



Annual Report

November 2015 – November 2016

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6 January 2017

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Foreword

My aim as Forensic Science Regulator, that all forensic science and forensic pathology¹ provided to the Criminal Justice System (CJS) is of the required level of quality, is unchanged. Last year I set out what achieving this aim required.

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.
2. 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 such that:
 - a. no procedures are static, but that all are continually improving;
 - b. quality failures are appropriately reported, investigated and lead to improvements in practice; and
 - c. the benefits of fully implementing quality systems are realised, in efficiency and effectiveness of practice.
3. 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, so that:
 - a. practitioners who have not adopted the relevant quality standards are no longer routinely instructed;
 - b. the work commissioned supports the overall aims of the CJS and not solely the aims of the commissioning party;
 - c. the forensic science quality standards are integrated into the requirements for expert witnesses;
 - d. there is an expectation in court that experts will have complied with the relevant quality standards; and
 - e. forensic science is supported by ongoing research to increase quality and capability.

¹ For ease, the term 'forensic science' shall be used from this point forward in the report to cover both forensic science and forensic pathology.

In this, my second annual report, I have updated my assessment of risks to quality in the CJS, reported on progress against last year's priority areas and defined priorities going forwards.

A year on, it is clear that the single biggest challenge to achieving my aim is financial: the costs associated with complying with and being assessed against the standards.

To be clear, the standards are not some unachievable 'gold-plated' ideal; they are the minimum standards expected of any reliable forensic science organisation, drawing from general good scientific practice and also learning from errors and omissions of the past and of other industries. There have been enough examples of poor practice, lack of validation of methodology and 'rogue' laboratories in recent years (largely outside the UK) to make the case for a robust but proportionate quality system, with an assurance mechanism to check compliance.

Funding for forensic science across the board, and particularly, perhaps, for defence provision via legal aid, must be at a level that enables the standards to be met. Otherwise we will face the costs, both in criminal justice terms and financially, of quality failures and loss of confidence in forensic science.

A handwritten signature in black ink, appearing to read "Gill Tully". The signature is written in a cursive style with a long horizontal stroke at the end.

Introduction: Updating the Risks to Forensic Science Quality

In last year's annual report, an analysis of risks to forensic science quality was presented. Since then, some of the risks have reduced whilst others have increased and new risks have been identified. These changes are now outlined. Actions to reduce these risks are detailed in sections 1–3 of this report.

General Risk Factors

Between November 2016 and April 2017, in excess of 60% by value of the outsourced market for forensic science services is either subject to competitive tender or due to transition from the incumbent to a new service provider. For some organisations, this represents 90% or more of their business. Whilst market regulation is outside the Forensic Science Regulator's remit, such a level of instability presents a significant risk to the quality of forensic science work. Experience has shown that when large volumes of work change hands, there is an increase in quality failures and a loss of skills. Alongside these direct impacts, during a period in which a large proportion of an organisation's work is being re-tendered, investment in staff development and operational research are likely to be at risk. For the work already awarded, transition plans are in place or being developed, which build on past experience to reduce risk. Nevertheless, vigilance will be required during the coming months.

In parallel, as forensic science activities within policing are required to comply with the Forensic Science Regulator's *Codes of Practice and Conduct* (the Codes), for example, digital forensics by 2017, fingerprint comparison by 2018 and crime scene activities by 2020, several trends that present a risk to forensic science quality are emerging. On a practical level, the quality management systems used in police forces were set up to deal initially with relatively small scopes of activity (DNA recovery and fingerprint enhancement). As the scope of activities requiring quality management increases, the quality management systems employed are reaching their capacity limits. This requires investment in systems that are fit for purpose, and ensuring that quality managers have the level of resource and influence they need to ensure that their organisations are sustainably competent to deliver the services to the appropriate standards.

Similarly, as the scope of activities coming under the quality management regime (and therefore the cost of compliance) increases, it is becoming clear that not all police forces are fully committed to reaching the required standards. This has been demonstrated by feedback from practitioners and quality managers regarding the lack of support at senior levels in their organisations for the adoption of quality

standards, by false dichotomies such as “*we can deliver operational work or adopt the quality standards but not both*” and by a failure to recognise the impact in cost, reputation and criminal justice terms, of quality failures. To mitigate this risk, Assistant Chief Constable (ACC) David Lewis, the new chair of the Performance and Standards Group,² has undertaken work to assess the risk of each force failing to meet the Regulator’s standards, and will be writing to Chief Officers accordingly. Ensuring that all parts of the forensic science process within policing are compliant with the standard, whether or not they sit within what was traditionally considered to be ‘forensics’, is critical and will require substantial effort by forces.

Whilst the majority of the large commercial and government-funded forensic science providers have a strong quality culture, lack of senior management support is evident in a small minority of providers.

Forensic science carried out on the instruction of the defence has also been under significant pressure. The current legal aid rates for experts makes establishing a sustainable and accredited business offering high quality scientific advice to the defence extremely challenging. This risks giving a competitive advantage to those who have not prioritised quality, with consequent risks to the Criminal Justice System (CJS). The Regulator has engaged with the Chartered Society of Forensic Sciences (CSFS) and the accreditation body, the United Kingdom Accreditation Service (UKAS), with the aim of encouraging their work towards a more affordable route for small businesses to reach the same standard as other forensic service providers. However, at present it is unclear whether or not an affordable scheme will result.

Digital Forensics

Substantial effort has been expended within policing (led by the Digital Portfolio under DCC Nick Baker) to coordinate and assist police forces in reaching the required standards. However, the indications are that few organisations will attain the required scope of accreditation by October 2017. There remains a significant level of risk as many methods have not yet been validated and objective evidence of competence is lacking.

Some small businesses do not appear to be committed to gaining accreditation to the standard at this point, and larger commercial organisations with accreditation feel that they are at a price disadvantage. This is illustrated by the fact that contracts have been placed by law enforcement agencies with organisations that may not reach the standard by October 2017.

² This is a policing group, reporting into the National Police Chiefs’ Council (NPCC) Forensic Science Portfolio Board.

Statutory powers for the Regulator are now needed in order that those organisations that have not committed the resource and effort required to attain the standards can be induced to do so.

Firearms Classification

The risk of incorrect classification of some weapons remains, with little evidence within policing of appropriate calibration or robust accounting for uncertainty of measurement. In issue 3 of the Codes, a category of “*simple classification*” was defined, for which an alternative framework of quality standards would be allowed, if implemented by October 2016. However, there has only recently been any coordinated activity by policing to suggest a framework, so the risk currently remains high.

Commissioning Not Always Meeting Needs of the Criminal Justice System

Ensuring that commissioning of forensic science meets the needs of all end users in the CJS is an important first step in assuring quality.

A specific risk has been identified in relation to commissioning of forensic medical examiners (FMEs), where not all procurement is specifying the appropriate level of FME training and qualification. The Regulator, together with the Faculty of Forensic and Legal Medicine (FFLM), has written to all Policing and Crime Commissioners highlighting the need to ensure that FMEs have the appropriate level of training and competence.

Last year the Regulator undertook a pilot case review audit, to examine a number of alleged rape cases from the first report of the incident to the outcome of court proceedings.³ The audit highlighted that there is a risk concerning the level of training, skills and experience of personnel within policing making initial evaluative strategy decisions. The way in which the activity-level information gathered at the start of an investigation is used in the initial forensic strategy was also found to be variable. The outcomes of this audit have been considered by the Forensic Science Advisory Council, which has recommended that a wider audit be undertaken.

Following the recent high profile conviction of Stephen Port⁴, the failure to commission DNA testing as recommended by the pathologist instructed in the third

³ FSR Annual Report 2015, pp 24–25, available at:

<https://www.gov.uk/government/publications/forensic-science-regulator-annual-report-2015>

⁴ Stephen Port was convicted in November 2016 of murdering four young men. The Independent Police Complaints Commission is investigating the Metropolitan Police Service’s handling of the cases.

murder was widely reported. Whilst there is no suggestion that forensic science was not conducted properly in this case, there is a question to answer regarding commissioning decisions, which has been referred to the Regulator for consideration.

Interpretation Standard and Data

Development of an interpretation standard is critically important because it will, as an appendix to the Codes, fill a gap whereby some organisations hold accreditation for their analytical work, but have no external assurance regarding their interpretation processes. It also aims to ensure that scientists and courts are aligned regarding the interpretation of evidence. However, this work has been delayed as insufficient resource was available.

