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Actuarial Risk Assessment vs. Clinical Decision Making in Child Welfare/Corrections: Should we use our heads or the formula?

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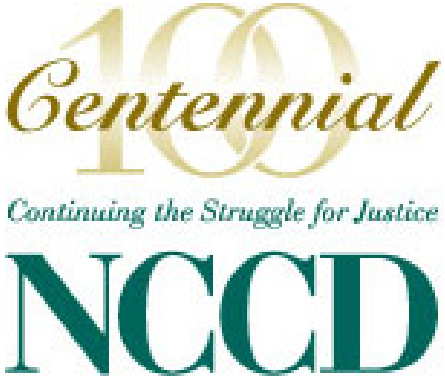

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1943: Actuarial/Clinical Prediction Controversy Begins

‘The problem may be posed in a brief and simple manner: In any given predictive situation, which method is better—i.e., more accurate and more informative in a scientific way—that of the clinician or that of the actuary?’

Sarbin, T. R. (1943). A contribution to the study of actuarial and individual methods of prediction. *American Journal of Sociology*, *48*, 593–602.

Sarbin's 1943 Study: The First Horse Race

- Predict academic achievement of new university students (73 men and 89 women) in Minnesota.
- Experienced (Ph.D.) clinical psychologists examine high school achievement records and aptitude/personality tests and conduct face-to-face interviews.
- Actuarial formula combines high school class rank and college aptitude test score.
- Two-variable formula proves more accurate than clinical judgment, especially among women.

Sarbin's Conclusion

'In short, a competent statistical clerk can make predictions as well as a highly trained clinical worker'.

'Those who hold that the clinical case study method can do more than the statistical method must submit evidence'. (Sarbin, 1943, p. 600)

1954: Paul Meehl's 'Evidence' Restarts Actuarial/Clinical Controversy in Psychology

Grad student for Sarbin study. Clinical and experimental psychologist.

Meehl publishes *Clinical Versus Statistical Prediction* (1954). In a review of 20 studies, actuarial prediction proves superior or equal to clinical estimates of future behaviour.

'The assertion sometimes heard from clinicians that "naturally", clinical prediction, being based on "real understanding", is superior, is simply not justified by the facts'. (Meehl, 1954, p. 119)

Meehl notes Glaser's study and comments on Blenkner's.

The 1954 Glaser Parole Prediction Study

1928: Burgess develops 21 predictors of recidivism in a sample of 1,000 released Illinois inmates. Simple additive scale.

1954: Glaser evaluates the Burgess model among 2,600 inmates released between 1940–1949 re: post-release prison recidivism.

Burgess scale predicts recidivism more accurately than prognoses of prison psychiatrists.

See:

Glaser, D. (1954). A reconsideration of some parole prediction factors. *American Sociological Review, 19*, 335–341.

Burgess, E. W. (1928). *Factors determining success or failure on parole*. In A. A. Bruce. The workings of the indeterminate sentence law and the parole system in Illinois (pp. 205–249). Springfield, IL: Illinois Committee on Indeterminate Sentence Law and Parole.

The 1954 Blenkner Study

Clinical social workers asked to predict successful client outcomes.

Identify five client characteristics as 'predictors' and score them for 47 intake clients. Each worker also makes a clinical prognosis.

A simple actuarial device (adds five scores) predicts client success more accurately than worker clinical prognoses.

Prognoses of these clinicians are uncorrelated with case outcomes and with one another, i.e., inter-rater reliability is very low.

Blenkner, M. (1954). Predictive factors in the initial interview in family casework. *Social Service Review, 28*, 65–73.

Meehl's Observation

'Apparently skilled case readers can rate complex factors reliably enough that an inefficient mathematical formula combining them can predict the criterion;

...but the same judges cannot combine the same data "impressionistically" to yield results above chance'.
(Meehl, 1954, p. 108)

Reaction to Meehl's Book From His Peers

'Clinical students in particular complain of a vague feeling that a fast one has been put over on them; that under a great show of objectivity, or at least bipartisanship, Professor Meehl has actually sold the clinical approach up the river'. (Holt, 1958)

'I was informed some years later that half the Freudian clinical staff at a large midwestern university lapsed into a long reactive depression after reading the book'. (Meehl, 1986)

1965: The 'Goldberg Rule'

- The 'rule' statistically weights 11 MMPI subscales to diagnose psychosis in a psych patient sample.
- Second sample: clinicians review same 11 subscales and diagnose patients.
- Rule's predictive accuracy exceeds all clinical judges and the best judge.
- Clinicians practice on 300 cases with known diagnosis before a third sample test; same result.

Goldberg, L. R. (1965). Diagnosticians versus diagnostic signs: the diagnosis of psychosis versus neurosis from the MMPI. *Psychological Monographs, 79* (9, Whole No. 602).

Meehl's View

'When you check out at a supermarket, you don't eyeball the heap of purchases and say to the clerk, "Well, it looks to me as if it's about $17.00 worth; what do you think?" The clerk adds it up.

There are no strong arguments...that human beings can assign optimal weights in equations subjectively or apply their own weights consistently'. (Meehl, 1986, p. 372)

Actuarial vs. Clinical Horse Race Studies by 1966

Sawyer reviews 45 recent comparative studies. Actuarial prediction proves more accurate (most) or equal to clinical. Concludes:

> 'The best method…includes data collected both clinically and mechanically. The clinician may contribute most not by direct prediction, but by providing, in objective form, judgments to be combined mechanically'. (p. 193)

Sawyer, J. (1966). Measurement and prediction, clinical and statistical. *Psychological Bulletin, 66*(3), 178–200.

Actuarial Versus Clinical Prediction Controversy: 1981

This has become ‘the academic equivalent of a cock fight’.

Monahan, J. M. (1981). *Predicting violent behavior*. Thousand Oaks, CA: Sage Publications. (p. 121)

Horse Race Studies by 2000

- 1989: Dawes et al. update with new studies; same findings.
- 1997: Grove and Meehl study update; same result.
- 2000: Grove et al. meta-analysis of 136 studies. Actuarial superior in about half, clinical in eight and the rest—dead heat.

Grove, W. M., Zald, D. H., Lebow, B. S., Snitz, B. E., & Nelson, C. (2000). Clinical versus mechanical prediction: A meta-analysis. *Psychological Assessment, 12,* 19–30.

Identified Problems in Clinical Prediction

- Predictors selected from vast array of observable client variables.
- Increased information does not improve clinical prediction nor do client interviews (Dawes et al., 1989).
- Why? It is more likely that the prognosis is based on factors with no relationship to the forecasted behaviour (Faust, 1984).
- 'Research shows that clinicians sometimes formulate impressions within minutes…of initial patient contact and spend much of the remaining time attempting to gather data in support of these hypotheses' (Faust, 1984, p. 475). **Confirmation bias.**
- Even when evaluating empirically validated risk factors, clinicians weigh them poorly, i.e., the 'Goldberg rule'.

Implications for Clinical Practice?

- Meehl: Prediction is important in only a few situations.
- At a static point where clinical treatment decisions hinge on the question, what will the client do next? A look into the future. **(Child Protection/Corrections)**
- Clinicians identified/scored many client characteristics employed by actuarial models—models they developed.
- Fluid, face-to-face client interactions required to diagnose psych process, identify treatment to change predicted behaviour remain the critical clinical task. **(Child Maltreatment/Criminal Behaviour)**
- Clinicians should carefully weigh actuarial information when available and applicable but:
  - » Competition with actuarial method is futile and unproductive.
  - » You have more important things to do.

ACTUARIAL VS. CLINICAL RISK ASSESSMENT IN US CHILD PROTECTIVE SERVICES

US Child Protective Services (CPS) Background

- By law and custom, the US has a 'residual' child welfare system, i.e., unlikely to intervene until families maltreat a child.
- As a result, the primary objective of CPS agencies is to prevent the recurrence of maltreatment.
- CPS agencies are risk managers. Can we manage it without defining it?

Los Angeles County, California CPS

- 1,100 CPS investigators
- Conduct 160,000 annual CPS investigations
- 40,000 are substantiated for child maltreatment
- Some families will maltreat their children again.
- Which families should we serve?

http://www.lacdcfs.org/aboutus/fact_sheet/DRS/September2009/Fact_Sheet.htm

Context of Los Angeles CPS Investigations

- Completed in difficult home settings with limited info.
- Average time of eight hours with multiple open cases.
- By investigation close (30 days) decide:
  1. Did maltreatment occur based on evidence?
  2. Remove child for protection—current harm/danger?
  3. **Are agency protective services necessary?**
- A comprehensive clinical assessment is not feasible but risk assessment triage is.

Risk Assessment in US CPS Agencies: 1990

- Most: **unstructured clinical**. Case study, professional experience, intuition selects risk factors and sets risk level. Then decide if protective services are necessary.
- Many: **consensus/clinical risk**. Workers score 'expert'-identified characteristics before choosing risk level. Structured form of clinical prediction.
- Two: **actuarial risk**. Workers score risk factors with a known empirical relationship to maltreatment. They total the score and apply thresholds to set a risk level.

The Emperor's New Clothes

- **1991:** Lawyers criticise consensus risk assessment, i.e., no evidence it can estimate future maltreatment.

  Wald & Woolverton. (1991). Risk assessment: The emperor's new clothes? *Child Welfare, 70*(3), 397–9.

- **1992:** Federal study has 12 experts and 103 CPS workers review 18 'serious' child maltreatment cases. Each decide whether a) child remains home or b) child is removed to foster care.

  'Decision making about serious abuse and neglect cases is inconsistent and lacking in structure'. (p. 595)

  Rossi, Schuerman, & Budde. (1996). *Understanding child maltreatment decisions and those who make them*. Chicago: Chapin Hall Center for Children, University of Chicago.

The CPS Case Management Problem

‘This mix of conditions—the potentially grave consequences of “error”, the inherent difficulty of accurately assessing family situations and relationships, and the range of “skills” evident in the nation’s CPS —presents a near-perfect equation for widespread disparity in case decision making’.

US Office of Child Abuse and Neglect Report, 1999

Federal Minimum Performance Indicators Established for US Child Welfare Agencies in Mid-1990s

- **Child Safety**:

  Child maltreatment recurrence rate below 6.1% within six months of a CPS investigation.

  Maltreatment in foster care below 0.57% among cases open last year.

- **Child Permanency in Foster Care:**

  76% of children reunified within 12 months of FC entry.

  Post-reunification foster care re-entry less than 8.6% within 12 months.

  Placement stability: 86% kids with 2 or less last 12 months.

