Government of **Western Australia**
Department of **Health**

Ross Inquiry into PathWest Laboratory Medicine WA

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Ross Inquiry into PathWest Laboratory Medicine WA

Inquiry to determine whether the Forensic Biology Department of PathWest issued incorrect evidence, results or reports to the WA Police or WA Office of the Director of Public Prosecutions

Final Report

Executive Summary

1. Between June 2016 and March 2017, the Office of the Director of Public Prosecutions (ODPP) held an investigation into cases potentially affected by the misconduct of a PathWest employee. This employee was a Reporting Scientist in the Forensic Biology Department (FBD) of PathWest, whose role was to interpret DNA analyses and provide reports to WA Police and the ODPP. The Inquiry reviewed 19 cases that involved a total of 27 persons of interest, as identified by the ODPP investigation.

2. In some of these cases, the related case files comprised of six or more large ring-backed binders containing over 1000 pages. The largest comprised of 11 ring-backed binders containing over 2,500 pages.

3. The Inquiry reviewed over 2,500 DNA analyses (electropherograms (EPGs)), and assessed reports, communications (e.g. e-mails) and related case file Communication Logs, Case Diaries and Peer Reviews.

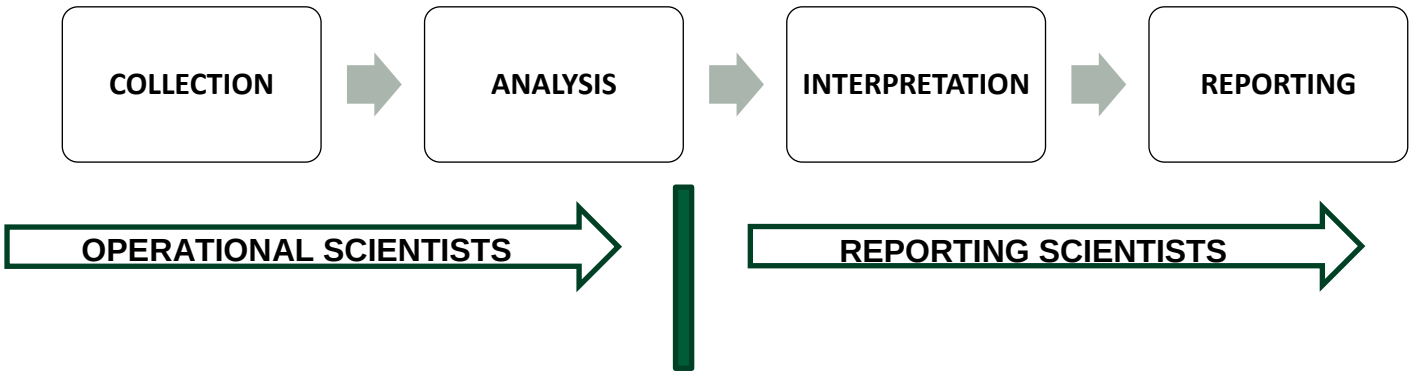
4. The FBD operates in an ever changing and increasingly complex environment. This includes a greater reliance on forensic science by police and the courts with a resultant increase in workload.

Science

5. The science at FBD used to produce EPGs from which DNA profiles are interpreted is of a consistently high standard. The processes are well documented and align with international standards.

6. The following schematic represents the forensic process and the role of the different staff members in that process. As shown, the role of the Reporting Scientist is in interpretation and reporting, and not collection or analysis of DNA evidence.

Forensic Science Process



Anomalous Results

7. The Inquiry identified a total of 11 anomalous results across six of the 19 cases examined. While this is of obvious concern to the Inquiry, it appears that none of the anomalous results are of probative value[1].

8. Of the 11 anomalous results identified, eight were transcription errors and two were typographical errors. The source of the remaining anomalous result has not been resolved but is the subject of further investigation by the laboratory.

9. Seven of the anomalous results were detected in Summary of Laboratory Findings (SOLF) and Summary of Preliminary Findings reports, and six of these were reported correctly in the Forensic Biology Report (FBR) which is used for court purposes. The Summary reports are not for court purposes and are issued with caveats to that effect.

10. Two of the anomalous results were detected in Evidentiary Certificates in a tabulated format. A DNA Evidentiary Certificate accompanies an FBR and is produced for criminal proceedings, setting out details of the evidence, such as when it was received, when it was examined and what DNA outcome was obtained. In the written/descriptive section of the FBR, the results were reported correctly. It should be noted that FBD no longer issues Evidentiary Certificates with tabulated results.

11. Two of the anomalous results were reported in an FBR, one of which was also reported in a SOLF. Whilst this is of obvious concern to the Inquiry, it appears none of the anomalous results are of probative significance.

12. The anomalous results were not detected by the FBD peer review process; this is of concern to the Inquiry.

13. The prominence of transcription and typographical errors as contributors to the anomalous results detected by the Inquiry is indicative of the risk points with manual processes.

14. New systems introduced by FBD since the period covered by the Inquiry (2007-2011) have reduced the number of manual actions required in the process from sample collection to reporting results. Accordingly, the risk of transcription and typographical errors has also reduced.

Peer Review

15. With respect to peer review, the Inquiry identified two instances where reports and communications may have been issued by FBD without peer review. Both of these were raised with FBD and satisfactorily resolved. None resulted in the issue of anomalous results.

16. Recommendations 1 to 3 of this report relate to peer review.

[1] The expression 'probative value' is defined to mean the extent to which the evidence could rationally affect the assessment of the probability of the existence of a fact in issue. (Uniform Evidence Acts Dictionary, Pt 1; Evidence Act 2001 (Tas) s 3(1)).

17. Of significant concern to the Inquiry was the fact that there is inadequate space at the FBD where larger case files and reports can be laid out in an environment conducive to peer review. Such files and reports are taken home by scientists for review with obvious security implications. FBD management is aware of the risks, and measures are taken to minimise them in an environment where alternatives are critically limited.

18. This is symptomatic of the fact that the space available and the condition of the FBD facilities are inadequate for the purpose for which they are being used. This is the basis of Recommendation 4.

Quality Management

19. With respect to quality management practices such as third party accreditation, proficiency testing and internal audits, FBD consistently reaches a high level of conformance.

20. The Inquiry found that a commitment to and sound practice of quality requirements at FBD was led by management. Terms such as 'ingrained' and 'second nature' used by staff in relation to quality are indicative of a positive quality culture.

21. Quality matters raised in discussions with FBD staff which were of serious concern to the Inquiry included:
    a) a lack of time and resources for constructive research and development, although this will be ameliorated by a recent recruitment program;
    b) 'compressed' work spaces;
    c) item/exhibit security, as it relates to afterhours surveillance;
    d) fundamental and ongoing risks related to item examination facilities; and
    e) some OH&S issues.

Communication

22. The Inquiry found that the method of recording case-related communications both from and to FBD was unstructured. Introduction of a new IT system since the period of the cases reviewed (2007 to 2011) has improved this situation.

23. However, IT enabled interdepartmental communication (e.g. between the FBD, WA Police and the ODPP) particularly with the introduction of electronic reporting by the FBD, requires serious consideration.

24. Recommendations 5 and 6 relate directly to this issue.

Numbering and Labelling of Items

25. The Auditor General's Report, Performance Examination; Behind the Evidence: Forensic Services, Report 4 for 2006, found that "the system for tracking exhibits across agencies was out-moded" and that it carried a level of risk.

26. The Inquiry found that for the period of cases examined (2007 to 2011), little had changed. While some improvements have been made since 2011, there is still no

single, uniform, ‘cradle to grave’ numbering or labelling of items across relevant agencies in Western Australia and while that situation continues, a level of risk of misidentification of samples and results remains.

27. Recommendation 7 relates directly to this issue but this recommendation should not be considered in isolation of Recommendation 6.

Contextual and Confirmation Bias

28. Contextual and confirmation biases have been shown to impact the thought processes of forensic scientists and, therefore, pose a risk.

29. It is essential that staff members at FBD and police who engage with the laboratory are aware of these biases and the risks involved. FBD must not receive extraneous or biasing information from police.

30. Recommendations 8 and 9 relate to raising awareness and mitigating the effects of contextual and confirmation biases.

Governance Structure

31. There is a lack of formal structure through which FBD acquires its funding and for issues such as the provision of suitable accommodation, funding seems inadequate. This is of significant concern to the Inquiry and should be reviewed.

32. FBD is currently administered by the North Metropolitan Health Service but is funded by WA Police.

33. The FBD output has direct and broad implications for police, the justice system and the safety and wellbeing of the Western Australian community.

34. Therefore, the governance arrangements for FBD should be expansive and transparent.

35. Such governance should include an Advisory Council which would maintain the independence of FBD and enhance collaboration, innovation, sustainability and accountability.

36. The Council should be structured such that it has the requisite status, influence and authority to develop and maintain FBD as a contemporary forensic science service provider for the State of Western Australia.

37. This is the basis for Recommendation 10.

Recommendations Summary

Recommendation 1

38. FBD should identify and highlight any manual actions remaining in the process from sample collection to reporting results, and where possible, eliminate them. Where elimination is not possible, FBD should emphasise these as risk points for attention in the peer review process and ensure that they are recorded in the Case Record Review form**.**

Recommendation 2

39. FBD should propose to the Australia New Zealand Policing Advisory Agency National Institute of Forensic Science (ANZPAA NIFS), through the Biology Specialist Advisory Group (BSAG), that a national methodology, including evaluation measures, is developed for casefile and report peer review, initially for DNA laboratories.

Recommendation 3

40. As part of the management of electronic reports, FBD should configure the case report management system (CRMS) such that it is not possible for reports to be issued without having been peer reviewed. This should include monitoring by the Quality Officer and form part of their weekly report to management.

Recommendation 4

41. FBD accommodation with respect to its condition and the space available for increasing workload demands, additional staff and future development of DNA is inadequate. This should be reviewed as a matter of urgency.

Recommendation 5

42. FBD (develops and) maintains a contemporary IT solution for the structured recording and maintenance of case-related communications such that they are readily accessible for report writing and peer review.

Recommendation 6

43. FBD, or a relevant authority, initiates the investigation, development and implementation of an IT system accessible to FBD, WA Police and the ODPP for direct communication related to, for example, the submission and tracking of items for analysis, electronic laboratory reports and notification of court dates.

Recommendation 7

44. FBD, in conjunction with WA Police and the ChemCentre, should, as a matter of priority, initiate the investigation, development and implementation of a single, uniform forensic item numbering and labelling system for the State of Western Australia. This would include consideration of the Forensic Register.

    NOTE: Recommendation 7 should not be considered in isolation from Recommendation 6.

Recommendation 8

45. FBD reinforces programs whereby staff members are aware of and where appropriate, trained with respect to the knowledge and risks of contextual and confirmation bias.

