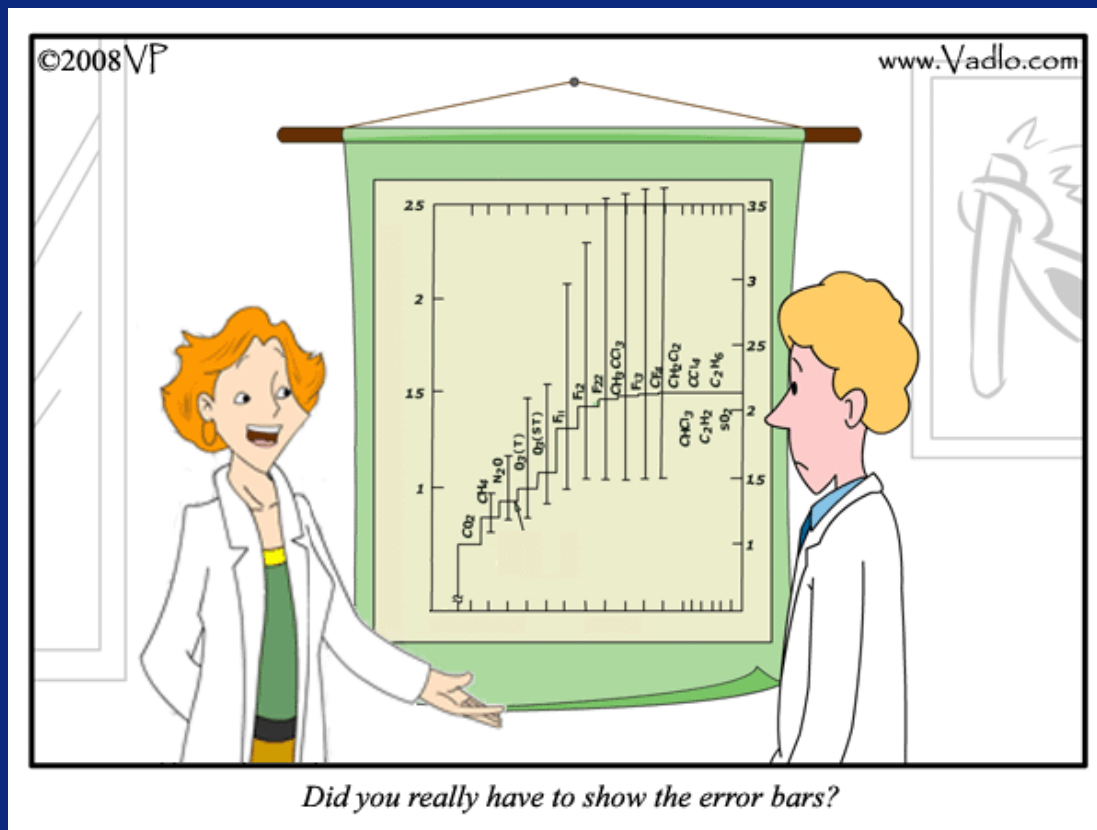


# Perspectives on Error Rate Reporting in Forensic Casework and Testimony



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# Tower of Babel

- Tuesday Morning Panel
- Mnookin – show me the data
- Faigman – error rates
- Bono – can't calculate it (received applause); muddy the waters!
- Petraco – 1 in quadrillion
- DNA model!!!!

# DNA Model

- Should you follow it?
- Gold Standard
- Objective
- There is little discussion on subjectivity
- Highly subjective in some applications
- Education and training issues
- What happened with the NAS Report and Courts with DNA?

# Non-DNA World

- You have a phenomenal opportunity
- Do not follow the current DNA model
- Be far more open
- Discuss limitations (Faigman/Mnookin position)
- Change the culture and raise the expectations

# Communication

# Whose Fault?--*Daubert* and the Notion of Error: Error Rates, Diagnosticity, and Overclaiming In Forensic Science

D. Michael Risinger

- “*Handwriting is even more precise than DNA evidence for identification purposes.*”
- Det. Chris White, testifying at trial as handwriting expert in Commonwealth v. Florence. *See Florence v. Commonwealth*. 120 S. W. 3d 699, 701(S. Ct., Ky., 2003)

# Is this statement true?

- Ever
- Sometimes
- Expertise
- Communication
- Risk association
- Of any value

# Communication

- Difficult because of Adversary umbrella
- Known error rate [of method] vs statistical weight (read what your “critics” are saying)
- Maybe questions and discussions need to be better framed
- Need to stop comparing with DNA and/or need to learn how DNA handled it before.....



# Adversary System and Science Perspective

- Courtroom v Scientific Process of Criticism
- Courtroom is not a good venue for resolving science issues – it perverts science
- Some said, for example “DNA Forensic Science is not a science”
- Some said “Consensus means that there is a conspiracy”
- Some said “The field is corrupt”
- The best approach was to address scientific issues
- Needs to be done for each discipline!

# Errors Occur

- Are they due to being fundamental problems of the science?
- Are they the result of an individual not performing correctly?
- Could sufficiency apply to both of the questions above?
- Are errors disclosed (individual or collective)?
- Are the risk of error/ limitations of technology disclosed?
- Should/Can more be done?

