Institution: University of Northumbria at Newcastle

Unit of Assessment: 18 (Law)

Title of case study: Developing a new professional Regulatory Standard and enhancing capability of forensic science practitioners to improve the reliability of forensic science evidence in the criminal justice system

Period when the underpinning research was undertaken: 2015 – 31st December 2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Emma Piasecki	Principal Lecturer/Associate Professor	01/09/2005 – present
Sophie Carr	Principal Lecturer	05/11/2007 – present
Adam Jackson	Senior Lecturer/Associate Professor	01/09/2005 – present
Michael Stockdale	Professor	01/09/1986 – present
Gemma Davies	Senior Lecturer/Associate Professor	12/09/2005 – present
Carole McCartney	Professor	01/09/2013 – present
Gary Edmond	Professor	01/10/2013 – present
Tim Wilson	Professor	01/05/2009 – present

Period when the claimed impact occurred: 2016 – 31st December 2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact (indicative maximum 100 words)

The House of Commons and The Law Commission have highlighted that innocent people are being wrongly convicted and criminals are escaping justice due to inadequate scrutiny of expert evidence from forensic science specialists by legal professionals. Northumbria University research has demonstrated that: (i) procedural legal reform governing the admissibility of expert evidence is insufficient to remedy the risks of inadequate scrutiny; (ii) risks are equally significant pre-trial, where transparent communication of evidence in an expert witness statement or report is pivotal; and, (iii) compulsory accreditation of professionals to regulatory codes and standards is fundamental in mitigating these risks by assuring compliance to demonstrably reliable evidence. These findings have been used to support the development of a new Regulatory Standard governing all forensic science expert evidence relied upon in criminal investigations and prosecutions in England and Wales. This new Standard bridges the gap between law and science to ensure forensic science evidence is capable of scrutiny and transparently communicated to non-experts. In parallel, through design and delivery of critical professional development, Northumbria researchers substantially enhanced the professional practice of all Crime Scene Investigators (CSIs) and Fingerprint Experts delivering forensic services to Northumbria Police, enabling them to understand and comply with legal and professional standards and to communicate their evidence reliably and transparently.

2. Underpinning research (indicative maximum 500 words)

Forensic science professionals – including forensic scientists, CSIs, Fingerprint Experts, and forensic pathologists – perform the role of an expert witness, assisting the court (and the broader criminal justice system) by providing evidence on matters outside of the court's knowledge and experience. This expert opinion evidence is provided in a written statement or, when required, by oral testimony in court. Expert evidence can impact and direct a criminal investigation, the decision to prosecute, plea decisions, and trial outcomes. As the subject matter is often complex and technical, and is necessarily outside the knowledge and experience of the court, there is often an element of deference afforded to, and complacency in the scrutiny of, expert evidence. Yet experts are not infallible. Regulation, compliance with the Forensic Science Regulator's Codes of Practice and Conduct (and the associated documentation - see figure 1), and external scrutiny remain necessary.

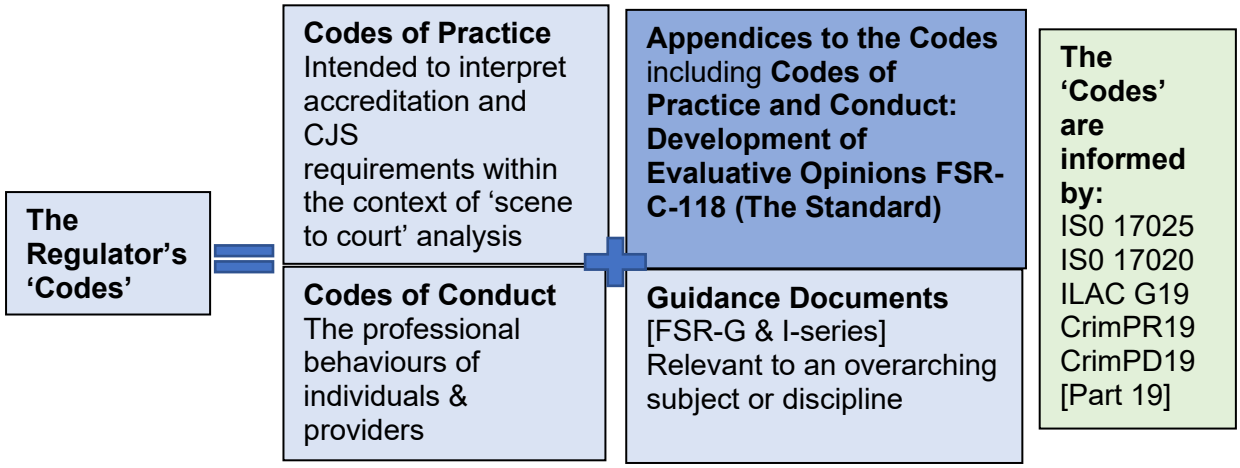

Figure 1: Overview of The Forensic Science Regulator's Codes and associated documentation

