SOLANO COUNTY PRETRIAL RISK ASSESSMENT REPORT 2024

Amalia Mejia

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Introduction

The Solano County Probation Department Pretrial Services program began in April of 2015. The program utilizes the Ohio Risk Assessment System-Pretrial Assessment Tool (ORAS-PAT) to assess an individual's level of risk for pretrial failure-to-appear and re-arrest. This report intends to correspond to the Judicial Council and SB 36 and AB3364 requirements related to a pretrial risk assessment tool validation and testing of disparate impact and bias based on gender and race/ethnicity. In Solano County, eligibility screening for pretrial assessment is conducted at pre-arraignment or earliest point after that. The Solano County Probation Department Pretrial Services program utilizes established eligibility criteria agreed upon by the Court and justice system partners. Those who are not eligible to be screened for pretrial release pre-arrangement are those individuals who are booked on fugitive holds, federal holds, parole holds, formal probation holds, felony warrants, and no bail 1320PC charges. Those individuals who post bail pre-arraignment, the District Attorney decides not to file charges on, or are released with a Promise to Appear (PTA) by the jail are also not screened. All bail eligible felonies, as well as misdemeanor Domestic Violence, Driving Under the Influence (DUI), and sex offenses that are registerable per 290 PC are screened. All other misdemeanors are not screened, as they are either released with a Promise to Appear (PTA) pre-arraignment or on their own recognizance at arraignment. The court can also release individuals on pretrial supervision at arraignment without a pretrial assessment. All non-eligible individuals in pre-arraignment can be referred for pretrial release screening post arraignment, as ordered by the Court. Pretrial Services prepares a report for the Court, summarizing the pretrial risk score, contributing risk factors, positive factors, social factors, and victim information if available. The risk score and pretrial report are used to inform decisions by the Court as to whether an individual is appropriate to be released pretrial along with their release type and condition of release, or if they should be detained.

Data

For this report, the information gathered de-identified information on individuals who received an ORAS-PAT assessment 2021 (n=846), 2022 (n=1,130), and 2023 (n=968). The data in this report included the individual ORAS-PAT risk score, failure-to-appear (FTA) outcomes, race, gender, age, city, zip code, new misdemeanor, or felony arrest, pretrial supervision release, own recognizance release (ORR), and those assesses but not released on pretrial supervision.[1] The pretrial sample consisted of individuals released on pretrial supervision by the Court who had a completed pretrial risk assessment on file. There are individuals released by the court without undergoing an assessment. The individuals without an assessment were excluded from the tool's validation process, as predictions can only be evaluated when the tool is utilized.

[1] The first analysis focuses on everyone assessed. The second analysis validates those assessed did the tool predict FTA, new arrest, or revocation.

ORAS-PAT tool

The ORAS-PAT is a six-item scale that provides a risk score ranging from zero to nine. This score reflects the relative likelihood that an individual released from custody will appear in court or re-offend pending the outcome of their court case. The following weigh how each item is calculated.

Table 1: ORAS Risk Factors and Scoring Guide

Pretrial Items	Response	Weight
Age at first arrest	32 or older	0
	Under 32	1
Number of failure-to-appear warrants past 24 months	None	0
	One warrant for FTA	1
	Two or more FTA warrants	2
Three or more prior jail incarcerations	No	0
	Yes	1
Employed at the time of the arrest	Yes, Full-time	0
	Yes, Part-time	1
	Not employed	2
Residential stability	Lived at current residence past six months	0
	Not lived at the same residence	1
Illegal drug use during the past six months	No	0
	Yes	1
Severe drug use problem	No	0
	Yes	1
Point Range		0-9

Requirement	**Definitions by SB 36**	**Meets requirements**
Pretrial Risk Assessment Tool	(Penal Code section 1320.35(b)(1)) A "pretrial risk assessment tool" is defined as an instrument used to determine the risks associated with individuals in the pretrial context.	✅
Pretrial Services Agency Definition	(Penal Code section 1320.35(b)(2)) A Pretrial Services Agency is defined as a local public agency that elects to perform pretrial risk assessments on individuals and provides the assessment information to a court.	Solano County Probation Agency
Validation Definition	(Penal Code section 1320.35(b)(4)) Validate is defined as using scientifically accepted methods to measure both of the following: • The accuracy and reliability of the risk assessment tool in assessing (a) the risk that an assessed person will fail to appear in court as required and (b) the risk to public safety due to the commission of a new criminal offense if the person is released before the adjudication of the current criminal offense for which they have been charge. • Any disparate effect or bias in the risk assessment tool based on gender, race, or ethnicity.	✅
Validation data	(Penal Code section 1320.35(c)(2)) A pretrial risk assessment tool shall be validated using the most recent data collected by the pretrial services agency within its jurisdictions	2021-2023 Data collected
Transparency Requirements	(Penal Code Section 1320.35(d)) A pretrial services agency shall make the following information publicly available: • Line items, scoring, weighting, and details on how each line item is scored for each pretrial risk assessment tool that the agency uses. • Validation studies for each pretrial risk assessment tool that the agency uses.	✅

PART I
PRETRIAL DEMOGRAPHICS

Outcomes for 2021 Data

The number of assessed individuals by age, gender, race, or ethnicity

Table 2 illustrates all individuals assessed in the 2021 data set (n=846), which comprises individuals who are on pretrial for the court regardless of the decision outcome. This population includes individuals released on pretrial supervision, ORR, or who were ordered detained. Table 2 suggests that of those assessed in 2021, 81% (686)[2] were male, and 19% (160) were female. Concerning race, approximately 34% (288) identified as white, 37% (317) as Black, 23% (192) as Latinx, four percent (33) as Asian, less than one percent (3) as Native American, and less than two percent (13) as other. The average age is 39 and the most age group is from age 35-44 at about 34%, followed by 26-34 at 30%, then 45-54 at 18%, 55+ at 12%, and seven percent are 18-25.

Table 2: 2021 Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
race	.	.	.	.	.
White	846	.34	.474	0	1
Black	846	.375	.484	0	1
Latinx	846	.227	.419	0	1
Asian	846	.039	.194	0	1
Native American	846	.004	.059	0	1
Other	846	.015	.123	0	1
Age	846	39.879	11.232	21	75
age group	.	.	.	.	.
18-25	846	.069	.253	0	1
26-34	846	.305	.461	0	1
35-44	846	.335	.472	0	1
45-54	846	.175	.38	0	1
55+	846	.117	.322	0	1
gender	.	.	.	.	.
male	846	.811	.392	0	1
female	846	.189	.392	0	1

The number of assessed individuals by risk level, booking charge levels[3], and release type

The ORAS-PAT matrix defines the risk level as the following: someone who scores a two or below low-risk, an individual who scores between three or five points is a medium-risk, and scores of six and above are considered a high-risk. For 2021, 846 people were assessed. 42 % of assessed were high-risk, 40% moderate-risk, and 17% low-risk. Table 3 provides a detailed breakdown of risk levels by the number of individuals and percentage.

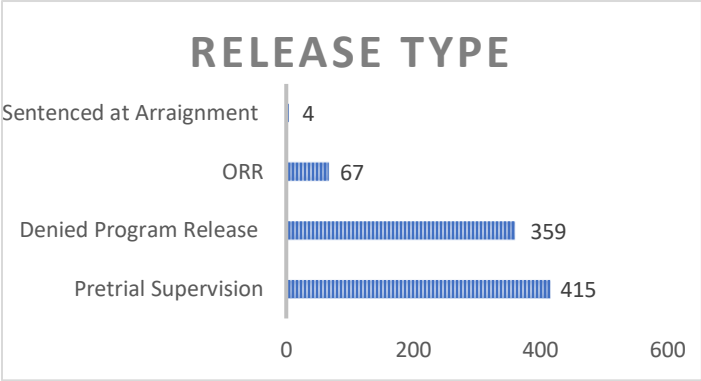
[2] Additional tables including counts per category (e.g. race, age) are found in the appendix below.

[3] Solano Probation is currently unable to track this information. The county is working to retrieve this information and will report it once it has updated data.

Table 3: Individuals Assessed by Risk Level

Risk Level	Freq.	Percent	Cum.
Low	198	23.40	23.40
Moderate	352	41.61	65.01
High	296	34.99	100.00
Total	846	100.00	

Figure 1: Individuals Assessed by Release Type (n=845)



In Figure 1, out of the 846 individuals assessed, 415 were released on pretrial supervision, 67 were released on own recognizance release (ORR)[4], and 359 were denied program release. Although more individuals were granted pretrial supervision, only those assessed by ORAS-PAT are reported in Figure 1. The difference between 846 and 845 is due to another release type, possibly by bail.

Figure 2: Risk Level by Release Type (n=815)

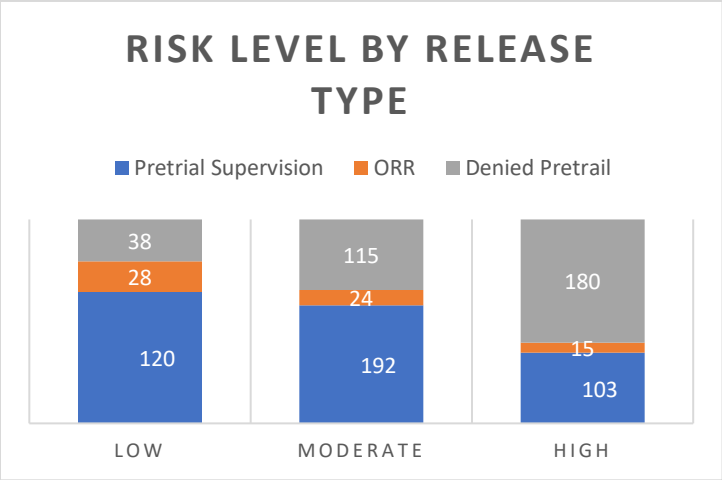


Figure 2 illustrates the number of individuals released by risk level. They do not include detained or sentenced at arraignment. Out of the 186 determined low-risk, 80% were released on ORR or pretrial supervision. Approximately 65% categorized as moderate were released on ORR or pretrial supervision. In comparison, 40% of high-risk levels were released on ORR or pretrial supervision. Thus, not all individuals who are scored low are released on pretrial supervision or ORR. The decision to release individuals is ultimately the Court's decision regardless of the pretrial risk assessment finding.

[4] The total released on ORR were 101 however some were released without a risk assessment. The numbers above represent those with a risk assessment.

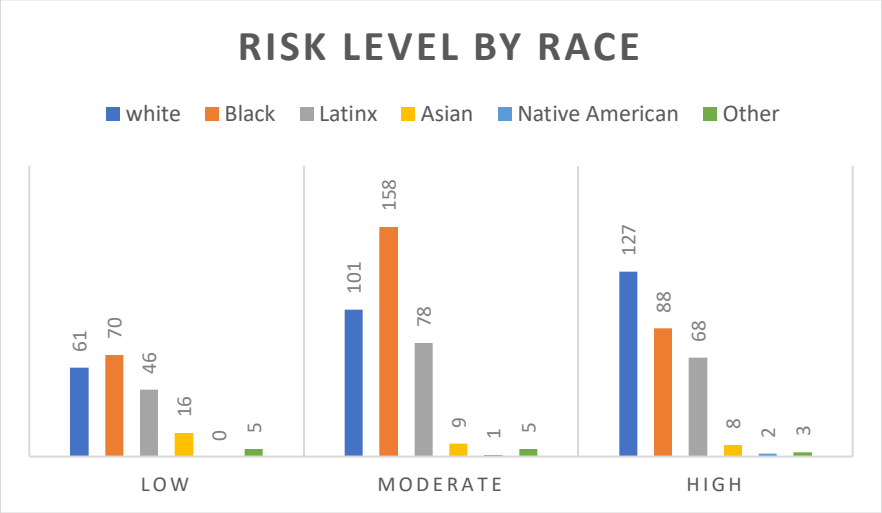
The number and percentage of assessed individuals who receive pretrial supervision by the level of supervision

Table 4 describes those individuals who received pretrial supervision by their risk level. Most of the individuals who were under pretrial supervision were at a moderate level of supervision. This table is different from Figure 2 since Figure 2 captures release type, including ORR and those denied pretrial, while Table 4 captures those released from the court on pretrial supervision.

Table 4: Pretrial supervision by the risk level[5] (n=415)

Risk Level	Freq.	Percent	Cum.
Low	120	28.92	28.92
Moderate	192	46.27	75.18
High	103	24.82	100.00
Total	415	100.00	

Figure 3: Risk Level by Race for all population



In Figure 3, out of the (n=846) individuals assessed, Black and white individuals are similar low-risk at (n=70) and (n=61). There was an increase in moderate for Black individuals at (n=158). The majority predicted high-risk are white individuals at (n=127), Black individuals (n=88), and Latinx (n=68).

The number and percentage of assessed individuals by supervision level who fail to appear in court as required, are arrested[6] for a new offense during the pretrial period, or have pretrial release revoked by the court due to a technical violation of release conditions

Probation only tracks FTA, new misdemeanor arrest, new felony arrest for those under pretrial supervision. Currently, Probation does not track FTA for those released on ORR. Table 5 illustrates that those assessed as low risk had 8.33% FTA, 2.5% had a new misdemeanor, and 1.67% were

[5] At this moment Solano Probation Department utilizes the risk level to inform supervision however supervision levels were not on the data set provided but will be included in future analysis.

[6] The arrest variable for the report defines arrest for individuals who are charge with a new arrest or if their supervision was revoked due to a new arrest. Therefore, currently probation does not capture all arrest since individuals might be arrested and released without a charge.

arrested for a new felony leading to a total revocation rate among low risk at 13.33%. Those assessed as moderate risk had a 23.44% FTA, 2.08% for a new misdemeanor, and 1.56% for a new felony, 1.04% had pretrial revoked with a total revocation rate of 28.12%. Those assessed as high-risk have a 34.95% FTA rate, 4.85% for a new misdemeanor, 6.8% new felony, 3.88% pretrial revocation, and a rate of 47.57% for total revocations. Thus, considering all risk levels, approximately 28% of individuals either FTA or commit a new crime, or revoked for a technical violation of their released conditions. For comparison, the ORAS-PAT tool has been validated across multiple jurisdictions; in one study, researchers found that individuals assessed as low-risk had a 5.4% FTA or new arrest rate, 17.8% for moderate-risk, and 29.5% for high-risk (Latessa et al., 2010).

Table 5: Fail to Appear or new conviction for those in pretrial supervision or direct court pretrial.

