Public Safety Assessment Validation for Tarrant County, TX

By Noah Atchison, Mei Yang, and Jessica Hickman

June 2023

About the Crime and Justice Institute

The Crime and Justice Institute (CJI), a division of Community Resources for Justice, bridges the gap between research and practice with data-driven solutions that drive bold, transformative improvements in adult and youth justice systems. With a reputation built over many decades for innovative thinking, a client-centered approach, and impartial analysis, CJI assists agency leaders and practitioners in developing and implementing effective policies that achieve better outcomes and build stronger, safer communities. CJI works with local, state, tribal, and national justice organizations, providing nonpartisan policy analysis, implementation consulting, capacity-building assistance, and research services to advance evidence-based practices and create systems-level change. For more information, please visit: www.cjinstitute.org.

Contents

EXECUTIVE SUMMARY

Over the past several years Tarrant County leadership worked to increase court system efficiency and improve outcomes through data driven initiatives. These efforts included implementation of a pretrial risk assessment, the Public Safety Assessment (PSA), and a locally developed Release Recommendation Matrix (RRM), which provides supervision recommendations based on risk. As part of this project, Tarrant County partnered with the Crime and Justice Institute (CJI) to complete a validation study to determine the effectiveness of the newly implemented PSA and release recommendations. The study tests whether the PSA is a valid tool for predicting court appearance and new criminal activity during the pretrial period and if the recommended release levels correspond appropriately with observed risk. More information about the PSA, RRM, and validation study methods is included in the full report.

KEY FINDINGS

- **The PSA is a valid instrument for predicting pretrial outcomes (i.e., failure to appear and new criminal activity) in Tarrant County.**

- **The RRM release levels significantly underperform the PSA scores as a predictor of risk and performance declines when the release level is automatically increased based on charge.** The RRM performance can be improved by adjusting how PSA risk scores are used to assign recommended release levels.

- **The PSA meets the minimum performance thresholds for all racial and gender groups, but there are differences in how well the PSA performs across groups.** Specifically, the PSA is a stronger predictor of failure to appear for women compared to men and the PSA is a stronger predictor of all pretrial outcomes for white, both Hispanic and non-Hispanic, individuals compared to Black individuals. These differences are more acute for the RRM when the recommended release level is automatically increased based on charge.

RECOMMENDATIONS

1. **Continue to collect data for future validation studies to monitor the predictive validity of the PSA over time.** Tarrant County could improve data quality by creating consistent definitions for pretrial outcomes and tracking arrest data outside of Tarrant County.

2. **Eliminate automatic, charge-based release level increases from the RRM and align release levels recommendations more closely with the PSA risk scores**. Tarrant County can accomplish this through a norming study, which examines the number of release levels as well as the cut points (the scores that trigger a change in the recommended release level) to optimize the RRM.

3. **Pilot and evaluate new or revised risk factors to improve the performance of the PSA for Black individuals and men.** Adjustments may include removing the risk factors that perform poorly or adding time limits for the current risk factors. For example, test whether limiting prior convictions to the past 5 years improves predictive validity for Black individuals and men while maintaining accuracy for the entire population.

INTRODUCTION

Tarrant County leadership is committed to increasing court system efficiency and improving outcomes through data driven initiatives. Recent efforts included the implementation of a pretrial risk assessment, the Public Safety Assessment (PSA) and a locally developed Release Recommendation Matrix (RRM), which provides supervision recommendations based on risk. As part of this project, Tarrant County partnered with the Crime and Justice Institute (CJI) to complete a validation study to determine if the newly implemented PSA and release recommendations are effective for the local population. The study tests whether the PSA is a valid tool for predicting failure to appear and new criminal activity during the pretrial period and if the recommended release levels are appropriately aligned with actual risk.

This report includes the results of the study and highlights opportunities for improvement. The findings have important implications for the pretrial release process in Tarrant County and could help decision makers more effectively allocate limited pretrial supervision resources.

TARRANT COUNTY PRETRIAL PRACTICES

In Tarrant County, magistrate judges conduct hearings seven days a week to ensure that bail and release conditions are set quickly following arrest. All criminal cases adjudicated in Tarrant County have initial bail conditions set at magistration, though judges can change bail conditions as the case progresses.

The pretrial release process incorporates the Public Safety Assessment and Release Recommendation Matrix. The goal is to have a PSA report available for every case so the magistrate judge can use the risk scores and corresponding recommendation to inform release conditions. Magistrate judges maintain full discretion to set bail and release conditions; the PSA scores and RRM simply provide additional information. The RRM does not provide any guidance on bail amounts, drug testing or electronic monitoring. These conditions are all set according to the magistrate judge's discretion. More information about the PSA and Tarrant County's RRM is included below.

The Public Safety Assessment (PSA)

The PSA is an actuarial pretrial risk assessment developed by the Laura and John Arnold Foundation (now Arnold Ventures) to provide standardized risk information for the pretrial release decision. The PSA uses nine static factors (such as criminal history) to predict risk of failure to appear for a scheduled court date (FTA), new criminal activity (NCA), and new violent criminal activity (NVCA) pending case disposition. The assessment separates the risk of FTA, NCA, and NVCA into distinct scales so decision makers can effectively assign interventions to mitigate predicted risk. For example, pretrial supervision conditions meant to increase court appearance are different than interventions designed to prevent new charges during the pretrial period. Separate risk scales allow judicial officers to assign conditions that are targeted to an individual's unique risk profile.

The risk factors associated with each scale are combined to generate scores of 1 to 6 for the FTA and NCA scales, and a "yes" or "no" flag for the NVCA scale. As illustrated in Table 1, certain factors (such as pending charge at time of offense) are included in more than one scale.

Table 1: PSA Risk Factors and Scales

Risk Factors	Points		
	FTA	NCA	NVCA
1. Age at current arrest (23+ or 22 & younger)		■	
2. Current violent offense			■
2a. Current violent offense & 20 or younger			■
3. Pending charge at time of offense	■	■	■
4. Prior misdemeanor conviction		■	
5. Prior felony conviction		■	
5a. Prior conviction	■		■
6. Prior violent conviction (no, 1-2, 3+)		■	■
7. Failure to appear in past 2 years (0, 1, 2+)	■	■	
8. Failure to appear older than 2 years	■		
9. Prior sentence to incarceration		■	

The PSA risk scores and NVCA flag are meant to provide additional information for the release decision and can be used to assign appropriate supervision conditions, as determined by the court, to increase the likelihood of pretrial success.

Release Recommendation Matrix (RRM)

The PSA is used to measure risk but does not manage the identified risk. Tarrant County developed a Release Recommendation Matrix to translate PSA scores into risk-based supervision recommendations. The matrix assigns a recommended release level based on FTA and NCA risk scores. As shown in Table 2, as risk scores increase, the recommended release level increases from Unmonitored to Release Level 5. The supervision conditions intensify at each level to appropriately mitigate risk.[i] The Community Supervision and Corrections Department (CSCD) personnel supervise all individuals according to the release level and conditions assigned by the court.

Tarrant County stakeholders including judges, representatives from the district attorney's office, law enforcement, CSCD, and court services staff worked together to develop the current RRM. PSA data were not available at the time, so the stakeholder group could not incorporate information about assessment performance or risk score distribution. This report provides specific recommendations on how the RRM can be updated based on the PSA and outcome data that Tarrant County collected since implementing the new release process. The current RRM is included in Table 2 below.

Table 2: Tarrant County Release Recommendation Matrix

Failure to Appear (FTA) Scaled Score	New Criminal Activity (NCA) Scaled Score					
	1	2	3	4	5	6
1	Unmonitored	Unmonitored				
2	Unmonitored	Unmonitored	Release Level 1	Release Level 2	Release Level 3	
3		Release Level 1	Release Level 1	Release Level 2	Release Level 3	Release Level 5
4		Release Level 1	Release Level 1	Release Level 2	Release Level 3	Release Level 5
5		Release Level 2	Release Level 2	Release Level 3	Release Level 4	Release Level 5
6				Release Level 5	Release Level 5	Release Level 5

Automatic Release Level Increases

In addition to the PSA risk scores, the RRM considers case-specific charge information in the release level recommendation. These automatic, charge-based "bump ups" increase the recommended risk level by one if certain charges are present. For example, if an individual has an NCA score of 3 and FTA score of 2, the baseline RRM would recommend Release Level 1. If, however, the person was charged with felony aggravated assault, the RRM automatically increases the recommendation to Release Level 2. For more serious charges, such as aggravated murder or aggravated robbery, the RRM automatically increases the recommendation to Release Level 5. An NVCA flag automatically results in Release Level 5.[ii] The charge-based bump ups only change the recommended release level in one direction. There is no mechanism to reduce the recommended release level when mitigating factors are present.

