



Annual Report

17 November 2017 – 16 November 2018

Dr Gillian Tully
15 March 2019

Foreword

The body of this report covers the period from 17 November 2017 to 16 November 2018 and as such reflects progress only over that period. Because its publication comes several months later, I have used this foreword as an opportunity to mention more recent events.

On a positive note, I am delighted to record the recent progress that has been made by fingerprint bureaux towards achieving the necessary standards. The increased rate of progress, stimulated by The Accreditation of Forensic Science Provider Regulations 2018, shows what progress can be made when there is a legislative imperative and national technical and scientific support. A large majority of fingerprint comparison capacity is now expected to meet the required standards by the time the Regulations come into effect on 25 March 2019; despite this being after my deadline of October 2018, it is substantially ahead of projections prior to the Regulations being laid before Parliament. It is my hope that this clear illustration of the necessity for a legal imperative will encourage policy makers to try every means possible to ensure that statutory enforcement powers are brought into force.

The initial award of accreditation to each fingerprint bureau is an important milestone but it does not represent the end of the journey towards improving quality. In most bureaux it has involved efficiency compromises, many of which can be addressed through optimal process design and implementation of effective methods for recording contemporaneous notes. Ongoing changes to training and culture are needed, to move away from the perception that the outcome of a comparison can be regarded with absolute certainty.

Meeting formal quality standards is only a tool to assist with achieving high quality forensic science. We need to promote and nurture a scientific culture and ensure that professional development, scientific advancement and the principles of balance, logic, robustness and transparency¹ are at the centre of all organisations providing forensic science. I have been encouraged by the culture of improvement in the forensic collision investigation community, which has clearly seen the requirement to comply with standards for what it is: an opportunity to improve the service provided to the public and the justice system.

Those who have been following the course of the House of Lords Science and Technology Committee's inquiry into forensic science will be aware that I was questioned at length in an oral evidence session on 22 January 2019. I was also asked to revert to the Committee with my views on how effective oversight of forensic science could be achieved and whether there is a role for a national body. This I have done, and I anticipate that my letter to the Committee will be published in

¹ The principles of balance, logic, robustness and transparency were published in: Association of Forensic Science Providers (2009) 'Standards for the formulation of evaluative forensic science expert opinions', *Science and Justice*, 49, pp 161–164.

due course. I was encouraged to hear Ministers from both the Home Office and Ministry of Justice speak of taking the Committee's recommendations into consideration. I have reviewed carefully the submissions made to the Committee regarding quality standards, and have referred criticisms of the standards regime back to my advisory groups. These groups are composed of subject matter experts and representatives from across forensic science and the Criminal Justice System (CJS). We are now in the position where there are data available from the implementation of standards in many disciplines and, as I laid out in my evidence to the Lords' Committee, the data show that requiring third-party attestation of compliance with standards highlights shortcomings and brings about demonstrable improvements, which will have a direct impact on cases in the CJS. It is not a perfect system; any system involving people carries a risk of error or inconsistency. However, it brings about measurable improvement and over time, as the culture of an organisation develops, becomes an effective tool for managing quality.

The strains from many years of funding restrictions continue to impact severely on forensic scientists in policing and the commercial sector. I am sure that all of those involved in forensic science as commissioners, practitioners, leaders or policy makers will agree with my hope that by the time of next year's report, the situation will have improved significantly. However, it is not clear whether or not this will be the case. It is my view that profound changes to funding and governance are required to ensure that forensic science survives and begins to flourish rather than lurching from crisis to crisis. I hope that those with a mandate for funding and governance will tackle the problems once and for all, for the protection of justice rather than the protection of historic or current policies.

A handwritten signature in black ink, appearing to read 'G. Tully', with a stylized flourish underneath.

Dr Gillian Tully

Forensic Science Regulator

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Abbreviations

Abbreviations used in this report are listed below in alphabetical order.

ACC	Assistant Chief Constable
AFSP	Association of Forensic Science Providers
APCC	Association of Police and Crime Commissioners
BSI	British Standards Institution
CC	Chief Constable
CCRC	Criminal Cases Review Commission
CCTV	Closed circuit television
CED	Contamination Elimination Database
CFS	Cellmark Forensic Services
CJS	Criminal Justice System
[The] Codes	Forensic Science Regulator's Codes of Practice and Conduct
CPS	Crown Prosecution Service
CQC	Care Quality Commission
CrimPD	Criminal Practice Directions
CrimPR	Criminal Procedure Rules
CSFS	Chartered Society of Forensic Sciences
CSI	Crime Scene Investigator
DCC	Deputy Chief Constable
DCG	Data Communications Group (portfolio of NPCC)
DFSG	Forensic Science Regulator's Digital Forensics Specialist Group
DNA	Deoxyribonucleic acid
DNASG	Forensic Science Regulator's DNA Specialist Group
Dstl	Defence Science and Technology Laboratory
EFS	Eurofins Forensic Services
EMSOU	East Midlands Special Operations Unit
GSR	Gunshot Residue
FFLM	Faculty of Forensic and Legal Medicine of the Royal College of Physicians
FME	Forensic Medical Examiner
FQSSG	Fingerprint Quality Standards Specialist Group
FRS	Fire and Rescue Services
FSAC	Forensic Science Advisory Council
FSM/1	Forensic Science Mirror Committee (of BSI)
FSRU	Forensic Science Regulation Unit
FTE	Full time equivalent
GDPR	General Data Protection Regulation
GMC	General Medical Council
HCPC	Health and Care Professions Council
HEFCE	Higher Education Funding Council for England
HOB	Home Office Biometrics Programme
IOPC	Independent Office for Police Conduct
ISFG	International Society for Forensic Genetics
ISO	International Organization for Standardization
KFS	Key Forensic Services

LAA	Legal Aid Agency
LASPO	Legal Aid, Sentencing and Punishment of Offenders Act 2012
LR	Likelihood ratio
MFSG	Medical Forensics Specialist Group
MoJ	Ministry of Justice
NaBIS	National Ballistics Intelligence Service
NCA	National Crime Agency
NDNAD	National DNA Database
NFCC	National Fire Chiefs' Council
NHS	National Health Service
NMC	Nursing and Midwifery Council
NPCC	National Police Chiefs' Council
PACE	Police and Criminal Evidence Act 1984
PED	Police Elimination Database
PQBD	President of the Queen's Bench Division
PSC	Police Staff Council
QSSG	Quality Standards Specialist Group
RAI	Royal Anthropological Institute
Regulator	Forensic Science Regulator
RTS	Radox Testing Services
SARC	Sexual assault referral centre
SFR	Streamlined Forensic Reporting
SPA	Scottish Police Authority
TLL	Trimega Laboratories Limited
UCOL	Undercover online
UKAS	United Kingdom Accreditation Service
UKIAFT	United Kingdom and Ireland Association of Forensic Toxicologists

Introduction: Risks and Assurance

Assessment of Assurance

The appendix to this report provides the Regulator's current assessment of the level of assurance and risk for the main forensic science disciplines. Whilst there is a level of subjective judgement, the assessment is based on measurable factors including:

- a. whether or not there is systematic quality assurance (and, where applicable, accreditation) in place;
- b. whether the nature, frequency and seriousness of quality referrals to the Regulator is in line with expectations;² and

² The frequency of quality referrals to the Regulator is not in itself an indicator of concern; of greater concern are quality failures that are unrecognised or unreported and are not effectively dealt with. As quality standards have been introduced into successive disciplines there has been an increase in referrals, which indicates that failures are being identified and acted upon, not that the number of failures is increasing.

- c. whether there have been issues identified that impact on the quality and/or availability of provision.

It should be noted that this assessment is for each discipline in general and must not be read as a guide to whether or not the evidence in a particular case is reliable.

Priorities

The Regulator's priorities for action are given below. Progress against last year's priorities, together with the next steps required, is reviewed in sections 1 to 3 of this report. The sections mirror the aims and requirements for forensic science quality set out by the Regulator in previous Annual Reports. The required actions are numerous and the team supporting the work of the Regulator is small, so progress has been and will continue to be made as effectively as possible within resource limitations, balancing the defined priorities against new issues arising.

High Priority Areas of Work³

- a. The Regulator will engage with all those who are in a position to influence policy and practice (including the Home Office, National Police Chiefs' Council [NPCC], the Transforming Forensics programme,⁴ Association of Police and Crime Commissioners [APCC], senior judiciary and the Science and Technology Committees of the House of Lords and House of Commons) to highlight ways in which the quality of forensic science is at risk and could be improved (sections 3.2 and 3.5).
- b. Speaking with forensic science practitioners and leaders will continue to be a high priority, to encourage the development of a mature quality culture (section 2.1 and 3.1). A series of Lessons Learnt publications will be initiated, to ensure that quality failures and 'near misses' are used as opportunities to improve across the sector rather than only in the organisation concerned (section 2.9).
- c. The impact of standards on the quality of forensic science will continue to be monitored through the review of actions raised during the accreditation process, formal and informal complaints and referrals, and court judgments in relation to expert evidence. A paper to disseminate the learning from a review of accreditation of digital forensics units will be submitted for publication (section 2.1).
- d. The development of, and consultation on, a standard for evaluative interpretation of evidence will continue (section 1.2).
- e. Standards for sexual assault referral centres (SARCs) and custody suites: the Regulator's Medical Forensics Specialist Group (MFSG) will consider the responses to the consultation on the standard for the collection of forensic

³ The position within the high priority list (or the medium priority list) does not indicate a further level of prioritisation.

⁴ Transforming Forensics is a police programme, funded by the Home Office.

- evidence at SARCs and will finalise the standard. Thereafter, the MFSG will begin work on a standard for forensic recovery in custody suites (section 1.3).
- f. The drug driving standard will be completed and a report on the interpretation model produced (section 1.4).
 - g. An update to the Video Analysis Appendix to the Regulator's Codes of Practice and Conduct (the Codes) will be published, to ensure that the courts are made aware of the limitations of the science underpinning facial comparison (section 1.8).
 - h. Digital forensics: The Regulator will work with all relevant NPCC portfolios including the Data Communications Group (DCG), the CCTV portfolio, the Digital Forensics portfolio (which is a sub-group of the Forensic Science portfolio), Internet Intelligence and Investigations portfolio and the Digital Policing portfolio, to ensure that all those who should have reached defined quality standards are supported and challenged to achieve compliance (section 2.2) and to ensure that appropriate quality standards are defined for remaining areas of risk (section 1.10). The Regulator will continue to press the NPCC's Forensic Science Marketplace Strategy Group and the Transforming Forensics programme to ensure that the police no longer procure digital forensic services from organisations that have not met the standards when there are compliant organisations.
 - i. Continuing to support the development of a more cost-effective route for small businesses to reach the standards will continue to be a high priority, as will liaison with the Legal Aid Agency (LAA), with the aim of changing the system for the selection and payment of experts (sections 1.13 and 2.8). The results from the dry run of accreditation to ISO 17020⁵ will be considered to determine whether or not this standard provides assurance of the quality of case review at a proportionate cost.
 - j. The pilot for accreditation of fire scene investigation will be completed and evaluated, to enable all fire investigation organisations to apply for accreditation (section 2.4).
 - k. The Regulator will continue to support Crime Scene Investigators (CSIs) and the collision investigation community as they work towards validation of their methods and accreditation (section 2.4).
 - l. The Regulator will continue to support the expansion and implementation of the Contamination Elimination Database (CED) (section 2.5).
 - m. The revised Code of Practice for Forensic Pathology will be published and the annual pathology audit will be conducted (section 2.6).
 - n. The Regulator will continue to support the NPCC-led Gold Group managing the aftermath of the improper data manipulation at Radox Testing Services (RTS) (section 2.9).

⁵ BS EN ISO/IEC 17020:2012 Conformity assessment. Requirements for the operation of various types of bodies performing inspection.

- o. The Regulator will continue to work with forensic units to investigate quality failures, to ensure that any immediate issues are contained and lessons are learnt to improve practice. A system to enable anonymous reporting of concerns, in situations where an individual feels unable to use their own organisation's whistle-blowing procedures, will be implemented (section 2.9).