		FTA		**New Misdemeanor**		**New Felony**		**Pretrial Revoked**		**Total Revoked**	
Monitor Level	Total	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count
Low	120	8.33%	10	2.50%	3	1.67%	2	0.83%	1	13.33%	16
Moderate	192	23.44%	45	2.08%	4	1.56%	3	1.04%	2	28.12%	54
High	103	34.95%	36	4.85%	5	6.80%	7	3.88%	4	47.57%	49
All Levels	415	21.93%	91	2.89%	12	2.89%	12	1.69%	7	28.67%	119

Zip code prevalence

Of the individuals assessed for ORAS-PAT, the majority lived in the following zip codes: 94533(22%), 94590 (10%), 95687 (9%), and 94589 (8%). Likewise, those individuals assessed and released on pretrial supervision lived in the same zip codes: 94533(22%), 94590 (11%), 95687 (9%), and 94589 (6%).

Outcomes for 2022 Data

The number of assessed individuals by age, gender, race, or ethnicity

The descriptive statistics of the data set for 2022 obtained 1,130 observations, including all assessed individuals regardless of release type. The male population comprised 82% (930)[7], while the female population was 18% (199), and less than 1% (1) non-binary. The racial and ethnic composition considered assessed for the ORAS-PAT was 29% (328) white, 38% (424) Black, 26% (288) Latinx, 7% (56) Asian, less than one percent Native Americans (5), and less than two percent (29) other. Of those assessed, 33% (374) were between 26 to 34 and 32% (362) between 35 to 44, 15% (174) between 45-54, 10% (110) were older than 55, and 10% (110) were between 18-25.

Table 6: 2022 data population (n=1130)

Variable	Obs.	Mean	Std. Dev.	Min	Max
race	.	.	.	.	.
White	1130	.29	.454	0	1
Black	1130	.375	.484	0	1
Latinx	1130	.255	.436	0	1
Asian	1130	.05	.217	0	1
Native American	1130	.004	.066	0	1
Other	1130	.026	.158	0	1
Age	1130	38.446	11.014	20	83
age group	.	.	.	.	.
18-25	1130	.097	.297	0	1
26-34	1130	.331	.471	0	1
35-44	1130	.320	.467	0	1
45-54	1130	.154	.361	0	1
55+	1130	.097	.297	0	1
gender	.	.	.	.	.
non-binary	1130	.001	.03	0	1
male	1130	.823	.382	0	1
female	1130	.176	.381	0	1

The number of assessed individuals by risk level, and release type

The ORAS-PAT matrix defines the risk level as the following: someone who scores a two or below low-risk, an individual who scores between three or five points is a medium-risk, and scores of six and above are considered a high-risk. The number of individuals assessed by risk level were 1,130. Out of those 1,130, about 22% were low-risk, 43% were moderate, and 35% were high risk.

[7] The counts are found below in the appendix.

Table 7: Individuals by risk level

Risk Level	Freq.	Percent	Cum.
Low	250	22.12	22.12
Moderate	481	42.57	64.69
High	399	35.31	100.00
Total	1130	100.00	

Figure 4: Release type (n=987)

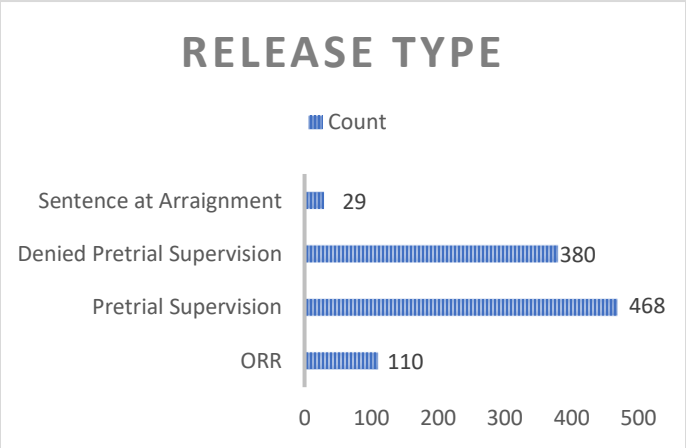


Figure 4 demonstrates 468 released under pretrial supervision, 110 released under ORR, and 380 denied pretrial supervision. The difference between all assessed 1,1130 and 987 in release type is due to those released on bail, DA decided not to file, or deemed ineligible. Most individuals were released by pretrial supervision rather than ORR.

Figure 5: Release type by risk level (n=916)

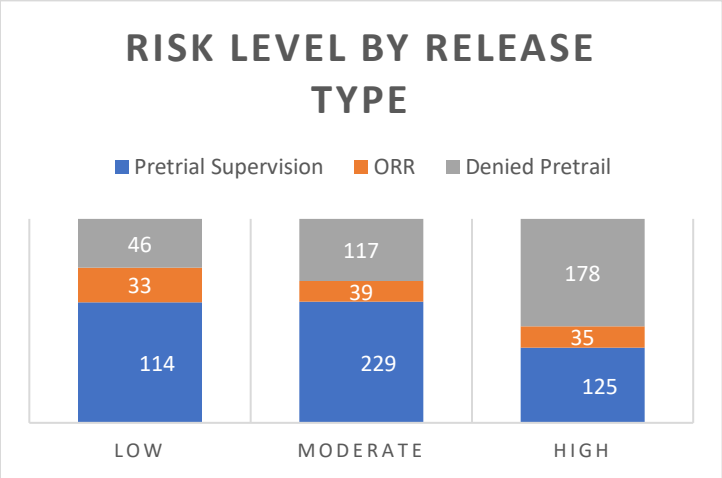


Figure 5 illustrates that 59% of those assessed low risk, were released on pretrial supervision. Similar percentage to moderate risk released on pretrial supervision. While only 37% of individuals who scored high-risk received pretrial supervision.

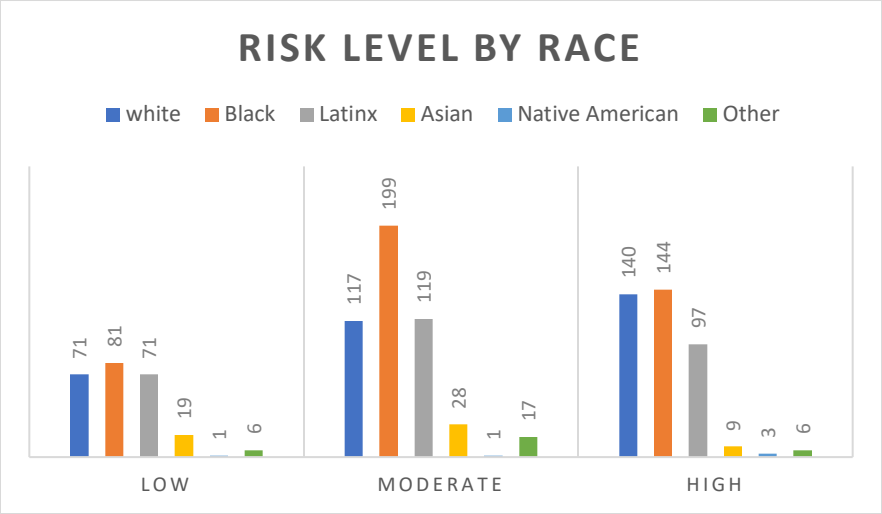
The number and percentage of assessed individuals who receive pretrial supervision by the level of supervision

Table 8 describes those individuals who received pretrial supervision by their risk level. Approximately 49% were moderate, approximately 27% were high-risk, and 24% were low risk.

Table 8: Pretrial supervision by the level of supervision

Risk Level	Freq.	Percent	Cum.
Low	114	24.36	24.36
Moderate	229	48.93	73.29
High	125	26.71	100.00
Total	468	100.00	

Figure 6: Risk Level by Race for all population



In Figure 6, out of the (n=1,130) individuals assessed, Black (81), white (71), and Latinx (71) individuals are similar low-risk. There was an increase in moderate for Black individuals at (n=199). The majority predicted high-risk are Black (144) and white (140) individuals.

The number and percentage of assessed individuals by supervision level who fail to appear in court as required, are arrested for a new offense during the pretrial period or have pretrial release revoked by the court due to a technical violation of release conditions

The failure-to-appear rate was the highest among high-risk individuals, with an FTA rate of 37%, while moderate-risk has an FTA rate of 21%. Table 9 demonstrates that it is unlikely that individuals on pretrial supervision will be charge with new misdemeanor arrest or new felony arrest. Accounting for all revocations, an individual who are low risk had a 17% revocation rate. While those who are moderate risk had a 32% revocation rate, and those who scored high-risk, had a 50% revocation rate. However, the overall revocation rate for all those who were released on pretrial supervision was 33%. This rate does not account for those released on ORR, as Solano County Probation does not track that information.

Table 9: Fail to Appear or new conviction for those in pretrial supervision or direct court pretrial.

		FTA		**New Misdemeanor**		**New Felony**		**Pretrial Revoked**		**Total Revoked**	
Monitor Level	Total	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count
Low	114	9.6%	11	3.51%	4	1.75%	2	1.75%	2	16.67%	19
Moderate	229	21.4%	49	4.80%	11	4.80%	11	2.18%	5	31.88%	73

High	125	37.6%	47	4.80%	6	4.80%	6	3.20%	4	50.40%	63
All Levels	468	22.86	107	4.49%	21	4.06%	19	2.35%	11	33.12%	155

Zip code prevalence

Of the individuals assessed for ORAS-PAT, the majority lived in the following zip codes: 94533(23%), 94590 (10%),95687 (8%), and 94589 (7%). Likewise, of those individuals assessed who are released on pretrial supervision or ORR live in the zip codes 94533 (26%), 94590 (9%), 95687 (8%), and 94589 (7%).

Outcomes for 2023 Data

The number of assessed individuals by age, gender, race, or ethnicity

The descriptive statistics of the data set for 2023 obtained 968 observations, including all assessed individuals regardless of release type. The male population comprised 80% (778)[8], while the female population was 20% (190). The racial and ethnic composition considered assessed for the ORAS-PAT was 27% (261) white, 38% (367) Black, 28% (271) Latinx, 4% (41) Asian, less than one percent Native Americans (7), and two percent (21) other. Of those assessed, 34% (325) were between 26 to 34 and 31% (299) between 35 to 44, 15% (149) between 45-54, 8% (79) were older than 55, and 12% (116) were between 18-25.

Table 10: 2023 data population (n=968)

Variable	Obs.	Mean	Std. Dev.	Min	Max
race	.	.	.	.	.
White	968	.27	.444	0	1
Black	968	.379	.485	0	1
Latinx	968	.28	.449	0	1
Asian	968	.042	.202	0	1
Native American	968	.007	.085	0	1
Other	968	.022	.146	0	1
Age	968	37.649	11.061	19	84
age group	.	.	.	.	.
18-25	968	.12	.325	0	1
26-34	968	.336	.472	0	1
35-44	968	.309	.462	0	1
45-54	968	.154	.361	0	1
55+	968	.082	.274	0	1
gender	.	.	.	.	.
Female	968	.196	.397	0	1
Male	968	.804	.397	0	1

[8] The counts are found below in the appendix.

The number of assessed individuals by risk level, booking charge levels[9]And release type

The ORAS-PAT matrix defines the risk level as the following: someone who scores a two or below low-risk, an individual who scores between three or five points is a medium-risk, and scores of six and above are considered a high-risk. The number of individuals assessed by risk level were 968. Out of those 968 about 25% were low-risk, 46% were moderate, and 30% were high risk.

Table 11: Individuals by risk level

Risk Level	Freq.	Percent	Cum.
Low	240	24.79	24.79
Moderate	438	45.25	70.04
High	290	29.96	100.00
Total	968	100.00	

Figure 7: Release type (n=756)

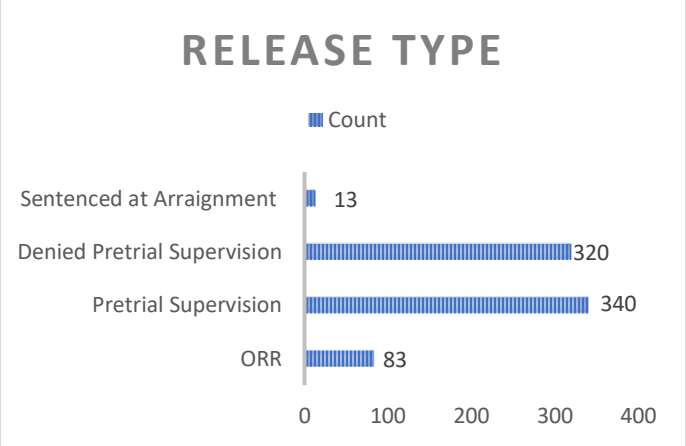


Figure 7 demonstrates 340 released under pretrial supervision, 83 released under ORR, and 330 denied pretrial supervision. The difference between all assessed 968 and 756 in release type is due to those released on bail, DA decided not to file, or deemed ineligible. Most individuals were released by pretrial supervision rather than ORR.

[9] Charge Level information was unavailable due to Solano County Probation switching to a new case management system in 2020.

Figure 8: Release type by risk level (n=684)

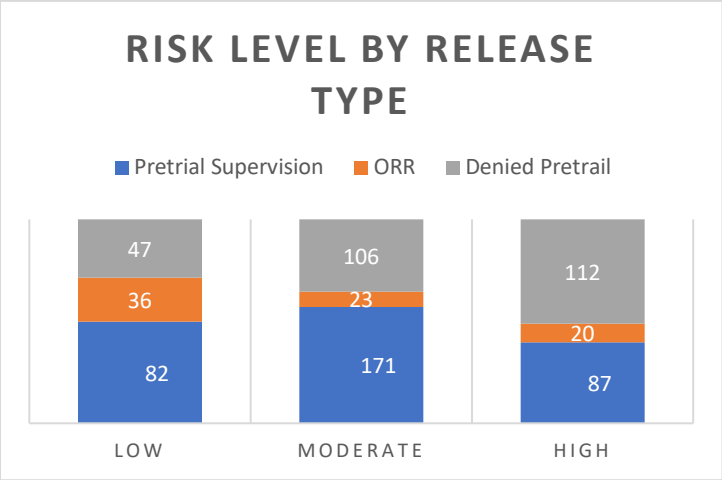


Figure 8 illustrates that 50% of those assessed low risk, were released on pretrial supervision. 57% of the moderate risk were released on pretrial supervision. While 39% of individuals who scored high-risk received pretrial supervision.

