

REPORT TO THE LEGISLATURE

Predicting Referrals for Competency Evaluation

As required per Engrossed Substitute Senate Bill 6032 (Chapter 299, Laws of 2018)

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Executive Summary

Engrossed Substitute Senate Bill (ESSB) 6032 (Chapter 299, Laws of 2018) directed the Department of Social and Health Services to develop and implement a predictive modeling tool to identify persons with behavioral health needs who are at high risk of future involvement with the criminal justice system. To meet this directive, this report describes a predictive model developed for Medicaid enrollees and the target outcome of a referral for a competency evaluation. This approach reflects several considerations including:

- The predominance of Medicaid beneficiaries in the population of persons with behavioral health needs involved in the criminal justice system;
- The potential for Medicaid-contracted integrated managed care plans and behavioral health organizations to implement behavioral health interventions to reduce the likelihood of arrest for their high-risk enrollees; and
- The urgency to improve outcomes for persons in the Trueblood class who are at risk of involvement in the forensic mental health system.¹

Our model predicts the target outcome of a referral for competency evaluation within the following 6 months. We calibrated the model using the experience of Medicaid enrollees age 18 to 64. To parallel a risk-scoring process that could provide regularly updated risk information to Medicaid managed care plans, observations used to calibrate the model were derived from “person months” of Medicaid enrollment spanning January 2015 to December 2016. Predictive accuracy was assessed using a validation sample of coverage months spanning January 2017 to October 2017.

In addition to the competency referral outcome used to calibrate the predictive model, we constructed a broader set of outcomes to better understand the experiences of persons identified as high risk by the model. The additional outcomes examined in the six-month follow-up period included: any arrest (whether or not the arrest led to a competency evaluation referral), any psychiatric hospitalization (whether or not that hospitalization was for competency evaluation or restoration services), use of mental health crisis services, homelessness, or death.

While our final statistical model provided a satisfactory level of predictive accuracy based on conventional statistical criteria, we analyzed the validation sample to assess whether the model would be sufficiently predictive to support targeted interventions. Based on this analysis we found:

- Forensic evaluation referrals are rare. Even in the top 10 percent of the risk pool, fewer than one percent experience the outcome of a referral for a competency evaluation within 6 months.
- Extreme risk thresholds such as the top 0.1 percent or 0.01 percent of the adult Medicaid risk pool would be appropriate for intervention targeting. At these

¹ In April 2015, a federal court found in the case of Trueblood v DSHS that the Department was taking too long to provide competency evaluation and restoration services. As a result, the State has been ordered to provide court-ordered competency evaluations within fourteen days and competency restoration services within seven days. The Trueblood class includes individuals detained in local jails awaiting competency evaluation or restoration services, and individuals previously receiving competency evaluation and restoration services who are released and at-risk for re-arrest or re-hospitalization.

thresholds, 20-40 percent of the validation sample experienced a competency evaluation referral in the six-month follow-up period.

On an annual statewide basis, the top 0.1 percent risk threshold would identify about 2,000 unique individuals for intervention, while the top 0.01 percent risk threshold would identify about 300 unique individuals for intervention.

Prior experiences in the forensic mental health system are by far the most important information in predicting future competency evaluation referrals. Rapid-cycle linkage of managed care enrollment with data from the recently implemented Forensic Data System (FDS) offers the most timely opportunity for identifying enrolled Medicaid beneficiaries who are at high risk of a future competency evaluation referral. The DSHS Research and Data Analysis Division is developing processes to link FDS data with ProviderOne managed care enrollment data. It is reasonable to expect that a mechanism for regularly sharing the results of that linkage with MCOs and BHOs for their currently enrolled members could be in production by July 2019. This timeline assumes progress continues to be made to improve FDS identifier quality.

We found that about half of Medicaid beneficiaries with the highest risk of future involvement in the forensic mental health system are homeless or unstably housed. Almost all (about 90 percent) have a substance use disorder. Other important attributes of the high-risk population include:

- A high proportion are from minority groups, reflecting racial disproportionality in the criminal justice system;
- A high proportion reside in urban counties;
- High-risk Medicaid enrollees are likely to experience other adverse outcomes including an arrest or psychiatric hospitalization;
- Some high-risk Medicaid enrollees have significant physical comorbidities (about 30 percent would meet risk criteria for eligibility for the Health Home program);
- A high proportion are enrolled in Medicaid Expansion coverage, presenting favorable intervention financing opportunities due to the higher federal match available for services covered under Medicaid.

Taken together, these attributes point to targeted interventions designed to engage a diverse, complex population with significant rates of homelessness, substance use disorder, and physical condition comorbidities.

We conclude with a discussion of clinical intervention strategies that may be effective in reducing future criminal justice involvement by high-risk patients. We note that the effectiveness of these strategies is dependent on factors such as:

- Developing financing strategies, including strategies for persons who are not enrolled in Medicaid;
- Supporting the readiness of managed care organizations to receive data identifying high-risk Medicaid beneficiaries currently enrolled with them; and
- Building capacity in community behavioral health delivery systems to provide intensive services and supports for high-risk populations.

Scope and Purpose

Engrossed Substitute Senate Bill (ESSB) 6032 (Chapter 299, Laws of 2018) directed the Department of Social and Health Services to develop and implement a predictive modeling tool which identifies persons with behavioral health needs who are at high risk of future involvement with the criminal justice system. To meet this directive, this report describes the development of a predictive risk model using the target outcome of a referral for competency evaluation.

Forensic competency evaluation services are ordered when a court believes a mental disability may prevent a criminal defendant from assisting in their defense.

Competency restoration services are provided when the evaluation finds the defendant is not competent.

