

## **Summary of the talks at the ESRC Research Seminar: Comparing stakeholder discourses about genetic technologies**

ESRC seminar series on genetics, technology, security and justice. Crossing, contesting and comparing boundaries

Wednesday, 16 March 2016, 12:00-18:00, Department of Chemistry, Room CG218, Science Site, South Road, Durham University, Durham DH1 3LE

This summary was collated by ECR bursary holder Diana Miranda (Open University)

---

- Gaps of knowledge
- Ideas that need to be explored

### **1<sup>st</sup> session – Framing the use of forensic genetic innovations**

**Gillian Tully (UK forensic science regulator) - “Quality Standards for forensic genetics: current and future challenges”**

Outline

- Fundamental quality requirements
  - ➔ People
  - ➔ Technical
  - ➔ Review
  - ➔ Constant cycle of improvement
- Roles and Competence

It's not just the analytical processes... It's the interpretation of the profile, the need to attend to context, make sure the results are understood (in the court, for instance)...

- The UK Quality framework
- Validation
  - ➔ Does not stop in the analytical method.
  - ➔ Quality needs collaboration between all the parties involved in the criminal justice system.
- Current challenges
  - ➔ Dealing with contamination.  
The need of anti-contamination measures (crime scene, police, health providers) – standards are of fundamental importance
  - ➔ DNA mixtures
- Future challenges: sequencing approaches, inaccuracy, complexity of process, wide variation in methodology, implementation issues, reporting clarity, interpretation.

The big questions

- Contextual interpretation – who is good at “who”? but not always “how”? (the need of data)
- Guidance – codes of practice and conduct

## Helen Wallace (GeneWatch UK) - "International standards for DNA databases?"

- The UK National DNA database  
GeneWatch – advocating changes
  - ➔ Explore people`s concerns: personal nature of DNA, being treated like a criminal, the growth of a "big brother" state...
  
  - ➔ One issue that came up during the debate of UK NDNAD expansion:  
  
DNA detections and the number of crime scene profiles in the database
    - Argument: having innocents in the database has no impact in solving crime.
    - Removal of 1.7m profiles did not reduce the role of the NDNAD in solving crimes.
  
  - ➔ Lessons learned from the debate in the UK  
DNA databases raise concerns about biosurveillance and discrimination based on genetics and other data  
  
Most countries now aim to remove innocent people`s DNA records
    - New EU data protection directive  
However, many policy areas remain contentious.
      - Data protection and privacy laws exist in some countries that provide safeguards but not in others (eg. India, there`s no privacy law)
      - Societal background influences public trust (eg. History of dictatorship)
  
- Scientific and technical standards vary
  - Laboratory quality assurance (QA) may be lacking
  - Police may be untrained in crime scene examination
  
- The case of Kuwait: law adopted to put its entire population and all visitors on a DNA database
  
  
- Towards best practice
  - 1 example: Brazil law 1 page, Irish law more than 200 pages.
  - Many countries` laws explicitly restricted stored data to non-coding DNA (EU`s Prum Decisions to specify non-coding DNA). India and Kuwait are some exceptions.
  
- Likely future developments
  - Potential for use of Rapid DNA testing (eg. Border)

### 1<sup>st</sup> session discussion:

- Danger of paternity testing and immigration cases  
(UK government and the tests with overseas families). Problems with paternity testing
- *At what level do you stop looking at DNA?*

- As one of the forensic scientists mentioned, many of the profiles that are being sent to court probably don't have enough quality. There's more uncertainty than certainty in some, but they are still being used.
  - Proportionality issue and crime scene
  - Standards. Trying to cover all the scenes of crime but there's still a long road to go.
  - Contamination – who is responsible?
  - Elimination databases – so many people involved...
  - Standards need to reach all the process and go in to all directions, instead of being just related to the lab
  - Helen Wallace mentioned how this is even more complicated when we think globally (eg. India)
  - Robin Williams: good at who and not good at how → huge list of research topics, the research social scientists could do and the lack of funding opportunities (the way funding is directed to that is deemed to be “scientific”)
- An enormous gap. The difficulty to obtain academic funding. But there's a gap in that sort of research.
- A question related to the scientific trial to Gillian: “do you think the regulator may have a role at all?”
    - o Difficulties in some forensic sciences
    - o Suitable proficiency trials
    - o To encourage the good use of proficiency trials. Yes, they have a role.