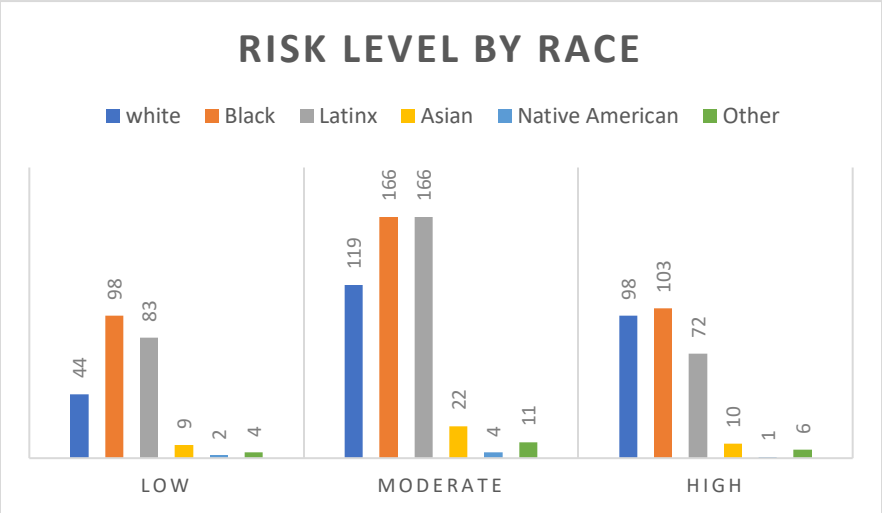
The number and percentage of assessed individuals who receive pretrial supervision by the level of supervision

Table 12 describes those individuals who received pretrial supervision by their supervision level. Approximately 50% were moderate, approximately 26% were high-risk, and 24% were low risk.

Table 12: Pretrial supervision by the level of supervision

Risk Level	Freq.	Percent	Cum.
Low	82	24.12	24.12
Moderate	171	50.29	74.41
High	87	25.59	100.00
Total	340	100.00	

Figure 9: Risk Level by Race for all population



In Figure 9, out of the (n=968) individuals assessed, Black (98), and Latinx (83) individuals are similar low-risk while whites (44) were less. There was an increase in moderate for Black individuals at (n=166). The majority predicted high-risk are Black (103) and white (98) individuals.

The number and percentage of assessed individuals by supervision level who fail to appear in court as required, are arrested for a new offense during the pretrial period or have pretrial release revoked by the court due to a technical violation of release conditions

The failure-to-appear rate was the highest among high-risk individuals, with an FTA rate of 29%, while moderate-risk has an FTA rate of 22%. Table 13 demonstrates that it is unlikely that individuals on pretrial supervision will be charge with a new misdemeanor arrest or new felony arrest. Accounting for all revocations, an individual who scored as low risk had a 11% revocation rate. While those who scored moderate risk had a 40% revocation rate and those who scored high-risk, had a 53% revocation rate. However, the overall revocation rate for all those who were released on pretrial supervision was 36%. This rate does not account for those released on ORR, as Solano County Probation does not track that information. Including the ORR might change the percentages.

Table 13: Fail to Appear or new conviction for those in pretrial supervision or direct court pretrial.

		FTA		**New Misdemeanor**		**New Felony**		**Pretrial Revoked**		**Total Revoked**	
Monitor Level	Total	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count
Low	82	3.66%	3	0	0	1.22%	1	7.32%	6	10.98%	9
Moderate	171	21.64%	37	1.17%	2	3.51%	6	14.62%	25	39.77%	68
High	87	28.75%	25	4.6%	4	5.75%	5	14.94%	13	52.87%	46
All Levels	340	19.12%	65	1.76%	6	3.53%	12	12.94%	44	36.18%	123

Zip code prevalence

Of the individuals assessed for ORAS-PAT, the majority lived in the following zip codes: 94533(25%), 94590 (9%),95687 (10%), and 94589 (6%). Likewise, of those individuals assessed who are released on pretrial supervision or ORR live in the zip codes 94533 (24%), 94590 (7%), 95687 (10%), and 94591 (7%).

PART II

PRETRIAL RISK ASSESSMENT TOOL VALIDATION REPORT

Data

For this report, the researcher gathered de-identified information on individuals who received an ORAS-PAT assessment prior to release and were released under pretrial supervision in 2021 (n=415), 2022 (n=468), and 2023 (n=340). Although some individuals were released under own recognizance release (ORR), the Solano Probation Department does not collect FTA for that population. Therefore, the tool validation focuses on the pretrial supervision population with an ORAS-PAT assessment conducted before release, FTA, new charge arrest, and revocation data. The data in this report included the individual ORAS-PAT risk score, FTA outcomes, race, gender, new charge misdemeanor or charge felony arrest, pretrial supervision release, and total revocations, including technical violations. The pretrial sample consisted of individuals released on pretrial supervision by the Court who had a completed pretrial risk assessment on file.

Background

The Ohio Risk Assessment System has been validated by the University of Cincinnati Corrections Institute (UCC) and the Ohio Department of Rehabilitation and Corrections (ODCR). One of those instruments under the ORAS umbrella is the Pretrial Assessment Tool (PAT). The ORAS-PAT concluded that the total score was correlated with outcome (r=.22), suggesting that as the score increases, the likelihood to re-offend or failing to appear increases (Latessa, 2010). The Area Under the Curve (AUC) quantifies the overall ability of the model to discriminate between groups. Likewise, an AUC score can distinguish between classes where a score of one indicates a good measure of accuracy, a score of zero indicates the worst measure of separability, and a .5 indicates the model is no better than chance at predicting FTA or new arrest (Rice & Harris, 2005). Thus, the Area Under the Curve (AUC) was used to compare the predictive accuracy. The AUCs can be read as the following a score of .50 indicates chance prediction, .56 a small predictive effect, .64 a medium predictive effect, .71 a significant predictive effect, and 1 a perfect prediction (Rice & Harris, 2005). To truly understand how the population and tool behave, the jurisdiction must validate with the local Solano County population.

Method

First, the report focuses on reporting descriptive statistics on individual-level information and percentage for gender, race, risk score, and risk level. A logistic regression was run to validate ORAS-PAT capacity to predict the likelihood of FTA accurately among the Solano population. Additional logistic regression models were conducted to differentiate if the tool also predicts new arrest and total revocations. For the total revocations, that is inclusive of FTA, new arrest, and technical violations. Specifically, the question under review determines if higher scores accurately predict FTA, new misdemeanor, or felony arrest. Probation only collects data on FTA for those who are on pretrial supervision not for those individuals released on ORR by the court. The tools are tested by year given the short period for pre-trial supervision.

2021 Tool Validation

The 2021 data consisted of n=415, of which 78% were male, and approximately 22% were female. The sample race composition was 36% Black, 32% white, 26% Latinx, less than five percent Asian, and less than one percent Native American and other. Table 14 illustrate the descriptive statistics for the sample population on pretrial supervision. It illustrates that the overall FTA rate was 22%, the rate for new charge arrest was 5%, and total revocations were 29%. In addition, the average total risk score was four, and most individuals released on pretrial were moderate risk.

Table 14: 2021 pretrial supervision population

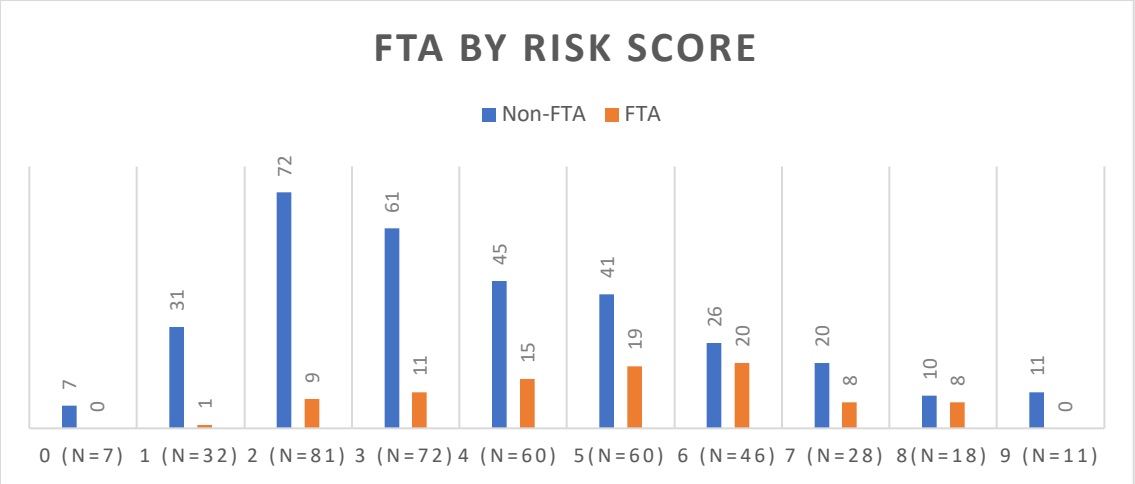
Variable	Obs.	Mean	Std. Dev.	Min	Max
race	.	.	.	.	.
White	415	.318	.466	0	1
Black	415	.357	.48	0	1
Latinx	415	.263	.441	0	1
Asian	415	.048	.214	0	1
Native American	415	.002	.049	0	1
Other	415	.012	.109	0	1
gender	.	.	.	.	.
male	415	.783	.413	0	1
female	415	.217	.413	0	1
Risk level	.	.	.	.	.
Low	415	.289	.454	0	1
Moderate	415	.463	.499	0	1
High	415	.248	.432	0	1
Risk Score	415	4.012	2.117	0	9
FTA	415	.219	.414	0	1
Charge Arrest	415	.053	.224	0	1
Technical violation	415	.017	.129	0	1
Revoked	415	.287	.453	0	1

Research question:

How successful was the total ORAS-PAT assessment score at predicting the likelihood of FTA among the Solano pretrial population?

A chi-square test examines the risk scores and risk level accuracy to predict FTA. First, the FTA rate was examined by risk score, as shown in Figure 10. Then, the FTA rate was examined by risk level. In theory, the risk scores should indicate that as the risk scores increase, so do the FTA rates. In Figure 11, the FTA rate was displayed by risk level. Individuals were placed in three different risk levels: low, moderate, and high. Low-risk is an individual who scored 0-2, a moderate-risk 3-5, and high-risk 6-9.

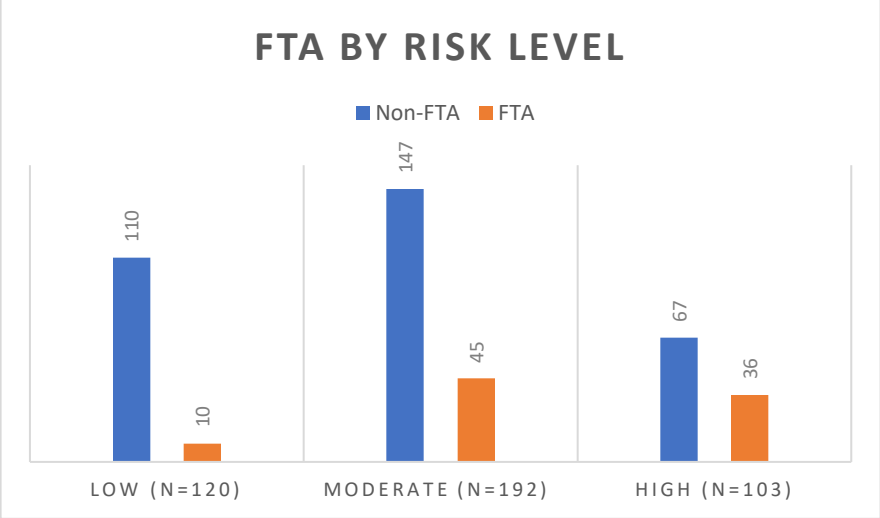
Figure 10: FTA by Risk Score



$\chi 2$ (9,N=415)=41.25; (p<.00) gamma=0.3932

The following n=415 depicts those that FTA by risk score. Figure 10 demonstrates the FTA rate by risk score for the population released on pretrial supervision. It was observed that those who scored 0 had a zero FTA rate. While those who scored one had a 3.12 % FTA rate, those who scored two had a 11.11 % FTA rate, those who scored three had a 15.28 % FTA rate, those who scored four had a 25% FTA rate, those who scored six had a 43.48% FTA rate, those who scored seven had a 28.57% FTA rate, and those who scored eight had a 44% FTA rate, those that scored 9 had a 0% FTA rate. Although generally, it was observed that there was an increase in FTA rates, there were no FTAs for those who scored nine. The chi-square test was conducted to test if the increases in FTA rates across ORAS-PAT assessment scores are statistically significant ($\chi 2$ (9) =41.25 (p=.00), the test indicated that the relationship between FTA rates and risk score is statistically significant suggesting that risk score predicts FTA. The gamma coefficient is measured as the following 0 is none, .01 -- 0.29 is a small association, 0.30 – 0.49 is a moderate association, 0.50 – 0.69 substantial association, and >.70 very strong association. The strength association of gamma=0.3932 a moderate association meaning as one variable (risk score) increases, FTA increases.

Figure 11: FTA by risk level



$\chi 2$ (2)= 23.41 (p<.00) Gamma=.4674

Figure 11 demonstrates that FTA rates were highest for moderate and high-risk levels and these increases were statistically significant. The chi-square test indicates that the rise in FTA rates across risk levels is statistically significant. The gamma coefficient measuring the relationship strength between risk levels and FTA is .4674, indicating a moderate association.

In addition to examining the failure-to-appear rates among risk scores and risk levels, a logistic regression examines the likelihood to predict FTA, new charge arrest, and total revocations as the dependent variable(s), and independent variables are risk score, female, Black population, and Latinx population. For this model, female, Black, and Latinx are binary variables. Therefore, if an individual is female, it is captured as one. Likewise, if an individual is Black, it is a one and zero for non-Black. If someone is Latinx, it is captured as one for the binary variable and zero if non-Latinx. Other races such as Asians, Native Americans, and others were not captured because they were very minimal in the pretrial supervision to provide a prediction.

Table 15: Logit Regression testing failure-to-appear, new charge arrest and revocations by race and gender

VARIABLES	(1) FTA OR	(2) Charge Arrest OR	(3) Revoked OR
Risk Score	1.286***	1.329***	1.329***
	(0.074)	(0.1358)	(0.072)
Female	1.484	1.013	1.202
	(0.420)	(0.543)	(0.325)
Black	0.805	0.500	0.729
	(0.230)	(0.279)	(0.1927)
Latinx	0.901	0.735	0.817
	(0.277)	(0.394)	(0.2337)
Constant	0.095***	0.019***	0.134***
	(0.0322)	(0.0124)	(0.041)
R2	0.0533	0.0588	0.0653
AUC	0.680	0.687	0.6865
Observations	415	415	415

Note: *** significant at the 1% level ** Significant at the 5% level and * significant at 10 %**.**

OR= Odds Ratio and SE= Standard Error

In Table 15, the results find that the risk score is statistically significant at predicting FTA, new arrest and total revocation at the 95% confidence level. An odds ratio of less than one indicates a lower outcome. For the model I, the risk score was associated with a 28% increase in the odds of pretrial failure (OR=1.28). If someone was a female, Black or Latinx it was not statistically significant at explaining FTA, new arrest, or revocations. The lack of statistical significance does not indicate racial disparity but indicates that race does not predict FTA, arrest, or revocation. To compare the models, the AUC score .68 in model 1, .687 in model II, and .6865 in model III indicates a medium predictive effect. The binary variables for Black or Latinx were not statistically significant at predicting FTA, arrest, or revocation, some scholars might argue that this demonstrates free of predictive bias. However, to ensure there is no predictive bias, further studies need to account for differences in risk levels among race and gender.

