

# Guidance documents for evaluative reporting in forensic science: European developments

Communicating Forensic Findings Workshop: Current Practices and Future Directions

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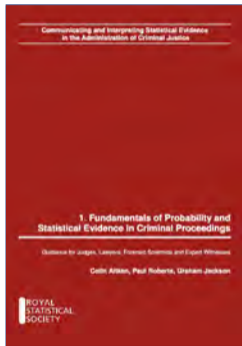
25th and 26th June, 2024

National Institute of Standards and Technology (NIST)

National Cybersecurity Center of Excellence (NCCoE)

**What will I talk about?**

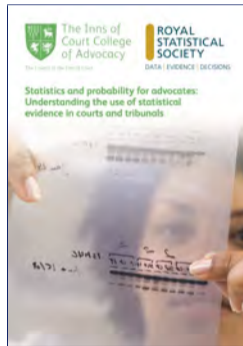
# Practitioner guidance for evaluative thinking (2010–2020)



Royal Statistical Society (2010)



European Network of Forensic Science Institutes (ENFSI, 2015)



Inns of Court College of Advocacy & Royal Statistical Society (2017)



The Royal Society & Royal Society of Edinburgh (2020)

# **The ENFSI Guideline for Evaluative Reporting in Forensic Science:**

**What is the institutional background and  
context of development of the ENFSI  
Guideline?**

# ENFSI Board: “Statement regarding interpretation”

Ref code: BRD-GEN-004 issued 6th July 2010 , Annual Meeting Prague

## Statement

ENFSI wishes to promote consistent and reliable scientific information through the whole forensic process from the scene of crime to court. It recognizes that it is of vital **importance to interpret** potential forensic evidence in the **context of a case**, using **all available information**\*; **reporting results of analysis alone may be misleading.**

The ENFSI Board plans to undertake actions to **agree a standard for the interpretation** of forensic evidence and to provide the necessary **support for implementing** this standard within the membership.

\*Today we would say **task-relevant information**

# Direct Grants – “Monopoly Programmes”

## ENFSI's Monopoly Position and Action Grant

In 2009 the **European Commission** has decided to grant ENFSI the **monopoly position** concerning forensic science in Europe. As a result of this decision the EC allocated a specific **action grant** for ENFSI to spend on project work.

## ENFSI's “M1 Project”    Sheila Willis (Principal Investigator)

Developing and implementing a **standard** for the **evaluation of forensic evidence** whilst providing some **educational support** in statistics for practitioners across Europe.



Dr. Sheila Willis\*

\*Image source: <https://x.com/sideliner2>

**In what sense is the ENFSI Guideline more than just a guideline?**

# More than just a guideline: Roadmap towards change

## [ ROADMAP ]

It is recognized that the implementation of the *Guideline for evaluative reporting* is a challenge in itself and below is proposed the key elements of a roadmap that should help laboratories in this task.

### Step 1 Managing the change

- Identifying **key personnel** responsible for the implementation
- Deciding on a **strategy** to approach each forensic discipline covered by the laboratory (focus groups, leaders in each discipline, etc.)
- Adopting a **project plan** with defined objectives and timeline

### Step 2 Training

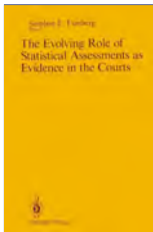
- Providing **training** a guideline (i.e. framework, circumstance, proportion, workshops)
- Identifying what is **reports** (compared to investigative reports)
- Training should include **testing**.
- Providing **informat** stakeholders (e.g. judiciary, mandating to the changes associated with the guideline in particular information at the reporting practice)

ENFSI Guideline (2015, p. 124)



**What is the theoretical background of the  
ENFSI Guideline?**

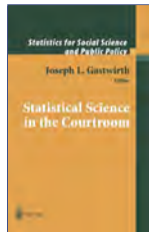
# Statistics and the Law & Forensic Inference and Statistics



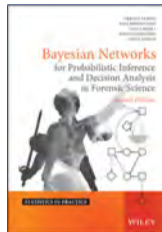
Fienberg (Ed.) (1989)



Aitken/Stoney (Eds., 1991)



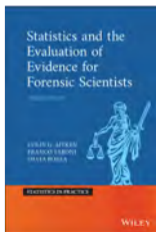
Gastwirth (Ed.) (2000)



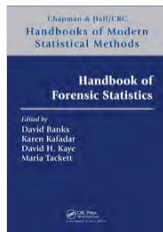
Taroni et al. (2014)



Robertson et al. (2016)



Aitken et al. (2020)



Banks et al. (2021)

\*Image sources: CRC Press, Ellis Horwood, John Wiley & Sons, Springer

**How original is the ENFSI Guideline?**

# How original is the ENFSI Guideline?



Standards for the formulation of evaluative forensic science expert opinion

AFSP Standard (2009)

in: Science & Justice, 49, 2009, 161–164.

## ENFSI Guideline

**Additional features:** Guidance notes,  
Case examples, more EU-compatible.



**What is the central conceptual challenge that the ENFSI Guideline is trying to address?**

## The challenge of practical application

- “(...) **no mathematical result is self-applying**, and **additional argument is necessary to bridge the gap** from a general mathematical truth to a substantive application – in law as in any other domain.”<sup>1</sup>



Prof. David H. Kaye\*

<sup>1</sup>Kaye D. H. 1999, **Clarifying the burden of proof: what Bayesian decision rules do and do not do**, International Journal of Evidence & Proof, 3, 1–28.

