February 2008

THE DANGEROUS MENTALLY ILL OFFENDER PROGRAM:
THREE-YEAR FELONY RECIDIVISM AND COST EFFECTIVENESS[†]

Significant reductions in felony recidivism rates for participants enrolled in Washington State's "Dangerous Mentally Ill Offender" (DMIO) program are observed three years after their release from prison. The reduction in felonies associated with the program is valued, by taxpayers and crime victims, at approximately $33,500 per participant minus program costs; this represents a return of about $1.24 for every public dollar spent on the program. Approximately 165 clients are enrolled in the DMIO program in a given month.

In 1999, legislation was passed to better identify and provide additional mental health treatment for mentally ill offenders released from prison who pose a threat to public safety and agree to participate in the program.[1] A dangerous mentally ill offender is defined as a person with a mental disorder who has been determined to be dangerous to self or others. Through interagency collaboration and state-funded mental health treatment and support services, the legislation intends to promote the safe transition of these individuals to the community.

The original legislation directed the Institute and the Washington Institute for Mental Illness Research and Training to evaluate the program. The 2005 and 2007 evaluations examined the 1.5- and 2.5- year outcomes of DMIO participants.[2] The legislature has budgeted funds for the Institute to continue the evaluation. The DMIO program is intended to serve participants up to five years after prison release; this analysis re-examines recidivism outcomes three years post-release. A detailed report on program costs and implementation was published in 2007.[3]

Summary

Washington State's DMIO program, enabled by the 1999 Legislature, identifies mentally ill prisoners who pose a threat to public safety and provides them services and treatment up to five years after their release from prison. This analysis of 172 DMIO participants three years after release from prison indicates that the program:

- ✓ **Reduces overall felony recidivism rates 37 percent;**

- ✓ **Does not significantly reduce new misdemeanor offenses; and**

- ✓ **Has not demonstrated a statistically significant reduction in new violent felonies.**

Using methods developed by the Institute for previous crime studies, the felony recidivism outcomes were used to estimate the total economic impact of the program for both taxpayers and victims of crime. The state spends $26,982 (in 2007 dollars) per DMIO participant over three years. **For taxpayers and victims**, the DMIO program generates:

- ✓ **$33,548 in benefits per participant.**

- ✓ **$1.24 for every dollar spent.**

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[1] SSB 5011, Chapter 214, Laws of 1999.

[2] D. Lovell, G. Gagliardi, & P. Phipps. (2005). *Washington's Dangerous Mentally Ill Offender Law: Was community safety increased?* Olympia: Washington State Institute for Public Policy, Document No. 05-03-1901; and J. Mayfield. (2007). *The Dangerous Mentally Ill Offender Program: Cost effectiveness 2.5 years after participants' prison release.* Olympia: Washington State Institute for Public Policy, Document No. 07-01-1902.

[3] D. Lovell & J. Mayfield. (2007*). Washington's Dangerous Mentally Ill Offender Law: Program costs and developments.* Olympia: Washington State Institute for Public Policy, Document No. 07-03-1901.

Previous Findings

The 2005 and 2007 reports demonstrated that the DMIO program significantly reduced recidivism after 1.5 years and continued to do so after 2.5 years.[4] Overall, the program appeared to be accomplishing its other principal objectives such as improving social services delivery and participant living situation. The 2007 benefit-cost analysis indicated that the reductions in DMIO recidivism generated slightly more financial benefits to taxpayers than program costs. This report re-estimates the total economic benefits to taxpayers and crime victims based on three-year recidivism rates. The report also provides an improved estimate of program recidivism outcomes based on comparisons with a more similar group of mentally ill offenders.

Key Methodological Issue: Selecting a Similar Comparison Group

This analysis includes 172 DMIO program participants who were released between the beginning of the program and December 31, 2003.[5] Program participants who died (3), moved out of state (5), or were deported (3) or civilly committed (9) were not available for a three-year follow-up in the community and were therefore excluded from the analysis.

To evaluate the program, it is necessary to compare DMIO participants to a group of offenders with similar characteristics (comparison group) who were released without the interagency coordination and supplemental funding for services created for the DMIO program. Due to ethical and political concerns about denial of service and public safety, a random assignment research design was not used for this study. Rather, we used a quasi-experimental approach that compares outcomes between closely matched pairs of individuals in the DMIO and comparison groups.