## **2<sup>nd</sup> session - Providing innovative DNA services**

### **Angela Gallop (Axiom Ltd.) - “Upsides and downsides associated with the introduction of new DNA technologies into operational forensic science”**

- The evolution and advances of analytical techniques until the current ones

#### Upsides

- DNA, incredible powerful tool
- Applicable to wide range of samples...

#### Downsides

- No common agreement on statistics or understanding by end users
- Insufficient attention paid to contextual understanding

#### Looking forward

- Next generation sequencing

#### Future challenges

- How was the DNA deposited?
- Ethics and data protection
- Forensics increasingly provided by police

## **Sheila Willis (Forensic Science Ireland) - "DNA at 32 – what will it be like when it's 64? A forecast in the Irish context"**

Ireland was late in the game

11/2015 – the database was set up

Challenges

- Technology moved faster than ability to deal with it
- No real attempt to distinguish between full profiles with clear attribution and mixtures
- Quite a complicated law: the more difficult it is to apply the law, more problems may rise.

Solutions at the scene

Evaluation

Phenotype (inevitable future)

Ethnicity

### **2<sup>nd</sup> session discussion**

- Lab professionals' samples – retention time
- The need to constantly question... if it's not valid, it's not valid. If it's not possible to establish when something is left (a small amount), there's the worry that the scientists won't have enough information to support that interpretation. That's a bigger risk than how it's interpreted.
- Mixtures – statistics being challenged in the court
- Fragmentation of forensic science: how will we train a forensic scientist? In order to go beyond the narrow view... Past: broader view, general way. While nowadays we're training in a narrow way and losing the skill to put things together. This may lead to miscarriages of justice. And, in the future, this may lead to the extinction of forensic scientists. These would be replaced by analysts.
- Training program changed: lack of broad knowledge, very specific focus. That does not work.

### **3<sup>rd</sup> Session - The use of new and emergent forensic genetic technologies**

**Aoife Dolan (DNA services, MET)**

How MPs implement new DNA technologies

- There's a lag between the emergence of new technologies and its implementation

Rapid DNA pilot

- Policing: profile (+/- 2h) and send that to the database

Y STR Pilot

Hurdles: Training, education, costs, ethics...

➔ In order to become operationally viable, it takes years.

How emerging technologies are evaluated

Challenges – emerging technologies

Budget (police need to deliver more for less)

- Funding for research
- Time and cost effective

Standards

- FSR codes
- Data sharing

Down Stream challenges

- Usefulness
- Interpretation
- Crime scene recovery

Ethical

- Increased scrutiny (PoFA)
- How will data be stored, managed...
- Legal framework

Frontline

- To bring these methods to the frontline
- Effective/ cost

**Felicity Carlyle – “Phenotyping: making the technology operational”**

KTN (Knowledge Transfer Network) – UK’s innovation network:

➔ Phenotyping report

3 discussion areas:

- The technology
- The requirements
- The ethical and regulatory concerns (DNA ethics committee)

**3<sup>rd</sup> Session discussion**

- Question about the economics of Rapid DNA (cost of cartridge and instrument)  
➔ Prices coming down significantly
- Phenotyping information: what type of phenotyping info is being used?  
➔ Not used in the MET. It needs to go through more tests and accreditation. Operationally, it is not used ( ethnic inference ad inference by red hair were used in the past though)

- How to ensure that the technologies will meet the expectations of people? How to deal with expectations?  
MET: educating the vast amount of officers, for instance.
- Phenotyping – future: who is the custodian of this data? When will it be deleted?
- Rapid machines and evolution – Machines that do not need to be calibrated (“police proof” machines)
- A question to Felicity: if there`s any sign of dialogue or interest? She said they are still trying to disseminate the information.