Medium Priority Work

- a. The gait analysis standard will be finalised and published (section 1.5).
- b. The legal obligations guidance and related guidance on expert and non-expert reports will be kept up to date with any significant changes in case law, Criminal Procedure Rules (CrimPR) or Criminal Practice Directions (CrimPD) (section 1.7).
- c. The Regulator's Codes will be updated and issue 5 published (section 1.9)
- d. The Regulator will continue to engage with the development of international standards through the technical committee of the International Organization for Standardization (ISO), particularly in relation to the development of a standard for forensic grade consumables (section 1.11).
- e. Once the fingerprint bureaux have achieved accreditation for their activities (section 2.7), the Regulator will work with her Fingerprint Quality Standards Specialist Group (FQSSG) and the fingerprint community to consider further what improvements can be made in the future, including to terminology and probabilistic approaches (section 1.12).
- f. The Regulator will continue to support the Ministry of Justice (MoJ) led Gold Group managing the aftermath of the improper data manipulation at Trimega Laboratories Limited (TLL) (section 2.9).
- g. The Regulator will continue to work with the Crown Prosecution Service (CPS), judiciary and the NPCC Streamlined Forensic Reporting (SFR) Board to ensure that:
 - i. abbreviated statements are phased out; and
 - ii. the process by which SFRs are deployed is robust, transparent and timely, enabling a proper understanding and identification of the issues by defence teams (section 2.10).
- h. The Regulator will continue to work with the Home Office Biometrics Programme (HOB) to ensure that the validation of the outputs meets the needs of users in the CJS (section 2.11).
- i. The Regulator will continue to ensure that quality-related research priorities are articulated and institutions are supported, where appropriate, in funding applications for high-quality research in line with these priorities (section 3.3).

Wider Risks

Risks to the Provision of Forensic Science

In last year's Annual Report, the Regulator highlighted the risk of exits from the forensic science market and opined that too much money had been driven out of

forensic science provision. Less than two weeks after publication of that report, Key Forensic Services (KFS) entered administration. In order to minimise damage to the CJS, policing provided financial support to enable work in progress to be completed. Eurofins Forensic Services (EFS) and Cellmark Forensic Services (CFS) worked constructively with the Gold Group set up by the NPCC to manage the issue and took on substantially more work. Nonetheless, with no new work going into KFS during the wind down, there was insufficient capacity elsewhere for a range of types of casework, and each police force was subject to a cap on submissions. This means that some cases where forensic science may have provided valuable information or evidence could not be processed. In addition, there was some evidence of an increased error rate during this period (although it is not possible to make a direct attribution of cause) as well as an unsustainable strain on staff working overtime.

During the wind-down period, the administrators of KFS were successful in securing a buyer for the majority of the business. The new business, also known as Key Forensic Services (KFS) was able to restart without some of the liabilities of the old company and made further savings by closing a unit and downsizing some activities.

It is clear that commercial forensic science providers continue to be under significant financial strain. This represents a serious risk to quality, particularly in relation to the potential for loss of skilled scientists, some of whom have already been made redundant more than once. It takes several years to train a graduate to become a forensic scientist and the most complex cases can only be effectively dealt with by those with a broad and deep level of knowledge and experience, which is becoming ever more difficult to achieve.

Commercial provision of digital forensic services is provided by a range of medium and small companies. Two companies, CCL-Forensics Limited and IntaForensics Limited have broad scopes of accreditation including accreditation to the Regulator's Codes. However, this success in operating to the correct quality standards has not yet been properly recognised by policing in their award of contracts, with a large contract having recently been renewed with a provider with significantly less accreditation. Although the Regulator recognises the strain on commercial resource in policing to re-tender the contract, it remains her position that the contract should have been placed with an appropriately accredited provider. In the absence of statutory enforcement powers, the only way in which the market for digital forensics can be incentivised to properly prioritise quality standards is through the award of contracts to those with the standards in place.

Similarly, commissioning at local level does not always support the appropriate quality of provision of forensic medical services. Where medical services are provided to custodial settings and SARCs by the same provider in the same area, there must be sufficient staffing to enable rotas for SARC and custody work to be populated by different practitioners so that a practitioner is never asked to attend a

suspect and complainant in the same case. Whilst this may incur greater cost to ensure that sufficient trained staff are available, it is essential to prevent cross-contamination of trace evidence.

In parallel to the financial strain in the commercial sector, similar strains are showing within policing's own provision of forensic science. There is insufficient resource allocated to forensic units in policing for them to both deliver operationally and achieve the requisite quality standards. In digital forensics, the situation is exacerbated and there are reports of cases being discontinued because the digital evidence is not available.

The Regulator's role concerns only quality standards; there is no economic regulator but clearly the financial issues represent real risks to quality. Public sector finances are limited everywhere, but the risks to forensic science provision are close to existential. A complete rethink of the structure, funding and oversight of forensic science is urgently required; minor alterations will not suffice.

Section 1: Quality Standards in Place for all Forensic Science Disciplines

Requirement⁶ 1: That appropriate quality standards are in place for all forensic science disciplines, which apply equally whether the services are delivered by small or large organisations, private companies, public laboratories, police forces or individuals.

1.1 Forensic Science Quality Standards in the UK

During the year from November 2016 to November 2017 the following standards and guidance documents have been published (Table 1).

⁶ The Regulator's aims and requirements were set out in full in previous Annual Reports, available at: www.gov.uk/government/publications/forensic-science-regulator-annual-report-2016 and www.gov.uk/government/publications/forensic-science-regulator-annual-report-2015.

Table 1: Standards and Guidance Published, 17 November 2017 to 16 November 2018

Publication	Date
Code of Practice for Forensic Anthropology FSR-C-136	Royal Anthropological Institute Code of Practice published in association with the Forensic Science Regulator (Issue 1) 23 May 2018
Forensic Gait Analysis Code of Practice FSR-C-137	Draft Code of Practice published for consultation 2 June 2018
Software Validation for DNA Mixture Interpretation FSR-G-223	Guidance published (Issue 1) 31 July 2018
DNA Mixture Interpretation FSR-G-222	Guidance published (Issue 1) 31 July 2018
Legal Obligations FSR-I-400	Information document published (Issue 6) 6 August 2018
DNA Mixture Interpretation FSR-G-222	Guidance published (Issue 2) 31 October 2018
Forensic Medical Examination Standard Adult and Child Sexual Assault Complainants FSR-C-116	Draft code published for consultation 2 November 2018

1.2 Evaluative Interpretation Standard

The last Annual Report discussed the importance of a standard for evaluative interpretation and the workshop undertaken to start the development process.

Following on from the workshop, comments from all participants were collated and a draft standard was developed. This has been reviewed and has been circulated to all participants in the workshop for comment. An updated draft will be circulated to participants in the near future before a wider consultation exercise is undertaken.

The draft standard promotes the use a likelihood ratio (LR) approach to the evaluation of scientific findings. The LR is the product of a robust approach to the

development of an expert's opinion. As such, there may be a legitimate difference in opinion between two experts. Use of the LR approach, however, supports greater transparency and enables the court to determine the specific nature of the differences between experts.

1.3 Update on Sexual Assault Referral Centres Standard

The MFSG was reconvened with a new chair, Mary Newton; it has agreed an ambitious 12-month work plan. The Regulator welcomes constructive engagement from a wide range of professionals on this group, including:

- a. medical practitioners (doctors, including practicing forensic medical examiners [FMEs] and paediatric specialists, nurses);
- b. commissioners including NHS England and policing;
- c. training professionals;
- d. the Faculty of Forensic and Legal Medicine (FFLM);
- e. the Care Quality Commission (CQC); and
- f. the United Kingdom Accreditation Service (UKAS).

The Regulator's remit in relation to SARCs does not include any issues of clinical care; it is limited solely to sampling and preserving samples for subsequent scientific analysis. The role of medical practitioners and other SARC staff is substantially wider, providing a full package of care for complainants. This wider remit is regulated by the CQC; doctors are regulated by the General Medical Council (GMC) and nurses by the Nursing and Midwifery Council (NMC).

A draft quality standard for taking forensic samples from complainants in sex offence cases (FSR-C-116) along with a 'readiness assessment questionnaire' and accompanying guidance (FSR-G-212) was developed and published for consultation.⁷ The quality standard is based on the international accreditation standard ISO 15189 2012 Medical laboratories – Requirements for quality and competence and incorporates the anti-contamination guidance (FSR-G-207) published in 2016.⁸ In developing the standard and guidance, the findings from the SARC contamination event first reported in the Regulator's 2016 Annual Report and from other quality issues referred to the Regulator have been incorporated. A Lessons Learnt document will be produced from the SARC contamination investigation; publication was delayed as the development of the SARC standard was prioritised.

⁷ The draft standard for taking forensic samples from complainants in sex offence cases and 'questionnaire' is available at: www.gov.uk/government/consultations/forensic-medical-exam-standard-for-sexual-assault-complainants. The draft guidance (FSR-G-212) is available at: www.gov.uk/government/consultations/forensic-medical-examination-assessment-collection-and-recording-of-forensic-evidence.

⁸ Available at: www.gov.uk/government/publications/sexual-assault-referral-centres-and-custodial-facilities-dna-anti-contamination

Following the consultation, the MFSG will consider all comments and the intention is to publish a revised standard and guidance in autumn 2019. It is likely that a pilot will be required thereafter to determine the methodology for assessing compliance with the standard. Discussions have been initiated between the Regulator, UKAS and the CQC about how information from CQC inspections and UKAS assessments could be used to complement each other, minimising duplication of effort but ensuring that concerns raised in one assessment/inspection, which are relevant to the other, are passed on.

1.4 Update on Toxicology Standards

UK and Ireland Association of Forensic Toxicologists (UKIAFT) Guidance for Toxicology

Following a consultation exercise, the UKIAFT has reviewed and published an updated version of its forensic toxicology guidance. Work is underway to review the new guidance to assess the manner in which issues raised in the consultation have been addressed. This will lead to work with the UKIAFT on the possibility of transforming the guidance into a standard.

Drug Driving Standard

The development of the drug driving standard has been delayed by the consideration of interpretation models. Therefore, a decision was made to split the standard from the interpretation model and publish them separately. The standard is still under discussion with providers and UKAS.

A targeted consultation exercise was carried out on the possible interpretation models and the responses are being considered. This will lead to a new report on the model.

1.5 Update on Anthropology and Forensic Gait Analysis Standards

Anthropology Standard

The Regulator worked with the Royal Anthropological Institute (RAI) to consider the feedback following a public consultation on the draft Code of Practice for Forensic Anthropology. After addressing consultation comments, the Code was finalised and published.⁹ It details the standards of practice that are expected for forensic anthropologists undertaking both Crown and defence casework within the criminal jurisdictions of the UK. After the Code has been embedded for a period, the Regulator will discuss with the RAI how its effectiveness in improving quality could be assessed.

⁹ The Code is available at: www.gov.uk/government/publications/forensic-anthropology-code-of-practice

Forensic Gait Analysis Standard

Last year's Annual Report noted that the College of Podiatry and the Chartered Society of Forensic Sciences (CSFS) had produced a draft document detailing the standards expected in forensic gait analysis.

Although the draft was quite advanced by November 2017, feedback was still being received from practitioners. Thus the engagement event arranged by the CSFS for November was postponed to January, to accommodate attendance by interested parties.

The role of the Health and Care Professions Council (HCPC) was raised during the development of the draft; some practitioners providing forensic gait analysis services are registered and regulated by the HCPC. The Regulator met with representatives of the HCPC in April, including the Chief Executive and Registrar. It was agreed that practitioners registered with the HCPC are required to comply with the HCPC Standards of conduct, performance and ethics, but that the HCPC would also expect practitioners to "... act in accordance with any relevant code of practice or conduct for expert witnesses that sets appropriate requirements in respect of such matters as objectivity, the avoidance of cognitive bias and scientific validity and quality".

The Institute of Chiropodists and Podiatrists contacted the Regulator and was invited to discuss the development of the draft with the Regulator and, of course, contribute when the draft went out for public consultation.

The public consultation ran from July to September 2018 on GOV.UK, publicised by the CSFS and through the Regulator's distribution list. Contributions were received from the HCPC, the College of Podiatry, the Royal Society and practitioners.

The Regulator is unable to respond personally to each organisation or individual submitting comments. However, all comments received as part of the consultation or indeed received earlier in the process of developing the standard will be carefully considered prior to publication of the final version. This is now expected early in 2019.

1.6 DNA Mixtures Guidance

After the consultation process in 2017 for the documents DNA Mixture Interpretation Software Validation (FSR-G-223)¹⁰ and DNA Mixture Interpretation (FSR-G-222)¹¹ the comments were collated, and detailed consideration given to each by the Regulator's DNA Specialist Group (DNASG). In July 2018 both documents were published.

¹⁰ Available at: www.gov.uk/government/publications/software-validation-for-dna-mixture-interpretation-fsr-g-223

¹¹ Available at: www.gov.uk/government/publications/dna-mixture-interpretation-fsr-g-222

In October 2018 Issue 2 of the DNA Mixture Interpretation (FSR-G-222)¹² was published including two updates:

- a. to clarify the implementation process for cases that had been completed by the forensic scientist but had not yet reached a CJS conclusion; and
- b. the major and minor profile approach discussed in a recent paper from the DNA commission of the International Society for Forensic Genetics (ISFG)¹³.

1.7 Legal Obligations Guidance

In April 2018 the provisions of the CrimPR related to providing information about assistants were altered (see the new Rule 19.4(e)).

The document Legal Obligations (FSR-I-400) was updated to reflect the new CrimPR provisions and published in August 2018. In addition to addressing the new provisions in listing assistants a number of recent developments in case law were discussed in the updated version.