The 2005 and 2007 studies used a comparison group of 287 mentally ill offenders who were part of the Community Transitions Study (CTS). There were, however, considerable differences in the felony recidivism risk of individuals in the DMIO and CTS groups (29 percent and 41 percent

respectively).[6] While statistical adjustments were made in those analyses, the recidivism outcome estimates from those studies may still have been biased. A considerably more similar comparison group was identified for this recidivism analysis.

Individuals with characteristics that closely resemble DMIO program participants were selected from a pool of 1,356 offenders released from prison between January 1, 1996, and December 31, 2000, and who met specific mental health criteria.[7] These individuals were matched with DMIO program participants based on similarities among eight variables that predict the likelihood of recidivism *and* the propensity for being a DMIO program participant.[8]

Exhibit 1 shows the eight variables used to pair DMIO participants with their counterparts in the comparison group. There are no statistically significant differences in seven of the eight characteristics that predict felony recidivism or participation in DMIO. The only statistically significant difference is the younger age at release of individuals in the comparison group.[9]

Exhibit 1
Pre-Release Characteristics of DMIO Participants and Matched Comparison Group (Average/Percent)

	DMIO Group (n=172)	Comparison Group (n=172)
Past felonies	3.7	3.3
Residential mental health days	429	392
Past drug offenses	.67	.56
Non-white	30%	26%
Past violent offense index	72%	72%
Age at release*	37	35
Annual infraction rate	4.0	3.4
Female	13%	11%

* Statistically significant at p<.05.

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[4] Lovell et al. (2005); Mayfield (2007).
[5] This study relied on databases maintained by the Administrative Office of the Courts; Department of Corrections; Department of Social and Health Services Mental Health Division, Division of Alcohol and Substance Abuse, and Research and Data Analysis Division; and Department of Health.

[6] G. Gagliardi, D. Lovell, P. Peterson, & R. Jemelka. (2004). Forecasting recidivism in mentally ill offenders released from prison. *Law and Human Behavior 28*(2): 133-155.
[7] Details on inclusion criteria are provided in the appendix.
[8] The method used to select members of the matched comparison group is available in the appendix.
[9] Additional multivariate analyses controlling for the difference in age did not alter the results presented in this report.

Because individuals in the DMIO and comparison groups are so similar, differences in actual recidivism are assumed to be attributable to participation in the DMIO program. There are, however, several limitations to the research design adopted for this study:

- Some individuals in the comparison group were released from prison more than four years before DMIO participants were released. During the intervening period, changes in factors such as interagency coordination and community supervision could account for some effects attributed to the DMIO program.

- Using a statistically matched control group minimizes observable differences between the study groups. Possible unobserved differences, however, such as motivation, may still bias the estimate of program effects. Consequently, for the benefit-cost analysis, we discount the estimated effect size to arrive at a more conservative estimate of the economic outcomes.

- This analysis of DMIO participants' criminal recidivism only reports three-year recidivism rates. The DMIO program is available to participants for up to five years.

Criminal Recidivism After Three Years

Significant Reductions in Overall Felony Recidivism. We define recidivism, in all Institute reports, as a reconviction in a Washington court for any offense during the follow-up period.[10] We examined three categories of recidivism: any new offense (including all felonies and misdemeanors), overall felony, and violent-only felony recidivism.[11] There were statistically significant differences in overall felony recidivism but not in any new offenses or violent-only felonies.

Compared to other mentally ill offenders with similar potential to reoffend (Exhibit 2), individuals participating in the DMIO program were significantly less likely to commit a new felony (43 versus 27 percent).[12]

DMIO participants were about 37 percent less likely to be convicted of a new felony than individuals with similar characteristics in the comparison group. That is, the comparison subjects were about 1.6 times more likely to be reconvicted of a felony than DMIO participants.