### **Plenum discussion – Opportunities, gaps and themes for research and policy work**

**Chris Lawless:** themes recurrent during the day and overall discussion of forensic genetics

#### ➔ Forensic innovation

- Innovation and technology – technology pushed societies forward. Historian sociologists started looking at technologies in more detail - 2 ways: innovation  $\leftrightarrow$  society
- Progress – innovation is something more complex
- Increasingly fragmentation of forensic activity  
What progress we need that needs to be made?

#### ➔ Interpretation of DNA evidence

- Methods of understanding interpretation itself
- To understand how DNA is used in certain types of criminal work
- Routines of investigators and how to make sense of DNA evidence: how does collaboration occur... Something to explore for those interested in sociological work (in more qualitative terms).

#### ➔ Concern for the future of forensic science

- What kind of forensic science is emerging?

#### ➔ Standards

- What do we mean by standards? How far does standards extend? How the idea about standards circulates between forensic stakeholders?

#### ➔ Notion of fragmentation and the role of the forensic scientists in the future? It relates to the notion of standards and control. And it also related to the education of people.

### **Responses/discussion**

- How to bring together specialists from different disciplines?
- In the context of education: what characteristics/ skills would we expect a forensic scientist to have?
- Technologies come and we start from scratch...

- First issue: money. There`s little money flying over this area. But there are organisational changes that need to be made.

➔ Concerns – future

- Forensic scientists move out of the laboratory and if these become redundant... Almost inevitably this will happen. How will we deal with it?
- 2 different kinds:
  - o Analytical / investigative kind
- “We need a strategy”
- Studies – forensic science in action

➔ Rapid DNA – not a big technological step for now

- Meaning for interpretation?
- Technological change – how to anticipate?

➔ From the perspective of social sciences:

- Evidence recovery: what are their skills or what skills are perceived to be...
- research in Colombia and the dispute among the scientists – reference populations
- Standards normalize notions: what can be done
- Linked with statistics
- Statistics and frequency of error
  - o UK – not prosecuting on DNA alone; otherwise it would lead to a lot of miscarriages

➔ Nature of the innovation

- Government: very narrow notion of innovation
- Innovation and process treated as a low level thing
- Companies → process → Reducing cost

➔ Work to do:

- Process of standardization in medicine/ no work in process standardization in this context (a big area to unpack)
- Notions of interpretation and context: it was discussed during the seminar the danger of contextual information
- Sociological interest – attempt to describe these processes... (looking at medicine for instance...) Translation process.
- Complete genome analysis, markers... New standards can be produced. Social sciences must get involved via questions...
- Future research pathways – something useful for the practitioners

➔ DNA and forensic gait analysis

- Standards: advice from different specialist groups

➔ Translation process: healthcare – forensics

- There`s some work around the value of forensic science...
- However, the scale is very different between areas medicine and forensics
- What metrics? “The only thing we can measure is cost and time”
- Discourse among scientists: what`s acceptable or not...
- Primers – a way of containing uncertainties

- consultations (Bioethics): public consultations? Certain type of specialist stakeholder
- Stakeholders perspectives
- Who are the stakeholders?
- More attention required, e.g. via comparative approach: versions of doing medicine
  - Observe the process: GPs, consultants, researchers.
  - Imaginaries: the version of the patient, the version of the criminal investigator...
- Value – forensic scientists
- How fast, how cheap?
- How to measure the impact?
- Canada study – costs of forensic science
- What`s the impact of doing forensic science?
- Benefits sometimes are in the eye of the beholder
- Judgement call - the issue when determining value:
- Who makes the assessment
- In forensic science, the results also depend on the quality of the samples
- Social research agenda – other questions that we may ask:
- Utility of databases
- House of Lords – concept of super databases or sharing across databases
  - UK and partner European countries – Prüm and other forms of sharing data
  - Social studies of database uses, impacts on persons (e.g. stigma, right not to know)
  - GeneWatch criticism
  - Standardization: huge issues
  - What would the police do to help their normal work? Getting information vs reluctant to give information
  - Match – corroborating evidence for prosecution. It`s not clear: sharing data?
- Legal point
  - Forensic sciences and different parts of the world
  - DNA policy initiative