HENDRICKS COUNTY: IRAS-PAT VALIDATION

FINAL REPORT

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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.

To date, the IRAS-PAT has not been subject to a formal validation. Other assessment tools in the IRAS suite – Community Supervision Tool (CST), Community Supervision Screening Tool, 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).

The initial validation of the ORAS-PAT offers promising results, but it is not clear if these findings are or are not consistent with the IRAS-PAT or samples of defendants from Indiana. Beyond generalizability concerns, researchers leading the initial ORAS-PAT validation note that findings may be influenced by measurement error as data were generated from detailed structured interviews with defendants. This suggests that the data used to validate the tool were not generated in the same manner used by local jurisdictions to administer the tool and identify risk levels.

To better understand the predictive validity of the IRAS-PAT, we report IRAS-PAT validation findings from Hendricks 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 for this investigation were drawn from Hendricks County, which is located in central Indiana near Indianapolis. Hendricks County has a population of 163,622 residents (2017 estimate). Hendricks County's pilot program began on January 1st, 2016 and is ongoing. Hendricks County targeted its pilot program to all individuals who were arrested and placed in

jail. Probation officers conducted IRAS-PAT assessments after jail booking but prior to an initial court appearance, but most typically within 24 hours of arrest.

For the purposes of this validation, we defined the 1-year study period as January 1st, 2016 through December 31st, 2016. The follow-up period for each defendant was defined by the pretrial processing period (i.e., the date of index jail release to the date of court disposition).

Data Sources

We received administrative data from several databases. Jail records from the Hendricks County Sheriff's Department provided information on booking dates and length of stay as well as offenses at the time of arrest over a 3-year period (January 1st, 2016 to December 31st, 2018). From INcite, we received pretrial records containing information on IRAS-PAT assessments, including date of administration and item-level data, for the 1-year study period. Court records were procured through the statewide Odyssey Case Management System (Odyssey), which included all case-related information such as FTAs and case outcomes over the same period.

Data Cleaning

Across jail, court, and risk assessment records, individuals were matched using a combination of the first three letters of an individual's first name, the first three letters of an individual's last name, and year of birth. We linked court case records to jail bookings using a combination of initial hearing dates that occurred on the same day or up to three days following a booking date or case filing dates that occurred within three days of a booking date (before or after). Where multiple court cases matched to a single booking record, we matched cases where the date logic matched closest to the booking date. Following this, we linked risk assessments to jail bookings resulting in a court case filing using an assessment that was conducted on the day of booking or up to three days following booking.

The sample creation process is depicted in Figure 1. Overall, we identified 4,531 unique jail bookings during the 1-year study period (January 1st, 2016 to December 31st, 2016). Of these bookings, 1,579 could be linked to a court case record using the aforementioned matching criteria. Of 1,465 assessments completed during the time period, 835 were conducted within three days of a booking that could be linked to a court case. Of these, 29 represented the same individuals who received multiple assessments during the study period. An additional 181 defendants did not have any time at risk in the community (i.e., the case was