CPS Risk Assessment Crisis in the 1990s

'The greatest concern about risk assessment is that some have no practical or scientific value'.
Curran. (1995). *American Professional Society on the Abuse of Children Advisor, 8*(4), 16.

'If we cannot specify the parameters of risk and empirical evidence for their viability, CPS has no objective, scientifically based rational foundation for its decisions'.
Reid. (1993). *Seventh National Roundtable on CPS Risk Assessment*, p. 85–93, American Public Welfare Association.

'If risk assessment models are based on a consensus of professional opinion, and the validity and reliability of these models is in doubt, so is the adequacy of current practice'.
Ciccinelli. (1995). *American Professional Society on the Abuse of Children Advisor*, *8*(4), p. 16.

What to Do?

'. . . whether a statistical or clinical approach is superior has been the subject of extensive empirical investigation . . . results have been uniform. Simple statistical methods outperform clinical judgment . . .

. . . Objections ignore data from over 100 studies and an ethical mandate that, for important social purposes such as protecting children, decisions should be made in the best way . . .

If relevant statistical information exists, use it. If it doesn't exist, collect it'.

Robyn Dawes, Carnegie Mellon University, *Chronicle of Higher Education*, June 1993

A Brief History of Actuarial Risk Assessment in CPS

- **1984**: First US actuarial study in Oakland, California.
  Johnson & L'Esperance. (1984). Predicting the recurrence of child abuse. *Social Work Research and Abstracts, 20*(2), 21–26.

- **1986**: First state actuarial study/implementation in Alaska, then Michigan 1989, Wisconsin 1991, Rhode Island 1993.

- **1994**: Federal OCAN study. One actuarial and two consensus risk assessments tested in four states. Prognosis at CPS investigation close for 900 families. Maltreatment observed for next 18 months. Findings (Baird & Wagner, 2000):

  1) Actuarial prediction is more accurate; and
  2) Has much higher inter-rater reliability (Baird et al., 1999).

Risk Assessment Estimate Type

Binary Prediction: A future behaviour is declared, e.g., this family will maltreat a child, yes or no.

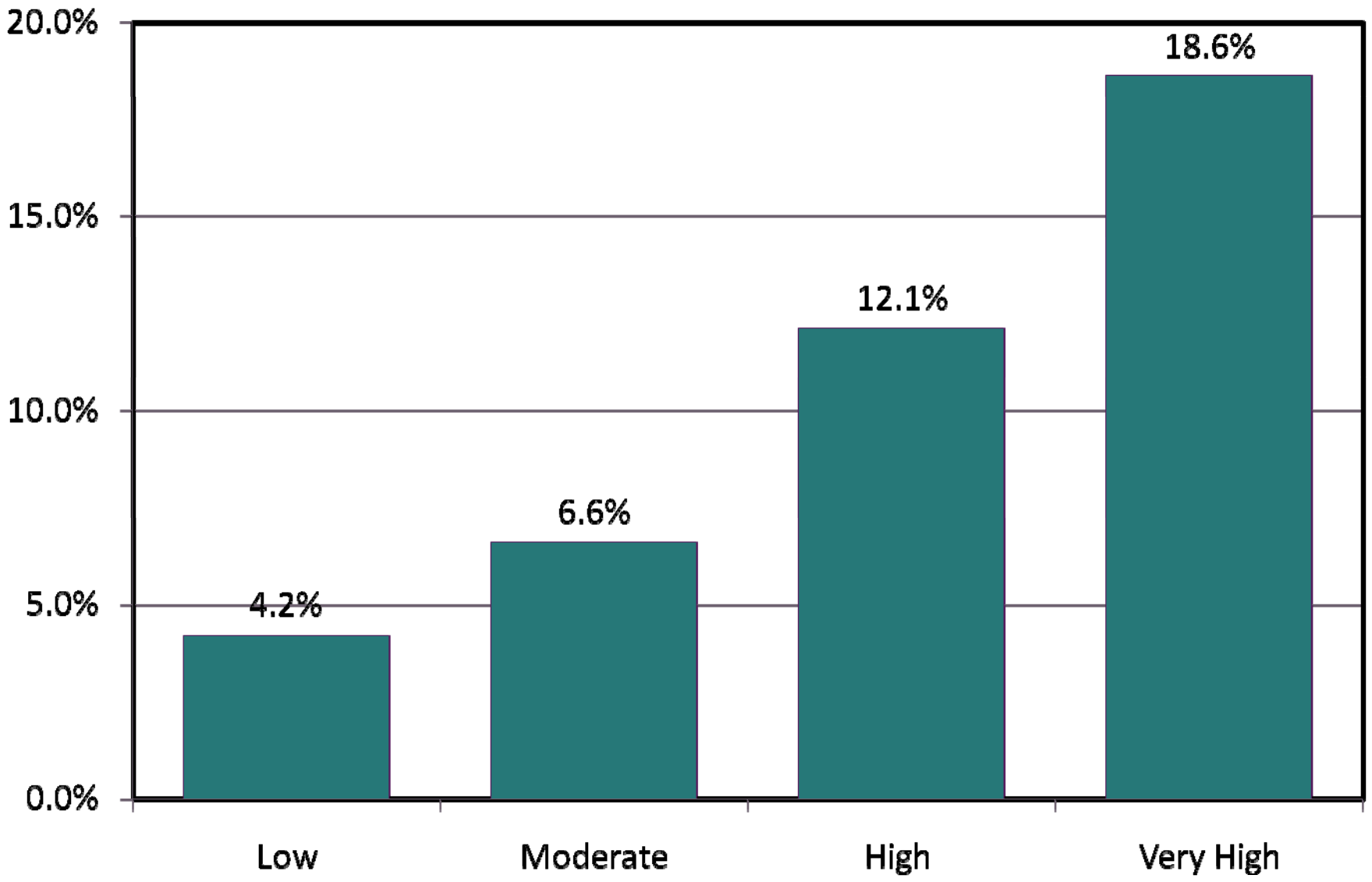
Classification: Medical model. Case assigned to prognostic groups by probability of occurrence: low, medium or high risk.

For utility in medical treatment decisions, prognostic groups must demonstrate significantly different rates of heart attack, cancer or child maltreatment recurrence—in expected form.

Prognostic groups, not correlation coefficients nor ROC, provide clinicians accessible/interpretable info. Think LA.

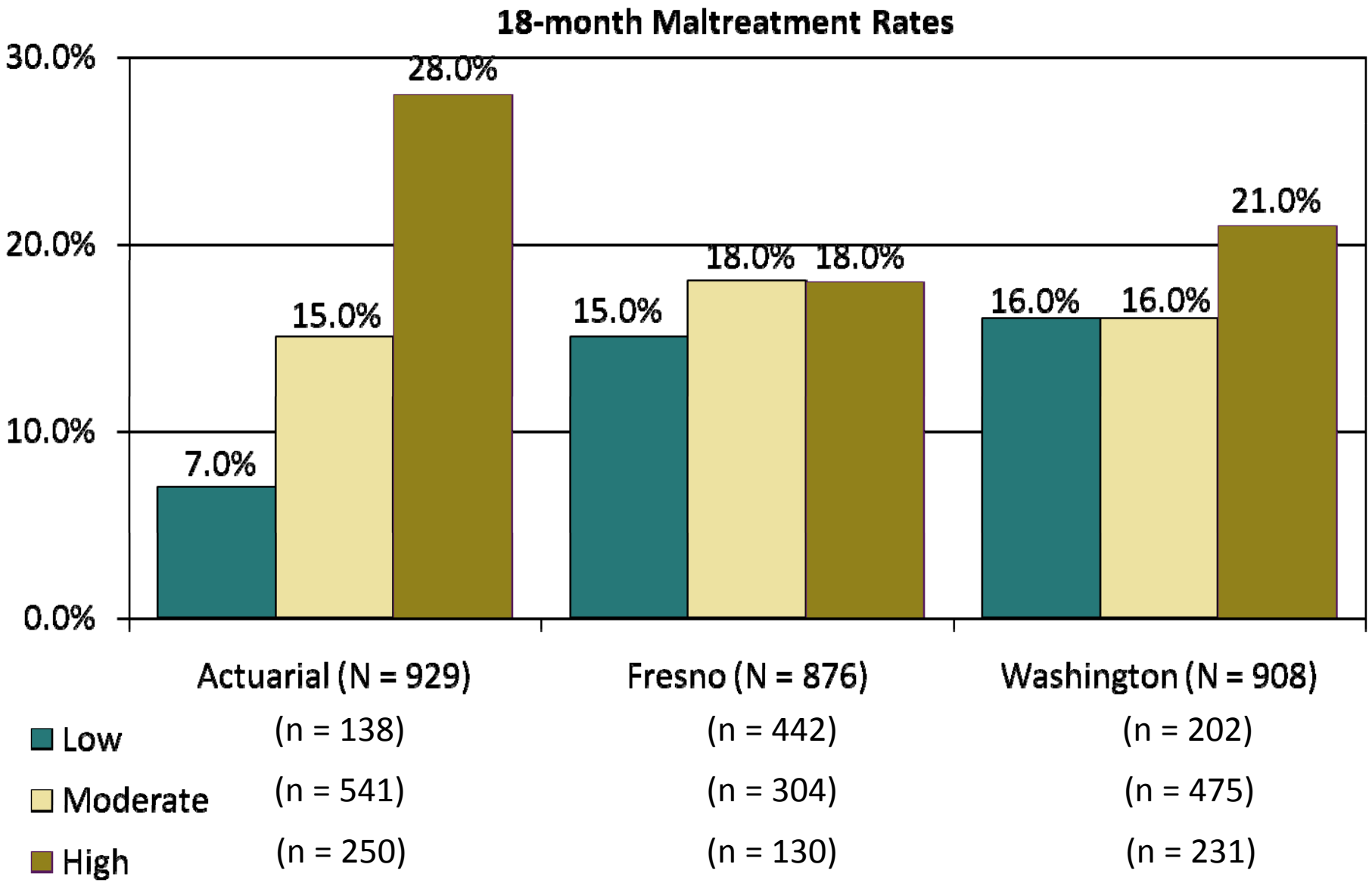
Altman & Royston. (2000). What do we mean by validating a prognostic model? *Statistics in Medicine, 19*(4), 453–473.