Despite good work by the Body Fluids Forum of the Association of Forensic Science Providers (AFSP) and by several academic institutes, the published data available to support the evaluative interpretation of forensic evidence are still limited. The data sets that do exist tend to be fragmented between different organisations. This leaves a substantial amount of interpretation based solely on the practitioner's opinion, which risks lack of consistency and reliability.

Divergence of Scientific Approach

There has been rapid development in DNA interpretation methods in recent years, which has increased the range of mixed profiles that can be evaluated. Each type of interpretation method:

- a. makes different assumptions;
- b. uses a different subset of the raw or processed data comprising a DNA profile; and
- c. employs different statistical models.

This means that when a mixed DNA profile is interpreted using the different approaches, even if the hypotheses being tested are identical, different values for the likelihood ratio will be obtained. There is no single 'right' answer.

There is a risk that such divergence may cause misunderstandings in court proceedings. Ensuring that both the underlying statistical models and the software in which they are encoded are validated appropriately is critical, as is effective communication of results and limitations.

Contamination

The sensitivity of methods for analysis of trace material such as DNA and firearms discharge residue means that precautions to guard against the inadvertent introduction of extraneous material (contamination) must be in place.

An important tool in detecting DNA contamination is the routine use of elimination databases. Such databases contain the DNA profiles of individuals who have had the potential to contaminate a sample, and when checked against crime scene profiles, can avoid contaminant profiles being loaded to the National DNA Database[®] (NDNAD) and/or misleading an investigation. Forensic science organisations have operated elimination databases of their staff and some police staff for a number of years, but in the past year, further progress has been made in the development of a Central Elimination Database (CED). This project, which is being led by the National Database Unit (NDU), aims to ensure that DNA profiles from police officers, police staff, staff of organisations that manufacture consumable items used in the DNA profiling process, forensic medical examiners and other relevant staff at Sexual Assault Referral Centres (SARCs) are all held and searched against the NDNAD so as to identify contaminant profiles. Continued progress in this project is important, to enable compliance with the requirements of the Regulator's protocol on the use of elimination databases.⁵

During the year, the risk posed by DNA contamination in SARCs was realised in an incident referred to the Regulator. This incident resulted in samples from a complainant being compromised beyond use, as well as raising serious questions regarding previously examined cases. An investigation report will be published in due course, to enable all SARCs and other DNA sampling facilities to learn from this incident.

The potential for DNA contamination in police custody remains a significant risk, and the Regulator has published interim guidance on this issue during the year.⁶ Although custody environments were not designed with anti-contamination measures in mind, the guidance must be adopted as a matter of urgency, to prevent contamination from compromising evidence or misleading enquiries or courts.

Operational Issues Regarding Streamlined Forensic Reports

Whilst the principle of streamlined forensic reports (SFRs) as a means to ensure proportionate forensic science work is carried out in a timely fashion in support of effective case management is sound, there are risks surrounding some aspects of operational deployment.

⁵ FSR-P-302, available at: <https://www.gov.uk/government/publications/dna-contamination-detection>

⁶ FSR-G-207, available at <https://www.gov.uk/government/publications/sexual-assault-referral-centres-and-custodial-facilities-dna-anti-contamination>

In particular, there is a risk that defendants and their legal representatives have an insufficient understanding of what is being presented in a SFR to enable them to determine if a disputed issue should be identified prior to the first hearing. A number of the referrals made to the Regulator during the year have included concerns regarding the SFR operation.

Priorities

The risk overview was used to update the Regulator's priorities for action. The priorities are given below. Progress against each of these priorities, together with the next steps required, is reviewed in sections 1–3 of this report. The sections mirror the aims and requirements for forensic science quality set out by the Regulator in the foreword to this report.

Ongoing High Priority Areas of Work⁷

- a. Digital forensics: The Regulator will continue to support the digital community to improve standards and achieve accreditation by October 2017, and complete the ongoing pilot for accreditation of cell site analysis. The Digital Forensics Specialist Group has been reconstituted to reflect the skill set required going forward, and has been tasked to advise the Regulator on the appropriate standards for network capture and analysis, open source investigations and analysis of communications data.
- b. Casework review: The Regulator will consider the outcomes from the pilot case review completed during the year, in order to consider the terms of reference for an expanded case audit and how such an audit might be achieved.
- c. The operational implementation of streamlined forensic reporting and casework management procedures continues to raise challenges. The Regulator will work with other stakeholders to resolve these. Work to resolve how DNA mixtures should be reported using the SFR process will continue.
- d. The evaluative interpretation standard will be progressed after a significant delay due to insufficient resource.
- e. Firearms classification: The Regulator will work with policing to ensure that the risk of incorrect classification of weapons is reduced as quickly as possible.
- f. Standards for SARCs and custody suites: The Regulator will publish a substantive standard for the collection of forensic evidence at SARCs for public consultation (following from publication of interim guidance this year).

⁷ The work areas are not listed in order of priority.

The Regulator's Medical Forensics Specialist Group will begin work on a standard for forensic recovery in custody suites.

- g. The Regulator will continue to support the expansion and implementation of the Central Elimination Database.
- h. DNA mixtures guidance: The Regulator will publish draft guidance on the clarity of wording, interpretation and validation of software for the interpretation of complex DNA mixtures for public consultation.
- i. The annual forensic pathology audit will be conducted.
- j. The Regulator will provide ongoing support for adoption of the Fingerprint Comparison Standard.
- k. Continuing to support the development a less cost-prohibitive route for small businesses to reach the standards remains a high priority.
- l. In this report, the Regulator has articulated research priorities and will continue to support bids to funding bodies for relevant, high quality research.

Areas of Work Moving from Medium to High Priority

- a. The Regulator will support the adoption of the ISO 17020 standard⁸ for crime scene examination, including fire investigation.
- b. Work to develop a standard for facial comparison will continue.

New Areas for High Priority

- a. The Regulator will continue to engage with the Home Office Biometrics Programme (HOB) to ensure that its outputs align with the validation requirements in the Codes.

Medium Priority

- a. Guidance will be published to clarify the quality requirements for infrequently used methods and occasional experts.
- b. The Regulator will work with the relevant professional bodies to complete the development of suitable quality standards for forensic podiatry and forensic anthropology.⁹
- c. The Regulator will continue to engage with the development of international standards through the technical committee of the International Organization for Standardization (ISO) to ensure that the UK has strong representation and

⁸ BS/EN ISO/IEC 17020:2012 *General criteria for the operation of various types of bodies performing inspection.*

⁹ Both of these draft standards had been initiated in discussions with the previous Regulator. The anthropology standard is now close to completion.

that standards developed assist in strengthening the quality of forensic science provision without adding significant additional regulatory burden.

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

Requirement 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 December 2015 to November 2016 the following standards and guidance documents have been published (Table 1).

Publication	Date
<i>Codes of Practice and Conduct: Bloodstain Pattern Analysis</i> FSR-C-102	Standard published (issue 1) 14 December 2015
<i>Forensic Pathology Audit</i> FSR-P-304	Protocol published (issue 1) 15 December 2015
<i>Laboratory DNA: Anti-Contamination Guidance</i> FSR-G-208	Guidance published (issue 1) 31 December 2015
<i>Forensic Science Providers: Codes of Practice and Conduct</i>	Standard published (issue 3) 12 February 2016
<i>Forensic Image Comparison and Interpretation Evidence: Guidance for Prosecutors and Investigators</i>	Guidance published (issue 2) Joint publication with the Metropolitan Police Service, National Crime Agency and the Crown Prosecution Service
<i>Validation – Use of Casework Material</i> FSR-P-300	Protocol published (issue 1) 31 March 2016
<i>Legal Obligations</i> FSR-I-400	Information published (issue 4) 26 April 2016
<i>Digital Forensics – Cell Site Analysis</i>	Standard published (issue 1)

FSR-C-135	9 June 2016
<i>Method Validation in Digital Forensics</i>	Guidance published (issue 1)
FSR-G-218	9 June 2016
<i>Speech and Audio Forensic Services</i>	Standard published (issue 1)
FSR-C-134	9 June 2016
<i>The Control and Avoidance of DNA Contamination in Crime Scene Examination Involving DNA Recovery</i>	Guidance published (issue 1) 12 July 2016
FSR-G-206	
<i>Sexual Assault Referral Centres and Custodial Facilities: DNA Anti-Contamination</i>	Guidance published 22 July 2016
FSR-G-207	
<i>Codes of Practice: Fingerprint Development and Image Capture</i>	Draft published for consultation 27 July 2016
FSR-C-127	

Table 1: Standards and Guidance Published, December 2015 to November 2016

1.2 Evaluative Interpretation Standard

The development of an evaluative interpretation standard, to ensure that scientists and courts are aligned regarding the interpretation of evidence, whether the interpretation is supported by a large data set or a limited data set, continues to be one of the Regulator's highest priorities. A consultation draft of a standard for evaluative interpretation was to have been published within the last year. However, due to the limited resources available and the pressure placed on those resources, in particular by the implementation of section 5A of the Road Traffic Act 1988 and the Psychoactive Substances Act 2016, this work was substantially delayed. A case to recruit an additional member of staff to the Forensic Science Regulation Unit (FSRU) has been submitted to Home Office, with a view to recruiting by the beginning of the next financial year.

