TIPTON 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.

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 **Tipton 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 Tipton County, located in Central Indiana. The county seat is in the city of Tipton. Tipton county has a population of 15,162 (2019 estimate). Tipton County commenced the pilot program in October 2016. Individuals who are arrested and booked into jail can be assessed up to seven calendar days after release.

The Tipton County study period for this validation ran from July 1st, 2018 through June 30th, 2020. The follow up period was defined by each defendant's pretrial processing period. The pretrial processing period 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. Tipton County staff provided jail records with information on booking dates, release dates, and associated charges 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. Notably, Tipton County staff alerted us to the possibility that some assessments may have been lag entered in INcite, which affected our date logic for linking assessments to jail booking records. Finally, the statewide Odyssey Case Management System provided us with case-related information such as FTAs, filing dates, disposition dates, and case outcomes between July 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 Tipton County assessment to a jail booking record. Individuals included in this step were assessed within two days of booking or up to 30 days post-release. After identifying a booking record for each assessment, we linked these matched records to court case records to ensure we could track case outcomes. Due to the small number of eligible assessments and after discussions with pretrial staff, we decided to match court case filing dates that occurred up to three days before booking and up to 45 days following release to ensure most eligible court cases could be matched. We present the sample creation process in Figure 1. We identified 274 IRAS-PAT assessments conducted in Tipton County between July 1st, 2018, and June 30th, 2020. We were able to match these assessments to 232 unique jail bookings. Of these 232 jail bookings, 153 cases were linked to a court case record based on criteria established above. There were no duplicate individuals in this sample. However, we removed one individual whose case was disposed after our follow-up period ended on June 30th, 2021. The final sample included 152 unique defendants who were booked into jail and assessed during the study period and released into the community prior to court case disposition.
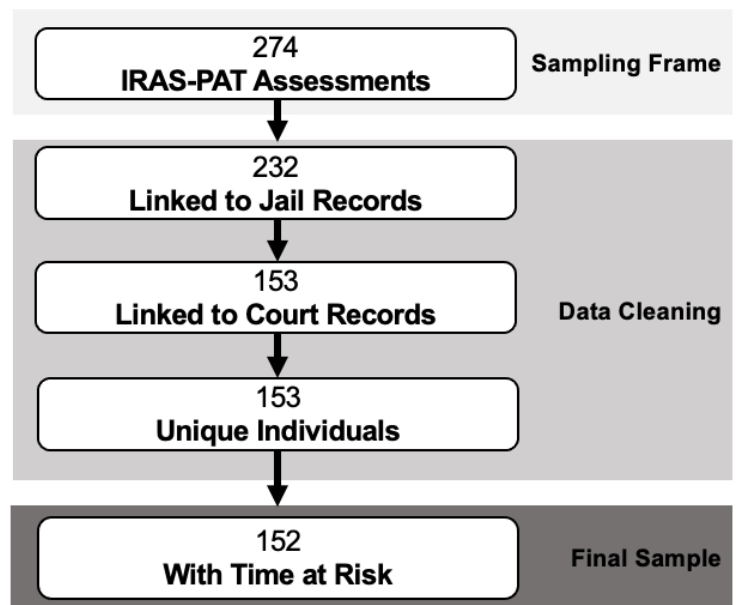

Figure 1. Data Cleaning Flowchart

Sample

The final sample for Tipton County consisted of 152 defendants on pretrial release with time at risk in the community. The average age at booking was 37.96 years old (*SD* = 13.05, Range: 19 to 75). Defendants were mostly male (*n* = 111, 73.03%; female: *n* = 41, 26.97%) and White (*n* = 138, 90.79%; Black: *n* = 5, 3.29%; Other: *n* = 9, 5.95%). On average, defendants were booked into jail on a charge level of 6.57, which corresponds to a felony level 6 to a misdemeanor level A. The most frequently occurring booking charge was for a drug (*n* = 61, 40.1%), DUI (*n* = 56, 36.84%) or motor vehicle (*n* = 27, 17.76%) related offense. Finally, defendants spent an average of 274.56 days in the community between release and case disposition (*SD* = 186.47, Range: 31 to 773).