Framingham Coronary Heart Disease Prediction Scores (CHDPS)
Event Rates: Heart Attack/Death Within 10 Years

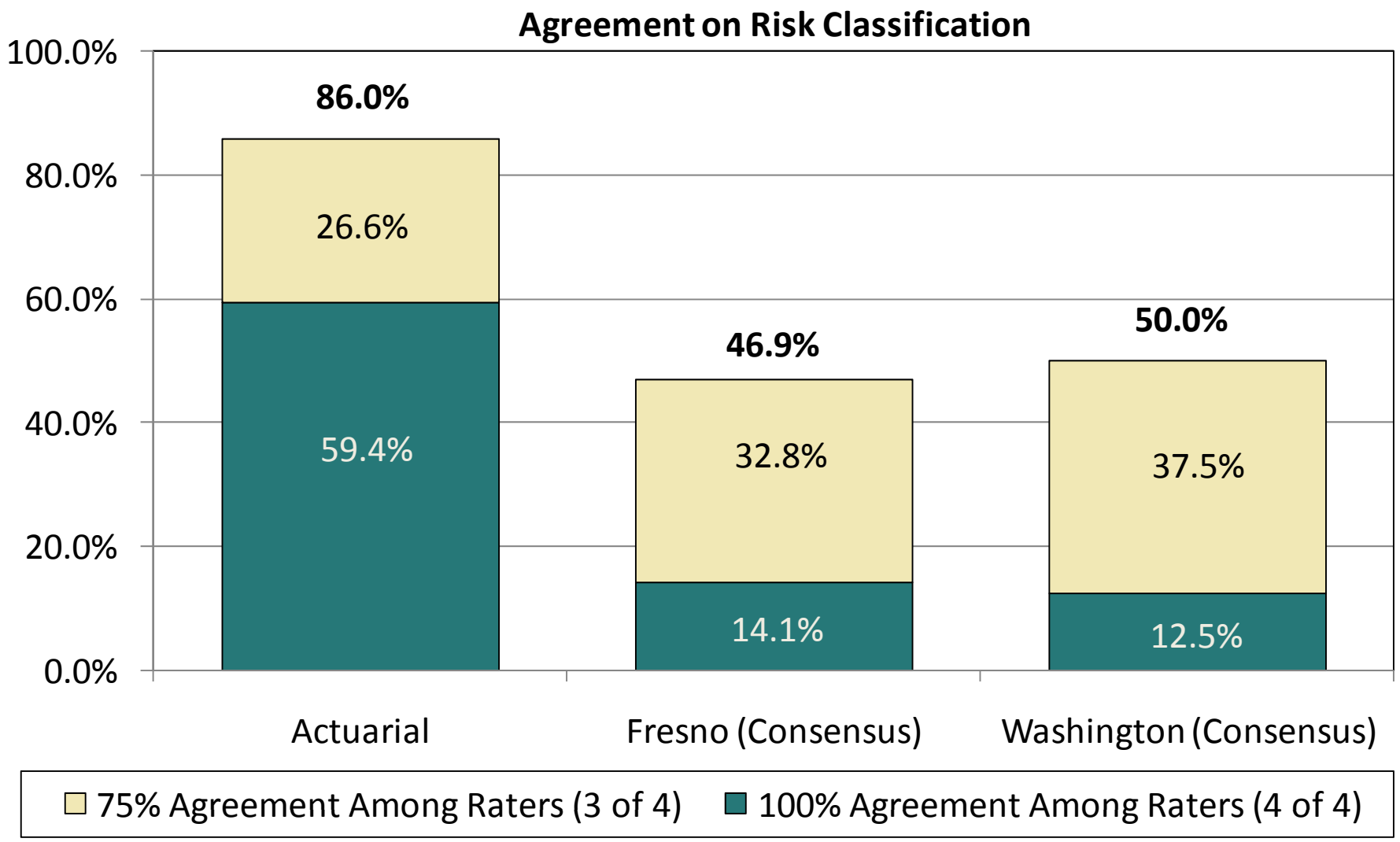


N = 7,739 D'Agostino et. al., 2001

Predictive Validity of Actuarial and Consensus Clinical Models (Baird & Wagner, 2000)

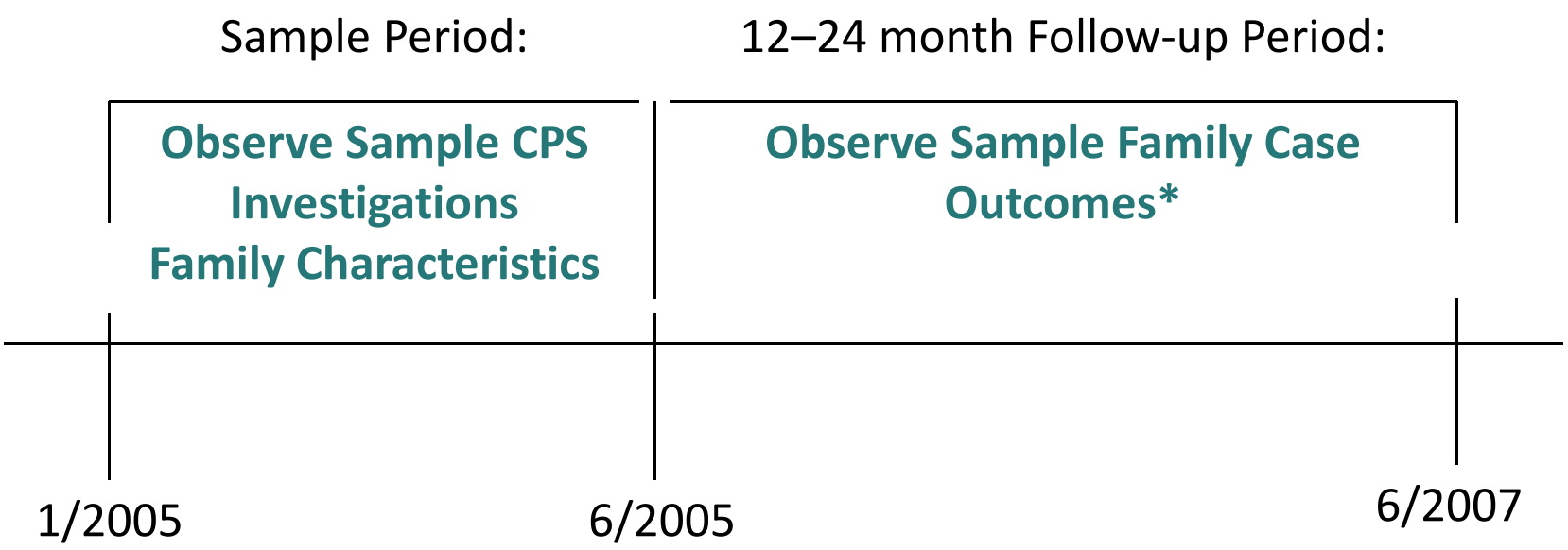


Inter-rater Reliability: Actuarial and Consensus Clinical



Sample: Four independent ratings of 80 cases; see Baird et al., 1999

Risk Assessment Study Sampling Frame



*Outcomes include:

a. New investigations
b. Maltreatment substantiations
c. Child injury severity
d. Child placement

California Family Risk Assessment Study

Study designed in a workgroup of 25 experienced California child welfare workers.

'Based on your experience/research/info, what risk factors can be reliably observed at CPS investigation closure, under field conditions'.

Design data collection instrument, applying local definitions.

2,500 CPS investigations followed 24 months post-closure
(seven counties: LA, Orange, Sacramento, etc).

After statistical analyses, group vetted final choice of risk assessment factors.
(Wagner & Johnson, 1999 or Shlonsky & Wagner, 2005)

California Actuarial Risk Factors

Prior CPS investigations/substantiations by type
Prior protective services episode

Number of children in family
Age of youngest child
Child mental, developmental, physical characteristics

Caregiver's physical care inadequate
Caregiver's mental health/substance use problems
Caregiver's history of abuse/neglect
Domestic violence
Excessive disciplinary practices
Prior injury to a child
Criminal history

Housing problems/homeless

Criminal Justice Actuarial Risk Factors

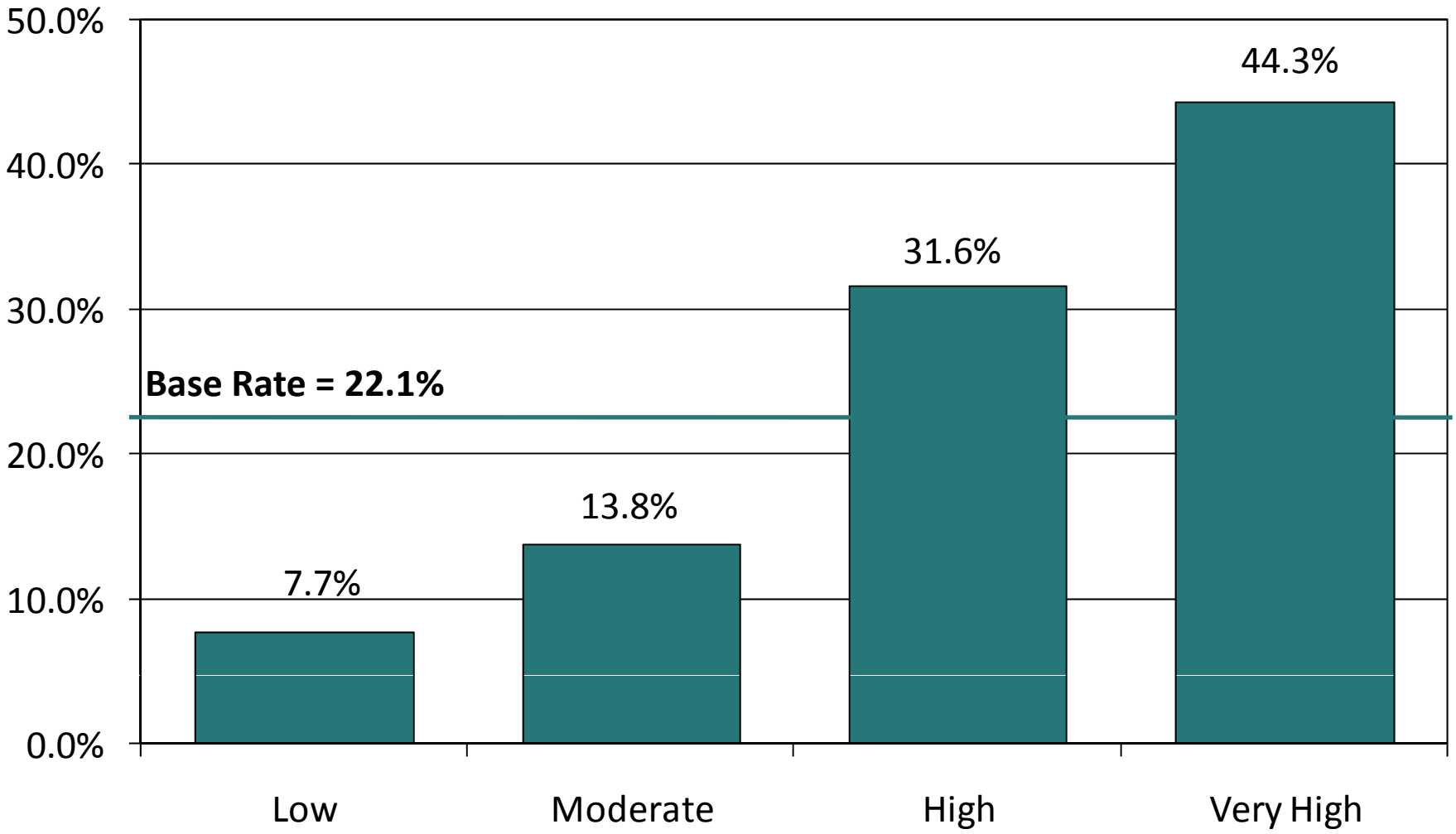
Prior arrests, convictions, referral count
Prior arrest/conviction types:
(burglary, robbery car theft, drug, weapons)

