ST. JOSEPH COUNTY: IRAS-PAT VALIDATION

FINAL REPORT

Evan M. Lowder

Chelsea Foudray

Hrishikesh Vibhute

Spencer G. Lawson

Ashley Rodriguez

FEBRUARY 2022

This report was prepared for the Indiana Office of Court Services (IOCS). The views and opinions expressed herein are those of the authors and do not necessarily reflect the views and opinions of IOCS.

INTRODUCTION

Pretrial decision-making involves timely choices by judges with limited information and variable input from members of the courtroom workgroup (DeMichele et al., 2018). It is well established that the decisions made at this phase of justice system have implications for subsequent outcomes. Defendants incarcerated pending trial are more likely to plead guilty, receive lengthier sentences, and subsequently recidivate more often in relation to defendants released prior to court disposition (Stevenson & Mayson, 2017). Incarceration can also disrupt housing, employment, family relationships, and ties to the community (Stevenson & Mayson, 2017). Pretrial risk assessments have emerged as one strategy to structure and improve pretrial decision-making. The integration of these assessment tools also comes at a time when reforms to reduce the use of monetary bond schedules are being advanced across the country (Stevenson, 2018).

Pretrial risk assessment tools are not without controversy. The primary set of criticisms about these tools concern whether they are able to predict pretrial misconduct, differentiate the likelihood or frequency of misconduct by risk level, and minimize the potential effect of racial, ethnic, and gender biases while maintaining comparable rates or reducing the risk of pretrial misconduct. Much of the evidence for or against the utility of pretrial risk assessment tools is based on theoretical claims; research evaluations have not kept pace with the volume of local implementations. Although studies have demonstrated the predictive validity of specific pretrial risk assessment tools (e.g., Austin, Bhati, et al., 2010; Austin, Ocker, et al., 2010; Cadigan & Lowenkamp, 2011; Latessa et al., 2010), questions remain about tools that have not been subject to validity tests, tools that have been constructed in one jurisdiction and integrated in another, the items used to score tools, the capacity to administer the tools, how the perceptions of courtroom workgroup professionals can influence the adoption of tools (DeMichele et al., 2018), and the effect of instrument adoption on rates of incarceration and pretrial misconduct (Stevenson, 2018).

Previously, researchers from the Indiana University Public Policy Institute, Center for Criminal Justice Research (CCJR) conducted a process evaluation of pilot counties to understand how the Indiana Risk Assessment System – Pretrial Assessment Tool (IRAS-PAT) was adopted by participating pilot counties. This foundational study also identified barriers and facilitators to implementation and explored relationships between IRAS-PAT items, risk categories, and bond or order for release outcomes (Grommon et al., 2017). The current inquiry moves to the second stage of research on the IRAS-PAT pilot program. This phase offers a county-by-county validation of the IRAS-PAT.

Other assessment tools in the IRAS suite – Community Supervision Tool (CST), Community Supervision Screening Tool (CSST), and Prison Reentry Tool (PRT) – were assessed in a sole Indiana validation study (Latessa et al., 2013). Overall, the findings confirmed that the IRAS-CST, IRAS-CSST, and IRAS-PRT are able to predict recidivism and the relative risk of recidivism varies by risk level. The predictive validity of the IRAS-PAT could not be assessed in this study due to the lack of requisite data (Latessa et al., 2013, p. 9).

Insights about the predictive validity of the IRAS-PAT can be deduced from the IRAS' predecessor, the Ohio Risk Assessment System (ORAS) and its Pretrial Assessment Tool (PAT).

The ORAS-PAT consists of seven items across four domains: criminal history (three items), employment (one item), residential stability (one item), and substance abuse (two items). ORAS-PAT assessments were validated in a sample of 452 defendants from seven Ohio counties and an average follow-up of 12 months (Latessa et al., 2009). Overall, 16% of defendants failed to appear or were rearrested. Risk score was positively and moderately associated with recidivism (r=0.23). Risk levels also followed a stepwise progression as 5% of Low risk defendants recidivated, while 18% of Moderate risk and 30% of High risk defendants recidivated. Similar stepwise patterns were observed within ORAS-PAT domains (although the associations between domains and recidivism outcomes were not as strong as those established in the test of relationship between risk score and recidivism, ranging in value from *r*=0.05 to *r*=0.19).

Preliminary predictive validity findings of IRAS-PAT assessments conducted in five Indiana counties were published in a prior report (Lowder et al., 2020). This study found the IRAS-PAT assessments produced good-to-excellent levels of predictive validity (AUCs = 0.67-0.72) for any FTA, any new arrest, and any arrest pretrial misconduct outcomes. In this pooled investigation, 4.3% of Low risk defendants, 12.9% of Moderate risk defendants, and 24.8% of High risk defendants had any FTA. Rates of any new arrest were 8.8%, 19.3%, and 31.9% for Low, Moderate, and High risk defendants, respectively. Findings overall showed strong levels of predictive validity for IRAS-PAT assessments conducted in practice.

To better understand the predictive validity of the IRAS-PAT, we report IRAS-PAT validation findings from **St. Joseph County**. Prior to presenting the results, we describe the methods, procedures, and assumptions. The study will conclude with a discussion of key findings.

METHODS

Study Context

Mirroring national trends, the state of Indiana reported the highest local incarceration rate of all midwestern states (330 per 100,000 residents) in 2013, representing a 15% increase over 1999 rates. Indiana's local jail capacity was among the highest for midwestern jurisdictions at year-end 2013 (83.2% capacity), second only to Ohio (Minton et al., 2015). Responding to these trends, the Indiana Supreme Court founded the Committee to Study Evidence-Based Pretrial Release to develop and evaluate evidence-based pretrial release practices. In 2014, the Committee developed a pilot program to examine implementation of the IRAS-PAT in 11 Indiana counties: Allen, Bartholomew, Grant, Hamilton, Hendricks, Jefferson, Monroe, Porter, St. Joseph, Starke, and Tipton. The purpose of the pilot project was to validate and evaluate the implementation of the IRAS-PAT in the 11 pilot counties, including the extent of its use and feasibility for use in other Indiana jurisdictions. The pilot program began between January 2016 and March 2017 in participating counties and is ongoing.

Data came from St. Joseph County, located in the North of Indiana. The county seat is in South Bend, and the County has a population of 271,826 (2019 estimate). St. Joseph County commenced the pilot program in October 2017. Individuals can be assessed up to 72 hours after arrest.