The Regulator is keen to promote research to support the evaluation of evidence, and can assist researchers seeking funding by providing support in relation to the potential impact of high quality research proposals.

1.3 Avoiding and Detecting Contamination: Standards for Sexual Assault Referral Centres and Custody Suites

A number of concerning contamination-related issues in both Sexual Assault Referral Centres (SARCs) and police custody were raised to the Regulator, including:

- a. the same medical practitioner being asked to examine multiple suspects within a case, or even both the victim and the suspect within the same case;
- b. DNA recovered from one complainant examined at a SARC being detected on the intimate swabs from another complainant examined in the same facility, in circumstances where the DNA could not have been present on the second complainant.

Therefore, interim guidance on anti-contamination measures for both SARCs and police custody was published as a priority. This delayed the production of the substantive SARC standard, which needs further work to separate the core standard from guidance on how to achieve it. The work to produce a consultation draft of the SARC standard will be progressed in the coming year, with the development of an anti-contamination standard for police custody to follow.

1.4 Toxicology Standards

General Forensic Toxicology

In 2015 the Regulator consulted on the possible adoption of the guidance for forensic toxicology published by the United Kingdom and Ireland Association of Forensic Toxicologists (UKIAFT). The responses to the consultation were collated into an anonymised form, which was shared with the UKIAFT.

The UKIAFT has been considering the issues raised and has informed the Regulator that a new draft of the guidance will be available early in the new year. The new draft will be reviewed, and the Regulator will consider a further consultation exercise to inform her views on the use of the document.

Drug Driving

The new 'drug driving' offence under section 5A of the Road Traffic Act 1988 was introduced in March 2015. At that time, the Regulator worked with those providing the analysis service to introduce an interim document (FSR-C-133) setting out an approach to the reporting of results against the legal limits. This approach was based on what had previously been done in cases of drink driving (under section 5 of the Act) and introduced the concept of maximum acceptable uncertainties and a common reporting threshold.

In March a new version of FSR-C-133 was introduced to alter the uncertainties and common reporting thresholds in response to updated information from providers. The interim document has also been developed into a more substantial set of standards for this work.

The Regulator has initiated discussions with the Royal Statistical Society on alternative methods of reporting the analytical results against the legal limits. Possible approaches have been discussed with forensic service providers (FSPs) providing analytical services in this area. The draft standards will be modified to reflect the outcome of the consideration of alternative methods.

1.5 Psychoactive Substances Act 2016

The introduction of the Psychoactive Substances Act 2016 created a new requirement for the Criminal Justice System (CJS): the need to test whether substances are psychoactive within the definition contained within the Act.

The Home Office worked with stakeholders and subject experts to develop a robust approach to establishing psychoactivity. The Regulator worked with the Home Office to establish the quality and CJS requirements of such testing.

1.6 Development of Standards for Forensic Anthropology and Forensic Podiatry

The draft standard for forensic anthropology has been modified to align more closely with other standards adopted by the Regulator, and will shortly be considered by the Quality Standards Specialist Group prior to a period of public consultation. The Regulator is grateful to the authors for their effort in bringing the draft to this stage.

The draft standard for podiatry is undergoing a similar process, to align the requirements with the relevant parts of the Regulator's *Codes of Practice and Conduct* (the Codes).

1.7 Exhibit Handling and Labelling

In last year's annual report, the Regulator raised concerns regarding whether or not sufficient action had been taken to prevent recurrence of a quality failure in which an exhibit had been swapped.¹⁰

Ultimately, barcoding exhibits will provide the most efficient solution to many of the sample handling risks. However, the necessary system changes take time. It is reported that police forces that use the Niche Record Management System (NicheRMS®) will benefit from a forensic module, which is being developed nationally. This will include the ability to track exhibits utilising barcodes. The delivery of this module will be after April 2017.

¹⁰ FSR-R-628, available at: <https://www.gov.uk/government/publications/the-performance-of-bedfordshire-police-and-key-forensic-services-re-bedfordshire-submission-a>

In the meantime, the risk is mitigated by police forces using unique numbering systems to prevent the switching of samples. These systems vary depending on the case management systems, ICT systems and local procedures, but in general involve ensuring that each exhibit is cross referenced with at least three pieces of identification data such as exhibit reference, location of recovery and time/date of recovery. This risk will continue to be monitored by the policing National Quality Managers Group.

When mouth swab samples are taken by police officers or staff from arrestees for inclusion on the National DNA Database (NDNAD), errors have been made in associating the barcoded DNA sample with the correct demographic information on the Police National Computer (PNC). Quantifying this source of error and ensuring that mitigating actions are put in place will be a priority in the coming year.

1.8 Legal Obligations Guidance

A new version of the guidance,¹¹ which addresses the range of legal obligations placed on expert witnesses in England and Wales, was published in April 2016 to address the changes to the Criminal Procedure Rules in October 2015 and judgments that had been delivered after the publication of the previous version.

In November 2016 the Lord Chief Justice made significant changes to the Criminal Practice Directions.¹² These include adding a new Part 19B that sets out requirements for the declaration at the beginning of a statement as well as a new Part 19C dealing with pre-hearing discussions of expert evidence. The guidance document is being updated to address those changes.

1.9 Facial Comparison Standard

In 2014 the then Regulator issued an appendix to the Codes for video analysis,¹³ which covered general issues such as ensuring that the customer is made aware of any limitations to the proposed analysis. These include whether or not the underlying scientific basis had been questioned and whether or not the inherent measurement uncertainty could be established. Providers which undertake image comparison were also required to comply with the following provisions.

¹¹ FSR-I-400, available at: www.gov.uk/government/publications/legal-obligations-issue-4

¹² Available at: www.judiciary.gov.uk/wp-content/uploads/2016/11/cpd-2015-consolidated-with-amendment-no2-nov2016.pdf

¹³ FSR-C-119, available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/351223/2014.08.28_FSR-C-119_Video_analysis.pdf

- a. To demonstrate the appropriate competence in relation to the image-based processes¹⁴ that have been undertaken in addition to demonstrating competence in comparison.
- b. To reduce the risk of confirmation bias, incident footage containing unknown persons or objects of interest shall be analysed to identify distinguishing features before known footage of the suspect objects of interest is viewed or information revealed to the analyst.¹⁵
- c. To ensure that all relevant information in relation to image processing undertaken by a third party is communicated to the person undertaking the comparison.
- d. To demonstrate the decision process and basis for critical findings.
- e. To demonstrate that the methods used for comparison are appropriate, through validation for the image characteristics of the case material. For example, methods developed for high quality recordings may not be valid for low quality CCTV images.

The appendix highlights methods that had been flagged as high risk, such as those that compare the proportional relationships of one photo usually using metrics or alignment. All methods, even ones without a direct measurement, have sources of uncertainty and/or error and these must be assessed as part of the required validation.

In looking to produce a bespoke document covering just the sub-discipline of facial comparison, it has become increasingly apparent that the underlying basis for many methods being used has been questioned at some point. A single academic study critical of a method does not automatically invalidate the use of a similar method but it may expose weaknesses and risks. If the scientific literature points to shortcomings in an approach or method, organisations will need to conduct, commission or encourage more basic research into the approach or method, which should ideally then be peer reviewed and published. The admissibility considerations laid out in the Criminal Practice Directions include:

- a. consideration of the validity of the method;
- b. the degree of precision or margin of uncertainty;
- c. accuracy;
- d. reliability;
- e. the extent to which any material upon which the expert's opinion is based has been peer reviewed; and

¹⁴ The appendix required that methodology used should be clear and may include the Analyse, Compare, Evaluate, Verify, Report (ACE-VR) methodology that is used for other types of comparisons. The overall method also requires validation.