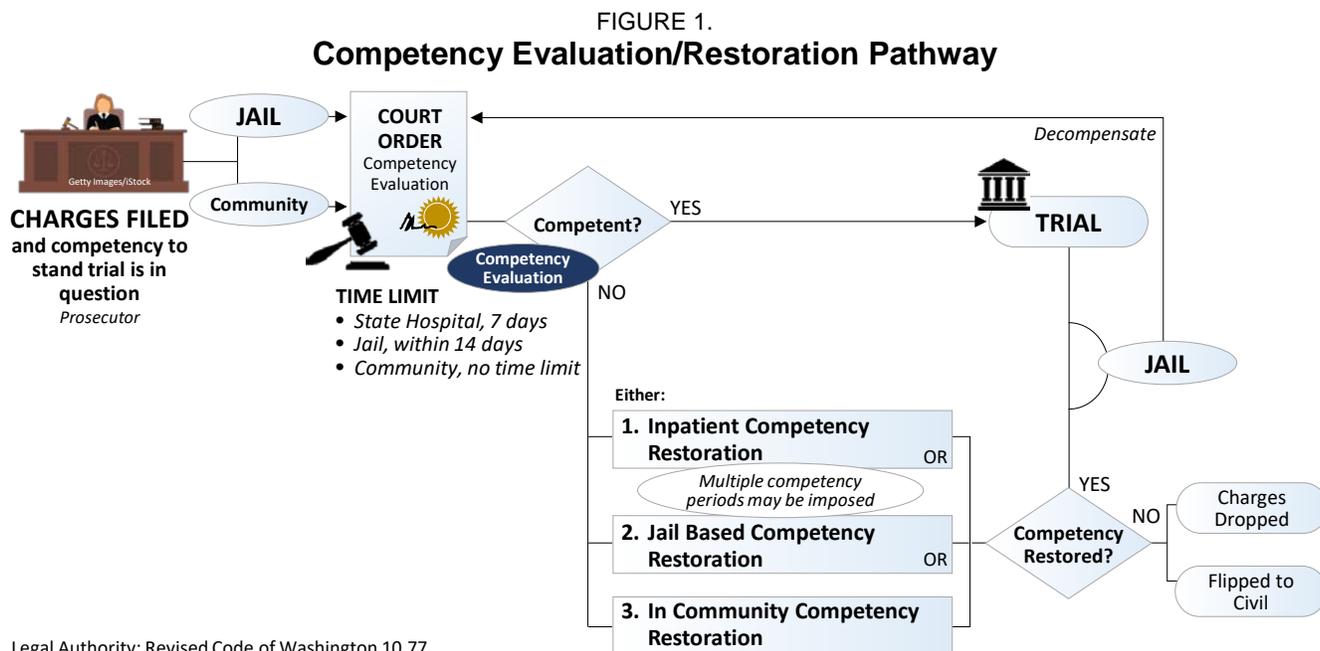
ESSB 6032 further directed:

- The predictive modeling tool must be developed to leverage data from a variety of sources and identify factors that are strongly associated with future criminal justice involvement.
- By December 1, 2018, the department must submit a report to the office of financial management and the appropriate committees of the legislature which describes the following:
 - The proposed data sources to be used in the predictive model and how privacy issues will be addressed;
 - Modeling results including a description of measurable factors most strongly predictive of risk of future criminal justice involvement;
 - An assessment of the accuracy, timeliness, and potential effectiveness of the tool;
 - Identification of interventions and strategies that can be effective in reducing future criminal justice involvement of high risk patients; and
 - The timeline for implementing processes to provide monthly lists of high-risk client to contracted managed care organizations and behavioral health organizations.

The first section of this report provides background information about the forensic mental health system and its intersection with the Medicaid-funded community mental health system. The next section describes the development of the predictive modeling tool. The following section assesses the predictive accuracy of the tool, and describes the characteristics of the high-risk populations it identifies. The closing section discusses implementation considerations and evidence-based clinical intervention strategies the tool could support. Detailed predictive modeling results are provided in an appendix.

Background

The forensic mental health system operates at the intersection of the legal and behavioral health care systems, providing competency evaluation services when a court believes a mental disability may prevent a criminal defendant from assisting in their own defense, and treatment for restoration when the evaluation finds the defendant is not competent. The court will then order the defendant to receive mental health treatment to restore competency. Figure 1 provides a high-level overview of the operation of the forensic mental health system.

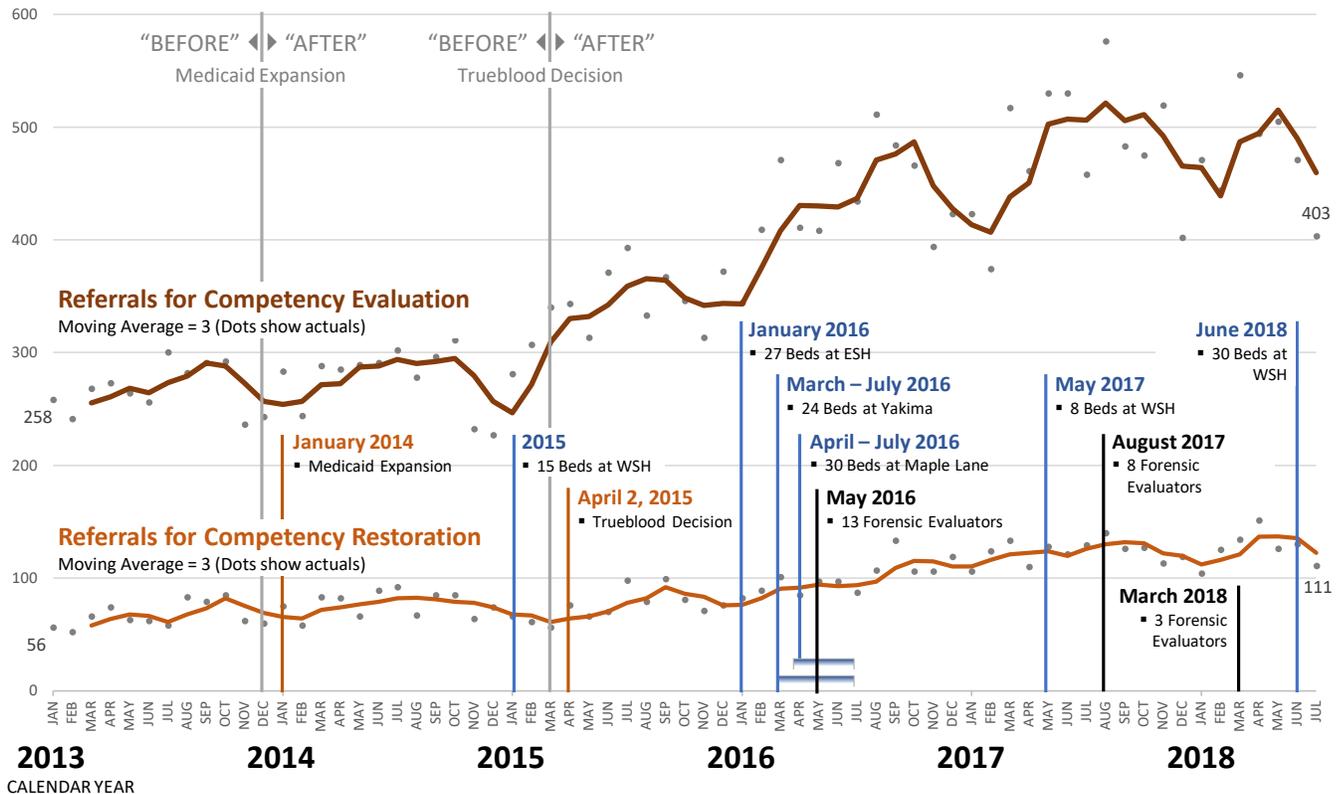


In April 2015, a federal court found in the case of *Trueblood v DSHS* (Trueblood) that the Department was taking too long to provide competency evaluation and restoration services. As a result of the Trueblood case, the State has been ordered to provide court-ordered competency evaluations within fourteen days and competency restoration services within seven days. The Trueblood class includes individuals who are detained in city and county jails awaiting a competency evaluation or restoration services, and individuals who have previously received competency evaluation and restoration services who are released and at-risk for re-arrest or re-hospitalization.