The change in 19.4(e) has an impact in the content required in experts' reports. As a result the document Expert Report Guidance (FSR-G-200) has been redrafted to set out the new requirements. Views on this document have been sought from the CPS and the new version will be published shortly after receipt of that advice.

The new CrimPR provisions require consideration of whether the expert has relied on representations of fact or opinion in preparing their report. This is not a simple issue to address and the Regulator has worked with the Association of Forensic Science Providers (AFSP) to develop guidance on this issue. Again the views of the CPS have been sought. This document may be published as a stand-alone guidance or as an annex to the updated version of FSR-G-200.

The Regulator has written to the Criminal Procedure Rules Committee to ask that it considers the extent to which some expert witnesses are providing a fair and accurate picture of their experience in reports.

1.8 Facial Comparison Standard

Update of the Video Analysis Appendix to the Codes

The Regulator has met with a range of organisations that provide facial comparison evidence in the CJS to identify risks and issues and determine what is impeding progress towards achieving compliance with quality standards. Limited understanding of method validation requirements appears to be one such barrier. Whilst the general guidance on validation¹⁴ and the requirements in the Codes remains relevant, additional detail on validation will be included in the update to the

¹² Available at: www.gov.uk/government/publications/dna-mixture-interpretation-fsr-g-222

¹³ Available at: [www.fsigenetics.com/article/S1872-4973\(18\)30346-6/fulltext](http://www.fsigenetics.com/article/S1872-4973(18)30346-6/fulltext)

¹⁴ Available at: www.gov.uk/government/publications/forensic-science-providers-validation

Video Analysis Appendix to the Codes. This update, which is being prepared with the assistance of subject matter experts, will include additional provisions specifically relevant to the comparison of faces captured from imagery. The new provisions will include the expectation that the validation process should include a review of the scientific literature of the method, to identify:

- a. the scientific basis for the method;
- b. studies critical of the method;
- c. examples of testing methodologies;
- d. end-user requirements, including avoiding any biasing effect of the observer;
- e. reproducibility of findings (including any verbal confidence scale); and
- f. false inclusion/exclusion rates.

In the Regulator's 2016 and 2017 Annual Reports, the need for more scientific studies to underpin facial comparison was highlighted; this remains the case. At the time of writing, the consensus in the scientific literature is that most methods, other than those based upon morphological features, should not be used in facial comparison involving images from an uncooperative or uncontrolled setting (i.e. imagery such as CCTV rather than the direct comparison of questioned passport photos). Obviously if methods advance and further research indicates that the issues identified have been controlled, the position may change. To counter published studies, new validation studies would need to be sufficiently rigorous to test if the problems identified in the literature have indeed been effectively controlled in the method being tested. It would not be sufficient to demonstrate that the method simply appears to work in the hands of those conducting the validation. It is worth noting that even if a modified method was shown to control problems previously highlighted in the scientific literature, it would not obviate the requirement to disclose that there is a range of scientific opinion on the matter (CrimPR 19.4(f)). The updated appendix will therefore highlight the fact that the scientific literature cautions experts away from most methods, however named, that are not based on morphological features. Even with the latter, there remains a paucity of scientific studies on the reliability of facial comparison where the questioned imagery is anything other than good quality. The updated appendix is expected to be ready for publication in the spring of 2019.

Image Analysis: Statement of Principles

The Regulator has been made aware that image analysis experts are, on occasion, failing to stay within the bounds of their expertise and failing to communicate effectively to the courts the limitations of work carried out. The Regulator will shortly be finalising guidance, in collaboration with NPCC and the CPS, to avoid any doubt about boundaries of expertise.

The expert must have specific expertise in the subject matter on which opinion is expressed. Expertise in CCTV, video, imaging or enhancement does not equate to expertise on the content of the image. Expert evidence is admissible "to furnish the

court with scientific information which is likely to be outside the experience and the knowledge of a judge or jury". It follows that if the individual intending to give evidence is no more 'expert' in the objects in the images (for example, cars, clothing) than the jury then his or her opinion is not expert and is not admissible as such. An expert on imagery may give expert evidence on aspects of imagery in which they have expertise, such as enhancement of imagery, artefacts in imagery including compression, interpolation or smoothing; they may have expertise to comment on factors affecting analysis, such as shape, lighting, shadow, size, shade and surroundings. Many items look quite different under street lighting, or where CCTV uses infrared illumination; these are areas that an imagery expert should rightly be called to give expert evidence. Experts in facial comparison, for example, may not have these skills; on occasion therefore more than one expert may be required.

Availability of Appropriate Quality Imagery

It has been highlighted to the Regulator that practitioners are on occasion only supplied with copy material, often referred to as DVD playable copies, rather than footage in a native format. An example of where the importance of a competent practitioner having access to original footage was recently highlighted to the Regulator:

"A compilation of CCTV footage was presented to the court by a police officer, who invited the jury to identify an object in one individual's hand as a knife. On examination the digital forensics expert engaged by the defence found frames that showed the object in question falling from the individual's hand and lighting up when it hit the floor. This object was therefore more likely to be a phone than a knife. These frames were missing from the Police's compilation video."

The Regulator raised the issue with the Digital Forensics Specialist Group (DFSG) and will discuss with the relevant NPCC lead what the scale of the issue might be and whether guidance and competence requirements can be updated.

Law Enforcement Facial Images and New Biometric Modalities Oversight and Advisory Board

As part of its Biometrics Strategy, the Home Office established a Law Enforcement Facial Images and New Biometrics Modalities Oversight and Advisory Board. This Board has no statutory remit and no statutory power to implement any recommendations it may make. It is chaired by CC Mike Barton of Durham Constabulary. Along with the Biometrics Commissioner, the Information Commissioner's Office and the Surveillance Camera Commissioner, the Regulator provides an advisory role to this Board.

It is perhaps too early to judge whether or not the Board will be effective in fulfilling an effective oversight function. The Regulator believes that from a reliability perspective, successful implementation of new technology in the CJS requires scientific validation of the technology against a well-defined user requirement and

technical specification, to determine its strengths and limitations; it is also critical to ensure that staff are properly trained in its use. Any pilot studies should be designed to facilitate the effective evaluation of results and not to enable technology 'creep' into routine operational practice. The other Commissioners and Regulators on the Board will take a view on the proportionality and legality of proposed approaches.

1.9 Revision of the Regulator's Codes of Practice and Conduct

Whilst a few forensic units have had the Codes in their schedules of accreditation for quite some time, the deadline of 2017 prompted a significant increase in compliance.

With so many organisations from a range of backgrounds implementing the Codes for the first time, sections have been identified where more description is required. The Regulator's Quality Standards Specialist Group (QSSG) has taken the lead in evaluating the range of comments received, and the Forensic Science Advisory Council (FSAC) has advised the Regulator on the options proposed.

The majority of the proposed changes are minor alterations and/or clarifications. Changes such as dropping the direct cross reference between each section of the Codes and the relevant section of ISO 17025, and including the appendices to the Codes within its contents pages will be the more obvious changes.

The topic that provoked the greatest debate was whether more provisions were required to deal with issues of integrity. Being more explicit that the auditing of methods should include data integrity, as well as looking at the controls in place was recommended, as was more awareness training. Definitions were also updated.

The next issue of the Codes is expected to be published in spring 2019.

1.10 Standards under Consideration for Digital Forensics

Cell Site Analysis and Communications Data

In June 2016 expressions of interest to take part in a pilot accreditation scheme were sought from UK-based bodies that undertake cell site analysis. Several organisations volunteered but much of the work stalled as validation studies proved more challenging than participants had anticipated.

Validation requires a demonstration that there is a sound underpinning scientific basis for the use of call data records to make the types of inferences that are expected, but there remains limited published peer-reviewed research in this discipline. The Regulator has supported efforts to address this, including by working with stakeholders to enable 'ground truth' call data records to be made available for aspects of this research. Areas being addressed include:

- a. the difference between technical interpretation and opinion evidence in cell site analysis;

- b. assessment of uncertainties within call data records;
- c. assessment of uncertainties of methods used within cell site analysis; and
- d. interpretation models for providing opinion in cell site analysis.

It is expected that scientific paper(s) dealing with aspects of validation for cell site analysis will be submitted for peer review in 2019. The Regulator is grateful to members of the DFSG for leading and supporting this work.¹⁵

The Regulator has called for expressions of interest from forensic units to join the pilot, to include interpretation of call data, to take place in mid to late 2019.

The Regulator has met with the DCG Oversight Board, to discuss how the quality of broader police use of communications data can be assured. The DCG is working to ensure that staff are appropriately trained and that procedures to minimise error are embedded; the Regulator will continue to engage with this group to determine whether additional standards are required.

Network Forensics

The Network Forensics sub-group of the DFSG has considered issues of scope and terminology. The 'Network Forensics' category in the Statements of Standards and Accreditation Requirements has been defined as screening/extraction of data from a business's networked computer system involving the network administrator(s). This was considered to be an area where a quality standard is required but is outside of current requirements for accreditation. The next step for the group is to consider what standard is required and when compliance should be expected.

Screening or extraction of data from a device and/or local area networks operated by domestic and small business users therefore remains within the scope of incident scene investigation, requiring accreditation to ISO 17020 and the Codes by October 2020.

Open Source Intelligence (Internet Intelligence and Investigations)

The NPCC has changed from the terminology 'open source intelligence' in favour of 'internet intelligence and investigations'; this report and future versions of the Codes will adopt the same terminology. This term now covers three levels of activity:

- a. core internet use;
- b. overt internet intelligence and investigations; and
- c. authorised covert internet intelligence and investigations.

The first category, core internet use, draws on online data sources, accessing online mapping facilities and includes ad hoc capture of online evidence highlighted by a

¹⁵ CCL Forensics is undertaking the work and the NPCC Digital Communications Group (DCG) has facilitated access to ground truth data.

complainant or witness. There are risks of quality failures in this activity, but they are considered lower than the other two areas.

Initial scoping suggests that both overt and covert internet intelligence and investigations should adopt the good practice of having a clear investigative strategy developed with the investigating officer. In simple cases involving retrieval of evidence this might be a generic strategy; in more complex cases it would be a dynamic document developed with the officer in the case and with input, where appropriate, from the senior investigating officer.

The third category 'authorised covert internet intelligence and investigations' excludes what is termed undercover online (UCOL) activity; UCOL typically involves direct interaction with subjects. It is an investigative activity rather than a forensic science activity and will not be further considered by the Regulator.

A current NPCC project is identifying the user requirements for internet intelligence and investigations; it includes a range of requirements analogous to quality controls in forensic science, including the requirement to have an audit trail of suitably detailed contemporaneous notes. The Regulator's DFSG sub-group dealing with internet intelligence and investigations will work with the relevant NPCC groups and the College of Policing to develop guidance, which should cover the end to end process including quality controls. This guidance should also be applicable to non-police practitioners such as those working in trading standards.

1.11 International Standards

The British Standards Institution (BSI) Mirror Committee for Forensic Science (FSM/1), chaired by the Regulator, continues to be the UK's voice in relation to the development of forensic science related standards internationally, through ISO. The BSI secretary of FSM/1 has been active in recruiting new members to the committee, to ensure adequate representation of all relevant groups.

The ISO Technical Committee TC 272 had continued its work of developing standards for forensic science. The first two of these standards have now been published:

- a. ISO 21043-1:2018 Forensic sciences – Part 1: Terms and definitions; and
- b. ISO 21043-2:2018 Forensic sciences – Part 2: Recognition, recording, collecting, transport and storage of items.

The UK quality standards framework for forensic science is set out in the Codes. The UK standards already cover the requirements in the new international standards. Therefore the Regulator will not require organisations to be certified against the new standards.

The FSM/1 committee has provided comments on three further standards under development in relation to analysis, interpretation and reporting. The development of a new standard for forensic grade consumables, ISO 20964, is continuing.

1.12 Update of Fingerprint Standards

The Fingerprint Quality Standards Specialist Group (FQSSG) has been tasked to consider the validation requirements for the introduction into casework of a new search algorithm, which is to be introduced in 2019, to replace the current IDENT1 algorithm. In future, the use of this new algorithm in the fingerprint examination work flow should form part of accreditation schedules. A preferred algorithm supplier has been identified by the HOB program and the Regulator is working with those involved to produce guidance on the overall validation requirements of this new software. The QSSG and the FQSSG are being consulted for feedback; when finalised, the guidance will provide assistance to HOB and fingerprint bureaux as they work to validate the algorithm centrally and verify its operation in each bureau.

To further underpin fingerprint examination and its use within the wider CJS, the FQSSG is working to identify research and development that would be beneficial to the fingerprint community. The output is intended to assist in identifying and prioritising research requirements for the fingerprint community to progress in a coordinated manner, for example, through research bids, Home Office commissioning of the Defence Science and Technology Laboratory (Dstl) or the Transforming Forensics programme.