The St. Joseph County study period for this validation ran from June 1st, 2018, through June 30th, 2020. The follow up period was defined by each defendant's pretrial processing period, which runs from jail release date to court disposition date. However, all defendants were required to have their case disposed by June 30th, 2021, which was the final date for follow-up data collection.

Data Sources

Data for this validation came from several databases. St. Joseph County staff provided jail records with information on booking and release dates for individuals who were arrested during the study and follow up periods. We received pretrial data containing assessment information such as risk level, risk score, and item-level data from an Indiana statewide database, INcite. Finally, the statewide Odyssey Case Management System provided us with case-related information such as charge information, FTAs, filing dates, disposition dates, and case outcomes between June 2018 and June 2021.

Data Cleaning

Our data cleaning and linking was done primarily through R and RStudio (R Core Team, 2017). First, we created a unique ID based on identifiable information to link a St. Joseph County assessment to a jail booking record. Individuals included in this step were assessed between booking and release dates. After identifying a booking record for each assessment, we linked these matched records to court case records to ensure we could track case outcomes. We matched court case records with initial hearing dates occurring up to five days post-booking and filing dates occurring between three days prior to booking and five days after booking. We present the sample creation process in Figure 1. We identified 3,167 IRAS-PAT assessments conducted in St. Joseph County between June 1st, 2018, and June 30th, 2020. We were able to match these assessments to 2,262 unique jail bookings. Of these 2,262 jail bookings, 1,686 cases were linked to a court case record based on criteria established above. Of these cases, 44 represented multiple cases for the same individual. After removing repeated admissions by the same individual, we additionally removed 556 individuals who either had no disposition date or had no time in the community prior to case disposition. The final sample included 1,086 unique defendants who were booked into jail and assessed during the study period and released into the community prior to court case disposition.

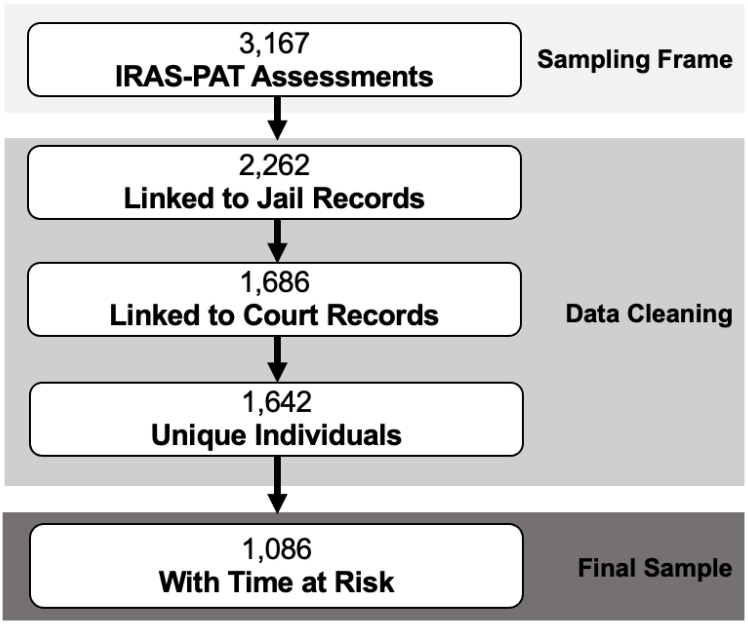

Figure 1. Data Cleaning Flowchart

Sample

The final sample for St. Joseph County consisted of 1,086 defendants on pretrial release with time at risk in the community. The average age at booking was 35.21 years old (*SD* = 11.44, Range: 17 to 78). Defendants were mostly male (*n* = 812, 74.77%; female: *n* = 274, 25.23%) and White (*n* = 644, 59.3%; Black: *n* = 435, 40.6%; Other: *n* = 7, 0.64%). On average, defendants were booked into jail on a charge level of 5.93, which corresponds to a felony level 6. The most frequently occurring booking charge was for Assault (*n* = 330, 30.39%), Drug (*n* = 327, 30.11%) or Other (*n* = 182, 16.76%) related offenses. Because individuals could be booked on multiple charges, these charges are not mutually exclusive. Finally, defendants spent an average of 261.18 days in the community between release and case disposition (*SD* = 182.49, Range: 1 to 1,107).

Variables

IRAS-PAT. The IRAS-PAT is an actuarial assessment designed to predict risk of arrest and FTA during the pretrial period. The IRAS-PAT is a 7-item instrument measuring 1) age at first arrest, 2) number of FTA warrants in the past 24 months, 3) three or more prior jail incarcerations, 4) employment at the time of arrest, 5) residential stability, 6) illegal drug use in the past six months, and 7) a severe drug use problem. Items 1, 3, 5, 6, and 7 are scored dichotomously (i.e., 0 or 1) and items 2 and 4 are scored on a 0-2 point scale, producing a maximum total score of 9. Total scores classify defendants into three risk levels: Low (0-2), Moderate (3-5), and High (6+). Our investigation used IRAS-PAT *total scores, risk levels*, and *items.*

Pretrial misconduct outcomes. Pretrial misconduct outcomes were measured in the period between a defendant's release date and case disposition date. We measured three primary outcomes. *Any arrest* measured any booking occurring during the pretrial period. *Any new arrest* measured a new booking occurring during the pretrial period in which a detainee was booked on any new offense charge. *Any FTA* measured Failure to Appear at any court appearance during case processing. Because few FTAs were recorded with accompanying event dates in court records, we triangulated FTA data from public records on Indiana My Case using individual case numbers. We recorded number of FTAs that occurred in between release and disposition dates, along with the date for the first FTA. In addition to these outcomes, we report descriptively on *any pretrial misconduct,* measured in two ways. First, we measured pretrial misconduct according to any arrest or FTA occurring during this period. Second, we measured pretrial misconduct according to any new arrest or FTA occurring during this period. Multivariable models additionally controlled for *time at risk,* defined as the number of days in the community, excluding jail time, between the release date and case disposition date. On average, defendants were at risk in the community for 253.90 days (*SD* = 177.29, Range: 1 to 1,074).

Analytic Strategy

We first conducted descriptive statistics on all study variables to assess response distributions. Then, we conducted crosstabulations of risk levels with pretrial misconduct outcomes to examine rates of misconduct at each risk level. Significant associations were tested using a chi-squared test of independence and effect size measured using Cramer's V. Cramer's V values of .10, .30, and .50 indicate small, medium, and large effect sizes, respectively (Cohen, 1988). Among defendants with arrests or any pretrial failure during the case processing period, we examined survival days (i.e., days from release to date of arrest or FTA) by risk level.