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. Due to low volume of defendants who were employed part-time, we recoded this variable to reflect full-time employment versus no full-time employment. We similarly recoded Item 2, to indicate dichotomously whether someone had any prior FTA. This was relevant only for the item-level analyses. 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 extracted 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 263.72 days (*SD* = 178.13, Range: 31 to 763).

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 2.16 ($SD = 1.67$, Range: 0 to 8) across defendants. This corresponds to a Low risk level. There were no defendants with a score of 9. We present the frequency distribution of risk scores in Figure 2. As shown, the defendants were assessed at a relatively Low risk, with over half of the risk scores falling at a score of 1 and 2 (55.9%).
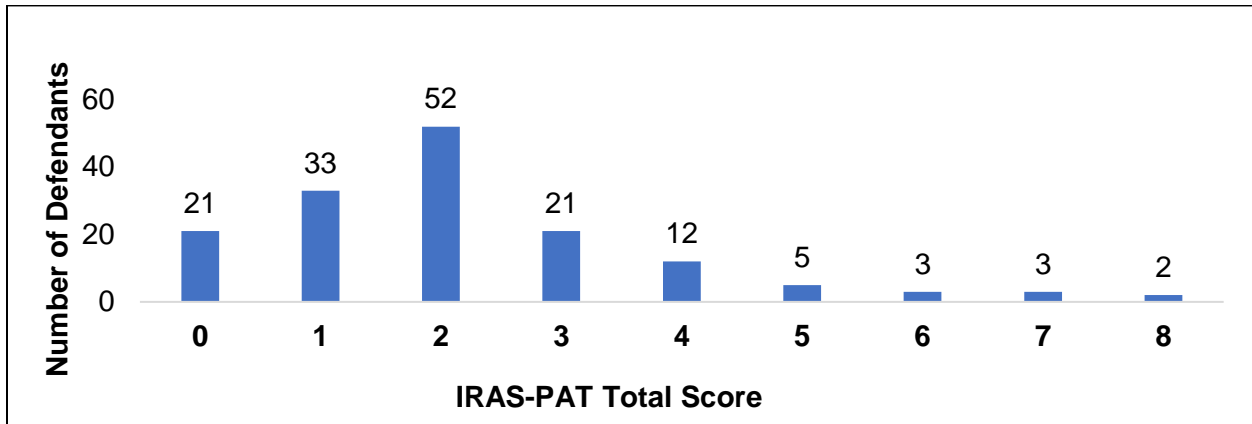

Figure 2. Frequency of IRAS-PAT Total Score

The distribution of defendants across risk levels is presented below in Figure 3. As shown, the majority of defendants were at Low risk ($n = 106$, 69.7%), followed by Moderate risk ($n = 38$, 25.0%) and High risk ($n = 8$, 5.3%).
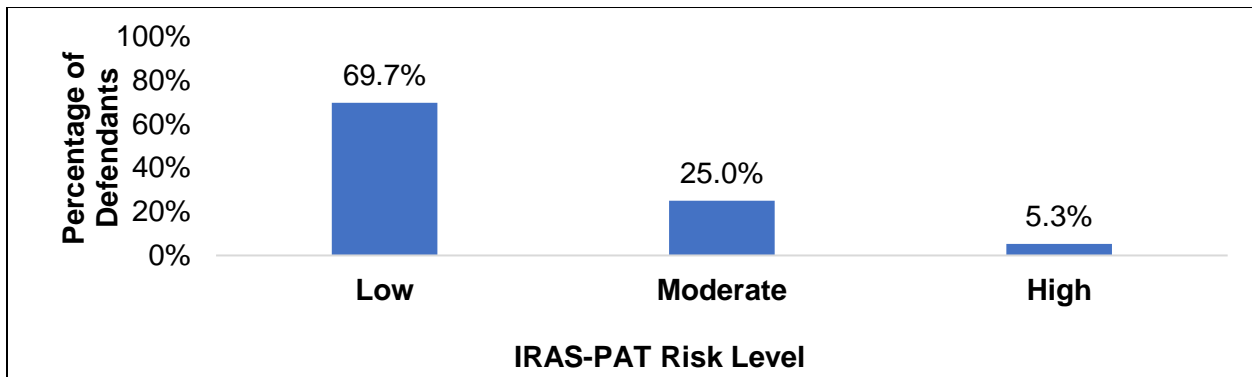
Figure 3. Frequency of IRAS-PAT Risk Level