Age at first criminal arrest or current age
Prior probation/parole failures (revocation)

Substance use problems (drug and/or alcohol)
School/employment history
Peer group relationships
Abuse/neglect victimisation (juveniles)
Placement as juvenile

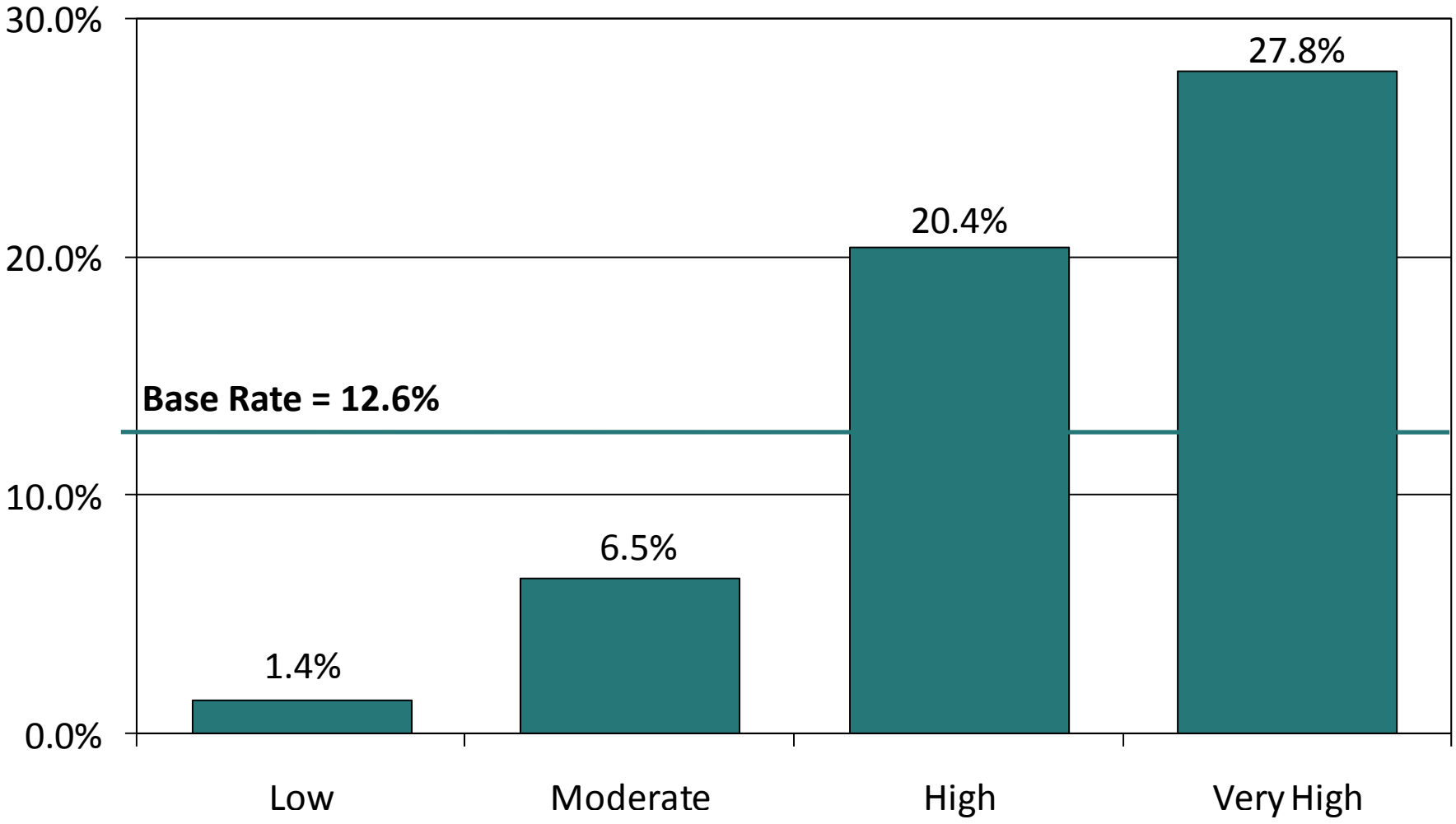
Family criminal history (juvenile)

1997 California Family Risk Assessment: 24-month Maltreatment Rate



N = 2,511; 24-month post-investigation follow-up (NCCD).

1997 California Family Risk Assessment: 24-month Child Placement Rate

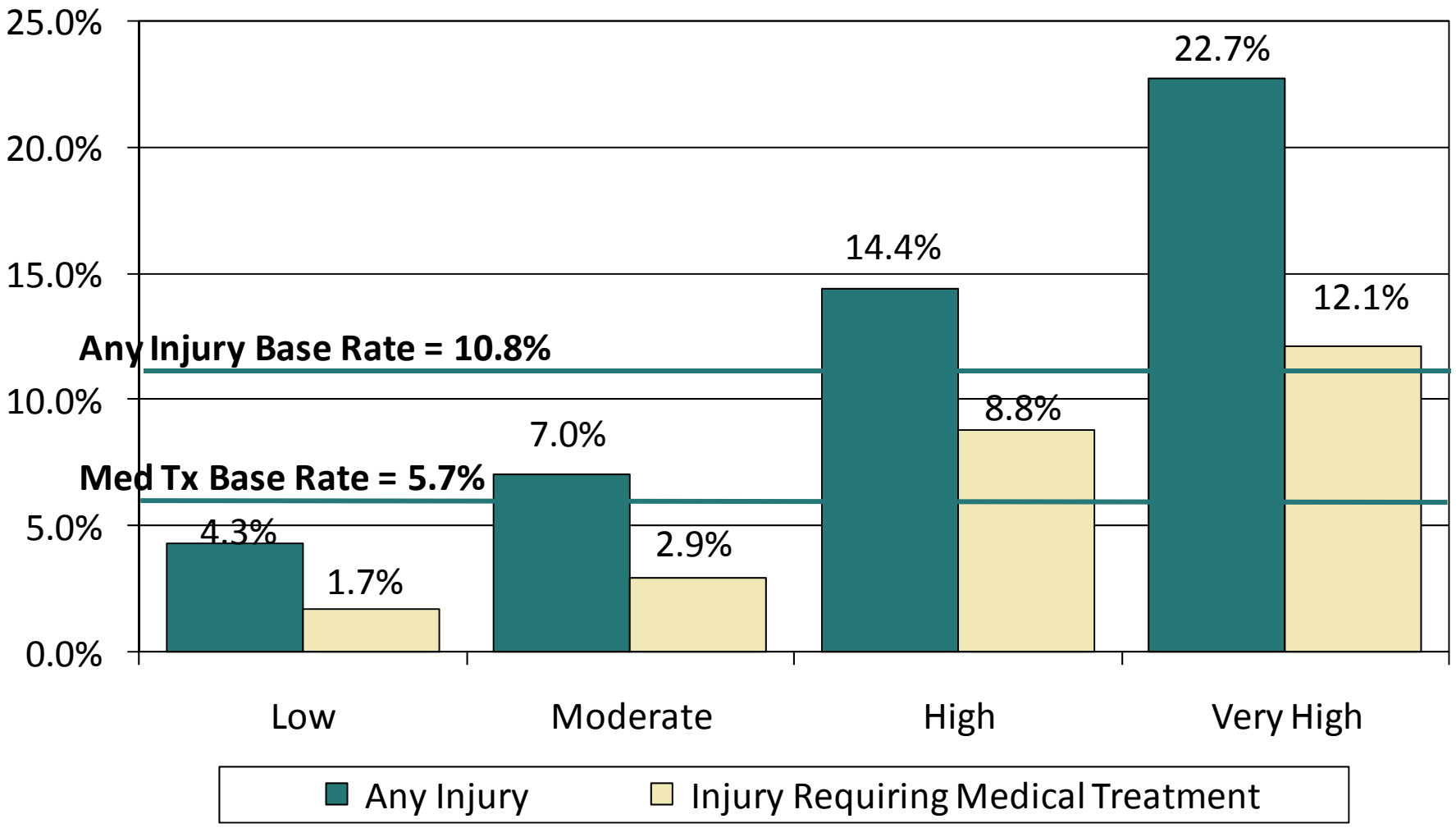


N = 2,511; 24-month post-investigation follow-up (NCCD).

