

# PCCD CJAB Conference

April 4, 2017

## Risk Assessment 101: A Non-Technical Guide to Understanding and Using Risk Instruments

# Risk Assessment 101

## Learning Objectives:

- To explore the concept and practice of risk assessment.
- To understand how risk assessment instruments are developed and what they do.
- To learn how use risk assessment instruments most effectively.

# Risk Assessment 101

Conference title:

*Law Enforcement, Courts, and  
Corrections in the 21st Century*

# Risk Assessment 101

One observer's thought:

“Recidivism prediction is ubiquitous.  
Everybody is doing it.”

Michael Tonry, 2014

# Risk Assessment 101

## Another Observer:

The “air *crackles* with urgent demands to reduce mass incarceration,...examine new role for prosecutors and judges, bring data analytics to our understanding of the justice system...”.

Jeremy Travis, Oct 25, 2016

# Risk Assessment 101

The Era of Big Data

Algorithms

Analytics

Automation

Supercomputers

IBM's *Deep Blue & Watson*

# Risk Assessment 101

**The New York Times**

**At BlackRock, Machines Are Rising Over Managers to Pick Stocks**

By LANDON THOMAS Jr.  
MARCH 28, 2017

# Risk Assessment 101

*Even in sports and popular culture!*

*Moneyball: The Art of Winning an Unfair Game*  
Michael Lewis  
(2003)



# Risk Assessment 101

For many practitioners and policy-makers,  
“risk is shrouded in uncertainty.”

Helmus and Babchishin (2017)

# Risk Assessment 101

## Risk Assessment in US Criminal Justice

Origins in parole release decision-making

Almost 100 years ago!

How to make better parole release decisions

# Risk Assessment 101

Branched out to pretrial release in the 1960s

...to probation and parole supervision in the 1970s

...to jail and prison classification in the 1970s, and

...to juvenile justice in the 1990s.

# Risk Assessment 101

## The Generations of Risk Assessment (Bonta 1996)

1G – Professional Judgment

2G – Actuarial Methods, Static Factors

3G – Dynamic Factors

4G – Strengths, Protective Factors, Responsivity

# Risk Assessment 101

**Q: What Does a Risk Assessment Do?**

**A: Provide information to assist with decision-making in the justice system.**

# Risk Assessment 101

## Examples:

- Pretrial Release
- Jail/Prison Intake
- Probation and Parole Supervision
- Parole Release

# Risk Assessment 101

## How Do Risk Assessments Work?

States use secret surveys to predict inmates' future crimes;  
experts skeptical of effectiveness

THE ASSOCIATED PRESS

Tuesday, February 24, 2015

By: Eileen Sullivan and Ronnie Green

# Risk Assessment 101

## How Do Risk Assessments Work?

Risk Assessment instruments look at past experience to inform present decisions.

Why?

Past behavior is the best predictor of future behavior.



# Risk Assessment 101

How does that work?

**Actuarial Methods** – a statistical method that enables us to learn from our past experiences.

# Risk Assessment 101

“Algorithm: Any evidence-based forecasting formula or rule. Includes statistical models. Decision rules and all other mechanical procedures that can be used for forecasting.”

Dietvorst, Simmons, and Massey. (2014)

# Risk Assessment 101

The insurance industry is the probably the best example of the use of actuarial methods.

Using past experience with similar clients to determine where to set policy rates.

# Risk Assessment 101

## Prediction, Forecasts and Probabilities

Predict commonly implies inference from facts or accepted laws of nature (*astronomers predicted an eclipse*).

Forecast adds the implication of anticipating eventualities and differs from predict in being usually concerned with probabilities rather than certainties (*forecast snow*).

# Risk Assessment 101

Actuarial science is about **probabilities, not prediction.**

**Assessment of Risk** is about probabilities.

We are not **predicting recidivism.**

# Risk Assessment 101

“Even the best risk assessments  
yield probabilities, not certainties.”

FiveThirtyEight [Barry-Jester](#), [Casselmann](#) and [Goldstein](#) (2015)

# Risk Assessment 101

## A Probability Statement:

Group A (with certain characteristics)  
will (criteria behavior) at  
a rate of X%  
within Y (time period).

# Risk Assessment 101

## Diagnosis vs. Prognosis

- *Diagnosis*: Presence or absence of a disease or condition  
Yes or No
- *Prognosis*: likelihood of an outcome  
More of a maybe, if/then



# Risk Assessment 101

## Risk is a Dynamic Concept.

“Risk of offending may change over time and may be influenced by many factors, some of which we know (empirical risk factors) and some of which don’t, including idiosyncratic features of the person and their situation at the moment.”

