

TALK TRANSCRIPT

Slide 1: The presentation will compare criminal procedures in adversarial versus inquisitorial justice systems. When talking about forensic science, the focus is on fingerprint identification and DNA profiling. I will describe how wrongful convictions may occur based on forensic science evidence, and highlight the types of scientific and evidentiary errors, as well as unconscious psychological biases, that may creep into criminal cases involving forensic evidence. Then, I will discuss ways in which forensic science evidence can be strengthened, with suggestions for guidelines on reporting a match, and highlight what legal professional need to know. Finally, I will consider the safeguards that exist to avoid wrongful convictions in the adversarial and inquisitorial systems, and suggest new safeguards that can be introduced.

Slide 2: There are many important differences between adversarial and inquisitorial justice systems that may account for their differential vulnerability leading to wrongful convictions in cases involving forensic science evidence. For example, in the adversarial system, the judge is a passive recipient of the evidence whereas in the inquisitorial system, the judge actively searches for the truth. In the adversarial system, forensic expert testimony is one-sided, but there is opportunity for expert rebuttal, whereas although in the inquisitorial system forensic experts are court-appointed, they are not necessarily fully independent. In addition, in the inquisitorial system, there is no independent investigation by the defence. Finally, in the adversarial system, the party with the most resources is at an advantage.

Slide 3: The forensic science evidence I focus on are fingerprint identification and DNA analysis. Fingerprint identification emerged in the early 19th Century, in the UK and India.

This involves comparing latent finger marks lifted from a crime scene (using various techniques) to 10-prints (i.e., fingers, thumbs and palms of both hands) of known or unknown suspects. The evidence is the number of points of similarity between the finger mark and fingerprint. DNA profiling is comparatively new, emerging in the early 1990s in the UK. This involves comparing crime scene samples of DNA to samples taken from known or unknown suspects, using various techniques. The evidence is likelihood of a random match in a population.

Slide 4: There are some similarities and differences between fingerprint identification and DNA analysis. For instance, from a scientific perspective, the uniqueness of fingerprints is assumed whereas it has been empirically established for DNA, and in fact there is no scientific basis for fingerprint identification whereas the basis is clear and unchallenged for DNA analysis. Experts in both areas of forensic science are, however, required to obtain relevant professional training. Both fingerprint and DNA analysis require pattern matching. However, whereas the criteria for a match are empirically validated for DNA analysis, they are arbitrary for fingerprint analysis. There are verification procedures in place for both fingerprint and DNA analysis. Whereas fingerprint similarity is often expressed in terms of certainty, DNA similarities are expressed in terms of probabilities. Nevertheless, both forms of evidence are rarely challenged in court.

Slide 5: Although forensic evidence is valuable in solving crimes and prosecuting criminals, errors do occur. Errors may occur at the earlier investigation/analysis stages or later at the court/evidentiary stage. For instance, at the crime scene investigation, there may be errors in lifting finger marks or gathering DNA samples, and errors in the pattern matching process, as well as errors in interpretation of the results. At the evidentiary stage, errors may arise

because the expert is not sufficiently competent to provide testimony, because details of the collection, analysis and error rates are not provided, as well as because the forensic evidence goes unchallenged and is overweighted.

Slide 6: There are several prominent examples of wrongful criminal convictions that occurred on the basis of forensic evidence. I briefly describe the cases of Shirley McKie in Scotland that involved fingerprint identification evidence, and Farah Jama in Australia that involved DNA analysis evidence. Marian Ross was murdered in her home in 1997 during what investigators thought was a break-in. The suspect was David Asbury, a handyman, and who had once worked for Ross in her home. Hundreds of prints were found at the crime scene, and experts at the Scottish Criminal Records Office claimed that Asbury's fingerprint was found at the victim's house, and that the victim's print was found on an item in Asbury's house. The experts also said that policewoman, Shirley McKie's thumbprint was found in the bathroom door frame of the victim's house, although McKie denied ever entering the house. The fingerprint identifications were presented at Asbury's trial, and he was convicted of murder and sentenced to life imprisonment. McKie, who continued to deny entering the house at Asbury's trial, was fired and charged with perjury. In McKie's 1999 perjury trial, fingerprint experts from the US disputed the thumbprint identification presented by the Scottish experts. They said that part of the mark found at the crime scene was distorted, and whereas the Scottish experts ignored the discrepancies between the mark and print, the US experts used these to cast doubt on the match. In summing up, the judge asked the jury to consider other factors in the case, beyond the fingerprint evidence, and even asked jurors to visually examine the thumbprint themselves. McKie was acquitted. Nevertheless, the Scottish experts maintained their conclusions. Later, in 2000, an investigation ordered by Scottish authorities concluded that the mark was not made by McKie. This called into question the

identification of other marks, including that of Asbury, and Asbury was eventually released.