¹⁵ When commissioning experts, police officers should consider whether phased disclosure to the provider is appropriate. As the bias is an unconscious act prior knowledge by the examiner of certain information (for example, the target number plate, injury, congenital disorders, damage features) may be seen as a source of such bias.

f. if there is a range of expert opinion on the matter in question.

As well as including any limitations or caveats in reports, practitioners are also expected to ensure that those instructing them are made aware of any limitations or caveats that are already known to apply to this type of analysis at the time of commissioning.

The Regulator intends to issue more detailed requirements for facial comparison in the coming year. Practitioners are reminded that the Codes and its appendices apply and guidance on validation is already published.

1.10 Revision of the Codes

The Codes were originally published in late 2011. They explain the standards required for UK forensic science, building on good practice and on lessons from previous failures and adverse court rulings. Forensic science providers and practitioners, whether instructed by the defence or prosecution, are expected to comply with the Codes.¹⁶ Where accreditation is required,¹⁷ organisations need to include adherence to the Codes in their schedule of accreditation by October 2017. This target was set in 2014.

Changes to the Criminal Procedure Rules and Criminal Practice Directions, together with the update to the ILAC-G19 document¹⁸ in 2014 and the more detailed accreditation requirements for digital forensics and firearms examinations, were reflected in issue 3 of the Codes, published in February 2016.

A thorough review of the Codes, taking into account feedback and questions received is now in progress. Each element of the Codes has been challenged by an editorial group, to ensure that it is necessary and appropriate, as well as ensuring that there are no substantive gaps in the standards. As many organisations are working very hard to ensure that all aspects of the Codes are incorporated into their quality management systems by October 2017, the Regulator has agreed with the Forensic Science Advisory Council not to issue an updated version of the Codes that takes affect before the target date of October 2017.

However, it is wise to give as much notice as possible of the changes currently been discussed and likely to be in the next issue.

The Codes detail the required features and structure for validation, with the original expectation that all new records created from the publication of the Codes in

¹⁶ The Regulator requires compliance as does the Crown Prosecution Service (CPS) as detailed here: http://www.cps.gov.uk/legal/s_to_u/scientific_evidence/core_foundation_principles_for_forensic_science_providers/

¹⁷ Set out in the Statement of Accreditation Requirements in the preface to the Codes, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/499850/2016_2_11_-_The_Codes_of_Practice_and_Conduct_-_Issue_3.pdf

¹⁸ ILAC G19:08/2014 Modules in a Forensic Science Process, available at: http://ilac.org/latest_ilac_news/ilac-g19082014-published/

December 2011 would be compliant. Harmonising the structure was designed to make it easier for those working in the Criminal Justice System (CJS):

- a. to understand the extent and limitations of the validation;
- b. to assure completeness; and
- c. to simplify and shorten external assessment.

A number of organisations have been granted accreditation without specific inclusion of adherence to the Codes; the validation would have been assessed as adequate to meet the ISO 17025¹⁹ standard, although normally an observation would have been made that it was not in the format expected. The Regulator has now agreed that all accreditation assessments from October 2016 should include assessment against the Codes, to ensure that compliance by October 2017 is possible. Therefore, all new validations from October 2016 will have to be in this common format; this replaces the requirement that has been in place since the initial publication of the Codes for all validation to be in the prescribed format from December 2011. This is because the benefit of immediate retrofitting all existing validations that have already been externally assessed is relatively small.

There will be a requirement for a plan to be in place to review all existing validations, with the production of a validation library and statement of validation completion as a minimum. If all validations in an organisation pre-date October 2016, for the purposes of assessing competence at least one completed validation will have to be produced in the required format.

The second proposed change, and possibly the most obvious to most readers, is to the terminology used to describe those who provide forensic science services. Not all organisations and people who provide forensic science services to the CJS, particularly individual practitioners and small teams in larger organisations, see themselves as 'forensic science providers'. The term 'forensic unit' was coined in the international guidance document (ILAC-G19²⁰) on accreditation. It is defined as "*a legal entity or a defined part of a legal entity that performs any part of the forensic science process*". Therefore the term forensic unit covers an individual practitioner and any unit within policing carrying out forensic science, all the way to a large traditional laboratory. The term forensic unit should be understandable to all, including those who might consider their work more engineering than science.

The third proposed clarification is to the section detailing the retention of material supplied to forensic units instructed by the defence. The defence's forensic unit should retain the notes and records it has created in line with the Codes. However, the legal obligations for retention fall on the police and prosecution side. Therefore, the forensic unit appointed by the prosecution may require that supporting material is

¹⁹ Currently BS/EN ISO/IEC 17025:2005.

²⁰ ILAC G19:08/2014 *Modules in a Forensic Science Process*, available at:
http://ilac.org/latest_ilac_news/ilac-g19082014-published/

returned by the defence's forensic unit or that the supplied copies are destroyed, as appropriate, once the case is concluded. The possibility of an appeal in the future is not grounds for the retention of material supplied to the defence's forensic unit once the case is complete if there is a requirement for return or destruction.

The next issue of the Codes will refer to the declaration requirements coming from the new Part 19B in the November 2016 edition of the Criminal Practice Directions (see footnote 12).

The final issue that the Regulator is addressing relates to continuity planning. The text will be expanded to remind both customers and forensic units to ensure that they have addressed the risk that the forensic unit goes out of business with no legal successor. The customer, usually the police, is reminded that although the case files and exhibits will almost undoubtedly be retrievable, without supporting material and records covering continuity, validation, competency, calibration and maintenance the reporting of the case in court may be hampered. Forensic units are expected to consider what additional supporting information would be required in such a circumstance (for example, validation reports, calibration records) and make provisions for an appropriate body to retain access to those records should it be required.

In last year's *Annual Report*, the Regulator proposed to progress a range of draft appendices to the Codes through technical review and public consultation in order to finalise the standards. However, it did not prove possible to tender for external services to progress this work. If resources permit, the drafts will be progressed next year.

1.11 New Standards for Digital Forensics

The newly reconstituted Digital Forensics Specialist Group has been tasked by the Regulator with recommending and/or developing standards for:

- a. radio frequency/electromagnetic geolocation services and communications data;
- b. network capture and analysis; and
- c. capture and analysis of social media and open source data.

1.12 DNA Mixtures Guidance

Given the divergence of approach evident in DNA mixture interpretation, it is important to ensure that courts are in a position to determine the reliability of interpretation methods. The Regulator has commissioned work to develop guidance and standards in this area. Drafts are being considered by the Regulator's DNA Specialist Group relating to:

- a. interpretation terminology, choice of hypotheses and general methodology;
and
- b. validation of software for DNA interpretation.

Once this review is complete, the drafts will be published for public consultation.

1.13 Pilot of ISO 17020 for Case Review

A range of organisations and individuals undertake case review services. Sometimes this involves reviewing historic unsolved cases to assess the potential for new forensic science interventions, but the primary area in which the Regulator is seeking to introduce quality standards relates to the review of cases on behalf of the defence. At present, there is no quality standard covering this work, and whilst some individuals and organisations are highly competent, others are not and at the extreme end, have been subject to adverse judicial comment.

The Regulator therefore wishes to set a quality standard to cover this work. Of the international accreditation standards, ISO 17020 would be the most suitable, and 13 organisations have expressed interest in taking part in a pilot study for accreditation to this standard for case file review. Until the pilot study has been undertaken and evaluated, the Regulator will not make a final decision on whether or not to adopt this standard.

This is an area in which the cost of accreditation is a significant disincentive to adopting the standard, since many of those undertaking this work operate as small or micro-businesses, or are sole traders and the revenue from the work is heavily constrained by legal aid funding. Nevertheless, it is not sustainable for the only guide to quality to be whether or not an individual expert has been criticised in court. Nor is a register of experts the solution, since such a register would be costly to set up and maintain, and would address only the competence of the expert and not the efficacy and validity of their processes.

The Regulator will work with the United Kingdom Accreditation Service (UKAS) during the pilot study to see how costs can be minimised, and will liaise with the Legal Aid Agency with the aim of enabling a standard to be set that is affordable but gives the requisite level of assurance.

1.14 International Standards

The Regulator, acknowledging the increasingly global nature of crime, continues to engage with the international forensic science community. The Regulator has commenced dialogue and shared draft standards with the relevant groups in the Organisation of Scientific Area Committees (OSAC) in the USA and spoke about the role of quality standards in moving forensic science forward, at the American Academy of Forensic Sciences meeting in February 2016.