Last year, the Regulator asked the FQSSG for the community's considered advice on the use of the term 'identification' and proposals for wording that better reflects the level of confidence justified by the experimental validation. This is particularly important where comparisons are complex and examiners may legitimately disagree on whether or not there is a sufficiency of detail to conclude that the marks originated from the same individual. The Regulator accepts that a major change cannot happen while organisations are concentrating on gaining accreditation, but the response of the community to a proposed change in terminology was very negative. Nonetheless, it remains the view of the Regulator that there must, in future, be a move away from terminology that risks giving a misleading impression of certainty or near certainty. This issue will be considered in more detail once bureaux have obtained accreditation and a more advanced draft of the evaluative interpretation standard is available.

1.13 Update on Standard for Case Review

As discussed in last year's Annual Report, there remains a structural problem with implementing a standard for case review work that is primarily funded by the LAA. During the year, the Regulator met with members of the team conducting the review

into the Legal Aid, Sentencing and Punishment of Offenders Act 2012 (LASPO post-implementation review¹⁶) to highlight important issues including the following.

- a. At present, solicitors are generally required to award work to the provider offering the lowest quote for the work; this takes no account of the quality of work provided and would probably result in providers who adopted a quality standard (which would have an associated cost) being placed at a competitive disadvantage.
- b. The current rates paid by the LAA for forensic science are too low to enable quality standards to be adopted. The rates for different disciplines of expert appear to be largely historical, and do not reflect the underlying costs of provision of the services. For example, a medical consultant's hourly rate (outside London) is £108, while that of a drug expert is £72. A medical consultant will almost certainly be employed by the National Health Service (NHS), have an NHS pension and access to NHS facilities in which to work. For the drug expert, either working as a sole trader or in a forensic science provider, the £72 will have to fund salary, pension, insurance, work premises, equipment and so on even before factoring in the cost of quality.

In parallel, the Regulator has funded a 'dry run' to evaluate whether or not accreditation against the standard ISO 17020 would provide an adequate level of assurance at a proportionate cost. Three organisations agreed to participate in the dry run, including one organisation participating in the pilot scheme being developed by the CSFS, in collaboration with UKAS and the Regulator, to enable small companies and sole traders to, in effect, share costs by using a common management system and share resources for audit and peer review. At the time of writing, UKAS assessment visits to two of the organisations have been carried out. The findings from the dry run will be considered by the QSSG and the FSAC.

Section 2: Full Compliance with Quality Standards

Requirement¹⁷ 2: That there is full compliance with the quality standards requirements across all forensic science disciplines, from crime scene to court and in all sectors, and that the quality culture has matured.

2.1 Compliance with the Regulator's Codes of Practice and Conduct

The extent of compliance with the Codes has increased significantly since last year's Annual Report. At that time, 19 organisations held accreditation to the Codes. Currently, 37 legal entities hold accreditation to the Codes, and some represent

¹⁶ Available at: www.gov.uk/government/publications/post-implementation-review-of-laspo

¹⁷ The Regulator's aims and requirements were set out in full in previous Annual Reports, available at: www.gov.uk/government/publications/forensic-science-regulator-annual-report-2016 and www.gov.uk/government/publications/forensic-science-regulator-annual-report-2015.

more than one police force or unit. This increase in compliance is a major step forward and the Regulator would like to thank all of those who have worked hard to ensure that their quality management is at the level required. What these figures do not show, however, is the number of organisations with no accreditation at all. It is still not possible to determine how many such organisations there are, offering services into the CJS without any systematic assurance of competence.

The Regulator has asked the NPCC to map the forensic science activities within policing, identifying where the gaps in compliance with standards lie. However, there is no way for the Regulator to gain a similar picture for the commercial sector as a whole; the large commercial providers have very broad scopes of accreditation, but there are numerous very small organisations with little or no accreditation and therefore no external assessment of the existence or adequacy of their systems for assuring quality.

The impact of standards on the quality of forensic science will continue to be monitored through a combination of:

- a. review of actions raised through accreditation;
- b. review of complaints and referrals; and
- c. review of court judgments in relation to expert evidence.

A paper to disseminate the learning from a review of accreditation of digital forensics units will be submitted for publication.

2.2 Update on Compliance with Digital Forensics Standards

The rate of increase in compliance with the digital forensics standards has slowed markedly during the year, primarily due to policing's focus on reaching the required standard for fingerprint comparison. Since there was a legal requirement to reach the standard for fingerprints and a limited level of resource, digital forensics compliance suffered. This illustrates that police force forensic units are not resourced sufficiently to meet the necessary standards in a timely fashion without compromising ongoing case delivery. Several of the larger commercial providers of digital forensics have broad scopes of accreditation, including compliance with the Codes. Police forces must decide if they will achieve the standards themselves and do so very soon or if they will signal to the market that they will outsource work to accredited providers in larger volumes. If the latter, the procurement approach must not make the errors that have been made before:

- a. to drive too much cost out of the market and endanger commercial viability; or
- b. to award contracts to organisations 'working towards' achieving quality standards without having done so.

There has been continued focus from the NPCC digital forensics portfolio on assisting police forces in complying with standards. The work with Dstl to validate

kiosk technology has proved to be very useful in establishing the limitations of the technology when deployed without manual verification, such as would be the case when used by front-line police officers. Understanding the limitations of what will reliably be downloaded versus what may or may not be recovered, depending on the make and model of phone, will greatly assist in ensuring that it is clear whether reasonable lines of inquiry have been pursued. Consequently, it will assist the police in fulfilling their disclosure obligations. It is also a positive example of collaboration reducing the cost of achieving the necessary levels of quality assurance and of a pragmatic approach to standards; only one deployment per force needs be on the schedule of accreditation providing the force can control further deployments and training of users.

It is of course important that this validation package is kept up to date on a rolling basis; the Regulator understands that this may be a responsibility that the Transforming Forensics programme can assume.

2.3 Update on Firearms Classification

Several years ago the Regulator made an offer to NPCC that if it could set out an adequate framework of quality control and assurance, this would be considered instead of accreditation for the simple classification and triage of firearms. However, no such framework was developed.

There are currently four police forces (including the three National Ballistics Intelligence Service [NaBIS] hubs) that hold accreditation for firearms classification. All other police forces must outsource their work to accredited providers unless or until they gain accreditation; there has been ample opportunity to reach the required standard.

2.4 Work Towards Compliance with Crime Scene Investigation Standards

There are three strands to the crime (or incident) scene investigation standards.

Investigation of Simple or Complex Crime Scenes by Crime Scene Investigators

During the year the Regulator funded UKAS to undertake two 'dry run' assessments of police forces. The aim of these dry runs was to confirm that the assessment procedure as applied to the only existing accredited entities for this activity, which are commercial forensic science providers, was also suitable for police CSI activity. It also assisted in confirming that the optimal approach would be for each force to start with simple scenes (where there is no Crime Scene Manager involvement and no placing of cordons) then to expand their scope of accreditation to cover all scenes. Alongside the dry runs, an NPCC Crime Scene Expert Network has led work towards preparing forces for accreditation, by considering issues such as validation of

methods. The Expert Network reports that the CSI community is constructively engaged with the process of working towards accreditation and anticipates that all forces will achieve accreditation of at least part of their CSI work ahead of the October 2020 deadline. However, it is unlikely that all forces will achieve accreditation of all their CSI work ahead of the deadline.

Fire Scene Investigation

Four organisations spanning Fire and Rescue Services (FRS), commercial and government sectors are participating in the accreditation pilot and attended a briefing day in July 2018; if they are successful, they will be awarded accreditation to ISO 17020. The pilot will enable accreditation methodology to be refined and validation studies to be evaluated fully for the first time. The scope of the pilot includes:

- a. determination of the origin/source of fires;
- b. opinion on the causes of fires and on whether or not they were started deliberately; and
- c. where applicable, supporting activities such as identification and recovery of items for scientific analysis, presumptive testing for accelerants and sampling for accelerants.

Although pilot accreditation visits were originally planned for the second half of 2018, there has been a delay into 2019 to give participants time to prepare all the necessary documentation. The Regulator welcomes the formal commitment of the National Fire Chiefs' Council (NFCC) to gaining accreditation for fire investigation within the FRS, but recognises that fire investigation is still an uncertain landscape, with commercial providers having no clarity on the likely demand for their services. Against this background, the Regulator is very grateful that commercial fire investigation companies have agreed to participate in the accreditation pilot. Provision of fire investigation services (particularly for fatal fires) must be addressed by the Home Office and NPCC as they consider forensic marketplace instability.

Collision Investigation

As part of the NPCC Specialist Capabilities Programme, a national programme to prepare police collision investigators for accreditation has been initiated, with Assistant Chief Constable (ACC) Martin Evans as the NPCC lead. The Regulator has been extremely impressed with leaders of the collision investigation community and their evident desire to increase professionalism and scientific rigour in their field. There is, however, much to be done. Collision investigation involves many measurement and opinion-based methods, none of which have previously been validated. The national approach is clearly the most efficient and indeed only approach feasible, given the scale of the task. The Regulator will continue to support collision investigators as they work towards accreditation and will consider the inclusion of a collision investigation appendix to the Codes to support standardisation.

2.5 Update on Contamination Elimination Database

Significant progress has been made towards moving police officer samples from the Police Elimination Database (PED), from which only individual records could be accessed in very restricted circumstances, to the Contamination Elimination Database (CED). This is important because it enables all DNA profiles from crime stains to be checked on a weekly basis to ensure that they are not in fact contaminants from officers. To date, 1,528 potential contaminant profiles have been identified, resulting in 810 profiles being removed from the National DNA Database (NDNAD); further investigations into potential contaminants are underway. These numbers show that contamination of crime scene samples by individuals attending the scene are not a theoretical possibility, but a real issue.

Effective use of elimination databases ensures that such profiles are identified early and removed from the database to avoid spending time and money on investigating DNA profiles that are, in fact, nothing to do with the crime. That is why it is deeply disappointing that the Police Staff Council (PSC) would not agree to mandatory inclusion of existing police staff on the CED. Police staff include CSIs and other individuals who could pose a high risk of contamination. The PSC has insisted that no adverse inference or treatment should result from an existing member of staff refusing to provide a sample. In essence, this means that an individual at high risk of contaminating scenes or items could refuse to give an elimination sample yet continue in that high-risk role, potentially contaminating evidence without there being a way to uncover that contamination. The Regulator does not believe that such an occurrence would be compatible with accreditation and strongly urges all police staff to consent to giving an elimination sample, to protect both themselves and the integrity of the NDNAD.

It is also disappointing that a small number of police forces have not yet conducted the necessary administrative checks to enable their police officer samples to transition from the PED to the CED. The Regulator has written to the Chief Officers of the Metropolitan Police Service, British Transport Police, Gwent Police, Sussex Police and Surrey Police to request urgent action.

Other individuals at risk of contaminating samples include those who work in SARCs and those who work in manufacturing or packaging consumable items used in the forensic science process. Pilot studies are underway to ensure processes for staff from these settings work appropriately. The Regulator would like to thank the manufacturers, SARC staff and their representative bodies who have been helpful in moving this important work forward.

2.6 Update on Forensic Pathology

Code of Practice

The Code of Practice for Forensic Pathology has been reviewed and updated. The publication has been delayed slightly to allow further consideration of issues related to:

- a. organ and tissue donation; and
- b. less invasive post mortem examinations.

Excited Delirium

The guidance on the use of excited delirium as a cause of death has now been completed and will be issued in the near future.

Audit

The 2017 audit has been completed and the report will be published shortly. One aspect of this audit was to look at cases where a forensic pathologist was asked to take over an examination started by a non-forensic pathologist. When this area of work was last examined (in the 2012 audit) significant issues were identified. These were not seen in this audit.

The 2018/2019 audit is being planned.

Legal Issues in Forensic Pathology and Tissue Retention

The text of the document has been updated and agreed by all stakeholders. Following recent high-profile cases where the handling of human tissue was criticised there is further consideration of any changes that need to be made to that section.

2.7 Fingerprint Comparison Compliance

The deadline for fingerprint comparison bureaux to gain accreditation to the required standard of ISO 17025 was October 2018. At that date, only three bureaux in England and Wales (East Midlands Special Operations Unit [EMSOU], Dyfed-Powys Police and the National Crime Agency [NCA]) had gained accreditation. This extremely poor level of compliance was despite the following timeline of events.

Year	Events
2009	The EU adopted accreditation framework decision 2009/905/JHA, which requires Member States to use organisations accredited to ISO 17025 for fingerprints (by November 2015) and DNA (by November 2013).
2010	The Regulator's FQSSG formed.
2011	Scottish Fingerprint Inquiry recommended that fingerprint comparison in Scotland should be accredited. Significant criticisms of fingerprint comparison were made in R v. Smith [2011] EWCA Crim. 1296, including the lack of contemporaneous notes.

