

Preselection Effects Can Explain Group Differences in Sexual Recidivism Base Rates in Static-99R ~~and Static-2002R~~ Validation Studies

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Base Rates and Risk Prediction

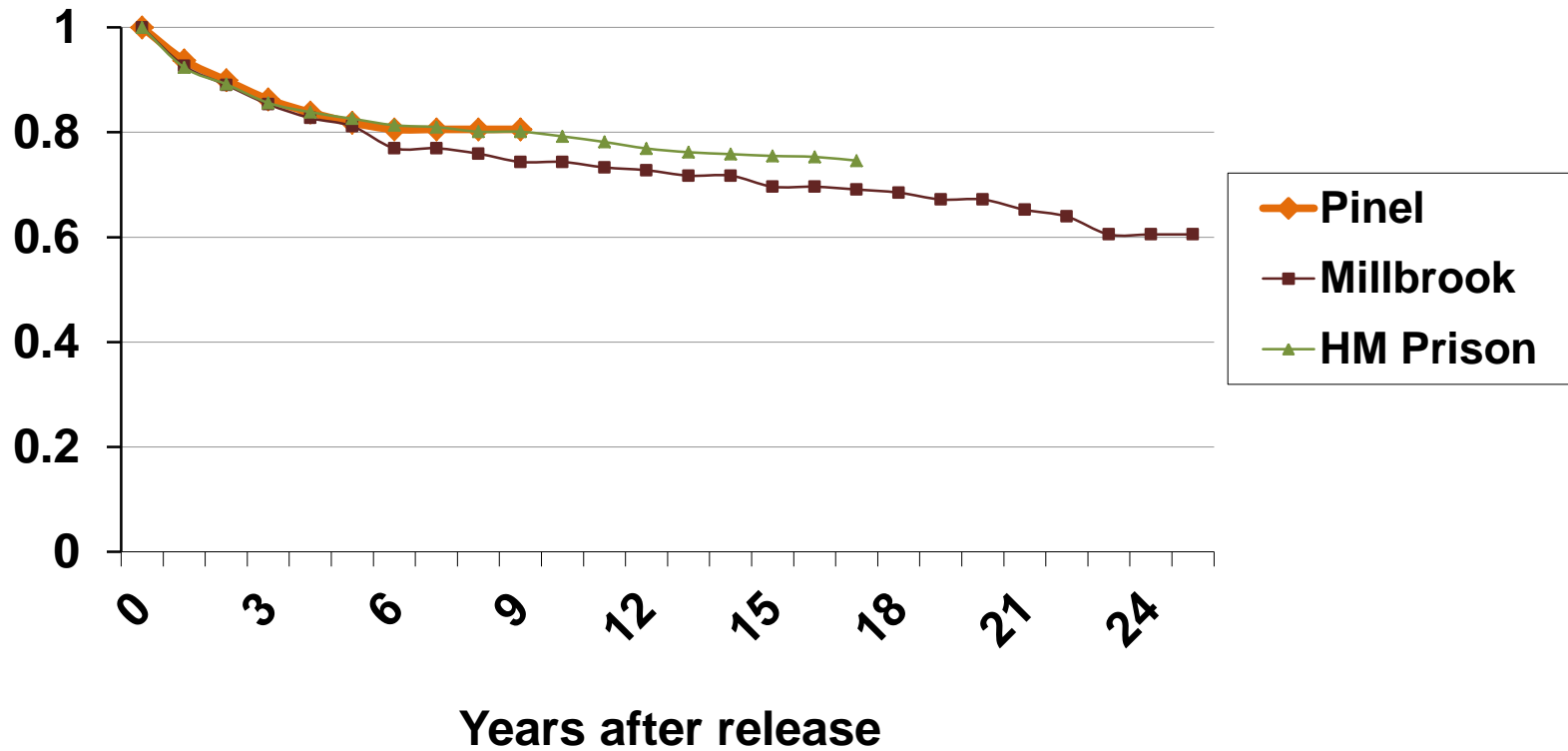
- A base rate is the proportion of a pre-defined group (or category) that will experience the adverse outcome
- Risk prediction concerns future events; consequently, it can never be known with certainty
- Future base rates estimated from past experience with *similar* cases

The Evolution of Static-99

- The absolute recidivism rates for the original Static-99 was tested on 3 distinct samples
- No significant variability was observed
- Consequently, all samples were combined into one (and only one) recidivism rate table