Pretrial Misconduct Outcomes. Approximately 14.5% of the defendants ($n = 22$) failed to appear for any court hearing following release from jail but prior to case disposition. Additionally, about 9.2% of the defendants ($n = 14$) were arrested on a new charge between jail release and case disposition. One-fifth of the sample had any pretrial misconduct however (including any new arrest), with approximately 19.7% of the defendants being booked into jail for any reason ($n = 30$).

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 ($M = 52.00$ days, $SD = 38.74$) than Low ($M = 175.45$ days, $SD = 166.05$) or Moderate risk defendants ($M = 204.86$ days, $SD = 260.51$). Among defendants booked into jail on a new offense between release and disposition, Moderate risk defendants were booked sooner ($M = 90.25$ days, $SD = 71.10$) than Low risk defendants ($M = 154.57$ days, $SD = 217.70$) and High risk defendants ($M = 154.00$ days, $SD = 39.40$). Moderate risk defendants were arrested for any reason sooner ($M = 103.00$ days, $SD = 74.54$) than Low risk ($M = 186.00$ days, $SD = 193.67$) and High risk ($M = 214.17$ days, $SD = 230.91$). Among all defendants, the length of time between pretrial release and case disposition was positively associated with any new arrest ($r[150] = .16$, $p < .05$), and any arrest ($r[150] = .32$, $p < .05$).

Pretrial Misconduct Outcomes	Risk Level						Comparison	
	Low		Moderate		High			
	n	%	n	%	n	%	X^2 (df)	Cramer's V
Any FTA	11	10.4	7	18.4	4	50.0	10.07** (2)	0.26
Any New Arrest	7	6.6	4	10.5	3	37.5	8.60* (2)	0.24
Any Arrest	15	14.2	9	23.7	6	75.0	17.88** (2)	0.34
Any Pretrial Misconduct (with Any New Arrest)	16	15.1	9	23.7	6	75.0	16.78** (2)	0.33
Any Pretrial Misconduct (with Any Arrest)	18	17.0	10	26.3	6	75.0	14.87** (2)	0.31

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

Table 1. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes

Predictive Validity Analyses

AUC of the ROC. AUC values were 0.72 (*SE* = 0.06, 95% CI: 0.61 – 0.83) for any FTA, 0.75 (*SE* = 0.07, 95% CI: 0.61 – 0.88) for any new arrest, and 0.73 (*SE* = 0.05, 95% CI: 0.63 – 0.83) for any arrest. These values correspond to an excellent level of predictive accuracy for risk of any FTA, any new arrest, and any arrest. However, notably, due to the small number of High risk individuals, these estimates may be unstable.

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 1.47 times greater likelihood of any FTA, 1.52 times greater likelihood of any new arrest, and 1.62 times greater likelihood of 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 = 7.36), but not for Moderate risk defendants compared to Low risk defendants. Similarly, in the detection of any new arrest, defendants at High risk compared to Low risk were 6.81 times more likely to be arrested on any new offense, but the difference between Moderate risk defendants and Low risk defendants was not statistically significant. IRAS-PAT risk levels significantly differentiated between likelihood of any arrest for High risk defendants compared to Low risk defendants (OR = 17.17) but not for Moderate risk defendants compared to Low risk defendants. However, as indicated by the wide confidence intervals, these estimates may be unstable.