Recommendation 9

46. FBD, in conjunction with WA Police, develops an awareness program related to contextual and confirmation bias for those police officers who communicate directly with FBD.

Recommendation 10

47. An Advisory Council is established as part of the governance arrangements for FBD. While not a decision making body, the Advisory Council should have sufficient status, influence and authority to develop and maintain FBD as a contemporary forensic science service provider for the State of Western Australia.

Background

48. This Inquiry was initiated by the Director General of the Department of Health in his role as System Manager (Department CEO) under Part 14 of the Health Services Act 2016 (the HS Act).

49. The Inquiry is being conducted at the request of the Minister for Health to determine whether incorrect evidence, results or reports were issued by the Forensic Biology Department (FBD) of the PathWest Laboratory Medicine WA (PathWest) to the WA Police or WA Office of the Director of Public Prosecutions (the ODPP).

50. The inquiry team was led by Mr Alastair Ross AM who previously worked as the Director of the National Institute of Forensic Science (NIFS). Mr Ross was supported by Jane Laurence, Solicitor to the Inquiry and Richard Zuiderduyn, Investigator to the Inquiry.

Purpose

51. The purpose of the Inquiry is to determine whether the misconduct of an FBD employee compromised the evidence, results or reports provided to the WA Police and the ODPP.

Scope

52. The Inquiry will:

a) undertake a forensic review of the 27 cases identified in the ODPP investigation and determine whether incorrect evidence, results or reports were issued to the ODPP or WA Police;
b) review any additional cases identified by ODPP, North Metropolitan Health Service (NMHS) or the Inquirer, in the course of the Inquiry;
c) identify any instances of non-compliance with the laboratory quality system and determine if the non-compliances resulted in erroneous evidence, results or reports being issued to the ODPP or WA Police;
d) review the audit conducted by NMHS on the erroneous DNA matching that occurred in 2004; and
e) make findings and recommendations as to any improvements that could be made to the policies and procedures, training and probity controls within the FBD in order to enhance the services provided by PathWest.

53. It should be noted that the review of the NMHS Audit from 52(d) above will not be included in this Inquiry Report, but form the subject of a supplementary report to be provided at a later date.

54. The Inquiry received submissions from members of the public, but was unable to comment on those submissions directly as the matters did not fall within the Terms of Reference of the Inquiry.

55. The interviewing of relevant staff members and review of procedures and protocols in relation to the laboratory quality assurance system has been critical to evaluating whether the concept and practice of quality management is embedded in the work practices of the FBD of PathWest to, amongst other things, minimise any protocol breaches.

56. The following is out of scope:

a) findings or judgements regarding the conduct or behaviour of individual employees;
b) review of the misconduct finding against the employee; and
c) resolution of allegations, complaints and issues identified as part of the evidence gathering exercise.

Context

57. It should be noted that the case files examined by the Inquiry are dated between 2007 and 2011. Therefore, on occasions, comments made in this report necessarily reflect the practices of that period of time and this will be identified as such. Where possible, comments and recommendations reflect practices as they are today.

58. The main purpose of this section of the report is to establish the context or environment in which FBL operates, which is in a constant state of change and growing complexity

The Changing Face of Forensic Science

59. The forensic sciences (including pathology and medicine) have traditionally engaged in the reconstruction of a crime through exploring questions such as 'what happened', 'how did it happen' and 'when did it happen'? Disciplines such as crime scene investigation, pathology and physical (trace) evidence (examination of paint, glass and fibres, for example) have played an important role in addressing these questions.

60. Published papers by J Robertson[2] and David and Paul Stoney[3] have highlighted concerns about the declining use of trace evidence in particular.

61. This together with the emergence of comprehensive and sophisticated national DNA and fingerprint databases is shifting the focus from 'what', 'how' and 'when' to 'who'. This, in the view of the Inquirer, is a worrying trend for forensic science as a whole.

62. Both DNA and fingerprints have the ability to directly implicate or exonerate suspects, a characteristic unique to these disciplines.

63. It is this characteristic that is leading to a greater emphasis on 'who' at the expense of 'what', 'how' and 'when' and therefore, there is increasing focus on DNA and fingerprints, often to the exclusion of other forensic science investigations.

64. In his report on the Inquiry into the circumstances that led to the conviction of Mr Farah Abdukadir Jama[4] , The Hon Frank Vincent AO QC stated:

> ***"I have been left with the deep impression that at virtually every point, and by almost everyone involved, it was handled with so little insight into the issues which it presented that no need was seen to explore (it) further… There were ample warning signs along the way that suggested that something was amiss, but they were simply not read."***

65. In the case of Mr Jama, a young man was convicted of rape based solely on DNA evidence, following an incident where an unconscious woman was found in a locked cubicle in a night club bathroom with her pants unzipped. The jury rejected Mr Jama's

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[2] Robertson J, Editorial: Trace Evidence – disappearing fast? Australian Journal of Forensic Sciences; 420 (2) p79-80 (2010).

[3] Stoney D and Stoney P. Critical review of forensic trace evidence analysis and the need for a new approach, Forensic Science International: p159-170 (2015).doi: 10.1016/j.forsciint.2015.03.022.

[4] Vincent FHR AO QC. Inquiry into the circumstances that led to the conviction of Mr Farah Abdukadir Jama, Victorian Government Printer (May 2010)

protests that he had never been to the nightclub and had been at home with family on the night in question.

66. In this matter, a DNA profile implicated Mr Jama in a 'crime'; that is the 'who', but there was no evidence as to 'what', 'how' and 'when'.

67. Eventually, after 14 months in prison, Mr Jama was exonerated not only for a 'crime' he did not commit, but a 'crime' that did not occur.

68. The DNA evidence which was so heavily relied upon was flawed due to contamination at the point of collection, something which was not considered at any point during the original trial.

69. Nonetheless, a continuation of the growing emphasis on 'who' at the expense of 'what', 'how' and 'when' will put increasing pressure on FBD, given that its predominant output is DNA profiles and the interpretation of them, namely findings that relate to 'who'.

70. Furthermore, this emphasis could also lead to a loss of expertise in the disciplines which contribute to 'what', 'how' and 'when'.

71. Also related to the changing face of forensic science is the provision of intelligence. Forensic science traditionally operates in the interpretation and court space and is yet to realise its potential in the policing and security space[5].

72. Forensic intelligence relies on a shift from the now traditional single case and single discipline focus to a multi-case and multi-discipline focus (e.g. house burglaries for the month and the results from DNA, fingerprints and shoe impressions for all of those). This enables links to be made between these cases so as to build a picture of a series of crimes committed by the same person/people, if that is occurring.

73. Morelato et al.[6] explain that:

> ***"At its essence intelligence is the result of a process that aims at transforming raw data into a form more suitable for making decisions. The aim is to add value to information collected by analysing it in a timely fashion"***

74. Intelligence cells have already been established in forensic science facilities in some jurisdictions in Australia and it is likely that this will become the expectation in all jurisdictions.

75. With forensic intelligence, the emphasis is absolutely on short turnaround times[7].

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[5] Ribaux O, Crispino F and Roux C Australian Academy Forensic Sciences Conference on Interpretation, Sydney (Dec 2011)

[6] Morelato et al, The use of forensic case data in intelligence-led policing: The example of drug profiling, Forensic Science International: 226 p1–9 (2013)

[7] Bruenisholz E. el al, The Intelligent Use of Forensic Data: An Introduction to the Principles, Forensic Science Policy & Management: An International Journal: 7:1-2. p21-29 (2016). http://dx.doi.org/10.1080/19409044.2015.1084405

76. This is a fundamental change to the way in which forensic science organisations have operated in Australia and indeed internationally, and could well lead to pressure for change at FBD to incorporate an intelligence-led capability.

Increased Reliance on Forensic Science

77. There are many examples through publications and experience within the forensic science, policing and justice communities where increasing reliance is being placed on both the quality and quantity of forensic science analysis.

78. In a report relating to the review of the provision of forensic science services in Ireland[8], Prof Ingvar Kopp stated:

> ***"The demand for forensic science continues to increase. Not only have the number of cases in traditional fields increased, but also an abundance of cases relate to new areas. New analysis possibilities, such as DNA analysis, have come into use and instrument techniques have improved markedly resulting in improved possibilities to obtain forensic evidence. The intelligence potential of forensic results have also been realised in a number of countries."***

79. Similarly, a research paper from the National Institute of Justice (NIJ) in the USA[9] reported that there is:

> ***"…pressure on the police and courts to increase their reliance on more objective forms of evidence, (including) scientific breakthrough in such fields as DNA testing that uniquely determine the source of biological substances."***

80. Finally, from an Australian perspective, Woodman et al.[10] report that:

> ***"There is an increasing reliance on forensic science to guide criminal investigations and to assist with achieving just outcomes in the courts."***

81. The increasing reliance on forensic science from both an investigative and court perspective and potentially an intelligence perspective has, and will inevitably require FBD to manage increased case numbers and shorten already impressive turnaround times.

Increased Work Load

82. Between 2011 and 2016, workloads at FBD have increased significantly. Examples of this are:

- 10% increase in exhibits;
- 33% increase in cases;
- 166% increase in reference samples;
- 47% increase in court reports issued;

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[8] Kopp I. Review of resource needs in the Forensic Science Laboratory and the wider scientific context in Ireland, http://www.justice.ie/en/JELR/Pages/Kopp-Review

[9] Peterson J, Sommers I, Baskin D and Johnson D, *The Role and Impact of Forensic Evidence in the Criminal Justice Process*, https://www.ncjrs.gov/pdffiles1/nij/grants/231977.pdf

[10] Woodman PA, Julian R and Spiranovic C. The effectiveness of forensic science in the criminal justice system: Measuring the impact of forensic evidence on police investigations & court trials, Forensic Criminology, Oral Presentation http://www.anzsoc2016.com/2052

- 50% decrease in Summary of Laboratory Findings (SOLF) reports, but this is offset by the issue of replacement spreadsheet reports (nil in 2011 and 10,080 in 2016); and
- STRmix analyses (interpretation of mixtures) which were nil in 2011 and 13,455 in 2016.

83. During that time, there was a slight reduction in the number of reporting scientists (9.4 FTE in 2011 and 8.8 FTE in 2016). Current numbers are 52.7 FTE scientists and 35.7 FTE technical and support staff.

84. FBD is in the process of recruiting three new scientists and an additional three are in training. There is generally a three year lead time between recruitment and a forensic scientist becoming totally operational (i.e. able to present evidence in court) due to the training requirements.

85. Of concern to the Inquiry is that any increases in staff numbers will exacerbate the already inadequate space occupied by FBD.