STATIC-99

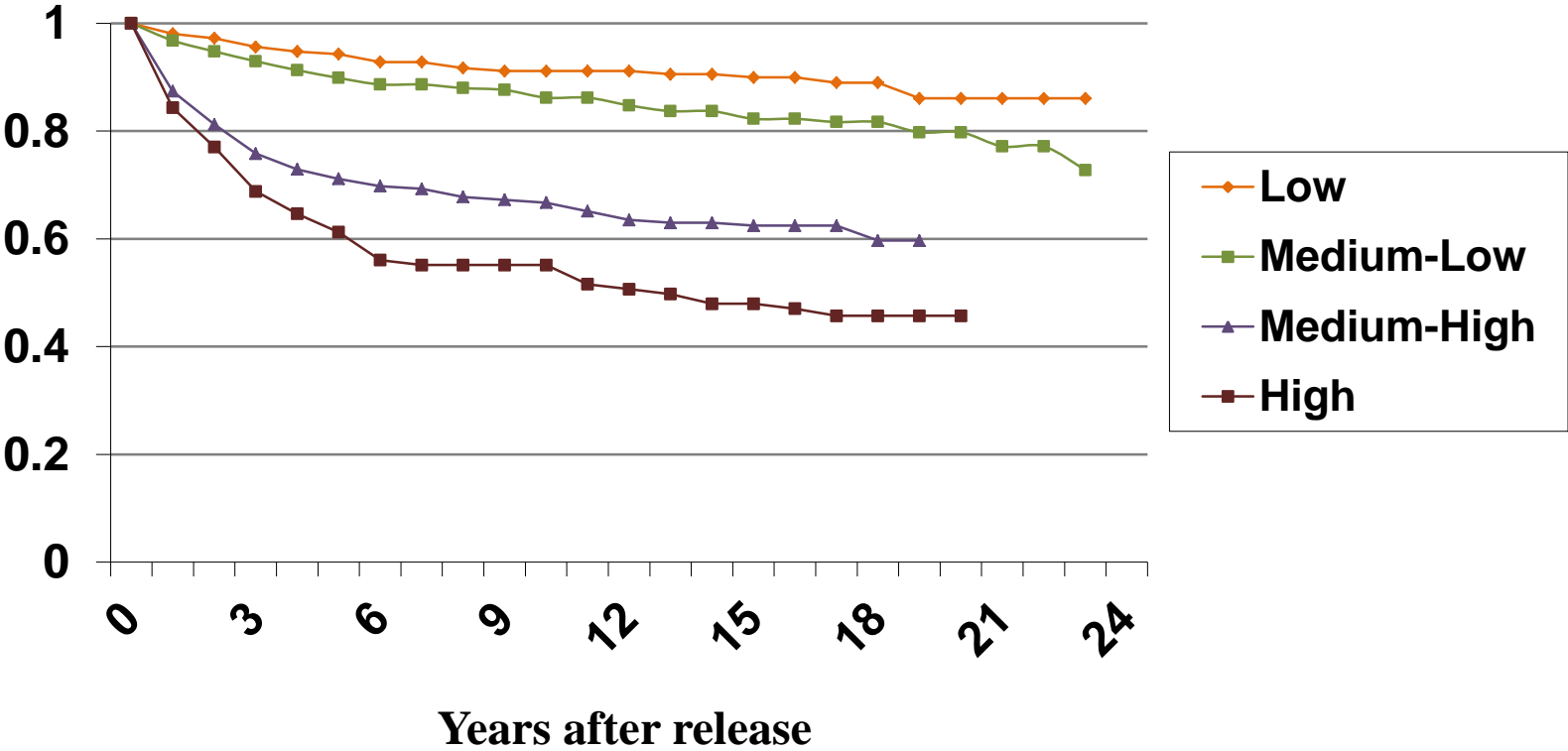
Sexual Reconviction Rates



NOTE: Untreated Samples

STATIC-99

Sexual Reconviction Rates



Life Gets More Complicated

- Updated the norms in 2008 (Harris et al., ATSA presentation) and 2009 (Helmus' MA Thesis)
- Significant variability was found
- The differences in recidivism rates across samples was large enough to matter

**Absolute Recidivism Rates Predicted By Static-99R and Static-2002R Sex Offender
Risk Assessment Tools Vary Across Samples : A Meta-Analysis**

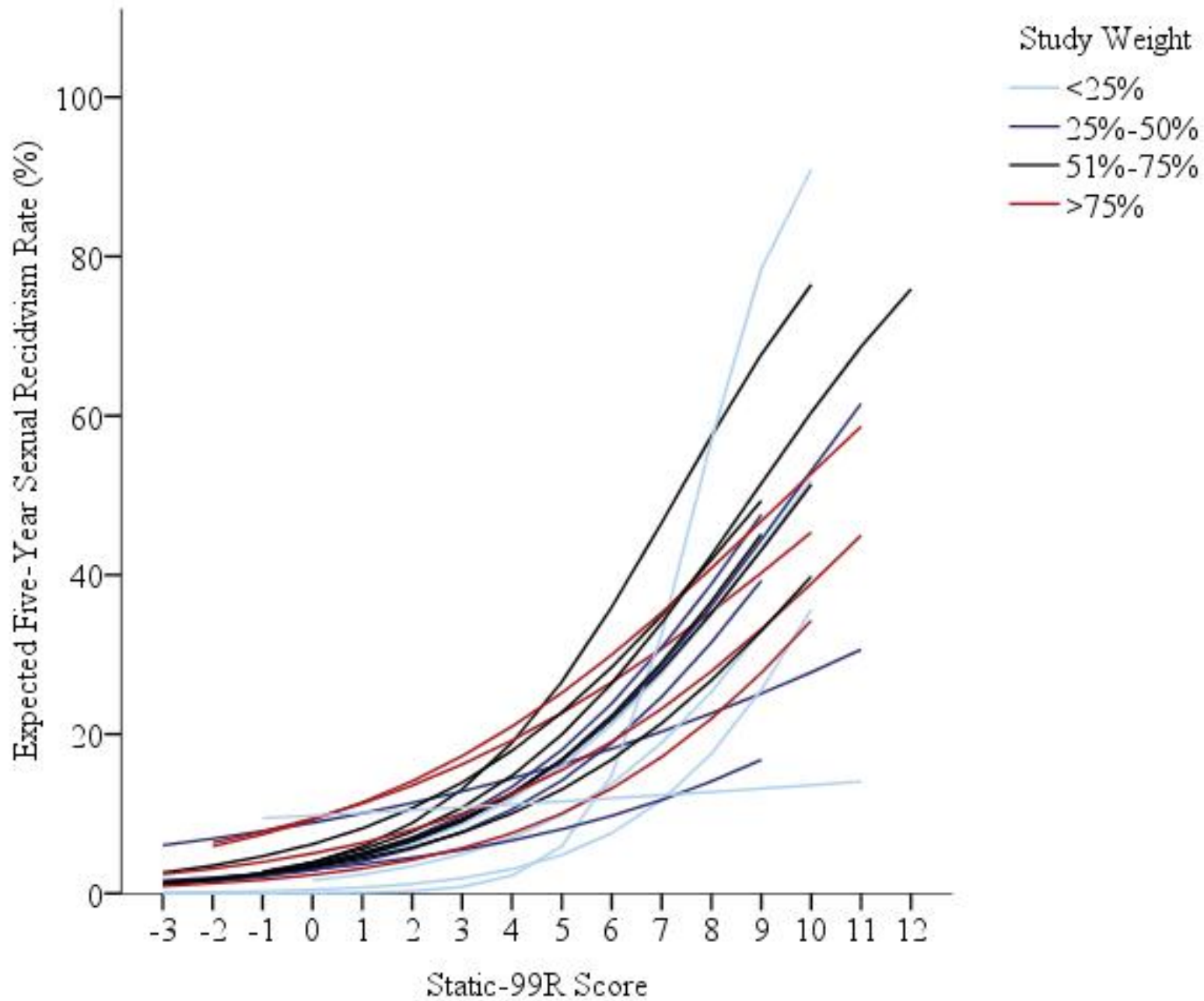
Leslie Helmus, R. Karl Hanson, David Thornton, Kelly M. Babchishin and Andrew J. R. Harris

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Questions?