	Pretrial Misconduct Outcomes														
Predictor	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	0.39	0.13	8.77**	1.47	1.14, 1.91	0.42	0.15	7.91**	1.52	1.14, 2.03	0.48	0.14	11.86***	1.62	1.23, 2.14
Time at Risk	<0.01	<0.01	1.17	1.00	1.00, 1.00	<0.01	<0.01	1.50	1.00	1.00, 1.00	<0.01	<0.01	9.95**	1.00	1.00, 1.01
Risk Level															
Moderate (Low)	0.67	0.53	1.58	1.94	0.69, 5.49	0.51	0.66	0.59	1.67	0.45, 6.10	0.69	0.50	1.92	1.99	0.75, 5.26
High (Low)	2.00	0.79	6.32*	7.36	1.55, 34.86	1.92	0.86	5.00*	6.81	1.27, 36.57	2.84	0.93	9.40**	17.17	2.79, 105.73
Time at Risk	<0.01	<0.01	1.87	1.00	1.00, 1.00	<0.01	<0.01	2.39	1.00	1.00, 1.01	<0.01	<0.01	11.49***	1.00	1.00, 1.01

Note. *p* < .05 ***p* < .01. ****p* < .001. OR = odds ratio. *N = 152.*

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 1.34, 1.39, and 1.31 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: 1.50 – 5.61) versus rearrest outcomes (HR range: 1.52 – 4.61). 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, although Moderate risk estimates were not statistically significant.

Predictor	Pretrial Misconduct Outcomes														
	Any FTA					Any New Arrest					Any Arrest				
	Estimate	SE	Wald χ^2	HR	95% CI	Estimate	SE	Wald χ^2	HR	95% CI	Estimate	SE	Wald χ^2	HR	95% CI
Total Score															
IRAS-PAT	0.29	0.10	8.88**	1.34	1.10, 1.62	0.34	0.11	8.16**	1.39	1.11, 1.74	0.27	0.08	11.55***	1.31	1.12, 1.54
Risk Level															
Moderate (Low)	0.40	0.51	0.63	1.50	0.55, 40.7	0.42	0.63	0.44	1.52	0.44, 5.20	0.59	0.43	1.93	1.81	0.78, 4.17
High (Low)	1.72	0.59	8.63**	5.61	1.78, 17.73	1.53	0.70	4.75*	4.61	1.17, 18.25	1.46	0.50	8.60**	4.32	1.62, 11.47

Note. *p < .05 **p < .01. ***p < .001. HR = hazard ratio. *N* = 152.

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, the survival curve for High risk defendants was noticeably different from Moderate and Low risk defendants. However, there were less noticeable differences in survival curves for Low and Moderate risk defendants for all outcomes, but especially for any FTA.
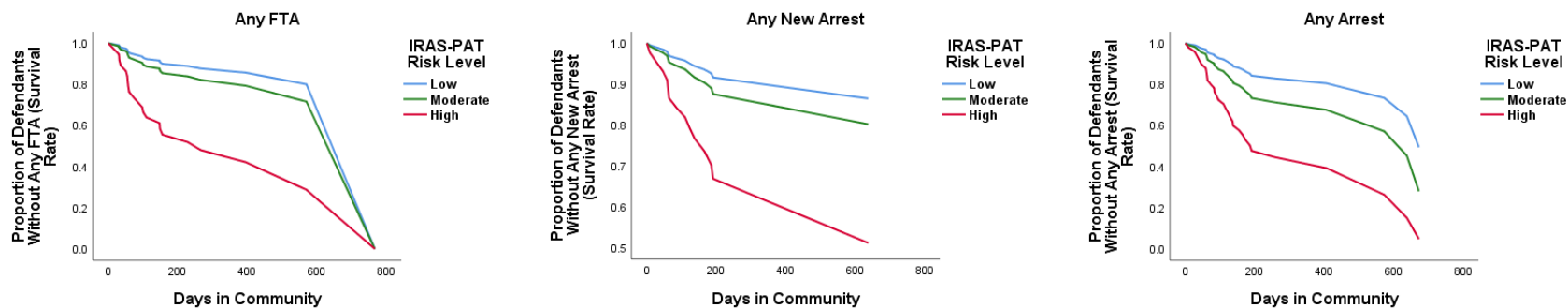