Research Question

Does ORAS-PAT produce racial or gender bias?

An analysis was conducted to test if the ORAS-PAT produces racial bias. Specifically, if the risk levels produce racial bias using FTA as the outcome. Skeem & Lowenkamp (2016) argue that similar distributions across groups would indicate free of predictive bias while differential distributions would indicate predictive bias. Other scholars like Chouldechova argue that bias is tested using false-positive rates. For this report, distributions across groups were tested to

determine bias. In addition, to test differences across groups, the AUC score was tested for each subgroup, and then a test for difference between AUC scores was run to determine predictive bias. A statistically significant difference between AUC scores would indicate predictive bias, while an insignificant difference would suggest there is no statistical significance to demonstrate predictive bias.

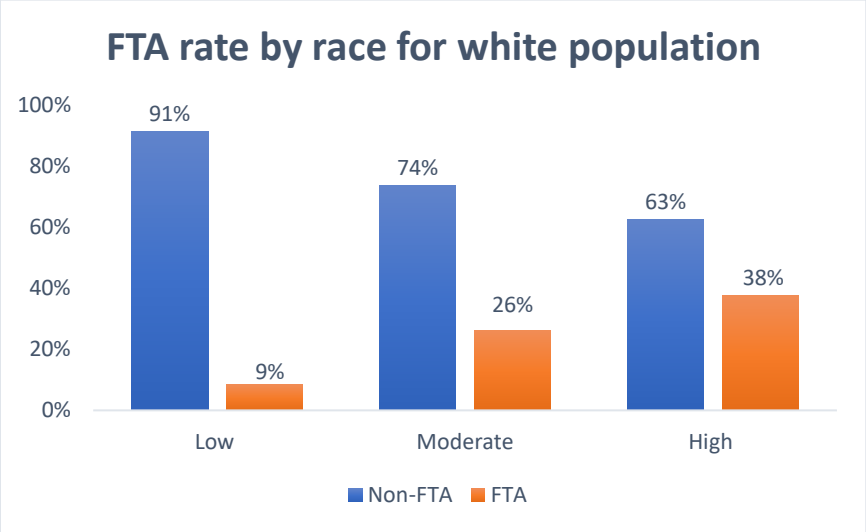
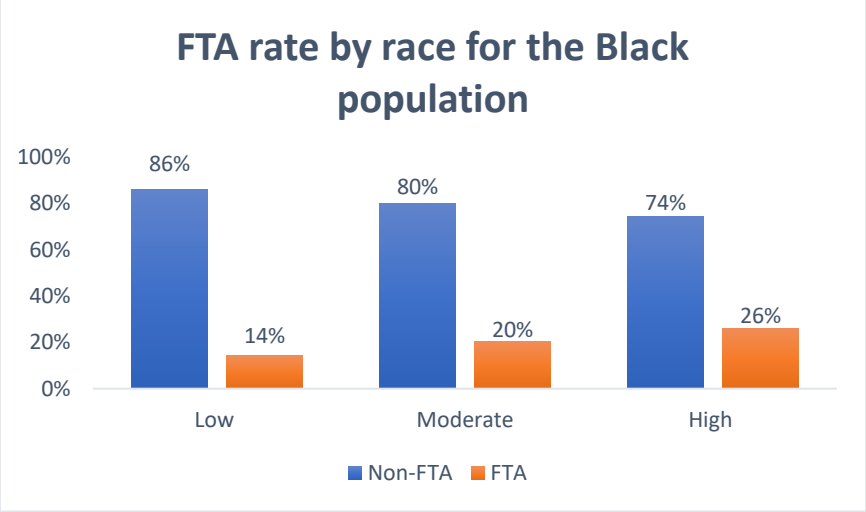


Figure 12: FTA rate by risk level for the white population n=132

In Figure 12, FTA rates increased by risk level for individuals who are white. This is statistically significant (Chi2=8.42; p <.015)[10]. The AUC score is .6552 suggesting a medium predictive effect. The AUC score does not statistically differ from other racial groups meaning there is no evidence of significant disparity in predictive accuracy in comparison to non-white groups.

AUC score=.6552

Figure 13: FTA rate by risk level for the Black population n=148



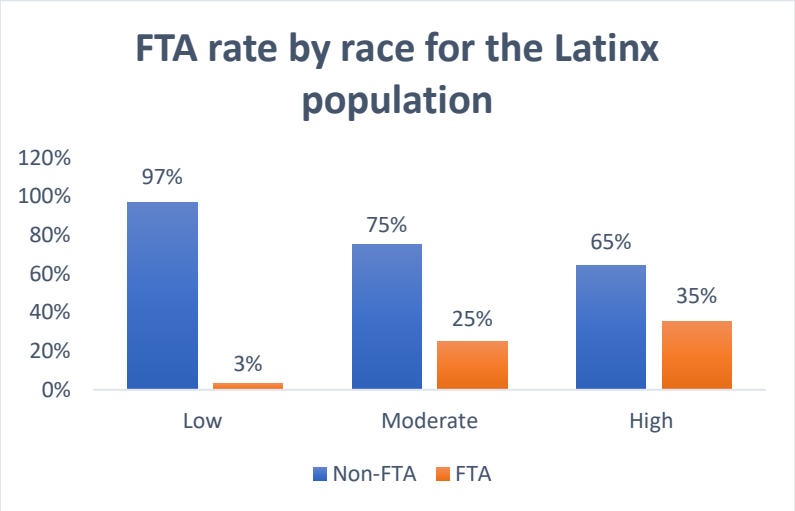
In Figure 13, the FTA rate distribution for individuals who are Black begins at 14% for low risk and increases as risk level increases. However, the increase is not statistically significant (Chi2=1.46; p >0.48). The AUC score is .5653 suggesting that it is marginally better than chance to predict FTA rates by risk level for individuals

[10] The chi2 is measuring if the observed differences between low and high are statistically significant while the AUC evaluates whether the risk level predicts FTA.

who are Black. The AUC score of .5653 might indicate that the ORAS-PAT risk level might not predict FTA as strong for individuals who are Black than the white population. However, when testing for significance this was insignificant. When testing AUC score to the Asian population it was statistically significant, suggesting that risk level might predict better for Asians than Black people.

AUC score= .5653

Figure 14: FTA rate by risk level for the Latinx population n=109



In Figure 14, the FTA rates increase as risk levels increase. The increase is statistically significant (Chi2=9.62; p <.008). The AUC score of .6880 suggest that the predicting FTA rate for Latinxs by risk level has a medium predictive effect. However, the AUC score does not statistically differ from other racial groups meaning there is no evidence of significant disparity for Latinxs.

AUC score=.6889

Figure 15: FTA rate by risk level for the Asian population n=20

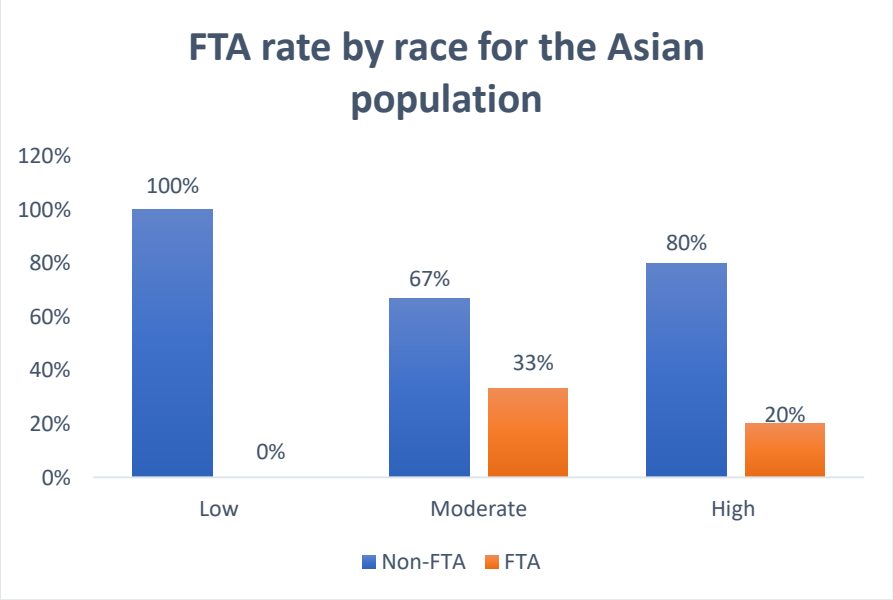
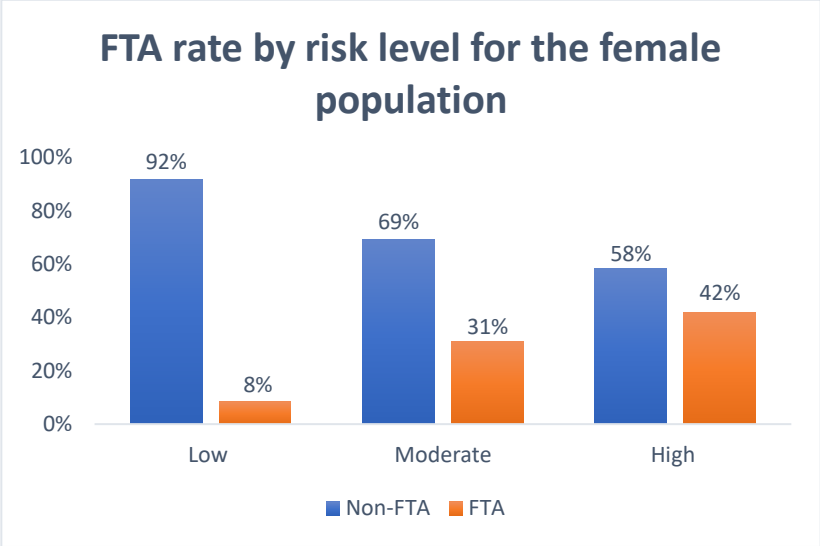


Figure 15 illustrates that FTA rates did not uniformly increase as risk levels increased. They FTA rate for moderates was higher than those with high-risk. The (Chi2=5.41; p>.067) meaning it is not statistically significant. The AUC score of .8438 suggest that there is a strong association (predictor) for FTA and risk levels. There was a statistical difference in AUC scores between Black and Asian people but not statistically significant difference with Asian and Latinx or white people. This indicates that ORAS-PAT may not predict FTA as strongly for

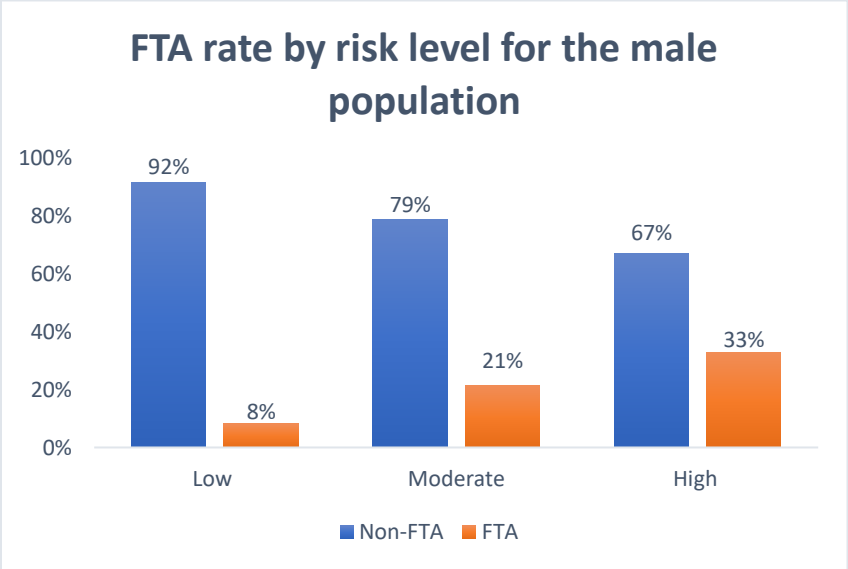
Black people in comparison to Asians, indicating potential racial bias or unequal model across racial groups. It is possible that these differences may stem from sample size (e.g. 20 vs 148).

Figure 16: FTA rate by risk level for the female population n=90



AUC score=.6625

Figure 17: FTA rate by risk level for the male population n=325



AUC score=.6494

Figures 16 and 17 illustrate the FTA rates by risk level for females (n=90) and males (n=325). For both females and males, the FTA rate increases as risk levels increase. In addition, the AUC score for females is .66, while for males, it is .64, a medium predictive effect for both. There was no statistical difference between females and males, suggesting no predictive bias in terms of gender.

The previous models examined predictive bias and the prediction of the likelihood of FTA. It is also essential to test disparate impact across racial, ethnic, and gender groups. Drawing from (Skeem & Lowenkamp, 2016; Barno, Williams, & Nevárez Martínez, 2019), disparate impact is measured by the difference in means scores of risks. A statistical difference in mean scores could potentially impact more restrictive conditions on pretrial release. For example, if someone who identifies as Black is scored higher and those differences are statistically significant, that would indicate that a difference in mean scores would cause Black individuals to be less likely released on pretrial.

There were no statistical differences in mean scores between males and females for the pretrial supervision group. There were no statistical differences in mean scores for race or ethnicity for the pretrial supervision group. The findings suggest there is no disparate impact based on race, ethnicity, or gender for those under pretrial supervision. Tables 16 and 17 demonstrate the mean risk scores based on race, ethnicity, and gender categories. It was observed that the mean risk score of individuals overall assessed is higher than the sample under pretrial supervision. There is no statistical difference by gender for everyone assessed. However, there is statistical difference in the mean risk scores between Black and white individuals, and Asian and white individuals suggesting disparate impact where white individuals are being assigned slightly higher.