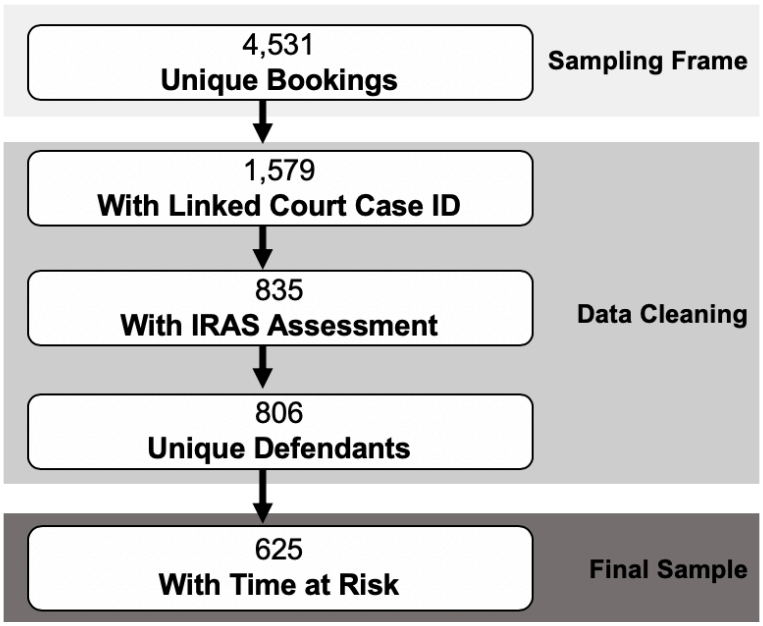

Figure 1. Sample Flow Chart

disposed prior to release). As a result, the final sample represented 625 unique defendants who were booked into jail and released into the community prior to a court case disposition.

Sample

The sample consisted of 625 pretrial defendants who were an average age of 32.04 (*SD* = 11.05, Range: 17 to 77). Defendants were primarily male (*n* = 440, 70.4%) and Caucasian (*n* = 504, 80.6%). Smaller proportions of defendants identified as African American (*n* = 106, 17.0%), Asian (*n* = 3, 0.5%), and Hispanic (*n* = 8, 1.3%). Racial or ethnic identification was unavailable for a small proportion of defendants (*n* = 4, 0.6%). Over half of defendants were booked on felony charges (*n* = 353, 56.5%). About two out of every five defendants were booked on only a misdemeanor charge (*n* = 272, 43.5%). Across all offenses for which defendants were booked into jail, offense categories included drug-related crime (*n* = 232, 37.1%), theft (*n* = 142, 22.7%), driving under the influence (*n* = 115, 18.4%), assault (*n* = 100, 16.0%), motor vehicle offense (*n* = 70, 11.2%), and disorderly conduct (*n* = 46, 7.4%). Importantly, these categories are not mutually exclusive because a detainee can be booked on more than one offense.

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 captured FTAs using triangulated jail booking and court warrant records. Specifically, we matched booking dates where an FTA charge was indicated to service dates for a warrant record in court records. This process allowed us to establish an issued date for the FTA warrant and link it to a specific court case. 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 165.34 days (*SD* = 157.54, Range: 1 to 995).

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 3.70 (*SD* = 1.78, Range: 0 to 9) across defendants, corresponding to a Moderate risk level. The frequency distribution of IRAS-PAT scores is presented in Figure 2. As shown, defendants were relatively Moderate risk, with over half of IRAS-PAT scores falling between 3 to 5 (58.1%).

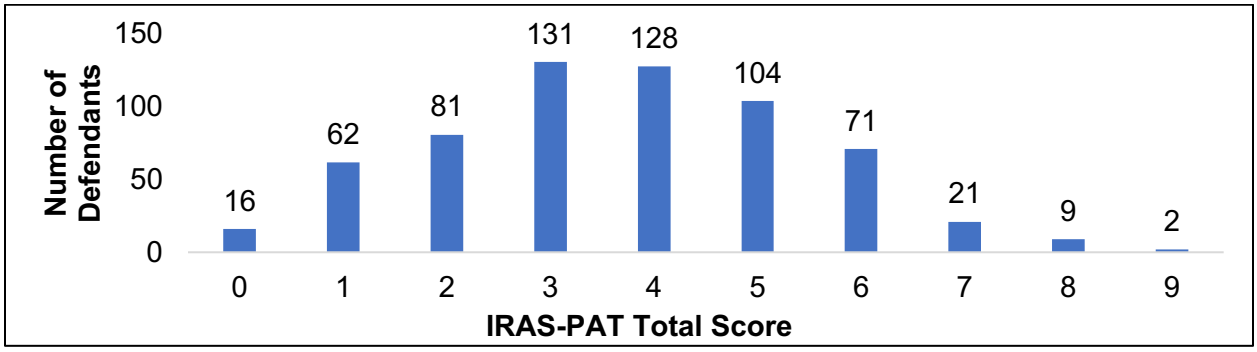

Figure 2. Frequency of IRAS-PAT Total Scores

The high proportion of defendants with Moderate risk (n = 363) is also depicted in Figure 3. As shown, one out of every four defendants were classified as Low risk (n = 159) with fewer defendants being classified as High risk (n = 109).