California Family Risk Assessment
24-month Child Placement Rate

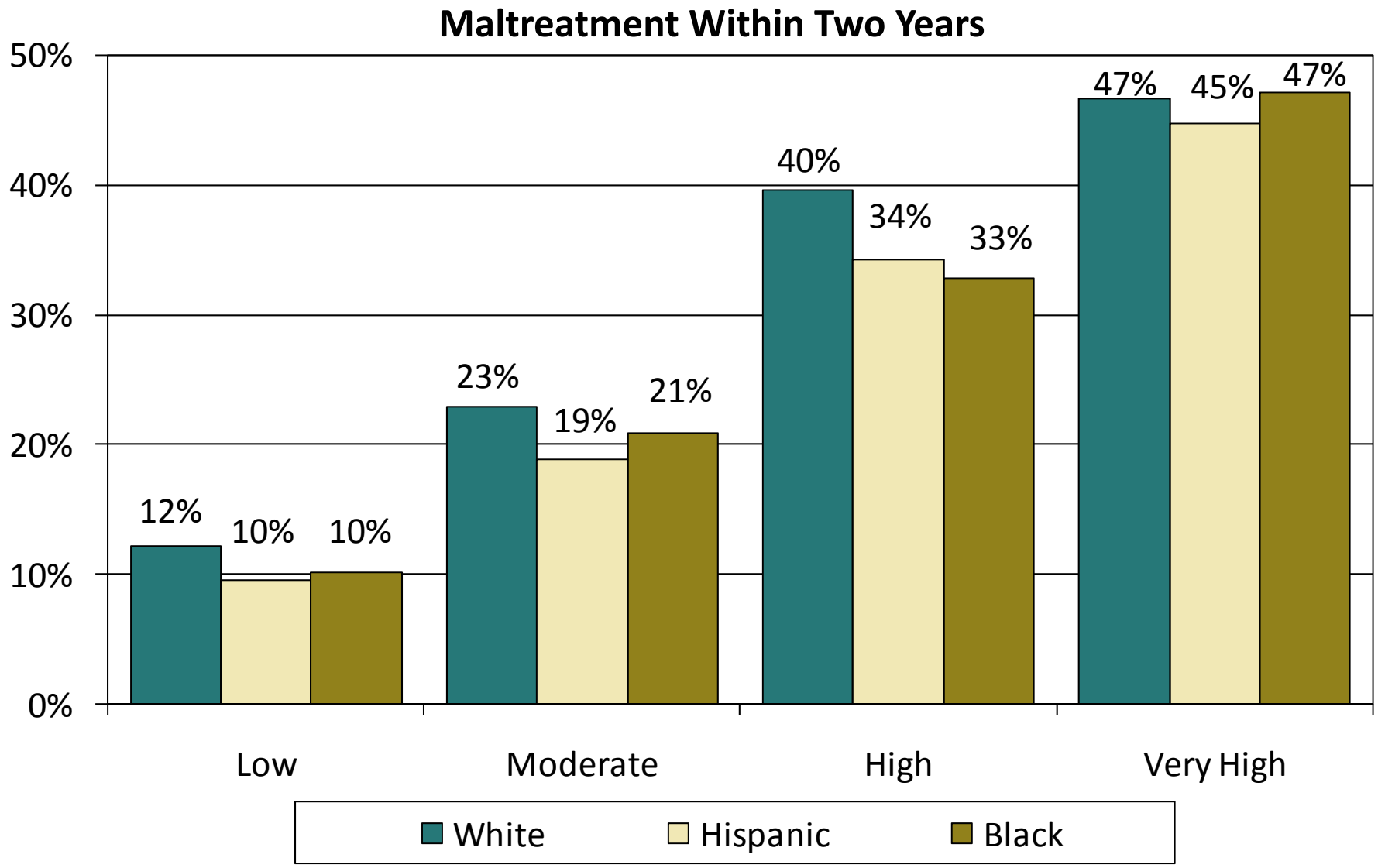
California Total Sample Cases: Final Risk Classification Findings for Follow-up Placement of Any Child				
Final Risk Classification	Sample Cases	% Sample	Follow-up Placement*	
			Cases	Rate
Low	352	14.0%	5	**1.4%**
Moderate	1,067	42.5%	69	**6.5%**
High	819	32.6%	167	**20.4%**
Very High	273	10.9%	76	**27.8%**
Total	**2,511**	**100.0%**	**317**	**12.6%**

1997 California Family Risk Assessment: 24-month Child Injury



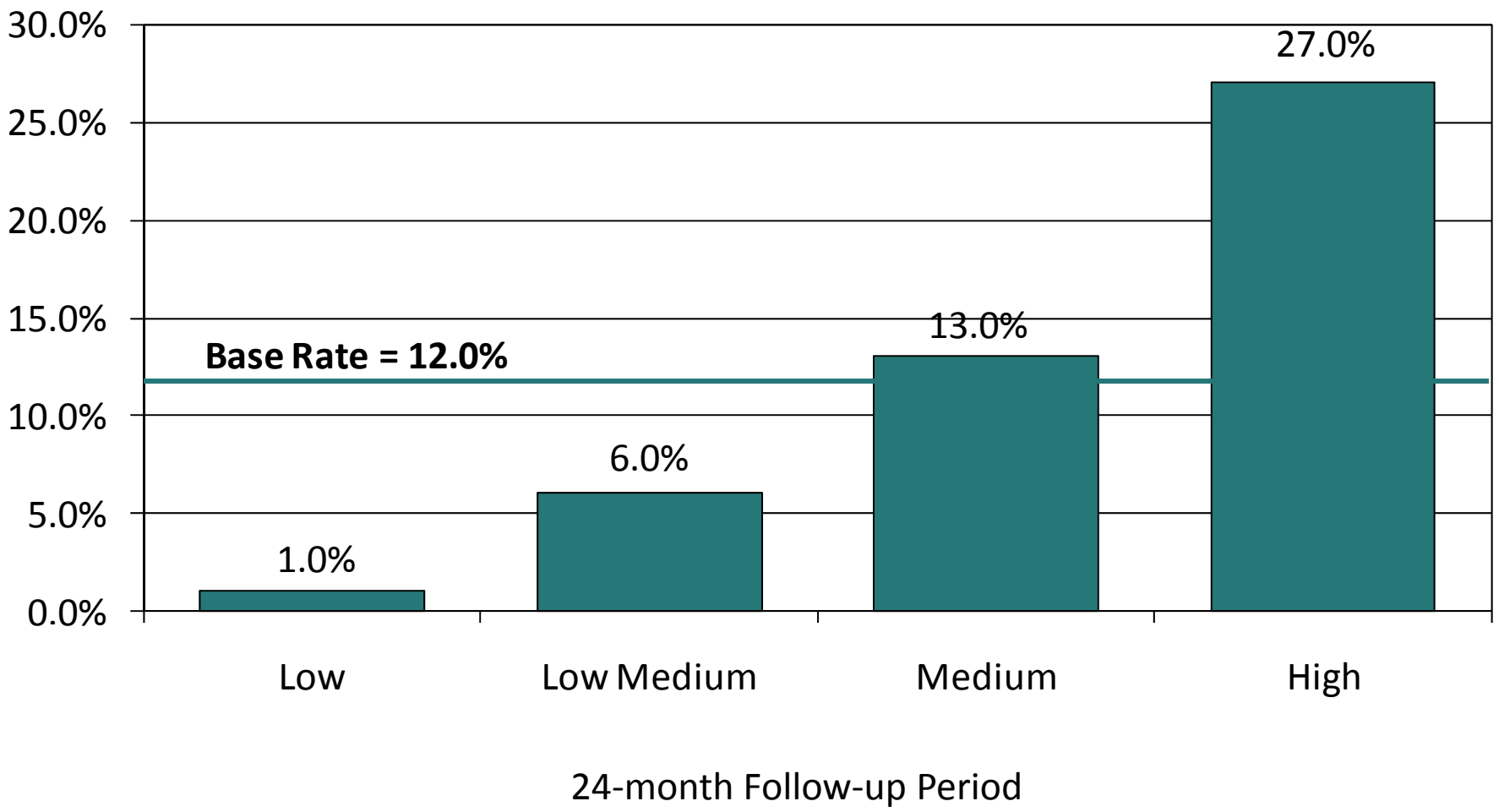
N = 2,511; 24-month post-investigation follow-up (NCCD).

California Family Risk Assessment: Equity



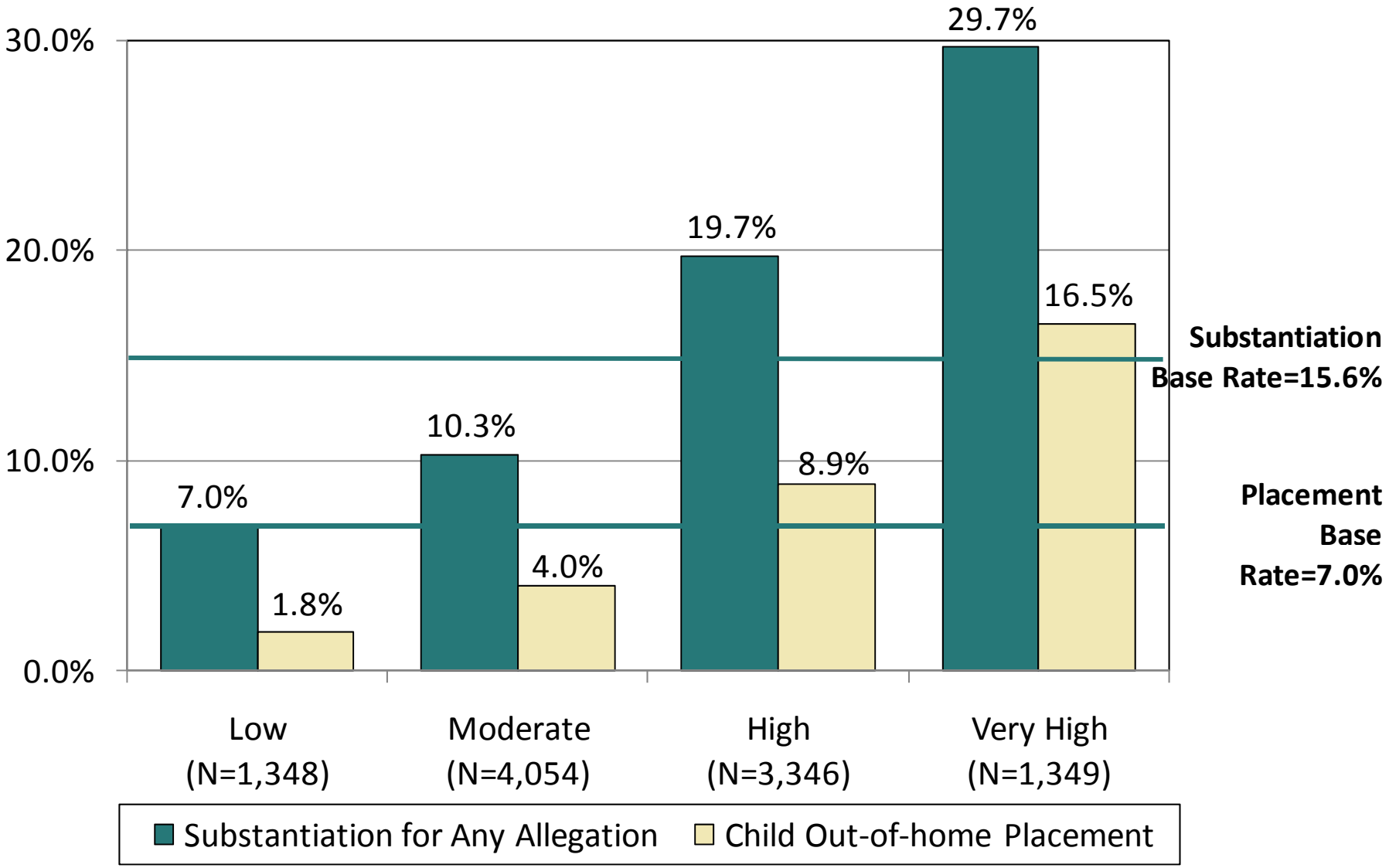
N=5,694 California Risk Validation Study, 1995