Other Recidivism Measures. Similar analyses were conducted for two other measures: "any new offense," which is a composite of misdemeanor and felony recidivism, and violent felony recidivism. Relative to the comparison group, DMIO participants were about 90 percent as likely to commit any new offense, but the difference between the groups was not statistically significant. Similarly, the number of violent felonies was lower in the DMIO group (24) than the comparison group (30).[13] The difference, however, was not statistically significant.

Exhibit 2
Overall Felony Recidivism Rates
DMIO Participants versus Comparison Group*
(Three-Year Follow-up)

* McNemar test, $\chi 2$=11.458, p=.0004

Program Costs and Recidivism Savings

Benefit-Cost Analysis. The Institute has developed methods of economic analysis to assess program benefits in terms of reduced costs to taxpayers for law enforcement, adjudication, and corrections, and for the victims of crime. To calculate benefits, the reductions in recidivism attributable to the DMIO program were applied to the lifetime distribution of criminal offenses expected from those released from prison. Per-person program costs were estimated based on a review of provider billing records.

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[10] R. Barnoski. (1997). *Standards for improving research effectiveness in adult and juvenile justice.* Olympia: Washington State Institute for Public Policy, Document No. 97-12-1201.
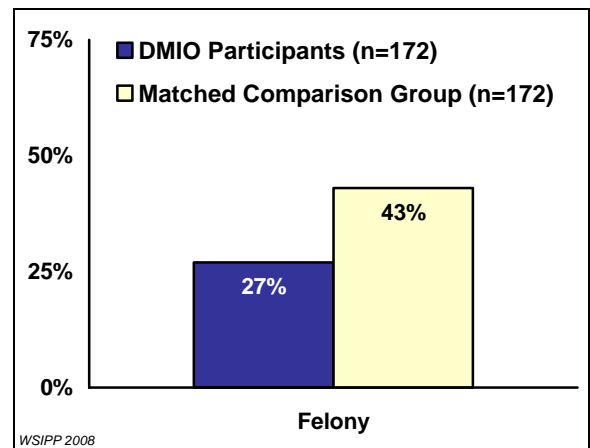[11] Violent felonies are crimes with Criminal Justice System Law Category codes of 100 and above.
[12] Based on pairwise comparison of recidivism outcomes for 172 pairs of DMIO participants and matched members of the comparison group.

[13] During the follow-up period, there were two murder convictions in the comparison group and none in the DMIO group. A December 31, 2007 murder in Seattle did not fall within the follow-up period of this study.

Program Costs. The state compensates Regional Support Networks (RSNs) and other providers who contract with the Department of Social and Health Services (DSHS) to provide additional support services for DMIO program participants. The program funds up to $10,000 per DMIO participant per year, for a maximum of five years. The specific funding formula established by DSHS-Mental Health Division is as follows:

- Providers of special services during the three months just before and just after prison release are reimbursed $6,000 to engage the participant.

- After the first three months, providers are reimbursed $700 per month for special DMIO services for Medicaid-eligible participants and $900 per month for non-Medicaid-eligible participants.

Per-person program costs over the three-year follow-up period are estimated at $26,982 per participant (in 2007 dollars). This estimate is based on a detailed review of billing records for agencies serving DMIO participants released between July 1, 2002, and December 31, 2003.[14]

Cost Savings of Reduced Recidivism. Does the value of the reduction in crime attributed to the DMIO program outweigh the costs? To answer this question, we turned to the Institute's benefit-cost model.[15] When there are fewer crimes, there are fewer victims and taxpayers spend less on the criminal justice system. We estimate the present value of crime-related costs avoided over the lifetime of a participant for both taxpayers and crime victims. To determine the economic "bottom line" of the program, we subtract the cost of the DMIO program from the present-value sum of its benefits (including avoided costs).

When research is based on a less-than-randomized research design, we know the results have a larger margin of error than a randomized design. Since random assignment was not possible for this study, we reduced the estimated effect on recidivism by 25 percent when calculating cost savings.[16] That is, since we cannot control for selection bias that may result in an overestimation of the effectiveness of the program, we apply a 25 percent discount factor to the program effect when we perform our benefit-cost analysis.