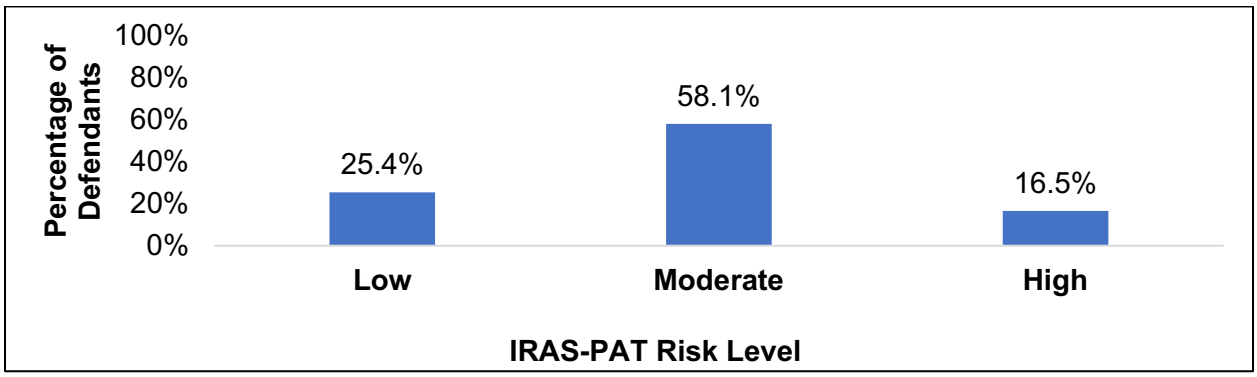

Figure 3. Frequency of IRAS-PAT Risk Level

Pretrial Misconduct Outcomes. Following jail release, but prior to case disposition, 9.6% of defendants had any failure to appear for any court hearing (n = 60), and 10.7% had at least one new arrest (n = 67). About one-fifth of the sample had any pretrial misconduct (with any new arrest) prior to case disposition (n = 117, 18.7%).

Crosstabulations of Risk Level and Pretrial Misconduct Outcomes

Table 1 presents risk level crosstabulated with pretrial misconduct outcome variables. As predicted, rates of pretrial misconduct were lowest for defendants classified as Low risk and highest for defendants at High risk level. Rates of pretrial misconduct were, on average, five times greater for High risk defendants relative to Low risk defendants. About three-fifths of all pretrial defendants classified as High risk and released into the community prior to case disposition had some form of pretrial misconduct (with any arrest). For defendants who had any FTA prior to case disposition, Low risk defendants failed to appear for a court appearance (M = 45.50 days, SD = 3.54) sooner than High (M = 94.00 days, SD = 76.41) and Moderate (M = 116.50 days, SD = 103.21) risk defendants. Among defendants who were arrested for a new offense prior to case disposition, Low risk defendants were arrested more quickly (M = 79.90 days, SD = 101.42) relative to Moderate (M = 149.50 days, SD = 167.37) and High (M = 151.00 days, SD = 156.72) risk defendants. Among all defendants, the length of time between pretrial release and case disposition was positively associated with any FTA (r[625] = .22, p < .001), any new arrest (r[625] = .18, p < .001), and any arrest (r[625] = .32, p < .001).

Pretrial Misconduct Outcomes	Risk Level						Comparison	
	Low		Moderate		High			
	n	%	*n*	%	*n*	%	X^2 (df)	Cramer's V
Any FTA	2	1.3	34	9.4	24	23.3	35.05*** (2)	.24
Any New Arrest	10	6.3	40	11.0	17	16.5	6.90* (2)	.11
Any Arrest	20	12.6	110	30.3	59	57.3	59.22*** (2)	.31
Any Pretrial Misconduct (with Any New Arrest)	12	7.5	66	18.2	39	37.9	37.92*** (2)	.25
Any Pretrial Misconduct (with Any Arrest)	20	12.6	110	30.3	60	58.3	61.63*** (2)	.31

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

Table 1. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes

Predictive Validity Analyses

AUC of the ROC. AUC values were 0.72 (*SE* = 0.03, 95% CI: 0.66 - 0.78) for any FTA, 0.60 (*SE* = 0.04, 95% CI: 0.53 - 0.67) for any new arrest, and 0.70 (*SE* = 0.02, 95% CI: 0.66 - 0.74) for any arrest. These values correspond to an excellent level of predictive accuracy for any FTA risk, a good level of predictive accuracy for risk of any arrest, and a fair level of predictive accuracy for any new arrest risk.