The Regulator continues to chair the British Standards Institution (BSI) Mirror Committee for Forensic Science (FSM/1), which is the UK's voice in relation to the development of forensic science-related standards internationally, through the International Organization for Standardization (ISO). This Committee votes on behalf of the UK on relevant ISO ballots in relation to forensic science standards.

This year, the international standard ISO 18385 was published; this covers consumables used in the DNA process. The FSM/1 Committee has proposed to the ISO Technical Committee developing forensic science standards (ISO TC 272) that an international standard for forensic grade consumables should be developed, based on the Publicly Available Standard 377 (PAS377), which was developed on behalf of the Regulator.

Section 2: Full Compliance with Quality Standards

Requirement 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 Declaration of Non-Compliance

Failure to comply with the Regulator's standards could significantly detract from the credibility of a forensic science professional, particularly when acting as an expert witness, and/or have a bearing on reliability. This means that if accreditation is required, as set out in the Statement of Requirements in the Regulator's *Codes of Practice and Conduct* (the Codes), but has not been achieved, such non-compliance should be declared. The court will thereby have the information, and may choose to scrutinise the reliability of the evidence more closely. The Regulator is in discussion with the Crown Prosecution Service (CPS) regarding the precise means of making disclosure.

2.2 Digital Forensics

Supporting the digital forensics community to adopt appropriate quality standards has continued to be a high priority, with a workshop hosted by the Regulator in February and guidance on method validation published in June, in addition to several presentations to practitioners (see Section 3.1, Tables 3 and 4) and meetings with commercial and policing providers of digital evidence. However, less progress towards reaching the standards has been made by the digital forensics community than should be the case at this stage. Although digital forensics has expanded rapidly in recent years, it is by no means new, and organisations have attained and maintained the ISO 17025 standard in this field for many years.

Experience to date indicates that there is insufficient detailed understanding within many police forces and some private providers of the way in which methods in digital forensics should be validated. The degree of separation of digital forensics from other forensic science activity adds to the challenge, with insufficient knowledge transfer between digital and traditional forensic sciences.

The National Police Chiefs' Council (NPCC) Forensic Portfolio's digital work, led by Deputy Chief Constable (DCC) Nick Baker and supported by an Expert Network, has continued to engage with the Regulator and with law enforcement agencies to support and challenge their progress towards the standard. They are seeking support for national resources to develop the necessary skills and knowledge in the community. This is very welcome, but the current progress of many organisations means that, even with additional intervention, it is highly unlikely that they will meet the requirement for accreditation of digital forensic activities by October 2017. This

means that for a substantial proportion of digital evidence produced after that date, disclosure of non-compliance will be required.

A standard for cell site analysis was published in June 2016 and a pilot study for accreditation of this activity is underway. There are currently four organisations taking part in the pilot, with a fifth having withdrawn due to the timescales but continuing to work towards accreditation. Whilst the current pilot study is dealing specifically with cell site analysis, the principles also apply to other forms of radio frequency and electromagnetic geolocation activities. Following the pilot, the standard will be updated to incorporate learning and specifically address other forms of location mapping. The College of Policing has coordinated provision of ground truth data to enable participants in the pilot study to undertake validation of their methods. The Regulator is in discussion with the College about the provision of a similar service for organisations seeking accreditation in the future.

2.3 Firearms

The Forensic Firearms Working Group has presented its recommendations to the Forensic Science Portfolio lead, Chief Constable (CC) Debbie Simpson. The Regulator was represented on this Group to ensure that quality standards were considered during the design of any future service delivery model.

In issue 3 of the Codes, a category of “*simple classification*” was defined, for which an alternative framework of quality standards would be allowed, if implemented by October 2016. However, there has only in the last few months been any coordinated activity by policing to suggest a framework. The proposal is being scrutinised by the Forensic Science Regulation Unit (FSRU) to determine if it is robust and proportionate.

2.4 Avoiding and Detecting Contamination: Elimination Databases

Full elimination databases to identify DNA contamination are not yet in place. The risk of wasting a significant level of investigative resource on the basis of contaminating DNA profiles, or of the presence of an unknown DNA profile misleading a court are therefore not fully controlled.

The second phase of the Central Elimination Database (CED) project, run by the National Database Unit (NDU), has been expanded to cover the requirements of the Codes. Although good progress was made towards the beginning of the year, with Lancashire Constabulary being the first force to transition their police officer DNA profiles to the CED and complete the investigation of all of the potential contaminant events identified, the progress of many other police forces has been slower. The reconciliation of data currently held on the Police Elimination Database (PED) is not yet complete. Until this work is completed, it will not be possible to complete the purge of the National DNA Database (NDNAD) to remove profiles caused by police

officer contamination. Disappointingly, the timescales for completing the transition of all police officer profiles to the NDNAD have slipped substantially. If progress does not rapidly improve, the Regulator will write to the relevant senior officers to emphasise the importance in both criminal justice and financial terms of detecting contamination at an early stage.

Negotiations to change the regulations for police staff, in line with those for police officers, so that elimination samples can be held on the CED are still ongoing; the proposal has been with the police staff council/trade union side to sign off for some time.

Discussions have begun with staff of Sexual Assault Referral Centres (SARCs), so that their profiles can be held on the CED. This is complicated by the range of employees and volunteers working in SARCs.

The Regulator and the Head of NDU have jointly written to manufacturers of consumables used in the DNA process, with the aim of entering their staff profiles onto the CED. Whilst some manufacturers have immediately seen the opportunity to improve the service they offer to their customers and the Criminal Justice System (CJS) by engaging with this process, others are not yet fully cognisant of the need for routine searches rather than one-off speculative searches if contamination is suspected. Over the next year, the Regulator will further engage with manufacturers with the aim of increasing compliance with the CED requirements.

2.5 Forensic Pathology

Code of Practice

The standards for forensic pathology in England, Wales and Northern Ireland are set out in the document *Code of Practice and Performance Standards for Forensic Pathology* (the pathology Code)²¹ published by the Regulator, Royal College of Pathologists, Home Office and the Department of Justice for Northern Ireland. The standards for Scotland are contained in a document published by the Crown Office and Procurator Fiscal Service and the Royal College of Pathologists.

The current version of the pathology Code was published in 2012. The process of reviewing the document has therefore been initiated.

Views on the content of the Code have been sought from the following:

- a. all forensic pathologists on the Home Office Register;
- b. forensic pathologists in the State Pathologists Department for Northern Ireland;

²¹ FSR-C-113, available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/115698/code-practice-forensic-pathology.pdf

- c. forensic pathologists working in Scotland;
- d. the main forensic science providers in England and Wales;
- e. Forensic Science Northern Ireland; and
- f. the United Kingdom and Ireland Association of Forensic Toxicologists.

The responses have been collated and are being reviewed by specialists with the aim of publishing a new version of the pathology Code in 2017.

Audit of Forensic Pathologists

The audit of the work of forensic pathologists provides a means to assess:

- a. the compliance of forensic pathologists with the standards; and
- b. the effectiveness of the standards.

It is a key feature of the revalidation process of forensic pathologists required by the General Medical Council (GMC).

The protocol under which the audit of forensic pathologists is undertaken has been published.²² At the same time all previous audits commissioned by the Regulator were published.²³

The audit of forensic pathologists initiated in 2015 has been completed and the report published.²⁴ This focused on deaths:

- a. in police custody; and
- b. following precipitate descent from height.

The results of the audit were very positive. The recommendations are now being addressed.

The audit identified variation between reports in relation to compliance with the requirements for statement and reports. To address this matter, guidance has been created and views are being sought from the CPS.

An audit has been commissioned considering cases where:

- a. the body was recovered from water; and
- b. the body was repatriated from abroad.

²² FSR-P-304, available at: www.gov.uk/government/publications/forensic-pathology-audit-protocol

²³ FSR-R-606, FSR-R-607, FSR-R-619 and FSR-R-633, available at: www.gov.uk/government/collections/forensic-pathology-audit

²⁴ FSR-R-635, available at: www.gov.uk/government/collections/forensic-pathology-audit.

Sampling at Post-Mortem Examinations

Guidance has been drafted on the taking of samples for forensic science examination during post-mortem examination. This is being reviewed and should be published in the near future.

Imaging in Forensic Pathology

The use of scanning technology in post-mortem examinations has increased over recent years. The existing standards for forensic pathology do not address scanning in any detail.

The Regulator has therefore asked experts in the field to generate the outline of standards for this area, which can form the basis of discussions with the Royal College of Pathologists and the Royal College of Radiologists.