Helmus and Babchishin (2017)

# Risk Assessment 101

## Effectiveness of Actuarial Methods

Actuarial Methods Outperform  
Unaided Human Judgment.

Outperform = Make More Correct Decisions.

# Risk Assessment 101

Why do we human lose to actuarial instruments?

- Limitations of the Human Brain
- Accuracy in Determining the Relevance of Information
- Reliability of Recall
- Susceptibility to Bias

# Risk Assessment 101

## What is so great about actuarial instruments?

- Large N
- Variables are related to the outcome of interest
- Information is readily available in user friendly format
- Computers have no channel capacity problems
- They are objective

# Risk Assessment 101

## Thinking, Fast and Slow (Kahneman 2011)

*Model 1 – fast and almost automatic, intuitive  
Utilizes Heuristics*

*Model 2 – slow and deliberate, systematic and deliberate  
Utilizes Data*

# Risk Assessment 101

“In a wide variety of forecasting domains, experts and laypeople remain resistant to using algorithms.”

Dietvorst, Simmons, and Massey. (2014) p. 1.

***Algorithm Aversion*** – when people use their own judgment instead of an algorithm, which is superior.

Harrell 2006

# Risk Assessment 101

## Reasons Why Staff Don't Use RAIs:

- Lack of Understanding of Actuarial RAIs.
- Lack of Trust in the RAI.
- Staff Resistance
- Time and Resources
- Correctional Philosophy
- Seeing Errors Undermines Confidence in Algorithms.

# Risk Assessment 101

Professional Judgment: Is there still a place for it?

Yes!

Professional Judgment, applied appropriately, enhances the accuracy of actuarial instruments.



# Risk Assessment 101

**The New York Times**

Big Data

**If Algorithms Know All, How Much Should  
Humans Help?**

By STEVE LOHR - APRIL 6, 2015

# Risk Assessment 101

“There are practical considerations that often favor having a scale that is as quick and easy to administer as possible. Consequently, predictive accuracy and efficiency are maximized by including the smallest number of items measuring the most distinct constructs as possible...”

Helmus and Babchishin (2017) p. 10

# Risk Assessment 101

## ASSESSMENT ACCURACY

Lowest Accuracy:	Individual Judgment
Better Accuracy:	Actuarial Instruments
Highest Accuracy:	Actuarial instrument + Clinical Judgment

# Risk Assessment 101

## Too Many Overrides?

- Poor Fit with Decisions and/or Offenders
- Resistance to Actuarial Models
- Algorithm Aversion

# Risk Assessment 101

## Overrides of Risk Assessment Instruments

- Should be rare (10%)
- Should be data driven, verified
- Avoid hunches and gut feelings
- Don't double count

# Risk Assessment 101

## Prediction Errors

- ***False positive*** – instrument suggest high probability but the offender does not recidivate.
- ***False negative*** – instrument suggests low risk but the offender commmits a new crime.

# Risk Assessment 101

Remember!

Low risk  $\neq$  No risk

# Risk Assessment 101

## Other Issues:

- Validation
- Risk and Offense Seriousness
- Risk and Stakes
- Data Quality and Completeness
- Newer Instruments



# Risk Assessment 101

## Risk and Sentencing: The Application of Group-Based Probabilities in an Individually-Focused Legal System

- The US legal system focuses on the individual – behavior, culpability, accountability, desert, punishment.
- ARAI provide probability statements based on the past behavior of groups of individuals.
- How do these two approaches mesh? Or do they? Can they?

# Risk Assessment 101

“The pervasiveness of risk assessment in criminal justice systems calls for a better understanding of the nature of risk scales and how to assess their accuracy. Risk is a continuous dimension and risk assessment is fundamentally **a prognostic task** assessed by criterion referenced measures. In other words, risk assessment provides information about the **likelihood of a future event**. Risk assessment scales are not meant to be a diagnostic task (i.e. determining whether a condition currently exists). Information communicated from risk assessment scales and attempts to evaluate risk scales should not be based on a dichotomous classification (i.e., recidivist or non-recidivist).”

Helmus & Babchishin (2017) p. 22

# Risk Assessment 101

## Conclusion

- Risk Assessments are a tool for decision-makers
- Risk Assessment is an Evidence-based Practice
- Used well, they can improve decision-making
- Used poorly, they can degrade outcomes

# Risk Assessment 101

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