Continuing evolution of DNA technology

86. In his paper "DNA fingerprinting in forensics: past, present and future"[11], Roewer traces the development of DNA profiling technology from its first use in forensic science in 1987 through to 2013, a period of around 25 years. The pace of the evolution is remarkable and there have been further significant changes in the last four years.

87. The early Restriction Fragment Length Polymorphism (RFLP) technology was cumbersome, time consuming and in today's terms, insensitive and difficult to interpret.

88. RFLP technology was replaced by the advent of polymerase chain reaction (PCR) which allows small amounts of DNA to be amplified (multiplied) and the introduction of short tandem repeats (STRs) which demonstrate variability between individuals at known DNA loci. The new technology was much faster from sample submission to result, much more sensitive and significantly easier to interpret. It was also significantly more discriminatory.

89. Using this technology, Australian forensic DNA laboratories first standardised on investigating 10 DNA loci for differentiating between individuals (e.g. victims and suspects). The number of loci investigated is now standardised at 18, with most laboratories investigating 21 or more.

90. Increased sensitivity has accompanied each development in the DNA profiling process to the point where a person merely touching an object may leave enough DNA to produce a profile, and sufficient DNA for a profile may be transferred from one object to another by a third person[12].

[11] Roewer L. DNA fingerprinting in forensics: past, present and future, Investigative Genetics, 4:22 (2013) doi: 10.1186/2041-2223-4-22

[12] van Oorschot RAH, Ballantyne KN and Mitchell RJ, Forensic trace DNA: a review, Investigative Genetics; 1:14. (2010) doi: 10.1186/2041-2223-1-14

91. Increased sensitivity has also led to the detection of more mixed profiles, DNA samples contributed to by two or more people. This has again placed the focus on the complexity of interpretation[13].

92. DNA technology continues to evolve. Examples are: DNA phenotyping, which provides an estimate or prediction of the externally visible characteristics (EVCs) of the source of human DNA left at a crime scene (e.g. hair and eye colour)[14]; and Massively Parallel Sequencing (MPS) or Next Generation Sequencing (NGS). Parson et al.[15] state that:

> ***"The DNA Commission of the International Society for Forensic Genetics (ISFG) is reviewing factors that need to be considered ahead of the adoption by the forensic community of short tandem repeat (STR) genotyping by massively parallel sequencing (MPS) technologies".***

93. Implementation of this technology which can investigate hundreds of DNA loci rather than the 18 to 21 investigated currently would revolutionise forensic DNA profiling.

94. Clearly, change in DNA profiling as used in forensic science is constant and FBD, of necessity, should position itself to adopt new technology, which is often governed by national initiatives, for example, the national DNA database.

95. Of concern to the Inquiry is that the current facilities and infrastructure available to FBD will prevent it from moving forward with most of these initiatives.

Contextual and Confirmation Biases

> ***"…the tendency to interpret new evidence as confirmation of one's existing beliefs or theories[16]."***

96. A report from the National Academy of Sciences (NAS) in the USA in 2009[17] stated that

> ***"The forensic science disciplines are just beginning to become aware of contextual bias and the dangers it poses. The traps created by such biases can be very subtle, and typically one is not aware that his or her judgment is being affected."***

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[13] Na Hu, Bin Cong, Shujin Li, Chunling Ma, Lihong Fu and Xiaojing Zhang, Current developments in forensic interpretation of mixed DNA samples (Review) Biomedical Reports, 2(3) 309-316 (2014) doi: 10.3892/br.2014.232

[14] MacLean CE and Lamparello A, Forensic DNA phenotyping in criminal investigations and criminal courts: assessing and mitigating the dilemmas inherent in the science, Recent Advances in DNA Genetic Sequencing, 8(2):104-12(2014)

[15] Parson W, Ballard D, Budowle B, Butler JM, Gettings KB, Gill P, Gusmão L, Hares DR, Irwin JA, King JL, Knijff Pd, Morling N, Prinz M, Schneider PM, Neste CV, Willuweit S and Phillips C, Massively parallel sequencing of forensic STRs: Considerations of the DNA commission of the International Society for Forensic Genetics (ISFG) on minimal nomenclature requirements, Forensic Science International Genetics; 22:54-63 (2016). doi:10.1016/

[16] Confirmation bias, https://en.oxforddictionaries.com/definition/confirmationbias. fsigen.2016.01.009.

[17] National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward, National Academies Press: p185 (2009)

97. Dr Itiel Dror is a prolific researcher and author in this field and makes the point that, because of the considerable human element in forensic science[18], it is open to bias:

> ***"…the human examiner plays a critical role in forensic science. Indeed, in many forensic domains, it is the human who is the main instrument of analysis. Even in the domains that rely more on objective quantification and instrumentation, the human still plays an important role, from the initial stages of sampling, determining what is noise and what should be used as input, to the final stages of communicating the results."***

98. Research and actual cases have demonstrated that extraneous information can influence forensic examiners and the results that are reported.

99. Brandon Mayfield, a USA lawyer and part of the Muslim community in the State of Oregon, was arrested by the FBI following 'identification' of his fingerprint on an item collected during the investigation of the bombing of commuter trains in Madrid in 2004.

100. The fingerprint identification was subsequently shown to be wrong.

101. The Office of the Inspector General in the U. S. Department of Justice convened a panel to investigate the misidentification and the panel made a number of findings[19]. Some of these related directly to the issue of cognitive bias.

102. Three examples are:

> ***"…verifiers are made aware that identification has already been made by a prior FBI examiner at the time they are requested to conduct the verification, contributing to the expectation that the second examiner will concur with his colleague."***
>
> ***"…in the case of a particularly heinous crime and a comparison of a single print in which there are ambiguities such that the examiner has insufficient confidence to reach a conclusion of identification, this circumstance could create pressure on the examiner to declare an identification when he should not. Fear of failing to identify a terrorist could push an examiner to make a false identification in a close case."***
>
> ***"…Mayfield's representation of a convicted terrorist and other facts developed during the field investigation, including his Muslim religion, also likely contributed to the examiners' failure to sufficiently reconsider the identification after legitimate questions about it were raised."***

103. In recognition of the reality of cognitive biases and their potential to influence decision making, the majority of forensic science laboratories are creating an awareness of the issue and limiting the amount of extraneous information that scientists receive. FBD is one of those laboratories.

104. This is a relatively new area of responsibility and management for forensic science laboratories.

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[18] Dror IE, Cognitive neuroscience in forensic science: understanding and utilizing the human element,

[19] U. S. Department of Justice, Office of the Inspector General, A Review of the FBI's Handling of the Brandon Mayfield Case (2006)

Emphasis on Science

105. It is essential that a clear focus of forensic science is on sound science.

106. The report from NAS[20] was highly critical of a number of forensic science disciplines because of their lack of demonstrable underpinning science. DNA was a noted exception to this:

> ***"Although the forensic use of nuclear DNA is barely 20 years old, DNA typing is now universally recognized as the standard against which many other forensic individualization techniques are judged. DNA enjoys this preeminent position because of its reliability and the fact that, absent fraud or an error in labelling or handling, the probabilities of a false positive are quantifiable and often miniscule".***

107. DNA profiling underwent significant scrutiny when it was first introduced as a forensic science discipline and this led to extensive research and field testing to 'get the science right'.

108. The same level of research and field testing has continued prior to the introduction of any new DNA technology/methodology, and this work has placed DNA profiling in a strong position in terms of its underpinning science.

Significance of Quality Management

109. In addition to having a clear focus on sound science, it is obligatory for forensic science laboratories to have a clear focus on quality management which incorporates continuous improvement:

> ***"Quality management is the act of overseeing all activities and tasks needed to maintain a desired level of 'excellence'. This includes the determination of a quality policy, creating and implementing quality planning, quality assurance, quality control and quality improvement[21]."***

110. To be most effective, it is essential that quality management is an integral part of organisational structure and culture. To that end, it must be championed, promoted and actioned by management as well as understood, supported and practiced by everyone within the organisation.

111. In Australia, with the exception of one, all government administered forensic science laboratories (including FBD) have third party accreditation to the International Standard ISO/IEC17025.

112. The accreditation body (AB) for Australia is the National Association of Testing Authorities (NATA).

113. One of the key activities of the AB is to conduct regular assessments of an accredited laboratory to monitor compliance with all aspects of the Standard and any other supplementary requirements associated with the accreditation program.

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[20] National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward, National Academies Press: p185 (2009)

[21] Quality Management. http://www.investopedia.com/terms/q/quality-management.asp

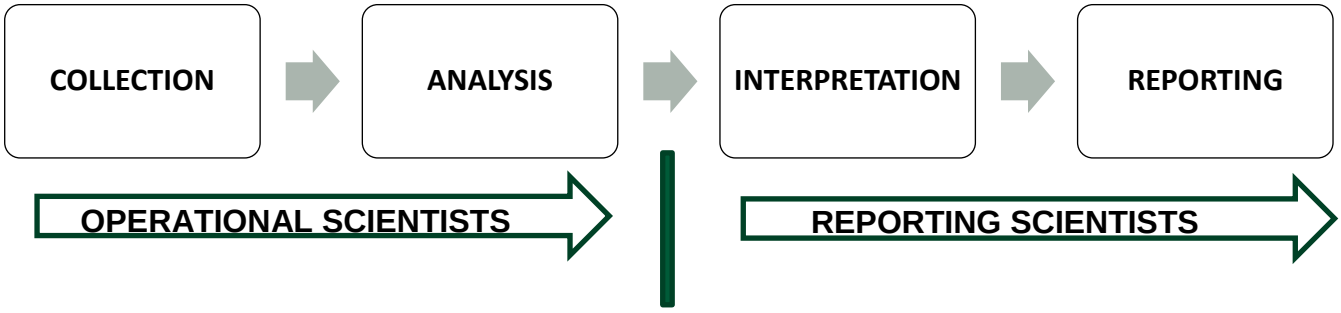
114. Ongoing requirements associated with accreditation are proficiency testing for scientific and technical staff and the quality system. Regular internal audits are also required.

Casework Practice for DNA Profile Generation, Interpretation and Reporting

115. As reported by NAS[22], the science for generating DNA profiles is reliable and well accepted by the scientific community.

116. As depicted in Diagram 1, the process of generating profiles at FBD is undertaken by a team of qualified and authorised scientists and technicians. Reporting Scientists become involved towards the end of the process, in the interpretation and reporting stages. They are also responsible for giving evidence in court, where necessary.