\*Image source: <https://pennstatelaw.psu.edu/faculty/kaye>

⇒ ...it's all about asking the relevant questions

**Is the ENFSI Guideline “Bayesian”?**

# The ENFSI Guideline is about inference

**Inference: the reasonable reasoning under uncertainty**

## Asking the relevant question

“(...) the **single most important advance** has nothing to do with technology (...). It tells us the most important lesson for the **logic of evaluative forensic science: consider the probability of the evidence, given the proposition.**”



Dr. Ian W. Evett CBE\*

I.W. Evett, Evaluation and professionalism, Science & Justice 49 (2009) 159–160, at p. 159

\* Image source: <https://www.principalforensicservices.com>



**Why are the recommendations in the ENFSI  
Guideline fundamental?**

**What is the structure of the ENFSI Guideline?**

# What is the structure of the ENFSI Guideline?

## Document structure

1. **Scope**
  2. **Evaluative reporting**
  3. **Standard framework**
  4. Guidance notes
  5. Glossary
- } 13 pages

**References**

**Case examples**

**Audit template**

- 4.1 Reporting requirements
- 4.2 Propositions
- 4.3 Data used to assess the strength of the findings
- 4.4 Meaning of the LR in an evaluative report

**What is the scope of ENFSI Guideline  
(Chapter 1)?**

# What is the scope of the ENFSI Guideline?

## Domain of application: What is evaluative reporting?

- The Guideline applies **only to evaluative reports for use in courts.**
- **Not covered:** Investigative, intelligence and technical reporting.



**What is evaluative reporting and when  
should an evaluative report be produced  
(Chapter 2)?**

# What is evaluative reporting and when should an evaluative report be produced?

“**Evaluative reports** for use in court should be produced when two conditions are met:

1. The forensic practitioner has been asked by a **mandating authority** or **party** to examine and/or **compare material** (typically recovered trace material with reference material from known potential sources)
2. The forensic practitioner seeks to **evaluate findings with respect to** particular competing **propositions** set by the specific case **circumstances** or as indicated by the mandating authority.” (p. 6)

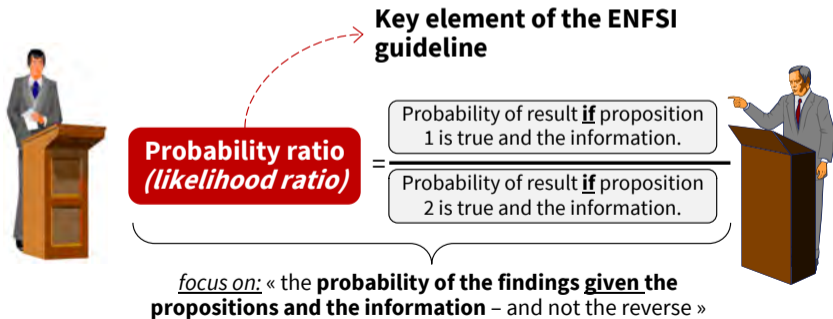


⇒ Section 2 of the ENFSI Guideline

# The core of an evaluative report: assessment of the value of the findings

Assessing the **value of the findings, not opining on the competing propositions**

- “Evaluation (...) is based on the assignment of a **likelihood ratio**.”
- The likelihood ratio measures the strength of support the findings provide to discriminate between propositions of interest.” (at p. 6)





**What is meant by the “Standard Framework”  
(Chapter 3) in the ENFSI Guideline?**

# The “Standard Framework”

Questioning the evaluation process: Three notions to understand the standard framework

1

(Key) issues

2

Propositions

3

Hierarchy of  
Propositions

What are key issues? (Glossary, p. 21)

“The **key issue(s)** represent those aspects of a case on which a Court, under the law of the case, seeks to reach a judgement. The key issue(s) provide the general framework within which **requests** to forensic practitioners and **propositions** (for evaluative reporting) are **formally defined**.”

⇒ Evaluation is a **process**, and you may want to **question** that process critically.

**What do the “Guidance Notes” of the  
ENFSI Guideline say (Chapter 4)?**

# What do the “Guidance Notes” of the ENFSI Guideline say?

## 4 Guidance Notes:

1. Reporting requirements: Balance, robustness, transparency and logic
2. Propositions
  - How to choose a level in the hierarchy?
  - What if no proposition(s) is (are) available?
  - When and how to change propositions?
3. Data and expert knowledge used to assess the strength of the findings and assignment of likelihood ratios
4. Meaning of the likelihood ratio in an evaluative report
  - Example of a verbal scale

**What does the ENFSI Guideline say about data and expert knowledge used to assess the strength of the findings and assignment of likelihood ratios?**

## ENFSI Guideline: transparency in probability assignment

- “(...) **probability assignment** is **not** arbitrary or speculative, but is based on a **body of knowledge that should be available for auditing and disclosure.**” (p. 16)
- **Data “hierarchy”**: “Such data can take, for example, the structured form of **scientific publications, databases or internal reports** or, in addition to or in the absence of the above, be part of the expert knowledge built upon **experiments** conducted under controlled conditions (including case-specific experiments), **training and experience.**” (p. 19)

**What are the benefits of the ENFSI Guideline  
and what are the prospects for change?**

## Conclusions

- Principles that are well established and reasonably practicable
- Resistance
  - limited resources (reduction of workflow)
  - adherence to traditional modes of thinking
- Keeping the status quo also has a cost
- Reduction and control of the points of attack of the forensic expert's work: change is in the scientists' own interest



**Thank you for your attention.**

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