Exhibit 3
DMIO Program Benefits and Costs
(In 2007 Dollars)

	Taxpayers and Victims	Taxpayers Only
Benefits (lifetime)	$33,548	$15,247
Costs (over 3 years)	$26,982	$26,982
Benefit/Cost Ratio	$1.24	$0.57
Net Benefits	$6,566	-$11,735

We estimate that the DMIO program costs about $26,982 per participant over the first three years post-release and produces about $33,548 in crime-reduction benefits (Exhibit 3). Of these total benefits, $15,247 accrues to taxpayers in the form of reduced criminal justice system expenditures; another $18,301 accrues to society because there are fewer crime victims. The result is an overall return to society of $6,566, or $1.24 per dollar spent on a DMIO participant.

Conclusion

The reductions in DMIO criminal recidivism found during the first 2.5 years after prison release hold up at the three-year mark. Participation in the DMIO program is associated with statistically significant decreases in felony recidivism three years after release. The analysis was unable to identify statistically significant effects on recidivism for combined felony or misdemeanor offenses or violent felony recidivism. A benefit-cost analysis indicates that the reduction in criminal recidivism attributed to the DMIO program is a net economic benefit to crime victims and taxpayers, providing net benefits comparable to other adult offender programs.

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[14] D. Lovell & J. Mayfield. (2007*).*
[15] S. Aos, R. Lieb, J. Mayfield, M. Miller, & A. Pennucci. (2004). *Benefits and costs of prevention and early intervention programs for youth.* Olympia: Washington State Institute for Public Policy, Document No. 06-10-1201.
[16]The rationale for this discount is explained in Aos et al. (2004). Previous studies used a 50 percent discount because of the dissimilar comparison group.

TECHNICAL APPENDIX: SELECTION OF PROGRAM AND CONTROL GROUPS[‡]

DMIO Participant Group. After removing those who had died, moved out of state, or been deported or civilly committed, there were 172 DMIOs released between the beginning of the program and December 31, 2003.

Control Group. Control subjects consisted of all qualifying offenders released from prison from January 1, 1996, through December 31, 2000, who met the qualifying criteria:

- Membership in the original community transition study,[17] with serious mental illness certified by OBTS screening criteria, archived chart reviews, and Regional Support Network enrollment records: n=287.

- Or one of the following:

  1) Certification in Department of Corrections tracking system, "Interview Confirms SMI" ("serious mental illness");

  2) More than one year of residential mental health treatment while in prison; or

  3) Both of the following:

     - Over 30 days of residential mental health treatment in prison; and

     - A qualifying diagnosis in offender tracking records (primarily the following: schizophrenia, schizoaffective, psychosis NOS, bipolar I, major depression, mood disorder NOS, organic mood or thought disorder, borderline personality).

Exclusion Criteria. Control subjects were excluded if they had a release zip code less than 98000, indicating probable out-of-state placement. For potential control subjects released in 1997 and 1998, there were data indicating whether they were released to an immigration detainer; these control subjects were excluded also. Because a previous study showed that almost two-thirds of releasees identified as Hispanic had immigration detainers, Hispanic control subjects released after 1998 were also excluded from the control pool. There were 1,356 members of the control pool after the inclusion and exclusion criteria were applied.

Selection of Matching Variables. A number of studies of general offenders and mentally ill offenders in Washington and elsewhere have identified a set of variables significantly correlated with recidivism.[18] Many of these were tested against the control subject dataset to determine which subset of eight variables provided optimal accuracy in predicting recidivism. Following the method of Lovell et al. (2007), we recoded continuous variables as ordinal variables with two to three values, using cut points that would provide significant numbers of subjects in each category and clear differences in average recidivism rates for each category. (The cut points for ordinal variable values are shown in Exhibit A2.) The reason for this procedure is that relationships to recidivism are non-linear: for variables such as number of previous offenses or time in mental health programs, the precise number of offenses is not as important as whether one is a first-time, repeat, or chronically repetitive felony offender; nor is the exact number of days of program residency as important as the difference between weeks, months, and years. As a result, the ordinally recoded variables generally showed stronger univariate correlations to recidivism than did the original continuous variables. Using ordinally recoded variables allowed us to maximize the number of variables on which we could match subjects and control subjects. We refer to "pairs" and "mates" to distinguish the 172 matched control subjects from the broader pool of 1,356 control subjects from which they were drawn.