	The court required that: “The Forensic Science Regulator and the recently established Fingerprint Quality Standards Specialist Group to examine as expeditiously as possible the issues we have identified, to assess the position and to ensure that there are common quality standards enforced through a robust and accountable system.”
2013	The UK opted out of 2009/905/JHA. The Regulator’s fingerprint comparison standard (based on ISO 17025) was published for public consultation.
2014	The Regulator’s Annual Quality Conference held a parallel session dealing specifically with fingerprints, to pave the way towards accreditation. The Codes Issue 3 specified deadline to gain accreditation as October 2018.
2015	The Regulator’s fingerprint comparison standard launched with a workshop in which the Scottish Police Authority (SPA), which was then close to award of accreditation, led sessions to assist bureaux in preparing for accreditation. The Regulator funded two pre-assessment workshops for all bureaux to attend, at which UKAS gave detailed commentary on the standard and what was required to gain accreditation.
2016	The SPA accreditation to ISO 17025 was granted. The UK opted back into 2009/905/JHA with no transitional arrangements, in effect meaning that the UK was infringing the decision since the bureaux were not accredited.
2017	The Regulator funded another workshop, run by the SPA, to assist all bureaux towards accreditation. Some bureaux still not accepting the need for contemporaneous notes.
2018	Forensic leaders in policing became aware that 2009/905/JHA was to be enacted. Coordinated effort began towards accelerating the accreditation process. Three bureaux in England and Wales gained accreditation by the Regulator’s deadline of October 2018.

Deputy Chief Constable (DCC) Rachel Swann was told by all bureaux at the time of last year’s Annual Report that their status was ‘green’ against the October 2018 deadline. She has continued to push all bureaux towards accreditation and it is now thought that approximately 80% will reach the required standard by March 2019. Without a doubt it was the imminent legal requirement to gain accreditation, as a result of the Accreditation of Forensic Service Providers Regulations 2018,¹⁸ by which 2009/905/JHA is being transposed into UK law, that finally enabled progress to be made. This has clearly demonstrated that some organisations will only comply with standards when they are required to by law; a clearer case for statutory powers for the Regulator would be difficult to make.

At the time of writing, three forces (Devon and Cornwall Police, City of London Police and Gloucestershire Constabulary) have not even reached the stage of applying for

¹⁸ The Accreditation of Forensic Service Providers Regulations 2018 No. 1276, available at: www.legislation.gov.uk/id/uksi/2018/1276

accreditation, which means that they are possibly more than 18 months away from compliance. The Regulator has written to the Chief Officers of these forces, seeking assurance that they will outsource work to accredited forces prior to the Accreditation of Forensic Service Providers Regulations 2018 taking effect on 25 March 2019.

2.8 Sole Traders and Small/Micro-Businesses

The scheme developed by the CSFS to assist small and micro-businesses to reach the necessary standards while continuing to deliver chargeable work and to reach them at a more predictable and proportionate cost, is currently being piloted as part of the study into case review, detailed in section 1.13.

The Regulator is cognisant of the difficult market conditions and the barriers to gaining accreditation caused by low LAA rates. However, there continue to be quality referrals to the Regulator about a range of work delivered by small businesses as well as larger ones, and an opt-out or lower standard for small businesses is at odds with the aim of ensuring that all forensic science delivered to the CJS is of the requisite standard. The issue was referred back to the FSAC, particularly in light of the very different views on regulation advanced by small versus large providers of forensic science in evidence to the House of Lords Science and Technology Committee. The Council was unanimous in supporting the principle that the quality standards must be applied equally, irrespective of the size of the organisation providing the service.

Fundamentally, this may be a system design problem. The Regulator is responsible only for quality standards and there is no regulation of the market or the economic aspects of forensic science provision. However, the Regulator will continue to work with the FSAC and with other stakeholders to assist smaller businesses to reach the appropriate standards in a way that is sustainable.

2.9 Complaints and Investigations – Update from Last Year’s Report

Referrals of Quality Issues During the Year

RTS/TLL

As noted in the last Annual Report an issue of improper data manipulation had arisen at RTS. The response to those events has become one of the largest programmes of work related to forensic science in this country. There is a police investigation, led by Greater Manchester Police, which is a large and complicated inquiry. In addition there is an overall CJS response led by the Gold Group chaired by Chief Constable (CC) James Vaughan; this Group oversees a programme for retesting the samples, balancing the demands for the very limited forensic toxicology capacity available. The MoJ has convened a Gold Group to lead the response to improper data manipulation at TLL.

Metropolitan Police

The Metropolitan Police has announced an issue with the work performed by one of its scientists.

There is a police investigation into the issue, which limits what can be said at the present time. Again a Gold Group has been established and a review of cases initiated. The Regulator is represented on the Gold Group and the review. Despite reviewing a large number of cases thus far, the number of cases affected remains low and the overall impact on the CJS is limited. Further cases are being reviewed, so final figures cannot be given at this time.

Independent Office of Police Conduct

As noted in the last Annual Report the Regulator, with the assistance of the Forensic Pathology Unit of the Home Office, has worked with the Independent Office of Police Conduct (IOPC) to review aspects of the investigations of the homicides committed by Stephen Port. At that time an interim report had been provided to the IOPC.

Following additional work a final report has now been provided to the IOPC. As this work was to assist the IOPC the report will not be made public at this time.

Super Recognisers

A number of issues have been raised in relation to the work of 'super-recognisers' and the output of their work in the CJS. As noted in last year's Annual Report, the Regulator does not believe the work of 'super-recognisers' is forensic science and therefore it is not within her remit. However, having considered the issues the Regulator has significant concerns about the framework within which 'super-recognisers' work and the use of the output from the work as evidence.

The Regulator has therefore provided advice to the Government about the issues and suggested matters that could usefully be addressed, for example, through strengthening the Police and Criminal Evidence Act 1984 (PACE) Code D.

Integrity

Over the last year doubts have been raised about the integrity of a small number of those operating within the forensic science profession.

Clearly the events at RTS and Trimega, if proved to be true, would amount to deliberate malpractice. That would, if proved, demonstrate a lack of integrity of those involved.

While not as clear cut as malpractice there have been other issues that, in the Regulator's view, demonstrate a lack of integrity; albeit at different levels.

The first relates to a lack of candour when producing reports and statements. Sections of reports setting out experience and qualifications fail to provide a fair and balanced picture by omitting reference to:

- a. cases where evidence has been ruled inadmissible;
- b. criticism by the judiciary;
- c. criticism by professional bodies; and
- d. lack of expertise or experience.

While this may seem, at first consideration, a relatively harmless positive slant on the individual's experience it is, in fact, a deliberate attempt to mislead the CJS. The Regulator has contacted the Criminal Procedure Rules Committee to flag the issue and seek views on what might be done to address the lack of candour.

The issue of judicial criticism is complicated by the fact that the scientist may be unaware of the fact such criticism has been made, and the nature of the criticism. The Regulator has therefore contacted the senior judiciary to seek views on whether there is a better way to deal with judicial concerns about the work of forensic scientists.

The second relates to a lack of understanding of the role and requirements imposed on those involved in the CJS. Examples include:

- a. failure to comply with the Criminal Procedure Rules;
- b. failure to comply with the Criminal Practice Directions;
- c. failure to meet the procedural requirements for evidence;
- d. pre-completion of continuity records prior to actual movement of the exhibits (this amounts to fabricating the continuity of exhibits); and
- e. incorrect completion of continuity records (again this amounts to fabrication of the records).

In relation to the lack of understanding the Regulator has engaged with forensic science units about the training to ensure that all staff properly understand:

- a. their role;
- b. the significance of that role to the CJS;
- c. the requirements imposed on them; and
- d. the potential consequences of failure to perform the role to the required standards.

The Regulator will this year provide training material to assist all forensic units in ensuring that staff understand issues of their role and the level of integrity required.

The response to deliberate malpractice is, perhaps, the most difficult to judge. The Regulator has already commissioned data integrity audits in the major suppliers. The results have been reassuring. Discussions with the FSAC and forensic units about building a data integrity audit into the annual audit programme will lead to an update to the Codes shortly. The intention is not to demand a new and separate audit. The intention is that every year one of the routine planned audits will have a particular focus on data integrity. If all staff understand that data integrity is being checked and that a different area will be checked every year there will be a clear deterrent to the

improper manipulation of data. This will also provide a greater chance of such manipulation being identified at an earlier stage.

Last year the Regulator reported that work had been commissioned to design an anonymous reporting facility. Work to procure and implement a full web and telephone based service has been disappointingly slow, but is progressing. The Regulator recently published guidance on how to make an anonymous referral in the interim.¹⁹

In order to improve dissemination of learning from quality failures, the Regulator will be producing a series of Lessons Learnt publications with a focus on opportunities to improve practice and prevent repeated failures.

Referral Trends

Table 2 details the number of referrals to the Regulator in each of the last four years. As noted earlier, the frequency of quality referrals to the Regulator is not in itself an indicator of concern; of greater concern are quality failures that are unrecognised or unreported and so are not effectively dealt with. As quality standards have been introduced into successive disciplines there has been an increase in referrals, which indicates that failures are being identified and acted upon, not that the number of failures is increasing.

Table 2: Referrals to the Regulator

Classification	2014–15²⁰	2015–16²⁰	2016–17²⁰	2017–18
High risk	7	9	14	6
Medium risk	15	33	25	44
Low risk	9	9	14	26
Outside Scope	3	4	6	8
Total	34	55	59	84

2.10 Streamlined Forensic Reports

The Regulator continues to receive sporadic referrals relating to stage 1 SFR1s being used in court even when the evidence has not been agreed by all parties. In one example, a forensic scientist was questioned on an SFR1 prepared by a police

¹⁹ Available at: www.gov.uk/government/publications/forensic-science-regulator-newsletter-number-30

²⁰ The number of complaints in previous years has altered slightly since last year's Annual Report to ensure that each year's figures relate to the period 17 November – 16 November, which is the period covered by each year's report.

staff member, when the scientist had not compared the samples referred to in the SFR1.

One problem that the Regulator has highlighted to the National SFR Board is that fingerprint SFR1s were not making clear that claimed 'identifications' are opinions, not facts. The Board is working to make the necessary changes.

However, a greater number of referrals concerned the use of abbreviated statements in evidence, despite these not being intended for that purpose and not being compliant with the requirements of the CrimPR and CrimPD.

Abbreviated statements were introduced prior to the development of the SFR system and there is no shared understanding of their status in the CJS. The continued use of this type of report appears to be because of contracts in which forensic science units are required to include an abbreviated report without additional charge. The risks of proceeding based on abbreviated reports include the following.

- a. The reports may present only initial work while awaiting further instruction on whether or not recommendations for further work will be authorised.
- b. The work may deal only with the source of a trace and not how it came to be there, yet the court may wish to consider the latter. In such instances, the scientist may be expected to give such evidence without having had the opportunity to go through the formal process of developing a scientifically supported inference that has been appropriately checked by a peer.

The CPS has helpfully clarified its position recently, as follows. "In the context of forensic work abbreviated statements should not be sought and or used. The SFR process should be the route for summaries of forensic findings to be served and agreed."

2.11 Home Office Biometrics Programme

Over the next year HOB will be delivering new algorithm(s) for searching fingerprint and fingermark databases. It will be essential for this new functionality to be thoroughly validated. A package of validation information should then be made available to fingerprint bureaux to enable each to verify that the algorithm(s) and databases are working effectively within their processes.

Similarly, later in 2019, the first phase of the upgrade to the NDNAD will be delivered. Ensuring that this upgrade is thoroughly tested and rolled out seamlessly will be critical. In the forthcoming issue of the Codes, the Regulator has specified certification to the TickITplus²¹ standard for the NDNAD. To date there has been no progress towards this goal and the NDNAD has been non-compliant with the

²¹ TickITplus offers a flexible approach to IT quality and certification, including software development and information security management. For further information, see www.tickitplus.org/en/information/information.html.

previous requirement, for TickIT certification, for some years. The Regulator has been given the task of setting quality standards for forensic science and forensic intelligence databases by the Home Office. It is therefore deeply disappointing that Home Office Data, Digital and Technology has intimated that it does not plan to meet the standard the Regulator has set for the database. The Regulator has written to the Head of the Forensic Information Databases Service to escalate the issue within the Home Office.

2.12 Statutory Powers

HM Government committed in 2016 to providing statutory powers to the Regulator, after a number of recommendations from the House of Commons Science and Technology Committee dating back to 2011. Statutory powers were also recommended by Sir Brian Leveson (President of the Queen's Bench Division [PQBD]) in his Review of Efficiency in Criminal Procedures in 2015. Since 2016 pressures in the Government's legislative programme and Parliamentary time has meant that the Government has been unable to bring forward legislation.

In 2018 a private member's bill (The Forensic Science Regulator Bill) was introduced into the House of Commons by Mr Chris Green MP and a number of supporters. The conventions that apply to private members' bills imposed a number of restrictions, which meant that its provisions could not be as extensive as might be included in a Government bill. However, the bill does address the key issues and would, if enacted, provide a much-improved basis for the work of the Regulator and a greater degree of protection to the CJS.