Logistic Regression Models. Table 2 presents results of a series of logistic regression analyses modeling pretrial misconduct outcomes while controlling for time at risk. The results showed strong predictive validity of IRAS-PAT assessments across all outcomes. In particular, each 1-point increase in IRAS-PAT total scores was associated with a 1.61 times increase in the likelihood of FTA, a 1.21 times increase in the likelihood of any new arrest, and a 1.54 times increase in the likelihood of any arrest. On average, IRAS-PAT risk levels showed similar ability to discriminate in the prediction of pretrial misconduct outcomes. High risk level was most discriminating relative to Low risk level in the prediction of any FTA (OR = 21.29), followed by any arrest (OR = 8.95) and any new arrest (OR = 2.71). Moderate risk defendants were 7.51 times more likely to FTA relative to Low risk defendants and were 2.89 times more likely to be rearrested (any arrest) relative to Low risk defendants.

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	0.48	0.09	30.67***	1.61	[1.36, 1.91]	0.19	0.07	6.45*	1.21	[1.04, 1.40]	0.43	0.06	55.10***	1.54	[1.37, 1.72]
Time at Risk	<0.01	<0.01	15.43***	1.00	[1.00, 1.00]	<0.01	<0.01	5.81*	1.00	[1.00, 1.00]	<0.01	<0.01	26.68***	1.00	[1.00, 1.00]
Risk Level															
High (Low)	3.06	0.75	16.54***	21.29	[4.88, 92.93]	1.00	0.42	5.51*	2.71	[1.18, 6.23]	2.19	0.32	47.91***	8.95	[4.81, 16.65]
Moderate (Low)	2.02	0.74	7.51**	7.51	[1.78, 31.76]	0.57	0.37	2.39	1.77	[0.86, 3.64]	1.06	0.27	15.67***	2.89	[1.71, 4.89]
Time at Risk	<0.01	<0.01	13.03***	1.00	[1.00, 1.00]	<0.01	<0.01	5.29*	1.00	[1.00, 1.00]	<0.01	<0.01	24.01***	1.00	[1.00, 1.00]

Note. *p < .05. **p < .01. ***p < .001. OR = odds ratio. *N* = 625.

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

Survival Models. Survival model results are presented in Table 3. As shown, each 1-point gain in the IRAS-PAT total score was associated with a 1.56, 1.16, and 1.33 times greater 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 any FTA (HR range: 7.62-18.19) versus the arrest outcomes (HR range: 1.54-4.24). Similar to the above logistic regression models, High risk level estimates had a greater magnitude relative to Moderate risk level estimates in predicting the hazard of pretrial misconduct outcomes. Survival curves by IRAS-PAT risk level and outcome are presented in Figure 4.

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	0.45	0.08	33.36***	1.56	[1.34, 1.82]	0.15	0.07	4.78*	1.16	[1.02, 1.33]	0.28	0.04	46.28***	1.33	[1.22, 1.44]
Risk Level															
High (Low)	2.90	0.74	15.52***	18.19	[4.30, 77.03]	0.77	0.40	3.67‡	2.15	[0.98, 4.72]	1.44	0.26	30.82***	4.24	[2.55, 7.06]
Moderate (Low)	2.01	0.73	7.62**	7.46	[1.79, 31.05]	0.43	0.36	1.46	1.54	[0.77, 3.08]	0.84	0.24	11.81**	2.31	[1.43, 3.73]

Note. ‡p < .10.*p < .05. **p < .01. ***p < .001. HR = hazard ratio. N = 625.

