

RISK ASSESSMENT FACTSHEET

Colorado Pretrial Assessment Tool (CPAT)

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Who created the risk assessment? Are they a public or private organization?

CPAT was created through a joint partnership between the Pretrial Justice Institute, the JFA Institute, and 10 Colorado counties.

How large was the training data set?

The initial data set contained 2,000 samples of defendants who were booked into a county jail. Only 1,315 of these samples were used to build the model (discussed later).

How was the training data set collected and assembled (i.e., what jurisdiction(s) is it from)?

Training data came from 10 Colorado counties. Each county was to contribute a specific number of samples to ensure the sample was representative of the overall populations of the 10 counties. Pretrial services staff conducted interviews and collected the data.

Over what time frame was the data collected?

The data was collected over a 16-month time period; samples were collected each day of the week and at all times of day.

What factors (i.e., defendant characteristics) were included in the data set? This question pertains to all the factors that were available about defendants, not necessarily all the factors that were used to train or develop the model.

There were over 100 factors included in the initial data set (though not all 100 were used to develop the model). These factors included information about criminal history, mental health, drug and alcohol use, housing and employment, as well as defendant demographics.

Does the dataset include instances of defendants who were detained? If so, does the data include outcomes for those people (i.e., was counterfactual estimation involved; if so, how)?

Of the 2,000 defendants, 1,315 (66%) were released from jail on pretrial status and 655 (33%) were held in jail until case closure. However, the researchers did not include the 655 detained defendants in the set of samples used to build the model (because outcome information was not available for these defendants).

Are there any known issues or errors with the data?

Some counties did not hit their target number of samples, so other (larger) counties collected more samples and contributed those samples to the data to accommodate.

In what year was the risk assessment created?

2012

What factors, among all the factors in the training data, were considered in the development of the risk assessment? If not all factors were considered, how were those that were considered chosen?

From the original set of more than 100 factors, 29 factors were considered in the development of the risk assessment. The 29 factors were chosen by examining simple correlations between each of the factors in the original set and the outcome variables. The 29 chosen factors had significant correlations that were not skewed.

How were factors that were considered ultimately chosen for exclusion or inclusion in the final model (the risk assessment itself)?

Logistic regression was used to estimate the relationship between each of the 29 predictors and the outcomes (failure to appear, new filings, and either). The predictors with a statistically significant relationship to the outcomes were chosen. A significance level of .30 was used (the researchers chose this level over the more common .05 level because “the sample size was too small to yield a sufficient number of predictors” using the .05 level).¹ 12 factors were selected for use in the final model.

Does the final model include as a factor(s) arrests that did not lead to convictions? Does the final model include socioeconomic factors such as housing and employment status? Does the final model include personal health factors such as mental health or substance abuse?

Yes. The model does consider housing status, whether the defendant has a phone, whether the defendant contributes to residential payments, history of problems with alcohol and mental health history, and whether the defendant has other pending cases, among other factors.

How were weights assigned to each factor included in the final model? (rounding correlation coefficients, Burgess Method, etc.)

The weights were assigned based on “marginal increase in pretrial misconduct risk attributable to each category. For example, if having a prior jail sentence increased the risk of pretrial misconduct by 4 percentage points relative to not having this history, then this category was assigned a weight of 4.”²

How does the final model define outcomes (i.e., during the model development process, was there a distinct outcome defined for each type of failure (failure to appear, new crime, new violent crime, etc.) or were outcomes compounded?

The final model defines a compound outcome of “Any Failure,” which includes failure to appear and new criminal filings. The researchers considered using separate models for each of these outcomes but ultimately concluded to use a single model to predict both outcomes, noting that “Additional diagnostics showed that the model assessing the likelihood of “Any Misconduct” is able to assess the likelihood of both of the individual outcomes as well as any models developed to assess the likelihood of only one of the individual outcomes.”³

What does the output of the model look like (i.e. a score on a scale of 1-10, etc.)?

The output is a total score, on a scale of 0 to 82.

¹ See Source 1, page 11

² See Source 1, page 13

³ See Source 1, pages 12-13

Does the model output risk level designations or convert raw scores into risk level designations such as “low risk,” “moderate risk,” and “high risk”?

The model classifies defendants into risk “categories” based on their score (for example, a score between 0 and 17 classifies a defendant as “Risk Category 1.” The categories were selected using the “natural breaks” method.⁴

What proportion of samples in the training data set failed at each risk score and/or level (for example, what percentage of people with a score of 5 or a label of “moderate risk” actually failed to appear)?

Failure rates from the training data (n = 1315):⁵

Risk level	Public Safety Failure Rate	Court Appearance Failure Rate	Overall Combined Failure Rate
1	9%	5%	13%
2	20%	15%	29%
3	31%	23%	42%
4	42%	49%	67%

Did the model developers assess the predictive validity of the model? If so, how (reported AUC, FPR, TPR, etc.)?

The researchers plotted pretrial misconduct rate as a function of risk scores in the training set (rounded to the nearest ten). The plot showed that “the misconduct rate increases as a defendant’s score on the tool increases.”⁶

Where is the risk assessment used?

As of May 2019, the CPAT is used in 22 counties throughout the state of Colorado.

Are the factors and weights of the risk assessment publicly available?

Yes

Does the risk assessment cost money for a jurisdiction to adopt?

No

Does the adoption of the risk assessment require training? If so, by who?

Training is not required, but it is highly advised by the tool developers and the pretrial services agencies that use the tool. The Colorado Association of Pretrial Services (CAPS) published a publicly-available training manual in June 2015 (Source 3).

Does the risk assessment come with any sort of software or software package?

No

⁴ See Source 1, pages 14 and 18

⁵ See Source 1 page 15

⁶ See Source 1, page 14

Does the risk assessment involve or require an in-person interview?

Yes - 8 of the 12 factors on the CPAT are based on a defendant's answers in an in-person interview.

How does the risk assessment account for missing information?

An administration manual includes guides for answering specific questions as "Yes" or "No" when information is unknown.⁷

Has the risk assessment been analyzed on non-training data for predictive validity? Has the risk assessment been analyzed with training data or non-training data with regard to performance for different race groups? Has the risk assessment been analyzed with training data or non-training data with regard to performance for different genders? If so, by who, when, and using what data?

Researchers at the University of Northern Colorado are working on a validation (and possible revision) of the CPAT. They expect to release the full validation report in mid-2020.

Information retrieved from:

- [1] CPAT Revised Report dated October 19, 2012
- [2] CPAT FAQs Document dated October 2012
- [3] CPAT Administration, Scoring and Reporting Manual Version 2 dated June 2015
- [4] Information from Sue Ferrere (Pretrial Justice Institute)
- [5] Information from Victoria Terranova (University of Northern Colorado, Department of Criminology and Criminal Justice)
- [6] Information from Michael Jones (Pinnacle Justice Consulting, formerly Pretrial Justice Institute)

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⁷ See Source 3, pages 5-8