Under the Curve (AUC) of 0.691 (95% CI: 0.665, 0.716). This result was similar to the one-year AUC of 0.663 and the two-year AUC of 0.681. A copy of the coordinates table is below (Table III) to show the true and false positive rates for the various cut-off points for the risk scores. While the general risk shows a good true positive rate, the false positive rates also tend to the high side.

Table III: Coordinates of the Curve For the General Risk Decile Cuts		
Positive if Greater Than or Equal To	Sensitivity (True Positives)	1 – Specificity (False Positives)
0.00	1.000	1.000
1.50	.977	.883
2.50	.955	.806
3.50	.922	.731
4.50	.879	.661
5.50	.832	.578
6.50	.778	.495
7.50	.691	.398
8.50	.547	.276
9.50	.368	.160
11.00	0.000	0.000

CONCLUSION

Reducing recidivism is of utmost importance to both general and prison populations. As such, discovering effective tools for the identification of likely recidivists and enrolling them in effective programming is imperative. Overall, the general recidivism risk score tends to predict fairly well which inmates will recidivate; however, the general risk score also has the potential to predict that an inmate who did not recidivate would come back. Table III, above, indicates a somewhat high instance of false positives occurring when using the general risk to recidivate decile score. Using this, and similar standards, as tools to allocate programming resources the DOC may better optimize efforts to reduce recidivism in the state.

Publication No. 18-110-DOC-01. 3 pgs. April 20, 2018. .Authorized by: Gary Lambert, Assistant Secretary for Operational Services. Any comments or questions can be addressed by the Research & Planning Division via email at Research@massmail.state.ma.us.
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