Legal Issues in Forensic Pathology and Tissue Handling

The document *Legal Issues in Forensic Pathology and Tissue Retention*²⁵ provides advice on the complex legal environment in which forensic pathology, and in particular the taking, retention, examination and disposal of tissue, is undertaken.

Over the last year issues have arisen in cases that have involved the examination of a foetus. Consideration has been given to the legal position of a foetus and the nature of the examination, and the guidance has been updated to reflect that consideration. The draft has been submitted for legal assessment and will be published in the near future.

Oversight of Revalidation of Forensic Pathologists

The Regulator provides independent oversight of the process adopted for the Pathology Delivery Board for the revalidation of forensic pathologists on the Home Office Register.

2.6 Fingerprints

The UK's current Automated Fingerprint Identification System (AFIS) is called IDENT1. The Regulator has been asked by a number of police forces whether the scope of accreditation for fingerprint comparison should include the use of IDENT1. Generally, the specific scope of accreditation depends on the services that a forensic unit offers, and so would not be centrally specified by the Regulator.

The Regulator's standards for fingerprint comparison were set out in detail in FSR-C-128,²⁶ as an appendix to the Regulator's Codes. The aim is to improve the quality of fingerprint comparison, by ensuring that properly validated methods are:

- a. employed by competent people;
- b. performed in a consistent manner;

²⁵ FSR-G-203, available at: www.gov.uk/government/publications/legal-issues-in-forensic-pathology-and-tissue-retention-issue-2-guidance

²⁶ FSR-C-128, available at: <https://www.gov.uk/government/publications/forensic-science-providers-codes-of-practice-and-conduct-2015>

- c. compliant with the Criminal Procedure Rules; and
- d. take account of the admissibility criteria in the Criminal Practice Directions.

The purpose of requiring accreditation for fingerprint comparison is to provide external assurance that all forensic units undertaking this work are compliant with the standards.

Whilst the date for achieving accreditation was set as October 2018,²⁷ the Regulator expects forensic units to work towards achieving the standards as quickly as possible; all should bear in mind that the admissibility considerations set out in the Criminal Practice Directions have already been in place for some time.

IDENT1

The use of IDENT1 to produce candidate lists of potential matches is integral to the fingerprint comparison process. All such AFIS systems used in various jurisdictions are typically described as being 70–80% accurate²⁸ but this accuracy can be influenced and improved by local policies and procedures on how searches are carried out. This includes the type of searches launched, the relaunch strategies, as well as even how far down the candidate list an expert will go in making manual comparisons. These policies and procedures must necessarily be informed by some level of knowledge regarding the performance and limitations of IDENT1 and the way in which searches are carried out in any particular bureau. To not seek to optimise processes could reduce, delay or prevent obtaining justice for victims of crime.

The performance of IDENT1 is assessed by using biometric accuracy testing, but this does not give a basis for forensic validation. The Regulator does not expect any forensic unit to start from scratch and validate the search algorithms within IDENT1. However, the Regulator does expect that bureaux will have validated their own processes, which include IDENT1, and will have an understanding of the limitations and risks associated with these processes. Accepting that IDENT1 is a screening method, the user requirement, risk assessment and acceptance criteria for the validation will be less exacting than would be the case if it were being used as a comparison method.

Whether or not this part of the process is included in the schedule of accreditation, all organisations are required to optimise and validate their end to end method. The Regulator will sponsor workshops to assist police forces in achieving this requirement.

Future Algorithms

The Regulator is in discussion with the Home Office Biometrics Programme Board, to ensure that the validation of future algorithms meets the requirements of the Codes, and is available to end users to assist them with validating their own processes.

²⁷ This date refers to the Regulator's requirements and not to any other accreditation requirements, for example, those from the European Union Framework Decision 2009/905/JHA.

²⁸ For example: <https://www.ncjrs.gov/pdffiles1/nij/225326.pdf>

2.7 Adoption of ISO 17020 for Incident Scene Investigation

By 2020 all organisations conducting incident and crime scene investigations (CSIs) should be accredited to ISO 17020. In order to assist the community in reaching the standard, the Regulator is undertaking several strands of work. These include hosting workshops to disseminate the requirements of the standard, and guidance on how to approach accreditation.

General Crime Scene Investigation Activity

The Regulator is providing guidance and support to the policing CSI Expert Network in relation to validation of methods. Coordination between policing and the commercial sector, via the Association of Forensic Science Providers (AFSP), has been facilitated.

Collision Investigation

The Regulator is supporting the collision investigation community to determine the scope of activities that will need to be accredited and the steps towards adopting the standards. Although the assessment of speed from CCTV footage should ideally have been carried out by the October 2017 deadline for digital forensics, the Regulator recognises that this is a complex area and little time remains. Therefore, formal accreditation will not be required until 2020 along with other aspects of collision investigation, but the Regulator will work with the community to ensure that risks are controlled as quickly as possible.

Fire Investigation

The Chief Fire Officers Association (CFOA) is working with the Regulator to assist those in the fire investigation community within Fire and Rescue Services to work towards adoption of the standards.

The standards requirement applies to all incident scene investigation where forensic science is deployed. Activities that routinely occur where there has been no incident are not included in the requirement set by the Forensic Science Regulator.

Therefore, it is not the intention of the Regulator that organisations conducting inspections for the purposes of regulatory enforcement against the Regulatory Reform (Fire Safety) Order would be required to be accredited for that purpose. However, if the Regulatory Reform (Fire Safety) Order assessment also requires scientific issues to be resolved then a suitably qualified expert should be sought.

2.8 Cost of Accreditation for Sole Traders and Micro-Businesses

Very small businesses and sole traders need to operate at the same standards as larger businesses. To set lower standards would be difficult to justify in criminal justice terms; neither suspects nor victims have a say in the choice of forensic units processing the evidence in their cases, yet all have a right to expect the same level of quality. However, the Regulator acknowledges that the costs of achieving

accreditation to international standards can be proportionately higher for smaller companies; this was discussed specifically in relation to case review in section 1.12.

Therefore, drawing on previous work carried out by the United Kingdom Accreditation Service (UKAS) with sole traders in an unrelated field, the Regulator has initiated discussions between UKAS and the Chartered Society of Forensic Sciences (CSFS) with a view to establishing if a more attractive route to achieve the same standards can be defined. Progression of this work with UKAS and the CSFS will be a priority over the coming year.

The outcomes of this work, in terms of effectiveness and cost, will inform future direction.

2.9 Complaints and Investigations

There has been a significant increase in the number of issues referred this year and the complexity of the issues raised has also increased. A total of 57 matters concerning quality have been referred to the Regulator. Of these, 21 were self-referrals.

The issues were categorised as low, medium or high risk. There were 9 regarded as high risk (of which 4 were self-referrals), 34 at medium risk and 13 low risk. There was also one issue raised that was outside the scope of the Regulator’s role. A comparison to the figures provided in last year’s annual report is set out in Table 2.

Classification	2014–15	2015–16
High	7	9
Medium	16	34
Low	10	13
Outside Scope	3	1
Total	36	57

Table 2: Referrals to the Regulator, 2014–15 and 2015–16

The Regulator’s response to the issues raised has varied depending on the nature of the issue raised and the potential consequences. This year the responses included:

- a. working with the forensic units involved to identify what occurred and what steps had been taken to address the issues;
- b. commissioning reviews of the cases involved by external experts;

- c. publishing new, or modified, standards and guidance to address the issues identified; and
- d. working with providers, the police, Government departments and the CPS to address issues raised.

An investigation report into one of the high risk issues, concerning contamination at a SARC, will be published to enable learning from this incident to be disseminated.

2.10 Statutory Powers and Governance

The Home Office *Forensic Science Strategy*, published in March 2016,²⁹ stated that *“The Government’s vision for forensic science is for a clearer system of governance to ensure quality standards and proper ethical oversight and a cost effective service that delivers to law enforcement and the criminal justice system robust and relevant forensic evidence, and in doing so strengthens public and judicial trust in forensic science.”* The strategy document included a commitment to a *“clearer statutory role”* for the Forensic Science Regulator by the end of this Parliament.

Home Office officials have held a number of events to consult with stakeholders regarding how this statutory role would be framed, and have been drawing up proposals for the legislation, with a view to legislating in the third session. However, the Regulator understands that pressure on parliamentary time following the vote to leave the EU may result in a delay to this timetable.

Any delay to provision of a statutory role for the Forensic Science Regulator is likely to have a direct impact on the speed of adoption of quality standards in a number of areas including digital forensics, and hence on the quality and reliability of some of the forensic science delivered in the CJS.