1993 Rhode Island Actuarial Risk: 24-month Child Hospitalisation/Medical Attention*



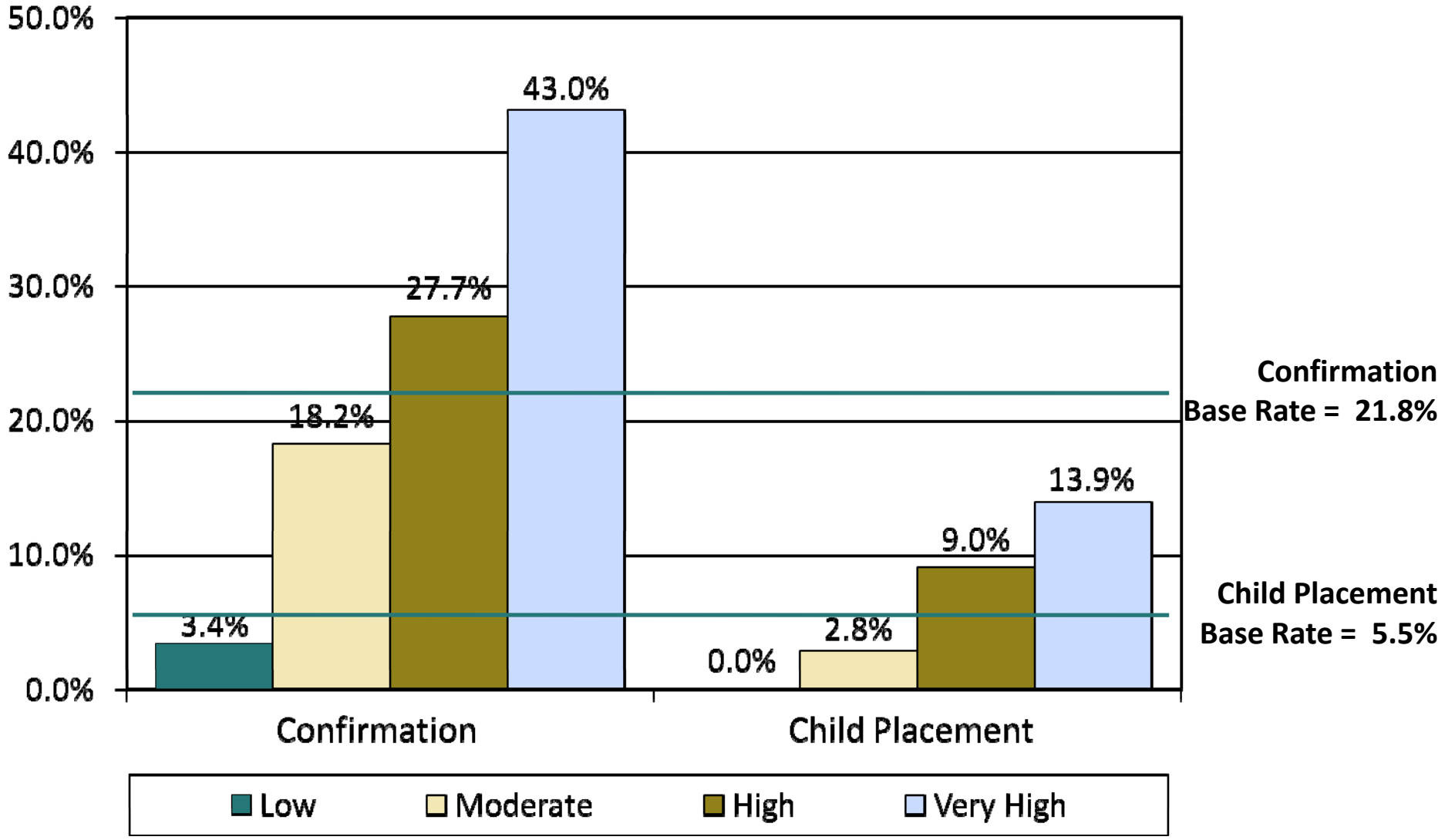
* Wagner & Squadrito, 1993

2007 California Family Risk Assessment: 18-month Maltreatment and Placement Rates



N = 10,097 Johnson, Wagner, & Scharenbroch 2007

South Australia Risk Classification by 18-month Confirmation/Child Placement



N = 674; see Johnson, Wagner, & Wiebush 1999.

Actuarial Risk Assessment in Corrections

- A longer tradition of use dating to 1928
- Well established in US federal parole by 1970s
- Adopted by probation and parole in the 1980s
- As later slides indicate, actuarial risk assessment findings in adult or juvenile corrections are similar to CPS.

Correctional History of Actuarial Risk Assessment

1928 Illinois Parole Board. Burgess develops a simple actuarial device to predict recidivism; 1,000 offender release sample.

1954 Glaser tests Burgess risk assessment re: 2,600 1940–9 releases. Proves more accurate than prognoses of prison psychiatrists.

1961 California adopts actuarial risk assessment for use by parole board (D. Gottfredson). It proved more accurate than a clinical prognosis.

1978 The US Parole Commission adopts Gottfredson's (SFS) risk assessment.

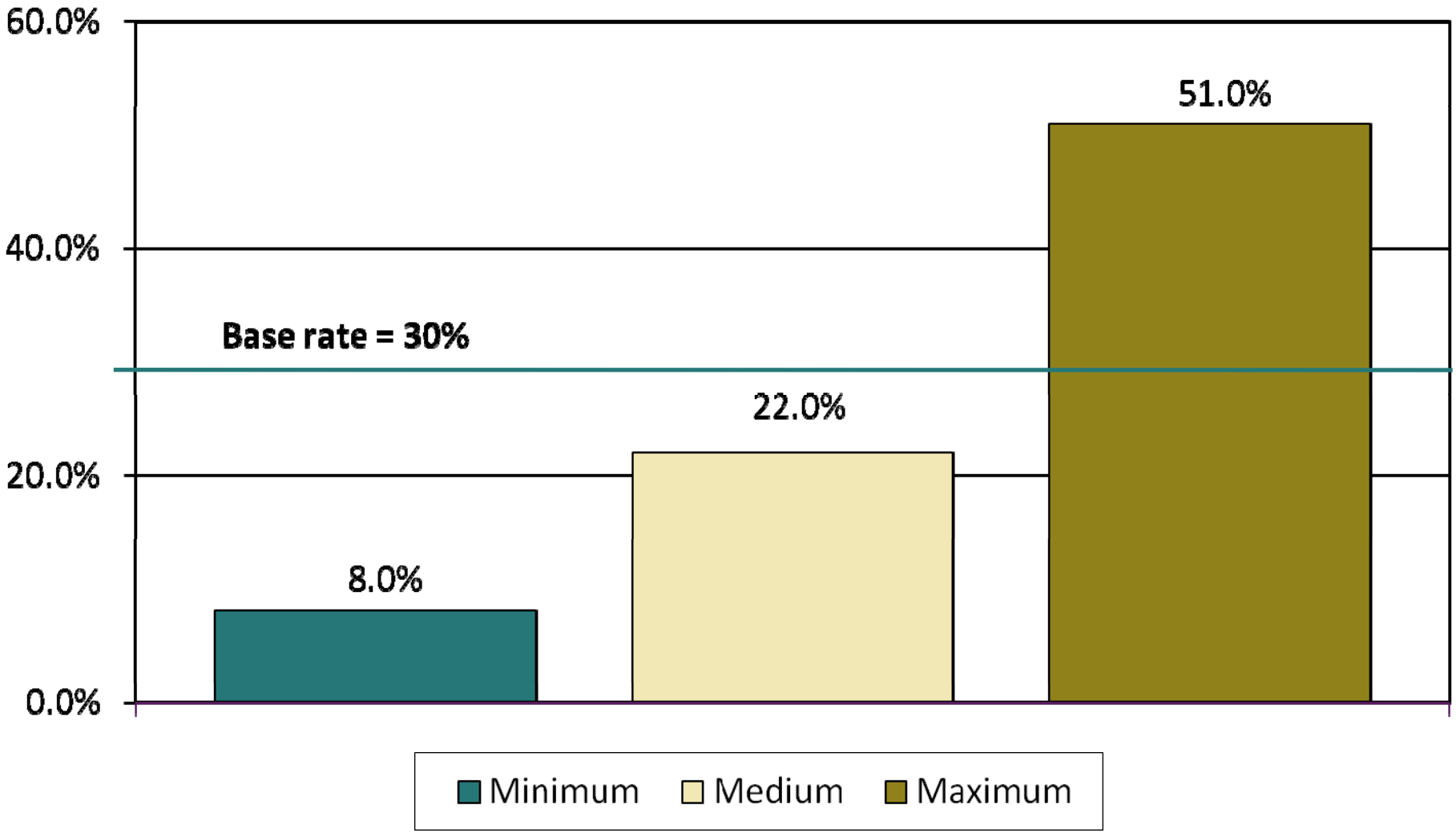
1979 Wisconsin develops actuarial risk assessment for probation/parole. Differential supervision assigned by risk classification. Lower recidivism found among high risk offenders with enhanced case management. Workload standards adopted (Baird).

1983 U.S. National Institute of Corrections endorses Wisconsin case management system as a national model. Adopted by 100 jurisdictions.

