

# NCFS Recommendations regarding use of the term ‘Reasonable Scientific Certainty

*Comment from the Statistics and Law Section of the Royal Statistical Society.*

This is a contribution from the committee of the Statistics and Law Section of the Royal Statistical Society. Membership consists of statisticians and forensic scientists with an interest in the interpretation and evaluation of evidence. One role of the Section is to make informed contributions to the administration of justice from the perspective of people long accustomed to consideration of the assessment of uncertainty in the context of the administration of criminal justice. Information about the Section and its work may be found at [www.rss.org.uk/statsandlaw](http://www.rss.org.uk/statsandlaw) with further details on <https://statslaw.wordpress.com/>

We support all three recommendations of the National Commission on Forensic Science (NCFS).

We agree also with the sentiments expressed on page 1 that

- ‘These terms have no scientific meaning and may mislead factfinders about the level of objectivity involved in the analysis, its scientific reliability and limitations, and the ability of the analysis to reach an individualized conclusion.’ and
- ‘Science should be used in the courtroom to clarify and elucidate rather than obscure’.

We look forward to the ‘discussion and development of appropriate and clearer phrasing’ and are very willing to contribute. (Page 2.)

We also endorse the comments following recommendation 3:

‘The scientific community, through the OSAC structure, may be best positioned to propose language that conveys the nature of the examination itself, including an expression of the uncertainty in the measurement or in the data, the bases for any opinion (the underlying information, studies, observations) and the limitations relating to the results of the examination.

‘Adopting this recommendation will help develop language based on and supported by scientific data and principles that can be useful to judges and juries.’

We refer the Commission to the recent comments on the presentation of reports provided by a document prepared by a group within the European Network of Forensic Science Institutes on the topic of a Guideline for Evaluative Reporting in Forensic Science. See [http://www.unil.ch/esc/files/live/sites/esc/files/Fichiers/2015/ENFSI Guideline Evaluative Reporting](http://www.unil.ch/esc/files/live/sites/esc/files/Fichiers/2015/ENFSI_Guideline_Evaluative_Reporting)

Guidance note 1 is of particular relevance:

The reporting of the value of scientific findings shall conform to four requirements: Balance, Logic, Robustness and Transparency. These requirements are met by following the principles of forensic evaluation. The framework set out in the ENFSI Guideline describes the mechanism by which these requirements are met in formulating evaluative reports.

## **Balance**

The findings should be evaluated given at least one pair of propositions: usually one based upon one party’s account of the events and one based upon an alternative (opposing party’s) account of the events. If no alternative can be formulated, the value of the findings cannot be assessed. In that case, forensic practitioners should state clearly that they are not reporting upon the value of the findings.

## **Logic**

Evaluative reports should address the probability of the findings given the propositions and relevant background information and not the probability of the propositions given the findings and background information. The report should not contain statements that are transposing the conditional.

### **Robustness**

The reporting should be capable of sustaining scrutiny and cross-examination. It should be based upon sound knowledge and experience of the trace type(s) and the use of data. The forensic practitioner will be satisfied that the results of the observations and analyses upon which inferences and conclusions are drawn are robust. When there are insufficient data, the likelihood ratio approach provides the practitioner with a framework for structured and logical reasoning based on his experience, as long as he can explain the grounds for his opinion together with his degree of understanding of the particular trace type.

### **Transparency**

The reported conclusions should be derived from a demonstrable process in both the case file and the report. The report should be written in such a way that it is suitable for a wide audience of readers (i.e., participants in the justice system). It may include supplements explaining the technical background.

One commentator to the current NCFs consultation, identified only as a fingerprint examiner, noted

‘While I agree with the overall reasoning put into this recommendation, I would strongly caution against implementing the "ban" of this term in the absence of further information as to what will or should replace it in a discipline-specific manner. This is akin to the whole "there is no scientific basis for a minimum number of points" that was brought from on high with no further direction or explanation. The void that created was felt broadly for the following decades. In the interests of justice, please don't put the cart before the horse yet again.’

We refer the Commission to the ENFSI Guidelines cited above and to the four guides of the RSS Section (then a working group) for advice as to what could replace the term (and referred to in our submission of May 2015). The four guides are on the general subject of ‘Communicating and interpreting statistical evidence in the administration of criminal justice’ with a subtitle of ‘Guidance for Judges, Lawyers, Forensic Scientists and Expert Witnesses’. The guides are available in pdf format from <http://www.rss.org.uk/statsandlaw>. The titles are

1. Fundamentals of Probability and Statistical Evidence in Criminal Proceedings
2. Assessing the Probative Value of DNA Evidence
3. The Logic of Forensic Proof: Inferential Reasoning in Criminal Evidence and Forensic Science.
4. Case Assessment and Interpretation of Expert Evidence.

For ease of reference the submission of the Section in May 2015 to an earlier consultation on the use of the term is appended.

We support the view of the National Commission on Forensic Science (NCFS) that

‘the scientific community should not promote or promulgate the use of this terminology [ ‘the opinions or facts stated are offered "to a reasonable scientific certainty" ’.’

We also believe this stricture should be extended to the terms ‘is consistent with’ and ‘could have’.

In the ENFSI guidelines (page 20), the phrase ‘could have’ is approved when the scientist is considering an explanation for the evidence, rather than propositions. Thus:

In the context of a forensic science evaluation, an explanation has been recognised as an intermediate consideration for use when exploring less formal alternatives. A key characteristic of explanations is that they are generated after the forensic findings have been obtained. While an explanation has the potential to account for particular observations, it does not qualify as a formal proposition because - often - it may be a statement of the obvious, speculative or fanciful.

A few examples of explanations are given by Jackson et al. (2014, p.21):

- The mark could have been made by the defendant’s shoe;
- The blood staining on the wall could have been caused by multiple blows to the deceased’s head;
- The injuries are consistent with having been caused by the end of a claw hammer;
- The defendant cannot be excluded as a source of the partial DNA profile seen in the mixture of DNA on the swabs.

Another comment from Jackson et al (2014, p.39) is pertinent:

A range of other linguistic expressions has traditionally been used to express forensic scientific findings. . . . Stock phrases include: ‘provides a link between’; ‘there is evidence of association between’; ‘is consistent with’; ‘could have originated from’; ‘there are no significant findings’; ‘cannot be excluded’ . Some of these phrases have perfectly legitimate forensic uses. But they require careful contextual interpretation. Although they express conclusions that are strictly speaking true (or perhaps, ‘not false’), vague or ambiguous expressions may be incomplete to the point of becoming positively misleading to certain audiences. Thus, findings of consistency or potential origin may easily give the impression of strong association, whereas, in strict logic, findings may be ‘consistent with’ the prosecution’s allegation of guilt and with the defendant’s denials. To take an extreme case for the sake of illustration, a forensic scientist might accurately report that ‘the footwear mark is consistent with the accused’s shoe’, but fail to mention that ‘the footwear mark is also consistent with the co-accused’s shoe’, or with 90% of training shoes worn by young people, etc. Extremely unlikely possibilities may still be ‘consistent with’ the evidence. If all that is said is that two items ‘could have’ a common origin or that common origin ‘cannot be excluded’, it is doubtful that this would be understood, according to the ordinary canons of communication and conversation, to cover cases of vanishingly small probability.

Jackson, G, Aitken C., Roberts, P. Case Assessment and Interpretation of Expert Evidence: Guidance for Judges, Lawyers, Forensic Scientists and Expert Witnesses, Practitioner Guide No. 4, Working Group on Statistics the Law of the Royal Statistical Society, 2014, <http://www.rss.org.uk/statsandlaw>.