In the Regulator’s view, governance for forensic science is even less effective now than it was prior to the publication of the Home Office Strategy. The Forensic Policy Group, which is intended to be *“the overarching board where all stakeholders meet to identify and manage progression of forensic science provision in England and Wales”*,³⁰ and which was to have overseen the delivery of the strategy commitments is not a functioning governance board, but merely an occasional stakeholder update forum, and has not as yet been replaced by a successor body. Without either statutory powers or an effective central governance mechanism, the Regulator’s role in ensuring that standards are adopted is significantly hampered.

The Regulator continues to engage with Home Office officials who are working to develop governance in this area.

²⁹ Available at: <https://www.gov.uk/government/publications/forensic-science-strategy>

³⁰ *Ibid.*, para 55.

Section 3: Shared Understanding of Quality and Standards

Requirement 3: 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

In order to make the case for the adoption of standards, and to ensure that both the need for standards and the timetable required by the Regulator are clear to all, a priority has been speaking to as many forensic experts, practitioners and relevant managers as possible. The Regulator has given numerous presentations to practitioners and stakeholders at conferences, meetings and seminars (Table 3), and has been represented by officials giving presentations at meetings (Table 4).

Presentation Title	Event
Challenges and Standards for Forensic Podiatry	College of Podiatry Annual Conference 19 November 2015
Forensic Science Quality and Future Challenges	Northern Ireland Forensic Services Strategy Workshop 30 November 2015
Moving Forward in Forensic Science: The Role of Quality Standards	American Academy of Forensic Sciences 24 February 2016
Understanding the Regulatory Environment	UKAS Cell Site Analysis Expression of Interest Event 4 March 2016
Quality Standards for Forensic Genetics: Current and Future Challenges	Economic and Social Research Council Seminar 16 March 2016
Equality of Quality	Chartered Society of Forensic Sciences SME and Sole Trader Workshop 22 April 2016
Quality Standards in Digital Forensics:	Mobile Forensics Workshop

Presentation Title	Event
where from and where to?	8 June 2016
Quality and Standards in Forensic Science	Nederlands Register Grechtelijk Deskundigen (NRGD) Quality Symposium 30 June 2016
Quality Standards for Speech and Audio Forensic Services	International Association for Forensic Phonetics and Acoustics 26 July 2016
Forensic Science Quality Standards and Implementation of New Technology to the Criminal Justice System	International Atomic Energy Agency Technical Meeting 5 September 2016
Quality Challenges in Forensic Science	Forensic Science in Defence and Security 15 September 2016
Understanding the Regulatory Environment	Professionalising Open Source 5 October 2016
Collision Investigation	Collision Investigation Workshop 7 October 2016
Forensic Science Quality and Biometrics	Biometrics 2016 19 October 2016
Challenges to Forensic Science Quality	Northumbria Centre for Evidence and Criminal Justice Studies 10th Anniversary Symposium 28 October 2016
Regulator's Annual Report: One Year On	Chartered Society of Forensic Sciences Autumn Conference 3 November 2016
Forensic Science Quality and Regulation	Scientific Evidence and Expert

Presentation Title	Event
	Testimony Program 7 November 2016

Table 3: Presentations Made by the Forensic Science Regulator

Presentation Title	Event
Cell Site	UKAS Cell Site Analysis Expression of Interest Event 4 March 2016
Quality Considerations: Attribution of DNA Using Current Technology Developments	Genetics in Forensics Congress 14 March 2016
Forensic Science Regulator Update	European Network of Forensic Science Institutes, DNA Working Group 29 April 2016
Role of Quality Standards – DNA Technology Developments	10th International Crime Science Conference, Jill Dando Institute 12 July 2016
CCTV Work Stream – Standards and the Criminal Practice Directions	Chartered Society of Forensic Sciences Autumn Conference 3 November 2016
Fingerprint Examination Accreditation – <i>Are We Nearly There Yet?</i>	Chartered Society of Forensic Sciences Autumn Conference 3 November 2016
	Fingerprint Enhancement Laboratory Conference 15 November 2016

Table 4: Presentations by Forensic Science Regulation Unit Officials Representing the Regulator

The Regulator’s conference was held on 3 March 2016, the theme of which was ‘Strengthening Forensic Science Quality 2016’. The conference was attended by more than 140 delegates from forensic service providers, the police and wider Criminal Justice System (CJS) stakeholders. The programme included sessions on:

- a. challenges, including communication between scientists and lawyers and providing reliable quantitative and qualitative opinions;
- b. the requirements of the Regulator’s *Codes of Practice and Conduct* (the Codes); and
- c. change, including the Better Case Management initiative and quality progress.

As discussed in relation to the specific disciplines, the workshops in Table 5 were hosted or supported by the Regulator.

Workshop Title	Date	Invitees
Scenes of Crime Pre-assessment Workshops	10 November 2015 16 December 2015	70
Digital Forensics Workshop	4 February 2016	220
Scenes Of Crime Anti-contamination Workshop	19 May 2016	55
Forensic Science Regulator’s <i>Code of Practice and Conduct</i> Pre-assessment Workshops	13 June 2016 30 June 2016 7 October 2016	70
Cell Site Pilot Pre-assessment Workshop (all organisations that applied to be in the pilot)	15 June 2016	14

Table 5: Workshops Hosted by the Forensic Science Regulator

3.2 Case Review Pilot: Quality Throughout the Commissioning and Supply Chain

During the year, a case review pilot exercise was carried out in order to evaluate the impact of decision making and information transfer on the effectiveness of the forensic science provision to the CJS.

The draft report highlighted a number of areas for further consideration, including variability in the level of knowledge and training of those making initial forensic case strategy decisions. The draft is being revised to take account of feedback from CPS and the participating police forces. The Regulator, together with the Forensic

Science Advisory Council (FSAC), will then consider whether a revised version is suitable for publication. The FSAC has recommended that, taking account of the findings and learning from the pilot study, a wider review is undertaken. This recommendation will be considered and further work planned and initiated during the coming year.

3.3 Effectiveness of Case Management

In addition to referrals concerning practical operation of the streamlined forensic report (SFR) process, the Regulator has been informed of regular failures in the process of the preparation of cases for court. Examples include forensic scientists being required to attend court and give evidence when they have not prepared an admissible expert report, and even being refused authorisation to prepare an admissible report by the relevant police force.

Conversely, forensic scientists who have had authorisation to prepare expert reports have, in some cases, not submitted statements that are fully compliant with the Criminal Procedure Rules (CrimPR). In several cases, this led to evidence being ruled inadmissible.

Such failures of the case management process are unnecessary and extremely concerning. It is the duty of all involved in the CJS to serve the overriding objective that cases are dealt with justly, including the requirement in part 1.1(e) of the CrimPR of dealing with the case efficiently and expeditiously. It is the duty of all participants to *“at once inform the court and all parties of any significant failure (whether or not that participant is responsible for that failure) to take any procedural step required by these Rules, any practice direction or any direction of the court.”*³¹

Following concerns raised by the Regulator about the way in which the strength of evidence of a DNA match resulting from a mixed profile was being reported using SFRs, work is ongoing, under the auspices of the National DNA Database (NDNAD) Strategy Board, to ensure that the practice of reporting mixed DNA profiles using SFRs is appropriate.

3.4 Development of Primers for Courts

The Lord Chief Justice of England and Wales is leading an initiative, together with the Royal Society, the Royal Society of Edinburgh, senior judicial colleagues and Professor Dame Sue Black and Professor Niamh NicDaeid from the University of Dundee to develop a series of primers. These will explain to lay readers the agreed scientific background to forensic evidence. The Regulator is contributing, as a member of the writing committee, to the DNA primer. A draft is being agreed among the writing committee prior to submission to the editorial committee.

³¹ Available at: <https://www.justice.gov.uk/courts/procedure-rules/criminal/docs/2015/crim-proc-rules-2015-part-01.pdf> part 1.2 (c)

3.5 Engagement across the Criminal Justice System

Following the publication of the Government Chief Scientific Advisor's *Annual Report 2016, Forensic Science and Beyond: Authenticity, Provenance and Assurance*,³² the Regulator has met with the Chief Scientific Advisor, Sir Mark Walport, and subsequently with a group of judges, academics and Home Office officials convened by the Lord Chief Justice and Sir Mark Walport. A forum to raise forensic science issues is to be convened.