VALIDATION

The purpose of the validation study is to determine how well the PSA predicts the intended pretrial failure outcomes and if the RRM appropriately corresponds to pretrial risk for Tarrant County's unique population. CJI used a series of statistical tests to answer three research questions:

1. Is the PSA a valid instrument for predicting pretrial outcomes (failure to appear, new criminal activity, and new violent criminal activity pending case disposition)?
2. Do the RRM release levels appropriately correspond to pretrial risk for the local population?

3. Do the PSA and RRM perform accurately and consistently across demographic groups (race, gender, and ethnicity)?

CJI used five statistical tests to answer the research questions: 1) chi-square, 2) correlation, 3) area under the curve-receiver operating characteristic (AUC-ROC), 4) bivariate logistic regression, and 5) multivariate logistic regression. Descriptions of these analyses are included in Appendix B. To be considered a valid instrument for predicting risk of pretrial failure, the results of the validation analyses must be statistically significant, meaning there is evidence to show that a relationship exists between PSA risk scores and outcomes, and that the findings are not due to chance. The results must also meet certain thresholds for minimum effect size. Results for all statistical tests can be found in Appendix C.

Validation Dataset

CJI worked closely with the Tarrant County Information Technology department to create a dataset for the validation study. The data include charges, key case dates, and outcomes for all cases adjudicated in Tarrant County since the PSA was implemented. PSA reports are generated by NOBLE case management, a third-party vendor, and manually merged with Tarrant County's case data. Only cases that met four requirements were included in the sample:

- The case had an associated PSA report.
- The individual was released pretrial. People who are detained do not have the opportunity to miss court or engage in new criminal activity.
- The case was disposed. The PSA measures the risk of failure to appear and new criminal activity during the entire pretrial period, so the validation must include the entire period from pretrial release to case disposition.
- The case met data quality requirements. CJI used a series of filters to eliminate cases with clear data entry errors from the sample.

As shown in Figure 1, there were 36,452 cases within the study timeframe (January 1, 2021 - December 16, 2022) that met the data quality and pretrial release requirements. Of these 36,452 cases, 23,489 cases were matched with a PSA report and 7,911 were disposed. All 7,911 cases that met the eligibility requirements were included in the study.

Figure 1: Case Inclusion and Final Sample

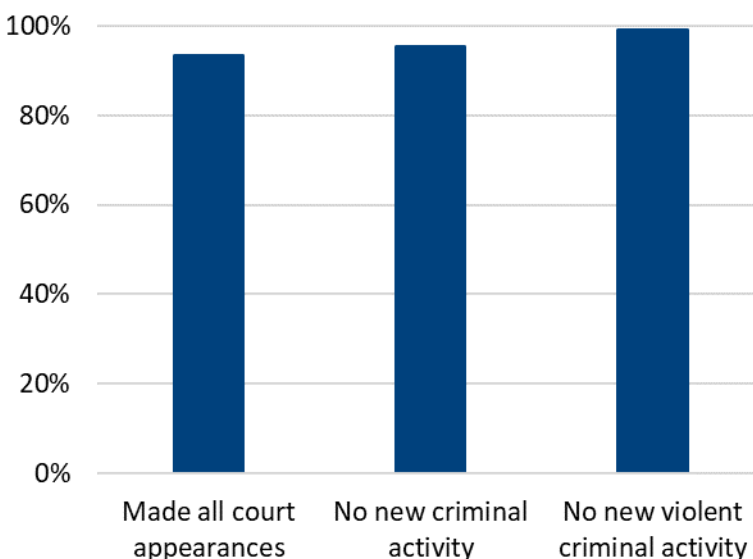| Initial Cases	36,452
Matching PSA report	23,489
Disposed	7,911

Pretrial Outcomes

Before analyzing how the PSA performs, it is important to understand the pretrial outcome data it is designed to predict (failure to appear, new criminal activity, and new violent criminal activity). In Tarrant County, individuals released pretrial are generally successful. As seen in Figure 2, 93% of individuals in the sample made all court appearances, 96% were not arrested for a new offense, and 99% were not arrested for a new violent offense during the pretrial period. As discussed in the limitations section, these numbers may change as data quality improves, but there are indications that these outcome rates are relatively stable and accurate.[iii]

Figure 2: Pretrial Outcomes in Tarrant County

The number of individuals released pretrial who are involved in new violent criminal activity is very small. CJI identified 54 cases with a new violent criminal offense, representing fewer than one percent of all cases. While this is a good signal for public safety, it unfortunately means that there is not enough statistical power to evaluate the accuracy of the NVCA flag. The performance of the NVCA flag should be a priority in future validations.

Knowing that most people are successful when released pretrial provides important context for the PSA risk scores: higher scores in Tarrant County do not indicate that someone *will* miss court or *will* be re-arrested. Instead, higher scores indicate a slightly decreased likelihood of success and a need for appropriate supervision.

VALIDATION FINDINGS

The following section of the report outlines the key validation findings for each research question and provides recommendations on how to use the results to improve outcomes.

Research Question 1: Is the PSA a valid instrument for predicting pretrial outcomes?

To determine if the PSA accurately predicts risk of pretrial failure, CJI examined the relationship between the FTA and NCA risk scores and pretrial failure outcomes. As risk scores increase, pretrial failure rates should also increase. The primary test used to answer this question is the AUC-ROC. The AUC-ROC score generally varies from 0.5 to 1, with scores above 0.5 indicating any predictive capacity and higher scores indicating better performance.[iv]

Figure 3: AUC-ROC Scores for the FTA and NCA Scales
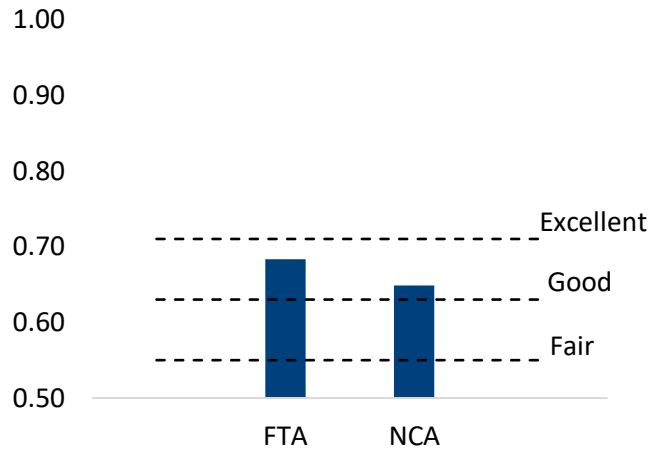
The AUC-ROC results show that the PSA is a good predictor of failure to appear and new criminal activity. As PSA scores increase, the chance that an individual misses a court date or is involved in new criminal activity also increases. The AUC-ROC results are illustrated in Figure 3.

The FTA and NCA scales fall within the "good" range,[v] which indicates that the PSA is performing adequately for both the FTA scale and NCA scale.

As noted above, we do not have sufficient data to determine the accuracy of the NVCA scale. This limitation may be addressed in future validation studies with additional data collection.

FINDINGS

- **The PSA is a valid instrument for predicting pretrial outcomes (i.e., failure to appear and new criminal activity) for Tarrant County's population.** This applies to the FTA and NCA scales, but there was not sufficient data to evaluate the accuracy of the NVCA flag.

RECOMMENDATIONS

1. **Continue to use the PSA to measure the risk of failure to appear and new criminal activity.**

2. **Continue to collect data and re-validate the PSA in 2024** to ensure the assessment performs well after policy or practice changes are implemented. Jurisdictions should complete a validation study approximately every three years because changes in population, policy, and other factors can impact predictive validity over time.