Diagram 1 Forensic Science Process



117. Once the profile is generated, the FBD has a documented process leading to the reporting of the result. It is outlined in an appendix to the FBR as follows:

> ***DNA Profile Interpretation includes the following stages:***
>
> ***1) Test results are read by a combination of trained scientists and/or expert software;***
>
> ***2) Interpretation of the test results is the responsibility of the Case Scientist who re-reads the test results before issuing a report;***
>
> ***3) The DNA profiles included in the report are again re-read by the reviewing Scientist prior to release of the report.***

118. Included in the appendix is the statement that:

> ***"The DNA profiles included in the report are determined using laboratory guidelines on DNA profile interpretation, scientific literature accepted in the field of Forensic Biology and scientific data that has been gathered by the laboratory through internal validation studies and experience."***

[22] National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward, National Academies Press: p185 (2009)

Delivery of Forensic Services in Western Australia

119. The delivery of forensic science services in Western Australia is split between four main service providers and three different administrations: PathWest FBD (forensic biology including DNA), PathWest Pathology, WA Police (e.g. crime scene investigation, fingerprint identification, ballistics/firearms examination and electronic evidence (computer forensics)) and ChemCentre (e.g. illicit drugs (including clandestine drug laboratory investigation) toxicology and physical (trace) evidence).

Inquiry Methodology

120. For the period of the Inquiry (2007 to 2011), FBD issued results in a number of different formats. The two principal formats were the SOLF report and the FBR. A DNA Evidentiary Certificate accompanies an FBR and is produced for criminal proceedings, setting out details of the evidence, such as when it was received, when it was examined and what DNA outcome was obtained.

121. The purpose of the SOLF report is to provide a simplified summary of the laboratory results available for the case at the time the report is requested.

122. The SOLF report is not for court purposes and this is stated in a prominent caveat to the report.

123. The FBR is for court purposes and provided at the request of the Courts of WA Police.

124. Depending on the duration and complexity of the forensic science investigation, there may be addenda to either or both of the SOLF report and FBR.

125. In addition to SOLF reports and the FBR, FBD may issue results by way of a Summary of Preliminary Findings, Interim Reports and e-mails. Similar to SOLF reports, these are not for court purposes.

126. In the cases reviewed by the Inquiry, all identified results issued by FBD (whether in the form of SOLF reports, FBR and any addenda, Summary of Preliminary Findings, Interim Reports and e-mails) were checked against the original results of analysis. For example, for reported DNA results, it involved a check of the original electropherogram (EPG).

127. The checking of the results was recorded in a Table for each case reviewed. An example of a page of the Table used is given at Appendix I.

Details of Methodology

128. DNA results which produced a full profile, a partial profile (PP), a mixture with an identified major component (Mix MC) or a mixture with an identified partial major component (Mix part MC) were checked against the original EPGs. Results which produced a non-reportable profile or a non-identifiable profile were also checked.

129. For results which involved a Match Probability Calculation, the alleles entered into the match probability calculation sheet were checked. Where a match probability was included in an issued report (e.g. FBR), the transfer of the relevant Point Estimate from the match probability calculation sheet to the report was checked.

130. Some results produced a DNA profile which was a mixture of DNA from two or more people and the results were expressed as:

    a) a person not being excluded from that mixture;
    b) insufficient information to draw an opinion about the contribution of a particular person to that mixture; and/or
    c) a person being excluded as a contributor to that mixture.

These results were not checked as the interpretation requires specialist experience and expertise. However, any misidentification related to a person not being excluded from a mixture is highly unlikely to be of any probative significance.

131. Specialist software, STRmix, was implemented by the FBD on 29 April 2013 and now assists with the interpretation of mixed DNA results.

132. Sourcing information for the Inquiry from FBD was conducted through written requests from the Inquirer and written responses from FBD. There were also face to face meetings to clarify any remaining issues from the written responses.

133. With respect to gaining an understanding of the FBD commitment to quality and the strength of their quality culture, interviews were held with six different members of staff.

134. As reported elsewhere, the commitment to quality at FBD is led by senior management and is well accepted and supported across the agency.

Findings

Anomalous Results

135. The Inquiry examined 19 cases (relating to 27 persons of interest) identified by the ODPP.

136. In some of these cases, the related case files comprised of over six large ring-backed binders containing over 1000 pages. The largest comprised 11 ring-backed binders containing over 2,500 pages.

137. One of the major focuses of the Inquiry case file review was the EPGs which display the DNA result. In total, 2,551 EPGs were reviewed and assessed.

138. The Inquiry identified a total of 11 anomalous results spread through six cases. None of the anomalous results were identified by peer review. While this is of obvious concern to the Inquiry, it appears that none of the anomalous results are of probative significance.

139. Of the 11 anomalous results identified, eight were transcription errors and two were typographical errors. The source of the remaining anomalous result has not been resolved but is the subject of further investigation by FBD.

140. Seven of the anomalous results were detected in Summary of Laboratory Findings (SOLF) and Summary of Preliminary Findings reports, but six of these were reported correctly in the FBR which is used for court purposes. The Summary reports are not for court purposes and are issued with caveats to that effect.

141. Two of the anomalous results were detected in Evidentiary Certificates in a tabulated format. A DNA Evidentiary Certificate accompanies an FBR and is produced for criminal proceedings, setting out the details of the evidence, such as when it was received, when it was examined and what DNA outcome was obtained. In the written/descriptive section of the FBR, the results were reported correctly. It should be noted that FBD no longer issues Evidentiary Certificates with tabulated results.

142. Two of the anomalous results were reported in an FBR, one of which was also reported in a SOLF. While this is of obvious concern to the Inquiry, it appears that none of the anomalous results are of probative significance.

143. A tabular summary of the identified causes of the anomalous results is given at Appendix III.

Cases

Case 07M0348

144. In the Summary of Preliminary Findings, a sample was reported to produce a major DNA component the same as the reference sample for Person A. However, the major DNA component produced was the same as the reference sample for Person B.

145. The result was correctly reported in the FBR and the accompanying Evidentiary Certificate.

Case 07M0348 continued

146. This was a transcription error.

147. In the Evidentiary Certificate, a swab was reported as giving a full DNA profile but in the EPG, the result at one locus was designated NR (not reportable). Therefore, the result was a partial profile.

148. The result in the report was correct, but it was not clear how it related to the previously stated statistical weighting.

149. This was a transcription error.

150. Similarly two samples were reported as giving full profiles in the Summary of Preliminary Findings but both produced part profiles, non-reportable results at two and three loci respectively.

151. The results were correct in the FBR.

152. These were both examples of transcription error.

Case 09M0097

153. This was an issue detected at peer review of a FBR where a match probability was given for a full profile. However, at one locus (D18), the EPG for the matching reference profile was deemed NR (not reportable).

154. A recalculation was made for the final report but the recalculation was attributed to a second stain from the same item.

155. This was a form of transcription error.

156. The match probability estimate for one stain (Stain C) while incorrect, is much more conservative than the correct estimate.

157. The match probability estimate for the other stain (Stain B) is for a full profile. However the reference sample, which the stain profile is said to match, gave a non-reportable result at one locus (partial profile).

158. FBD has re-analysed the reference sample and a full profile was obtained confirming the reported match probability estimate.

159. In a SOLF, an item was reported as having stains which gave mixed DNA profiles. Major contributors were identified for two stains but in the SOLF report, the results were transposed (i.e. X was named as the major contributor for stain A and Y as the major contributor for stain B whereas the opposite was true).

160. The results were reported correctly in the FBR and the accompanying Evidentiary Certificate.

161. This was a transcription error.

Case 10M0010

162. In a SOLF report, results from two stains from the same item were transposed (i.e. result A was said to originate from the front of an item of clothing and result B from the back of the item whereas the opposite was true).

163. The same transposed results were given in the FBR.

164. This was a transcription error.

Case 10M0063

165. In a SOLF report a DNA profile from a stain on a pair of shorts was attributed to the alleged victim of a male on female sexual assault.

166. The profile, from a female, was different to that of the alleged victim and could not be attributed to any other person involved in the case from whom reference samples were taken.

167. The cause of this anomalous result is unknown. However, an investigation is being undertaken within FBD, including the raising of a Corrective Action Report (CAR), in an endeavour to gain more information.

Case 10M0291

168. In the SOLF, a sample was labelled as having come from a person's right hand whereas it came from the left hand.

169. It was reported correctly in the FBR.

170. This was a typographical error.

Case 10M0091

171. In the Evidentiary Certificate, in a tabulated format, there were samples listed in rows along with designated DNA profiles.

172. Two of the samples were listed in a row along with a DNA profile that was not the same as the profile the samples produced.

173. In the written/descriptive section of the accompanying FBR, the two samples were assigned their correct DNA profile.

174. This was a typographical error.

175. In one of the SOLF reports for this case (4 June 2010), two results from one item were transposed (i.e. no profile from a sample taken from the end of a paper towel roll and a mixed profile from a stain in the middle of the roll whereas the opposite was true).

176. The results were reported correctly in the FBR dated 5 September 2011.

177. This was a transcription error.

Science

178. The EPGs assessed by the Inquiry are plots or graphs which display the results of DNA analyses (e.g. a profile). An example of an EPG is given at Appendix II.

179. The Inquiry found that the quality of the EPGs examined was consistently high.

Quality Management

180. FBD is accredited by NATA to the International Standard ISO/IEC 17025. It was first accredited in April 2001 and has undergone regular assessments by NATA since that time.

NATA assessments

181. The NATA assessments occur once every three years and inspection by the Inquiry of the NATA assessment reports from 2009, 2012 and 2015 demonstrated that FBD has a very high rate of compliance with the criteria against which it is assessed. The NATA reports made no comment on the accommodation for FBD.

Proficiency testing

182. The accreditation criteria mandate that scientific and technical staff participate in an external proficiency test annually. The proficiency test results for individual practitioners are recorded in their personal training file.

183. Proficiency tests are procured from a supplier who knows the result of the test but the result is unknown to the participant.

184. Inspection by the Inquiry of a record of all proficiency tests undertaken by staff within FBD for the period January 2007 to October 2011 identified that 78 proficiency tests were completed. Of these, one reported an additional allele not present in the actual profile but the conclusion related to the test was correct. The remaining 77 were all correct.

185. Inspection of a record of all proficiency tests undertaken by staff for the period January 2014 to November 2016 identified that 58 proficiency tests were completed and all results were correct.

Internal Auditing

186. Trained auditors from elsewhere in WA Health (external to FBD) participate in the audits undertaken for FBD. FBD has a number of trained auditors on staff who reciprocate for other areas within the WA health system.

187. At least four, but mostly five to six, internal audits are undertaken each year covering different areas and activities within FBD.

188. The Inquiry examined a record of the audits conducted for the periods 2007 to 2011 and 2014 to 2016.

189. A number of minor issues (e.g. incomplete training records, pagination of case file contents and method documentation requiring updating) were identified in the audits and where appropriate, CARs were raised.

190. No issues critical of the results issued by FBD were identified in any of the audits.

Induction and training

191. The Inquiry found that FBD has comprehensive induction and training programs and the issue of quality management is well covered in both programs.