Formal reviews, instigated by the House of Commons Science and Technology Committee (2005) and the Law Commission (2011), highlighted the problematic laissez-faire approach to the admission of expert evidence in criminal proceedings. Legislation to clarify and focus the obligations on individual experts and forensic science professions to demonstrate the reliability of their evidence was proposed. Despite this, only procedural (non-statutory) reform was implemented. This reform consisted of amendments to the Criminal Procedure Rules Part 33 (now 19) and the associated Practice Direction (together Part 19), which place the onus predominantly on lawyers to identify unreliable evidence. Emma Piasecki and Gemma Davies conducted a national survey of criminal barristers which demonstrated overwhelmingly that, one year on from reform, the procedural changes had had little-to-no effect on enhancing the reliability of expert evidence. In addition, although criminal barristers were familiar with the amendments, they were not confident about applying them in practice [**R1**]. Critically, 82% of the respondents felt more training was needed for the changes to be fully implemented in practice [**R1**]. In addition to this, research by Professor Michael Stockdale and Adam Jackson concluded that effective implementation of the rules designed to enhance reliability was further hindered by a lack of clarity in the revised Part 19 and highlighted areas that required elucidation [**R2**].

Through critical and comparative readings of the relevant legal provisions and empirical analysis of their application in criminal proceedings, Sophie Carr, Emma Piasecki, and Professor Tim Wilson – working with former president of the Chartered Society of Forensic Sciences, Professor Angela Gallop CBE, and the Forensic Science Regulator (The Regulator), Dr Gillian Tully CBE – identified the following:

1. There is disparity between the legal and scientific professions' understanding and measurement of reliability. Addressing this disparity is critical to effective engagement with, and application of, the amended Part 19 [**R3**].
2. 'Critical trust' offers a sound conceptual foundation for assessing the way in which risks relating to expert scientific evidence are managed within the criminal justice system. There is a fundamental need for a quality culture that includes compliance, accountability, and training, as part of the scaffolding that enables 'critical trust' in the individuals and organisations working in the criminal justice system [**R4**].
3. The transparency of information and clarity of forensic science evidence communicated in a written statement or report, or in oral evidence, is pivotal in enabling a full and proper assessment of its evidential reliability [**R5**] and critical to ensuring plea decisions are based on a sound understanding of the evidence [**R4**].
4. Streamlined Forensic Reporting (SFR) is increasingly used to communicate forensic findings. Whilst designed to deliver scientific results in a timely and cost-effective manner, through early identification of the pertinent issues in the case, SFR actually delivers a caricature of forensic science evidence. SFR does nothing to improve the quality of communication, the understanding of the presented evidence and its limitations, and the fairness of proceedings

or the accuracy of verdicts. It reduces transparency by obscuring, blurring, and concealing the value of scientific findings under the auspices of efficiency [**R4**].

5. It is possible to identify unreliable evidence pre-trial. In the light of these findings, Carr, Piasecki, and Wilson worked closely with Gallop and The Regulator to develop and publish the Scientific Validity Framework (SVF) by which unreliable evidence can be identified [**R4**], and reliable evidence can be mapped to recent legal reform and The Regulator's 'Codes'. The SVF enables: (i) experts to transparently communicate the scientific validity and significance of their findings; and (ii) non-experts to assess the reliability of the expert's findings and resulting opinion, including as part of an admissibility assessment [**R3**, **R5**].

Fundamental to increasing the reliability and transparent communication of expert evidence is cultural change, including the extent to which expert witnesses understand their role in the wider criminal justice system, from investigation, through charge and pre-trial, to trial, and appeal [**R4**, **R5**]. To ensure expert evidence is reliable and properly communicated and so justice achieved, it is crucial that the legal and regulatory duties of experts are understood and met by those expected to comply [**R4**]. Specifically, they must have full knowledge, understanding, and compliance with Part 19. This includes expert witnesses who work within police forces – predominantly CSIs and Fingerprint Experts. Jackson, Piasecki, and Carr conducted a survey of all Northumbria Police Force's CSIs and Fingerprint Experts which demonstrated a clear need for enhanced capacity to (i) understand their role in the criminal justice system and (ii) effectively communicate their findings, including the reliability of their evidence [**R5**, **R6**].

3. References to the research (indicative maximum of six references)

Northumbria researchers work in collaboration through in-house research groups - the Northumbria Centre for Evidence and Criminal Justice Studies (NCECJS), and the Science and Justice Research Interest Group, identified in below sources of corroboration.