[‡] This technical appendix is adapted from D. Lovell. (December 10, 2007). *DMIO program evaluation, 2007*. Seattle: University of Washington, Department of Psychosocial & Community Health. Memorandum to the Washington State Institute for Public Policy.

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[17] D. Lovell, G. Gagliardi, & P. Peterson. (2002). Recidivism and service use among mentally ill offenders released from prison. *Psychiatric Services 53*(10):1290-1296.
[18] Ibid.; D. Lovell, L. Johnson, & K. Cain. (2007). Recidivism of supermax prisoners in Washington State. *Crime and Delinquency 53*(4); Gagliardi et al. (2004); R. Barnoski & S. Aos. (2003*). Washington's Offender Accountability Act: An analysis of the Department of Corrections' risk assessment.* Olympia: Washington State Institute for Public Policy, Document No. 03-12-1202; A. Beck. (1997). *Recidivism of prisoners released in 1983*. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics; and P. Gendreau, T. Little, & C. Goggin. (1996). A meta-analysis of the predictors of adult offender recidivism: What works! *Criminology 34*: 575-607.

Since the index offenses of participants were felonies, control subjects were matched with participants in terms of the likelihood of felony recidivism. Because not every potentially relevant characteristic could be matched, and some predictors (such as age of admission to prison and age of release) are correlated with each other, logistic regression and Area Under the Receiver Operating Characteristic (AUC) analyses were used to identify an optimal set of control variables, each of which made significant contributions to a prediction equation for felony recidivism. The AUC curve describes the extent to which a set of variables yields predictions better than chance (an AUC value of .50). Exploratory logistic regression analysis with the control pool yielded a set of eight ordinal demographic, correctional, and criminal history variables that together yielded an AUC of .777 for felony recidivism, better than many well-established, more complex recidivism prediction instruments. Exploratory analysis of the combined control-DMIO sample also indicated that an overlapping group of variables strongly predicted membership in the DMIO group (AUC=.773).

Exhibit A1 presents average scores (for continuously distributed variables) and rates (for categorical variables) of DMIO participants, matched-control mates, and the entire control pool on the eight predictor variables. The demographic, criminal history, and age-related variables in this set are well established predictors of recidivism. As noted above, many studies have found associations between recidivism and socioeconomic disadvantage, youth, prison misbehavior, and extensive criminal history. Involvement in residential mental health treatment while in prison makes this set distinctive; note that having an index violent offense is *negatively* correlated with felony recidivism.

Exhibit A1
Recidivism Predictors for DMIO Subjects,
Matched Control Mates, and All Control Subjects

Variable	DMIO (n=172)	Mates (n=172)	All Control Subjects* (n=1,356)	DMIO vs. All Control Subjects p-value
Past Felonies (+)	3.67	3.30	4.20	.021
Residential Mental Health Days (-)	429	392	169	.000
Past Drug Offenses (+)	.67	.56	1.35	.000
Non-White (+)	30%	26%	30%	1.000
Index Violent Offense (-)	72%	72%	38%	.000
Age at Release (-)	37.3	35.3	34.4	.000
Annual Infraction Rate (+)	4.00	3.36	2.80	.098
Female (-)	13%	11%	32%	.000

Note: plus or minus signs indicate the direction of association with recidivism.
* Hispanic origin not a control variable.

Felony Risk Scores. Exhibit A2 displays the variable ranges used for coding ordinal variables. Except for age of release, which was recoded into only two levels to reduce the number of mismatches between DMIO participants and mates, continuous variables were recoded into three levels, with cut-offs designed to create clear differences in recidivism rates between levels. Following Gagliardi et al. (2004), risk scores of –1, 0, or 1 were assigned to each level to reflect rates of recidivism that were lower, approximately equal, or higher compared with the entire control pool (the three-year felony recidivism rate for all control subjects was 53 percent). Gender did not contribute to risk scores.

Felony risk scores were computed in two stages: (1) a raw total was calculated by summing scores on the individual variables and adding 5 points to ensure that all totals were positive; and (2) due to small numbers and random variations causing small differences or slight fluctuations in recidivism rates between some scores, the raw totals were rescored into an 8-point scale reflecting differences in recidivism. Felony risk scores and associated recidivism rates are displayed in Exhibit A3.