Commitment to quality

192. The Inquiry held discussions with the Head of Department, the Quality Officer of FBD and, independently, four other scientists in relation to quality management at FBD.

193. The discussions identified that there is a universal understanding and acceptance of the fact that quality should, and does, underpin all aspects of the work at FBD.

194. This is constantly and consistently promoted and championed at senior management level.

195. The senior management team meets weekly and the Quality Officer provides a status report to that meeting.

196. The reporting scientists meet fortnightly. Quality management is often discussed and the Quality Officer attends as appropriate.

197. Staff members at all levels are actively encouraged to, and do, raise issues related to quality. Open discussion and resolution of these issues is given priority.

198. Any changes to the quality management system are communicated by e-mail and a response from those receiving the e-mails to confirm the communication was read and understood is mandatory and monitored.

199. Proficiency testing and internal audits are a well-accepted part of the quality management process.

200. The discussions with staff revealed that the level of confidence in the quality management process at FBD is high because of the policies, procedures and practices in place. Confidence is also enhanced by the fact that the process is transparent and there is an emphasis on continuous improvement.

201. The discussions also revealed that quality is ‘ingrained’ and ‘second nature’ to staff members which is indicative of a strong quality culture.

202. Quality matters raised in discussions with FBD staff which were of serious concern to the Inquiry included:
    a) a lack of time and resources for constructive research and development;
    b) ‘compressed’ work spaces;
    c) item/exhibit security, as it relates to afterhours surveillance;
    d) fundamental and ongoing risks related to item examination facilities; and
    e) some OH&S issues.

Peer Review

203. The NATA Forensic Science ISO/IEC Application Document[23] provides criteria for case record review and the reporting of results. The criteria state that:

> "***Records of reviews (of case records) conducted must be kept and include the identity of the reviewer and the date of the review."***

204. A policy document (FBRM003) sourced from FBD and relevant to the period of the Inquiry (2007-2011) outlines the various forms of reports and for each one, states that there must be a peer review undertaken prior to the report (in whatever form) being released.

205. The Inquiry sought information from the FBD regarding two instances of what appeared to be a lack of peer review prior to the release of results/information, and instances where it appeared that there was no follow-up to perceived quality management issues.

206. The Inquiry received a clear and comprehensive response from the FBD regarding each of the queries raised.

207. One of the issues is still under review by the FBD.

208. With respect to the other issues raised, the response revealed that no anomalous results had been released with respect to non-peer reviewed communications, and that there was appropriate follow-up to each of the perceived quality management issues raised.

209. The Inquiry identified a total of 11 anomalous results in six of the 19 cases reviewed. These anomalies were not detected by the peer review process. The anomalies are discussed under Anomalous Results.

210. The finding of anomalies in reports that had been peer reviewed is of concern to the Inquiry, and is discussed in greater detail in the Recommendations section of this report.

211. Also of concern to the Inquiry was the fact that there is inadequate space at the FBD for larger case files and reports to be laid out in an environment conducive to peer review. Consequently, such files and reports are taken home by scientists for review with obvious security implications. FBD management is aware of the risks and measures are taken to minimise them in an environment where alternatives are critically limited.

Communication

212. The Inquiry found that the recording of communications both sent and received by FBD was unstructured. There was no central record of relevant communication for any specific case.

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[23] NATA Forensic Science ISO/IEC Application Document (July 2015). https://www.nata.com.au/nata/phocadownload/publications/Accreditation_criteria/ISO-IEC-17025/Forensic/Forensic-Science-Application-Document.pdf

213. Records of communications consisting largely of printed e-mails and hand-written notes on pages of e-mails, were generally included in the first part of each file. However, the section was not specifically labelled and in some of the larger cases, these records were distributed throughout the file.

214. Communications included information regarding results of analysis, notifications of court dates, approvals for the use of Intelligence Samples and in one file, a letter from the Office of the Chief Justice related to a delay in the provision of a report.

215. A Communications Log was included towards the front of the first file for each case, but was not generally used for the purpose of recording what appeared to be relevant communications.

Numbering and Labelling of Items

216. The Auditor General's Report, Performance Examination; Behind the Evidence: Forensic Services, Report 4 for 2006[24] stated that:

> "***the IMS unique identifiers (used by police) are not used by PathWest … to track the exhibits in their own exhibit registers. When PathWest …receive forensic exhibits from WA Police, they register the exhibit in their own database(s) under different identifying numbers. This means that a forensic exhibit can be allocated at least three different identifying numbers during investigation and analysis"***

217. This statement in the report was under the heading "The System for Tracking Exhibits Across Agencies is Out-moded".

218. The finding of this Inquiry for the period 2007 to 2011 is that little, if anything had changed.

219. There were still several versions of how items were numbered and labelled.

220. WA Police were using Request for Analysis (RFA) numbers, Incident (IMS), property and Forensic identification numbers. (FSID) and item descriptors (e.g. swab from heel of right shoe).

221. PathWest Forensic Pathology (Coronial) were using Coronial Case Numbers.

222. FBD were using Forensic Biology Reference numbers, Batch numbers and unique bar codes which included the police property number often with a suffix for identifying sub-samples.

223. Suffixes were, for example, a single letter or an abbreviation of the descriptor (e.g. H RShoe).

224. Different numbers, descriptors and barcodes were used for different purposes. For example, the FBD barcode number and property number with the suffix appeared on some EPGs as an identifier but these were never used in reports, either written or tabulated formats.

[24] Auditor General for Western Australia, Auditor General's Report, Performance Examination; Behind the Evidence: Forensic Services, Report 4 (2006)

225. Because of this, the Inquiry found it difficult in some instances to reconcile the EPG results with those in the reports. While this reconciliation was achieved, it made the review of the cases difficult and time consuming, and it is highly likely that this would also be applicable to internal peer reviews.

226. For large cases, items were received at FBD in different batches. In some instances, different items in different batches had the same police property number. As an example, in case 10M0091, the police property number 0001 was used for a tool box, a tarpaulin and a set of number plates although the property number was accompanied by other identifiers.

227. This issue was eliminated by the introduction of the Forensic Register (FR) system in 2011.

228. The Auditor General's report also stated that:

> "***The security and reliability of forensic exhibits is put at risk by the absence of a single reliable State exhibit register that records exhibit details and tracks movement within and between agencies".***

Contextual and Confirmation Bias

229. Awareness of contextual and confirmation bias in forensic science was heightened by the release of the NAS report[25]. This report highlighted the potential negative impact of such biases and there have been many further reports published relating to this issue.

230. The Inquiry identified a clear example of FBD receiving potentially biasing information in case 10M0010.

231. FBD received an e-mail from WA Police which stated in part: "A pair of shoes was seized from the accused, making them an important exhibit as the victims (sic) blood on them will put him in the scene".

232. This is obviously extraneous information which should not have been sent to FBD.

233. A copy of the e-mail was saved to file but all that appeared in the Case Diary was an entry requesting that the shoes be tested.

234. Those involved in undertaking the analysis and testing of the shoes including reading the results were therefore unlikely to have been aware of the e-mail.

235. Furthermore, two scientists read and interpret all DNA results independently and without reference or access to the case file.

236. Nonetheless, the issue of bias remains a risk, and police officers and staff of FBD must be conscious of it at all times.

[25] National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward, National Academies Press: p185 (2009)

Governance Structure

237. The Inquiry is of the view that the Head of Department at FBD is in an unenviable position in that FBD is administered by the North Metropolitan Health Service but is funded by WA Police.

238. The Head of Department at FBD reports directly to the Network Director, PathWest QEII Medical Centre. There is no direct reporting line to WA Police. However, there is newly formed six member strategy group within WA Police headed by the Assistant Commissioner State Crime. The Head of Department of FBD is the only member of this group from PathWest.

239. The FBD output has direct and broad implications for police, the justice system and the safety and wellbeing of the Western Australian community. Therefore, the governance arrangements for FBD should reflect this by being expansive and transparent.

240. The current governance arrangements appear to place FBD at a considerable disadvantage with respect to securing adequate funds for facilities, infrastructure and resources.

Recommendations

Peer Review Recommendations

241. The anomalous results identified by the Inquiry were not identified by the peer review process at FBD and this is of concern to the Inquiry.

242. A literature search related to the peer review of case files and reports in forensic science indicated that there has been very little research conducted on the structure, function and effectiveness of such peer reviews.

243. Indeed Ballantyne et al.[26] reported that:

> "***No published, empirically derived reports exist regarding the ability for technical and administrative reviews to detect errors, enhance accuracy or improve the communication of opinions and results, despite their mandated use.***"
>
> ***"There are also few standards and guidelines regulating documentation of analyses and case file contents, and no standards or training on how to conduct technical reviews, what should be checked by reviewers, and to what level any disputes or disagreements should be documented. (Furthermore) no detailed guidance exists for how to develop these procedures, or how to measure empirically that the reviews fulfil the stated aim of enhanced accuracy."***

244. The authors provide some guidance on the establishment of a viable structure for peer review:

    a) checklists and detailed guidance should be provided for the technical and administrative review of reports and statements;
    b) primary examiners cannot select individual reviewers;
    c) the task of reviewing is matched with the level of expertise and competence required for the task;
    d) human factors and potential sources of bias must be considered when designing effective peer review systems; and
    e) systems should be in place for monitoring the validity and efficacy of verification and review.

245. High rates of disagreement between examiners and verifiers may indicate emerging issues with the application of the method or in the interpretation of evidence; a complete lack of disagreement may indicate that verifiers or reviewers are not detecting the inevitable errors of omission, transcription or reporting which may occur within any process.

246. FBD already has a number of procedural mechanisms in place including the central management of peer reviews, independent selection of suitable reviewers and a Case Record Review form (checklist), a copy of which is attached as Appendix IV.

[26] Ballantyne KN, Edmond G and Found B, Peer review in forensic science; Review Article, Forensic Science International 277; p66–76(2017)

247. The prominence of transcription and typographical errors as contributors to the anomalous results detected by the Inquiry is indicative of the risk points with manual processes.

248. New systems introduced by FBD since the period covered by the Inquiry (2007-2011) have reduced the number of manual actions required in the process from sample collection to reporting results. Accordingly, the risk of transcription and typographical errors has also reduced.

249. However, to further minimise these risks, FBD should identify and highlight any manual actions remaining in the process and where possible eliminate them.

250. Where elimination is not possible, FBD should emphasise these as risk points for attention in the peer review process and include them in the Case Record Review form.