To examine the predictive validity of IRAS-PAT assessments, we used a multi-pronged approach. First, we examined the Area Under the Curve (AUC) of the Receiving Operating Characteristic (ROC) curve statistics. AUC values are commonly used to evaluate the predictive accuracy of risk assessment total scores. AUC values range from .50 to 1, with .50 indicating chance levels of classification and 1 suggesting perfect classification. AUC values below .54 are typically considered poor, .55 to .63 fair, .64 to .70 good, and .71 and above excellent. These conventions have been documented in reports adopted by the Bureau of Justice Assistance, National Institute of Justice, and National Institute of Corrections and represent the benchmarks for predictive accuracy in the field of risk assessment (Desmarais & Singh, 2013). Second, we conducted a series of logistic regression analyses to examine the predictive validity of IRAS-PAT assessments for each pretrial misconduct outcome, controlling for time at risk. For reference, odds ratios of 1.50, 3.00, and 5.00 indicate small, medium, and large effect sizes, respectively (Chen et al., 2010). Third, we conducted survival analyses using cox proportional hazard models to examine predictive accuracy as a function of time to a specific outcome. Resulting hazard ratios (HR) produced by cox regression models are a numerical expression of a difference in the rate of an outcome occurring between two conditions. For inferential statistics, we used a $p<.05$ criterion to determine statistical significance.

RESULTS

Sample Descriptives

IRAS-PAT. IRAS-PAT scores averaged 3.83 (*SD* = 1.90, Range: 0 to 9) across defendants. This corresponds to a Moderate risk level. We present the frequency distribution of risk scores in Figure 2. As shown, the defendants were assessed at a relatively Moderate risk, with over half of the risk scores falling between a score of 3 and 5 (51.38%).

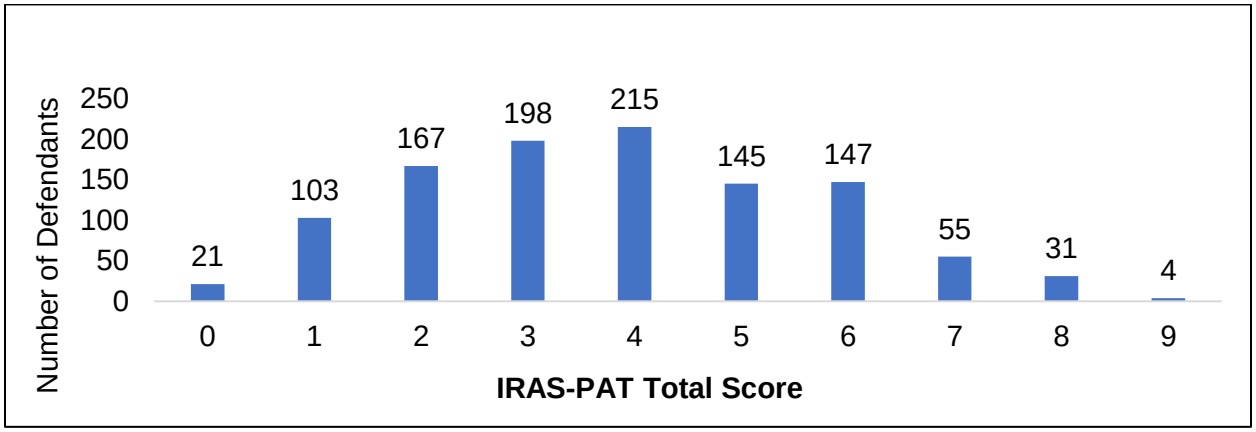

Figure 2. Frequency of IRAS-PAT Total Score

The distribution of defendants across risk levels is presented below in Figure 3. As shown, the majority of defendants were at Moderate risk (*n* = 558, 51.38%), followed by Low risk (*n* = 291, 26.80%) and High risk (*n* = 237, 21.82%).

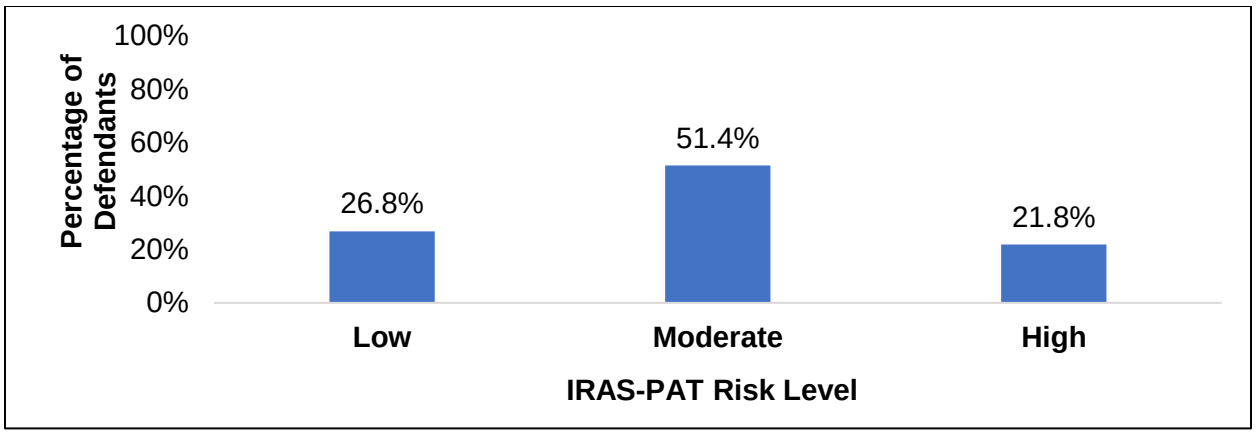

Figure 3. Frequency of IRAS-PAT Risk Level

Pretrial Misconduct Outcomes. Approximately 28.1% of the defendants (*n* = 305) failed to appear for any court hearing following release from jail but prior to case disposition. Additionally, about 17.4% of the defendants (*n* = 189) were arrested on a new charge between jail release and case disposition. A little under one-fifth of the sample had any pretrial misconduct however (including any new arrest), with approximately 17.8% of the defendants being booked into jail for any reason (*n* = 193).