Figures 2 and 3 put recent trends in competency evaluation and restoration referrals into the context of larger trends in arrests and the timing of two changes in the criminal justice and behavioral health care systems affecting the forensic mental health system:

- Announcement of the Trueblood decision in April 2015, and
- Expansion of Medicaid eligibility under the Affordable Care Act in January 2014.

FIGURE 2.
Competency Evaluation/Restoration Referrals in a Policy Context
 Washington State



NOTES: 1. Total Competency evaluation referrals includes jail, inpatients, and personal recognizance (PR) based competency evaluations. The data also includes Pierce County Evaluation Panel data from January 2016 to July 2018. 2. Total Competency restoration referrals includes inpatient admissions to state hospitals and other competency restorations facilities.

DATA SOURCE: Total Competency restoration referrals includes inpatient admissions to state hospitals and other competency restorations facilities, September 2018.

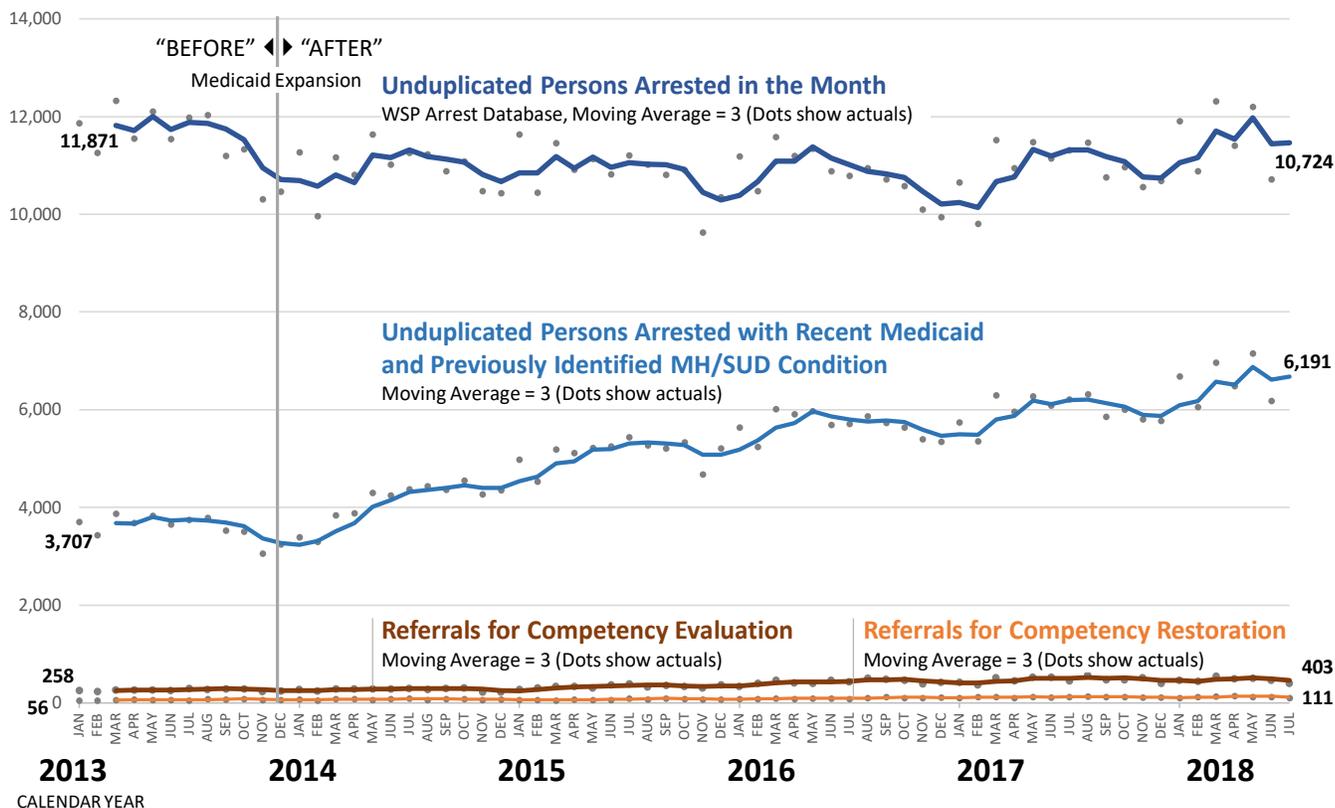
Following the Trueblood decision, referrals for competency evaluation and restoration surged. The timing of the increase in forensic competency evaluation referrals following the Trueblood decision suggests the decision spurred changes in forensic system behavior that have resulted in rapidly rising referral trends.

Meanwhile, Medicaid Expansion has led to a significant increase in the number of persons arrested who both:

- Are currently enrolled or have recently been enrolled in Medicaid and
- Have a mental illness or substance use disorder identified in their recent Medicaid health service experience.

This phenomenon is illustrated in Figure 3 below. As of 2018, most persons arrested in Washington State are currently (or were very recently) enrolled in Medicaid and have a mental illness and/or substance use disorder identified in their Medicaid service experience (58 percent as of July 2018).

FIGURE 3.
Trend in Arrests and Competency Evaluation/Restoration
 Washington State



NOTES: 1. Total Competency evaluation referrals includes jail, inpatients, and personal recognizance (PR) based competency evaluations. The data also includes Pierce County Evaluation Panel data from January 2016 to July 2018. 2. Total Competency restoration referrals includes inpatient admissions to state hospitals and other competency restorations facilities.

DATA SOURCES: DSHS Research and Data Analysis Division, Client Outcomes Database and Washington State Patrol Arrest Database. Total Competency restoration referrals includes inpatient admissions to state hospitals and other competency restorations facilities, September 2018.

In this context, the primary conclusion we draw from Figure 3 is that reducing rates of arrest in the general population largely requires reducing arrest rates among Medicaid beneficiaries with mental illness and/or substance use disorders. In the predictive model described in the next section, we focus on the Medicaid population and the target outcome of a referral for a competency evaluation. This approach reflects a range of considerations, including:

- The predominance of Medicaid beneficiaries in the population of persons involved in the criminal justice system;
- The potential for Medicaid integrated managed care plans and behavioral health organizations to manage interventions to reduce the likelihood of arrest for their high-risk enrollees; and
- The urgency to improve outcomes for persons in the Trueblood class.