The Regulator therefore wishes to express her thanks to Mr Green and the supporters of the bill for bringing it forward and attempting to steer its progress through Parliament. The Regulator understands that officials within the Home Office assisted in the production of the text of the bill; the Regulator would also like to thank those officials for their excellent work and the Ministers and senior managers within the Department for deploying that resource.

As a private member's bill the chance of the bill being enacted is low and its progress has been stalled by Parliamentary processes.

The Regulator has therefore discussed the issue with representatives of the Government and they have assured her that the Government is still committed to providing powers and is looking for a suitable vehicle to introduce the matter into Parliament. As discussed in relation to the progress of fingerprint bureaux in gaining accreditation (section 2.7) it is abundantly clear that without statutory powers, the Regulator will be unable to achieve her aim of ensuring that all forensic science used in the CJS is of the requisite quality.

Section 3: Shared Understanding of Quality and Standards

Requirement²²³: That there is a shared understanding of quality and standards by all stakeholders, including commissioners of forensic science, expert practitioners, researchers and all end users, including the police, the prosecuting authorities, defence and courts.

3.1 Promoting Adoption of Standards

The successful adoption of standards requires not only methodological changes but also culture change. Therefore, an understanding of the standards, why they are required and what they address is critical to ensure more effective adoption. To this end, the Regulator continues to prioritise speaking to practitioners and forensic leaders (including but not limited to the presentations listed in Table 3).

Currently, anecdotal evidence suggests that there is a significant difference in the effectiveness of adoption of standards between organisations with local leaders who value quality and prioritise it alongside delivery versus those who retain a 'we're OK as we are' approach. The former group understand the issues, managing and driving improvements, providing leadership, direction and encouragement. The latter group's approach can lead to a choice of delivery or quality, and an inability to articulate benefits or drive improvement. There are examples where experienced police staff started from an exceedingly anti-standard approach but became committed advocates, having seen the benefits that were achieved. On the other hand, there are examples where the requirements of the standards have simply been layered over the top of an existing inefficient system, rather than re-designing the system to deliver lasting benefits. Such an approach produces only delays and frustration and does not lead to a mature quality culture.

The Regulator will continue to work with national policing leaders, particularly CC James Vaughan, who leads the NPCC Forensic Science portfolio and DCC David Lewis, who leads the Performance and Standards Group of that portfolio. These leaders are committed to gaining the necessary standards. It remains difficult, however, to translate a national commitment in policing into effective and timely local action, when each force has an independent Chief Constable and an independent Police and Crime Commissioner, with differing local priorities. Until there are statutory powers for the Regulator, ensuring that forensic science is of the required quality is unlikely to be sufficiently prioritised in some forces.

²² The Regulator's aims and requirements were set out in full in previous Annual Reports, available at: www.gov.uk/government/publications/forensic-science-regulator-annual-report-2016 and www.gov.uk/government/publications/forensic-science-regulator-annual-report-2015.

Table 3: Presentations delivered by the Regulator

Presentation Title	Event
Forensic Science Quality and Regulation	Bond Solon Expert Witness Conference London, November 2017
Assuring Quality in Fire Investigation	United Kingdom Association of Fire Investigators Buckinghamshire, January 2018
Quality Standards for Fingerprint Enhancement: Review and Benefits	National Scientific Support Laboratory Conference Manchester, February 2018
Regulator's Introduction	Fire Investigation Expression of Interest Day Staines, February 2018
Digital Forensics, Communications Data and the Forensic Science Regulator	International Communications Data and Digital Forensics Conference Heathrow, March 2018
Facial Comparison as Evidence: Principles and Governing Rules	Facial Comparison Workshop Doha, Qatar, March 2018
Forensic Science Update	St Mary's Sexual Assault Referral Centre Conference Manchester, April 2018
Why Quality Matters	NPCC Accreditation Learning Event Leicester, April 2018
Quality and Accreditation for Facial Comparison	Chartered Society of Forensic Sciences Forensic Image Analysis Division workshop Birmingham, May 2018
Quality and Standards for Digital Forensics	Interpol Digital Forensics Conference Heathrow, June 2018
Quality Standards in Digital Forensics	NPCC Market Engagement Event Heathrow, June 2018
Challenges in Forensic Toxicology	London Toxicology Group Conference

Presentation Title	Event
	London, June 2018
Improving Forensic Science Quality	Centre for Forensic Linguistics 10th Anniversary Symposium Birmingham, June 2018
Structural, Scientific and Cultural Changes to Assure Quality	National Senior Forensic Collision Investigators Conference Leicester, September 2018
Improving Forensic Science Quality	Global Forensics in the 21st Century London, September 2018
Panel Discussion on Super-Recognisers	Biometrics Institute Conference London, October 2018
Forensic Science Quality: Current and Future	Chartered Society of Forensic Sciences Autumn Conference Northampton, November 2018

Table 4: Presentations by Forensic Science Regulation Unit officials representing the Regulator

Presentation Title	Event
Dealing with Opinions and Interpretation	Quality Standards for Crime Scene Investigation, CSFS Manchester, June 2018
Dealing with Opinions and Interpretation	Quality Standards for Crime Scene Investigation, CSFS Oxford, June 2018
Forensic Science Regulation	Royal Statistical Society Annual Conference Cardiff, September 2018
Forensic Science – Integrity	Chartered Society of Forensic Sciences Autumn Conference Northampton, November 2018

Regulator's Annual Quality Conference

The Regulator's annual quality conference on 19 March 2018 brought together experts from all parts of the CJS, looking at how the Regulator, the courts, the CPS, the police and legal professionals can work together to ensure the provision of high quality forensic science. The conference was attended by over 150 professionals, representing the police, commercial, medical, defence and security, and academic sectors, as well as prosecutors, legal professionals and policy officials.

Sir Brian Leveson (PQBD) told the conference that "to ensure we have effective scrutiny and to ensure that the public retains confidence in the system we must make sure we see the regulations and rules as supportive and not superfluous."²³

Chief Crown Prosecutor Adrian Foster spoke of the importance of investigating all reasonable lines of enquiry and of the role of the Regulator's Codes in helping prosecutors to apply the tests of admissibility, reliability and credibility from the Code for Crown Prosecutors.²⁴

Dr Anya Hunt, Chief Executive of the CSFS, generated substantial interest from delegates by describing the assistance the Society can provide to organisations seeking to comply with the quality standards.

DCC (then ACC) David Lewis spoke of the efforts of the Performance and Standards Group of the NPCC's Forensic Science portfolio, giving a critical assessment of why progress has been slow in achieving the quality standards within policing, and the plans to improve.

Delegates were rather taken aback by Dr Dean Jones' presentation of his work on potential 'missed homicides', where sudden deaths that had not originally been considered suspicious proved to have been homicides.

Mr Tom Nelson, Scotland's Director of Forensic Services, spoke of the importance of culture in attaining high quality and challenged forensic leaders to ensure that they led from the front, engendering a culture that values quality.

The Regulator's 2019 conference will be held on 5 March in Birmingham.

3.2 Parliamentary Scrutiny of Forensic Science

During the year the House of Commons Science and Technology Committee held an inquiry into the biometrics strategy and forensic services.²⁵ The Regulator gave oral

²³ Available at: www.gov.uk/government/speeches/sir-brian-leveson-speech-at-the-forensic-science-regulator-annual-conference

²⁴ Available at: www.gov.uk/government/speeches/adrian-foster-speech-at-the-forensic-science-regulator-annual-conference

²⁵ Available at: www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/inquiry11/

evidence to the Committee on 6 February 2018 and wrote to the Chair of the Committee.²⁶ The Committee published its report on 25 May 2018.²⁷

The Committee called again for the Regulator to be given statutory powers and also recommended that “The Regulator should work with UKAS to strengthen the auditing of standards compliance, to include validation of test results as well as governance structures and processes; the effectiveness of which would be bolstered by the Regulator being given statutory enforcement powers, which we discuss below. The Ministry of Justice should work with the Home Office and the Forensics Regulator to examine the scope for the Regulator’s remit to be extended to the civil courts forensics system, or for a similar regulator to be established with a similar remit, to bring a comprehensive and enforceable standards system to that sector also.”

The Regulator has been working with UKAS and RTS to determine what needs to change as a result of the events at RTS, which were described in last year’s Annual Report. At a point when it will not risk prejudicing police action, the Regulator will publish a document setting out lessons learnt. The UKAS review includes a root and branch examination of the work being performed by all of the toxicology laboratories it accredits; this includes those not performing forensic toxicology work. Specific information to enable a comprehensive review was requested by UKAS from all 20 accredited laboratories on 2 February 2018, including copies of procedures and validation data. The resulting data took the laboratories some time to compile, but has subsequently been evaluated by UKAS technical assessors to determine areas:

- a. where improvements can be made; or
- b. where attention needs to be focused during future UKAS assessments.

The report is being scrutinised by an independent technical specialist to ensure that the conclusions UKAS has reached are consistent with the data provided, and that nothing of significance has been overlooked.

On 15 May 2018 the Regulator gave oral evidence to the House of Commons Justice Committee’s inquiry into disclosure of evidence in criminal cases. The widely publicised disclosure issues in recent cases²⁸ involved failures of disclosure at the investigative stage rather than the forensic science stage. However, several submissions to the Committee were critical of the quality standards for digital forensics. The Regulator submitted evidence to the Committee to clarify the issues.²⁹

²⁶ The letter was published on 27 March 2018 and is available at:
<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/biometrics-strategy-and-forensic-services/written/80704.html>

²⁷ Available at:
<https://publications.parliament.uk/pa/cm201719/cmselect/cmsctech/800/80002.htm>

²⁸ For example, *R v. Liam Allen*, a review into which was published by the CPS at:
www.cps.gov.uk/publication/joint-review-disclosure-process-case-r-v-allan

²⁹ Available at:
<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/justice-committee/disclosure-of-evidence-in-criminal-cases/written/83257.html>

In July 2018 the House of Lords Science and Technology Committee announced an inquiry into forensic science. The Regulator submitted written evidence³⁰ and expects to give oral evidence to the Committee in January 2019. Written submissions were numerous and while many were supportive of the work of the Regulator, it is clear that small businesses are extremely concerned about the potential impact of regulation. This issue is discussed further in sections 1.13 and 2.8. It is also evident from a minority of the written submissions that misconceptions persist regarding what standards are required. Further clarification was provided in the Regulator's newsletter.³¹

3.3 Research Priorities from a Quality Perspective

From the perspective of improving quality, the priorities identified by the Regulator for research remain unchanged but are included here for completeness.

- a. To underpin the scientific basis of methods such as facial comparison, where research is limited.
- b. To provide data and robust interpretation methods to support the effective evaluation of evidential significance. Such data may include, for example:
 - i. structured studies on the transfer and persistence of trace evidence and the significant factors affecting such transfer; or
 - ii. the frequency of occurrence of patterns (for example, fingerprint characteristics or the characteristics of gait), or the impact of wear on marks.

Interpretation methods can drive optimal structuring of required data collections and enable combinations of factors such as class characteristics in a way that can be validated and demonstrated to be robust.

3.4 Encouraging Research in Forensic Science

The Science and the Justice System Forum, of which the Regulator is a member, is expected to finalise its recommendations for stimulating and coordinating research effort in forensic science early in 2019, for consideration by the Home Office. It remains to be seen whether positive change can be brought about.

3.5 Engagement Across the Criminal Justice System

The Regulator has continued to communicate with those with an interest in forensic science in the CJS, including:

- a. professional bodies and learned societies;

³⁰ Available at: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee-lords/forensic-science/written/89800.html>

³¹ Available at: www.gov.uk/government/publications/forensic-science-regulator-newsletter-number-30

- b. collaborative groups such as the AFSP;
- c. policing, via the NPCC Forensic Science portfolio and its sub-groups, the Transforming Forensics programme and the APCC;
- d. the Criminal Cases Review Commission (CCRC);
- e. the senior judiciary;
- f. the CPS;
- g. Home Office Ministers and officials; and
- h. academic institutions and the Higher Education Funding Council for England (HEFCE).

The following publications considering the role of regulation within the wider CJS and the status of forensic science quality in England and Wales have been authored or co-authored by the Regulator.

- a. Tully, G. (2018) 'Regulating Forensic Science'. In *Forensic Science Evidence and Expert Witness Testimony: Reliability Through Reform?* Roberts, P. and Stockdale, M. (eds). Cheltenham, UK: Edward Elgar.
- b. Carr, S., Gallop, A., Piasecki, E., Tully, G. and Wilson, T. J. (2018) 'Clarifying the "Reliability" Continuum and Testing its Limits: Biometric (Fingerprint and DNA) Expert Evidence'. In *Forensic Science Evidence and Expert Witness Testimony: Reliability Through Reform?* Roberts, P. and Stockdale, M. (eds). Cheltenham, UK: Edward Elgar.
- c. Tully, G. (2018) 'Forensic science in England & Wales, a commentary', *Forensic Science International*, 290, DOI 10.1016/j.forsciint.2018.06.028.