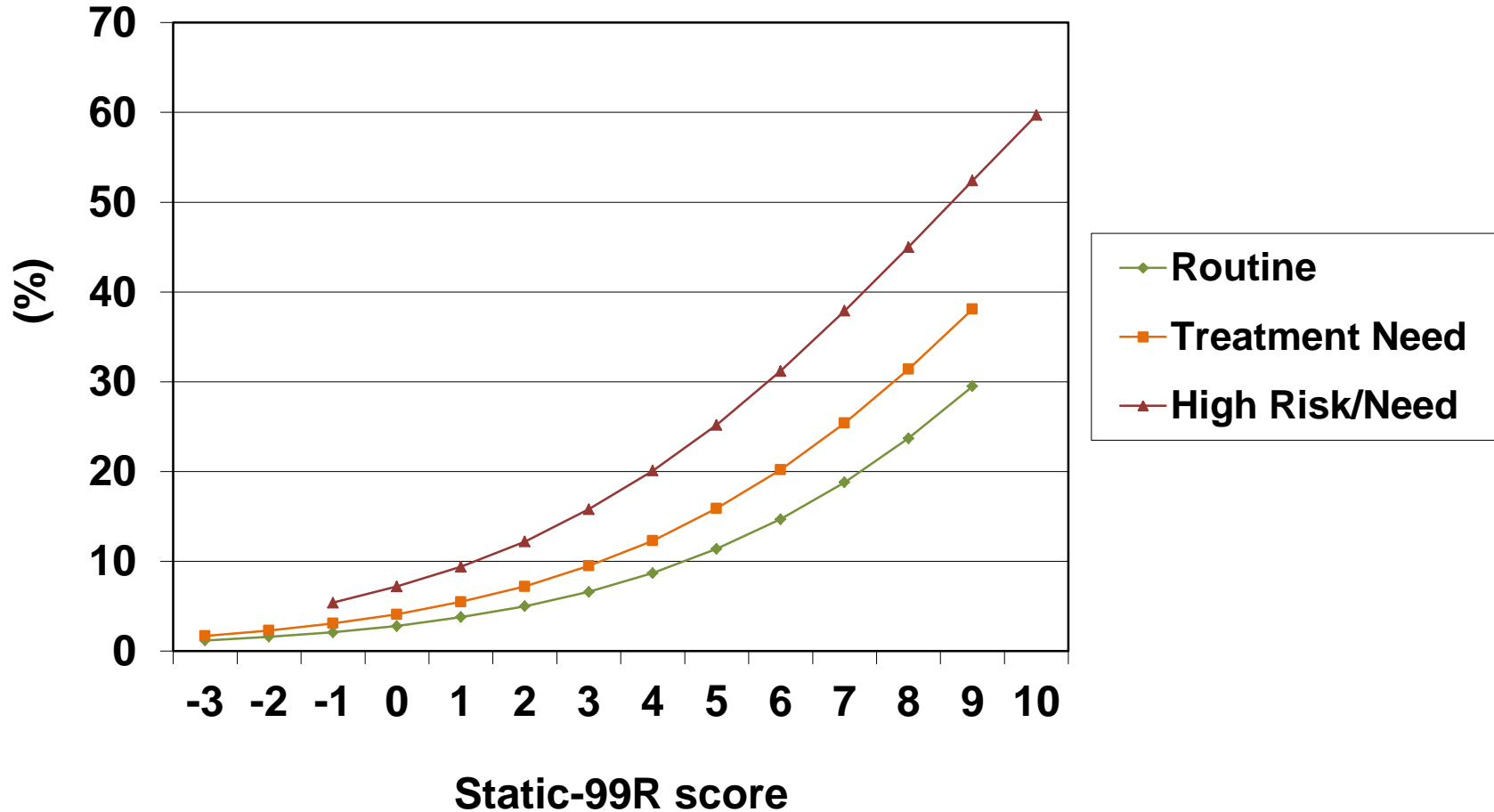
- Is the variability random?
- Different jurisdictions?
- Different definitions of recidivism?
- Preselection effects on risk relevant variables?

Degree of Preselection

- None
 - Routine samples, not obviously selected on risk relevant variables
- Some
 - mostly treatment samples, demonstrating some criminogenic needs
- Lots
 - High Risk/High Needs samples, explicitly selected on risk relevant variables

Rater Reliability: Kappa = .92 (95% agreement; 19/20)