Figure 4. Survival Curves for Pretrial Failure Outcomes

Item-Level Analysis

We present the results of logistic regression models of IRAS-PAT items predicting pretrial misconduct outcomes in Table 4. Due to a low volume of respondents, we opted to code Item 4 (employment) and Item 2 (prior FTA) dichotomously. Item 4 was recoded to reflect full-time versus not full-time employment, and Item 2 was recoded to reflect any prior FTA versus no prior FTA. Individual IRAS-PAT items were relatively weak predictors of FTA and rearrest outcomes. Only Item 6 (illegal drug use in the past six months) significantly contributed to any FTA. Individuals who reported any illegal drug use in the past six months were 3.18 times more likely to have any FTA ($p = .037$). For any arrest, Item 5 (residential stability) significantly contributed to predicting this outcome. Individuals who have not lived at the same address for six months or more were 4.48 times more likely to be arrested on any offense ($p = .009$). No individual IRAS-PAT item significantly contributed to the prediction of any new arrest. Age at first arrest (Item 1), any prior FTAs (Item 2), prior incarcerations (Item 3), employment (Item 4), and severe drug use problems (Item 7) did not contribute to the prediction of any of the three assessed pretrial misconduct outcomes.

| | Pretrial Misconduct Outcomes | | | | | | | | | | | | | | |
| | FTA | | | | | Any New Arrest | | | | | Any Arrest | | | | |
Predictor	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+)	0.01	0.64	<0.01	1.01	0.29, 3.56	1.06	1.10	0.93	2.90	0.33, 25.10	0.11	0.60	0.03	1.12	0.34, 3.65
Any prior FTA (None)	1.51	1.00	2.29	4.54	0.64, 32.24	1.15	1.18	0.96	3.17	0.32, 31.79	0.73	0.99	0.53	2.07	0.29, 14.48
Three+ Prior Incarcerations (No)	-0.46	0.69	0.44	0.63	0.16, 2.46	0.19	0.72	0.07	1.21	0.30, 4.94	-0.14	0.63	0.05	0.87	0.25, 3.01
Employed – Not Employed/Part-Time (Full-Time)	0.47	0.56	0.70	1.60	0.53, 4.85	0.03	0.74	<0.01	1.03	0.24, 4.42	0.62	0.53	1.38	1.86	0.66, 5.21
Residential Stability (In Residence 6 Mo)	0.80	0.65	1.54	2.23	0.63, 7.90	1.34	0.70	3.60	3.80	0.96, 15.10	1.50	0.57	6.92**	4.48	1.47, 13.72
Illegal Drug Use 6 Months (No)	1.16	0.55	4.34*	3.18	1.07, 9.43	0.74	0.68	1.21	2.10	0.56, 7.92	0.52	0.50	1.08	1.69	0.63, 4.54
Severe Drug Use Problem (No)	-0.66	1.04	0.40	0.52	0.07, 3.99	-0.58	1.29	0.20	0.56	0.05, 7.05	0.06	0.94	<0.01	1.06	0.17, 6.72
Time at Risk	<0.01	<0.01	0.60	1.00	1.00, 1.00	<0.01	<0.01	1.30	1.00	1.00, 1.00	<0.01	<0.01	9.08**	1.00	1.00, 1.01

Note. *$p < .05$ **$p < .01$. ***$p < .001$. OR = odds ratio. $N = 152$.