In the past year, the Home Office governance group, the Forensic Policy Steering Group, has primarily considered issues of immediate urgency such as:

- a. the failure of policing to meet the fingerprint accreditation deadline; and
- b. forensic science market instability.

It has therefore spent little time on work towards shaping future policy, although members have had the opportunity to comment on developing recommendations from the tripartite review into forensic science provision, carried out by the Home Office, NPCC and APCC.

In the coming year, ensuring that the quality of forensic science is fully considered by all those with the potential to influence policy, strategy and practice will continue to be one of the Regulator's high priorities.

Routine/Administrative Report

General Data Protection Regulation and Data Protection Act

The General Data Protection Regulation 2016/679 (GDPR) is implemented in the UK through the Data Protection Act 2018. It came into effect on 25 May 2018.

The Regulation and Act set out various legal bases on which an individual's personal information can and cannot be processed, and detailed principles on which any such processing can be carried out.

The Regulator already holds some personal information, usually little more than contact details, on the individuals and organisations with whom she collaborates in carrying out her role. She understands her obligations to treat this information lawfully and fairly and with appropriate security as stipulated in the Act.

As part of the requirements for compliance with the Act, the Regulator has published a privacy notice,³² which describes how personal information that she receives may be processed on her behalf by the civil servants of the Home Office who support her in fulfilling her role, these primarily being the staff of the Forensic Science Regulation Unit (FSRU). This privacy notice has recently been updated and can be found on the Regulator's website; it also sets out the rights of the individual data subject, including restricting any processing of their information or having it deleted. The privacy notice further describes the channels and processes for these requests.

From time to time, the Regulator needs to engage with organisations and/or individuals with specific knowledge or skills and to share certain personal information with those organisations and/or individuals. Similarly, those organisations and/or individuals may have cause to share information with the Regulator.

To ensure that any information so shared is also processed in accordance with the Act, the Regulator has produced an Information Sharing Agreement that outlines both:

- a. the requirements that the Regulator has of an organisation or individual with whom she shares information; and
- b. the assurances that the Regulator can provide to a party wishing to share information with the Regulator.

With a Home Office trained Data Protection Practitioner in close support and a Data Protection Officer designated, the Regulator is committed to continue meeting in full the requirements for compliance with the Act. Comprehensive supporting documentation, which is subject to review and update, has been produced to further demonstrate this compliance by design and default.

Resources

The Home Office allocated the following resources to the Regulator for the financial years 2017/2018 and 2018/2019 (Table 5).

³² Available at: www.gov.uk/government/organisations/forensic-science-regulator/about/personal-information-charter

Table 5: Resources allocated to the Regulator, 2017/2018 and 2018/2019

	Financial Year 2017/2018	Financial Year 2018/2019
Administration budget (staff pay, travel, accommodation, etc.)	£374,684	£470,000
Programme budget (developing standards and forensic pathology audits)	£150,000	£100,000
Total Budget	£524,684	£570,000
Staffing: Regulator (full time equivalent [FTE])	0.6	0.75
Officials: Specialist scientific roles (FTE)	3 plus 1 vacancy	4.9 (5 x FTE)
Secretariat support	Part of 2 x FTE	Part of 2 x FTE

Acknowledgements from the Regulator

I would like to thank the Chairs of my advisory groups and the very many expert advisors who are members of these groups. They give their time and energy with no payment and their input in scrutinising the standards developed is vital to ensuring that the standards are fit for purpose. I would also like to thank those who have contributed to consultations on draft standards; the suggestions received always improve the standards, for which I am grateful.

Despite the inevitably challenging nature of some of our conversations, I am most grateful for the constructive engagement I enjoy with forensic units in the commercial sector (particularly through AFSP) and policing (particularly through the Forensic Science portfolio led by CC James Vaughan and its subgroups, as well as the Transforming Forensics programme). This constructive engagement extends to Home Office policy and science teams, senior members of the judiciary, academics, professional bodies and others. The CSFS has greatly increased the support it provides to forensic units in achieving the standards I have set; this is of great value to me and to the profession. The Royal Statistical Society has supported the development of the evaluative interpretation standard and the interpretation methodology for drug driving, the Royal Anthropological Institute has worked with me in developing a code of practice for forensic anthropologists and the College of Podiatry, CSFS and HCPC have been helpful in negotiating the difficult path of developing standards for forensic gait analysis. My thanks also to Professor John

Aston (Home Office Chief Scientific Advisor) and to the Biometrics Commissioner, Paul Wiles, and his staff, particularly Lucy Bradshaw-Murrow, for helpful discussions in areas of mutual interest.

The team of officials in FSRU who support my work are tireless in their efforts to bring about improvement in quality and I greatly value their expertise and commitment. In addition to Jeff Adams, June Guinness and Simon Iveson, I was delighted to welcome two new members to the team this year, Lee Parkes and Graeme Willmott.

The secretariat and administrative support of officials in the Home Office Science Secretariat, Pathology and Regulation Services is greatly appreciated, particularly in ensuring that the minutes of the many advisory groups are produced and published to increase openness and visibility of these groups. I am also grateful for the assistance of Priscilla Richards in juggling my diary and travel arrangements, and to Matt Hunter and Hannah Schraer, who provide valuable press-related advice and support.

A handwritten signature in black ink, appearing to read 'G. Tully', with a stylized flourish underneath.

Dr Gillian Tully, Forensic Science Regulator

15 March 2019

Appendix: Assessment of Assurance

Please note this table is formatted to print at A3 size.

Discipline	Sub-Speciality	Significant Gaps in Scientific Knowledge or Practice	Standards Required	Current Level of Compliance	Complaints and Referrals	Concerns/Issues	Level of Commitment/ Collaboration on Improving Quality	Quality Improving, Static or Deteriorating	Specific Actions Required
					Relative Number/Significance				
Biology and DNA	Source of DNA	There will always be limits to the complexity of DNA mixtures that can safely be interpreted, but the guidance published in FSR-G-222 and FSR-G-223 should ensure that interpretation does not stray beyond what is scientifically robust.	ISO 17025 since October 2012. The Regulator's Codes of Practice and Conduct plus appendices since October 2017.*	Very high	The total number of referrals is high, but in relation to the high use of biology/DNA this is as expected. The impact of a DNA error can be very high due to the highly discriminating nature of the analysis. Overall assessment of level/seriousness of complaints: Medium.	Case-by-case challenges, generally relating to the method or outcome of interpretation. Improvement expected following publication of guidance documents FSR-G-222 and FSR-G-223. Concern that not all police staff are willing to have their DNA profiles included in the Contamination Elimination Database.	High	Improving	Monitor effectiveness of FSR-G-222 and FSR-G-223 in improving standards of mixture interpretation. Ensure learning from contamination events is disseminated.
	Body fluid detection and association of DNA with a specific body fluid	Confidence with which the DNA can be associated with a particular body fluid varies depending on the number and specificity of the presumptive test(s) used and the nature of the stain (single source or mixture).	ISO 17025 since October 2012: Presumptive screening tests. The Regulator's Code of Practice and Conduct since October 2017 for presumptive screening tests.*	High		If a DNA profile cannot be attributed to specific body fluid, it can be more difficult to consider issues of the activity by which the DNA came to be deposited.	Medium	Static	Further research to improve body fluid identification would improve interpretation. Development of robust interpretation models to include evaluation of body fluid of origin – linked to transfer and persistence and interpretation standard.

Discipline	Sub-Speciality	Significant Gaps in Scientific Knowledge or Practice	Standards Required	Current Level of Compliance	Complaints and Referrals	Concerns/Issues	Level of Commitment/ Collaboration on Improving Quality	Quality Improving, Static or Deteriorating	Specific Actions Required
					Relative Number/Significance				
Biology and DNA	Activity level – how the DNA came to be present	Dependent on case circumstances – see judicial primer ³³ for detail. Further studies on transfer and persistence would improve interpretation.	No requirement is explicit in the Regulator's Codes of Practice and Conduct although it is expected that the ISO 17025 scope for DNA should include opinions and interpretations.*	Low: Awaiting evaluative interpretation appendix.		Case-by-case challenges, generally relating to the applicability of the research and data and accumulated knowledge on which the interpretation depends.	High	Static	Evaluative interpretation standard is in development as an appendix to The Regulator's Codes of Practice and Conduct. Continuing research to build knowledge base of factors affecting transfer and persistence.
Fingerprints	Comparison	Scientific consensus is that a move towards a probabilistic approach is required. This will require: future training; additional underlying data and development; validation; and the implementation of probabilistic software tools.	ISO 17025 since October 2018. The Regulator's Codes of Practice and Conduct plus appendices since October 2018.*	Low	The number of complaints is relatively low in comparison to the usage of fingerprints. Fingerprint comparison is only now adopting the quality standards that require reporting of concerns, so it is anticipated that the number of referrals will rise. Overall assessment of the level/seriousness of complaints: low, but expected to rise as reporting of issues becomes the norm.	Few challenges – insufficient scrutiny. Lack of compliance impacts on Prüm data exchange and UK obligations under 2009/905/JHA may result in reduction in capacity to deliver fingerprint work.	High: Legal requirement by 25 March 2019.	Improving	Concerted action by policing to improve the level of compliance and quality culture. Under-resourced fingerprint bureaux likely to need additional investment. Once accreditation is in place consider changes to the term 'identification'.
Fingerprints	Enhancement		ISO 17025 since October 2015. The Regulator's Codes of Practice and Conduct plus appendices since October 2017.	High: All forensic units have some accreditation but not all regularly used methods are in scope.		The fingerprint community relies heavily on the Fingerprint Visualisation Manual and the Fingerprint Source Book to underpin methods and validation. Ongoing central support for an update of the Fingerprint Visualisation Manual and Source Book is essential.	High	Static	Forensic units need to expand scope of accreditation to include all regularly used methods.

³³ Available at: <https://royalsociety.org/about-us/programmes/science-and-law/>

Discipline	Sub-Speciality	Significant Gaps in Scientific Knowledge or Practice	Standards Required	Current Level of Compliance	Complaints and Referrals	Concerns/Issues	Level of Commitment/ Collaboration on Improving Quality	Quality Improving, Static or Deteriorating	Specific Actions Required
					Relative Number/Significance				
Toxicology	General		ISO 17025 since October 2017. The Regulator's Codes of Practice and Conduct since October 2017 plus due regard to UKIAFT guidelines.*	High	Due to the scale and seriousness of the inappropriate data manipulation issue, the overall assessment of the relative significance of complaints is very high.	Market capacity is substantially below requirements. Increased pressure of work and backlogs cause increased risk of quality failures. Ongoing high level of challenge in the light of RTS issues including: the high level of demand for witness attendance at court; and the low level of acceptance of SFRs. Inappropriate use of disclosure process by some firms of solicitors in drug driving cases.	Very high.	Improving	Market not functioning adequately – urgent action to increase capacity for complex toxicology is required.
	New Psychoactive Substances (NPS)	Finding an acceptable way to establish in evidence the psychological properties of NPS.				Challenges over NPS effects.	Unknown		
Crime scene examination	General	Gaps tend to concern the optimal method of locating and recovering trace evidence.	ISO 17020 by October 2020. The Regulator's Codes of Practice and Conduct by October 2020.	N/A – working towards 2020 deadline.	Low: Likely to grow as the level of review of CSI activities increases during preparation for accreditation.	Any errors or cognitive bias at the scene may compromise the entire scientific process thereafter.	High: Active expert network in policing but the risk of not achieving the required level of accreditation by the deadline is significant.	Improving	Need more police forces to apply for accreditation early in 2019.

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Crime scene examination	Fire investigation	Gaps currently being evaluated as part of the risk assessment of methods for accreditation.	ISO 17020 by October 2020. The Regulator's Codes of Practice and Conduct by October 2020.*	N/A – working towards 2020 deadline.	High: Many of the complaints were not attributed to a particular organisation so could not be fully investigated, but there are clear trends.	Reduction in number of scientists with experience in examining the most serious fires. Lack of clarity concerning supply and demand between the Fire and Rescue Services and private sector suppliers.	Medium: Accreditation pilot underway, will inform level of effort required to obtain standards. Risk of organisations failing to meet the deadline for accreditation is high.	Improving	Complete accreditation pilot as soon as possible.
Crime scene examination	Collision investigation	Insufficient understanding of uncertainty of measurement. Insufficient validation of methods.	ISO 17020 by October 2020. The Regulator's Codes of Practice and Conduct plus potential appendix by October 2020.*	N/A – working towards 2020 deadline.	Low: Likely to increase as increased review and referral embeds.	Currently carried out primarily by police officers with, in some cases, insufficient operational separation from investigative teams. Few challenges – insufficient scrutiny.	High: National programme of improvement but significant hurdles among the police at middle management level. Risk of organisations failing to meet the deadline for accreditation is high.	Improving	Organisations needed to sign up for accreditation pilot.