Table 16: Disparate impact: risk scores on those released under pretrial supervision (n=415)

Mean Risk Scores								
	Males (n=325)	Females (n=90)	White (n=132)	Black (n=148)	Latinx (n=109)	Asian (n=20)	Native American (n=1)	Other (n=5)
Mean Risk Score	3.97	4.15	4.20	3.88	4.12	3.35	7	2.4

There were no statistical differences in mean scores by race, ethnicity, or gender.

Table 17: Disparate impact: mean risk regardless of all assessed (n=846)

Mean Risk Scores								
	Males (n=686)	Females (n=160)	White (n=288)	Black (n=317)	Latinx (n=192)	Asian (n=33)	Native American (n=3)	Other (n=12)
Mean Risk Score	4.51	4.58	4.86	4.32	4.53	3.57	6.33	3.91

There were no statistical differences by gender.

Discussion

Overall, the FTA rates increased as the ORAS-PAT risk level increased, and these increases were statistically significant. Indicating that the increases in FTA rate are not by chance; the risk level does predict FTA. At the same time, the FTA rates increase as the ORAS-PAT risk score increases are statistically significant. The logistic regression model predicting the likelihood

of FTA, arrest, and total revocations were consistent that risk score was statistically significant at predicting FTA, arrest, or total revocation. Although the covariates of race and gender do not seem to predict FTA, arrest, or revocations, suggesting no racial bias. The strength of ORAS-PAT on FTA rates by subgroups means that the prediction for Black individuals is less compared to whites, Latinxs, and Asians. This suggests that FTA rates for Black individuals are no better than chance and further analysis should test what is causing these differences. Testing individual items of the tool will allow a better explanation of why there is a difference in prediction strength. At this moment, Probation is unable to retrieve that data. What can be concluded is that the risk levels do not accurately predict FTA for Black people. There was no gender bias, and the tool predicted an increase in FTA rates as risk levels increased by gender and it was statistically significant chi(2)=16.35 $p < 0.00$; chi2(2)=7.04, $p < 0.03$.

2022 Tool Validation:

The 2022 data consisted of n=468, of which 80% were male, and approximately 20% were female. The sample race composition is 37% Black, 29% white, 26% Latinx, approximately 5% Asian, less than one percent Native American, and less than one percent other. Tables 18 illustrates the descriptive statistics for the sample population released under pretrial supervision in 2022. It shows that the overall FTA rate is 23%, the rate for new arrest is 8%, and total revocations rate is 33%. In addition, the average total risk score was four, and most individuals released on pretrial are moderate-risk level.

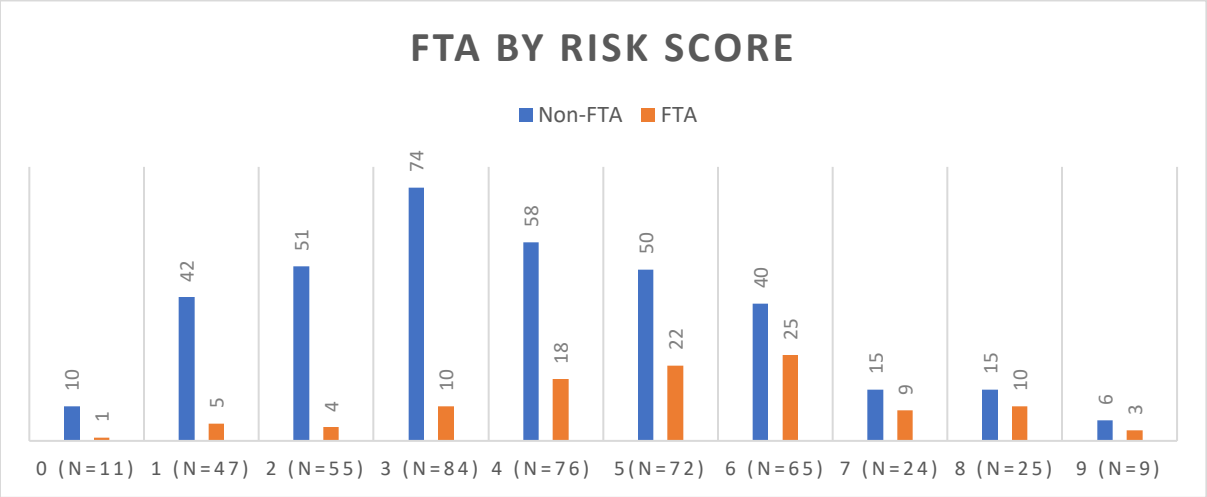
Table 18: Descriptive Statistics for 2020 data

Variable	Obs.	Mean	Std. Dev.	Min	Max
race	.	.	.	.	.
White	468	.286	.453	0	1
Black	468	.37	.483	0	1
Latinx	468	.261	.439	0	1
Asian	468	.045	.207	0	1
Native American	468	.006	.08	0	1
Other	468	.032	.176	0	1
gender	.	.	.	.	.
non-binary	468	.002	.046	0	1
male	468	.795	.404	0	1
female	468	.203	.403	0	1
age group	.	.	.	.	.
18-25	468	.115	.32	0	1
26-34	468	.325	.469	0	1
35-44	468	.323	.468	0	1
45-54	468	.141	.348	0	1
55+	468	.096	.295	0	1
Risk level	.	.	.	.	.
Low	468	.244	.43	0	1
Moderate	468	.489	.5	0	1
High	468	.267	.443	0	1
Risk Score	468	4.085	2.107	0	9

FTA	468	.229	.42	0	1
arrest	468	.083	.277	0	1
Technical violation	468	.024	.152	0	1
Revoked	468	.331	.471	0	1

Research question:
How successful was the total ORAS-PAT assessment score at predicting the likelihood of FTA among the Solano pretrial population?

Figure 18: FTA by risk score



$\chi 2$ (9) = 37.51 (p < .00) Gamma=.4204

Figure 18 (n=468) depicts those that as the ORAS-PAT risk score increases, the FTA rate is consistent with the increase. The p-value (p =0.000) indicates that the relationship between the ORAS-PAT risk scores and FTA is statistically significant. The graph demonstrates that those who scored higher marginally increase in FTA; there is an exception for those who scored 9 probably due to the small sample. To be more specific, those who scored a risk score of 0 had an FTA rate of 9.09%, those with a score of one had an FTA rate of 10.64%, those who scored a two had an FTA rate of 7.27%, those that scored a three had an FTA rate of 11.9%, those who scored four had an FTA rate of 23.65%, those that scored 5-7 had a rate from 30-37%, and if scored 8 had an FTA rate of 40%, then those who scored 9 had a 33.33% FTA rate. The gamma coefficient =0.4204 which measures the strength and direction of association between FTA and risk scores this indicates a moderate positive association suggesting that as risk scores increase, the likelihood of a FTA increases.

Figure 19: FTA by risk level

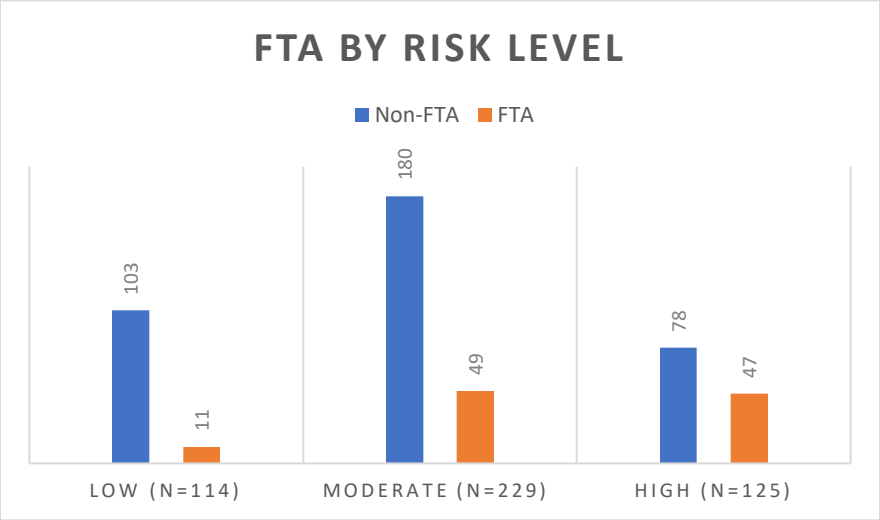


Figure 19 demonstrates that FTA increases relatively as risk level increases, and the increase was statistically significant (Chi2=26.95; p <.00). The p-value at 0.00 indicates it was statistically significant at the 95 % CI. The gamma coefficient = .4246 suggesting a modest relationship of risk levels.

Chi2(2) =26.95 (p < .00) Gamma=.4674

Table 19: Logit Regression predicting failure-to-appear, new arrest and total revocations (n=467)

VARIABLES	(1) FTA OR	(2) Charge Arrest OR	(3) Revoked OR
Risk Score	1.341***	1.115	1.342***
	(0.075)	(0.088)	(0.068)
Female	0.914	0.994	0.992
	(0.242)	(0.413)	(0.253)
Black	0.688	0.824	0.633*
	(0.182)	(0.323)	(0.151)
Latinx	0.722	0.927	0.714
	(0.213)	(0.394)	(0.189)
Constant	0.100***	0.062***	0.179***
	(0.033)	(.0293)	(0.0523)
R2	0.066	0.008	0.071
AUC	0.688	0.583	0.691
Observations	467	467	467

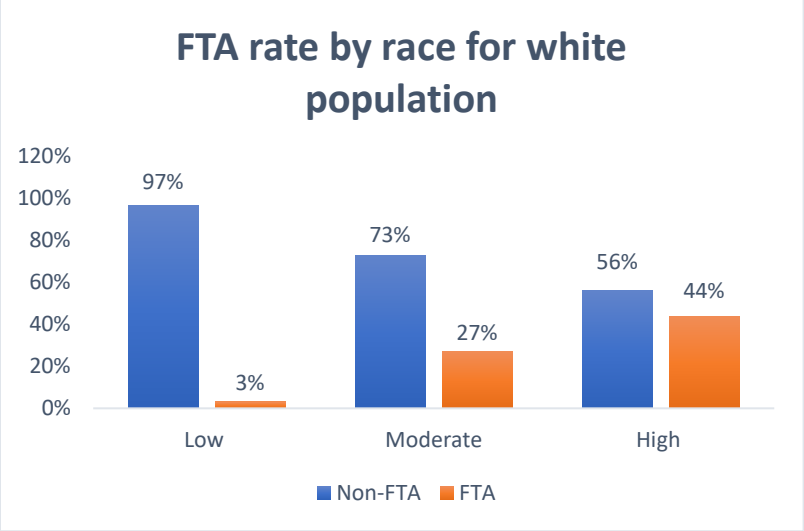
Note: *** significant at the 1% level ** Significant at the 5% level and * significant at 10 %**.** OR= Odds Ratio and SE= Standard Error

A logistic regression was run to predict the odds ratio of FTA for those that were released on pretrial supervision. The R-squared (R2) is a statistical measure in a regression model that measures the proportion of the variation in the dependent variable that is explained by the independent variables. The R2 of the model predicting FTA is .0688, indicating that the variables in the model explain 6.9% of the variance. An odds ratio of less than one indicates a lower

outcome. An odds ratio above one indicates an increased likelihood of FTA. In Table 19, the results find that the risk score was statistically significant at predicting FTA at the 99% confidence level. It indicates that the risk score was associated with a 34% increase in the odds of pretrial failure (OR=1.34). If someone was a female, Black or Latinx was not statistically significant at explaining FTA. The nonstatistical significance does not indicate there is no racial disparity but indicates that race does not predict FTA. In model II predicting new charge arrest, no variable is statistically significant at predicting the likelihood of a new charge arrest. In model III, risk score is statistically significant at the 99% level at predicting total revocations. Holding others constant, an increase in risk score is associated with a 34% increase in the odds of total revocation (OR=1.34). Therefore, the total risk score is statistically significant at predicting FTA and total revocations but not a new charge arrest, this difference might be because charge arrest is not a full representation of arrest. In model III, being Black is statistically significant at the 10% level with a OR=0.633 suggesting that the odds of revocation for Black individuals are approximately 36.5% lower.

Although race is not predictive at the 5% level for FTA, new arrest, or total revocations to further assess significant differences in the ORAS-PAT's capacity to predict FTA across racial, ethnic, and gender groups, additional tests are needed. The following examines the capacity across race and gender.

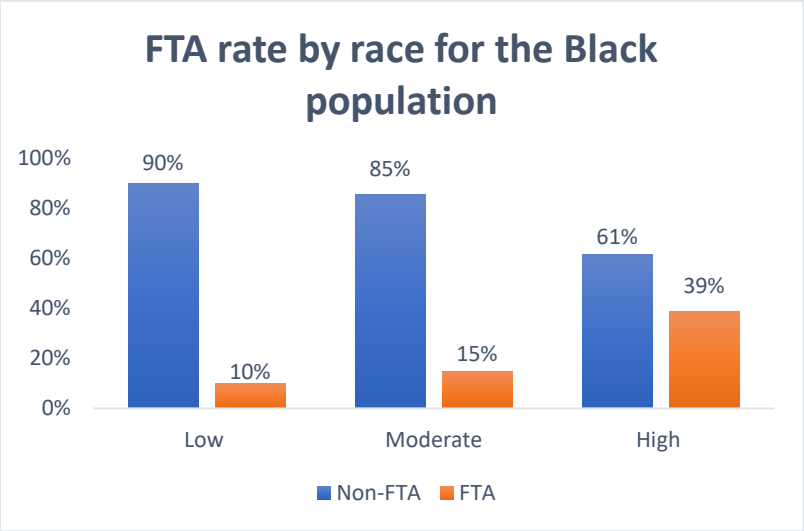
Figure 20: FTA rate by risk level for the white population n=134



In Figure 20, FTA rates increased by risk level for individuals who are white, and those increases are statistically significant chi2(2) =15.48, p < 0.00). The AUC score = .7017 suggesting a strong predictive effect. The AUC score for white individual is the strongest compared to other racial groups but those differences are not statistically significant.