Recommendation 1

251. ***FBD should identify and highlight any manual actions remaining in the process from sample collection to reporting results and where possible, eliminate them. Where elimination is not possible, FBD should emphasise these as risk points for attention in the peer review process and include them in the Case Record Review form.***

252. FBD has membership in the Biology Specialist Advisory Group (BSAG) under the auspices of the Australia New Zealand Policing Advisory Agency National Institute of Forensic Science (ANZPAA NIFS). The Head of Department of FBD is a member of the Australia New Zealand Forensic Executive Committee (ANZFEC) which is an oversight body for ANZPAA NIFS.

253. The Specialist Advisory Groups (representing nine different forensic science disciplines) and ANZPAA NIFS have a national mandate for raising standards of practice in the forensic sciences in Australia and New Zealand.

254. Given the findings of Ballantyne et al[27], who are internationally renowned Australian researchers, a national methodology including evaluation measures should be developed for case file and report peer review, initially for DNA laboratories and later for other disciplines.

Recommendation 2

255. ***FBD should propose to ANZPAA NIFS, through the BSAG, that a national methodology, including evaluation measures, is developed for casefile and report peer review, initially for DNA laboratories.***

256. FBD is introducing electronic reporting and as such, 'hard copy' reports will no longer be issued.

257. A new case report management system (CRMS) was introduced by FBD following the period covered by the Inquiry (2007-2011) and this will facilitate electronic reporting.

[27] Ballantyne KN, Edmond G and Found B, Peer review in forensic science; Review Article, Forensic Science International 277; p66–76(2017)

258. As part of the management of electronic reports, FBD should configure CRMS such that it is not possible for reports to be issued without having been peer reviewed.

259. This should include monitoring by the Quality Officer, and form part of the Quality Management weekly report to management.

Recommendation 3

260. ***As part of the management of electronic reports, FBD should configure the case report management system (CRMS) such that it is not possible for reports to be issued without having been peer reviewed. This should include monitoring by the Quality Officer and form part of their weekly report to management.***

261. FBD staff members are taking larger case files home to conduct peer reviews and this presents a considerable security risk.

262. This is symptomatic of the fact that the space available and the condition of the FBD facilities are inadequate for the purpose for which they are being used.

263. This is of serious concern to the Inquiry.

Recommendation 4

264. ***FBD accommodation with respect to its condition and the space available for increasing workload demands, additional staff and future development of DNA is inadequate. This should be reviewed as a matter of urgency.***

Communication Recommendations

265. CRMS can record in-coming and out-going communications such as e-mails, letters and phone calls. However the system relies on manual input. The recently acquired electronic Document Control Management System (eDCMS) is more automated but manual involvement will still be required.

266. CRMS also includes the capability to auto-save notes of telephone calls. However it is up to individuals to ensure that this happens.

Recommendation 5

267. ***FBD develops and maintains a contemporary IT solution for the structured recording and maintenance of case-related communications such that they are readily accessible for report writing and peer review.***

268. Ideally, there should be a common IT system accessible to FBD, WA Police and the ODPP for direct communication related to, for example, the submission and tracking of items for analysis, electronic laboratory reports and notification of court dates.

269. This is particularly relevant with the imminent introduction of an electronic reporting initiative by FBD.

270. Data within each agency could be securely compartmentalised such that there is access to only relevant information between the organisations.

271. A less favourable but arguably more practical alternative is for the IT systems in each of these organisations to have the capability for direct three way communication of agreed data.

Recommendation 6

272. ***FBD or a relevant authority, initiates the investigation, development and implementation of an IT system accessible to FBD, WA Police and the ODPP for direct communication related to, for example, the submission and tracking of items for analysis, electronic laboratory reports and notification of court dates.***

Numbering and Labelling of Items Recommendations

273. Similar to the Auditor General's Report of May 2006, the Inquiry identified the numbering and labelling of items for forensic analysis as an area of risk (at least for the period covered by the Inquiry 2007-2011).

274. While changes have been made to the system since that time, there is still no single, uniform, 'cradle to grave' numbering and labelling of items for analysis and, therefore, the risk remains.

275. WA Police now use the Forensic Register and common use of this system across forensic science agencies in Western Australia could form the basis of a common item numbering and labelling system.

Recommendation 7

276. ***FBD in conjunction with WA Police and the ChemCentre, should, as a matter of priority, initiate the investigation, development and implementation of a single, uniform forensic item numbering and labelling system for the State of Western Australia. This would include consideration of the Forensic Register.***

NOTE: Recommendation 7 should not be considered in isolation from Recommendation 6.

Contextual and Confirmation Bias Recommendations

277. Research outcomes and actual forensic science cases have identified that cognitive biases can and do impact on forensic scientists and the results and reports that they produce. Therefore, it is an ongoing area of risk.

278. FBD should ensure that:
    a) awareness of contextual and confirmation bias is part of its induction program for new staff members; and
    b) readings and discussion related to biases are an integral and assessable part (e.g. through group discussion) of the internal training program.

279. Papers by authors such as Itiel Dror, Saul Kassin and Bryan Found should be considered for the readings.

280. FBD should assess its overall analysis program and identify key risk points for contextual and confirmation bias so that they can be mitigated and monitored.

281. Equally, those members of WA Police who communicate directly with FBD should be fully cognisant of the risks of contextual and confirmation bias such that they do not engage in the provision of extraneous information to the laboratory.

Recommendation 8

282. ***FBD reinforces programs whereby staff members are aware of and where appropriate, trained with respect to the knowledge and risks of contextual and confirmation bias.***

Recommendation 9

283. ***FBD, in conjunction with WA Police, develops an awareness program related to contextual and confirmation bias for those police officers who communicate directly with FBD.***

Governance Structure Recommendations

284. There is a lack of a formal and transparent structure through which FBD acquires its funding and for issues such as the provision of suitable accommodation, funding seems inadequate. This is of significant concern to the Inquiry and should be reviewed.

> ***"An advisory board can provide the strategic advice and complementary skills required to take your small or medium business to the next level***."[28]

285. The above statement is equally applicable to a continuously evolving scientific environment as it is to a competitive commercial environment.

286. It is the Inquirer's view that the governance of FBD should include an appropriately structured Advisory Council that would maintain the independence of FBD and enhance collaboration, innovation, sustainability and accountability.

287. Proposed Terms of Reference and structure for an Advisory Council are given as Appendix V.

288. The Advisory Council would assist FBD management with:
    a) strategic and business planning guidance;
    b) provision of advice and reasoned support with respect to infrastructure and resourcing requirements;
    c) consideration of reports related to quality management, evolving science and technologies;
    d) nationally-driven forensic science initiatives; and
    e) advice on State issues (e.g. legislation) impacting forensic science, particularly forensic biology, service delivery.

[28] Australian Institute of Company Directors, SME Business Owners/Directors The benefits of an advisory board – mentoring for growth. (2009)

289. Such an Advisory Council should not be a decision making body, but should have sufficient authority, status and influence to maintain FBD as a contemporary forensic science service provider for the State of Western Australia.

Recommendation 10

290. ***An Advisory Council is established as part of the governance arrangements for FBD. While not a decision making body, the Advisory Council should have sufficient authority, status and influence to maintain FBD as a well-respected and contemporary forensic science service provider for the State of Western Australia.***

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Glossary

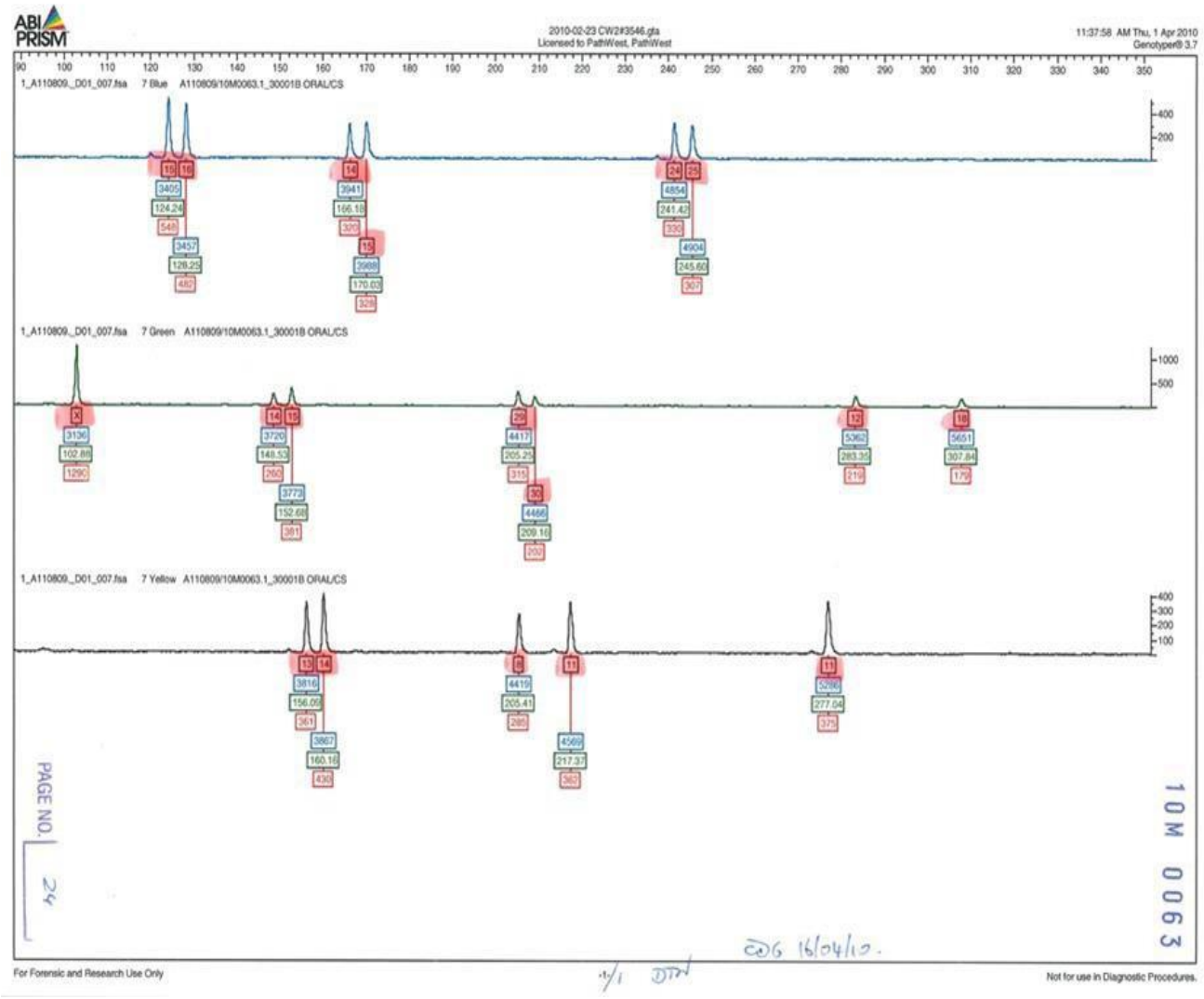
AB	Accreditation body
ANZPAA	Australia New Zealand Policing Advisory Agency
NIFS	National Institute of Forensic Science
BSAG	Biology Specialist Advisory Group
CAR	Corrective action report
CRMS	Case report management system
DNA	Deoxyribonucleic acid
EPG	Electropherogram
EVC	Externally visible characteristics
FBI	Federal Bureau of Investigation (USA)
FBD	Forensic Biology Department
FBR	Forensic Biology Report
ISFG	International Society for Forensic Genetics
ISO/IEC	International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC)
Mix MC	DNA mixture with a major component (full profile). Also Mix part MC which is a mixture with a partial major component (partial profile)
MPS	Massively Parallel Sequencing
NAS	National Academy of Sciences (USA)
NATA	National Association of Testing Authorities
NGS	Next Generation Sequencing
NIJ	National Institute of Justice (USA)
NR	Not reportable
ODPP	Office of the Director of Public Prosecutions
PCR	Polymerase chain reaction
PP	Partial profile
RFLP	Restriction Fragment Length Polymorphism
SOLF	Summary of Laboratory Findings
STR	Short tandem repeat