Research Question 2: Do the RRM release levels appropriately correspond to pretrial risk?

Completing the PSA is only the first step in Tarrant County's pretrial release process. The PSA scores for the FTA and NCA scales are applied to the Release Recommendation Matrix, which determines the recommended release level.

Figure 4 illustrates the AUC-ROC results for three measures. The first bar represents the PSA FTA score, the second shows the RRM level assigned based on the PSA score, and the last bar shows the recommended release level when automatic, charge-based bump ups are included. The baseline RRM significantly underperforms the FTA score as a predictor of failure to appear and performance declines when automatic, charge-based bump ups are added. As mentioned above, bump ups automatically increase the recommended release level based on specific charges.

Figure 4: AUC-ROC Performance of the RRM Compared to PSA Score (FTA Scale)
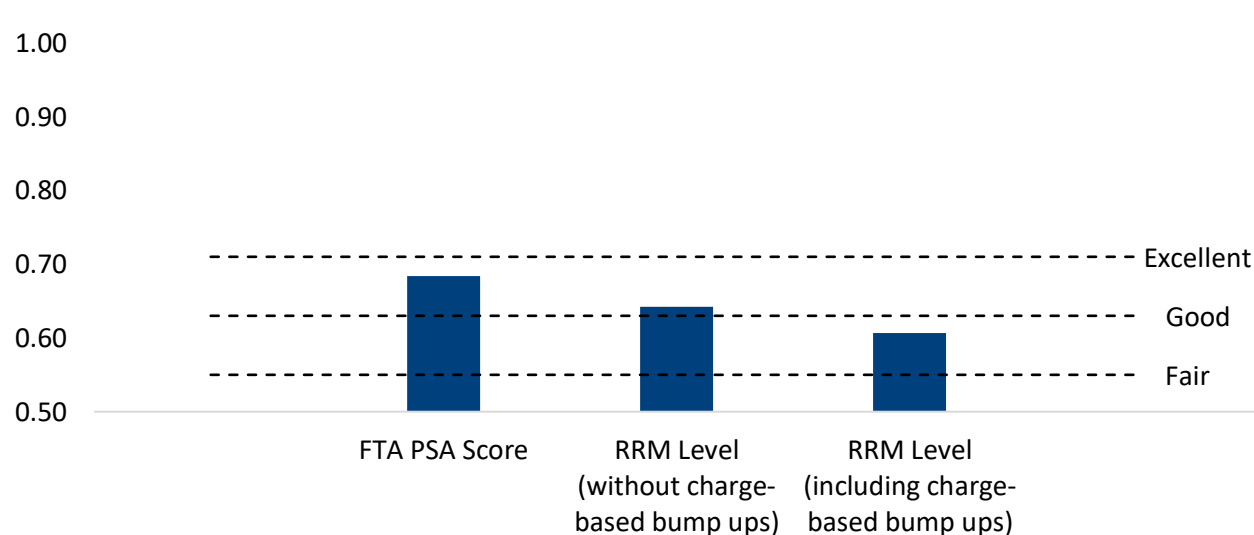
Figure 5 illustrates a similar story for the NCA scale. The RRM levels significantly underperform the PSA score when predicting new criminal activity, especially when charge-based bump ups are present.

The drop in performance from the PSA scales to the RRM is partially due to how risk scores are translated to RRM levels. While the underlying risk score performs relatively well, the cutoffs that define supervision levels are not closely aligned with actual outcomes. This means that adjusting the recommended release levels to correspond more closely with the risk score could improve RRM performance.

Eliminating the automatic, charge-based bump ups could also improve RRM performance. Results indicate that individuals with charges that require automatic bump ups are not significantly more likely to miss court or be rearrested than individuals with the same risk score, but different charges. The PSA score is the most effective predictor of pretrial risk and adding automatic, charge-based requirements only hurts the predictive validity of the assessment.

Figure 5: AUC-ROC Performance of the RRM Compared to PSA Score (NCA Scale)
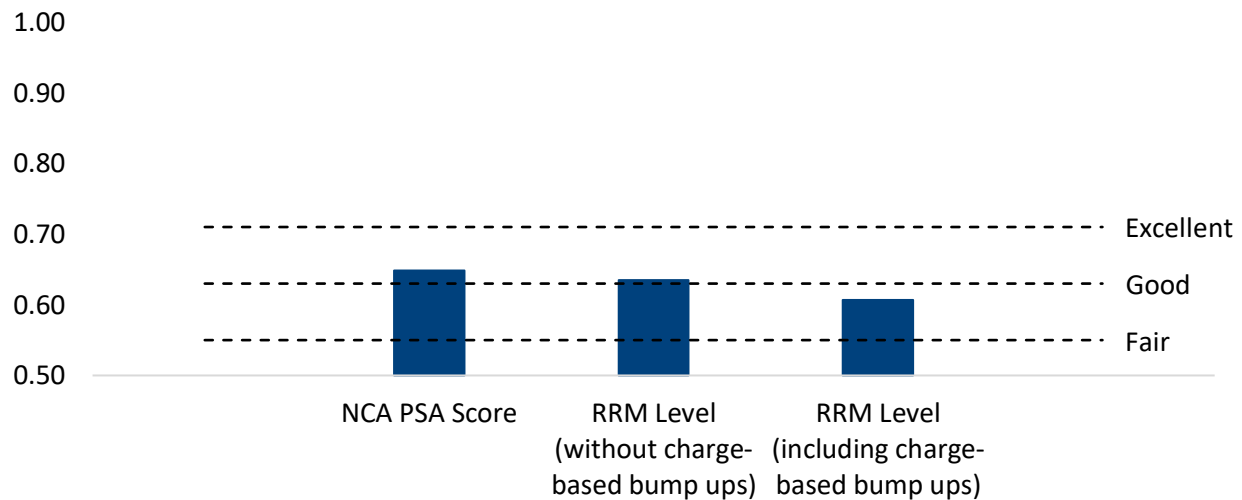
FINDINGS

- **The RRM significantly underperforms the FTA and NCA scales as a predictor of risk and performance declines when automatic, charge-based bump ups are added.** RRM performance can be improved by adjusting how PSA risk scores are used to assign recommended release levels.

RECOMMENDATIONS:

1. **Eliminate automatic, charge-based bump ups in the recommended release level**. Decision makers can be confident using the more accurate PSA scores along with additional case information, such as current charges, to make supervision decisions on a case-by-case basis.

2. **Align the current Release Recommendation Matrix levels more closely with PSA score distribution by completing a norming study.** Norming analysis examines the number of risk levels as well as the cut points (the scores that trigger a change in the recommended release level) to produce an RRM that best aligns recommended release levels with observed risks.

Research Question 3: Does the PSA predict failure accurately and consistently across demographic groups?

CJI used two approaches to test whether the PSA performs consistently for all demographic groups: a comparison of performance across groups and multivariate logistic regression analysis to test for bias.

Multivariate logistic regression analysis shows the relationship between risk score and pretrial outcomes when controlling for factors such as case processing time or charge severity. The output for this analysis is an odds ratio. Odds ratios above 1.0 indicate that an outcome is *more likely* if a certain factor is present. Odds ratios below 1.0 indicate that an outcome is *less likely* if a certain factor is present. For example, an odds ratio of 2.0 for FTA score means that for every person with an FTA score of 1 who missed a court date, we would expect two people with an FTA score of 2 to miss a court date.

CJI also tested for interaction effects to measure the influence of demographic factors on PSA performance. This test estimates whether a change in PSA score indicates the same level of risk for each demographic group.

Gender

Results indicate that the FTA scale is a stronger predictor of failure to appear for women than men, as shown in Figure 6. This finding is consistent across the FTA score, the baseline RRM level, and the RRM level with automatic, charge-based bump ups. RRM level with bump ups is the weakest predictor of failure to appear for both men and women.