# Issues of Error

- Measurement error
- Human error
- Contextual and Confirmation bias
- Communication (different focal points)
- Risk assessment and conveyance

# Properly Convey Evidentiary Weight

- “DNA-based” model of quantification???
- Quantitative assessment
- Qualitative statement that appropriately conveys the significance of the match or association – each discipline is different (Ex: shoe print v handwriting)
- Hair microscopic vs mtDNA example

# Where Do WE Go From Here?

- Philosophy change - openness
- Recommendations
- Interpretation
- Case Reporting
- Education
- Training
- Ethics
- Validation, Statistics
- Problem solving

# Addressing Errors

- Need a strong QA program (models exist and in practice) - raises standards of operation
- Focus on areas of likely error
- Most often human error
- Most people do good jobs
- A few tend to make most of the errors
- Do not confuse standards and standardization
- More education and training

# Addressing Errors

- Validation studies
- Describe limitations
- Make limitations available to community
- State assumptions

# Errors and Bias

- We all can appreciate that a technique can be reliable despite the unavoidable prospect of *some* erroneous interpretation due to analyst error or bias
- Important to recognize that errors occur (human beings)
- **What is done about the error is the real issue!**
- While we need to eliminate the few rogue practitioners – focus on the stated practices for a discipline as the model
- Having said that – must be applied correctly



# Errors

- Instead some focus on diminishing the weight of evidence based on a hypothetical error rate that does not necessarily apply to the case at hand
- Some might proffer “the fact that an error is possible necessarily lessens the value of the evidence”; However...
- A “known” error rate or proficiency test mistake is at best some indirect measure of the verity of the proposed results in any given case
- But can never be a direct measure of the reliability of the specific result(s) in question

# Errors

- Did an error occur in the case analysis that results in a false match or inclusion, a wrongful exclusion, or overstates the evidence
- Proper to ask if analyst has ever committed an error or errors and what was done about the error
- Perhaps maintain a portfolio

# Errors

- Error rates are difficult to calculate - they are fluid
- Corrective action is taken (to include review of cases analyzed by the examiner prior to and post the discovery of the error)
- That performance error may no longer impact negatively on the individual's future performance
- In fact, he/she may be better educated and less likely to err
- The calculation of a current error rate would have to accommodate corrective action

# Errors

- An incorrect description of current error rates - false positive error rate for microscopic hair comparison is 12% based on a study of morphological hair comparisons and mitochondrial DNA analysis
- The Houck and Budowle study contains no data on false positive errors - a comparative study of the different resolving capacities of the methods
- Do not confuse these two issues! - similar to ABO and DNA
- However, if an analyst purports that the hair (based on microscopic comparison) is from one person only (source attribution), then...

# Peer Review

- Confirmation and contextual biases are inherent in the psyche of human beings
- Science advocates independent confirmation and peer review to overcome these potential weaknesses

# Blind Verification

- An internal peer review
- Defined as an independent second examination of an item(s) of evidence by another qualified examiner, who does not know the conclusion of the original examiner
- Withholding the interpretation of the first examiner from a second independent examiner can decrease the effects of bias
- The protocol should ensure that the blind verification process includes both associations and non-associations

# Peer Review v Espousing Errors

- Most of the forensic disciplines employ non-consumptive forms of examination
- The most direct way to measure the reliability of the purported results is have another expert conduct review and/or
- Conduct a re-analysis (or review) – (NRC II Report – DNA)\*\*\*
- More meaningful and less costly than entertaining experts espousing hypothetical error rates
- Scientists should search for the truth

# Interpretation

- In lieu of a quantitative approach...
- Not a justification to not convey weight of evidence (Is DNA exempt from this problem?)
- Imperative that the weight of the evidence be explained so that investigators, fact finders or other scientists can appreciate the limitations of the analysis and comparison



# Interpretation

- Strongly recommend to document and provide to the legal and greater scientific communities...
- The limitations associated with qualitative interpretations
- The features used to effect an interpretation
- The relative rarity or commonality of those features
- Useful for communication and would assist the prosecution and defense in mounting support or criticism

# Specific Definitions Regarding Qualitative Associations in Case Reports

- Provide more definition or supporting data in case reports for qualitative/quantitative statements offered
- Such additional information might be provided during courtroom presentation to assist the trier of fact
- However, most cases never reach the courtroom because they are plea-bargained or the additional information is not elicited during testimony!!!!

# Specific Definitions Regarding Qualitative Associations in Case Reports

- Define what additional information should be placed in reports so that the significance of qualitative statements can be better understood by all parties
- Appropriate supporting information in the report should encompass the ASSUMPTIONS, analyses, comparisons, associations, conclusions and other interpretations drawn from the data generated or other information gathered during a forensic evidence examination
- Documentation!!!!

# Conclusion

- Each discipline has its own requirements; but some practices/philosophies transcend the disciplines
- Create the right environment and science issues can be addressed professionally and responsibly
- Address errors appropriately
- Education and Training responsibilities (statistics)
- Train Trainers
- Continuing Education
- Ethics and Professionalism
- Review of practices (e.g., sufficiency)