As we show later in this report, the population at high risk of a referral for a competency evaluation is also at high risk of (1) being arrested (whether or not the arrest leads to a

competency evaluation referral) and (2) being hospitalized in a psychiatric facility (whether or not that hospitalization is for competency evaluation or restoration services). In other words, the predictive model described in this report effectively identifies Medicaid beneficiaries who are at high risk of arrest or psychiatric hospitalization, in addition to their risk of a referral for a competency evaluation.

Model Development

Our model predicts the target outcome of a referral for competency evaluation within the following 6 months. We calibrated the model using the experience of Medicaid beneficiaries age 18 to 64. To parallel a monthly risk-scoring process, observations used to calibrate the model were derived from “person-months” of Medicaid enrollment spanning January 2015 to December 2016. We assessed predictive accuracy using a “validation sample” of observations derived from coverage months spanning January 2017 to October 2017.

At each monthly observation point, eligible individuals were assessed to determine whether they experienced the outcome of a referral for a competency evaluation within the next six months. For example, a person who was enrolled in Medicaid for all 24 months of the calibration period would contribute 24 observations to the statistical model. In this example, if the person was referred only once for a competency evaluation in July 2016, 6 of the 24 observations used for model calibration would reflect the occurrence of the target outcome (specifically, the six observations spanning January 2016 to June 2016). The predictive model was calibrated using a stepwise logistic regression model.

Figure 4 lists the measurement domains associated with risk factors considered in the model. Most predictive risk factors reflect time-dependent experiences and were measured in time intervals relative to the “index month” associated with the observation. For example, separate indicator variables were developed for the occurrence of a forensic evaluation referral in the month prior to the index month, the second month prior to the index month, and so on. This approach reflects the temporal dimension of the relationship between a potentially predictive prior experiences and the target outcome. For example, recent prior competency evaluation referrals indicate a higher risk of re-referral than events occurring in the more distant past.

In addition to the competency referral outcome used directly in the predictive model, we constructed a broader set of outcomes to better understand the experiences of persons in the high-risk target population. As identified in Figure 4, these additional outcomes included the following experiences in the six-month follow-up period: any arrest (whether or not the arrest leads to a competency evaluation referral), any psychiatric hospitalization (whether or not that hospitalization is for competency evaluation or restoration services), use of mental health crisis services, homelessness, or death.

FIGURE 4.
Prior Risk Indicators and Future Outcomes

PRE-PERIOD RISK INDICATORS EXAMINED

60 months with stratification of events based on recency

- Forensic evaluation referrals
- Arrests
- Convictions
- DOC incarceration
- Psychiatric hospitalizations (community psych, E&T, state hospitals)
- Volume of prior OP mental health services
- Mental illness diagnosis
- Substance use disorder diagnosis
- Homelessness and housing instability
- Receipt of LTSS or DD services
- Use of Basic Food
- Involvement in child welfare system
- Involved with child support services
- Earnings history
- Demographics: age, gender, race/ethnicity



POST-PERIOD OUTCOMES

6 month follow-up

- **Competency evaluation referral**
- Arrest
- Psychiatric hospitalization
- Mental health crisis services
- Homelessness
- Death



Model Results

The final model is described in the appendix, including regression coefficients and odds ratios. Prior competency evaluation history is by far the most important measurement domain in predicting future competency evaluation referrals, reflecting high rates of recidivism in the forensic system. Other factors with a statistically significant (positive or negative) relationship to the target outcome included: age, gender, race/ethnicity, prior DOC incarceration history, and prior psychiatric hospitalization history. Note that we dropped arrest history, adjudication history, and behavioral health diagnosis variables from our final model due to data timeliness limitations in an operational context, with minimal loss of predictive accuracy in the validation sample.²

We recognize the potential concerns about using race/ethnicity information in a predictive modeling context. Because our predictive model is intended to identify high-risk persons for community-based behavioral health interventions to reduce risk of arrest, it may be appropriate to use race/ethnicity information in this modeling context to support the potential to reduce racial disproportionality that currently exists in the forensic mental health system. We would seek further community input before operationalizing a predictive model using race/ethnicity information.

While our final statistical model provided a satisfactory level of predictive accuracy based on conventional “goodness of fit” criteria for logistic regression models (e.g., a c-statistic of 0.79 for our final model), we used our validation sample to further assess

² Restrictions on the ability to share risk factor information derived from non-conviction criminal justice data (e.g., arrest data) also motivated the exclusion of arrest and non-conviction adjudication data from the final model.

whether the model would be sufficiently predictive to be actionable in supporting care management interventions. Table 1 summarizes this exploration by describing the proportion of the validation sample experiencing the target outcome, when stratified by the predictive risk score (first in deciles, then in smaller quantiles at the highest end of the risk-score distribution).

We draw the following conclusions from Table 1:

- **Forensic evaluation referrals are rare.** Even in the top 10 percent of the risk pool, less than one percent experience the outcome of a referral for a competency evaluation within 6 months.
- **The rate of the target outcome is relatively high in the top 0.1 percent and 0.01 percent of the risk pool; these thresholds could plausibly be used for intervention targeting.** Approximately 20 to 40 percent of these groups experienced a competency evaluation referral in the six-month follow-up period.

We note that on an annual statewide basis, the top 0.1 percent risk threshold would identify about 2,000 unique individuals for intervention, while the top 0.01 percent risk threshold would identify about 300 unique individuals for intervention.

TABLE 1.
Assessing Predictive Accuracy in the Validation Sample

Validation Sample: First 10 Months of Calendar Year 2017

Predictive Accuracy in the Validation Sample by Decile

Risk Score Decile	Observations	% With Forensic Evaluation in next 6 months
1	760,910	0.01%
2	566,565	0.03%
3	1,550,852	0.02%
4	587,933	0.01%
5	679,674	0.05%
6	980,712	0.04%
7	336,197	0.06%
8	1,128,577	0.05%
9	964,303	0.10%
10	827,865	0.85%

Predictive Accuracy in the Highest-Risk Quantiles

Risk Score Quantiles	Observations	% With Forensic Evaluation in next 6 months
Top 1%	83,787	5.1%
Top 0.1%	8,383	20.6%
Top 0.01%	838	40.1%

Given that efficient intervention targeting would likely require focusing on the extreme high end of the risk distribution, the descriptive analyses that follow focus on persons in the top 0.1 percent and 0.01 percent of the 2017 validation sample. From Figures 6 through 12 we draw the following conclusions:

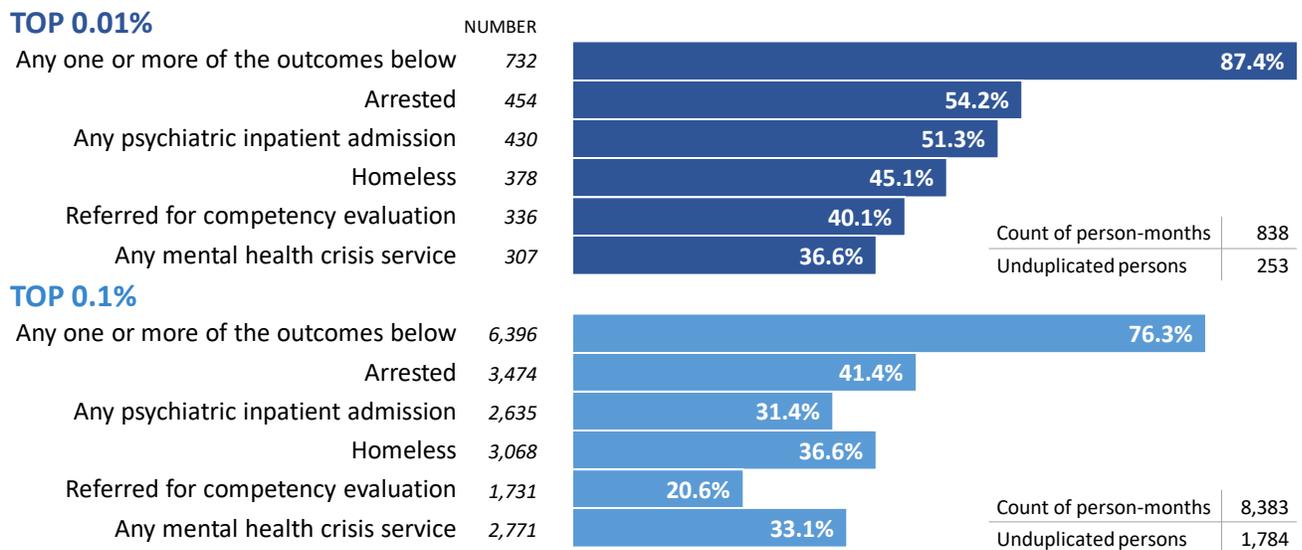
- The vast majority of both the top 0.1 percent and top 0.01 percent target populations experience one or more of the adverse outcomes charted in Figure

6. In particular we note that a significant proportion of each high-risk group experienced an arrest or a psychiatric hospitalization within the next 6 months.³

- The highest risk groups identified by the risk model are disproportionately minority (Figure 7).
- Most high-risk Medicaid enrollees are men (Figure 8).
- A large minority of each high-risk group experiences homelessness (Figure 9).
- Most high-risk group members are enrolled in “New Adult” Medicaid coverage, which means that Medicaid-funded interventions would have a relatively high federal fund share (Figure 10).
- Most high-risk group members are enrolled in managed care (Figure 11).
- A disproportionate share of the high-risk groups live in King County (Figure 12).

FIGURE 6.
Outcomes

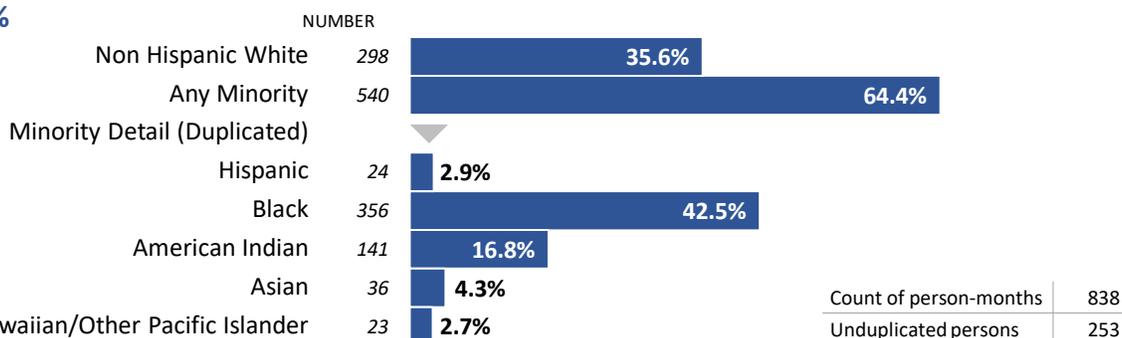
Forensic Predictive Modeling Results: 10 Month Validation Sample



³ Mortality rates were very low in the high-risk groups (approximately 0.5 percent in each group), and are not presented in Figure 6.

FIGURE 7.
Race/Ethnicity Distribution
 Forensic Predictive Modeling Results

TOP 0.01%



TOP 0.1%

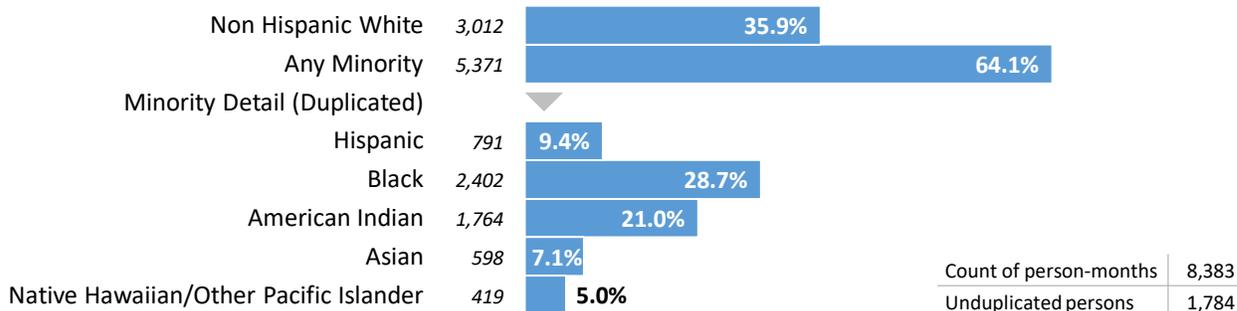


FIGURE 8.
Gender Distribution
 Forensic Predictive Modeling Results

TOP 0.01%



TOP 0.1%



FIGURE 9.
Housing Status as of Index Month
 Forensic Predictive Modeling Results

TOP 0.01%



TOP 0.1%

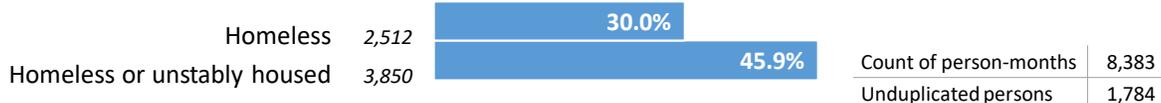
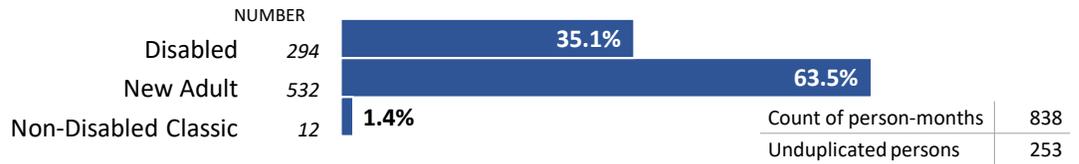


FIGURE 10.