Figure 6: AUC-ROC by Gender (FTA Scale)
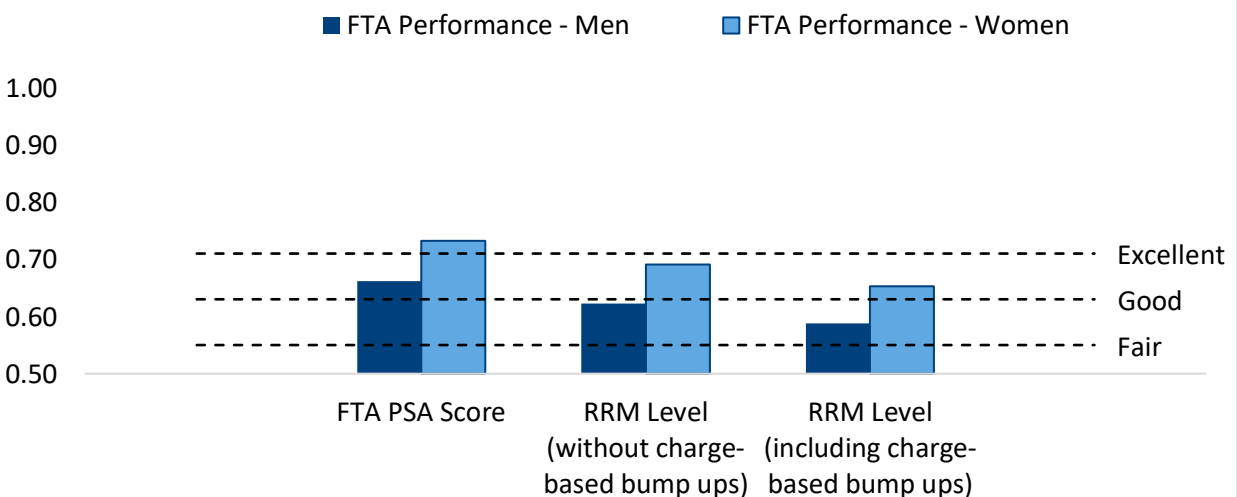
Regression analyses confirm that there is a statistically significant interaction effect between gender and the FTA risk metrics. The difference in performance across gender is primarily driven by two risk factors, "pending charge at time of offense" and "prior failure to appear in the past 2 years", both demonstrating statistically significant interaction effects.[vi] Specific recommendations to address the gender difference are included below.

As illustrated in Figure 7, the analysis does not show any pronounced gender differences for the NCA scale. Recommended release level with automatic, charge-based bump ups is the weakest predictor of new criminal activity for both men and women.

Figure 7: AUC-ROC by Gender (NCA Scale)
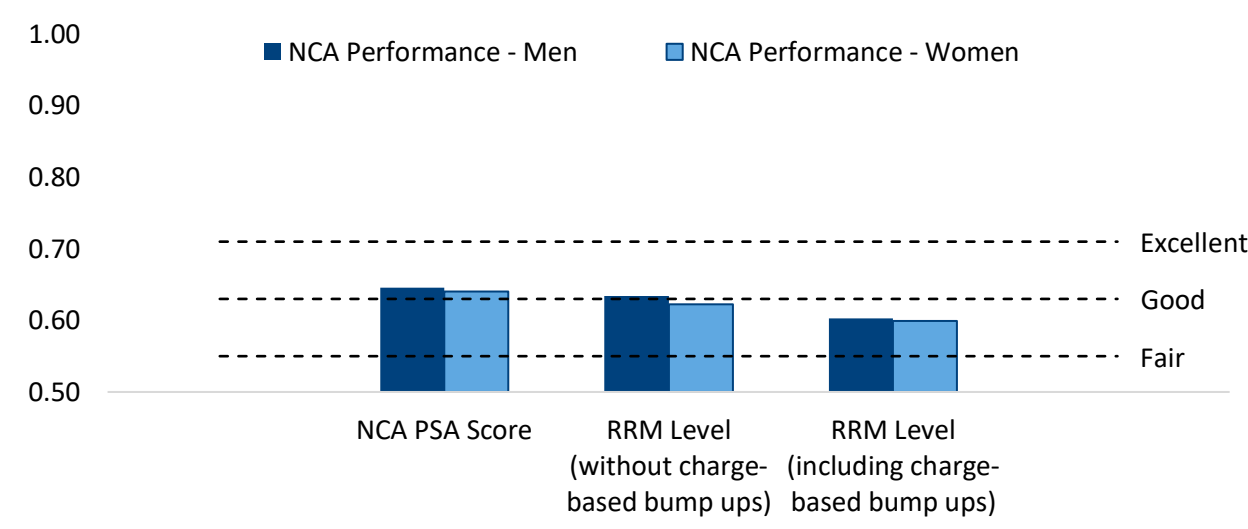
Race

The validation population includes three racial and ethnic groups: white non-Hispanic, white Hispanic, and Black.[vii] As shown in Figure 8, the PSA predicts failure to appear more accurately for white non-Hispanic and white Hispanic people than Black people. The PSA score is the best predictor of failure to appear for all groups. The RRM levels significantly underperform the PSA score, especially when charge-based bump ups are present. This decrease in performance is most pronounced for Black individuals and leads to a significant gap in the AUC-ROC scores across racial and ethnic groups for the FTA scale.

Figure 8: AUC-ROC by Race (FTA Scale)
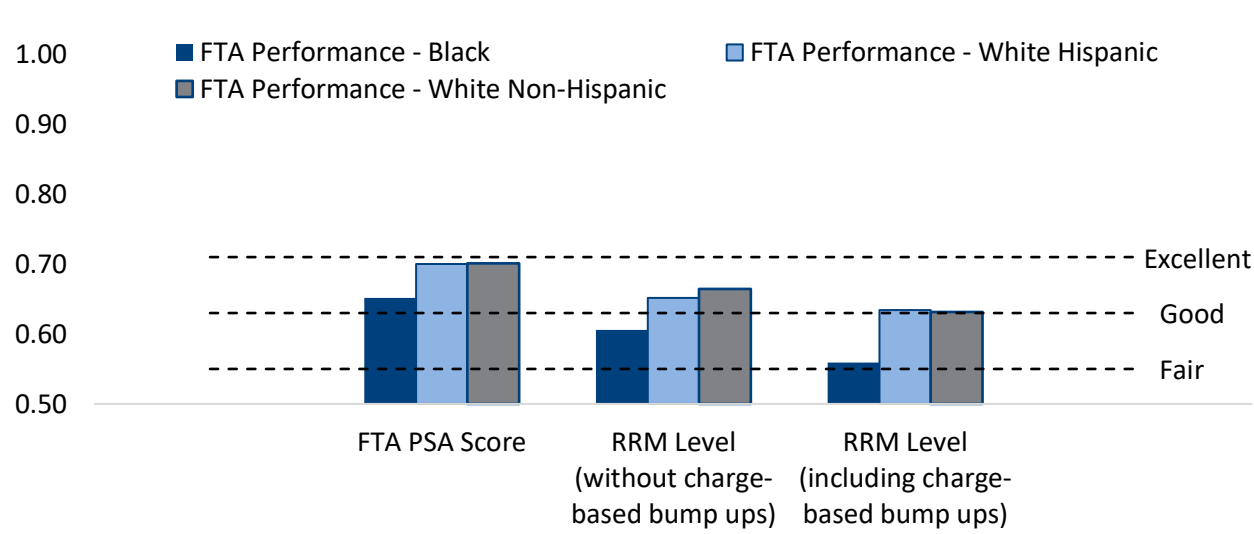
Multivariate regression analyses corroborate these results. Analyses testing for interaction effects shows two statistically significant relationships. There is a weaker relationship between FTA score and missed court appearance for Black people compared to white Hispanic or non-Hispanic people. This is also true for RRM level when comparing Black people and white non-Hispanic people .

The difference in performance across race and ethnic groups appear to be driven by two risk factors. "Pending charge at the time of offense" is a stronger predictor of failure to appear for white Hispanic people than white non-Hispanic people or Black people. "Prior conviction (misdemeanor or felony)" is a stronger predictor of failure to appear for white non-Hispanic people compared to white Hispanic people or Black people.[viii]

The AUC-ROC results for the NCA scale suggest that it performs better for white Hispanic people than Black or white non-Hispanic people as shown in Figure 9. Regression analysis did not detect statistically significant interactions between any NCA risk metric and race or ethnic group. This does not necessarily mean the NCA scale is performing equally across all groups, only that one test found a difference and the other did not. The inconsistency between statistical tests indicates a need to reexamine the NCA scale in future validations to ensure it performs accurately and consistently for all racial and ethnic groups.