Crosstabulations of Risk Level and Pretrial Misconduct Outcomes

Table 1 presents a crosstabulation of risk level with pretrial misconduct outcomes. Rates of pretrial misconduct were lowest for Low risk defendants, and highest for defendants at High risk, across all pretrial outcomes. For individuals who had an FTA for any court hearing, High risk defendants who were released into the community on average failed to appear sooner (M = 91.34 days, SD = 104.69) than Moderate (M = 93.12 days, SD = 99.00) or Low risk defendants (M = 144.52 days, SD = 168.50). Among defendants booked into jail on a new offense between release and disposition, Low risk defendants were booked sooner (M = 243.90 days, SD = 118.65) than Moderate risk defendants (M = 245.46 days, SD = 160.10) and High risk defendants (M = 257.99 days, SD = 171.19). Moderate risk defendants were arrested for any reason sooner (M = 243.26 days, SD = 159.05) than High risk (M = 258.63 days, SD = 170.16) and Low risk (M = 258.67 days, SD = 133.99). Among all defendants, the length of time between pretrial release and case disposition was positively associated with any FTA (r[1,084] = .29, p < .05), any new arrest (r[1,084] = .36, p < .05), and any arrest (r[1,084] = .37, p < .05).

Pretrial Misconduct Outcomes	Risk Level						Comparison	
	Low		Moderate		High			
	n	%	*n*	%	*n*	%	X^2 (*df*)	Cramer's V
Any FTA	27	9.28	144	25.81	134	56.54	147.41*** (2)	0.37
Any New Arrest	20	6.87	92	16.49	77	31.49	60.30*** (2)	0.24
Any Arrest	21	7.22	94	16.85	78	32.91	59.69*** (2)	0.23
Any Pretrial Misconduct (with Any New Arrest)	35	12.03	175	31.36	152	64.14	161.60*** (2)	0.39
Any Pretrial Misconduct (with Any Arrest)	36	12.37	176	31.54	152	64.14	159.08*** (2)	0.38

Note. *p < .05. **p < .01. ***p < .001

Table 1. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes

Predictive Validity Analyses

AUC of the ROC. AUC values were 0.75 (*SE* = 0.02, 95% CI: 0.71 – 0.78) for any FTA, 0.69 (*SE* = 0.02, 95% CI: 0.65 – 0.73) for any new arrest, and 0.69 (*SE* = 0.02, 95% CI: 0.65 – 0.73) for any arrest. These values correspond to an excellent level of predictive accuracy for risk of any FTA and good levels of predictive accuracy for any new arrest and any arrest.

Logistic Regression Models. We present the results of a series of logistic regression analyses modeling pretrial misconduct outcomes while controlling for time at risk in Table 2. The results showed a good predictive validity of IRAS-PAT risk assessments across any FTA, any new arrest, and any arrest. Specifically, each 1-point increase in risk score was associated with a 1.63 times greater likelihood of any FTA, and a 1.40 times greater likelihood of any new arrest and any arrest. IRAS-PAT risk levels were able to differentiate between the likelihood of FTA for High risk defendants compared to Low risk defendants (OR = 12.24), and for Moderate risk defendants compared to Low risk defendants (OR = 3.48). Similarly, in the detection of any new arrest, defendants at High risk compared to Low risk were 6.01 times more likely to be arrested on any new offense, and defendants at Moderate risk compared to Low risk were 2.77 times more likely to be arrested on any new offense. IRAS-PAT risk levels significantly differentiated between likelihood of any arrest for High risk defendants compared to Low risk defendants (OR = 5.82) and for Moderate risk defendants compared to Low risk defendants (OR = 2.70).

Predictor	Pretrial Misconduct Outcomes														
	Any FTA					Any New Arrest					Any Arrest				
	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI
Total Score															
IRAS-PAT	0.49	0.04	124.29***	1.63	[1.49, 1.77]	0.34	0.05	49.95***	1.40	[1.28, 1.54]	0.34	0.05	49.90***	1.40	[1.28, 1.54]
Time at Risk	<0.01	<0.01	62.25***	1.00	[1.00, 1.00]	<0.01	<0.01	102.16***	1.00	[1.00, 1.01]	<0.01	<0.01	105.63***	1.00	[1.00, 1.01]
Risk Level															
Moderate (Low)	1.25	0.23	29.35***	3.48	[2.22, 5.47]	1.02	0.27	13.98***	2.77	[1.62, 4.71]	0.99	0.27	13.76***	2.70	[1.60, 4.56]
High (Low)	2.50	0.25	101.88***	12.24	[7.53, 19.91]	1.79	0.29	39.36***	6.01	[3.43, 10.52]	1.76	0.28	39.06***	5.82	[3.35, 10.11]
Time at Risk	<0.01	<0.01	63.98***	1.00	[1.00, 1.00]	<0.01	<0.01	103.83***	1.00	[1.00, 1.01]	<0.01	<0.01	107.32***	1.00	[1.00, 1.01]

Note. *p < .05 **p < .01. ***p < .001. OR = odds ratio. *N = 1,086.*

Table 2. Logistic Regression Models of IRAS-PAT Total Scores and Risk Level Predicting Pretrial Misconduct Outcomes

Survival Models. We show the survival model results in Table 3. As shown, each 1-point increase in IRAS-PAT score was associated with a 1.44, 1.29, and 1.28 times increased hazard of any FTA, any new arrest, and any arrest respectively. Across pretrial misconduct outcomes, risk levels were more discriminating in predicting the hazard of FTA outcomes (HR range: 3.11 – 7.98) versus rearrest outcomes (HR range: 2.34 – 4.13). Overall, High risk level estimates were stronger in predicting the hazard of pretrial misconduct relative to Low risk level outcomes compared to Moderate risk level estimates relative to Low risk outcomes.

Predictor	Pretrial Misconduct Outcomes														
	Any FTA					Any New Arrest					Any Arrest				
	Estimate	*SE*	Wald X^2	HR	95% CI	Estimate	*SE*	Wald X^2	HR	95% CI	Estimate	*SE*	Wald X^2	HR	95% CI
Total Score															
IRAS-PAT	0.37	0.03	149.42***	1.44	[1.36, 1.53]	0.25	0.04	43.25***	1.29	[1.19, 1.39]	0.25	0.04	43.02***	1.28	[1.19, 1.38]
Risk Level															
Moderate (Low)	1.13	0.21	29.18***	3.11	[2.06, 4.68]	0.88	0.25	12.64***	2.41	[1.48, 3.91]	0.85	0.24	12.38***	2.34	[1.46, 3.76]
High (Low)	2.08	0.21	96.77***	7.98	[5.28, 12.07]	1.42	0.25	31.84***	4.13	[2.52, 6.75]	1.38	0.25	31.48***	3.98	[2.45, 6.44]

Note. *p < .05 **p < .01. ***p < .001. HR = hazard ratio. N = 1,086.

