Forensic Science Regulator
Overseeing Quality

Forensic Science Advisory Council (FSAC)

Minutes of the meeting held on 10 December 2019
Home Office, 2 Marsham Street, London, SW1P 4DF

1. Opening and welcome

1.1 The Chair, the Forensic Science Regulator (the 'Regulator'), welcomed all to the meeting. See Annex A for a list of representatives present.

2. a. Minutes of previous meeting and matters arising

2.1 The minutes of the previous meeting held on 11 September 2019 had been approved by members prior to the meeting and it was agreed they could be published on the GOV.UK website.

Action 1: Publish the minutes from the 11 September 2019 meeting.

2.2 The actions from the previous meeting were discussed:

2.3 Action 1: The Regulator to confirm whether representation has been arranged at the Homicide Working Group. The Regulator confirmed this action had been completed and the Regulator would be attending the homicide working meeting in January 2020.

2.4 Action 3: FSRU representative to report back on information from the Crown Office. The action has been completed. The Crown Office had confirmed the rules on disclosure in Scotland have the same principles as the rules on disclosure in the England and Wales.

2.5 Action 4: AFSP representative to share the "heat map" after the SFR group meeting. This action is ongoing, and a meeting would be held in January 2020 to collate instances where the SFR1 process did not function as it should. The AFSP representative will share the information with the FSAC.

2.6 Action 5: Members to send formal comments to the Regulator on the addition of further cyber security requirements to the code. This would be discussed in the meeting under agenda item 7.

2.7 Action 6: The British Association in Forensic Medicine (BAFM) to provide comment on the NCSC document. This action is ongoing, and no comments had been received to date.

2.8 Action 9: The Regulator to seek the views of the Criminal Justice Board Forensics Sub-Group on accreditation of defence case review. The meeting to discuss this was postponed, and this will be discussed at its next meeting.

2.9 Action 10: Members to feedback details of approaches to handling freedom of information act (FOIA) requests. This action was complete, no further comments were received.

2.10 Action 11: UKAS representative to feedback on specific confidentiality agreements in place between the FSR and UKAS. UKAS had reviewed the agreement and there was no mention of FOIA requests. The FSR and UKAS representative would discuss this further at their next quarterly meeting.

2.11 All other actions were complete or would be covered under later agenda items.

3. Massively Parallel Sequencing

3.1 Representatives from Cellmark attended the meeting to give a presentation on Massively Parallel Sequencing (MPS) of DNA. It was noted that Eurofins also provided this service.

3.2 The MPS technique was described as Next Generation Sequencing, capable of sequencing hundreds of thousands of short tandem repeats (STR) at the same time, in parallel. Cellmark was utilising the Verogen MPS which included 230 DNA markers in one test, including physical features and ancestry information. Both STRs and Single nucleotide polymorphisms (SNP) were analysed in MPS, 27 STRs were analysed.

3.3 It was explained that sequencing of standard forensic STRs with MPS would pick up many more possible alleles at each locus than traditional STR analysis. This was because MPS could identify sequence variation within the STR repeating regions.

3.4 One advantage of MPS was described as not having to choose between different DNA analyses, such as Y-STR analysis, as they can all be done in one test. Better separation of mixed DNA profiles had also been observed.

3.5 The phenotypic characteristics predicted with MPS in the kit being validated were hair and eye colour. A biogeographical assay would give an indication of geographical origin that would depend on the geographical databases available. The representative from the Association of Forensic Science Providers (AFSP) commented that there were a number of panels available for different locations.

3.6 The Council were informed that Cellmark was in discussion with the Forensic Information Database Services (FINDS) and UKAS to accredit the technique and permit loading of the forensic STR markers to the National DNA Database (NDNAD). A new code would be needed for loading to the NDNAD to identify the sequencing method used, this was expected to be possible when the new version of the NDNAD went live.

3.7 The software used in the Verogen MPS analysis included 16 of the 17 loci from DNA-17, the current chemistry used for the NDNAD. The seventeenth loci, SE33, was very long and challenging to analyse and could be analysed by separate software if needed. Cellmark's application for accreditation to load to the database would be for 16 of the 17 DNA-17 loci, excluding SE33, as this was acceptable for database loading. The additional

information generated from MPS profiling could not currently be loaded to the NDNAD. The representative from the AFSP informed the Council that the Netherlands and France had begun to load MPS data to their DNA databases. It was discussed that the ability to load this type of information to the NDNAD would depend on the Home Office Biometrics Programme.

3.8 The Council was informed that the aim of this presentation was to identify the next steps needed for introducing a new technology. The Regulator reminded the Council of the steps that were required during the transition from SGM to SGMplus DNA chemistries and to consider the requirement for a briefing for the CPS on MPS.

3.9 The representative from the ASFP pointed out that MPS has been used in the UK, for identification of bodies and a body part.