Figure 9: AUC-ROC by Race (NCA Scale)
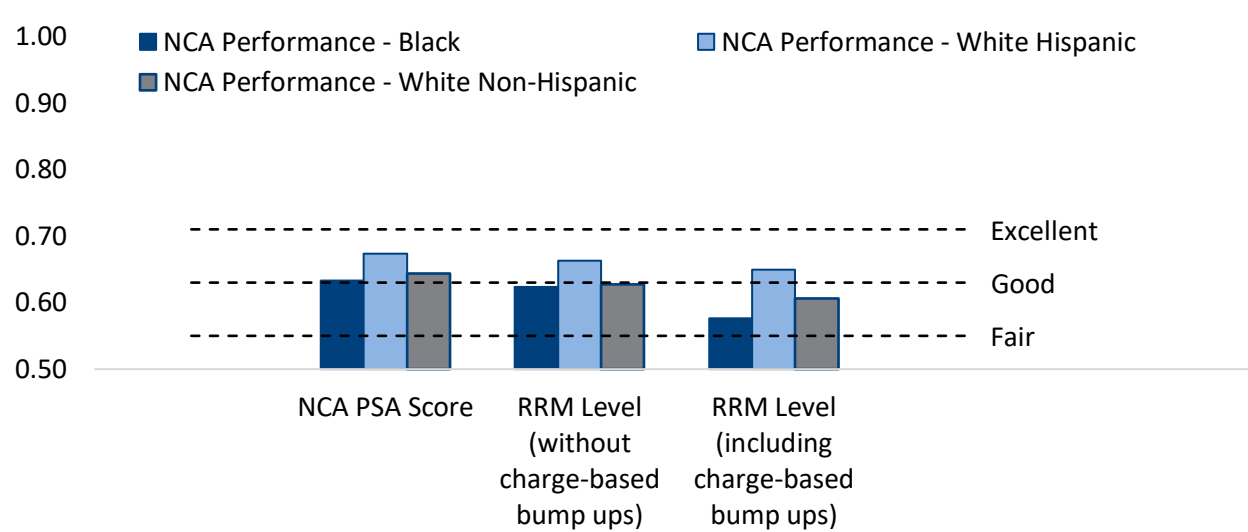
While there are no statistically significant interaction effects between new arrest and race or ethnic group, there are statistically significant differences for certain NCA risk factors. "Prior felony conviction" is a significantly stronger predictor of new criminal activity for white Hispanic and white non-Hispanic people compared to Black people. "Prior misdemeanor" is a significantly stronger predictor of new criminal activity for white non-Hispanic and Black people compared to white Hispanic people. Finally, "pending charge at time of offense" is a significantly stronger predictor for Black individuals compared to white non-Hispanic individuals. AUC-ROC results also demonstrate differences in the predictive power of these NCA factors (see Appendix C).

As discussed in the recommendations section, a norming study could determine whether the PSA would perform better with these factors removed or altered, replaced, or down weighted.

The difference in PSA performance across groups could lead to recommended release levels that are based on demographics rather than risk of pretrial failure. In some cases, this could result in over-supervision of individuals from certain groups.

FINDINGS

- **The PSA meets the minimum validity standards across all demographic groups for the FTA and NCA scales, but there are significant differences in performance.** The PSA is less accurate at predicting failures to appear for men and for Black people and is less accurate at predicting new criminal activity for Black and white non-Hispanic people.

- **Automatic, charge-based bump ups have a larger impact on Black individuals than other groups.** The drop in performance when recommended release level is automatically increased is most pronounced for Black individuals. This could mean that charge-based bump ups lead to over-supervision of Black people.

1. **Eliminate automatic, charge-based bump ups in the recommended release levels** to improve the accuracy and consistency of recommendations across demographic groups. Collect data and test changes in the release process to ensure new practices are effective.

2. **Pilot and evaluate new or revised risk factors to improve PSA performance across demographic groups.** Specifically, test the PSA criminal history risk factors using different time limits. For example, factors that do not change over time such as "prior felony conviction" perform worse for Black people than other demographic groups. Limiting that factor to "prior felony conviction in the past 5 years" could improve performance consistency. Tarrant County could also test the impact of removing the risk factors that do not perform consistently across groups.

3. **Collect data to evaluate the performance of any revised PSA risk factors during subsequent validations.** If the new, revised, or removed risk factors improve PSA performance across groups during the pilot period, permanently replace the worst performing factors with the revised versions.

LIMITATIONS

There are important limitations to note for this study. First, PSA implementation began in 2021, during the Covid-19 pandemic. Though the impact of the pandemic on pretrial behavior is not within the scope of this report, court cases took longer to move from arrest to disposition in 2021 and 2022 than in prior years. This led to longer supervision periods, which generally increases failure rates. It also means the disposition rate was lower for cases in the pandemic period, limiting the sample size. While the study controlled for case length to minimize the impact, the case dynamics during this period may not be representative.

Outcome information was also limited and inconsistent. The FTA rate changed significantly over the study period. Notably, FTA rates in 2022 were, on average, twice as high as FTA rates in 2021. Based on conversations with Tarrant County officials, the low FTA rate before 2022 was due to inconsistencies in how failures to appear were recorded in court data systems. The increase in FTA rates in recent months indicates that the quality of FTA data is improving. However, due to the timing of these changes and the low number of disposed cases, the analysis could not be limited to the recent, more accurate failure to appear data.

The data on new criminal activity are more consistent but are limited to the offenses recorded in Tarrant County's court system. This means that new arrests outside of Tarrant County are not included in the analysis. The current validation results should be confirmed using more complete arrest data.

The final limitation is that the number of individuals released pretrial who are involved in new violent criminal activity is very small. In the current RRM, a positive NVCA flag automatically places an individual on the highest level of pretrial supervision, so this is an important component of Tarrant County's risk management system. However, CJI identified 54 cases with a new violent criminal offense, representing fewer than one percent of all the cases. While this is a good signal for public safety, it also means that

there is not enough statistical power to evaluate the predictive value of the NVCA flag. The performance of the NVCA flag should be a priority in future validations.

RECOMMENDATIONS

1. Continue to complete the PSA for every case at magistration. This will improve the breadth of data available for future validations.

2. Continue to improve court appearance tracking by ensuring the PSA's definition of failure to appear is consistently followed.[ix]

3. Incorporate new criminal activity and new violent criminal activity data into ongoing pretrial performance tracking. Tarrant County could create an internal NCA statistical report like the existing FTA statistical report available to court administrators through the judicial portal. The report should include information on whether an individual was rearrested during the pretrial period and whether that arrest met Tarrant County's definition of a violent offense. An NCA statistical report would ensure consistency in future validations and provide an important measure of public safety for CSCD and magistrate judges.

4. Explore methods to incorporate offenses outside of Tarrant County into Tarrant County's outcome data tracking. This will provide a more comprehensive measure of new criminal activity and ensure that judges and CSCD have complete and accurate information about the public safety impact of supervision practices.

NEXT STEPS

The PSA is a valid predictor of pretrial outcomes and Tarrant County should continue to use the assessment to inform pretrial release decisions. However, given the limitations of the study and the nuanced findings outlined in this report, there are several steps Tarrant County can take to improve the pretrial release process and prepare for the PSA validation study planned for 2024.

1. **Continue to collect comprehensive data for future validation studies to monitor the predictive validity of the PSA over time.** To improve data quality, Tarrant County should keep the definitions of pretrial outcomes consistent and include arrest data outside of Tarrant County.

2. **Eliminate automatic, charge-based release level bump ups from the RRM and align release levels more closely with the PSA risk scores**. Tarrant County can accomplish this through a norming study, which examines the number of release levels as well as the cut points (the scores that trigger a change in the recommended release level) to optimize RRM performance.