Medicaid Coverage Group Distribution

Forensic Predictive Modeling Results

TOP 0.01%



TOP 0.1%

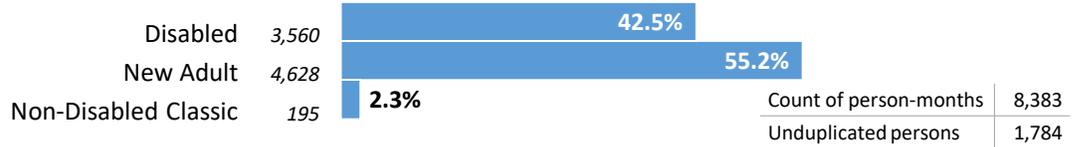
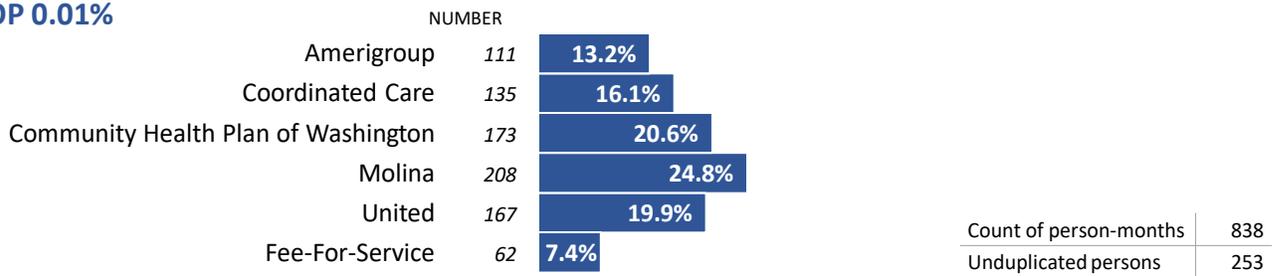


FIGURE 11.

Managed Care Plan Distribution

Forensic Predictive Modeling Results

TOP 0.01%



TOP 0.1%

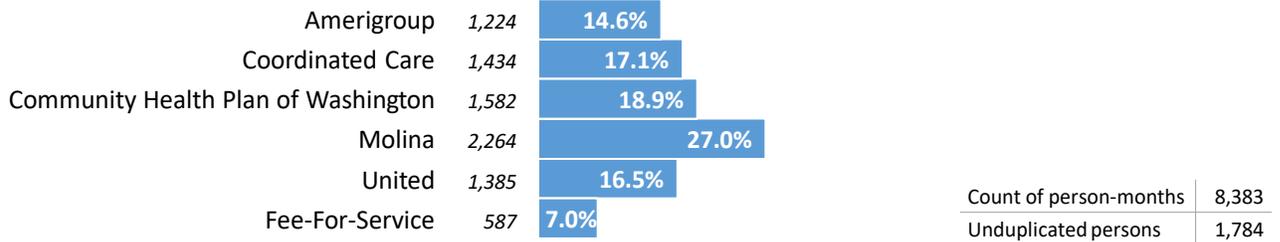
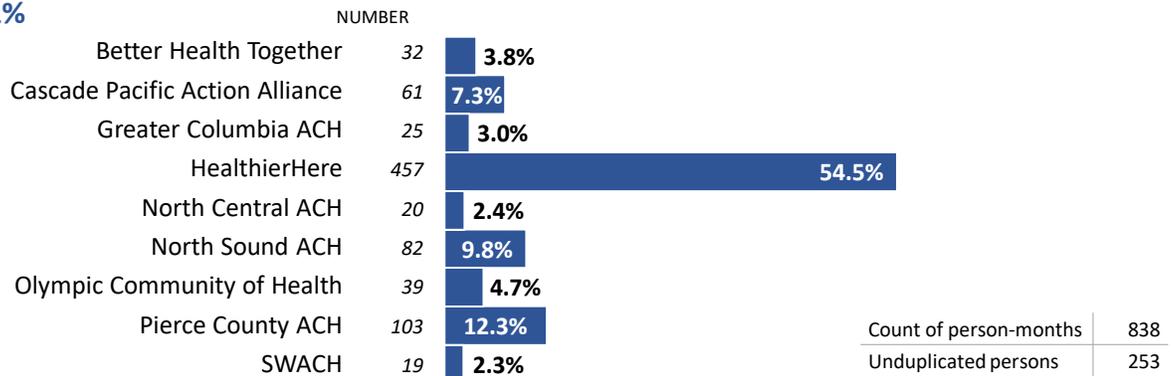
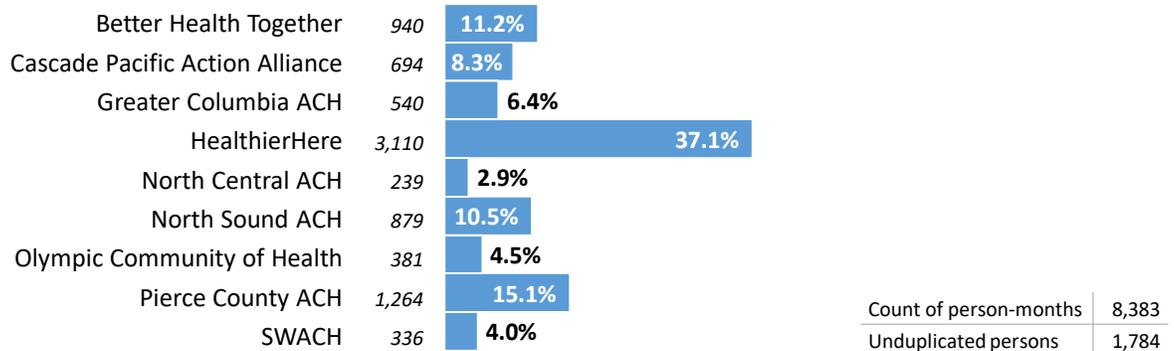


FIGURE 12.
Accountable Community of Health (ACH) Region Distribution
 Forensic Predictive Modeling Results

TOP 0.01%



TOP 0.1%



Discussion

We have shown that most persons who are arrested in Washington State are currently (or were recently) enrolled in Medicaid, and have mental illness and/or substance use disorders identified in their Medicaid-paid health service experience. It is technically feasible to provide regularly updated Medicaid member-level data to MCOs and BHOs that would identify their currently enrolled members who are at highest risk of being arrested and referred for a competency evaluation in the near future. The risk factors contained in the predictive model described in the appendix (including incarceration and forensic evaluation data) reflect information that would be legally permissible to share with MCOs and BHOs for their currently enrolled members.