3.10 The Regulator commented that the technique was unlikely to be used as a replacement for current STR chemistries as a result of cost and analysis time, it would be a specialist technique.

3.11 The representative from the Scottish Police Authority (SPA) Forensic Services commented that a public consultation was being carried out in Scotland on the direction of DNA profiling so that the public were aware of the possibilities before cases came to court.

3.12 It was noted that the phenotypic and standard genotypic elements of MPS can be performed separately, however the representative from the SPA Forensic Services highlighted that the potential for using phenotypic and biogeographical ancestry elements remained.

3.13 A representative from the FSRU suggested that a presentation from Cellmark to the Science and Technology Select Committee and to inform ministers of the technique might be beneficial. The Regulator could also write directly to ministers. The presenters from Cellmark added that they have an information document that they can provide to interested parties. The representative from the SPA Forensic Services suggested that information on MPS should come from an independent source, rather than from a service provider.

3.14 The NPCC representative asked the presenters if they had been in consultation with police forces. It was confirmed that Cellmark had held information sessions with forces to explain the technology and have given presentations at Senior Investigating Officer conferences.

3.15 The representative from the Crown Prosecution Service (CPS) asked about the prospective costs of the technique and what the uptake would be. The presenters responded that MPS was not seen as a replacement for standard PACE profiling because of costs, however the costs would reduce if the technique was used more.

3.16 The CPS representative also highlighted that the additional information generated from the MPS technique would need to be disclosed.

3.17 The Council discussed the next steps for the consideration of MPS. The Regulator would ask the DNA Specialist Group (DNASG) to collate cases where the use of MPS

could have been of benefit. The Regulator would also approach the judiciary and CPS about a briefing on the new technology. The Regulator would liaise with the Biometrics and Forensic Ethics Group to investigate the ethical issues in MPS.

Action 2: The Regulator to ask the DNASG to draft guidance on cases where massively parallel sequencing and generation of phenotypic indicators would be critical or useful.

Action 3: The Regulator to approach the judiciary and the CPS to discuss a briefing on Massively Parallel Sequencing

Action 4: The Regulator to approach the BFEG to consider ethical issues in the use of massively parallel sequencing.

3.18 The representative from UKAS was asked for their position on implementation of new technologies. The representative replied that their position was to be bold and support the development of new technologies as long as they meet the standards. The issue of new technologies was not isolated to forensic science and there were opportunities for cross learning.

4. Forensic Genetic Genealogy (FGG)

4.1 The Council were asked to consider the use of genetic genealogy techniques by law enforcement. The Regulator commented that current familial searching on the NDNAD was limited to identification of siblings and parent/child relationships while genetic genealogy techniques could identify more distant relatives. Genetic genealogy was utilised by law enforcement in the United States to identify a suspect after which a link between the suspect and the crimes was established using traditional DNA profiling techniques.

4.2 It was noted that privacy, ethical and legal issues of genetic genealogy for law enforcement were outside the remit of the Regulator but the Council were asked to consider whether, and at which stages of the process, the Regulator should consider setting quality standards.

4.3 It was noted that the Biometrics and Ethics Group (BFEG) had previously considered the ethical issues of FGG and an updated report on this was being prepared.

Action 5: The Science Secretariat to circulate the BFEG report on FGG when completed.

4.4 The Council discussed that, in the UK, it was not immediately clear which body or bodies would make a policy decision whether to use FGG for law enforcement purposes, since it did not sit within the governance remit of the Forensic Information Databases Strategy Board.

4.5 Members commented that laboratories in the US were carrying out genetic genealogy analysis but that no DNA analysis for genetic genealogy was currently being carried out in the UK. The representative from the AFSP highlighted that genetic genealogy involved the analysis of around 700,000 Single Nucleotide Polymorphisms

(SNP) and there was a significant bioinformatics requirement to database these that would have an influence on quality considerations.

Action 6: The Regulator to add to the quality considerations for genetic genealogy consideration of the bioinformatics required.

4.6 The Regulator asked the Council to consider where the quality standards would need to concentrate. The members discussed the genealogical step of the analysis. Forensic scientists would not be able to carry out this step. It was discussed whether this step should not be regulated as this was an investigative tool only.

4.7 The FSRU representative mentioned genealogists may already have presented expert evidence in the UK courts. It was explained that genealogy may have been used to locate and identify nearest living relatives, for unclaimed estates seized by the Treasury Solicitors. The FSRU representative offered to find out more information on these types of cases.

Action 7: The FSRU representative to seek information from the government legal department on civil cases that used genealogy.

4.8 The representative from the AFSP commented on the professionalism of the genealogists they had worked with on their research who were part of the International Society of Genetic Genealogists (ISGG). The Regulator suggested that the Chartered Society of Forensic Sciences (CSFS) could work with the ISGG to develop a code of practise.