Slide 7: In 2010, after taking prescription medicine and drinking alcohol, a woman collapsed unconscious in a toilet cubicle at a nightclub. The security guard who found her in a half-dressed state, suggested that she had been raped. She was taken to hospital where doctors confirmed her symptoms resembled those of victims of GHB, although no traces of a date-rape drug were found. Four swabs were taken to see if she had been sexually assaulted, one of which yielded DNA traces that matched the DNA of Farah Jama. Although a sperm count per ejaculation of 20 million is normal, the single sample yielded only one intact sperm cell and 15 dead ones. Jama, a Somali student, denied ever attending that club, no-one saw him there, and he did not appear on club CCTV. His alibi was that he was home at his critically ill father's bedside. Nevertheless, Jama was arrested and charged with rape. He entered a not guilty plea. To avoid prejudice to the accused, the court excluded the background about how the swab from Jama was obtained and came to be included in the DNA database. Although the jury asked about contamination statistics they were instructed that there was no evidence of contamination in this case and to forget about other cases. The jury also asked how the police came to have Jama's DNA sample, but they were instructed that there was no evidence on this aspect and it was irrelevant. The prosecutor told the jury not to be concerned about the absence of other evidence because the DNA match indicated that the sample was 800 billion times more likely to have originated from Jama than from an unknown person at random. Jama was convicted and sentenced to six years imprisonment. After the possibility of contamination of the DNA samples was raised before the Victorian Court of Appeal, it was revealed that 28 hours before the alleged rape, a swab was taken from a semen deposit in the hair of a young woman with whom Jama had a nonpenetrative sexual encounter. This sample was taken at the same site in the same room, where the victim had been taken by the police

for examination. The standard of cleaning in the room was inappropriate for the removal of DNA traces. Statistical probability was converted into a prima facie case. The Appeal court determined that no rape had occurred and that Jama was wrongly convicted.

Slide 8: There are several scientific errors that occurred in the cases of McKie and Jama. For example, the samples were ambiguous in McKie's case and contaminated in Jama's case. Exonerating facts were ignored in both cases and error rates were ignored.

Slide 9: In terms of evidentiary errors, only circumstantial evidence was presented in both McKie's and Jama's cases. Information about how the samples could have originated was excluded and the possibility of error and contamination was not considered. The experts' test results were overstated.

Slide 10: Finally, there is also evidence of unconscious biases in the cases of McKie and Jama. Specifically, it was expected that McKie would have entered the murder victim's house as she was a policewoman involved in the investigation, and it was expected that Jama a 20-year old male might attend a singles nightclub to seek a sexual partner. The experts thus looked for evidence to confirm their ideas, and they were overconfident in their conclusions. In addition, in McKie's case, the fingerprint experts remained committed to their conclusions despite contrary evidence, while in Jama's case contextual bias was that he was a member of 3 out groups: a racial minority, a religious minority (Muslim), and non-Australian.

Slide 11: To minimize human errors, scientists should be shielded from information that indicates the suspect is the source of the sample they are testing. Thus, the "CSI model" where scientists visit the crime scene and work alongside the investigators is risky. Instead,

procedures that segregate scientists from case information are recommended. While forensic experts do not need to know the case facts, it is important to know more about accuracy of their procedures. In Jama's case DNA tests were performed in a lab where the rate of mixed samples was unusually high, suggesting contamination, but without knowing the lab rates the presumption was no lab error. Evaluation studies are needed to tell us how often scientists declare a match when there is none, and where they fail to say there is a match when there is. So, signal detection methods reporting d prime statistics with accuracy rates and false alarm rates are recommended. It is also useful to know a threshold for a match.

Slide 12: A major controversy in the literature for 3 decades and now in legal cases and among practising forensic scientists is the language used to convey tests results in expert written reports and orally in court. Routinely, Australian lawyers refuse to allow the jury to see the expert's report because they are considered too technical and confusing, so all the fact finder may hear is oral evidence from the witness stand. The trend is away from any making any definitive statement that there is or is not a match between samples. Even fingerprints experts are beginning to use likelihood ratios rather than conclusively declare a match; DNA practice has always been probabilistic. Percentages are more persuasive and incriminating than the reciprocal likelihood that someone else is the source. Many experts make errors when questioned about probabilities. Many judges are susceptible to errors such as the prosecution or defence fallacy. It is not only lay jurors who find the language of probabilities and concept of chance difficult. Some DNA experts want to eliminate all mathematical probabilities and simply say the match is strong or very strong, after calculating the statistics in private. This practice is NOT recommended is too vague to be helpful and is also less transparent. Whatever the likelihood ratio, it is critical that the expert state the strength of the match independently of other case facts, and based only on the test results. In some cases,

particularly when the expert is not blind to the investigation and case facts, the question the expert is answering is not the same as the question the court thinks the expert is answering. Is the question: “Do these samples match?” versus “Is the defendant the source of the sample?”? The recommendations of the National Science Foundation Cognitive Group of experts leading global standards in this area were for scientific experts to avoid any comment about the source, or any ultimate opinion as to whether the sample comes from the defendant or someone else.