5 Year Sexual Recidivism: Static-99R



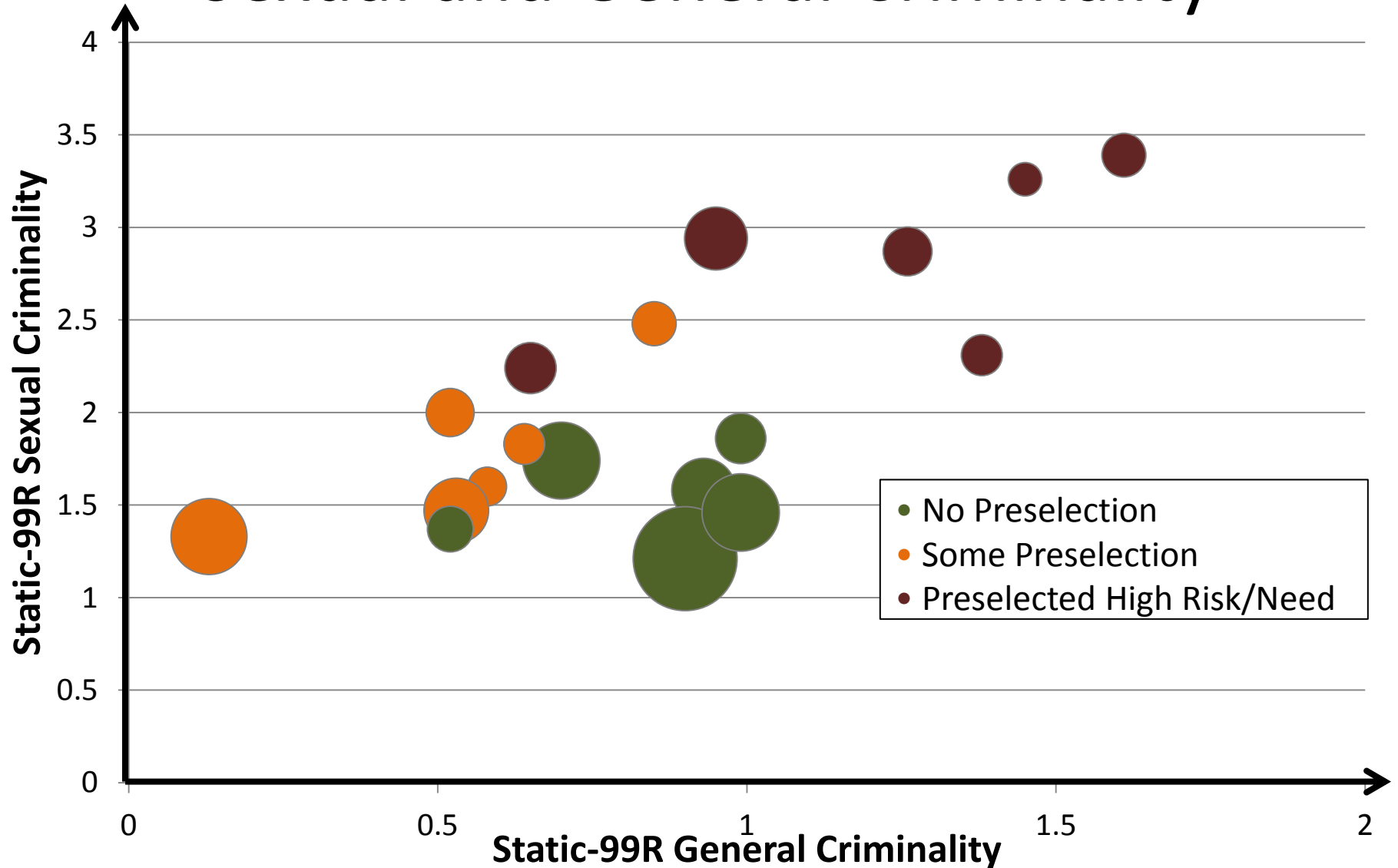
Part 1

- Evidence of preselection effects on risk relevant variables

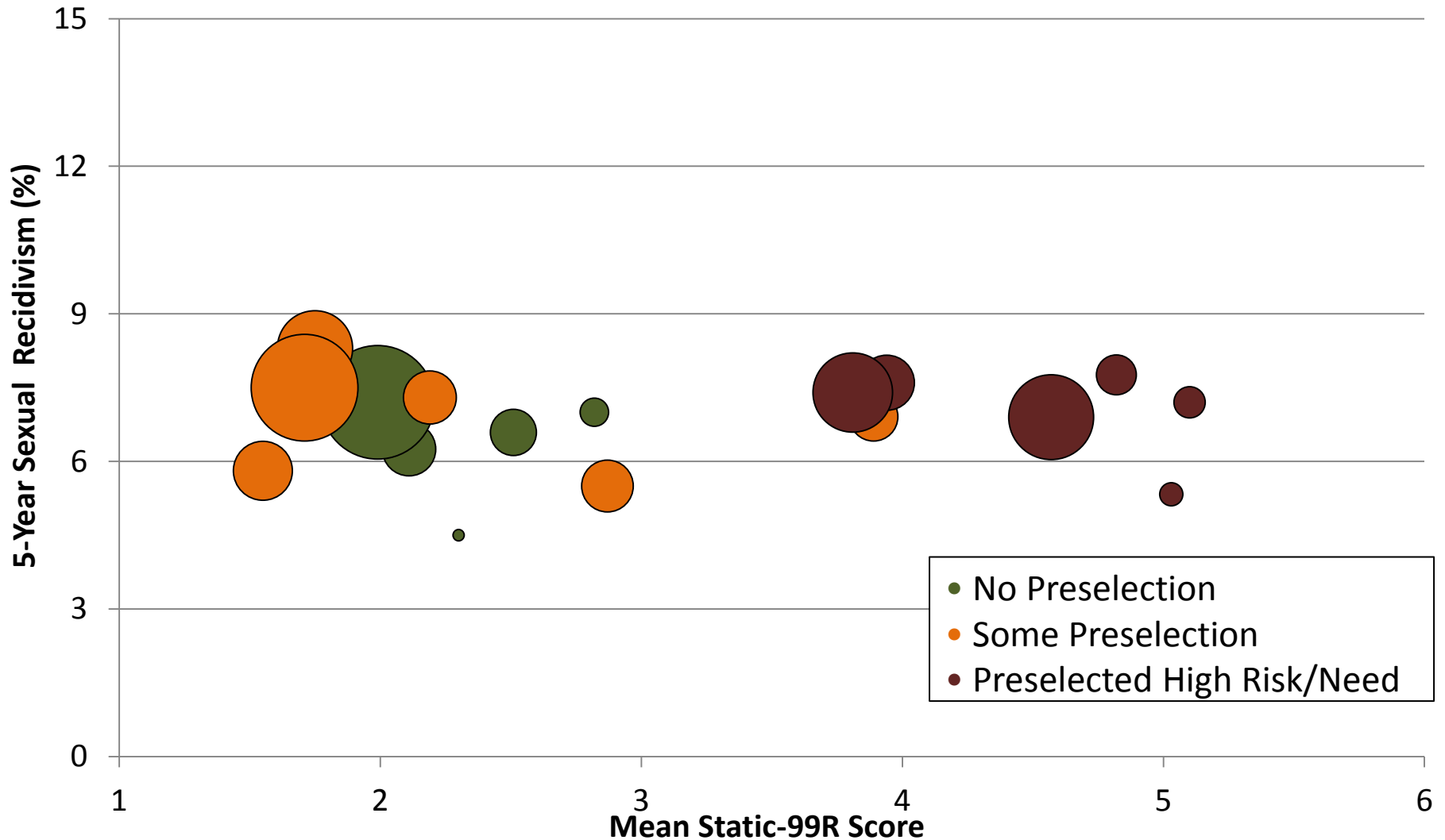
Samples: Study 1

- 20 samples from the Static-99 re-norming project
 - N ranged from 133 to 1,278 ($N = 7,778$)
 - Majority from Canada ($k = 9$) or the U.S. ($k = 5$)
- Studies excluded if they:
 - (1) Could not be classified into a sample type
 - pre-selected low risk offenders (Cortoni & Nunes, 2007)
 - only sexual murderers (Hill et al., 2008)
 - (2) Were identified as a statistical outlier
 - Saum (2007)
- None of the samples were preselected based on Static-99/R scores