Prior experiences in the forensic mental health system are by far the most information in predicting risk of a future competency evaluation referral. Rapid-cycle linkage of managed care enrollment with data from the recently implemented Forensic Data System (FDS) offers the most timely prospect for identifying enrolled Medicaid beneficiaries who are at high risk of a competency evaluation referral. The DSHS Research and Data Analysis Division is developing processes to link FDS data with ProviderOne managed care enrollment data. It is reasonable to expect that a mechanism for regularly sharing the results of that linkage with MCOs and BHOs for

their currently enrolled members could be in production by July 2019. This timeline assumes that progress continues to be made to improve FDS identifier quality.

We found that about half of the Medicaid beneficiaries with the highest risk of future involvement in the forensic mental health system are homeless or unstably housed. An even larger proportion (about 90 percent) have a substance use disorder. Based on this profile, we would expect the high-risk population to be challenging to find and engage in services. We note that from a client-finding perspective, MCOs and BHOs have access to their internal encounter data and case management systems, and the state-operated PRISM application, which provide them with information about primary care providers and other current treating providers (to the extent the identified high-risk member has recently received care). Leveraging this information may be an avenue to more current means of contact for some high-risk, unstably housed members.

Other important attributes of the high-risk population include:

- A high proportion are from minority groups, reflecting racial disproportionality in the criminal justice system;
- A high proportion reside in urban counties;
- High-risk Medicaid enrollees are likely to experience other adverse outcomes including arrest or psychiatric hospitalization;
- Some high-risk Medicaid enrollees have significant physical comorbidities, and about 30 percent would meet PRISM risk score criteria for eligibility for the Health Home program;
- A high proportion are enrolled in Medicaid Expansion coverage, presenting favorable intervention financing opportunities due to the higher federal match available for services covered under Medicaid.

Taken together, these attributes point to targeted interventions designed to engage a diverse, complex population with significant rates of homelessness, substance use disorder, and physical condition comorbidities.

We conclude with a discussion of intervention strategies that may be effective in reducing future criminal justice involvement by high-risk Medicaid enrollees. We note that the effectiveness of these strategies is dependent on factors such as:

- Developing intervention financing and implementation strategies, including strategies for persons who are not enrolled in Medicaid;
- Supporting the readiness of managed care organizations to receive data identifying high-risk Medicaid beneficiaries currently enrolled with them; and
- Building additional capacity in community mental health and SUD treatment delivery systems to provide intensive services and supports for high-risk populations.

With regard to specific potential intervention strategies, we begin with consideration of the Assertive Community Treatment program (also known as the Program of Assertive Community Treatment, or PACT). PACT is a model of community care intended for

persons who experience severe and persistent symptoms of mental illness (e.g., repeated hospitalization). PACT provides a comprehensive range of services from a treatment team typically consisting of a medication prescriber, case manager, mental health professional, peer specialist, and team leader. Supported employment and vocational rehabilitation are also an aspect of PACT.

PACT has been evaluated in a large number of randomized trials, and results suggest it is effective in reducing hospitalizations, costs no more than care-as-usual, and is more satisfactory to consumers and their families (Boust, Kuhns, & Studer, 2005 in Stout and Hayes, Eds.). Although scoring poorly from a benefit/cost model perspective, the Washington State Institute for Public Policy (WSIPP) found PACT is effective in reducing homelessness and psychiatric hospitalizations. WSIPP benefit-cost analyses have also found employment counseling and job training services (in the context of transitional reentry from incarceration into the community) are effective at increasing earnings, reducing technical violations of conditional release, and are cost-effective.

Our forensic risk model found both homelessness and prior psychiatric hospitalizations to be predictors of future competency evaluation referrals. Given that the PACT model has been shown to reduce rates of homelessness and psychiatric hospitalization, there is evidence to suggest it could reduce the risk of referral for competency evaluation. While Washington State currently has a PACT program for adults with serious mental illness, wider targeted implementation of this program may lessen the number of competency evaluation referrals and help Medicaid beneficiaries avoid involvement in the forensic mental health system.

While research indicates the PACT model is effective in reducing patient rehospitalization and in increasing stable housing (Baronet & Gerber, 1998; Bedell, Cohen, & Sullivan, 2000; Bond et al., 2001; Gorey et al., 1998; Herdelin & Scott, 1999; Latimer, 1999; Marshall & Creed, 2000; Ziguras & Stuart, 2000), some have argued the PACT model can be strengthened by incorporating recovery-focused clinical interventions, such as Illness Management and Recovery (IMR; Gingreich & Muser, 2005) into the PACT model. IMR is an evidenced-based intervention designed to improve consumers' self-management of their mental illness (McGuire et al., 2013). IMR includes psychoeducation (i.e., teaching consumers about mental illness and treatment), cognitive-behavioral therapy (see below), and motivational interviewing (i.e., technique to increase consumers' motivation to participate in treatment (McGuire et al., 2016; Salyers et al., 2009). Consumers are considered to be active members of their treatment team and are encouraged to make their own informed choices (Gingreich and Muser, 2005). A recovery orientation is adopted, in which treatment team members help consumers reestablish their sense of self, find their place in society, and reach their full potential (McGuire et al., 2016).

Evidence suggests IMR can be successfully incorporated into the PACT model (Salyers et al., 2009, 2010). For example, Salyers et al. (2009) found IMR was successfully integrated into PACT teams at six of seven studied sites, and five sites achieved high fidelity scores (i.e., full integration of IMR into PACT model) within one year. In addition, consumers demonstrated significant positive changes in their illness management skills and sense of hope. A meta-analysis completed by WSIPP (2017) found IMR had a

positive benefit/cost ratio. As consumers' improved self-management of their mental illness could reduce the risk of psychiatric decompensation and hospital readmission, integration of IMR in the PACT model may indirectly reduce competency referrals, as both psychotic symptoms and psychiatric hospitalization are predictive of competency referrals.

Cognitive-behavioral therapy for psychosis (CBTp) may also indirectly decrease Washington's competency referrals. Cognitive-behavioral therapy for psychosis (CBTp) is an evidence-based treatment designed to target psychotic symptoms (e.g., hallucinations, delusions) that persist despite treatment with antipsychotic medications (Velligan, 2009). It involves the use of cognitive techniques to change consumers' maladaptive thoughts, feelings, and behaviors, as well as behavioral strategies to target their negative symptoms (e.g., reduced emotional expression; social withdrawal). Consumers are taught coping strategies, problem-solving skills, social skills, and relapse prevention strategies. Multiple meta-analyses indicate CBTp is effective in reducing psychotic symptoms, as well as improving consumers' quality of life, self-esteem, and coping strategies (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012; Sarin, Wallin, & Widerlöv, 2011; Turner, van der Gaag, Karyotaki, & Cuijpers, 2014; Wykes, Steel, Everitt, & Tarrier, 2008). A meta-analysis completed by the Washington State Institute for Public Policy (2017) found CBTp had a positive benefit/cost ratio.