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Forensic pathology			Forensic Pathology Code of Practice in conjunction with the Home Office, Department of Justice Northern Ireland and Royal College of Pathologists since October 2012. Inclusion on the Home Office register is required for a pathologist in England or Wales to be instructed by the prosecution.	High	Complaints and referrals dealt with via Home Office Pathology Delivery Board and General Medical Council. However, the annual audit has not identified any major issues in recent years.	Critical shortfall in capacity for some sub-specialities such as bone pathology. Lack of toxicology capacity is causing delays in the delivery of forensic pathology reports. Delays in receiving reports causing delays to court cases in some instances.	High	Improving	Update to Pathology Code to be published.
Blood pattern analysis		Unknown – possibly validation of crime scene measuring and reconstruction tools.	ISO 17025 since April 2012. The Regulator's Code of Practice and Conduct plus appendix since October 2017.*	High	Medium: Overall number of complaints was low, but in relation to usage is significant.	Factual observation (identification/ detection of blood) is not confused with opinion on activity. Specialised area, small number of experts and accredited organisations.	Medium	Static	Impact of ISO 17020 on evaluation of blood distribution and sampling at scenes to be assessed. BPA appendix due to be reviewed.*

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Digital forensics	Imaging of hard drives and/or removable media.		ISO 17025 since October 2017. The Regulator's Codes of Practice and Conduct since October 2017.	Medium	Currently medium, but growing rapidly. Expected to grow further as review and referral of issues embeds.	Critical shortfalls in capacity and delays are in some cases causing trials to collapse.	Medium: Compliance in referring quality issues to the Regulator is improving. Many of the police forensic units High Tech Crime Units (HTCUs) are accredited for some aspect of their service. Most with accreditation still need to increase their scope to cover more of their services and to include the Codes. Many organisations still need to ensure digital forensics performed outside the HTCUs or central laboratory meets the standards.	Improving – referrals are rising in line with the trends seen in all areas new to quality standards; issues that were not previously considered, such as differences in tool and method efficiency, are now visible; and understanding the differences in the service from commercial providers offering a basic tool output-based service versus methods with manual quality control checks.	
	Screening or recovery of data from a device using an off-the-shelf tool for factual reporting.	No consensus of the level of acceptable tool performance; and variability for use by non-specialists.	At least one deployment in scope of ISO 17025 and the Regulator's Codes of Practice and Conduct since October 2017.	No compliant organisations			Medium	Static	Process for updating central validation is required. Police forces need to adopt national procedures and validation package and apply for accreditation.

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Digital forensics	Extraction and analysis of data from digital media.	Tool performance and variability versus wider hand crafted method with manual checks quantified and risks understood.	ISO 17025 and the Regulator's Codes of Practice and Conduct since October 2017.	Low			Medium: Organisations are tending to focus on the acquisition of data only and not on the wider analysis. This category includes mobile phones.	Improving – the number of organisations with mobile phones in scope is rising.	
	Network capture and/or analysis.		Under consideration for ISO 17020 by October 2020.	N/A			Low	Static	
	Capture and/or analysis of social media and open source data.		To be determined.	N/A			Medium	Static	
	Cell site analysis and communications data.	Underpinning validation is currently missing, but is in the process of being carried out	The Regulator's Codes of Practice and Conduct and appendix apply; however the formal accreditation date is still to be determined.*	Very low.			Low in cell site analysis; much higher in communications data analysis.	Improving	Complete cell site validation and set date for compliance. Review progress with communications data error reduction plan.

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Analysis of imagery	Capture	The wide range of formats can lead to gaps in the ability to recover optimal quality imagery.	Recovery from a working CCTV system is exempt from accreditation, otherwise ISO 17025 and The Regulator's Codes of Practice and Conduct since October 2017.	Very low.	High: The number of issues is high in relation to the size of the discipline. The nature of referrals tends to be serious, with the potential for evidence to be misleading.		Medium	Static	Discussions with the NPCC and College of Policing on what guidance can be issued or amended to improve this stage of the process.
	Processing, optimisation and assessment of the reliability of image information.		ISO 17025 and the Regulator's Codes of Practice and Conduct and Video Analysis Appendix since October 2017	Very low.		Likelihood of issues is higher outside the imaging expert's workflow. Here the trier of fact (usually a magistrate or jury member) is expected to form a judgment as to an identity or activity. Issues may include reduction in image quality, inappropriate aspect ratio (i.e. distortion) or loss of material including but not limited to frames.	Low: A few police forces have accreditation for presentational court processes, many others are doing much more processing.	Static	Regulator to finalise and issue a clear statement of principles for image analysis.

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	Facial comparison	Impact of variables is poorly known. Insufficiently validated methods: Many methods shown to be biased for even elimination purposes; other methods not tested sufficiently for the quality of images typically encountered.	ISO 17025, the Regulator's Codes of Practice and Conduct and Video Analysis Appendix since October 2017.*	No compliant organisations		Lack of understanding of uncertainty and lack of court scrutiny. Imagery experts not always consulted when required, so artefacts can be misinterpreted. 'Recognition' or 'identification' by non-experts admitted as evidence.	High: Chartered Society of Forensic Sciences assisting.	Improving	Substantial body of research required to bolster scientific underpinning. Regulator to finalise and issue a clear statement of principles for image analysis.
	Comparison of clothing, footwear, vehicles, etc.	Impact of variables is poorly known. Impact of cognitive bias unknown for this type of comparison activity.	ISO 17025, the Regulator's Codes of Practice and Conduct and Video Analysis Appendix since October 2017.*	Very low.		The subjective nature of comparison; and often there are limited data on the prevalence of features that are not always made clear. Comparison and interpretation not always carried out by an expert in the domain.	High: Chartered Society of Forensic Sciences assisting.	Improving	Regulator to finalise and issue a clear statement of principles for image analysis.
Firearms	Triage and/or simple classification.		ISO 17025 since 2012. The Regulator's Codes of Practice and Conduct since October 2017.	Very low.	Medium		Low	Slowly improving.	Police forces must outsource classifications unless or until accreditation is achieved.

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Firearms	Firearms classification, firing marks, ballistics, etc.	Although much of the comparison work is purely manual, proficiency tests provide a level of assurance that reliable comparisons can be made. As for other comparison disciplines, a move towards evaluating against alternative hypotheses would be a step forward.	ISO 17025 since October 2012. The Regulator's Codes of Practice and Conduct since October 2017.*	High	Medium	Differences in interpretation of the law, e.g. in the classification of unconverted blank calibre pistols. Differences in approach to the classification of expanding ammunition.	Low: There is a shortage of experts and some units are conducting too few comparisons to maintain skills.	Static	To train sufficient experts for the future needs action now. Standardisation of approach is required in some areas.
	Firearm discharge residue (GSR)	Updated surveys required on background levels of FDR, e.g. on public transport and on level of FDR from armed police officers and suspects in custody on non-firearms related offences. All would improve ability to interpret evidence.	ISO 17025 since October 2012. The Regulator's Codes of Practice and Conduct since October 2017.*	High	Low	Interpretation of low levels of FDR historically – in current cases the approach is more conservative if the number of particles found is small.	Low: Little or no casework-applicable research on background levels of FDR being carried out. Expertise within some providers is reducing due to low submission rates.	Static	It would be advantageous to pool knowledge of ammunition headstamp and primer type across all providers.
Drug analysis to evidential standards			ISO 17025 since October 2012. The Regulator's Codes of Practice and Conduct since October 2017.*	High	High	Capacity limited and at risk of decreasing further.	Low: Capacity issues and low pricing inhibit collaboration for proactive improvement.	Static	Stabilisation of capacity.

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Medical forensics	Collection of samples in SARCs.	Training, competency assessment, anti-contamination practice.	Consulting on ISO 15189 by 2021. Draft appendix to the Regulator's Codes of Practice and Conduct in consultation phase. Guidance on anti-contamination issued in 2016.	Low level of compliance with anti-contamination guidance currently.	Low level of verifiable referrals but those that were received were of high impact, as potentially were non-verifiable allegations about unspecified providers. Overall assessment: High.	Variable quality of sampling and evidence provided.	Medium	Improving	Agree standard, finalise standard/ guidance to the Regulator's Codes of Practice and Conduct; pilot accreditation with UKAS. Work with the CQC once data sharing protocol is in place.
	Collection of samples in police custody,	Training, competency assessment, anti-contamination practice, adequacy of facilities.	To be determined. Guidance on anti-contamination issued in 2016.	Extremely low level of compliance with anti-contamination guidance currently.		Increasing number of female suspects in sexual assaults; inadequate facilities in custody to obtain intimate samples for analysis.	Low	Static	Increase the profile of the standard with stakeholders in policing and policy.
Toolmark impression comparison		Comparison and evaluation of significance of matches is largely subjective and would be improved by regular calibration of expert opinion using ground truth data.	ISO 17025 since October 2012. The Regulator's Codes of Practice and Conduct since October 2017.*	High	Very low.		Low	Slowly improving –better proficiency trials and review of validation required by the Regulator's Codes of Practice and Conduct.	Promote development of and participation in more challenging proficiency trials.

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Footwear impressions	Screening		To be conducted by competent staff using validated methods approved by the organisation, but accreditation to ISO/IEC17025 is optional.	N/A	Low		Low	Static	
	Comparison to evidential standards.	More structured data on wear would improve interpretation.	ISO 17025 since October 2012. The Regulator's Codes of Practice and Conduct since October 2017.*	High			Low	Slowly improving – better proficiency trials and review of validation required by the Regulator's Codes of Practice and Conduct.	Promote development of and participation in more challenging proficiency trials.
Forensic anthropology			Stand-alone code of practice developed in collaboration with the Royal Anthropological Institute (RAI) since May 2018.	Review one year post-introduction of the code of practice.	Very low.		High: RAI collaborated to produce the code of practice.	Unknown – review one year post-introduction of the code of practice.	
Forensic archaeology			Stand-alone standard and guidance for forensic archaeologists in collaboration with the Chartered Institute for Archaeologists.	Unknown	Very low.	Reference to ISO 17020 was made in evidence to the House of Lords Science and Technology Committee but no such requirement has been set.	Unknown	Unknown	

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Forensic gait analysis		See forensic gait analysis judicial primer ³⁴ .	Stand-alone code of practice being developed with the Chartered Society of Forensic Sciences and College of Podiatry.	N/A – standard not yet finalised.	Medium: Overall number of complaints was low, but in relation to usage, is significant.		Good collaboration from some practitioners and the College of Podiatry but there appears to be significant opposition from other practitioners.	Static	Complete code of practice.
Forensic casework review			Dry run of ISO 17020 underway.	N/A – standard not yet determined.	Medium	<p>Current system of legal aid funding does not support adoption of standards.</p> <p>Funding level too low and competition for work is largely on the basis of price, with no consideration of quality standards.</p> <p>Courts being misled by ‘experts’ with no proven competence in some cases.</p> <p>No requirement for defence to disclose expert evidence.</p>	Low: Funding situation needs to change as a prerequisite for change.		<p>Continued engagement with the Legal Aid Agency to determine if funding system could be altered to accommodate the introduction of quality standards.</p> <p>Complete and evaluate pilot of ISO 17020.</p>
Questioned documents		The comparison and evaluation of the significance of matches is largely subjective and would be improved by regular calibration of expert opinion using ground truth data.	<p>ISO 17025 since October 2013.</p> <p>The Regulator’s Codes of Practice and Conduct since October 2017.*</p>	Medium	Medium		Low	Slowly improving – better proficiency trials and review of validation required by the Regulator’s Codes of Practice and Conduct.	Promote development of and participation in more challenging proficiency trials.

³⁴ Available at: <https://royalsociety.org/about-us/programmes/science-and-law/>

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Fibres analysis and comparison		Studies of the prevalence of fibre types and colours are not routinely being updated.	ISO 17025 since October 2013. The Regulator's Codes of Practice and Conduct since October 2017.*	High	Very low.	Demand low but may be required in critical cases.	Low: Capacity issues and low pricing inhibit collaboration for proactive improvement.	Decreasing as skills atrophy.	Policy decision required on how skills will be retained.
Trace evidence analysis and comparison			ISO 17025 since October 2013. The Regulator's Codes of Practice and Conduct since October 2017.*	High	Medium: Overall number of complaints was low, but in relation to usage, is significant.	Demand low but may be required in critical cases.	Low: Capacity issues and low pricing inhibit collaboration for proactive improvement.	Decreasing as skills atrophy.	Policy decision required on how skills will be retained.

* The evaluative interpretation standard (section 1.2) will apply.

The Regulator would welcome evidence-based additions to or comments on this assessment, to inform the requirement for future action.

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