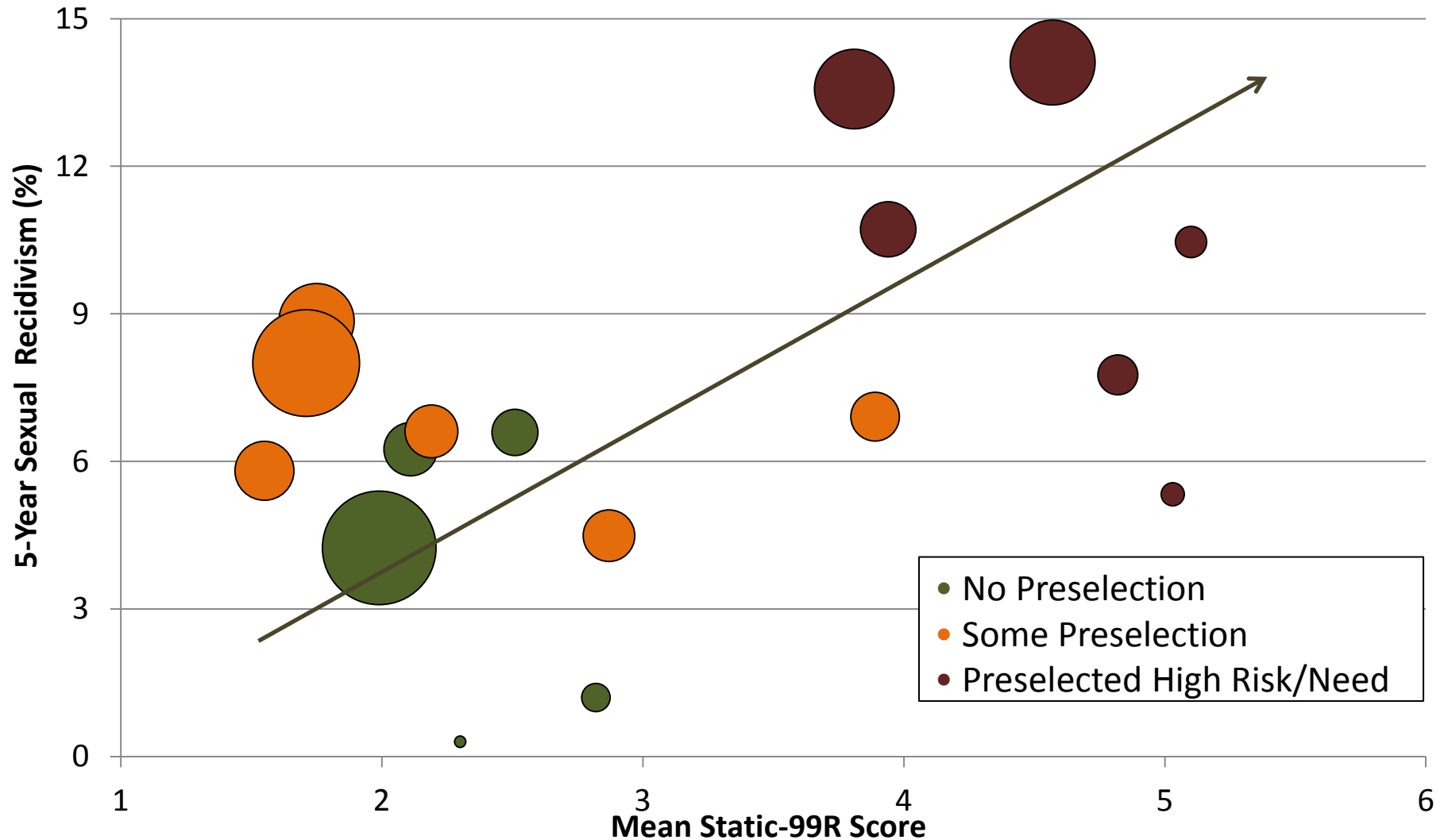
Sample Types Score Differently on Sexual and General Criminality



Hypothetical Pattern: No Significant Variability on Base Rates



Observed Pattern: Sample Types Differ on Sexual Recidivism Rates



Part 1 Conclusions

- Selection process resulted in meaningful differences in Static-99R scores
- Incremental effect of sample type indicates that they were also preselected on risk factors external to Static-99R

Part 2: Evidence of Preselection Effects on Risk Factors External to Static-99R

- Are different samples different in the density of external risk factors?
- And if so, by how much?

Samples for Study 2

- Studies included if reported:
 - (1) On measure that was found to provide incremental validity over Static-99 or Static-99R
 - (2) Could be classified in one of the three sample types
- Measures included if:
 - Means and standard deviations for at least two of the sample types
- Three measures selected:
 - VRS-SO (Olver et al., 2007)
 - SRA-FV (Thornton)
 - STABLE-2007 (Hanson et al., 2007)

Sample: Study 2

- $K = 19$; n ranged from 15 to 792 (Total $N = 3,976$)
 - Most from Canada ($k = 8$) and the U.S. ($k = 7$)
 - Measures:
 - VRS-SO ($N = 991$; $k = 5$), SRA-FV ($N = 952$; $k = 5$), and STABLE-2007 ($N = 2,033$; $k = 9$)
 - Sample types:
 - Routine ($N = 1,198$; $k = 2$), Treatment ($N = 1,566$; $k = 12$), and High risk/high need ($N = 1,212$; $k = 5$)