3. **Pilot and evaluate new or revised risk factors to improve PSA performance for Black individuals and men.** Specifically, begin recording data for the PSA's criminal history risk factors with different time limits, starting with unbounded criminal history factors. Include the revised risk factors in future validations to test whether the consistency of the PSA improves. Future validations can also test the validity of the PSA when poorly performing risk factors are removed. If the changes improve the PSA's predictive validity, replace the worst performing factors with the adjusted risk factors.

APPENDIX A: TARRANT COUNTY PUBLIC SAFETY ASSESSMENT (PSA) SCORING

Step 1: Complete the PSA to generate scores for the FTA scale, NCA scale and NVCA flag.

Step 2: Review the following information:

1. If the individual was extradited for the current charge;

2. If any current charge is
   a. 38.06 Escape (F1, F2, F3)
   b. 19.02 Murder (F1, F2)
   c. 19.03 Capital Murder (FC)
   d. 22.011 Sexual Assault (F1, F2)
   e. 22.021 Aggravated Sexual Assault (F1)
   f. 29.03 Aggravated Robbery (F1)
   g. or an FTA for any of these charges; or

3. If the PSA resulted in an NVCA flag.

4. If the answer to any of the above is yes, Release Level 5. If no, continue to step 3.

Step 3: Apply the FTA and NCA scale scores from Step 1 above to the Release Recommendation Matrix (RRM) to determine the preliminary recommended release level and corresponding conditions.

Step 4: Determine if any current charge is:
   a. 22.01 Assault of a Family Member
   b. 25.07(1) & 25.072 Violation of Certain Court Orders, Repeated Violations of Certain Court Orders (F3, FS, MA)
   c. 21.02 Continuous Sexual Abuse of Young Child or Children (F1)
   d. 28.02 Arson (F1)
   e. 22.02 Aggravated Assault (F1, F2)
   f. Involved the use of a deadly weapon
   g. Failure to appear for any of these charges.

1. If no, the preliminary release recommendation level and corresponding conditions identified in Step 3 is the final recommendation.

2. If yes, increase the preliminary release recommendation level and corresponding conditions by one level as shown below:
   - Unmonitored or Release Level 1 = Release Level 2
   - Release Level 2 = Release Level 3
   - Release Level 3 = Release Level 4
   - Release Level 4 = Release Level 5

Appendix A – Table 1: Tarrant County Supervision Levels and Conditions

Release Level	Phone Contact	Face-To-Face Contact	Conditions Monitoring	Court Reminders & CCH Checks
Unmonitored	None	None	No	No
Release Level 1	None	None	No	Yes
Release Level 2	Monthly	None	Yes	Yes
Release Level 3	None	Monthly	Yes	Yes
Release Level 4	None	Bi-weekly	Yes	Yes
Release Level 5	Bi-weekly	Bi-weekly	Yes	Yes

Note: All pretrial supervision from Release Level 1 to Level 5 includes criminal history checks and reminder notifications before each court date.

APPENDIX B: STATISTICAL TESTS USED IN RISK ASSESSMENT VALIDATION STUDIES

χ^2 **(Chi-square) analysis** utilizes the results of cross-tabulations to determine whether an outcome is distributed randomly, or due to a relationship between the risk factors and outcome. A statistically significant χ^2 test indicates that the distribution of an outcome across risk scores is not due to chance.

Correlations measure the strength and direction of the relationship between two variables. The strength of the correlation (r-value) is reported as a number between -1 and 1, with an r-value of less than 0 indicating a negative relationship and an r-value of more than 0 indicating a positive relationship. The r-value for a risk assessment that works is at least 0.10 or -0.10, depending on the direction of the effect, indicating a fair correlation between the risk score and outcomes.

Area Under the Curve – Receiver Operating Characteristic (AUC-ROC) analysis is used to indicate how well the risk scales predict a binary outcome. Specifically, it measures how well the tool distinguishes between likely failures (e.g. failure to appear for court) and likely successes (e.g. appearing for all court hearings). The AUC-ROC score can vary from 0 to 1, with a score above 0.5 indicating some ability to distinguish between likely failures and successes. For example, an AUC-ROC value of 0.7 for an FTA scale would indicate that the tool successfully distinguished between someone who failed to appear and someone who did not for 70% of the sample.

Bivariate Logistic Regression examines the relationship between an individual risk factor and an individual outcome, resulting in the odds that the outcome will occur given the presence or absence of a risk factor.

Multivariate Logistic Regression tests the likelihood of pretrial failure, controlling for risk score, demographic information, and time at risk (the amount of time an individual is in the community and can experience failure). If the risk assessment is valid, the risk score will be a strong predictor of the likelihood of pretrial failure. The odds ratios from regression models offer insight into the likelihood of pretrial outcomes with every one-point increase in the risk assessment score.

APPENDIX C: RESULTS FOR THE VALIDATION ANALYSIS STATISTICAL TESTS

Appendix C - Table 1: Full Statistical Test Results for Entire Sample Population

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.20	0.00	1.59	0.00	0.68
FTA Scaled Score	0.19	0.00	1.83	0.00	0.68
RRM Level (without charge-based bump ups)	0.13	0.00	1.42	0.00	0.64
RRM Level (including charge-based bump ups)	0.08	0.00	1.21	0.00	0.61
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.12	0.00	2.54	0.00	0.61
FTA 2: Prior conviction (misdemeanor or felony)	0.05	0.00	1.45	0.00	0.55
FTA 3: Prior failure to appear in the past 2 years	0.23	0.00	1.95	0.00	0.64
FTA 4: Prior failure to appear older than 2 years	0.02	0.08	1.29	0.08	0.51
Risk Scores and Levels - New Criminal Activity					
NCA Total Points	0.11	0.00	1.21	0.00	0.65
NCA Scaled Score	0.11	0.00	1.44	0.00	0.65
RRM Level (without charge-based bump ups)	0.11	0.00	1.40	0.00	0.64
RRM Level (including charge-based bump ups)	0.06	0.00	1.20	0.00	0.61
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	0.01	0.39	1.06	0.39	0.51
NCA 2: Pending charge at time of offense	0.08	0.00	1.29	0.00	0.59
NCA 3: Prior misdemeanor conviction	0.08	0.00	2.18	0.00	0.60
NCA 4: Prior felony conviction	0.07	0.00	2.03	0.00	0.58
NCA 5: Prior violent conviction(s)	0.05	0.00	1.48	0.00	0.55
NCA 6: Prior failure to appear in the past 2 years	0.05	0.00	1.70	0.00	0.53
NCA 7: Prior sentence to incarceration	0.07	0.00	1.42	0.00	0.59

Appendix C - Table 2: Full Statistical Test Results for Men in the Sample Population

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.17	0.00	1.49	0.00	0.66
FTA Scaled Score	0.17	0.00	1.69	0.00	0.66
RRM Level (without charge-based bump ups)	0.11	0.00	1.34	0.00	0.62
RRM Level (including charge-based bump ups)	0.07	0.00	1.17	0.00	0.59
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.10	0.00	2.13	0.00	0.59
FTA 2: Prior conviction (misdemeanor or felony)	0.05	0.00	1.48	0.00	0.55
FTA 3: Prior failure to appear in the past 2 years	0.19	0.00	1.77	0.00	0.62
FTA 4: Prior failure to appear older than 2 years	0.02	0.09	1.33	0.09	0.51
Risk Scores and Levels - New Criminal Activity					
NCA Total Points	0.11	0.00	1.20	0.00	0.64
NCA Scaled Score	0.11	0.00	1.43	0.00	0.65
RRM Level (without charge-based bump ups)	0.11	0.00	1.38	0.00	0.63
RRM Level (including charge-based bump ups)	0.06	0.00	1.18	0.00	0.60
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	0.01	0.42	1.06	0.42	0.51
NCA 2: Pending charge at time of offense	0.09	0.00	1.31	0.00	0.60
NCA 3: Prior misdemeanor conviction	0.08	0.00	2.11	0.00	0.59
NCA 4: Prior felony conviction	0.07	0.00	1.96	0.00	0.58
NCA 5: Prior violent conviction(s)	0.04	0.01	1.36	0.00	0.54
NCA 6: Prior failure to appear in the past 2 years	0.05	0.00	1.64	0.00	0.53
NCA 7: Prior sentence to incarceration	0.07	0.00	1.38	0.00	0.58