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

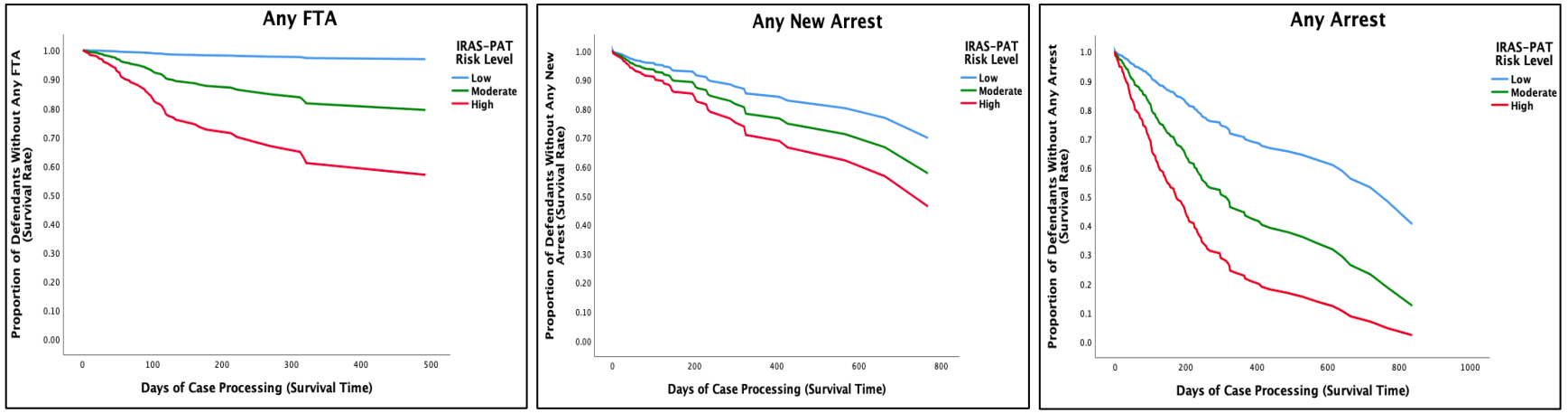

Figure 4. Survival Curves by IRAS-PAT Risk Level and Pretrial Misconduct Outcome

Item-Level Analysis

In Table 4, we present results of logistic regression models of IRAS-PAT items predicting pretrial misconduct outcomes. For any FTA, a recent history of at least one FTA (Item 2, OR = 2.05), unemployment (Item 4, OR = 2.63), and severe drug use problem (Item 7, OR = 2.82) were the strongest unique predictors. IRAS-PAT items were weaker predictors of any new arrest overall, but more than two FTAs in the past 24 months (Item 2, OR = 2.53) was a significant item-level predictor of any new arrest. In contrast, most items contributed uniquely to the prediction of any arrest, although two or more FTAs in the past 24 months (Item 2, OR = 2.45) and unemployment (Item 4, OR = 2.23) were the strongest unique predictors. No single IRAS-PAT item uniquely contributed to the prediction of all three outcomes. Age at first arrest (Item 1) and illegal drug use in the past 6 months (Item 6) did not contribute uniquely 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+)	1.55	1.03	2.26	4.71	[0.62, 35.60]	0.17	0.50	0.12	1.19	[0.45, 3.17]	0.60	0.38	2.53	1.83	[0.87, 3.83]
Number of FTAs – 1 (None)	0.72	0.36	3.86*	2.05	[1.00, 4.19]	-0.33	0.43	0.57	0.72	[0.31, 1.69]	0.49	0.26	3.49‡	1.64	[0.98, 2.75]
Number of FTAs – 2+ (None)	0.61	0.49	1.50	1.83	[0.70, 4.83]	0.93	0.46	4.05*	2.53	[1.03, 6.22]	0.90	0.40	5.08*	2.45	[1.12, 5.34]
Three+ Prior Incarcerations (No)	0.47	0.31	2.29	1.60	[0.87, 2.95]	0.17	0.28	0.37	1.19	[0.68, 2.07]	0.62	0.20	9.89**	1.86	[1.26, 2.73]
Employed – Part time (Full-Time)	0.41	0.48	0.72	1.51	[0.58, 3.90]	0.35	0.39	0.80	1.41	[0.66, 3.01]	0.49	0.28	3.05‡	1.63	[0.94, 2.81]
Employed – Not Employed (Full-Time)	0.97	0.40	5.74*	2.63	[1.19, 5.81]	0.34	0.33	1.03	1.40	[0.73, 2.68]	0.80	0.24	11.38**	2.23	[1.40, 3.55]
Residential Stability (In Residence 6 Mo)	0.08	0.30	0.08	1.09	[0.61, 1.96]	0.14	0.27	0.26	1.15	[0.67, 1.97]	0.36	0.20	3.32‡	1.43	[0.97, 2.10]
Illegal Drug Use 6 Months (No)	0.07	0.36	0.04	1.08	[0.53, 2.17]	0.40	0.30	1.80	1.49	[0.83, 2.69]	0.34	0.22	2.47	1.40	[0.92, 2.14]
Severe Drug Use Problem (No)	1.04	0.37	7.94**	2.82	[1.37, 5.79]	-0.08	0.37	0.04	0.93	[0.45, 1.91]	0.37	0.26	1.97	1.45	[0.86, 2.43]
Time at Risk	<0.01	<0.01	12.89***	1.00	[1.00, 1.00]	<0.01	<0.01	6.07*	1.00	[1.00, 1.00]	<0.01	<0.01	23.83***	1.00	[1.00, 1.00]