Transforming to a Common Metric (Z scores)

$$Z = \frac{X_i - \bar{X}}{SD}$$

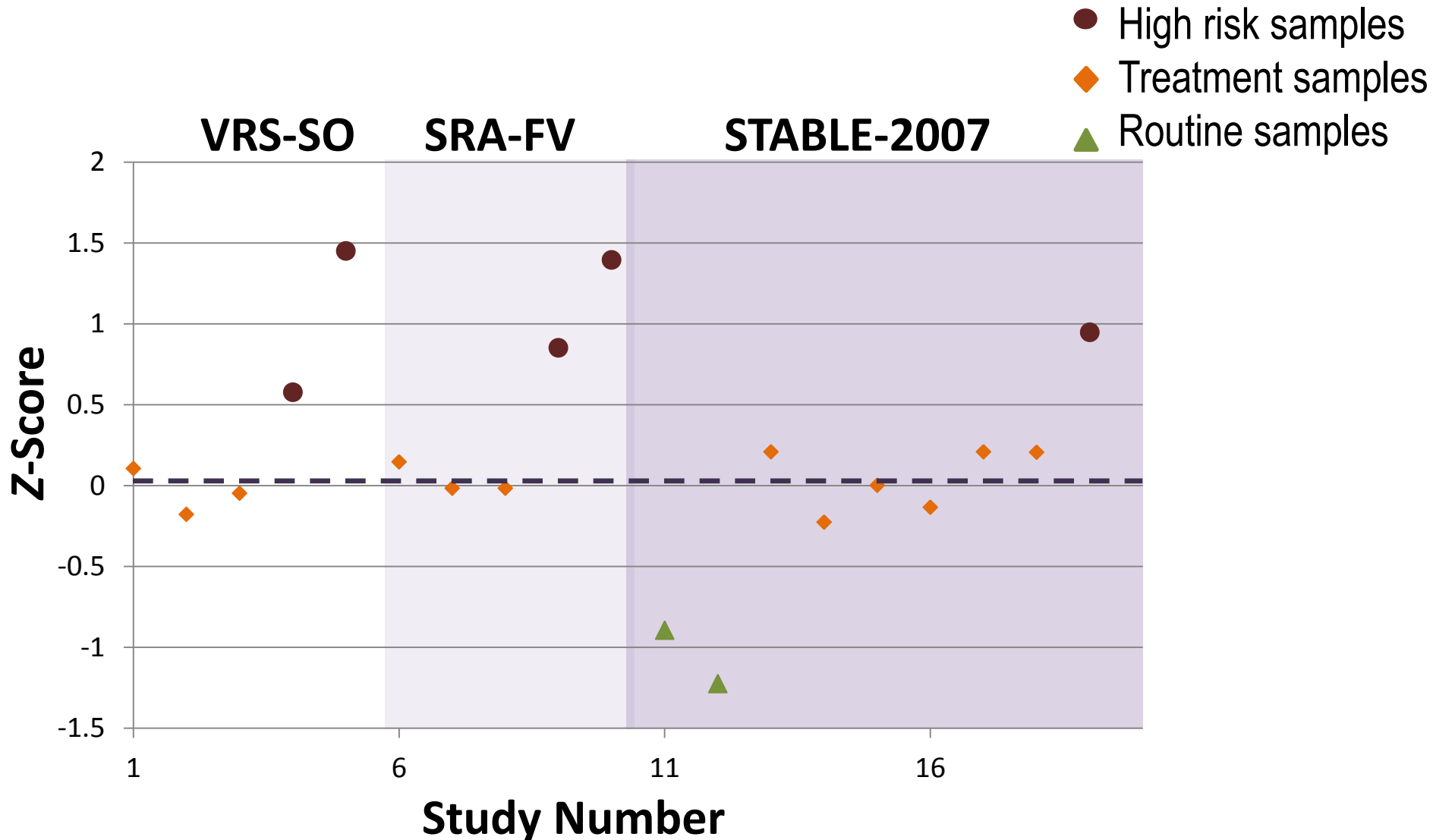
Ideal:

$$Z = \frac{(Score_i) - (Population Mean)}{SD \text{ for population}}$$

Available:

$$Z = \frac{(Score_i) - (Treatment Mean)}{Total SD \text{ for treatment groups}}$$

Sample Type Differ in their Degree of Risk Factors External to Static-99/R



Part 2 Conclusions

- Consistent differences in external risk factors based on sample type
- High Risk/High Need samples 1 *SD* above Treatment Samples
- Routine samples 1 *SD* below Treatment Sample

Average Scores on External Risk Factors based on Degree of Preselection

Sample Type	Z-score	Weighted <i>M</i>			<i>N</i> (<i>k</i>)
		VRS-SO	SRA-FV	Stable-2007	
Routine	-1.06	-	-	7.06	1,198 (2)
Preselected for Treatment	0.0	20.74	2.22	10.99	1,566 (12)
Preselected High Risk/Need	1.04	27.24	3.26	14.70	1,212 (5)

Note: Z-scores based on M(SD) of Treatment Groups

Part 3

- How Well Can Individual Differences on External Risk Factors Estimate Sample Type Recidivism Rates Norms?

Samples: Study 3

- Four datasets that included the Static-99/R AND the VRS-SO, SRA-FV, and/or Stable-2007
 - Fixed 5-year follow-up

Sample	Country	Measure	N
Eher et al. (2012)	Germany	Stable-2007	259
Hanson et al. (2012)	Canada	Stable-2007	262
Olver et al. (unpublished data)	Canada and New Zealand	VRS-SO	538
Thornton (unpublished data)	U.S.	SRA-FV	418

Calculating Estimates 1: Study Specific Estimates

- The basic equation is:

$$\text{Logit} = B_0 + B_1 * (\text{STATIC-99R}) + B_2 (\text{other measure})$$

$$\text{Logit} = (B_0 \pm [1\text{SD adjustment}]) + B_1 * (\text{STATIC-99R})$$

Calculating Estimates 2

Averaged Across Studies

- B_0 is the logit of the recidivism rate of the treatment group (7.2% or $B_2 = -2.5563$) for a Static-99R score of 2, used as a constant reference point
- B_1 for Static-99R is the relative risk estimate from Helmus, Hanson et al. (2012) ($B_1 = .293$)

Calculating Estimates 3

- B_2 is the average incremental effect of the external risk measures across the 4 samples in Z units ($B_2 = 0.5273$)
- Therefore, the 1 *SD* adjustment can take on three values:
 - 1*0.5273 = -0.5273
 - 0*0.5273 = 0
 - 1*0.5273=0.5273