Exhibit A2
Prediction Variable Ranges, Risk Scores, and
Recidivism Rates for Control Subjects (n=1,356)

Variable	Range	Risk Score	New Felony Rate
Past Felonies	0 – 1	-1	22%
	2 – 5	0	53%
	6 or more	1	73%
Residential Mental Health Days	0	1	62%
	1 – 89	0	55%
	90 or more	-1	33%
Past Drug Offenses	0	-1	41%
	1	0	54%
	2 or more	1	68%
Race	White	-1	46%
	Person of color	1	69%
Index Violent Offense	Yes	-1	41%
	No	1	60%
Age at Release	35 or younger	1	61%
	36 or older	-1	42%
Annual Infraction Rate	0 – 1	0	45%
	1 or more	1	59%

Exhibit A3
Felony Risk Scores and Felony Recidivism Rates
for Control Subjects (n=1,356)

Risk Score	Recidivism Rate (Mean=54%)
1	2%
2	23%
3	33%
4	40%
5	56%
6	60%
7	71%
8	80%

DMIO Propensity Scores. A similar process was followed to select variables associated with likelihood of participation in the DMIO program. Five of the original eight risk variables made substantial contributions: felonies, drug offenses, age of release, mental health time, and index violent offense. Two further variables were used in place of racial classification and infraction rates: past violent (non-sex) felonies, and past sex felonies. Exhibit A4 displays the propensity values assigned to ranges of these variables.

Exhibit A4
DMIO Propensity Variable Ranges, Scores, and
DMIO Membership Rates for DMIO and Control Subjects (n=1,529)

Variable	Range	Propensity Score	DMIO Rate (Mean=11.3%)
Past Felonies	0 – 1	1	15%
	2 or more	0	10%
Residential Mental Health Days	0 – 30	0	7%
	31 or more	1	18%
Past Drug Offenses	0	1	15%
	1	0	12%
	2 or more	-1	5%
Index Violent Offense	Yes	1	19%
	No	-1	5%
Age of Release	25 or younger	-1	7%
	26 – 35	0	10%
	36 or older	1	14%
Violent Felonies	0	-1	5%
	1	0	15%
	2 or more	1	25%
Sex Felonies	0	0	10%
	1 or more	1	16%

Matching DMIO Participants With Mates. The combination of eight predictor variables (Exhibit A1) was used to match control subjects to DMIO participants.

- A 1:1 match was achieved for 142 cases. If multiple matches were available, mates were assigned at random from the group of control subjects closest to the DMIO participants in an additional variable: number of past violent or sex offenses.

- For the 30 cases without an exact match on all eight variables, control subjects were matched according to the felony recidivism risk scale and then assigned at random to the closest DMIO participants in propensity for DMIO membership.

Results of the matching in terms of risk and DMIO propensity are displayed in Exhibits A5 and A6. DMIO participants and mates closely resembled each other in risk of recidivism; DMIO participants had higher scores than mates in DMIO propensity, but differences between groups were not statistically significant.

Exhibit A5
Distribution of DMIOs and Mates
by Felony Recidivism Risk Scores

Risk Score	DMIOs (n=172)		Mates (n=172)	
	n	Pct	n	Pct
1	24	14%	25	15%
2	23	13%	23	13%
3	46	27%	46	27%
4	23	13%	23	13%
5	22	13%	22	13%
6	15	9%	14	8%
7	17	10%	17	10%
8	2	1%	2	1%

DMIO participants vs. Mates: χ^2 = 1.03, df=7, p=.998

Exhibit A6
Distribution of DMIOs and Mates
by DMIO Propensity Scores

Propensity Score	DMIOs (n=172)		Mates (n=172)	
	n=172	Pct	n=172	Pct
1	11	6%	17	10%
2	18	11%	21	12%
3	23	13%	18	11%
4	87	51%	84	49%
5	33	19%	29	17%
6	0	0%	3	2%

DMIO Participants vs. Mates: χ^2 = 5.44, df=5, p=.365

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