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 (darkest gray 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" or "2" 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 5 (Residential Instability), Item 6 (Illegal drug use in past 6 months), and Item 7 (Severe Drug Use Problem) were among the most discriminating IRAS-PAT items for any arrest or any new arrest outcomes. Item 3 (3 or more prior incarcerations) was the least discriminating overall item.
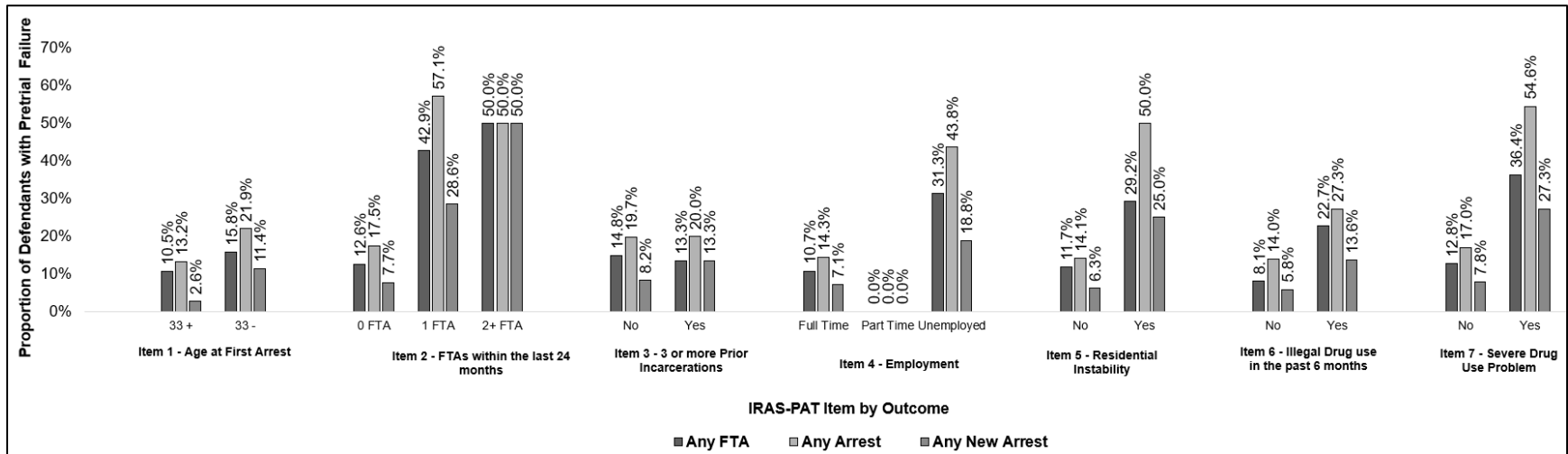
Figure 5. Rates of Pretrial Misconduct by IRAS-PAT Item Response and Outcome

SUMMARY OF FINDINGS

Overall, several findings emerged from the present investigation:

- IRAS-PAT total scores were good predictors of any FTA, any arrest, and any new arrest risk, though estimates were highly variable due to small number of High risk defendants.
- IRAS-PAT risk levels successfully differentiated between defendants at Low and High risk of pretrial misconduct for all outcomes.
- There was no difference in FTA rates between defendants assessed at Low versus Moderate risk. There were also no differences in any new arrest or any arrest rates between defendants assessed at Moderate and High risk.
- Few IRAS-PAT items uniquely predicted pretrial misconduct outcomes. However, models may have been underpowered to detect significant effects given the low sample size (n = 152).
- Roughly three-quarters of defendants classified as High risk experienced some type of misconduct prior to the end of case disposition, relative to one-fourth of Moderate risk and 17% of Low risk defendants.
- Due to the small number of defendants classified at high risk, predictive validity estimates were not stable and may be lower in a larger sample of assessments.

DISCUSSION

The purpose of this investigation was to examine the predictive validity of IRAS-PAT assessments conducted in practice on pretrial misconduct outcomes in Tipton County, Indiana. In a sample of 152 defendants, we found IRAS-PAT assessments showed evidence of predictive accuracy overall; however, results were unstable across findings due to the small number of defendants, particularly those classified at High risk. Levels of predictive accuracy were similar across the three outcomes (any FTA, any new arrest, and any arrest). There was limited evidence that individual IRAS-PAT items uniquely contributed to predicting pretrial misconduct outcomes, likely due to the small sample size. Specifically, item-level findings showed only Item 5 (Residential Instability) and Item 6 (Drug Use in Past 6 Months) uniquely contributed to the prediction of pretrial misconduct outcomes. Below we discuss study findings in greater detail.