Calculating Estimates - 4

- For routine:

$$\text{logit} = (-2.5563 - 0.523) + .293 \text{ (Static-99R scores)}$$

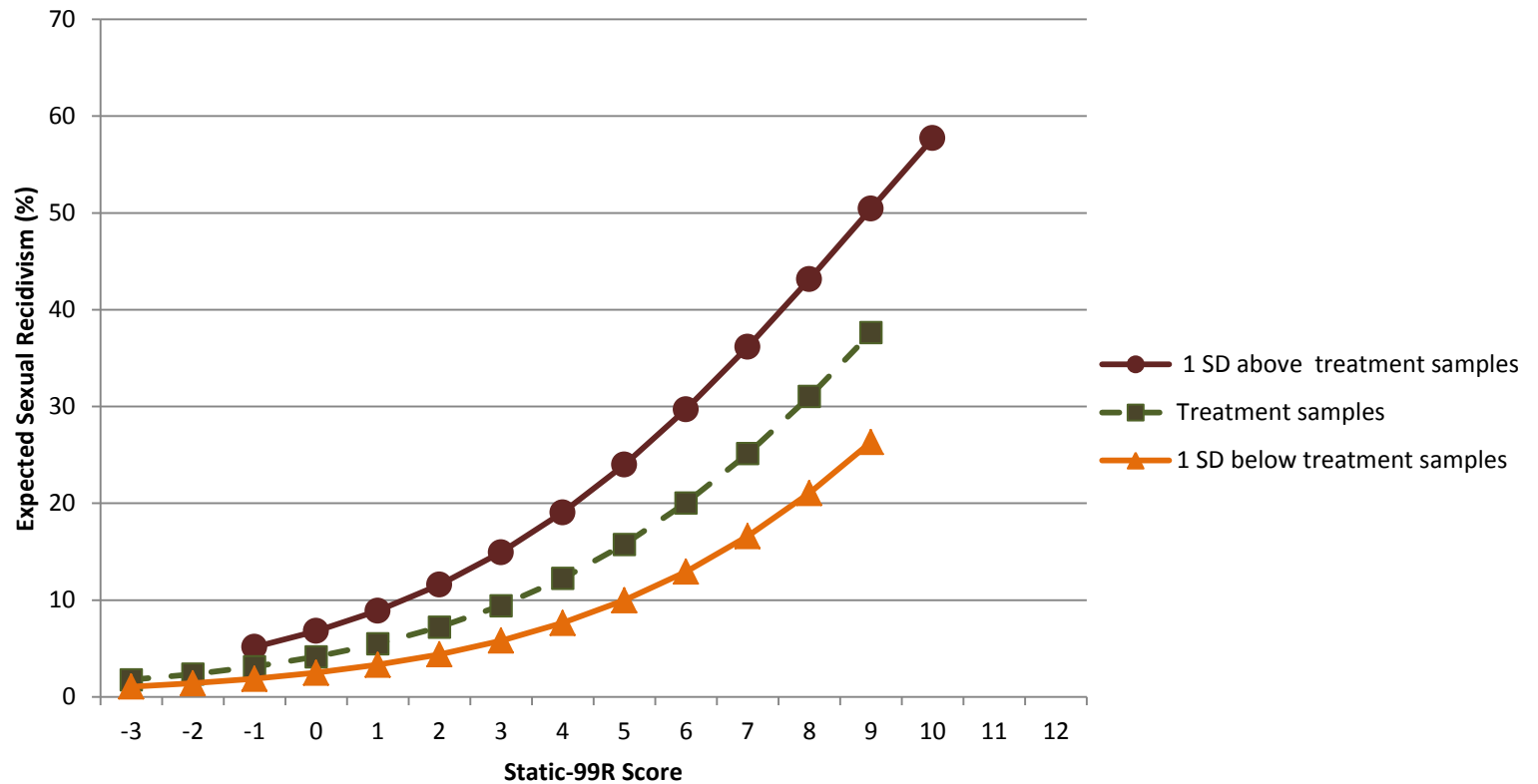
- For HR/HN:

$$\text{logit} = (-2.5563 + 0.523) + .293 \text{ (Static-99R scores)}$$

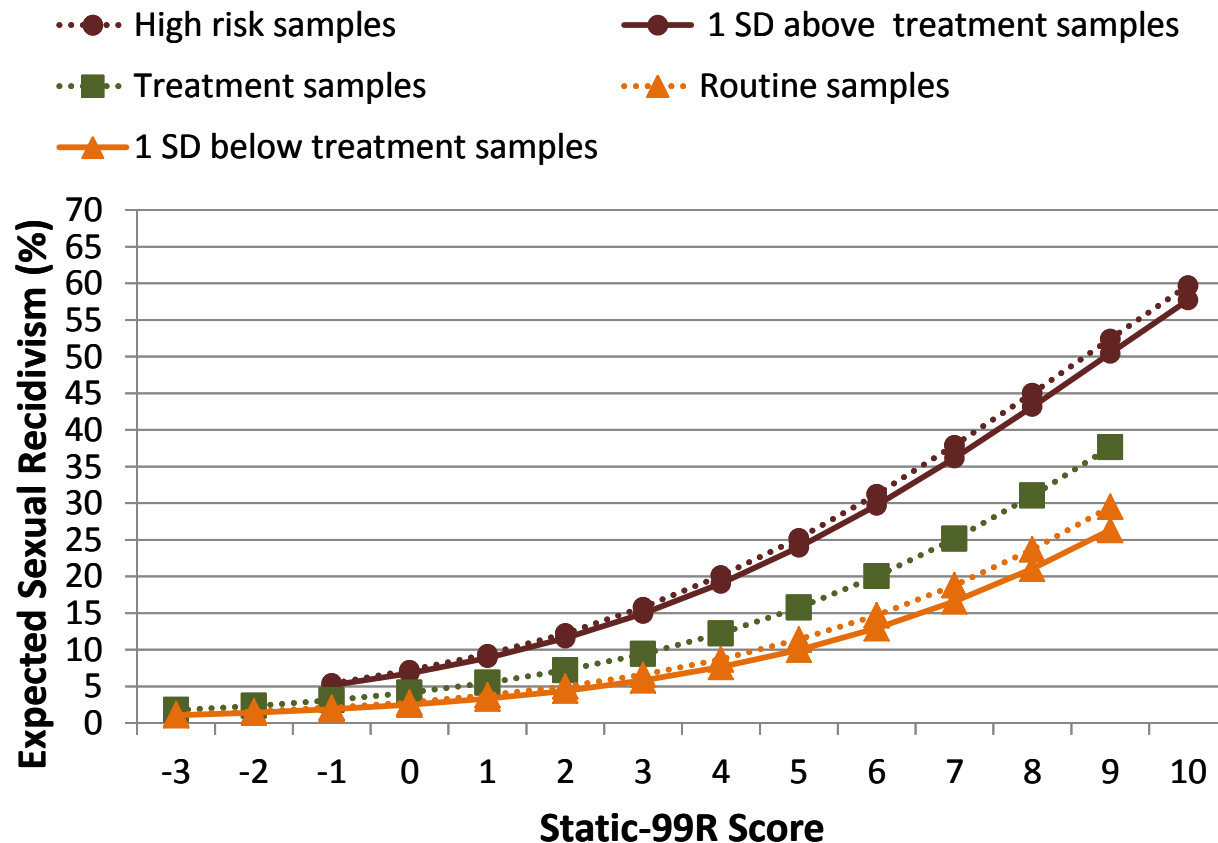
- For Treatment:

$$\text{logit} = (-2.5563 + 0) + .293 \text{ (Static-99R scores)}$$

Expected Sexual Recidivism Rates after Adjusting for Presence of External Risk Factors



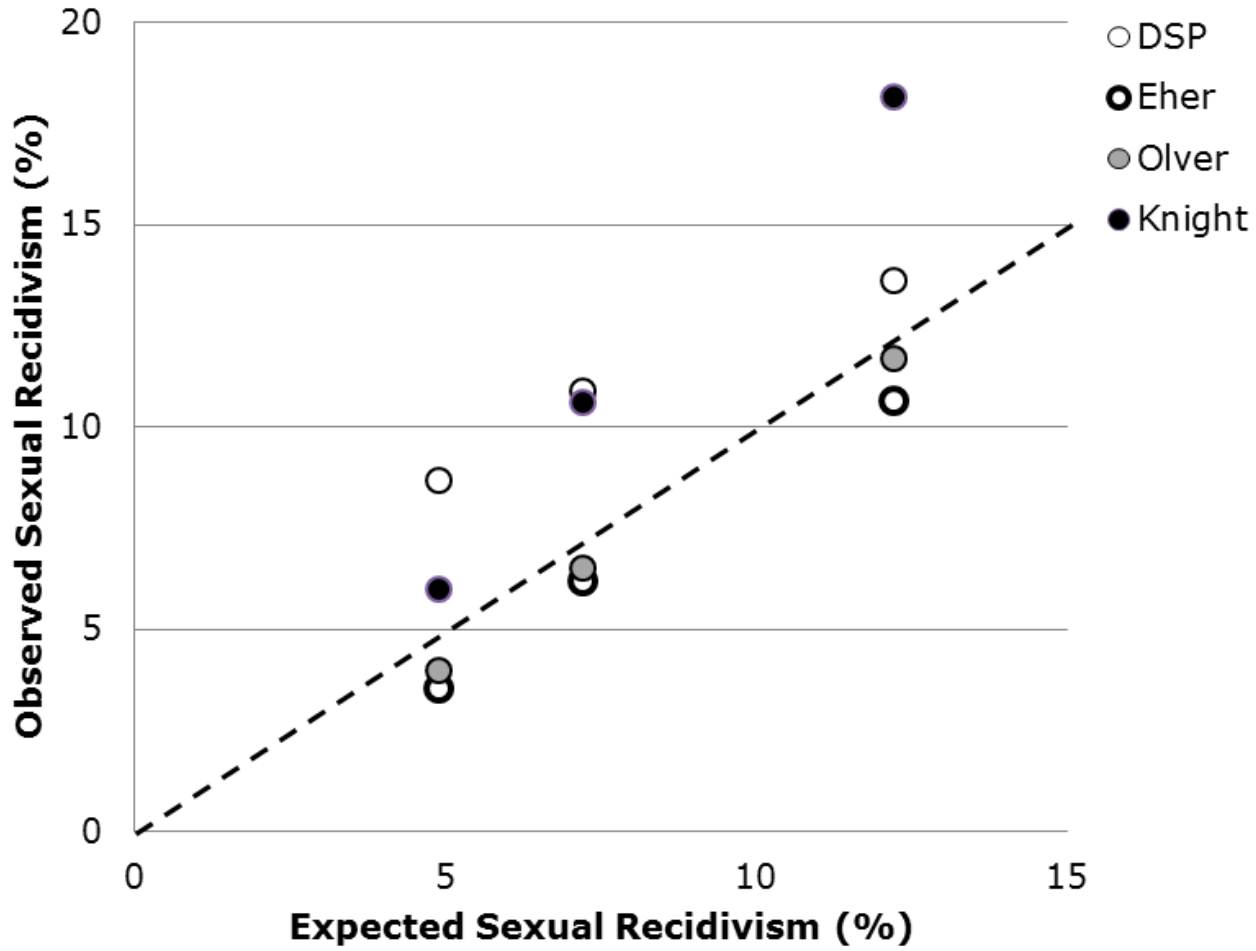
How Well Does Adjusting for External Risk Factors Match the Static-99R Sample Type Norms?



Have We Explained It All?

- Is there residual variability left over after accounting for Static-99/R and the density of external risk factors?

Calibration Plot



Part 3 Conclusions

- The Static-99R sample type recidivism rates closely match the recidivism rates expected for offenders who have different density of criminogenic needs
- Considering external risk factors with Static-99R improve the calibration of risk predictions
- Further research is needed on other sources of residual variability across samples

General Conclusion

- There are strong preselection effects on risk relevant variables across samples
- The Static-99R sample types can be interpreted as corresponding to groups that are 1 SD above (High Risk/High Need) or 1 SD below (Routine) the density of criminogenic needs found in treatment samples
- Several different measures can be used to assess the density of criminogenic needs

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