Appendices

Appendix I – An example page from the Table used for the review of casefiles

Name/number	Type	Result	EPG page no	Match	Match prob
A115648 0918	Swab – rear driver's side foot well	Mix MC RTJ	798-800	Checked	802 Y
A115712 0003	Swab – Motor vehicle 1CYC126	nr	809	Checked	
0363A Hclip, 0364A Hclip, 0365A Hclip, 0366A hclip and 0368A Hclip	Swabs (x5) – hair clips; as described on p815,820 826, 834 and 843	Profile CPE	818-819, 824-825, 829-830, 837-838 and 846-847	Checked	848 Y
A122109 0365B Hclip	Swab – hair clip; as described on p826	Part profile CPE	831-832	Checked	833 Y
A22027 0367A bags	Swab - as described on p839	nr	842	Checked	
0612A knife, 0612B knife and 0612C knife	Swabs (x3) – various areas of knife and sheath as described on p849	nr	855 and 856 (no EPG for 0612B knife – DNA not detected	Checked	
0665H and 0665B	Swabs (x2) – various areas of knife as described on p861	nr	865-866 and 867	Checked	
0059,0062-0065, 0091 and 0092	Cig butts (7)	nr	EPG's between 876 and 903 (no EPG's for 0062 and 0065 – DNA not detected)	Checked	
A122248 0060	Cig butt	Part profile BD	877-878	Checked	879 Y
A122287 0061	Cig butt	Profile Unknown female UNK3	883-884	Checked	
A122385 0093	Cig butt	Part profile BD	904-905	Checked	906 Y
A122386 0094	Cig butt	Mix no MC	911-913	Checked	
A122389 0097	Cig butt	Profile RP	918-919	Checked	920 Y
62103422	Person PED	Profile	917	Checked	

Appendix II – A copy of an electropherogram



Appendix III – A summary of the source and identified causes of the anomalous results

Anomalous Results		
Case	**Source**	**Identified Cause**
07M0348	Summary of Laboratory Findings (SOLF) report	Transcription error
07M0348	Evidentiary Certificate	Transcription error
07M0348	Summary of Laboratory Findings (SOLF) report	Transcription error (x2)
09M0097	Forensic Biology Report	Transcription error
09M0097	Summary of Laboratory Findings (SOLF) report	Transcription error
10M0010	Summary of Laboratory Findings (SOLF) report and Forensic Biology Report	Transcription error
10M0063	Summary of Laboratory Findings (SOLF) report	*Unknown
10M0291	Summary of Laboratory Findings (SOLF) report	Typographical error
10M0091	Evidentiary Certificate	Typographical error
10M0091	Summary of Laboratory Findings (SOLF) report	Transcription error

- An investigation will be undertaken within the Laboratory, including the raising of a Corrective Action Report (CAR), in an endeavour to gain more information.

Appendix IV – A copy of the Case Record Review form

C A S E R E C O R D R E V I E W

Case Manager: _____

		Court	Short	Interim	SOLF (&Add)	Adden/ Replace	No Report	DBH & INT
Prelim. Case File Check	Case no. on everypage							
	All pages & records initialled and dated							
	All records legible, unobscured and of a permanent nature							
	Communications Log completed							
	Daybook logs present & correct: Incoming Exhibits, EAML, EAML(ref), Items Log All batches received acknowledged in case notes							
	Every batch of items has a storage location or has been returned							
	EAML: appropriate record of all evidence movement							
	Item exam: Date, time, location, examiner & supervisor recorded							
	All corrections single strike-through & initialled & dated							
	Signed and dated by:							
Preliminary Draft Report Check	Report has a title and name & address of the lab							
	Report has case number & pagination (page x of y) on every page							
	Report has name & qualifications of author							
	Refers to any interim reports issued							
	Addendum/replacement report refers to original report							
	Batch no., Mortuary No., PTS, IMS or OR all correct							
	Name/Rank/Badge of all relevant officers & Operation name are							
	Names, DOB's, Companies, Addresses & MV no.'s are correct							
	Date of receipt & delivery officers correct							
	Identifying details of exhibits match exhibits labels & RFAs							
	Names & locn of who & where to send report copies are correct							
	Evidentiary Certificate prepared(if required)							
	No typographical or spelling errors in report or Evidentiary Certificate							
	Signed and dated by:							
Technical Review & Database Check	Each exhibit/item is unambiguously identified in report							
	Items not examined explained in Case Diary/Communications							
	Reported information for each item is an accurate representation of the results documented in the case notes							
	If EP's retrieved directly, controls printed out & are correct							
	Query sheets with all associated Sample ID's and cases printed from							
	Stats re-calculated and are correct							
	Reports refer to Evidentiary samples (Intel only by WAPOL							
	Report refers to any reference database used, where the use affects the validity or application of results.							
	Any test performed by ANOTHER laboratory clearly identified							
	All reference samples registered into correct DBI category							
	All links comply with CI(IP) Act2002							
	If all CS samples are MXT, at least one uploaded as MC (if poss)							
	U/K Partial SS profiles (<6 loci) have been checked against staff/PED							
	Conclusions worded correctly (eg. no prosecutor's fallacy)							
	All appropriate testing performed & test results accurately reported							
	Reviewer agrees with all the opinions expressed in the report							
	Signed and dated by:							
Final Check	Case file paginated							
	All pages of the report initialled and dated by author & report signed							
	Signed and dated by:							

Comments

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Appendix V – Draft Terms of Reference for the proposed PathWest Forensic Biology Department Advisory Council

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TERMS OF REFERENCE

PURPOSE

ADVISORY COUNCIL

The PathWest Forensic Biology Department Advisory Council (Advisory Council) exists to guide and support the ongoing development and delivery of an innovative, transparent, impartial and responsive range of forensic biology services that support law enforcement, the justice system and ultimately, contributes to delivering a safer environment for Western Australians.

CORPORATE FOCUS

The Advisory Council is committed to ensuring that the development and delivery of forensic biology services accords with the organisational objectives and initiatives.

ROLE

The Advisory Council primary roles shall be:

- **Advisory** – to guide and support the development of forensic biology services to ensure that service provision is contemporary and responsive to the needs of all end-users;

- **Consultative** – to consider, broadly discuss and deliberate on issues and developments which are significant to management, staff, end-users, the broader forensic and scientific communities and the community of Western Australia;

- **Analytical** – to identify emerging issues and trends which may impact on justice, law enforcement and forensic science and propose strategies and initiatives to ensure that the Forensic Biology Department (FBD) is positioned at the leading edge within the local, national and international science and forensic science communities.

FUNCTION

The functions of the Advisory Council shall include:

- Monitoring of trends and strategic developments within forensic science in general and forensic biology in particular and providing options and strategies to ensure that FBD is appropriately positioned to provide innovative and expert service outcomes to all end-users;

- Considering options and providing advice on strategic alliances, partnerships and benchmarking opportunities with academia, local, national and international forensic and scientific service providers, law enforcement agencies, the justice system, industry and the community;

- Considering proposals and making recommendations in respect to establishing and prioritising research and development projects, professional development programs and quality assurance activities; and

- Considering proposals and making recommendations regarding major project initiatives, having regard to national initiatives, organisational priorities, project cost and resource availability;

The Advisory Council will report directly to the Department of the Attorney General.

COMPOSITION OF THE ADVISORY COUNCIL

The composition of the Advisory Council must be at a level such that members can liaise directly with and influence senior decision makers. The Advisory Council shall comprise the following members:

- A (retired) judge;
- Head of Department, Forensic Biology
- A member of WA Police (such as a Deputy Commissioner);
- A representative from WA Health Department (such as the Chair of the North Metropolitan Health Service Board);
- A representative from the Office of the Director of Public Prosecutions (such as a Director or Deputy-Director)
- A representative from the Law Society of WA;
- A representative from another forensic science organisation (such as Director of Forensic Science, ChemCentre);
- A representative from academia (such as a Professor of a science faculty);
- A representative from the community/business sector (such as a CEO)

MEMBERSHIP

Representation on the Advisory Council shall be by invitation only and required to fill one of the designated positions. There will be a minimum number of six representatives to form the Advisory Council including the Chairperson.

A person may become a member upon being nominated by a current member of the Advisory Council. That nomination will then require endorsement by a majority of Advisory Council members and the position to which the Advisory Council reports before becoming effective.

The Head of Department, Forensic Biology will be responsible for the preparation of formal invitations to prospective Advisory Council members.

A person shall cease to be a member of the Advisory Council if they:

- miss three consecutive meetings without apology or leave of absence;
- resign from the Advisory Council;
- are deemed unsuitable by a majority of Advisory Council members;
- cease to represent a designated position as part of the composition of the Advisory Council.

An Advisory Council member may nominate a proxy to represent the member at no more than two meetings per annum. Where possible, written advice regarding representation by a proxy should be provided to the Secretariat prior to the meeting. The proxy carries all voting rights of the Advisory Council member.

Advisory Council memberships will be for a period of three years with a right of extension for a further two years, the latter by agreement of a majority of Advisory Council members and the position to which the Advisory Council reports.

MEETINGS

Ordinary meetings of the Advisory Council shall be held in February, June and November of each year. Special meetings may also be called, as required, by the Chairperson.

The Head of Department, Forensic Biology, with notification to the Chairperson, may seek advice from Advisory Council members at any time between meetings.

OPERATING PRINCIPLES

CHAIRPERSON AND SECRETARIAT SUPPORT

The Chairperson will be elected by Advisory Council members for a period of three years. Any extension would be for a period(s) of one year subject to agreement by a majority of Advisory Council members.