Along with co-authors from the Northumbria University Centre for Evidence and Criminal Justice Studies, the Regulator has contributed to a special issue of the *Journal of Criminal Law*, to follow on from Sir Mark Walport's report. The article deals with the means by which the CJS can understand the extent to which expert scientific evidence can be trusted; adherence to the Regulator's quality standards is a key element to assure reliability.³³

The Regulator has accepted an invitation to give a lecture at the Old Bailey in March 2017, as part of the Criminal Bar Association's education and training lecture series.

3.6 House of Commons Science and Technology Committee

In March 2016 the Science and Technology Committee (Commons) launched an inquiry to scrutinise the Government's Forensic Science Strategy. The Regulator submitted written evidence to the enquiry,³⁴ in which she considered the extent to which the strategy reduced the risks that she had identified to forensic science. Subsequently, the Regulator, along with Dr Anya Hunt of the Chartered Society of Forensic Sciences (CSFS), gave oral evidence to the Committee.³⁵

The Regulator welcomes the Committee's report,³⁶ which urged that "*the Government must before the end of the current 2016–17 Session bring forward the legislation necessary to give the Forensics Regulator the statutory powers needed to ensure accreditation and quality standards compliance*" and "*the Government should make it clear that while some police forces may face challenges in securing accreditation of their forensic laboratories to the industry's standards by the deadlines set by the Forensic Services Regulator, they must do so.*"

³² Available at: <https://www.gov.uk/government/publications/forensic-science-and-beyond>

³³ Carr, S., Piasecki, E., Tully, G. and Wilson, T. (2016) 'Opening the scientific expert's black box: "critical trust" as a reformatory principle in criminal justice', *Journal of Criminal Law*, 80 (5), pp 364–386.

³⁴ Available at: <http://data.parliament.uk/WrittenEvidence/CommitteeEvidence.svc/EvidenceDocument/Science%20and%20Technology/Forensic%20Science%20Strategy/written/31138.html>

³⁵ Session transcript and recording available at: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/forensic-science-strategy/oral/31891.html>

³⁶ Available at: <http://www.publications.parliament.uk/pa/cm201617/cmselect/cmsctech/501/50102.htm>

The Government's response to the Committee³⁷ has not accepted many of the Committee's recommendations, but has committed to take forward legislation to give the Regulator statutory powers "*as soon as is practicable*".

3.7 Research Priorities from a Quality Perspective

Whilst novel innovations that will enable the development of new forensic science methodologies in the future are likely to arise from fundamental and applied research in other fields, there remains a requirement for applied research in forensic science. The Regulator's highest priorities for research are as follows.

- 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.

This year saw the opening of the Leverhulme Research Centre for Forensic Science, which provides welcome focus and funding for underpinning science. Other academic groups are contributing research in this area, and where appropriate and possible, the Regulator is keen to support high quality research proposals, by reiterating to research councils the impact that such research can have.

³⁷ Available at:

<http://www.publications.parliament.uk/pa/cm201617/cmselect/cmsctech/845/84502.htm>

Routine and Administrative Report

European Union

Framework Directive 2009/905/JHA

The EU adopted Framework Directive 2009/905/JHA³⁸ on the accreditation, to ISO 17025, of certain activities related to fingerprint examination and DNA analysis. The UK exercised its right to opt-out of the provisions of this Directive.

As part of the process of joining the Prüm Decisions the UK applied to rejoin the Directive. By Commission Decision (EU) 2016/809,³⁹ the UK rejoined the Directive in 2016.

The Government has prepared and published draft legislation to implement the Directive.⁴⁰

The Regulator has provided support to the Home Office in discussions on:

- a. the manner in which the Directive is implemented;
- b. the wording of the proposed legislation; and
- c. the content of the guidance that the draft legislation foreshadows.

Data Protection

The EU initiated a programme to replace its data protection provisions with new regulations covering general data protection and a directive covering data protection in the context of prevention, detection and prosecution of crime.⁴¹

The Regulator provided support to the Government in the discussion on the draft directive on issues related to forensic science.

Financial Information

The Home Office allocated the following resources to the Regulator for the financial years 2015/2016 and 2016/2017 (Table 6).

³⁸ Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009F0905&from=EN>

³⁹ Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016D0809&from=EN>

⁴⁰ Available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/463469/ANNEX_J_Prüm_draft_legislation_final_version_for_BIC_v3_2_.pdf

⁴¹ See: <http://ec.europa.eu/justice/data-protection/>

	Financial Year 2015/2016	Financial Year 2016/2017
Total Budget (staff pay, travel, accommodation, developing standards and forensic pathology audits, etc.)	£ 608,000	£547,170
Staffing: Regulator (Full Time Equivalent [FTE])	0.6	0.6
Officials: Specialist Scientific Roles (FTE)	3	3

Table 6: Resources Allocated to the Forensic Science Regulator

The small number of officials available to support the work of the Regulator is the main challenge to making progress against the stated aims. Whilst a level of shared administrative and secretariat support is available, further dedicated resource would enable more progress to be made. Discussions with the Home Office have resulted in agreement in principle to recruit another member of staff to the Forensic Science Regulation Unit (FSRU). However, the cost of this recruitment will have to be met through the existing budget. Whilst this is an acceptable position in the first year, if budget cuts continue on a year by year basis, the position will rapidly become unsustainable and either the budget will need to stabilise or the ability of the Regulator to fulfil her functions will be substantially impacted.

Acknowledgements from the Forensic Science Regulator

I would once again like to record my thanks to:

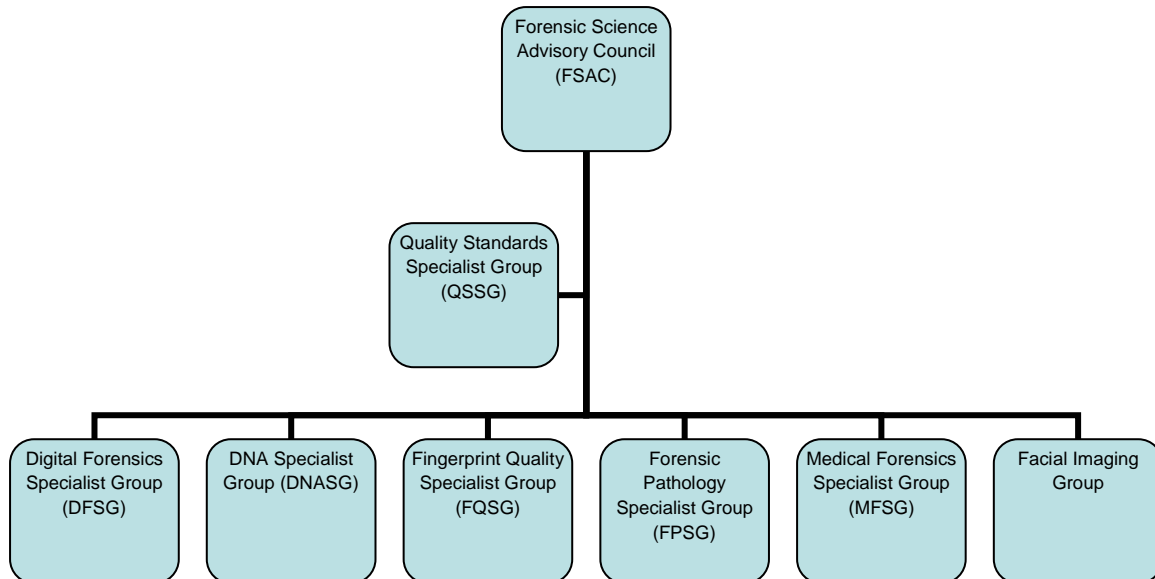
- a. all chairs and members of the specialist groups;
- b. the Forensic Science Advisory Council; and
- c. those who have provided specialist advice, including professional bodies, societies and individuals.

A particular word of posthumous thanks in acknowledgement of his wise counsel, humour and support is due to Alastair MacGregor QC, who was Commissioner for the Retention and Use of Biometric Material from 2013 to 2016. He is greatly missed.

To the officials from the Forensic Science Regulation Unit, my special thanks; their knowledge and commitment are essential to my work. Finally, my thanks to officials from the Science Secretariat, the Forensic Pathology Unit and the wider regulation support area.

Appendix 1: Forensic Science Regulator's Advisory Groups

The current (at November 2016) active groups advising the Regulator are shown below. The Quality Standards Specialist Group and the Forensic Science Advisory Council review new and significantly revised standards prior to implementation.



Published by:

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<https://www.gov.uk/government/organisations/forensic-science-regulator>

ISBN: 978-1-78655-322-5