Nevada Adult Probation/Parole Admission Risk Assessment: Revocation or Felony Conviction at 24 Months

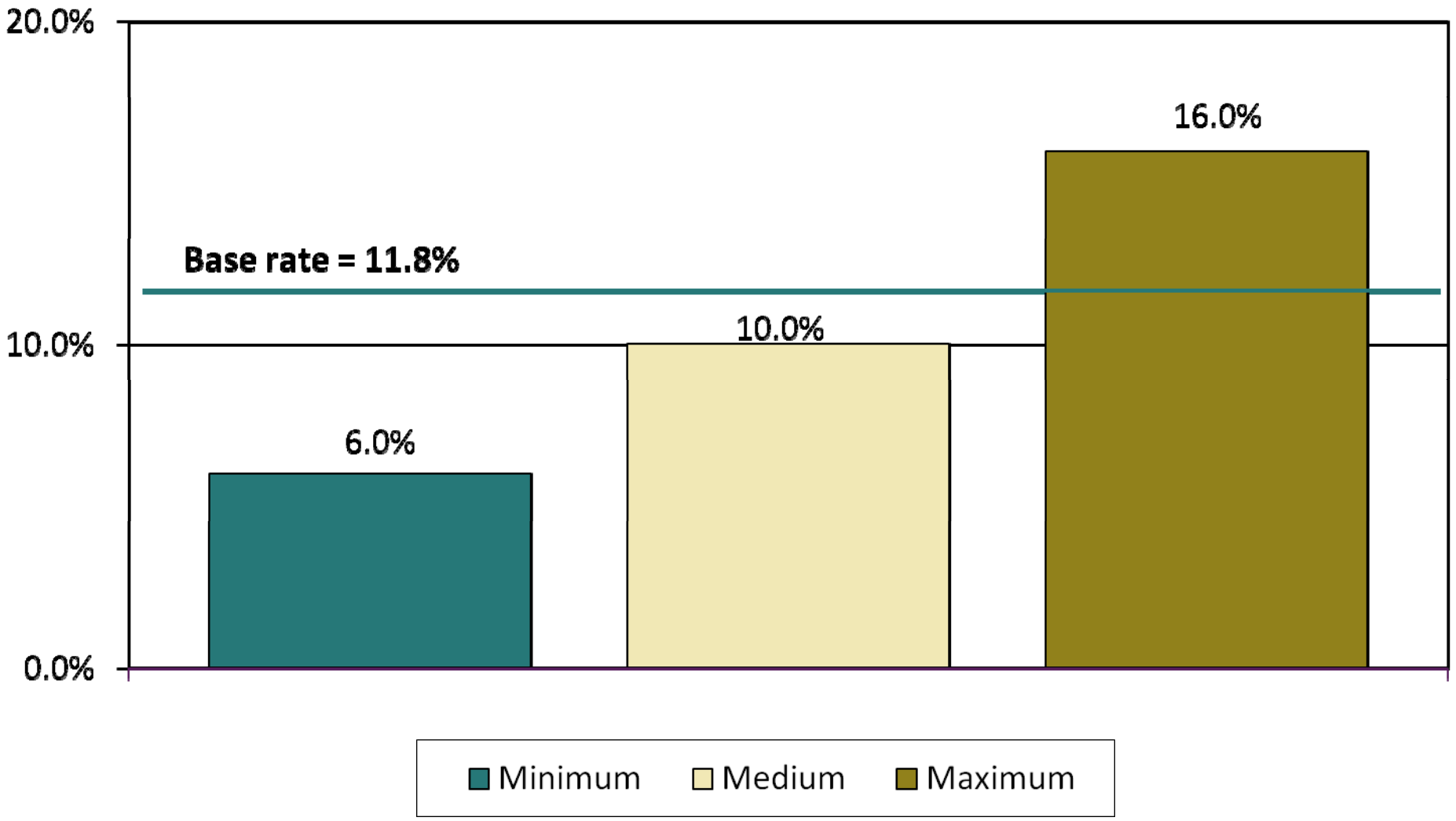
Risk Score	Risk Classification	Percent of Cases	Subsequent Felony/ Revocation Rate
0 to 7	Minimum	229 (18%)	**8%**
8 to 16	Medium	592 (47%)	**22%**
17+	Maximum	447 (35%)	**51%**
Total		**1,268 (100%)**	**30%**

Nevada Adult Risk Assessment: Revocation or Felony Conviction at 24 Months



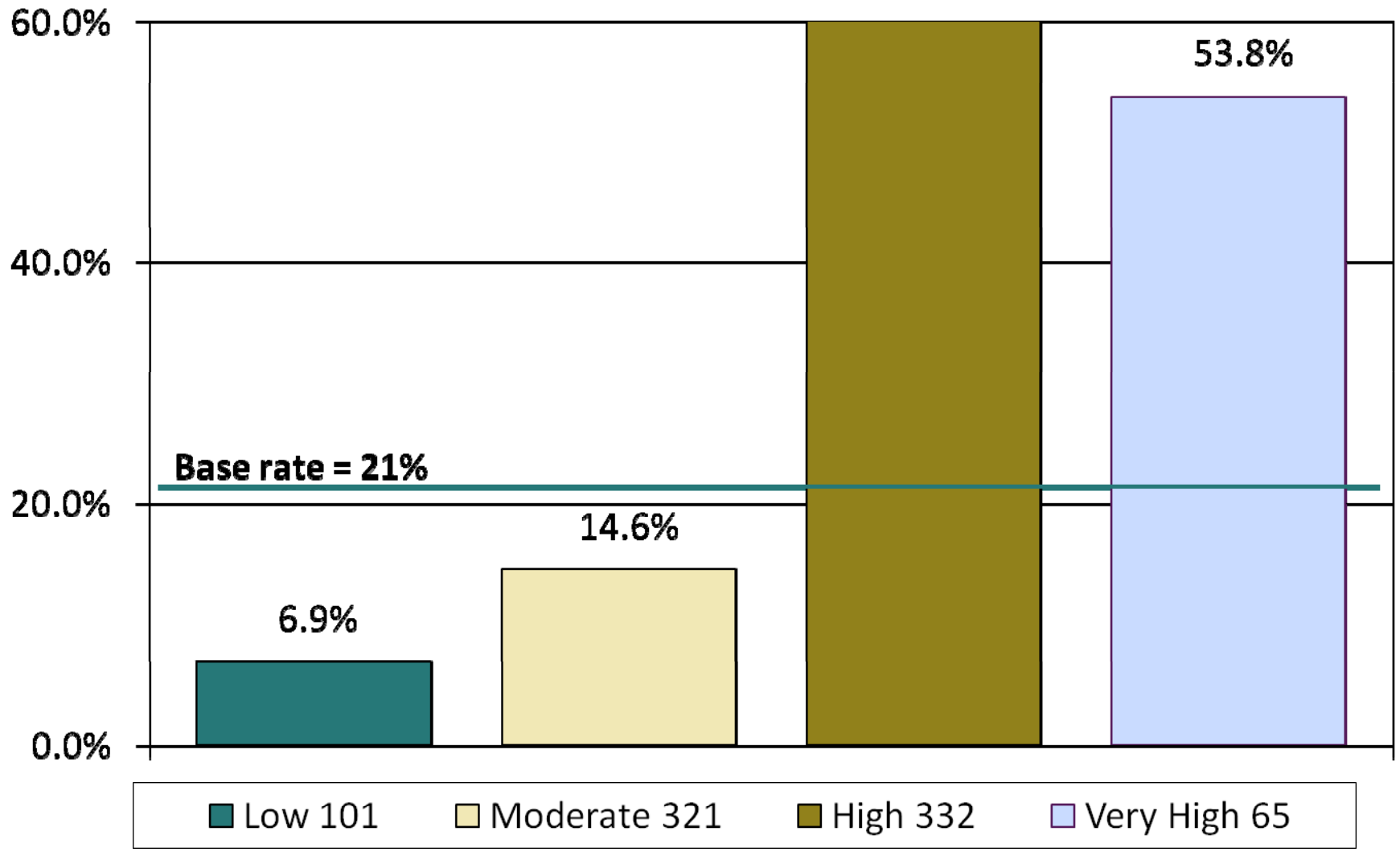
N = 1,268 based on 24-month follow-up.

Nevada Adult Risk Assessment: Arrest for Violent Offense at 24 Months



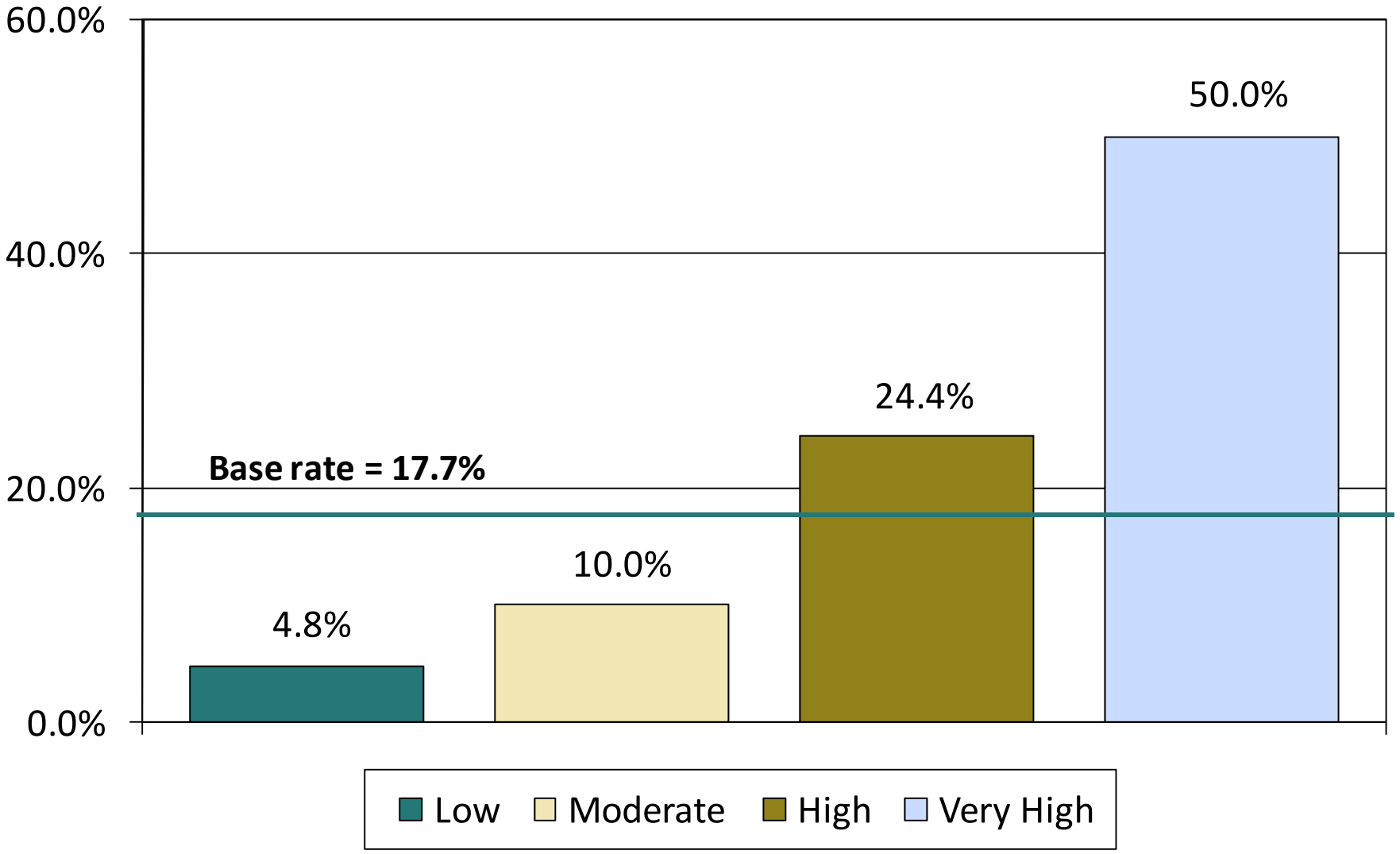
N = 1,268 based on 24-month follow-up.