Overall, findings of the validation showed IRAS-PAT assessments predicted outcomes (any FTA, any new arrest, and any arrest) with similar accuracy. Across all outcomes, Moderate risk individuals had higher rates of misconduct relative to Low risk individuals. High risk individuals similarly had higher rates of outcomes relative to Moderate risk individuals. In models that controlled for differences in defendants' time at risk in the community, there were no significant differences in misconduct risk for Low and Moderate risk defendants. However, these results are likely due to the small sample size and lower rate of misconduct for the entire sample (specifically, the 9.2% new arrest rate, 14.5% FTA rate, and 19.7% any arrest rate). Although rates of any FTA were comparable to those of other jurisdictions, arrest rates were lower on average. Lower rates of outcomes decrease our ability to predict outcomes with good stability, meaning that predictive validity estimates may not reflect the true population predictive validity estimates or the estimates we would see in a validation with a larger sample size.

Another factor decreasing the stability of estimates was the small number of individuals classified at high risk (i.e., only 5.3% of the entire sample). These individuals were at much higher risk of misconduct. However, there were too few individuals to produce a stable estimate for this group. It is likely that Tipton County serves a much lower risk population relative to other pilot jurisdictions in Indiana, based on the distribution of risk scores and rates of pretrial misconduct outcomes observed in this study (e.g., see Lowder et al., 2020). Promisingly, the vast majority of the sample was Low risk (i.e., 70%) and this group had quite low rates of pretrial misconduct outcomes. One in ten Low risk individuals had an FTA and less than one in ten had a new arrest during the pretrial period.

Despite the limited number of High risk individuals in the sample, there was limited evidence that the validation sample differed meaningfully from the population of assessments ($N = 274$) administered during the study period. In particular, the average IRAS-PAT score for the entire population was 2.52 ($SD = 1.75$, range: 0-8). The majority of individuals in the population were classified at Low risk (56.9%) with fewer at Moderate risk (36.1%). Less than one in ten individuals assessed were assessed at High risk (6.9%), consistent with the validation sample. Moderate risk individuals were slightly underrepresented in the validation sample. However, this could be due to other case processing considerations that may have excluded these individuals from eligibility in the validation (e.g., some individuals may not have had formal charges filed). Overall, these findings confirm that Tipton County serves a predominantly Low risk population. As mentioned previously, it is promising that rates of misconduct were low in this group, which represents the bulk of pretrial defendants in Tipton County.

Item-level findings showed only two IRAS-PAT items were unique predictors of pretrial misconduct outcomes. Specifically, Item 6 (Illegal Drug Use in the Past 6 Months) predicted any FTA above and beyond all other IRAS-PAT items. Item 5 (Residential Instability) predicted any arrest above and beyond all other IRAS-PAT items. There were no unique predictors of any new arrest. These findings largely suggest that IRAS-PAT items together contribute to predicting misconduct for defendants, rather than any one item having unique predictive accuracy. Descriptive trends in Figure 5 support this conclusion, with most items showing some ability to differentiate different levels of misconduct risk. However, we note that the validation sample was small relative to other pilot county validations. Additionally, there were few individuals who scored a value of "2" on Item 2 (i.e., 2+ FTA) or a value of "1" on Item 4 (i.e., part-time employment). As a result, these items were dichotomized to measure any FTA or any underemployment relative to no FTA and full-time employment, respectively.