Table 3. Cox Regression Survival Models of IRAS-PAT Total Scores and Risk Levels Predicting Pretrial Misconduct Outcomes

We present the survival curves by IRAS-PAT risk level and outcome in Figure 4. Each line represents the proportion of defendants who did not experience that outcome for each day of case processing time in the community. Typically, we would like to see good separation in each line to suggest that each risk level is associated with a different hazard of pretrial misconduct across the case processing period. As shown, there is good separation across FTA, any new arrest, and any arrest outcomes, providing evidence of predictive validity of risk levels even with different amounts of exposure time in the community.

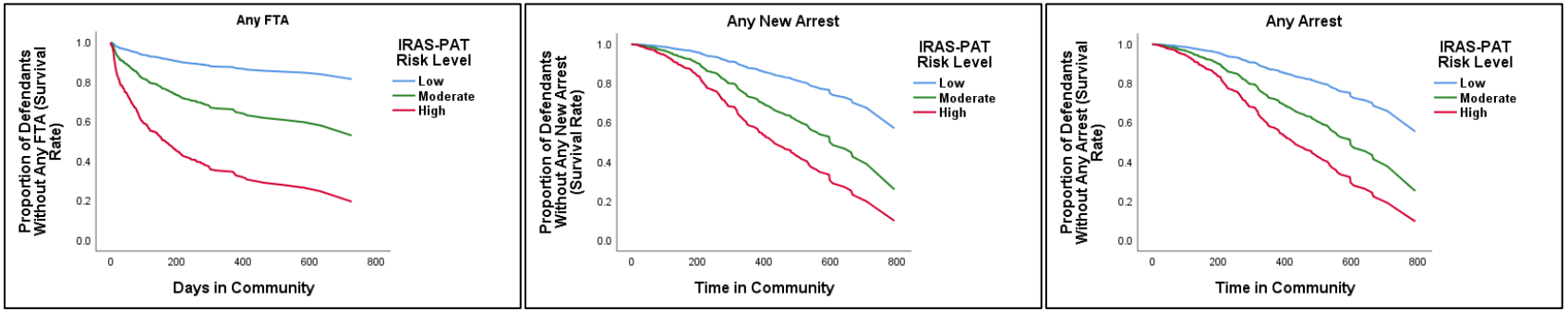

Figure 4. Survival Curves for Pretrial Failure Outcomes

Item-Level Analysis

We present the results of logistic regression models of IRAS-PAT items predicting pretrial misconduct outcomes in Table 4. Individual IRAS-PAT items varied in their prediction of FTA and rearrest outcomes. Item 2 (Prior FTAs), Item 3 (3 or more Prior Incarcerations), Item 4 (Unemployment only), Item 5 (Residential Stability), Item 6 (Illegal Drug Use in Past 6 Months), and Item 7 (Severe Drug Use Problem) significantly contributed to any FTA. For these items, individuals who had one or more prior FTAs (OR = 1.82, $p = .005$; OR = 3.39, $p < .001$), more prior incarcerations (OR = 1.67, $p = .001$), were not employed (OR = 2.21, $p < .001$), had no residential stability (OR = 1.44, $p = .018$), reported illegal drug use in the past six months (OR = 2.00, $p < .001$), and had a severe drug use problem (OR = 1.53, $p = .025$) reported higher odds of FTA. For any arrest, Item 2 (two or more prior FTAs), Item 3 (3 or more Prior Incarcerations), Item 4 (Unemployment only), and Item 6 (Illegal Drug Use in Past 6 Months) significantly predicted this outcome. Individuals with two or more prior FTAs were 2.18 times more likely to be rearrested on a new offense ($p = .004$). Similarly, individuals with three or more prior incarcerations were 1.50 times more likely to be rearrested ($p = .031$), individuals who were not employed were 1.65 times more likely to be rearrested compared to full-time employed defendants ($p = .012$), and individuals who reported illegal drug use in the last 6 months were 2.07 times more likely to be rearrested ($p = .001$). Item 2 (two or more prior FTAs), Item 3 (3 or more Prior Incarcerations), Item 4 (unemployment), and Item 6 (Illegal Drug Use in Past 6 Months) also significantly predicted any arrest. Two or more prior FTAs (OR = 2.15, $p = .005$), three or more prior incarcerations (OR = 1.52, $p = .024$), no employment compared to full-time employment (OR = 1.70, $p = .007$), and any illegal drug use in the past 6 months (OR = 2.10, $p = .001$) increased the odds of being arrested on any charge. Only Item 1 (Age at First Arrest) and Item 2 (Part-Time Employment) did not significantly contribute to the prediction of any of the three assessed pretrial misconduct outcomes.

Predictor	Pretrial Misconduct Outcomes														
	FTA					Any New Arrest					Any Arrest				
	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI
Age at first arrest – (33+)	0.23	0.37	0.39	1.26	[0.61, 2.59]	0.06	0.42	0.02	1.06	[0.46, 2.43]	0.10	0.43	0.06	1.11	[0.48, 2.55]
One prior FTA (None)	0.60	0.21	7.89**	1.82	[1.20, 2.75]	0.14	0.25	0.31	1.15	[0.70, 1.88]	0.22	0.24	0.79	1.25	[0.77, 2.02]
Two or more prior FTAs (None)	1.22	0.24	24.93***	3.39	[2.10, 5.48]	0.78	0.27	8.39**	2.18	[1.30, 3.71]	0.77	0.27	8.06**	2.15	[1.27, 3.65]
Three+ Prior Incarcerations (No)	0.51	0.16	10.28**	1.67	[1.22, 2.29]	0.41	0.19	4.64*	1.50	[1.04, 2.17]	0.42	0.19	5.06*	1.52	[1.06, 2.20]
Employed – Part-Time (Full-Time)	-0.22	0.32	0.46	0.81	[0.43, 1.50]	-0.30	0.40	0.56	0.74	[0.34, 1.62]	-0.32	0.40	0.64	0.73	[0.33, 1.59]
Employed – Not Employed (Full-Time)	0.79	0.17	22.13***	2.21	[1.59, 3.07]	0.50	0.20	6.37*	1.65	[1.12, 2.43]	0.53	0.29	7.23**	1.70	[1.15, 2.50]
Residential Stability (In Residence 6 Mo)	0.37	0.16	5.56*	1.44	[1.06, 1.96]	0.25	0.18	1.94	1.29	[0.90, 1.84]	0.19	0.18	1.05	1.20	[0.84, 1.72]
Illegal Drug Use 6 Months (No)	0.69	0.18	15.14***	2.00	[1.41, 2.84]	0.73	0.22	11.28***	2.07	[1.35, 3.16]	0.74	0.21	11.92***	2.10	[1.38, 3.20]
Severe Drug Use Problem (No)	0.42	0.19	5.03*	1.53	[1.06, 2.21]	0.26	0.21	1.50	1.30	[0.86, 1.97]	0.21	0.21	0.95	1.23	[0.81, 1.87]
Time at Risk	<0.01	<0.01	56.78***	1.00	[1.00, 1.00]	<0.01	<0.01	97.11***	1.01	[1.00, 1.01]	<0.01	<0.01	100.01***	1.00	[1.00, 1.01]

Note. *$p < .05$ **$p < .01$. ***$p < .001$. OR = odds ratio. $N = 1{,}085$.