Appendix C - Table 3: Full Statistical Test Results for Women in the Sample Population

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.29	0.00	1.94	0.00	0.73
FTA Scaled Score	0.27	0.00	2.29	0.00	0.73
RRM Level (without charge-based bump ups)	0.20	0.00	1.76	0.00	0.69
RRM Level (including charge-based bump ups)	0.13	0.00	1.37	0.00	0.65
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.18	0.00	3.99	0.00	0.66
FTA 2: Prior conviction (misdemeanor or felony)	0.04	0.11	1.39	0.05	0.54
FTA 3: Prior failure to appear in the past 2 years	0.35	0.00	2.55	0.00	0.69
FTA 4: Prior failure to appear older than 2 years	0.01	0.62	1.16	0.62	0.51
Risk Scores and Levels - New Criminal Activity					
NCA Total Points	0.10	0.00	1.21	0.00	0.64
NCA Scaled Score	0.09	0.00	1.43	0.00	0.64
RRM Level (without charge-based bump ups)	0.09	0.00	1.42	0.00	0.62
RRM Level (including charge-based bump ups)	0.05	0.03	1.21	0.00	0.60
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	0.00	0.87	1.02	0.87	0.50
NCA 2: Pending charge at time of offense	0.05	0.05	1.19	0.03	0.56
NCA 3: Prior misdemeanor conviction	0.07	0.00	2.19	0.00	0.60
NCA 4: Prior felony conviction	0.06	0.01	2.08	0.00	0.57
NCA 5: Prior violent conviction(s)	0.06	0.02	2.00	0.00	0.55
NCA 6: Prior failure to appear in the past 2 years	0.06	0.03	1.86	0.01	0.54
NCA 7: Prior sentence to incarceration	0.08	0.00	1.52	0.00	0.60

Appendix C - Table 4: Full Statistical Test Results for White Non-Hispanic Individuals in the Sample Population

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.22	0.00	1.71	0.00	0.70
FTA Scaled Score	0.21	0.00	1.98	0.00	0.70
RRM Level (without charge-based bump ups)	0.15	0.00	1.50	0.00	0.66
RRM Level (including charge-based bump ups)	0.10	0.00	1.26	0.00	0.63
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.12	0.00	2.72	0.00	0.62
FTA 2: Prior conviction (misdemeanor or felony)	0.08	0.00	1.94	0.00	0.58
FTA 3: Prior failure to appear in the past 2 years	0.24	0.00	2.13	0.00	0.64
FTA 4: Prior failure to appear older than 2 years	0.02	0.13	1.41	0.13	0.51
Risk Scores and Levels - New Criminal Activity					
NCA Total Points	0.10	0.00	1.19	0.00	0.65
NCA Scaled Score	0.10	0.00	1.40	0.00	0.64
RRM Level (without charge-based bump ups)	0.09	0.00	1.35	0.00	0.63
RRM Level (including charge-based bump ups)	0.06	0.00	1.19	0.00	0.61
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	0.00	0.87	1.02	0.87	0.50
NCA 2: Pending charge at time of offense	0.05	0.01	1.18	0.00	0.56
NCA 3: Prior misdemeanor conviction	0.08	0.00	2.23	0.00	0.60
NCA 4: Prior felony conviction	0.11	0.00	2.95	0.00	0.62
NCA 5: Prior violent conviction(s)	0.04	0.04	1.49	0.01	0.55
NCA 6: Prior failure to appear in the past 2 years	0.02	0.56	1.27	0.28	0.51
NCA 7: Prior sentence to incarceration	0.09	0.00	1.54	0.00	0.60

Appendix C - Table 5: Full Statistical Test Results for Black Individuals in the Sample Population

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.18	0.00	1.47	0.00	0.65
FTA Scaled Score	0.17	0.00	1.65	0.00	0.65
RRM Level (without charge-based bump ups)	0.11	0.00	1.31	0.00	0.61
RRM Level (including charge-based bump ups)	0.05	0.03	1.11	0.01	0.56
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.09	0.00	1.98	0.00	0.58
FTA 2: Prior conviction (misdemeanor or felony)	0.01	0.97	1.11	0.49	0.51
FTA 3: Prior failure to appear in the past 2 years	0.22	0.00	1.78	0.00	0.65
FTA 4: Prior failure to appear older than 2 years	0.00	0.97	0.95	0.85	0.50
Risk Scores and Levels - New Criminal Activity					
NCA Total Points	0.11	0.00	1.19	0.00	0.63
NCA Scaled Score	0.11	0.00	1.39	0.00	0.63
RRM Level (without charge-based bump ups)	0.11	0.00	1.35	0.00	0.62
RRM Level (including charge-based bump ups)	0.05	0.06	1.13	0.01	0.58
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	0.02	0.60	1.12	0.24	0.52
NCA 2: Pending charge at time of offense	0.10	0.00	1.36	0.00	0.61
NCA 3: Prior misdemeanor conviction	0.08	0.00	1.98	0.00	0.58
NCA 4: Prior felony conviction	0.00	0.85	1.03	0.85	0.50
NCA 5: Prior violent conviction(s)	0.02	0.60	1.21	0.22	0.52
NCA 6: Prior failure to appear in the past 2 years	0.09	0.00	1.91	0.00	0.56
NCA 7: Prior sentence to incarceration	0.04	0.15	1.19	0.04	0.54

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.21	0.00	1.61	0.00	0.70
FTA Scaled Score	0.21	0.00	1.91	0.00	0.70
RRM Level (without charge-based bump ups)	0.13	0.00	1.43	0.00	0.65
RRM Level (including charge-based bump ups)	0.11	0.00	1.29	0.00	0.63
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.16	0.00	3.68	0.00	0.65
FTA 2: Prior conviction (misdemeanor or felony)	0.01	0.68	1.10	0.68	0.51
FTA 3: Prior failure to appear in the past 2 years	0.25	0.00	2.02	0.00	0.63
FTA 4: Prior failure to appear older than 2 years	0.05	0.18	1.73	0.09	0.53
Risk Scores and Levels - New Criminal Activity					
NCA Points	0.14	0.00	1.28	0.00	0.67
NCA PSA Score	0.14	0.00	1.59	0.00	0.67
RRM Level (without charge-based bump ups)	0.14	0.00	1.57	0.00	0.66
RRM Level (including charge-based bump ups)	0.11	0.00	1.38	0.00	0.65
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	-0.02	0.39	0.84	0.39	0.47
NCA 2: Pending charge at time of offense	0.09	0.00	1.37	0.00	0.61
NCA 3: Prior misdemeanor conviction	0.08	0.01	2.33	0.00	0.60
NCA 4: Prior felony conviction	0.14	0.00	3.84	0.00	0.65
NCA 5: Prior violent conviction(s)	0.10	0.00	2.12	0.00	0.61
NCA 6: Prior failure to appear in the past 2 years	0.04	0.24	1.60	0.15	0.52
NCA 7: Prior sentence to incarceration	0.11	0.00	1.77	0.00	0.64

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.17	0.00	1.53	0.00	0.68
FTA Scaled Score	0.16	0.00	1.78	0.00	0.68
RRM Level (without charge-based bump ups)	0.10	0.00	1.33	0.00	0.63
RRM Level (including charge-based bump ups)	0.03	0.18	1.09	0.04	0.56
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.10	0.00	2.49	0.00	0.61
FTA 2: Prior conviction (misdemeanor or felony)	0.03	0.21	1.32	0.10	0.53
FTA 3: Prior failure to appear in the past 2 years	0.21	0.00	1.84	0.00	0.64
FTA 4: Prior failure to appear older than 2 years	-0.02	0.37	0.79	0.37	0.49
Risk Scores and Levels - New Criminal Activity					
NCA Total Points	0.08	0.00	1.15	0.00	0.60
NCA Scaled Score	0.08	0.00	1.29	0.00	0.60
RRM Level (without charge-based bump ups)	0.08	0.00	1.29	0.00	0.59
RRM Level (including charge-based bump ups)	0.03	0.12	1.10	0.04	0.56
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	0.00	0.82	0.97	0.82	0.50
NCA 2: Pending charge at time of offense	0.05	0.03	1.17	0.01	0.56
NCA 3: Prior misdemeanor conviction	0.05	0.03	1.69	0.01	0.56
NCA 4: Prior felony conviction	0.06	0.01	1.74	0.00	0.57
NCA 5: Prior violent conviction(s)	0.04	0.07	1.40	0.02	0.55
NCA 6: Prior failure to appear in the past 2 years	0.06	0.01	1.70	0.00	0.53
NCA 7: Prior sentence to incarceration	0.05	0.03	1.29	0.00	0.56