AUC score=.7017

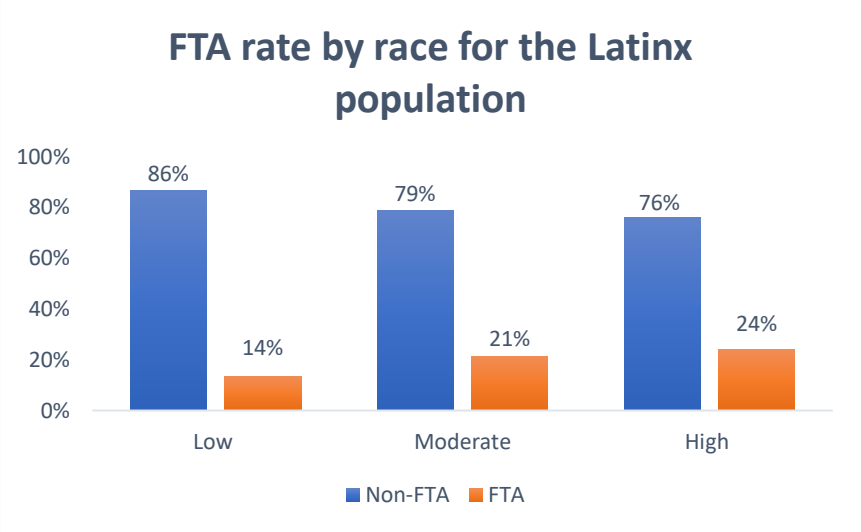
Figure 21: FTA rate by risk level for the Black population n=173



In Figure 21, the FTA rate distribution for individuals who are Black increased by risk level and this increase is statistically significant chi2(2) = 13.83, p < 0.001). The AUC score is .6702 suggesting that it is moderate effect to predict FTA rates by risk level for individuals who are Black. The difference in AUCs between white, Latinxs, is not statistically significant at the 5% level.

AUC score=.6702

Figure 22: FTA rate by risk level for the Latinx population n=122



The FTA rates for the Latinx population increase as risk levels increase however they are not statically significant chi2(2) = 1.36 p > 0.05. The AUC score of .5685 also indicates the risk levels for the Latinx population are no better than random chance at predicting FTA. There was no statistical difference in AUC scores between white and Latinx nor between Black and Latinxs.

AUC score=.5685

Figure 23: FTA rate by risk level for the Asian population n=21

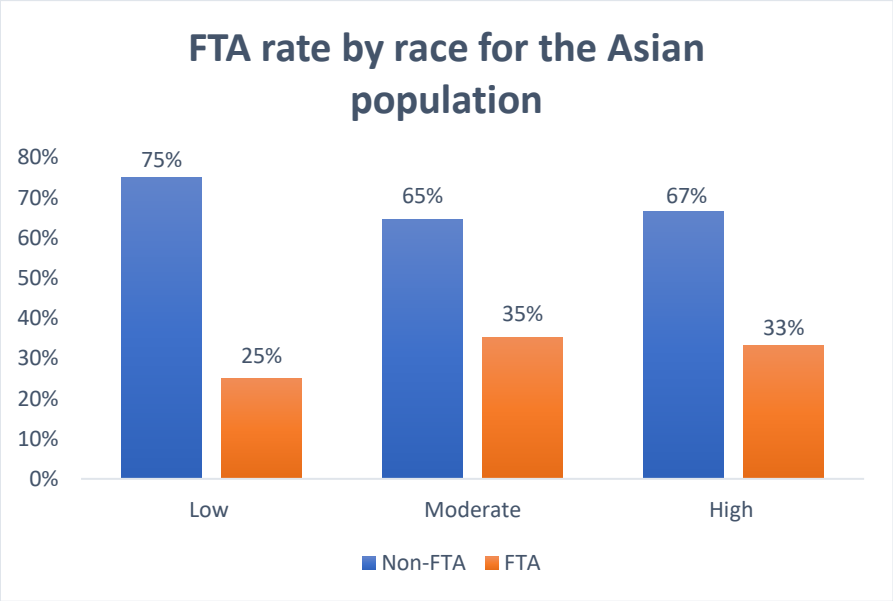
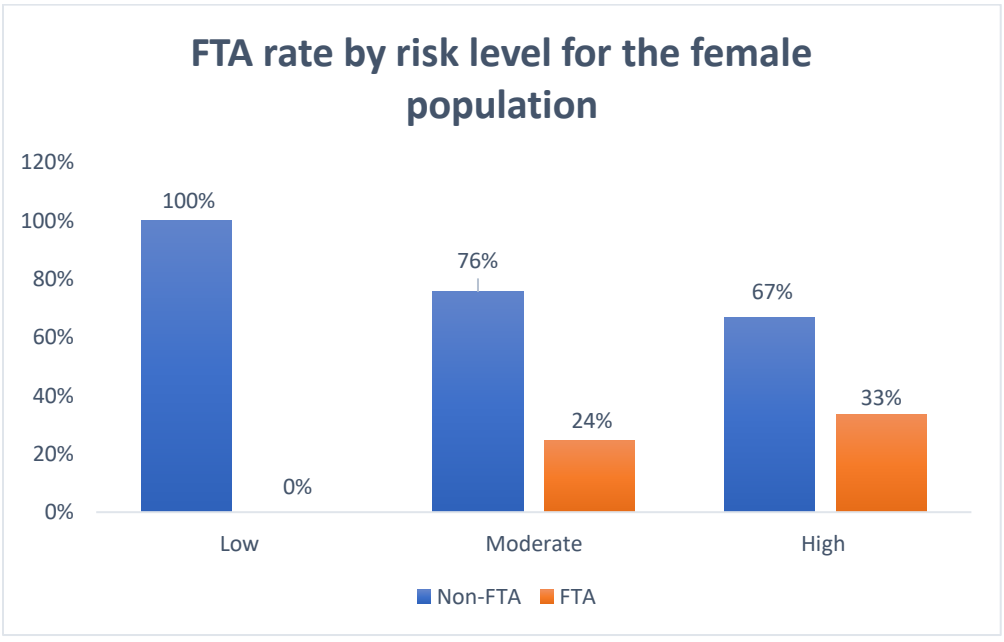


Figure 23 illustrates that FTA rates did not uniformly increase as risk levels increase. The risk scores predicting FTA for Asians is not statistically significant chi2(1) =0.15, $p > 0.05$. The AUC score of .5357 suggest that FTA prediction for the Asian population is not better at predicting than by chance. There was no statistical difference in AUC scores between white and Asian people, or Black and Asians, or Latinx and Asians.

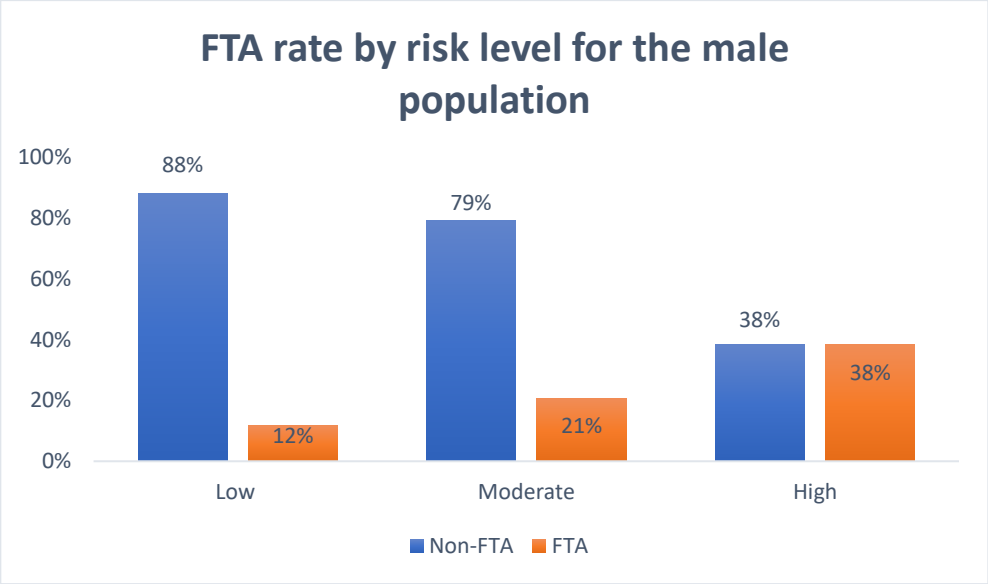
AUC score=.5357

Figure 24: FTA rate by risk level for the female population n=95



AUC score=.6737

Figure 25: FTA rate by risk level for the male population n=372



AUC score=.6424

Figures 24 and 25 illustrate the FTA rates by risk level for females (n=95) and males (n=372). For both females and males, the FTA rate increased as risk levels increased, and both are statistically significant at predicting the increase. In addition, the AUC score for females is .6737 a medium predictive effect, while for males, it is .6225, a medium predictive effect. There was no statistical difference between females and males, suggesting no predictive bias in terms of gender.

The previous models examined predictive bias and the prediction of the likelihood of FTA. It is also essential to test disparate impact across racial, ethnic, and gender groups. Drawing from (Skeem & Lowenkamp, 2016; Barno, Williams, & Nevárez Martínez, 2019), disparate impact is measured by the difference in means scores of risks. Table 20 illustrates the mean score of risk for race, ethnicity, and gender comparison for those released under pretrial supervision. A statistical difference in mean scores could potentially impact more restrictive conditions on pretrial release. There were no statistical differences in mean scores between males and females for the population released under pretrial supervision. An independent t-test was run on a sample populations comparing among racial groups. There is a statistically significant difference between Black and White individuals in the mean score ($p = 0.04$), with the mean score for White individuals being 0.485 points higher than that of Black individuals; however, this difference is relatively small. Additionally, there was statistical significance difference between white and Latinxs $t(254) = 2.66$, $p= 0.0084$, and white and Asians $t(153) = 2.33$, $p=0.020$. both suggesting that white individuals have a higher mean score than Black, Latinxs, and Asians.

Testing for disparate impact should also include the entire population assessed. In Table 21, all individuals, including those denied release, are included. It was observed that the mean risk scores for all assessed compared to those released are slightly higher. For all assessed the difference between white and Black mean score is statistically significant t (750) = 1.97, p=0.04. The difference between white and Latinxs mean score is statistically significant t (614) =2.71, p=0.006. The difference between white and Asian mean sore is statistically significant t (382) =3.53, p=0.000. There is no gender statistical significance in mean risk score.

Table 20: Disparate impact: risk scores on those released under pretrial supervision (n=468)

Mean Risk Scores								
	Males (n=372)	Females (n=95)	White (n=134)	Black (n=173)	Latinx (n=122)	Asian (n=21)	Native American (3)	Other (n=14)
Mean Risk Score	4.06	4.17	4.51	4.02	3.76	3.33	4.66	4.64

The mean scores were statistically different for whites compared to Black, Latinxs, and Asians ($p < 0.05$).

Table 21: Disparate impact: mean risk regardless of pretrial release (n=1,130)

Mean Risk Scores								
	Males (n=930)	Females (n=199)	White (n=328)	Black (n=424)	Latinx (n=288)	Asian (n=56)	Native American (n=5)	Other (n=27)
Mean Risk Score	4.48	4.54	4.83	4.5	4.3	3.61	5.6	4.18

The mean scores were statistically different for white and Latinx mean score ($p < 0.05$)

Discussion

Overall, the FTA rates increase as ORAS-PAT risk level increase, and these increases are statistically significant. Indicating that the increases in FTA rate are not by chance; the risk level does predict FTA. The logistic regression model predicting the likelihood of FTA, and total revocations were consistent that risk score was statistically significant at predicting FTA or total revocation but not a new charge arrest. Although the covariates of race and gender do not seem to predict FTA, or arrest. Being Black predicts revocations at the 10% level, however because the odds are that they are less likely it does not suggest potential racial bias. When the strength of ORAS-PAT was examined on FTA rates by subgroups, the prediction for Latinx and Asian individuals is less in comparison to white and Black individuals. The predictive strength (AUC) varied for Latinx and Asian individuals. Testing individual items of the tool will allow a better explanation of why there is a difference in prediction strength. What can be concluded is that the risk levels do not accurately predict FTA for Latinx and Asian populations, in other words it performs only slightly better than random guessing. It is statistically significant that white individuals had a higher mean score than other racial groups. This suggests that the scoring system may produce slightly different risk levels based on race, though the observed differences are

modest. For Latinx individuals, those who are released have a mean score of 3.7, compared to a mean score of 4.3 for those assessed, indicating that Latinx individuals may need substantially lower scores to be released. Similarly, Black individuals who are released have a mean score of 4, compared to a mean score of 4.5 for all assessed, reflecting a pattern similar to that observed for Latinx individuals. In contrast, White individuals appear to be released even with relatively high scores There was no gender bias, and the tool predicted an increase in FTA rates as risk levels increased by gender.

2023 Tool Validation:

The 2023 data consisted of n=340, of which 79% were male, and approximately 20% were female. The sample race composition is 38% Black, 28% white, 28% Latinx, approximately 4% Asian, and less than one percent other. Table 22 illustrate the descriptive statistics for the sample population released under pretrial supervision. It illustrates that the overall FTA rate was 21%, the rate for new charge arrest was 4%, and total revocations were 36%. In addition, the average total risk score was four, and most individuals released on pretrial are moderate-risk level. Most moderate-risk level individuals are released on pretrial supervision because low scores are more likely to be ORR.

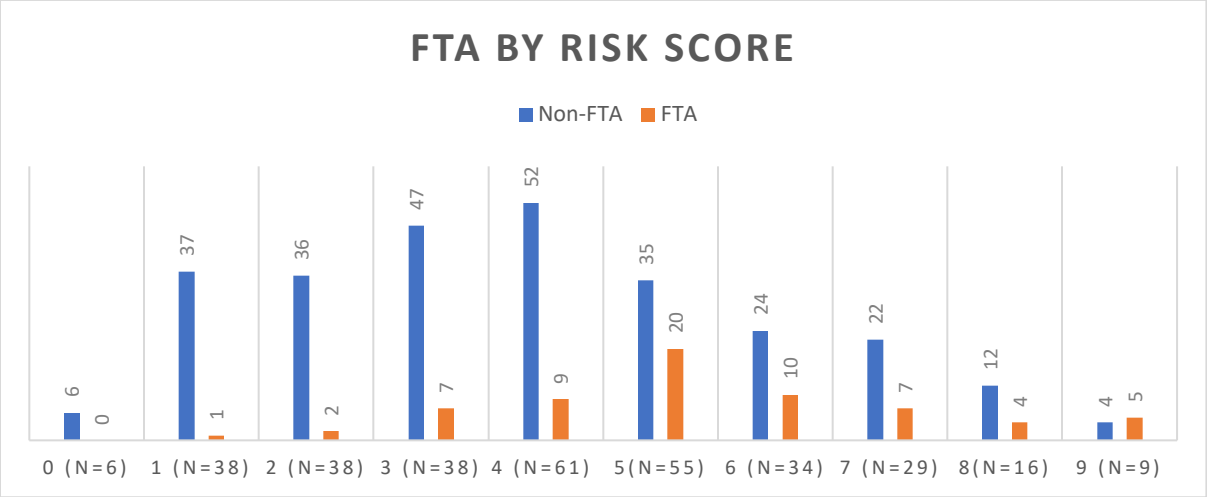
Table 22: Descriptive Statistics for 2023 data

Variable	Obs.	Mean	Std. Dev.	Min	Max
race	.	.	.	.	.
White	340	.279	.449	0	1
Black	340	.379	.486	0	1
Latinx	340	.279	.449	0	1
Asian	340	.038	.192	0	1
Native American	340	0	0	0	0
Other	340	.024	.152	0	1
gender2	.	.	.	.	.
Female	340	.206	.405	0	1
Male	340	.794	.405	0	1
Risk level	.	.	.	.	.
Low	340	.241	.428	0	1
Moderate	340	.503	.501	0	1
High	340	.256	.437	0	1
Risk Score	340	4.15	2.152	0	9
FTA	340	.209	.448	0	2
Charge Arrest	340	.044	.206	0	1
Technical violation	340	.144	.399	0	3
Total revoked	340	.362	.481	0	1

Research question:

How successful was the total ORAS-PAT assessment score at predicting the likelihood of FTA among the Solano pretrial population?