Table 4. Logistic Regression Models of IRAS-PAT Items Predicting Pretrial Misconduct Outcomes

Figure 5 presents the rates of pretrial misconduct separately by outcome and IRAS-PAT item response. Thus, the reader can compare how the rate of any FTA, for example (white bar), differs across individuals who were 33+ (i.e., a score of 0 on the item) or under 33

(i.e., a score of 1 on the item) at their first arrest. The difference between rates of a given outcome across scoring categories for a single outcome provides an indication of how discriminating that item is in predicting misconduct (i.e., how much greater is the rate of misconduct for an individual who has a "1" coded response on that item versus a "0" response). A discriminating item successfully distinguishes between individuals who do or do not go on to commit misconduct. As shown in Figure 5, Item 2 (FTAs Within the Last 24 Months), Item 4 (Employment), Item 6 (Illegal Drug Use in the Past 6 Months), and Item 7 (Severe Drug Use Problem) were the most discriminating IRAS-PAT items for FTA and rearrest outcomes. Item 3 (3 or More Prior Incarcerations) was the least discriminating overall item.

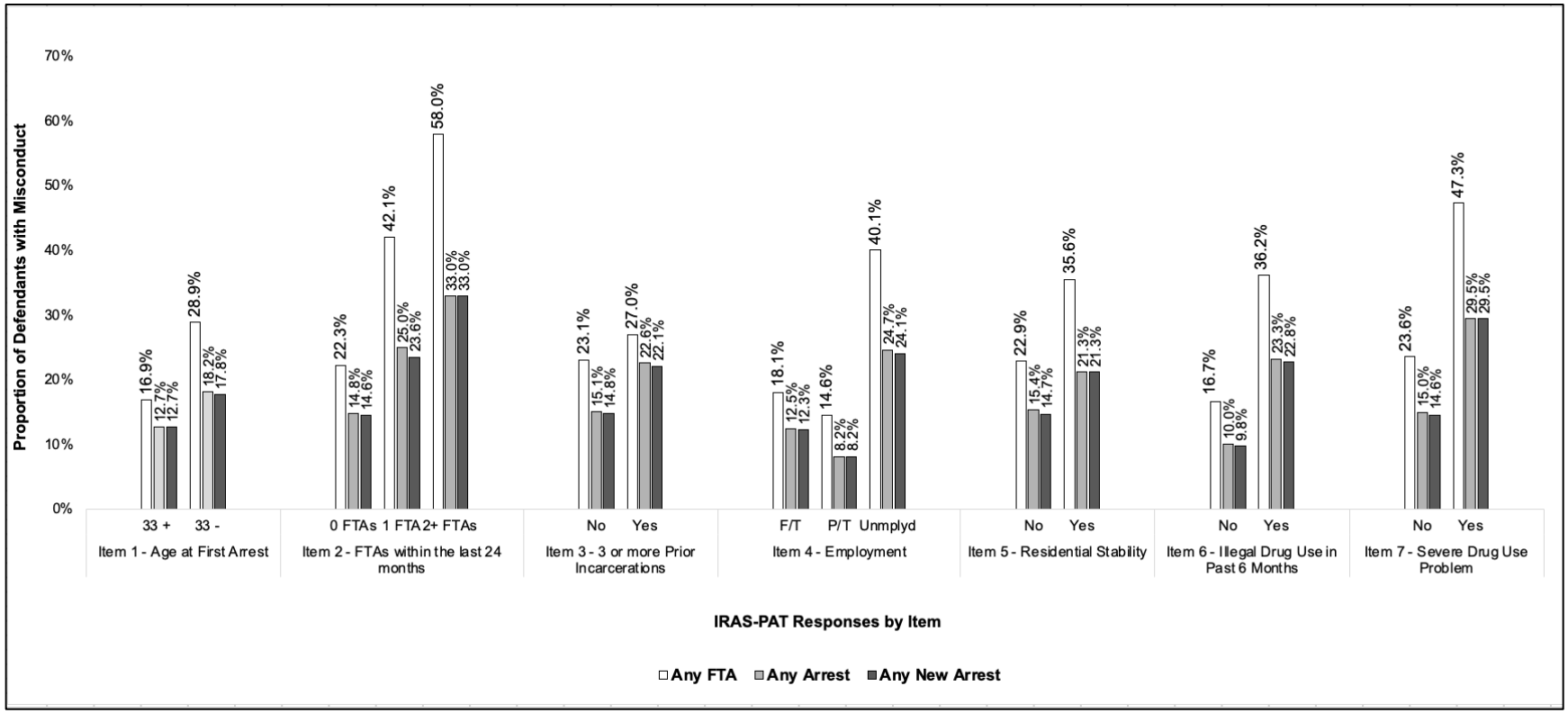

Figure 5. Rates of Pretrial Misconduct by IRAS-PAT Item Response and Outcome

SUMMARY OF FINDINGS

Overall, several findings emerged from the present investigation:

- IRAS-PAT total scores predicted any FTA, any arrest, and any new arrest risk with good levels of accuracy.
- IRAS-PAT risk levels successfully differentiated between defendants at Low, Moderate, and High risk of pretrial misconduct for all outcomes.
- Almost all IRAS-PAT items uniquely predicted pretrial misconduct outcomes. Only Item 1 (Age at First Arrest) did not significantly predict any of the assessed pretrial misconduct outcomes.
- Having 2+ prior FTAs (Item 2), being unemployed (Item 4), and illicit drug use in the past 6 months (Item 6) were the strongest predictors of pretrial misconduct outcomes.
- Roughly two-thirds of defendants classified as High risk experienced some type of misconduct prior to the end of case disposition, relative to one-third of Moderate risk and 12% of Low risk defendants.