R1. Gemma Davies and **Emma Piasecki** (**2016**) 'No more laissez faire? Expert evidence, rule changes and reliability: can more effective training for the bar and judiciary prevent miscarriages of justice?' *Journal of Criminal Law* **80**(5): 327-343 https://doi.org/10.1177/0022018316670967
R2. **Michael Stockdale** and **Adam Jackson** (**2016**) 'Expert Evidence in Criminal Proceedings: Current challenges and opportunities' *Journal of Criminal Law* **80**(5): 344-363 https://doi.org/10.1177/0022018316668448
R3. Sophie Carr, **Emma Piasecki**, and Gallop, A.* (**2019**) 'Demonstrating Reliability Through Transparency: a scientific validity framework to assist scientists and lawyers in criminal proceedings' *Forensic Science International* **308**: 1-6 https://doi.org/10.1016/j.forsciint.2019.110110
R4. Sophie Carr, **Emma Piasecki**, Tully, G.*, and **Tim J. Wilson** (**2016**) 'Opening the scientific expert's black box: "critical trust" as a reformative principle in criminal evidence' *Journal of Criminal Law* **80**(5): 364-386 https://doi.org/10.1177/0022018316669220
R5. Sophie Carr, Gallop, A.*, **Emma Piasecki**, Tully, G.*, and **Tim Wilson** 'Clarifying the reliability continuum and testing its limits: Biometric (Fingerprint and DNA) Expert Evidence' in Roberts, P and **Michael Stockdale** (eds), *Forensic Science Evidence and Expert Witness Testimony: Reliability Through Reform?* 155-183 (Cheltenham: Edward Elgar, **2018)** https://doi.org/10.4337/9781788111034.00012 available on request
R6. **Gary Edmond**, **Sophie Carr**, and **Emma Piasecki** (**2018**) 'Science Friction: Streamlined Forensic Reporting, Reliability and Justice' *Oxford Journal of Legal Studies* **38**(4): 764–792 https://doi.org/10.1093/ojls/gqy025

*Practitioner co-authors: Professor Angela Gallop CBE, former President of the Forensic Science Society; Dr Gillian Tully CBE, UK Government Forensic Science Regulator, November 2014 to February 2021. Dr Tully was a Visiting Professor at Northumbria University 2018 – 2019.

4. Details of the impact (indicative maximum 750 words)

The criminal justice system must ensure forensic science evidence is reliable and communicated transparently in order for justice to be done. To achieve this, Northumbria research, in

collaboration with The Regulator, has delivered a Standard for evaluating the strength of the evidence and communicating that in a transparent manner (4.1). In parallel, Northumbria researchers have enhanced the capability of forensic science practitioners to produce reliable evidence and communicate effectively and transparently (4.2).

4.1 Development of a Standard for improved reliability and consistency in the use of expert evidence in courts in England and Wales

In May 2019, the House of Lords Science and Technology Select Committee published a Report, which cites Northumbria University's research in its conclusions, outlining requirements for improving the evaluation of evidence and the importance of transparent communication of expert evidence to reduce the risks of future miscarriages of justice [**E1**, para 119 and 160]. It is The Regulator's responsibility to ensure that the provision of forensic science services across the Criminal Justice System of England and Wales is subject to an appropriate regime of scientific quality standards. With experts in mind, Northumbria researchers and The Regulator utilised the SVF framework for demonstrating evaluative validity [**R3**, **R5**] to develop the new Regulatory Standard for the evaluation and communication of expert opinion evidence - the Codes of Practice and Conduct: Development of Evaluative Opinions [**E2**]. The Regulator's Codes, which includes the new Regulatory Standard (see figure 1), apply to all forensic science expert evidence relied upon in criminal proceedings in England and Wales. The Standard directs how evidence is evaluated and communicated to ensure *'common terminology, reduce variability in approaches, increase transparency, and allow the proper assessment of expert evidence across the spectrum of forensic science disciplines*' [**E3**, p2], to prevent innocent people being wrongly convicted and criminals escaping justice. This publication directly addresses these risks and is underpinned by a broad body of academic work and engagement, focussed on cultural change within the scientific and legal professions.

The '*significant impact of NCECJS on the development of new practices in expert evidence'* and the '*important role in the future development of this area of law'* is recognised both by Professor David Ormerod CBE QC [**E4**] and in the three latest annual reports of The Regulator. The Regulator highlighted that Northumbria's research directly addressed several key areas of relevance to the required cultural change, including: the use and format of Streamlined Forensic Reporting (SFR) [**E5**, p43-44]; the lack of statistical training within the legal profession [**R1**]; and the development of a co-authored Massive Open Online Course on Forensic Statistics in response [**E6**, p26-27] that will be made freely available to all legal and forensic professionals and adopted on the Bar Course at Northumbria. Ultimately, Northumbria researchers delivered '*a unique and crucial contribution to development of the standard, delivering a scientifically informed legal practice perspective critical to ensure the standard meets the needs of both science and the criminal justice system* [**E3**, p2] leading to The Regulator achieving her *'absolute priority to publish a standard for the development of evaluation opinions, to ensure that this systematic approach to quality covers all scientific activities from crime scene to court*' [**E3**, p2].