There are several limitations to our investigation. First, as discussed previously, the validation sample was small, which limited our ability to produce stable predictive validity estimates. Furthermore, there was a small pool of High risk defendants in both the population of assessments and the validation sample, which increases the uncertainty around any conclusions about misconduct rates among High risk defendants. The limited sample size and limited number of High risk defendants additionally decreased our ability to examine item-level trends. Second, because the population of assessments was small relative to other validations, we allowed for less restrictive date logic to link assessments, jail bookings, and court case records. Not all individuals received assessments while incarcerated and some individuals had charges filed up to a month or longer following release. Our decision to allow for more time between these events

was made in consultation with county staff and to maximize the validation sample. Again, these are known challenges with conducting risk assessment validations in the context of routine practice, particularly in pretrial settings (Lowder et al., 2020; Reaves & Cohen, 2007). Finally, consistent with other IRAS-PAT validations in Indiana, we found FTA events were under-recorded in Odyssey, which resulted in the research team manually recording FTAs for court hearings from Indiana's MyCase (Office of Judicial Administration, 2021).

Overall, this investigation provides support for the predictive validity of IRAS-PAT assessments in Tipton County. The findings are limited by the small number of High risk individuals in the sample. However, the sample reflects the broader population of individuals entering the Tipton County jail, providing some evidence that these validation results may generalize to the entire jail population.

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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, although the number of Black defendants in the sample was small ($n = 5$), these individuals had no instances of FTA, new arrest, or any arrest misconduct in the pretrial period. Separately, we provide misconduct rates by risk level for White defendants, which more closely approximates the study sample.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Black	White	Black	White	Black	White
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Any FTA	0 (0.0)	11 (11.5)	0 (0.0)	7 (20.6)	0 (0.0)	4 (50.0)
Any New Arrest	0 (0.0)	7 (7.3)	0 (0.0)	4 (11.8)	0 (0.0)	3 (37.5)
Any Arrest	0 (0.0)	15 (15.6)	0 (0.0)	9 (26.5)	0 (0.0)	6 (75.0)

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 any FTA and any arrest relative to female Low risk defendants. However, female defendants classified at Low risk had higher rates of new arrest. At Moderate risk, female defendants had higher rates of pretrial misconduct across all outcomes. High risk male defendants had higher rates of any new arrest compared to High risk female defendants. For any FTA and any arrest, however, outcomes were comparable across sex for High risk defendants.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Male	Female	Male	Female	Male	Female
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Any FTA	10 (12.2)	1 (4.2)	4 (16.0)	3 (23.1)	2 (50.0)	2 (50.0)
Any New Arrest	5 (6.1)	2 (8.3)	2 (8.0)	2 (15.4)	2 (50.0)	1 (25.0)
Any Arrest	12 (14.6)	3 (12.5)	5 (20.0)	4 (30.8)	3 (75.0)	3 (75.0)

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

Age. For the purposes of comparison, we grouped defendants ages 18-35 as well as defendants who were 36 and older. As shown in Table 7, the younger age group had higher rates of all pretrial outcomes for Low risk levels across all misconduct outcomes. In contrast, older defendants assessed at High risk had higher rates of pretrial misconduct across all outcomes. For defendants assessed at a Moderate risk levels, the younger age group had higher rates of new arrest and any arrest, however, older defendants had higher rates of any FTA.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	18-35	36+	18-35	36+	18-35	36+
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Any FTA	7 (15.9)	4 (6.45)	5 (11.4)	2 (12.5)	9 (20.5)	1 (50.0)
Any New Arrest	5 (22.7)	2 (3.2)	3 (13.6)	1 (6.3)	6 (27.3)	1 (50.0)
Any Arrest	3 (50.0)	6 (9.7)	2 (33.3)	3 (18.8)	4 (66.7)	2 (100.0)

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, few defendants were charged with a misdemeanor-level offense in the sample. Thus, these rates may not reflect stable estimates of misconduct among misdemeanant defendants.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Misdemeanor	Felony	Misdemeanor	Felony	Misdemeanor	Felony
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Any FTA	2 (3.6)	9 (17.7)	1 (7.7)	6 (24.0)	1 (100.0)	3 (42.9)
Any New Arrest	2 (3.6)	5 (9.8)	0 (0.0)	4 (16.0)	0 (0.0)	3 (42.9)
Any Arrest	4 (7.7)	11 (21.6)	0 (0.0)	9 (36.0)	1 (100.0)	5 (71.4)

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