However, as many consumers in the community do not have access to mental health providers with training in CBTp, attention has been devoted to the delivery of low-intensity, or brief, CBTp (Bennett-Levy et al., 2010). In brief CBTp, non-therapist providers are taught a simplified version of CBTp so they can incorporate CBTp therapeutic techniques into their work with patients without going outside their scope of practice. For example, psychiatrists could include these strategies with patients during medication management sessions or case managers could incorporate them into their regularly scheduled client interactions (Montesano et al., 2014).

Studies on the efficacy of brief CBTp generally found the incorporation of CBTp into treatment resulted in significant improvements in patients' psychotic symptoms, depressive symptoms, social functioning, overall quality of life, and insight into their mental illness (Nareem et al., 2016; Turkington et al., 2002, 2014; Waller et al., 2013). In addition, both Nareem et al. (2016) and Waller et al. (2016) found the moderate effects (i.e., strength of the relationship) observed were maintained after patients completed brief CBTp treatment.

Similar to IMR, the incorporation of brief CBTp into PACT may be beneficial to both patients and treatment providers. As case managers tend to spend more time with patients than other mental health professionals in community mental health clinics (Sivec et al., 2017), incorporating brief CBTp into Washington's PACT program would make a potentially efficacious treatment more accessible to patients (Bond & Dryden, 2005). In addition, this would be cost-effective for community programs, as fewer doctorate-level psychologists would need to be employed to provide individualized treatment for active mental health symptom (Sivec et al., 2017). As psychotic symptoms predict inpatient hospitalizations and inpatient hospitalizations predict competency

referrals (Beard et al., 2016; Sfetcu et al., 2017), the integration of brief CBTp and PACT may indirectly reduce the number of Washington's competency referrals.

Finally, there may be ways to reduce the number of competency referrals in Washington that do not involve psychiatric interventions. For example, although there is no known data on the number of cases referred for forensic evaluation at arraignment, anecdotal evidence suggests the number is quite high in certain jurisdictions. Many defendants may be under the influence of mind-altering substances at the time of arrest. Their behavior and cognition may continue to be affected at the time of arraignment, resulting in a referral for a competency evaluation. However, these behavioral and cognitive effects may abate once the defendant is no longer under the influence of substances, at which time the competency evaluation may no longer be deemed necessary. Deferring competency evaluation requests until the defendant has had time to undergo managed withdrawal (while considering defendants' rights to due process) might reduce some potentially avoidable competency evaluation referrals.

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Appendix

APPENDIX TABLE 1.
Final Model Parameter Estimates and Odds Ratios
 Model Calibration Data: Calendar Year 2015 – Calendar Year 2016

Variable	Coefficient	Odds Ratio Estimate
Intercept	-7.0944	
Age 25 – 29, relative to Age 18 - 24	0.0906	1.095
Age 40 – 44, relative to Age 18 – 24	-0.1193	0.888
Age 45 – 49, relative to Age 18 – 24	-0.1772	0.838
Age 50 – 54, relative to Age 18 – 24	-0.3186	0.727
Age 55 – 59, relative to Age 18 – 24	-0.4478	0.639
Age 60 – 64, relative to Age 18 – 24	-0.6550	0.519
Female, relative to Male	-0.8981	0.407
Black	0.4428	1.557
American Indian	0.4905	1.633
In DOC facility, prior 7 to 12 months	0.3323	1.394
In DOC facility, prior 13 to 24 months	0.2292	1.258
In DOC facility, prior 25 to 36 months	0.2673	1.306
In DOC facility, prior 37 to 60 months	0.6374	1.892
Forensic State Hospital admit, prior 4-6 months	0.7290	2.073
Forensic State Hospital admit, prior 7-12 months	0.7076	2.029
Forensic State Hospital admit, prior 25-36 months	0.9061	2.475
Forensic State Hospital admit, prior 37-60 months	0.7904	2.204
Civil State Hospital admit, prior month	-1.1683	0.311
Com. Psych admit, 1 month prior	0.8756	2.400
Com. Psych admit, 2 months prior	0.7053	2.024
Com. Psych admit, 3 months prior	0.5617	1.754
Com. Psych admit, 4-6 months prior	0.6663	1.947
Com. Psych admit, 7-12 months prior	0.7887	2.201
Com. Psych admit, 13-24 months prior	0.7437	2.104
Com. Psych admit, 25-36 months prior	0.5836	1.793
Com. Psych admit, 37-60 month prior	0.6003	1.823
E&T admit, 1 month prior	0.6797	1.973
E&T admit, 2 months prior	0.6174	1.854
E&T admit, 4-6 months prior	0.5205	1.683
E&T admit, 7-12 months prior	0.9505	2.587
E&T admit, 13-24 months prior	0.6787	1.971
E&T admit, 25-36 month prior	0.8907	2.437
E&T admit, 37-60 month prior	0.3240	1.383
Forensic State Hospital discharge, 13-24 months prior	0.5755	1.778
Forensic State Hospital discharge, 25-36 months prior	0.5733	1.774
Civil State Hospital discharge, 1 month prior	0.7664	2.152
Civil State Hospital discharge, 4-6 months prior	0.5704	1.769
Civil State Hospital discharge, 7-12 months prior	0.8159	2.261

Civil State Hospital discharge, 13-24 months prior	0.3260	1.385
Civil State Hospital discharge, 37-60 month prior	0.5662	1.762
Homeless without housing, 1 month prior	0.5611	1.753
Homeless without housing, 7-12 months prior	0.2494	1.283
Homeless without housing, 25-36 months prior	0.2533	1.288
Homeless with housing, 1 month prior	0.8785	2.407
Homeless with housing, 7-12 months prior	0.1731	1.189
Homeless with housing, 13-24 months prior	0.2973	1.346
Homeless with housing, 37-60 months prior	0.2593	1.296
Competency evaluation referral, 1 month prior	3.2568	25.967
Competency evaluation referral, 2 months prior	1.7282	5.630
Competency evaluation referral, 3 months prior	1.5506	4.714
Competency evaluation referral, 4-6 months prior	1.8563	6.400
Competency evaluation referral, 7-12 months prior	1.6106	5.006
Competency evaluation referral, 13-24 months prior	1.8805	6.557
Found not competent, 1 month prior	-1.1486	0.317
Found not competent, 13-24 months prior	-0.2655	0.767
Other competency evaluation disposition, 2 months prior	0.9482	2.581
Other competency evaluation disposition, 3 months prior	0.8289	2.291
Other competency evaluation disposition, 7-12 months prior	0.2854	1.330