Action 8: The CSFS to liaise with the ISGG regarding the potential to draft a code of practice for law enforcement work.

4.9 The members discussed the lack of regulation in FGG and the potential issues. The representative from the NPCC commented that quality assurance was necessary to reduce investigative dead-ends.

Action 9: The Regulator to ask the DNASG to consider quality standards to evaluate the suitability of crime scene samples for genetic genealogy.

4.10 The representative from the NPCC also noted that clarity on the acceptable use of private information by police would be required. The Regulator informed the Council that ancestry DNA companies required the DNA donor to give consent for the data to be used for law enforcement purposes. However, in the US a court order was grated to allow law enforcement access to the data (without consent). The members were informed of a recent paper in Nature, 5 December 2019, that discussed DNA profiling and human-rights issues.

Action 10: Secretariat to send the FSAC the Nature paper commentary about genetic surveillance

4.11 The representative from the AFSP explained that the GEDmatch database originally assumed consent for uploaded profiles could be accessed for law enforcement purposes, this was changed, and ancestry DNA companies now require consent to be actively given. It was noted that genetic genealogy had been used in over a 100 cases in the US so there was an issue to address.

4.12 The Council discussed some of the challenges of using genetic genealogy for law enforcement; control over who could submit a DNA sample; establishing the evidential value of the resulting analysis; understanding the ethical issues; and risks of using publicly held records because of inherent inaccuracies in these.

4.13 The representative from the NPCC was keen to link the NPCC ethics group with the FSAC in discussions of the ethics of genetic genealogy. The Regulator requested that the Council focus on the regulatory issues and leave the legal and ethical issues to other appropriate groups.

5. Conflict of interest

5.1 The Regulator had received a referral that raised the issue of conflict of interest arising from a scientist being consulted by both parties in a case and receiving information from both. For example, if a scientist was consulted by the defence in relation to a case and, as part of that process, was provided with significant information about the case, then declined the instruction and accepted instruction from the prosecution in the same case. The Regulator asked the Council to consider what conflict arises from the additional information seen by the scientist in relation to the defence case and what, if any, standards or guidance should apply in this area.

5.2 While the Codes of Practice and Conduct already had sections addressing conflict of interest, these sections dealt with the issues related to personal conflict of interest and did not consider areas of conflict related to information received. The representative from the FSRU asked the Council if the Regulator should include guidance on this.

5.3 The Council agreed that they could foresee this issue arising and considered guidance on whether you should inform one party that you were initially contacted by the other party.

5.4 The representative from the NPCC asked if this type of conflict of interest would be covered by the Criminal Procedure Rules (CPR). The representative from the FSRU commented that the CPR don’t have detail on this. The representative from the Crown Prosecution Service suggested that the responsibility would be with the scientist to alert parties if they felt there was a conflict.

5.5 The Council was asked to consider the best way to inform scientists of this issue and avoid conflict situations arising. The representative from UKAS mentioned that this might be a training issue and provision of examples could be useful.

Action 11: FSRU to add guidance to Codes on conflict of interest for scientists contacted by both parties and privy to additional information.

6. Non-Human Reasoning issues for the CJS

6.1 The Regulator presented this item. Machine learning algorithms (also known as artificial intelligence or algorithms and henceforth referred to as non-human reasoning (NHR) systems) were increasingly being used within the Criminal Justice System (CJS). If the output from NHR systems may in future be presented as evidence, issues of admissibility, rules of evidence, quality standards and regulation needed to be considered ahead of time. NHR systems were already being used or being considered in a variety of ways in the CJS, such as:

- to direct the use of police resources to where crime is most likely to happen;
- in intelligence tasks such as scanning people entering a defined area to identify individual faces from a “watchlist”;
- in considering decision-making processes by juries;
- in relation to application of sentencing guidelines.

6.2 The risks of using NHR systems in the CJS was mentioned. The current rules of evidence codified in the Criminal Procedure Rules do not lay out any provisions in relation to NHR systems. There was a risk that the NHR systems contained bias caused by the initial programming and the training of the datasets. NHR systems change over time, which could make it difficult to validate and assure the court the evidence is reliable. The FSAC was asked to consider how the use of NHR would fit in the CJS, and should the Regulator begin to consider these issues, and if so, which parties should be involved.

6.3 The Council discussed issues that may arise including; scientists giving opinion on evidence where they don’t clearly understand the NHR element; and issues of ensuring complete disclosure of evidence used by the NHR system. The Council discussed the possibility of facial and object recognition as an NHR system being presented as evidence and the representative from the NPCC suggested developing some examples of how this could be presented. Members raised the issue how the jury would view a disagreement between a human expert witness and an NHR system output.