Appendix C - Table 8: Full Statistical Test Results for the Sample Population Arrested for Misdemeanors

	Correlation (r-value)	Chi-Square (p-value)	Bivariate Regression Coefficient	Bivariate Regression p-value	AUC-ROC
Risk Scores and Levels - Court Appearance					
FTA Total Points	0.24	0.00	1.69	0.00	0.70
FTA Scaled Score	0.23	0.00	1.94	0.00	0.69
RRM Level (without charge-based bump ups)	0.17	0.00	1.53	0.00	0.66
RRM Level (including charge-based bump ups)	0.14	0.00	1.36	0.00	0.64
Individual Factors - Court Appearance					
FTA 1: Pending charge at time of offense	0.14	0.00	2.76	0.00	0.62
FTA 2: Prior conviction (misdemeanor or felony)	0.07	0.00	1.66	0.00	0.56
FTA 3: Prior failure to appear in the past 2 years	0.25	0.00	2.05	0.00	0.64
FTA 4: Prior failure to appear older than 2 years	0.05	0.00	1.90	0.00	0.52
Risk Scores and Levels - New Criminal Activity					
NCA Total Points	0.14	0.00	1.26	0.00	0.68
NCA Scaled Score	0.14	0.00	1.56	0.00	0.68
RRM Level (without charge-based bump ups)	0.13	0.00	1.49	0.00	0.66
RRM Level (including charge-based bump ups)	0.09	0.00	1.30	0.00	0.63
Individual Factors - New Criminal Activity					
NCA 1: Age at current arrest	0.02	0.22	1.11	0.22	0.52
NCA 2: Pending charge at time of offense	0.10	0.00	1.37	0.00	0.61
NCA 3: Prior misdemeanor conviction	0.10	0.00	2.57	0.00	0.62
NCA 4: Prior felony conviction	0.09	0.00	2.40	0.00	0.58
NCA 5: Prior violent conviction(s)	0.05	0.00	1.58	0.00	0.54
NCA 6: Prior failure to appear in the past 2 years	0.05	0.00	1.70	0.00	0.53
NCA 7: Prior sentence to incarceration	0.09	0.00	1.53	0.00	0.60

	Missed at least one Court Date			
	FTA Factor	FTA Score	RRM	RRM with Bump ups
FTA 1: Pending charge at time of offense	0.68*** (0.10)			
FTA 2: Prior conviction	0.27** (0.10)			
FTA 3: Prior failure to appear in the past 2 years	0.62*** (0.04)			
FTA 4: Prior failure to appear older than 2 years	-0.10 (0.17)			
FTA PSA Score		0.70*** (0.04)		
RRM Level			0.43*** (0.03)	
RRM Level with Bump ups				0.26*** (0.03)
Black	0.01 (0.10)	0.01 (0.09)	0.05 (0.09)	0.07 (0.09)
Male	-0.05 (0.10)	-0.08 (0.10)	-0.14 (0.10)	-0.07 (0.10)
Felony	-0.37*** (0.11)	-0.45*** (0.10)	-0.43*** (0.10)	-0.45*** (0.11)
Time at Risk in Days	0.004*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
Constant	-3.69*** (0.14)	-4.60*** (0.16)	-3.40*** (0.13)	-3.29*** (0.13)

Note: *p<0.05; **p<0.01; ***p<0.001
Standard errors in parentheses

Appendix C - Table 10: NCA Multivariate Regression Models

		Re-arrested at least once during the pre-trial period		
	NCA Factor	NCA Score	RRM	RRM with Bump ups
NCA 1: Age at current arrest	0.23** (0.07)			
NCA 2: Pending charge at time of offense	0.23*** (0.04)			
NCA 3: Prior misdemeanor conviction	0.54*** (0.16)			
NCA 4: Prior felony conviction	0.32* (0.16)			
NCA 5: Prior violent conviction	-0.06 (0.12)			
NCA 6: Prior failure to appear in the past 2 years	0.27* (0.11)			
NCA 7: Prior sentence to incarceration	0.08 (0.09)			
NCA PSA Score		0.40*** (0.04)		
RRM Level			0.36*** (0.04)	
RRM Level with Bump ups				0.21*** (0.03)
Black	0.24* (0.11)	0.24* (0.11)	0.25* (0.11)	0.28** (0.11)
Male	0.13 (0.13)	0.11 (0.13)	0.13 (0.13)	0.19 (0.12)
Felony	0.03 (0.12)	0.04 (0.12)	0.07 (0.12)	0.07 (0.12)
Time at Risk in Days	0.01*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Constant	-4.85*** (0.19)	-5.20*** (0.20)	-4.48*** (0.17)	-4.36*** (0.17)

Note: *p<0.05; **p<0.01; ***p<0.001
Standard errors in parentheses

END NOTES

[i] A full description of supervision conditions associated with each RRM level is provided in Appendix A.

[ii] A full list of charges and a step-by-step description of Tarrant County's PSA scoring process is included in Appendix A.

[iii] The data only include arrests within Tarrant County and data collection there were inconsistencies over time with regards to FTA data collection. In more recent months, the court appearance rate was closer to 85-90%. Again, conversations with stakeholders indicate that this is due to changes in data collection practices more than changes in the behavior of individuals released pretrial.

[iv] While AUC-ROC scores below 0.5 are technically possible, they are rare in this context and are generally not suitable for interpretation. For a fuller explanation see: Karimollah Hajian-Tilaki, "Receiver Operating Characteristic (ROC) Curve Analysis for Medical Diagnostic Test Evaluation," *Caspian Journal of Internal Medicine* 4, no. 2 (2013): 627–35.

[v] The "fair," "good," and "excellent" performance benchmarks used for AUC-ROC analysis are explained inSarah L Desmarais and Jay P Singh, "Risk Assessment Instruments Validated and Implemented in Correctional Settings in the United States" (Council of State Governments Justice Center, March 27, 2013), https://csgjusticecenter.org/wp-content/uploads/2020/02/Risk-Assessment-Instruments-Validated-and-Implemented-in-Correctional-Settings-in-the-United-States.pdf.
A more detailed statistical exploration of the AUC-ROC benchmarks is found in: Henian Chen, Patricia Cohen, and Sophie Chen, "How Big Is a Big Odds Ratio? Interpreting the Magnitudes of Odds Ratios in Epidemiological Studies," *Communications in Statistics - Simulation and Computation* 39, no. 4 (March 31, 2010): 860–64, https://doi.org/10.1080/03610911003650383.

[vi] Pending charge at the time of offense is a good predictor of failure to appear for women (AUC = 0.66) but only a fair predictor for men (AUC = 0.59).[vi] Prior failure to appear in the past 2 years is a good predictor for women (AUC = 0.69) but fair predictor for men (AUC = 0.62). Full results for all individual risk factors can be found in Appendix C.

[vii] While there were a small number of individuals in other racial and ethnic groups, the sample size was not a large enough to draw robust conclusions about the performance of the tool. This should be revisited in subsequent validations where the sample size may be larger.

[viii] Notably, this factor is only mildly predictive of court appearance even for non-Hispanic white people (AUC = 0.58) and was not at all predictive for white Hispanic people or Black people (AUC = 0.51 in both cases). This factor would be a good candidate for adjustment when piloting alternative risk factors.

[ix] The PSA defines a pretrial failure to appear as a failure to appear for a scheduled pre-disposition court appearance for which the court took an action such as bond forfeiture or issuing a bench warrant.