4.2 Enhanced capacity for forensic experts in Northumbria Police to communicate robust and reliable expert evidence

Alongside the development of the new Standard [**E2**], Carr, Piasecki, Jackson, and Stockdale delivered critical professional development, through research informed training, to all CSIs and Fingerprint Experts providing forensic services to Northumbria Police in 2019 [**E7**, **E8**]. This delivery focused upon ensuring the experts understand and meet the requirements of The Regulator's Codes and the new legal requirements, demonstrating reliability through effective communication of their expert evidence. This material is now part of ongoing professional development for forensic service professionals [**E7**, p2]. As part of the largest metropolitan force in the North East of England, Northumbria Police Forensic Service operates from the Scottish border to County Durham, from the Pennines to the North East coast. Kirsty Potter, Head of Forensic Services at Northumbria Police, explained that the work with Northumbria researchers addressed a critical gap in their workforce's *'knowledge base and understanding of legal and procedural rules*' [**E7**, p2]. As a result, there had been *'an invaluable increase in confidence'* and enhanced capability in *'communication of oral evidence'* which has been *'crucial in ensuring the*

continued delivery of high quality evidence to the criminal justice system, demonstrably meeting legal reliability criteria and communicated transparently and effectively' [**E7**, p2].

The CSIs and Fingerprint Experts were evaluated on the day of the training to capture its immediate impact. Feedback from all participants confirmed that the training had improved their professional practice at all stages of the criminal justice system (investigation, charge, pre-trial, trial, and appeal) [**E8**, p1-5]. As a result of the training, they all had a better understanding of their duty as an expert, increasing their confidence and ability to communicate their evidence at court. A follow up evaluation conducted 12-18 months after the training confirmed the application of the new knowledge and skills developed through the training, and consequent improvements in communication and crime-scene recording for CSIs, especially regarding the accuracy and clarity of their statements for use by other practitioners [**E8**, p2-5, p10-171]. Participants reported an improved ability to take *'[n]otes explaining actions that were carried out and why'*, *'thinking about communicating methods and practices' and 'reinforced the importance of a clear statement'* [**E8**, p4]. They also reported an enhanced understanding of the importance of accreditation to The Regulator's Codes [**E8**, p3, p6]. This, in turn, has ensured that they can independently demonstrate reliability in their everyday practices. Further, participants acknowledged that they would communicate evidence in court with greater confidence and clarity, both through evidence-in-chief and in being able to explain anything under cross-examination that has been misunderstood or misrepresented: *'The most valuable thing I took away from this exercise was, having more confidence in my own ability to clarify points that may have been misunderstood'* [**E8**, p3].

Evaluation of this research-informed training confirms that it provides an effective model for enhancing both the expert's understanding of factors relevant to the reliability of their evidence and their ability to effectively communicate that evidence in the appropriate criminal justice context [**E8**, p1-5]. Potter concludes that the *'Fingerprint Bureau and the CSI team are, as a direct result of Northumbria's work, better placed to meet current and future challenges and demands of the criminal justice system*' [**E7**, p2].

5. Sources to corroborate the impact (indicative maximum of 10 references)

Ref.	Source of corroboration	Link to claimed impact
E1	House of Lords Science and Technology Select Committee 3rd Report of Session 2017–19: Forensic science and the criminal justice system: a blueprint for change (compiled with Northumbria authored evidence submissions)	Guiding policymaker awareness and scrutiny, establishing a route to improved evidence evaluation
E2	Forensic Science Regulator's Codes of Practice and Conduct: Development of Evaluative Opinions	New national standards for all forensic practitioners
E3	Testimonial - Dr Gillian Tully, UK Government Forensic Science Regulator	Role of Northumbria research in shaping the new national standard
E4	Testimonial - Prof. David Ormerod, Criminal Law Commissioner for England and Wales	Importance of Northumbria research shaping awareness and understanding
E5	UK Government Forensic Science Regulator 2019 Report (published 25th February 2020)	Guiding policy and practice developments and scrutiny
E6	UK Government Forensic Science Regulator 2020 Report (published 13th January 2021)	Guiding policy and practice developments and scrutiny
E7	Testimonial - Kirsty Potter, Head of Forensic Services, Northumbria Police	Enhanced practice and understanding in all North East crime scene professionals
E8	Initial CPD evaluation and feedback and 12-18-month CPD follow up with Northumbria Police crime scene technicians and fingerprint experts	Changes in practice and understanding in all North East crime scene professionals