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Title:

Statistical evaluation of DNA evidence in criminal casework

Abstract:

Probability and statistics have much to offer the legal system but, with the exception of DNA profile evidence, this potential is barely exploited. Even for DNA profiles, the computation and interpretation of probabilities used to convey weight-of-evidence have been controversial, and misunderstandings are common. During my experience of over 20 years working with DNA profile evidence in the UK criminal justice system, I have seen big advances by forensic scientists in their appreciation and use of statistical ideas and methods. Paradoxically, as standards have improved courts in England and Wales have become more resistant to numerically-based reasoning, and even statistical assessments of DNA profile evidence have been undermined by a recent Appeal Court judgment. I will review statistical approaches to the evaluation of DNA profile evidence, illustrating some of the many statistical subtleties and complexities with reference to cases in which I have been involved. I hope to show why judges have good reason to be wary about statistics in their courts, but also why moves to discourage statistical reasoning are likely to be detrimental to justice, both in cementing past and present bad practice and in missing out on opportunities for improvements.