Note. ‡p < .10.*p < .05. **p < .01. ***p < .001. OR = odds ratio. N = 624 (Item-level data were missing for a defendant thus one case with these missing values were dropped in the analyses).

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

SUMMARY OF FINDINGS

Overall, several findings emerged from the present investigation:

- IRAS-PAT assessments were strong predictors of any arrest and any FTA, but predicted new arrest with less accuracy.
- IRAS-PAT total scores and risk estimates were especially strong predictors of any FTA.
- Item 4 (unemployment relative to full-time employment) emerged as the most consistent item-level predictor across outcomes.
- IRAS-PAT items were more likely to be unique predictors of any arrest relative to any FTA or any new arrest.
- Over half of defendants classified as High risk experienced some type of misconduct prior to the end of case disposition, relative to 1 in 3 Moderate risk defendants and 1 in 10 Low risk defendants.

DISCUSSION

The purpose of this study was to examine the predictive accuracy of IRAS-PAT assessments with respect to pretrial misconduct outcomes in Hendricks County, Indiana. Overall, our findings showed that the IRAS-PAT met or exceeded performance standards for risk assessment instruments implemented in criminal justice settings (Desmarais & Singh, 2013). Similarly, we found that IRAS-PAT assessments performed on-par with other validation studies of pretrial risk assessments (Desmarais et al., 2020). IRAS-PAT assessments were particularly effective at predicting any arrest and any FTA. Across all outcomes, we found that High risk defendants had the highest rates of misconduct, following by Moderate risk and then Low risk defendants.

Despite promising findings overall, IRAS-PAT assessments were less accurate in predicting risk of new arrest. In particular, although High risk defendants had a significantly greater likelihood of re-arrest relative to Low risk defendants, there was no significant difference in rates of new arrest between Moderate and Low risk defendants. These findings could reflect the overall low rate of new re-arrest observed in this sample (10.7%). AUC values, in particular, are base-rate dependent, which means that AUC values may be lower when the overall rate of misconduct is lower (Youngstrom, 2014). Regardless, AUC values produced in this study (0.60-0.72) were comparable to or exceeded values from other validation studies on pretrial risk assessments (0.64-0.73; Desmarais et al, 2020).

An outstanding concern about the use of pretrial risk assessments in practice is their ability to predict outcomes with similar accuracy by race, ethnicity, and sex (VanNostrand, 2007). We were unable to produce a sample large enough in this validation that would allow for meaningful statistical comparisons between demographic groups. However, we report descriptively on frequencies across various subgroups. Further examination of differences in the predictive accuracy by demographic subgroups will be conducted in the future using pooled data across multiple counties.