6.4 The NPCC representative commented that the police use of NHR technologies would be either for intelligence purposes or as a predictive tool. The Centre for Data Ethics and Innovation (CDEI) had partnered with Royal United Services Institute (RUSI) think tank to produce a piece of work around policing data analytics. A report was drafted with recommendations and would be published soon. The NPCC representative stated that they would be happy to share a copy of the report with the Regulator.

Action 12: NPCC representative to share the RUSI/CDEI report on data analytics in policing with the Regulator.

6.5 The Crown Prosecution Service representative suggested the criminal procedure rules committee should also be involved.

6.6 The Regulator queried with the UKAS representative if they had accredited organisations that had used NHR technologies in other sectors. The UKAS confirmed they

had, specifically in the healthcare sector. The representative commented that UKAS would rely on the standard approach to validation, however this would be more challenging with an evolving algorithm as conclusions may change over time and so would expect the validation to be more extensive as the ground rules are not known. It was stated that UKAS would like to issue advice in this area in the future but would require input from experts in this area first, the theme of accreditation of emerging technologies would be covered in the UKAS annual conference. The UKAS representative confirmed they would keep the FSAC updated on their progress in this area.

7. Cyber Security for Forensic Science Providers

7.1 The Regulator provided the members with an update on cyber security provisions for forensic science providers. As a result of a recent cyber security issue that significantly affected one forensic science provider the National Cyber Security Centre (NCSC) was asked to provide specific requirements that could be considered for future versions of the Codes. Proposed text was published for comment on the Regulator's website on the 6th August 2019 and all forensic science providers of any size, were asked to provide their views by the 21st October 2019. A representative from the NCSC presented their findings to the Quality Standards Specialist Group (QSSG). An issue was identified on how the provisions could be made suitable for digital forensics units whilst ensuring digital evidence was not altered by security processes. It was agreed that the NCSC representative would meet with a selection of digital forensics services providers from private and policing sectors. The NCSC representative would then draft the proposed text by the end of the year.

7.2 It had been decided to issue the new version of the Codes without the new cyber security requirements included. A regulatory notice would be issued later that would include the new cyber security requirements. FSPs would be expected to start preparing for the requirements, as these would be included in the next version of the Codes. The Regulator commented that there would need to be some drive from forensic departments of police forces to ensure the requirements would be met and that policy changes might be needed, this was expected to take time.

8. Imagery: provision of opinion

8.1 At a previous FSAC meeting the Regulator had shared a paper written by Jonathan Hak. The paper criticised the regulatory notice published on Imagery. The Regulator had published a response to Jonathan Hak's paper.

8.2 The Chartered Society of Forensic Sciences held an Imagery day in October with the forensic image analysis group. The status of this group had been changed to a working group and the CSFS was acting as the chair in order to assist with progress towards accreditation of image analysis. The representative from the CSFS stated that it would be important for the group to consider image analysis, particularly vehicle comparison, as opinion evidence. The Regulator proposed that the next steps for this group should be development of a competency test and a proficiency trial to clarify what would be needed to obtain accreditation.

8.3 The regulator highlighted the issue of non-payment of fees to small forensic businesses as having a significant impact on the ability to deliver quality work.

9. Annual Report

9.1 The annual report was in progress, and it should be published in February 2020. The report would cover the period from November 2018 to November 2019. The report would contain standards that have been published, complaints and referrals, compliance with the standards, and risks identified in forensic science quality. The Regulator was pleased that the report would contain much more reporting from police forensic services and commented that this was helpful for identifying issues and providing learning points.

9.2 The FSAC was asked if they had any issues they would like to be included in the annual report. The representative from the AFSP asked for cyber security issues to be included.

Action 13: FSAC to provide FSR with any pertinent issues to be included in the 2019 annual report, to be published in February.

10. Recruitment of next Regulator

10.1 The Regulator's term comes to an end in November 2020. A new Regulator would be recruited by the Home Office. The FSAC was asked what should be included in the role profile for the next Forensic Science Regulator.

Action 14: FSAC to provide FSR with any thoughts for the role profile for the new FSR.

11. AOB

11.1 The Biometrics and Forensics Ethics Group (BFEG) meeting would be held on the 16th December 2019. The FSAC was asked if they had any ethical issues they would like the BFEG to consider to inform the secretariat as soon as possible.

Annex A

Representatives present:

- Forensic Science Regulator
- Forensic Science Regulation Unit (FSRU)
- The Chartered Society of Forensic Sciences
- Criminal Bar Association
- NPCC Forensic Science Portfolio
- UK Accreditation Service
- Crown Prosecution Service
- Forensic Science Northern Ireland
- Association of Forensic Science Providers
- Scottish Police Authority
- British Association in Forensic Medicine
- HO Science Secretariat

Apologies received from:

- Coroners' Society of England and Wales
- NPCC National Quality Managers Lead
- Chief Coroner
- Judiciary
- The Chartered Society of Forensic Sciences