DISCUSSION

The purpose of this investigation was to examine the predictive validity of IRAS-PAT assessments conducted in practice on pretrial misconduct outcomes in St. Joseph County, Indiana. In a sample of 1,086 defendants, we found IRAS-PAT assessments showed strong evidence of predictive accuracy. Predictive accuracy was stronger for the assessment of any FTA risk; however, assessments were still good predictors of arrest outcomes. Most IRAS-PAT items uniquely contributed to the prediction of pretrial misconduct outcomes, with the exception of Item 1 (age at first arrest) and Item 4 (specifically, part-time employment relative to unemployment). Several items emerged as particularly strong predictors across all outcomes. Below we discuss these findings in greater detail.

Across the three assessed outcomes (any FTA, any new arrest, and any arrest), IRAS-PAT assessments were good predictors of pretrial misconduct. Assessments produced slightly stronger predictions of any FTA risk relative to any new arrest or any arrest. This trend was likely driven by the high rate of any FTA (28.1%) in the present sample, particularly relative to previous local validations of the IRAS-PAT in Indiana (Lowder et al., 2020). Over half of High risk defendants had an FTA at some point during the court case processing period. Notably, a considerable proportion of the follow-up period for St. Joseph County occurred post-COVID-19 (i.e., March 2020 through December 2021). It is possible that higher rates of FTA could reflect changing appearance rates in response to COVID-19. However, we only coded FTA events when a warrant was issued. In many cases, a defendant would fail to appear for court but have a note in case records explaining that the absence was due to a medical reason or COVID-related exposure, and the judge would withhold a warrant. These events were not coded as an FTA. Regardless, IRAS-PAT assessments showed good ability to differentiate between defendants at Low, Moderate, and High risk of any FTA.

Assessments showed similar predictive validity for any arrest, though estimates were slightly lower. Importantly, jail records rarely indicated that defendants were admitted for a warrant alone, which meant estimates for the any arrest outcome did not differ meaningfully from the any

new arrest outcome. The lack of differences between arrest outcomes could reflect changing court policies during the COVID-19 pandemic. For example, other midwestern courts adopted policies to decrease use of arrest warrants during this period (Hrdinova et al., 2020). As a result, it is possible that use of arrest warrants decreased in in 2020 and 2021, lowering the likelihood that individuals would be booked into the jail for any reason other than a new offense.

Given the large sample size, we were able to conduct a robust analysis of item-level predictions. Our analyses showed that nearly all IRAS-PAT items helped predict pretrial misconduct outcomes. The only item that did not contribute uniquely to predicting pretrial misconduct outcomes was Item 1 (i.e., age at first arrest). Additionally, the ordinal coding associated with Item 4 (i.e., if defendants were employed part-time relative to maintaining full-time employment) did not uniquely predict pretrial misconduct outcomes. Across all outcomes, the strongest predictors of misconduct outcomes were Item 2 (i.e., 2+ prior FTAs), Item 4 (i.e., unemployment relative to full-time employment), and Item 6 (i.e., illegal drug use in the past 6 months). Other items were still significant predictors, but did not produce as strong of effects. Notably, Item 2 (i.e., 2+ prior FTAs) was the strongest predictor across all outcomes, suggesting a recent history of multiple FTAs during the case processing period is not only a risk factor for subsequent FTA, but also a risk factor for new criminal activity during the pretrial period. Both unemployment and substance use are known risk factors in justice-involved populations more broadly (Yukhnenko et al., 2020). These findings suggest they are particularly important risk factors in the St. Joseph County pretrial population.

Findings from this report should be considered together with several limitations. First, there was a substantial portion of the original assessment population that was not included in the validation. Many of these assessments were excluded because they were not conducted during an episode of incarceration, consistent with local protocols. A smaller proportion of assessments were excluded because they could not be linked to court case records. Notwithstanding this limitation, the validation sample overall was sufficiently large to proceed with the validation. Second, and relatedly, the validation sample differed slightly from the population of IRAS-PAT assessments and was assessed at lower risk overall. To illustrate, the average population IRAS-PAT score was 4.38 (*SD* = 2.02) relative to the sample average, 3.82 (*SD* = 1.90). High risk individuals were underrepresented in the validation sample. However, both sets of assessment scores showed similar variability in total scores, and there was still a considerable proportion of High risk defendants in the sample (21.8%). Finally, there was little difference between any arrest and any new arrest outcomes, owing to few instances where individuals were booked on an arrest warrant alone. As discussed previously, this trend could be due to the follow-up period overlapping with the onset of the COVID-19 pandemic.

Overall, this investigation shows strong support for the predictive validity of IRAS-PAT assessments conducted in St. Joseph County. Item-level findings suggest IRAS-PAT items function as useful risk factors for pretrial misconduct, informing risk levels that successfully differentiate between Low, Moderate, and High risk of pretrial misconduct.

REFERENCES

Austin, J., Bhati, A., Jones, M., & Ocker, R. (2010). *Florida Pretrial Risk Assessment Instrument* (p. 17). The JFA Institute.

Austin, J., Ocker, R., & Bhati, A. (2010). *Kentucky Pretrial Risk Assessment Instrument validation*. The JFA Institute.

Cadigan, T. P., & Lowenkamp, C. T. (2011). Implementing risk assessment in the federal pretrial services system. *Federal Probation*, *75*, 30.

Chen, H., Cohen, P., & Chen, S. (2010). How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in Statistics - Simulation and Computation*, *39*(4), 860–864. https://doi.org/10.1080/03610911003650383

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge.

DeMichele, M., Baumgartner, P., Barrick, K., Comfort, M., Scaggs, S., & Misra, S. (2018). *What do criminal justice professionals think about risk assessment at pretrial?* (SSRN Scholarly Paper ID 3168490). Social Science Research Network. https://papers.ssrn.com/abstract=3168490

Desmarais, S. L., & Singh, J. P. (2013). *Risk assessment instruments validated and implemented in correctional settings in the United States*. Council of State Governments Justice Center.

Grommon, E., Ray, R., Sapp, D., & Thelin, R. (2017). *Process evaluation of the IRAS-PAT pilot program implementation*. Center for Criminal Justice Research, Public Policy Institute, Indiana University.