In the absence of the Chairperson, a person nominated by the Chairperson prior to his/her departure shall undertake such duties. In the case of an unforeseen absence by the Chairperson, the substitute Chairperson shall be the Head of Department, Forensic Biology.

FBD will perform the role of Co-ordinator and Secretariat for the Advisory Council.

ADMINISTRATIVE FUNCTIONS

The Secretariat will be responsible for preparing an agenda prior to each meeting. Members wishing to place items on the agenda should do so at least fourteen days prior to the next scheduled meeting.

Where possible, agenda papers will be circulated at least seven days prior to the meeting.

Notice of meetings shall be given at the previous meeting or at least twenty-eight days beforehand if such meeting is held out of sequence.

Each member on the Advisory Council has the right to raise an issue at meetings provided that the issue or topic falls within the parameters of the objectives of the Advisory Council.

Approved minutes are to be circulated to all members within twenty-one days of each meeting.

CODE OF CONDUCT

In order to achieve the objectives of the Advisory Council, members shall not pursue individual/specific issues which are more appropriately dealt with in other forums; nor pursue their private or alternative agenda or use their position on the Advisory Council to do so.

Unless specifically authorised by the Chairperson, Advisory Council members are not permitted to make public comment or cause any other person to make public comment on issues discussed or disclosed during their tenure on the Advisory Council.

REVIEW OF TERMS OF REFERENCE

These Terms of Reference will be reviewed following the first full year of operation of the Advisory Council and then as determined by the Advisory Council to ensure they are current and appropriate, particularly in relation to the role and function of the Advisory Council. Reviews should be no more than three years apart.

Appendix VI – North Metropolitan Health Service formal response to the Ross Inquiry Report

Government of Western Australia
North Metropolitan Health Service

Our Ref: D/17/28829
Enquiries: Gavin Turbett, 94733900

Ms. Jane Laurence
Solicitor to the Ross
Inquiry 189 Royal Street
EAST PERTH WA 6004

jane.laurence@health.wa.gov.au

Dear Ms Laurence

FORMAL RESPONSE TO THE REPORT FROM THE ROSSINQUIRY

The North Metropolitan Health Service (NMHS), PathWest Laboratory Medicine WA and the Forensic Biology Department (FBD) would like to thank Mr Ross and the Inquiry team for their significant efforts.

The report by the Ross Inquiry is welcome and accepted. The observations and recommendations that have been made provide further opportunity for continuous process improvement into the future.

The Inquiry Team have acknowledged that the science used at the FBD is of a consistently high standard. They noted that the quality of DNA profile results is consistently high, that the laboratory has a very high rate of compliance with the NATA assessment criteria, that proficiency test results are correct, and that no critical issues are being identified by internal audits.

The Inquiry Team have found that the commitment to quality at the FBD is led by senior management and is well accepted and supported across the agency. The culture of the laboratory is very positive and is strongly focussed on and committed to sound scientific processes and quality management at all times.

Please find attached comments and observation on the draft report for consideration as part of finalising the review.

PathWest FBD provides a critical state-wide service. While there has been recent negative publicity, the very important work done by the FBD on a daily basis is rarely acknowledged or recognised publically.

Yours sincerely

Professor Bryant Stokes AM

BOARD CHAIR

20 August 2017

FORMAL RESPONSE TO THE REPORT FROM THE ROSS INQUIRY

Anomalous Results: The NMHS are pleased that the Inquiry Team has determined that the occurrence of anomalous results during this time period was very low. The case files examined by the Inquiry team were typically large and very complex, comprising approximately 15,700 pages in total, and containing more than 3,100 DNA results.

The Ross Inquiry found a total of 11 anomalous results, indicating an overall error rate of 0.34%, and have concluded that none of the anomalous results appeared to have had any probative significance.

This overall error rate is comparable to, or lower than published error rates of 0.31 - 0.72% experienced by other forensic and DNA testing laboratories.[12]

The NMHS and the FBD acknowledge that while six anomalous results located within preliminary summary reports went undetected at the time, they were subsequently detected and corrected in the final Court reports issued for those cases.

Analysis of the findings of the Inquiry Team indicate that the remaining five anomalous results were undetected by the laboratory peer review process and went uncorrected.

Accordingly, the frequency of occurrence of undetected, uncorrected anomalous results by the Inquiry Team represents less than 0.16% of the total DNA results for the cases reviewed.

The FBD reporting procedures have changed since the time period represented by these cases (2007 - 2011). An analysis of the anomalous results observed by the Inquiry Team has determined that two of the five errors that went undetected and uncorrected would not occur in the current reporting system, and one further error would be very unlikely to occur in the current reporting system.

Only two anomalous results were located within final Forensic Biology Court reports and both of those relate to transcription of information into the report, which is currently still a manual process. Identification of this type of error is reliant on the peer review process. The FBD acknowledge Recommendation 1 of the Inquiry team and will continue to identify and highlight any manual actions remaining in the reporting process and eliminate them where possible.

---

[1] Kloosterman A, Sjerps M. & Quak A (2014). Error rates in forensic DNA analysis: Definition, numbers, impact and communication. Forensic Science International: Genetics, 12; 77-85.

[2] Wilson-Wilde L., Smith S., & Bruenisholz E. (2017). The analysis of Australian proficiency test data over a ten-year period. Forensic Science Policy & Management: An International Journal [in press].

While it is acknowledged that the occurrence of anomalous results was found to be higher in the summary reports, these reports are a very important aspect of the service provided by the FBD, as they are a critical mechanism by which important preliminary results are communicated to police investigators. Summary reports are not intended to be used for court purposes, and are issued with clear caveats to that effect.

While there are risks associated with the early communication of results, the NMHS and FBD believe that there are far greater risks to the community if such results were not communicated to police investigators in a timely fashion. The increased focus on the early communication of critical results for intelligence purposes was acknowledged by the Inquiry Team in their Report.

In regards to the anomalous result detected within a summary report which was not a transcription or typographical error, this matter is being investigated further by the FBD. While the Inquiry Team have concluded that the anomalous result was highly unlikely to be of any probative significance, the matter will be discussed with the WA Police and the ODPP once this report has been released, and further action taken as deemed necessary.

The Inquiry Team found that critical enhancements have been made by the FBD since the review period of 2007 - 2011 to minimise the overall risk of transcription and typographical errors. These included the implementation of a new IT system for the recording of case-related communications and reduced manual processes from sample collection to reporting. In addition, the NMHS wishes to point out that there have been additional enhancements and improvements made, including the introduction of barcode scanners, the electronic transfer of critical data to and from the WA Police and the recent acquisition of an electronic document and content management system.

The NMHS and the FBD agree that an IT-enabled interdepartmental communication system would significantly enhance the provision of forensic services in WA, particularly if it permitted an integrated solution to evidence management and electronic reporting between agencies. The implementation of such a system will require extensive collaboration and coordination between multiple government agencies.

The NMHS and the FBD have a permanent and ongoing commitment to the process of continuous improvement, and will seek to learn from the findings of the Inquiry Team and develop additional strategies to further minimise risk.

Facility: The NMHS and the FBD agree that the current facility has significant limitations, particularly in regards to the ability of staff to author complex reports and undertake peer review activities. Despite these limitations, the Inquiry Team did observe that the quality of the science undertaken by the FBD is of a consistently high standard. Significant planning is currently underway to address the issues regarding the space and accommodation requirements of the FBD

.

Resources: The Inquiry Team have correctly identified that the FBD staff are under significant pressure to manage the workload and to continue to meet the very high expectations of the WA community. The Inquiry Team noted that turn-around times are impressive, and the goal of the FBD is to ensure that this continues in the face of ever-increasing demands for forensic DNA analysis. An additional four reporting forensic scientists are being appointed this year, as well as two staff specifically dedicated to research and development activities.

Budget: The NMHS and the FBD consider that the funding model for operations, including ICT and equipment, is acceptable. However, it is agreed that there is no clear mechanism to acquire the significant funding that would be required to address the FBD accommodation.

Governance: The NMHS and FBD welcome the recommendation made by the Inquiry Team regarding the formation of an Advisory Council as part of the governance arrangements for FBD, and will investigate this proposal further.

There are a small number of specific points the FBD wishes to address regarding the findings or conclusions detailed in the Inquiry Report. These points have been raised with the Inquiry Team during preparation of this response, and are detailed in the Appendix to this letter.

APPENDIX - ADDITIONAL COMMENTS BY FBD

Quality Management

Concerns about *"item/exhibit security"* related in part to issues around exhibit labelling. This exhibit labelling issue has been addressed since this time period (2007 – 2011).

Numbering and Labelling of Items

There is a system for "single, uniform, 'cradle to grave' numbering or labelling of items for analysis" by WA Police, and evidence of this was provided to the Inquiry Team. WA Police generate unique identifiers for each exhibit to be analysed and these identifiers are imported into the FBD system and are traceable throughout receipt, analysis and reporting. It must be acknowledged that these identifiers cannot be used on their own, as sub-sampling of exhibits within the laboratory is common and requires an additional layer of identification to differentiate individual sub-samples taken from the parent exhibit.

Recommendations

The Inquiry Team suggest that an ICT solution is required to ensure that it is not possible for reports to be issued without having been peer reviewed. Whilst the Inquiry noted no instances of unreviewed reports being issued, the FBD agree that such a solution is highly desirable, and would further enhance current quality assurance processes.

Appendix VII - Biography Mr Alastair Ross AM

Mr Alastair Ross is a Member of the Order of Australia (AM). Alastair began his career in 1976 as a forensic scientist in South Australia serving with the South Australian Forensic Science Centre until 1990.

In 1992 Alastair was appointed as the first director of the newly established National Institute of Forensic Science (NIFS). Under his leadership NIFS developed into an internationally respected institution.

Alastair has played a key role in the development of forensic accreditation in Australia. He chaired the National Association of Testing Authorities (NATA) Forensic Science Accreditation Advisory Committee for many years and Chaired the Board of NATA.

Alastair is renowned for his work with the Senior Managers of Australia and New Zealand Forensic Laboratories (SMANZFL) group and with NIFS supporting their Scientific Advisory Groups (SAGs) to develop individual disciplines.

In 2003 Alastair left NIFS and took up a position as Director of the Victoria Police Forensic Science Centre (VPFSC), a role he held for five years. During this period Alastair guided VPFSC throughout a significant period of change.

In 2008 Alastair returned to NIFS, for his second term as Director finally retiring from this position in July 2015. Over his two periods as Director of NIFS Alastair left a 20 year legacy of achievements.

Alastair has received recognition at a national and international level with the Adelaide Medal, the John Harber Phillips Award and a Member of the Order of Australia.

This document can be made available in alternative formats on request for a person with a disability.