We note that similar to other investigations of pretrial risk assessment tools (e.g., Baglivia et al., 2019; Barno et al., 2019), defendants who were unable to secure pretrial release were excluded

from this investigation. These defendants may have been at higher risk than those who were released (as reflected in the overall small proportion of high-risk defendants in this sample) and may have contributed more to pretrial misconduct outcomes had they been released into the community. The extent to which exclusion of High risk defendants impacted results is unknown, but may have attenuated predictive validity estimates, particularly for re-arrest outcomes.

Our ability to link records across jail, pretrial services, and court records was limited by the available indicators captured in each system. The overall objective of the matching strategy was to model typical case processing by connecting pretrial risk assessments conducted close to the start of the court case processing period to relevant court case and re-arrest outcomes. We are confident that the matches produced here meet this broader objective; however, whether findings generalize to the entire population of individuals assessed in Hendricks County is uncertain. Some individuals who were assessed may have been excluded from the validation if they had a court case filing occur long before or after an index jail booking or if they were assessed more than three days after a jail booking.

Despite these limitations, the present study provides support for the predictive accuracy of IRAS-PAT assessments in Hendricks County, particularly for re-arrest and FTA outcomes during the pretrial processing period. Together with other local validations, this study contributes to growing evidence of the utility of IRAS-PAT assessments in predicting pretrial misconduct outcomes in Indiana.

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

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

Results

Race. On average, Black and White defendants across risk levels had similar levels of pretrial misconduct. However, Black defendants classified as Low risk had slightly higher rates of pretrial misconduct relative to White defendants at Low risk level. See Table 5.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Black	White	Black	White	Black	White
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	2 (6.9)	0 (0.0)	9 (13.0)	25 (8.8)	1 (12.5)	23 (24.2)
Any New Arrest	3 (10.3)	7 (5.6)	7 (10.1)	33 (11.6)	2 (25.0)	15 (15.8)
Any Arrest	8 (27.6)	12 (9.6)	25 (36.2)	84 (29.6)	4 (50.0)	55 (57.9)

Note. 2.4% of defendants (*n* = 15) identified with other racial or ethnic groups or had racial identities that were unknown.

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

Sex. As shown in Table 6, male and female defendants had, on average, similar rates of pretrial misconduct at each risk level, with the exception of the rate of any FTA for defendants classified as Moderate risk. As shown, female defendants classified as Moderate risk had a lower proportion of any FTA relative to male defendants at Moderate risk level.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Male	Female	Male	Female	Male	Female
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	2 (1.7)	0 (0.0)	30 (11.5)	4 (3.9)	15 (23.8)	9 (22.5)
Any New Arrest	8 (6.8)	2 (4.8)	28 (10.8)	12 (11.7)	11 (17.5)	6 (15.0)
Any Arrest	15 (12.8)	5 (11.9)	82 (31.5)	28 (27.2)	37 (58.7)	22 (55.0)

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, adults ages 17-35 classified as High risk had higher rates of pretrial misconduct across all outcomes relative to adults ages 36 and older. Adults ages 36 and older at Low and Moderate risk levels had slightly higher rates of any FTA relative to adults ages 17-35 classified as Low and Moderate risk.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	17-35	36+	17-35	36+	17-35	36+
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	0 (0.0)	2 (2.7)	20 (7.5)	14 (14.4)	21 (26.6)	3 (12.5)
Any New Arrest	7 (8.2)	3 (4.1)	32 (12.0)	8 (8.2)	14 (17.7)	3 (12.5)

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 defendants at Low and Moderate risk levels had slightly higher rates of pretrial misconduct across all outcomes. In contrast, misdemeanor defendants classified as High risk had higher rates of pretrial misconduct relative to felony defendants at High risk level.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Misdemeanor	Felony	Misdemeanor	Felony	Misdemeanor	Felony
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	1 (1.1)	1 (1.5)	13 (8.8)	21 (9.7)	8 (25.0)	16 (22.5)
Any New Arrest	5 (5.4)	5 (7.6)	12 (8.2)	28 (13.0)	9 (28.1)	8 (11.3)
Any Arrest	11 (11.8)	9 (13.6)	34 (23.1)	76 (35.2)	20 (62.5)	39 (54.9)

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