Hrdinova, J., Berman, D. A., Pauley, M., & Ridgway, D. (2020). *Documenting the challenges (and documents) as Ohio courts respond to COVID-19* (SSRN Scholarly Paper ID 3574733). Social Science Research Network. https://doi.org/10.2139/ssrn.3574733

Latessa, E. J., Lemke, R., Makarios, M., Smith, p., & Lowenkamp, C. T. (2010). The creation and validation of the Ohio Risk Assessment System (ORAS). *Federal Probation*, *74*(1), 16.

Latessa, E. J., Smith, P., Lemke, R., Makarios, M., & Lowenkamp, C. T. (2009). *Creation and validation of the Ohio Risk Assessment System: Final report*. Center for Criminal Justice Research, School of Criminal Justice, University of Cincinnati. http://www.uc.edu/content/dam/uc/ccjr/docs/reports/project_reports/ORAS_Final_Report.pdf

Latessa, E., Lovins, B., & Makorios, M. (2013). *Validation of the Indiana Risk Assessment System: Final report*. Center for Criminal Justice Research, School of Criminal Justice, University of Cincinnati.

Lowder, E. M., Lawson, S. G., Grommon, E., & Ray, B. R. (2020). Five-county validation of the Indiana Risk Assessment System – Pretrial Assessment Tool (IRAS-PAT) using a local validation approach. *Justice Quarterly*, *37*(7), 1241–1260. https://doi.org/10.1080/07418825.2020.1829006

Minton, T. D., Ginder, S., Brumbaugh, S. M., Smiley-McDonald, H., & Rohloff, H. (2015). *Census of jails: Population changes, 1999-2013* (NCJ 248627; p. 22). Bureau of Justice Statistics, Office of Justice Programs, U.S. Department of Justice.

Office of Judicial Administration. (2021). MyCase-Odyssey Public Access. https://public.courts.in.gov/mycase/#/vw/Search

R Core Team. (2017). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. http://www.R-project.org

Reaves, B. A., & Cohen, T. H. (2007). *Pretrial release of felony defendants in state courts* (NCJ 214994; p. 18). Bureau of Justice Statistics, Office of Justice Programs, U.S. Department of Justice.

Stevenson, M. (2018). *Assessing risk assessment in action* (SSRN Scholarly Paper ID 3016088). Social Science Research Network. https://papers.ssrn.com/abstract=3016088

Stevenson, M. T., & Mayson, S. G. (2017). *Bail reform: New directions for pretrial detention and release* (SSRN Scholarly Paper ID 2939273). Social Science Research Network. https://papers.ssrn.com/abstract=2939273

Yukhnenko, D., Blackwood, N., & Fazel, S. (2020). Risk factors for recidivism in individuals receiving community sentences: A systematic review and meta-analysis. *CNS Spectrums*, *25*(2), 252–263. https://doi.org/10.1017/S1092852919001056

Appendix I: Risk Distribution by Race, Sex, Age, and Charge Level

We conducted supplemental analyses to examine the distribution of risk levels and pretrial outcomes by demographic characteristics of defendants and highest charge level. Because there were few defendants classified in specific demographic subgroups (i.e., Black defendants), we present these breakdowns for descriptive purposes only.

Results

Race. As shown in Table 5, Low and Moderate risk Black defendants had higher rates of pretrial misconduct for any FTA compared to White defendants. However, for rearrest outcomes, only Low risk Black defendants recorded higher rates. Moderate risk White defendants recorded higher rates of any new arrest and any arrest compared to Black defendants. Overall, High risk Black defendants had fewer instances of all pretrial misconduct outcomes compared to White defendants.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Black	White	Black	White	Black	White
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	9 (10.00)	18 (9.05)	66 (25.98)	77 (25.58)	46 (50.55)	88 (61.11)
Any New Arrest	7 (7.78)	13 (6.53)	37 (14.57)	54 (17.94)	26 (28.57)	51 (35.42)
Any Arrest	7 (7.78)	14 (7.04)	38 (14.96)	55 (18.27)	26 (28.57)	52 (36.11)

Table 5. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Race

Sex. As shown in Table 6, Low risk male defendants had higher rates of pretrial misconduct for all pretrial outcomes relative to female Low risk defendants. At Moderate risk, female defendants had higher rates of pretrial misconduct for any new arrest and any arrest, but lower rates of any FTA. High risk male defendants had higher rates of any new arrest and any arrest compared to High risk female defendants. For any FTA, however, female defendants recorded higher rates.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Male	Female	Male	Female	Male	Female
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	21 (9.91)	6 (7.59)	111 (26.24)	33 (24.44)	99 (55.93)	35 (58.33)
Any New Arrest	16 (7.55)	4 (5.06)	67 (15.84)	25 (18.52)	59 (33.33)	18 (30.00)
Any Arrest	17 (8.02)	4 (5.06)	69 (16.31)	25 (18.52)	59 (33.33)	19 (31.67)

Table 6. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Sex

Age. For the purposes of comparison, we grouped defendants ages 17-35 as well as defendants who were 36 and older. As shown in Table 7, the younger age group had lower rates of all pretrial outcomes for Low risk levels across all misconduct outcomes. In contrast, older defendants assessed at Moderate risk had lower rates of pretrial misconduct across all outcomes. For defendants assessed at a High risk levels, the older age group had higher rates of new arrest and any arrest, however, younger defendants had higher rates of any FTA.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	17-35	36+	18-35	36+	18-35	36+
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	9 (6.00)	18 (12.77)	96 (28.32)	48 (21.92)	83 (58.04)	51 (54.26)
Any New Arrest	9 (6.00)	11 (7.80)	59 (17.40)	33 (15.07)	43 (30.07)	34 (36.17)
Any Arrest	9 (6.00)	12 (8.51)	61 (17.99)	33 (15.07)	43 (30.07)	35 (37.23)

Table 7. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Age

Charge level. Charge level was coded based on the highest charge at booking (misdemeanor or felony). As shown in Table 8, felony level defendants had lower rates of pretrial misconduct for any FTA across all risk levels. For rearrest outcomes, Low risk felony defendants had lower rates of pretrial misconduct. However, for Moderate and High risk defendants, those charged with a misdemeanor had lower rates of any new arrest and any arrest.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Misdemeanor	Felony	Misdemeanor	Felony	Misdemeanor	Felony
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	24 (10.21)	3 (5.36)	115 (27.12)	18 (21.64)	105 (57.69)	29 (52.73)
Any New Arrest	17 (7.23)	3 (5.36)	67 (15.80)	25 (18.66)	57 (31.32)	20 (36.36)
Any Arrest	18 (7.66)	3 (5.36)	67 (15.80)	27 (20.15)	58 (31.87)	20 (36.36)

Table 8. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Charge Level