Slide 13: Legal professionals, whether judges or lawyers, need to be familiar with contemporary DNA profiling techniques and scientific status of fingerprint evidence. Legal professionals who believe in CSI effects are calling DNA experts to tell factfinder there is no DNA evidence. Research shows DNA evidence is very incriminating, as matched cases with and without DNA evidence produce conviction rates 23-33 times higher when included. For this reason, circumstantial cases where the scientific test results are the sole evidence linking a suspect to a crime scene, are cases where the forensic science warrants the greatest scrutiny. Although cold hits matches are rare, and cases where sole evidence is scientific are rare, a lot hinges on science in these cases. There is some evidence of the “white coat” effect among less well educated factfinders, people with less science and math expertise, those who place more faith in science, or do not understand its vulnerabilities. Familiarity with the data gathering, analysis and interpretation procedures for fingerprints, DNA and other types of forensic science is critical to understanding that it is subject to human errors. By and large, empirical studies of the US approach that relies on judges to screen out unreliable science, show this has been ineffective. The mere fact that the judge admits the expert witness is viewed by some jurors as a badge of reliability and veracity. Enhanced status may be attached to single experts, and can generate a white coat effect. Science courses, continuing education

for judges and lawyers can assist in avoiding a typical scattergun cross-examination covering all stages all scientific analysis instead of genuine vulnerable areas. For example, in Jama, jurors figured out rapidly that the area of cross-examination should have been the source of police sample in the database and potential confirmation surrounding that event. Suggesting to the expert that there was contamination in the match of Jama against his own sample was not illuminating. The scientific test appropriately yielded strong results. In addition, the legal professional need to attend to whether the evidentiary framework is distorting the information before the factfinder. The inquisitorial system and lay-jurors tend to look for ultimate truth. Would it have been prejudicial to know that Mr Jama had his DNA sample taken the previous week because he was a suspect in an acquaintance rape case? Was it more prejudicial to exclude this information? These are empirical questions and challenges to the adversarial system because of the rules developed as to what comprises a fair trial. Although, studies have shown that just as scientists can be biased by contextual information, judges too are also biased by knowledge of inadmissible evidence such as information about prior criminal conduct by the defendant.

Slide 14. What are respective legal safeguards in the adversarial and inquisitorial legal systems to ensure reliable scientific evidence is considered? Both have some strengths and some vulnerability. Completeness of information can be crucial but also biasing. The adversarial system places increasing emphasis on exchange of information between the parties before trial and more communication between experts before trial, even some concurrent testimony by experts so that points of consensus are clarified, points of difference highlighted and there is less fragmented testimony at trial.

Slide 15: To help determine which safeguards to implement, we need to acknowledge the

significance of fact-finding in cases involving forensic scientific evidence. 90% of cases turn on their facts, not the law. We should be teaching lawyers more about effective fact finding and less doctrinal law. To avoid wrongful convictions, we need procedures that promote relevance, reliability and fairness from whatever system. Recently, the Chief Justice of New South Wales in Australia retired, and was very critical of the traditional view of the adversary system that ignores the pursuit of truth as the major objective of the legal system. He said: (read quote) that truth is the paramount concern even in adversarial systems, not reduce legal process to a forensic game.

Slide 16: Justice Spigelman described 3 traditional views of adversarial justice. Interestingly, he started out in his role as Chief Justice believing in second option and finished by endorsing the third.

Slide 17: In drawing to a close, we should consider which system, adversarial or inquisitorial, produces fewer errors in terms of wrongful convictions. It is still an open question. Special inquiries that follow miscarriages of justice are far more thorough, probably not representative of inquisitorial trials. Information sharing is important if the adversarial system is to work well. If not, the inquisitorial system is stronger. However, dossier review in the inquisitorial system can be vulnerable to a sort of confirmation bias itself, in pursuit of a single hypothesis. There is also less open challenge and testing of the information that is possible in the adversarial system, when it works well. Ineffective legal counsel is often the problem. Data on error rates are comparatively hard to obtain and there are few experimental studies. More are needed. Justice Spigelman emphasised the need for an independent fact finder, whether judge or jury. Perhaps we should consider taking the strengths of each system rather than committing to one or the other.

Slide 18: A hybrid adversarial -inquisitorial model has been proposed by Findley (2011) to respond to weaknesses of accessibility of information. He proposes to no longer have the institutional schism between prosecution and defence, which in both the inquisitorial and adversarial system can be a risk factor for error. He proposes to strengthen it by having a single legal pool or office, with individually qualified legal counsel whose services are rotated from prosecution and defence, so they do not build up a mind-set of one versus the other but work both cases as advocates. This addresses the problem of ineffective counsel for clients from minority groups and lack of equal resources. Scientists, all independent of police, can be consulted by all lawyers. They will not know whether the lawyer was seeking information for the State or an individual defendant. At trial the scientist should be cross-examined as if in the adversarial system. Fact finders who are independent, active, engaged could be a judge, or could be a jury. The chance to ask questions is critical. Findley advocates a jury system safeguard, including deliberation.