Figure 26: FTA by risk score



$\chi 2$ (9)= 36.35 (p<0.00) Gamma=.4575

Figure 26 (n=340) depicts that as the ORAS-PAT risk score increases, the FTA rate is increases. The p-value (p =0.00) indicates that the relationship between the ORAS-PAT risk scores and FTA is statistically significant and not due to random chance. The graph demonstrates that those who scored higher substantially increased in FTA. To be more specific, those who scored a risk score of one had an FTA rate of 2.63%, those with a score two had an FTA rate of 5.26%, those who scored a four had an FTA rate of 14.75%, those that scored a five had an FTA rate of 36.36%, those who scored six had a 29.41% FTA, and those that scored seven had 24% FTA, those who scored eight had a 25% FTA rate, and those that scored 9 had a 55.5% FTA rate. In comparison, those who rank zero had a zero percent FTA rate. The gamma statistic (γ = 0.4575) suggests a moderate positive association between ORAS-PAT risk scores and the likelihood of FTA.

Figure 27: FTA by risk level

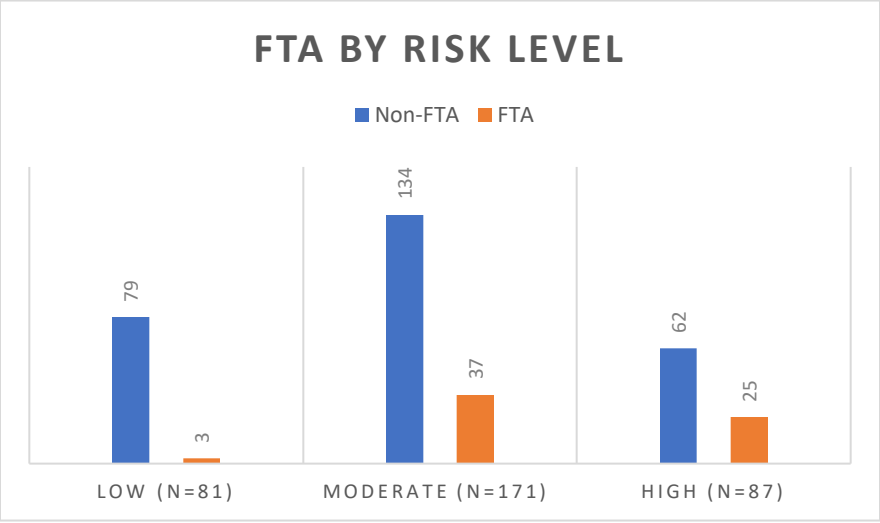


Figure 27 demonstrates that FTA increases relatively as risk level increases, and the increase was statistically significant (Chi2=18.58; p <.00). The p-value at 0.00 indicates it was statistically significant at the 95 % CI. The gamma coefficient is .48 suggesting a moderate relationship of risk levels.

Chi2(2) =18.58 (p<.00) Gamma=.4821

Table 23: Logit Regression predicting failure-to-appear, new arrest and total revocations (n=340)

VARIABLES	(1) FTA OR	(2) Charge Arrest OR	(3) Revoked OR
Risk Score	1.398***	1.205	1.433***
	(0.099)	(0.155)	(0.087)
Female	0.632	0.512	0.677
	(0.246)	(0.398)	(0.197)
Black	1.022	0.937	0.697
	(0.337)	(0.522)	(0.198)
Latinx	0.631	.1612*	0.713
	(0.244)	(.1746)	(0.223)
Constant	0.061***	-.0302***	0.162***
	(0.061)	(.0237)	(0.057)
R2	0.0859	0.0626	0.1037
AUC	0.7171	0.7173	0.7190
Observations	340	340	340

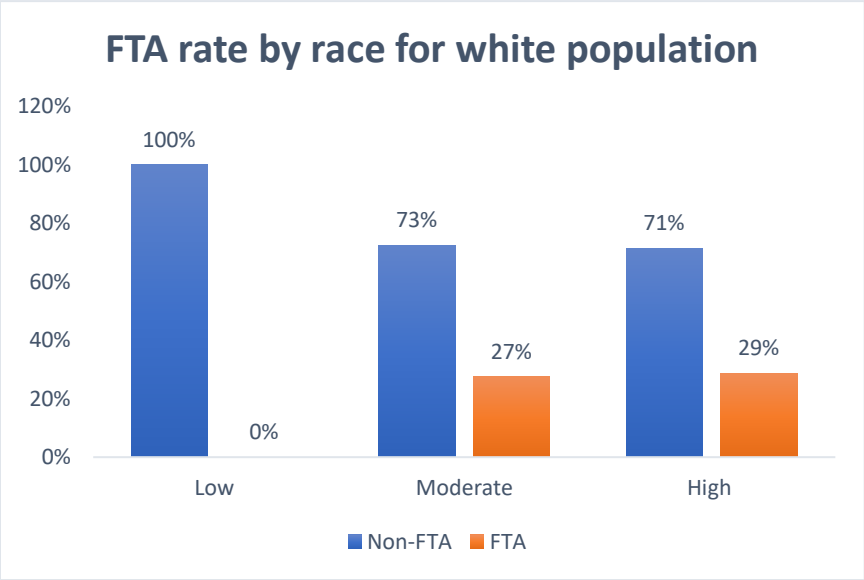
Note: *** significant at the 1% level ** Significant at the 5% level and * significant at 10 %**.** OR= Odds Ratio and SE= Standard Error

A logistic regression was run to predict the odds ratio of FTA for those that were released on pretrial supervision. The R2 of the model is .0859, indicating that the variables in the model explain 8.6% of the variance. An odds ratio of less than one indicates a lower outcome. An odds ratio above one indicates an increased likelihood of FTA. In Table 23, the results find that the risk score was statistically significant at predicting FTA at the 1% level. It indicates that the risk score was associated with a 39% increase in the odds of pretrial failure (OR=1.39). If someone was a female, Black or Latinx was not statistically significant at explaining FTA. The nonstatistical significance does not indicate there is no racial disparity but indicates that race does not predict FTA. In model II predicting new arrest, only Latinx was statistically significant at the 10% level however it was less than 1 suggesting that for a new charge arrest as an outcome Latinx were 84% less likely to predict arrest. For model II, female, Black or risk score were not statistically significant at predicting the likelihood of a new charge arrest. In model III, risk score is statistically significant; they are less likely to have a new revocation. Holding others constant, the risk score was associated with a 43% increase in the odds of total revocation (OR=1.43). Therefore, the total risk score is statistically significant at predicting FTA and total revocations but not a new charge arrest.

Although race is not predictive of FTA, new charge arrest, or total revocations to further assess significant differences in the ORAS-PAT's capacity to predict FTA across racial, ethnic, and

gender groups, additional tests are needed. The following examines the capacity across race and gender.

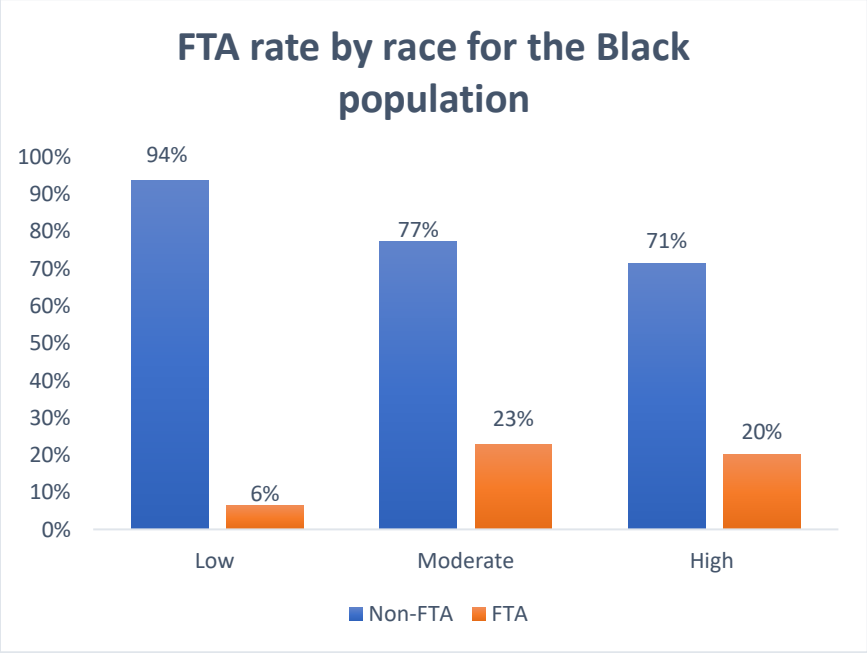
Figure 28: FTA rate by risk level for the white population n=95



In Figure 28, FTA rates increased by risk level for individuals who are white. The AUC score is .6146 suggesting a slight moderate predictive effect.

AUC score=.6146

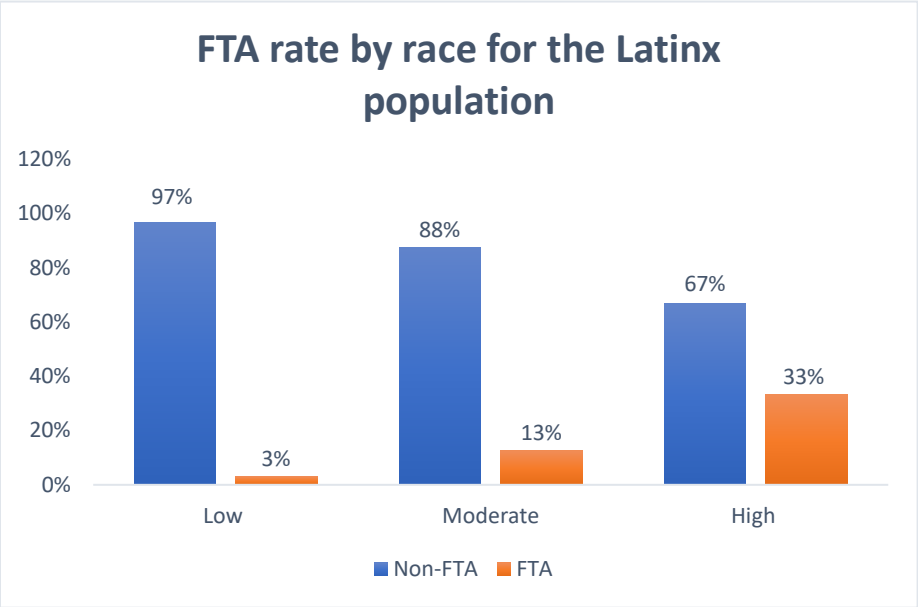
Figure 29: FTA rate by risk level for the Black population n=129



In Figure 29, the FTA rate distribution for individuals who are Black increased for moderate and then slightly decreased for high risk level. The AUC score is .6232 suggesting that it is slightly moderate effect to predict FTA rates by risk level for individuals who are Black. There is no statistical difference between the AUC for white individuals or AUC for Black individuals.

AUC score=.6232

Figure 30: FTA rate by risk level for the Latinx population n=95



The FTA rates for the Latinx population steadily increase for moderate and substantially increase for high-risk level individuals. The AUC score of .7377 also indicates the risk levels for the Latinx population are a strong predictor of FTAs. Although AUC suggests that the predictive model performs better for Latinxs than for Black or white people, the difference is not statistically significant at the 5% level.

AUC score=.7377

Figure 31: FTA rate by risk level for the Asian population n=17

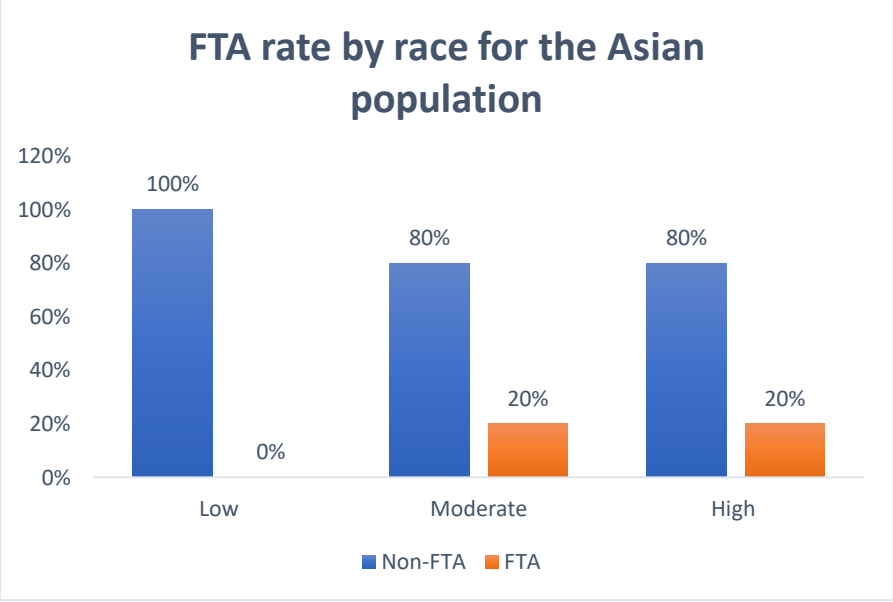
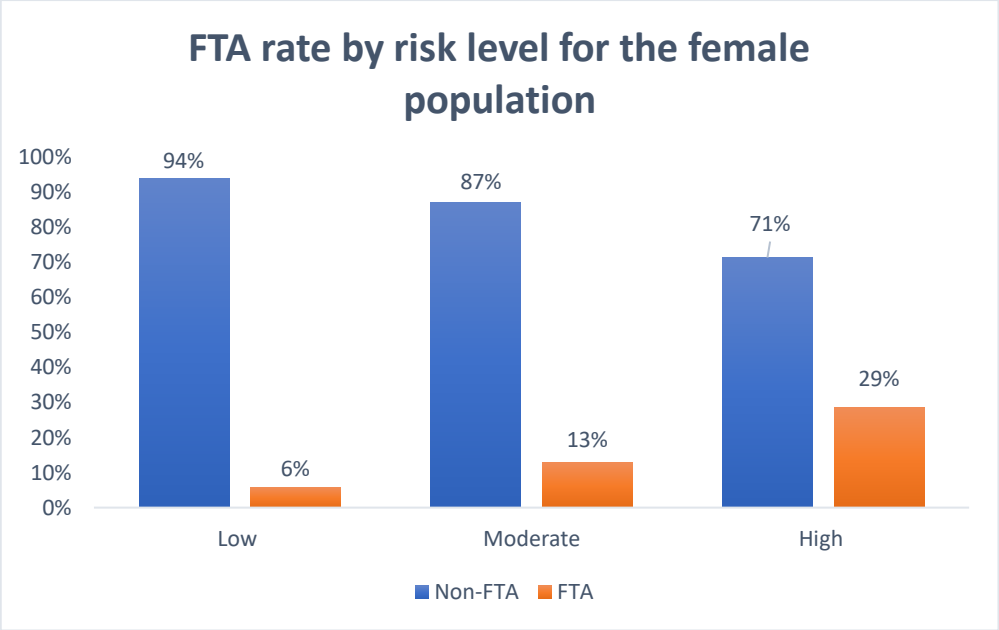


Figure 31 illustrates that FTA rates did not uniformly increased as risk levels increased. The AUC score of .6364 suggest that FTA prediction for the Asian population slightly moderate at predicting effect. There was no statistical difference in AUC scores between white and Asian people as well as Black and Asians or between Asians and Latinxs.