Indiana Juvenile Risk Classification by Adjudication at 12 Months



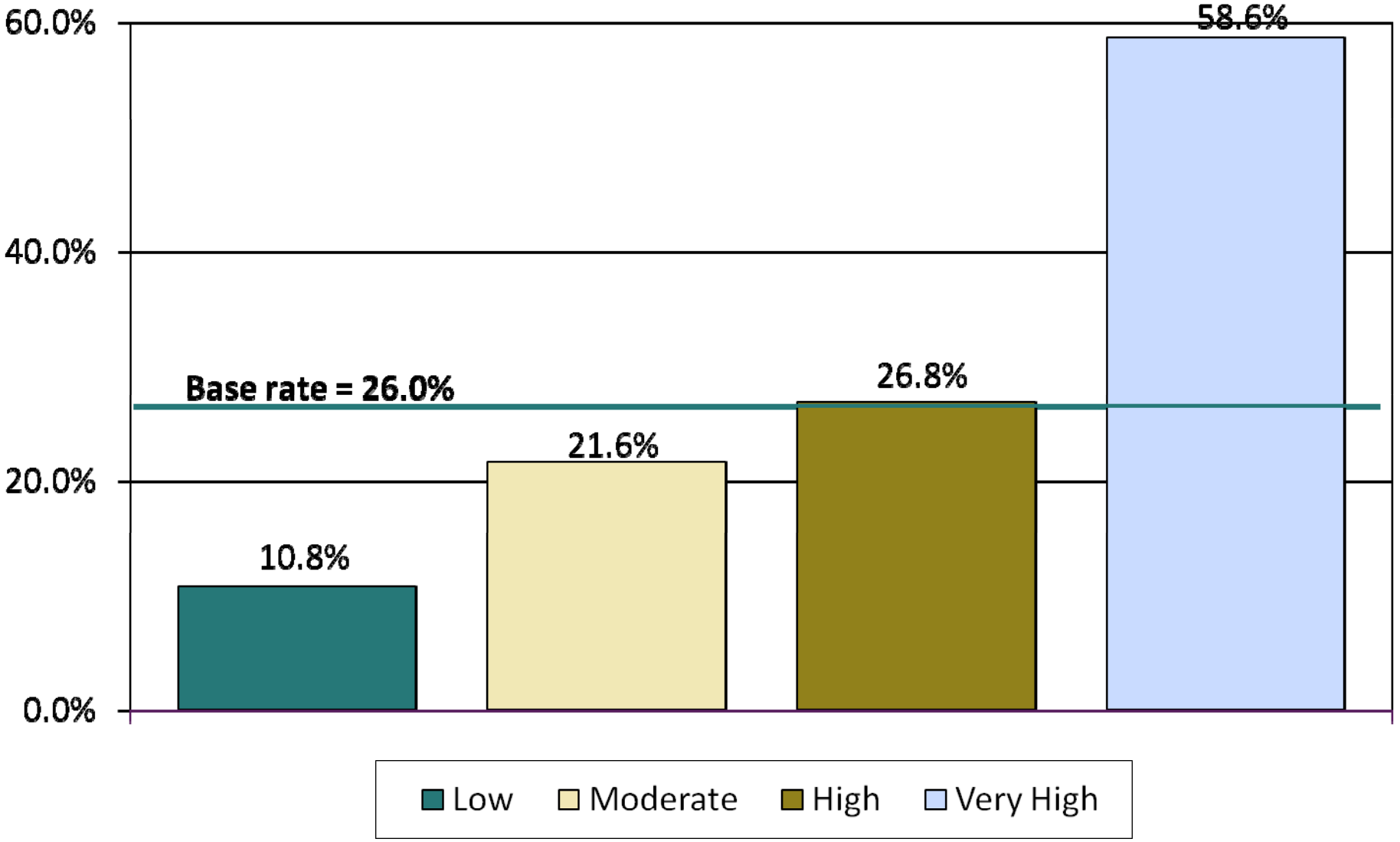
N = 819 based on 12-month follow-up.

Indiana Juvenile Risk Classification by Adjudication: White



N = 491 based on 12-month follow-up.

Indiana Juvenile Risk Classification by Adjudication: Non-White



N = 304 based on 12-month follow-up.

INTEGRATING ACTUARIAL RISK AND CLINICAL PRACTICE

Integration Approaches in Practice Setting

1) Use policy and discretionary overrides in practice.

2) Prioritise high risk for clinical assessment and case management.

3) Clarify the utility and limitations of actuarial risk findings.

4) Emphasise the critical role of clinical judgment in treatment.

CPS Policy or Discretionary Overrides to Actuarial Risk

Policy conditions: Risk level is set to very high.

1. Sexual abuse AND perpetrator access to victim.
2. Non-accidental injury child under age three.
3. Severe non-accidental child injury.
4. Parent/caregiver involved in child death (previous/current).

Clinical Discretionary (higher level).

Corrections Overrides to Actuarial Risk

1. Sexual assault and offender has access to victim.
2. Violent offense in last five years with injury to victim.
3. Use/possession of a handgun.
4. Discretionary override by officer.

CPS Case Opening Guidelines Integrate Clinical Decisions

Risk Level	Recommendation
Low	Close, unless unresolved safety issues
Moderate	Close, unless unresolved safety issues Refer to Community Services
High	**Open for clinical assessment/treatment** **Reduced caseload**
Very High	**Open for clinical assessment/treatment** **Reduced caseload**

CPS Differential Case Management

Sample Guidelines: Child in Home With Family

Risk Level	Contact Guidelines
Low	One face-to-face visit every month with the child and caregiver(s); and one collateral contact per month by the worker
Moderate	One face-to-face visit per month with the child and caregiver(s); and two collateral contacts per month by the worker
High	Two face-to-face visits per month with the child and caregiver(s); and three collateral contacts per month by the worker
Very High	Three face-to-face visits per month with child and caregiver(s); and four collateral contacts per month by the worker

Why Use Actuarial Risk Assessment?

- Actuarial prognostic models triage high risk families/offenders into clinical assessment/treatment. Limited but critical task in large public agencies.
- A necessary first step for reducing maltreatment or criminal offending but not sufficient.
- Changing predicted behaviour is a clinical task. This remains the primary challenge in CPS/corrections.
- Engaging high risk clients, diagnosing behavioural dynamics and setting treatment goals are essential clinical skills for behavioural change.

Actuarial Risk Assessment Is Not:

- A contextually sensitive needs/protective factors assessment identifying viable treatment strategies for a particular case.
- Other specialized assessments evaluate substance abuse, parental strengths/deficits, mental health, etc.
- Does the client drink because of depression or depressed because of drinking? Important clinical question. Requires client engagement and case-sensitive information.
- Can <u>any</u> fixed assessment answer these questions? (See Shlonsky & Wagner, 2005.)

Challenge to Future Clinical Practice in CPS/Corrections

- Can we develop effective clinical approaches that change the behaviour of high risk clients? This is necessary to reduce harm to children or criminal victimisation.

- Active experimentation in this area is required. It must be pursued with accurate actuarial identification of high risk families and/or offenders.

- Example: BOSCAR Evaluation of NSW Court Liaison Service (Bradford & Smith). Can we ask what the impact on high risk cases was? We can if we use the risk assessment reported in the Screening Juvenile Offenders for Further Assessment & Intervention study (Weatherburn, Cush, & Saunders).

What do we mean by validating a prognostic model?*

In both the model's development sample and an independent validation sample:

1) Model provides prognostic information, e.g., event rates between groups are significantly different.

2) Functional form of the prognostic model is correct—groups predicted to exhibit higher event rates do so.

3) Each prognostic variable (risk factor) is significant.

Actuarial models noted above meet these requirements.

*Altman & Royston. (2000). *Statistics in Medicine,19*(4), 453–473.

Agency Relevant Risk Assessment Evaluation Criteria

Validity:	Provides prognostic information re: recidivism in correct functional form for assigned groups and each variable?
Inter-rater Reliability:	Different officers scoring same case arrive at the same risk classification? Consistent and equitable practice?
Equity:	Prognostic form correct for ethnic/gender groups?
Utility:	Assessment findings guide agency decisions and policy? Assessment, case management standards and service priority based on prognostic group?

Do combined risk/needs models meet these criteria?

Hard to determine.

Validations of YLS/CMI, LSI-R or YASI rarely evaluate prognostic groups or component variables. Typically based on outcome correlation with total score, ROC or AUC.

Inter-rater reliability seldom tested. Tests of internal scale consistency are not substitutes for inter-rater reliability.

Validations that evaluate prognostic groups and underlying variables do not show strong findings regarding these criteria.

Should 'criminogenic' need or protective factors have a significant relationship to recidivism?

Relevant Validation Study Findings for Combined Risk/Needs

- Flores et al. (2003) YLS/CMI validation for Ohio juvenile offenders.
- Only 8 of 42 items significant (≤.10) with positive relationship to recidivism. Another 3 items significant in wrong direction, i.e., negative re: recidivism. (p. 74)
- Only 2 of 8 domains (prior/current offenses and substance abuse) had significant positive relationship to re-arrest. One significant but negative. Multivariate analysis. (p.73)
- 'Correctional agencies should be wary of adopting universal risk/need classifications without norming them to their populations' (p. 32).

LSI-R /ADULT: Pennsylvania Board of Probation/Parole

Austin 2003 and 2006: Pennsylvania Board of Probation/Parole study.

Only 8 of 54 LSI-R items significant re: recidivism. Most are 'static' criminal history and prior drug use items.

Low overall inter-rater reliability, i.e., 29% disagreement on the risk classification.

Risk Assessment Validation: Why It Matters

- Actuarial risk assessment can help public agencies manage risk more effectively.
- This requires a clear understanding of the limitations of risk assessment as well as the critical role clinicians must play in altering the behavior of high risk cases.
- Validation of actuarial risk assessment instruments is critical to their effective deployment. They must demonstrate that they work in jurisdictions that adopt them.
- The validation standards applied by medical researchers (Altman & Royston, 2000) are clearly applicable to any risk assessment model employed in corrections or CPS.

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