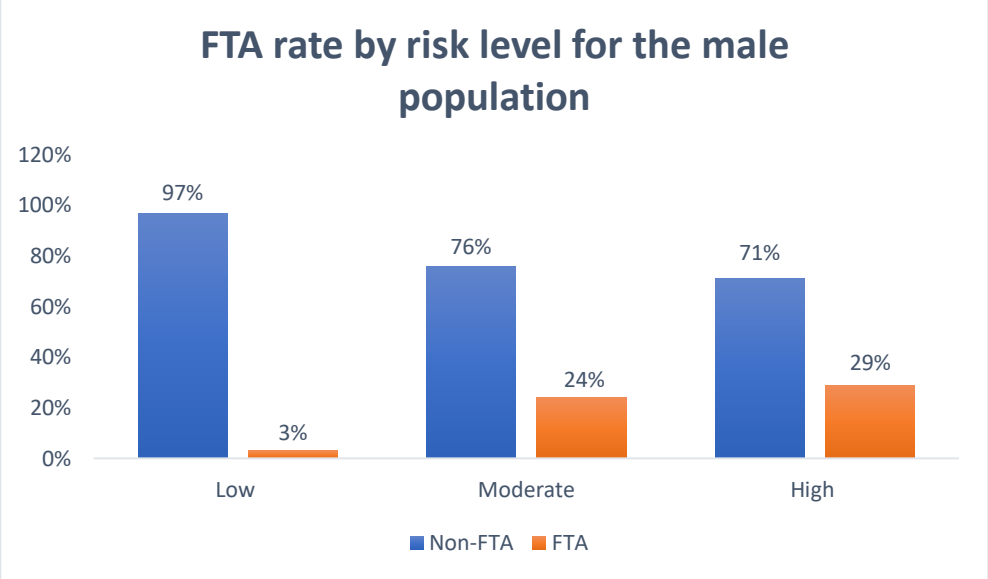
AUC score=.3917

Figure 32: FTA rate by risk level for the female population n=70



AUC score=.6550

Figure 33: FTA rate by risk level for the male population n=270



AUC score=.6468

Figures 32 and 33 illustrate the FTA rates by risk level for females (n=70) and males (n=270). For both females and males, the FTA rate increased as risk levels increased with higher percentage shares for males than females. In addition, the AUC score for females is .66 very similar to males

at .65 suggesting that the model performs similarly across gender groups regarding FTA. There was no statistical difference between females and males, suggesting no predictive bias in terms of gender.

There were no statistical differences in mean scores between males and females for the population released under pretrial supervision. There were no statistical differences in mean scores for white, Black, Asian, or Native American, or Latinxs released on pretrial supervision.

Testing for disparate impact should also include the entire population assessed. Table 24 illustrates the mean score of risk for race, ethnicity, and gender comparison for those released under pretrial supervision. In Table 25, all individuals, including those denied released, are included. It was observed that the mean risk scores for all assessed compared to those released are slightly higher. There is a statistically significant difference in mean score between Black and white individuals $t(626) = 3.08$, $p<0.002$. This suggests that white people who were assessed overall regardless of released status scored slightly higher than Black individuals and this difference is statistically significant. When testing the mean scores among white and Latinxs, it was statistically significant $t(530) = 3.34$, $p<0.000$. Also suggesting that white individuals statistically test higher than Black and Latinxs on risk scores meaning there could be disparate impact.

Table 24: Disparate impact: risk scores on those released under pretrial supervision (n=340)

Mean Risk Scores								
	Males (n=270)	Females (n=70)	White (n=95)	Black (n=129)	Latinx (n=95)	Asian (n=13)	Native American (0)	Other (n=8)
Mean Risk Score	4.18	4	4.4	4.06	3.97	4.38	_____	3.38

Table 25: Disparate impact: mean risk regardless of pretrial release (n=968)

Mean Risk Scores								
	Males (n=778)	Females (n=190)	White (n=261)	Black (n=367)	Latinx (n=271)	Asian (n=41)	Native American (n=7)	Other (n=20)
Mean Risk Score	4.28	4.26	4.71	4.16	4.04	4.04	4	4.2

The mean scores were statistically different for white and Latinxs mean score ($p< 0.00$) and white and Black ($p<0.002$).

Discussion

Overall, the FTA rates increase as ORAS-PAT risk level increase, and these increases are statistically significant. Indicating that the increases in FTA rate are not by chance; the risk level does predict FTA. Similarly, the predictability of the ORAS-PAT risk score is statistically significant suggesting that both the risk level and risk score predict FTA rates. The logistic regression model predicting the likelihood of FTA, and total revocations were consistent that risk score was statistically significant at predicting FTA or total revocation but not a new charge arrest. The covariates of race and gender do not seem to predict FTA, or revocations, suggesting no racial bias. However, covariates of Latinx predicts charged with a new offense, the odds ratio is less than 1 suggesting Latinxs are less likely to have a new charged arrest suggesting potential no racial bias. The predictive strength for Latinxs had a stronger predictive for FTAs. The difference in strength may be due to the moderate category being lower than expected for moderate level individuals who are Latinx. Albeit the AUC for Latinxs had a moderate predictor compared to other racial groups, there was no statistical significance when comparing the AUCs. There was no gender bias when testing FTA predictability and disparate impact.

Conclusion

In conclusion, the ORAS-PAT in Solano County demonstrates to be statistically significant at predicting FTA by risk level and by risk score an improvement from 2019-2020. For the 2021 data, the strength of risk level in predicting FTA rates was low for Black individuals compared to their counterparts but the difference was only statistically significant compared to the Asian individuals. The 2023 logistic regression model indicates lower odds of being charged with a new crime while on pretrial supervision for Latinx individuals, while the 2022 model shows lower odds of revocation for Black individuals. The 2022 data demonstrated a moderate predictive strength in risk levels across the white and Black populations but not for the Latinx or Asian populations. The 2023 data demonstrated a moderate predictive strength in risk levels across the white, Black, and Latinx population but not for the Asian population. However, these differences were not statistically significant at the 5% level. The study also examined potential gender bias. Based on the findings, there was no statistical difference to determine gender bias on either 2021,2022 or 2023 data. Lastly, the study examined disparate impact based on the average mean score by race and ethnicity. For the 2021 data, there is no disparate impact. For 2022 and 2023 the disparate impact findings suggest a statistical difference between the mean risk score for white compared to Black and Latinxs, which suggests that a closer look at the model needs to be considered for those differences. White individuals had higher mean scores; however, this does not appear to result in disparate impact, as White individuals with higher scores were released compared to the lower thresholds observed for Black and Latinx individuals. Those differences might be due to how different groups score for individual items in the ORAS-PAT; however, that data was unavailable. For 2022 when testing disparate impact pattern suggests a potential threshold or stricter scrutiny applied to the release of individuals from these groups, where lower risk scores may be required for release compared to other groups. While the risk score is a key factor, the ultimate decision to

be released on pretrial supervision rests with the judge, who also considers the seriousness of the offense, the number of pending criminal cases, and their perception of public safety.

Appendix

2021 Data counts per category

Table: 2021 race by count and %

Race	Freq.	Percent
White	288	34.04
Black	317	37.47
Latinx	192	22.70
Asian	33	3.90
Native American	3	0.35
Other	13	1.54
Total	846	100.00

	Freq.	Percent	Cum.
18-25	58	6.86	6.86
26-34	258	30.50	37.35
35-44	283	33.45	70.80
45-54	148	17.49	88.30
55+	99	11.70	100.00
Total	846	100.00	

2021: gender count and %

	Freq.	Percent	Cum.
male	686	81.09	81.09
female	160	18.91	100.00
Total	846	100.00	

Table:2021 age count and %

Variables	Obs	Mean	Std. Dev.	Min	Max
Age	846	39.879	11.232	21	75

2022 Data counts per category

	Freq.	Percent	Cum.
White	328	29.03	29.03
Black	424	37.52	66.55
Latinx	288	25.49	92.04
Asian	56	4.96	96.99
Native American	5	0.44	97.43
Other	29	2.57	100.00
Total	1130	100.00	

	Freq.	Percent	Cum.
18-25	110	9.73	9.73
26-34	374	33.10	42.83
35-44	362	32.04	74.87
45-54	174	15.40	90.27
55+	110	9.73	100.00
Total	1130	100.00	

	Freq.	Percent	Cum.
non-binary	1	0.09	0.09
male	930	82.30	82.39
female	199	17.61	100.00
Total	1130	100.00	

	Freq.	Percent	Cum.
White	134	28.63	28.63
Black	173	36.97	65.60
Latinx	122	26.07	91.67
Asian	21	4.49	96.15
Native American	3	0.64	96.79
Other	15	3.21	100.00
Total	468	100.00	

2023 descriptives

	Freq.	Percent	Cum.
White	261	26.96	26.96
Black	367	37.91	64.88
Latinx	271	28.00	92.87
Asian	41	4.24	97.11
Native American	7	0.72	97.83
Other	21	2.17	100.00
Total	968	100.00	

Tabulation of age_group

	Freq.	Percent	Cum.
18-25	116	11.98	11.98
26-34	325	33.57	45.56
35-44	299	30.89	76.45
45-54	149	15.39	91.84
55+	79	8.16	100.00
Total	968	100.00	

Tabulation of gender

gender	Freq.	Percent	Cum.
Female	190	19.63	19.63
Male	778	80.37	100.00
Total	968	100.00	

Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Age	968	37.649	11.061	19	84

2021: Descriptive tool validation counts

Tabulation of race

	Freq.	Percent	Cum.

White	132	31.81	31.81
Black	148	35.66	67.47
Latinx	109	26.27	93.73
Asian	20	4.82	98.55
Native American	1	0.24	98.80
Other	5	1.20	100.00
Total	415	100.00	

Tabulation of age_group

	Freq.	Percent	Cum.
18-25	26	6.27	6.27
26-34	131	31.57	37.83
35-44	138	33.25	71.08
45-54	64	15.42	86.51
55+	56	13.49	100.00
Total	415	100.00	

Tabulation of gender

	Freq.	Percent	Cum.
male	325	78.31	78.31
female	90	21.69	100.00
Total	415	100.00	

Tabulation of risklevel

	Freq.	Percent	Cum.
Low	120	28.92	28.92
Moderate	192	46.27	75.18
High	103	24.82	100.00
Total	415	100.00	

Tabulation of arrest

	Freq.	Percent	Cum.
0	393	94.70	94.70
1	22	5.30	100.00
Total	415	100.00	

Tabulation of benchwarrant2

	Freq.	Percent	Cum.
0	324	78.07	78.07
1	91	21.93	100.00
Total	415	100.00	

2022: Descriptive tool validation counts

Tabulation of age_group

	Freq.	Percent	Cum.
18-25	54	11.54	11.54
26-34	152	32.48	44.02
35-44	151	32.26	76.28
45-54	66	14.10	90.38

55+	45	9.62	100.00
Total	468	100.00	

Tabulation of gender

	Freq.	Percent	Cum.
non-binary	1	0.21	0.21
male	372	79.49	79.70
female	95	20.30	100.00
Total	468	100.00	

Tabulation of risklevel

	Freq.	Percent	Cum.
Low	114	24.36	24.36
Moderate	229	48.93	73.29
High	125	26.71	100.00
Total	468	100.00	

Tabulation of arrest

	Freq.	Percent	Cum.
0	429	91.67	91.67
1	39	8.33	100.00
Total	468	100.00	

Tabulation of benchwarrant2

	Freq.	Percent	Cum.
0	361	77.14	77.14
1	107	22.86	100.00
Total	468	100.00	

2023: Descriptive tool validation counts

Tabulation of race

	Freq.	Percent	Cum.
White	95	27.94	27.94
Black	129	37.94	65.88
Latinx	95	27.94	93.82
Asian	13	3.82	97.65
Other	8	2.35	100.00
Total	340	100.00	

Tabulation of age group

	Freq.	Percent	Cum.
18-25	40	11.76	11.76
26-34	103	30.29	42.06
35-44	110	32.35	74.41
45-54	54	15.88	90.29
55+	33	9.71	100.00
Total	340	100.00	

Tabulation of gender

gender	Freq.	Percent	Cum.
Female	70	20.59	20.59
Male	270	79.41	100.00
Total	340	100.00	

Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Age	340	38.241	11.601	19	84

Tabulation of risk level

	Freq.	Percent	Cum.
Low	82	24.12	24.12
Moderate	171	50.29	74.41
High	87	25.59	100.00
Total	340	100.00	

Tabulation of arrest

	Freq.	Percent	Cum.
0	325	95.59	95.59
1	15	4.41	100.00
Total	340	100.00	

Tabulation of FTA

(sum) FTA	Freq.	Percent	Cum.
0	275	80.88	80.88
1	59	17.35	98.24
2	6	1.76	100.00
Total	340	100.00	

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For any report questions please contact Earl Montilla at EMontilla@solanocounty.com