Witness Name: Professor John Anthony James Barbara

Statement No: WITN6989001

Dated: 06/01/2022

INFECTED BLOOD INQUIRY

WRITTEN STATEMENT OF PROFESSOR JOHN ANTHONY JAMES BARBARA

I provide this statement in response to a request under Rule 9 of the Inquiry Rules 2006 dated 24 August 2021.

I, Professor John Anthony James Barbara, will say as follows:

Section 1: Introduction

1. Please set out your name, address, date of birth and professional qualifications.

1. Professor John Anthony James Barbara.

2. My date of birth is GRO-C 1946.

3. My address is c/o NHS Blood and Transplant, Head Office, 500 North Bristol Park, Filton, Bristol, BS34 7QH.

4. My professional qualifications are:

Qualification	Year
BA (Hons) Cantab Natural Sciences	1968
M.Sc. Birmingham	1969
Ph.D. Reading	1972
M.A. Cantab	1972
Fellowship of Institute of Biology, now the Royal Society of Biology (FRSB)	1983
Membership of Royal College of Pathologists	1990 (backdated to 1987)
FRCPath	1997
FBBTS	2021

5. I make this statement in response to a request for evidence by the Inquiry under Rule 9, dated 24 August 2021. It is based on my own recollection of events and following consideration of the documents provided to me.

3. Please set out your employment history with dates if possible, including the various roles and responsibilities that you have held throughout your career.

6. My employment history is set out below:

Role	Employer	Period
Previous employment and appointments		
Temporary Student Teacher	Damers Road Primary School, Dorchester	1964 - 1965
Examiner	Oxford University GCE A Level Biology	1974 - 1985

Lecturer	Department of Virology, Reading University	1972-1974
Honorary Associate Research Fellow	Brunel University	1988 -1999
Research Student Supervisor	Open University	1988-1999
Blood Service employment and appointments		
Head of Microbiology	North London Blood Transfusion	1974 - 1996
Honorary Senior Lecturer	Medical School, University College London (Middlesex Hospital)	1978-1990
Microbiology Consultant	National Blood Authority	1994 - 2001
Emeritus Microbiology Consultant	National Blood Authority	2001 - 2005
President	British Blood Transfusion Society	1995 - 1997
Vice-President	International Society of Blood Transfusion	2000 - 2004
Principal/Head	National Transfusion Microbiology Laboratories	1991-2001
Visiting Professorship	University of the West of England	2000 – 2005
Visiting Professorship	University of Plymouth	2000 – to date

7. I have a visiting professorship at the University of Plymouth and continue to provide lectures to students on various topics. I attach a copy at **WITN6989002** (part one) and **WITN6989003** (part two) of my lecture slides on '*Microbial Threats to Transfusion Safety*' provided on 30 October 2019. I

also attach at **WITN6989004** a copy of my lecture slides on *'A Tale of Two Entities'* dated 12 December 2017. I have also referenced specific slides from both lectures in responding to specific questions in the request for evidence by the Inquiry under Rule 9.

3. Please set out your membership, past or present, of any committees, associations, parties, societies, or groups relevant to the Inquiry's Terms of Reference, including the dates of your membership.

8. Membership of committees/working parties/professional bodies:

Name	Role
NLBTC Counselling Working Group	Member
NLBTC Research and Development Committee	Member
NLBTC Staff Regrading Committee	Member
NLBTC Staff Appraisals Committee	Member
Regional Professional Advice Group for Blood Transfusion	Member
Standing Advisory Committee on Transfusion – Transmitted Infection	Secretary
ACTTD sub-committee on Laboratory Aspects	Chairman
BTS Post-Transfusion Hepatitis Working Party (absorbed into ACTTD)	Secretary

NIBSC/NBTS Microbiology Advisory Group on QC in Blood Transfusion and provision of working standards	Member
CPHL/BTS Improved Services Steering Group	Member
UK Blood Transfusion Service and British Blood Transfusion Society, Transfusion Microbiology discussion group	Chairman
National BTS Laboratory Staffing Working Party	Member
Whitley Council; BTS clinical scientist	Assessor/Advisor
NIBSC/UK Transplant Support Service Working Party on Microbiological Safety	Member
NBA Task Force: Batch Pre acceptance Testing Testing Safety Research & Development	 Chairman Co-opted member Transfusion Microbiology Advisor
BPL plasma specification working group	Microbiology representative
Advisor to RC Path working party on HIV	Advisor
NBA Reference and Reporting Coordination Group	Chairman
NBA NAT Steering Group	Member
NBA NAT Scientific Group	Chairman
NBA NAT Review Group	Member

NBA Kit Monitoring Group	Member
NBA CJD R&R Working Party	Member
Serious Hazards of Transfusion () Steering Group	Founder/Member
MDA Diagnostics Committee	Member
NBA R&D National Review Group	Member
International Blood Transfusion Society; Working Party on Transmissible Diseases	Member
Canadian Red Cross; working party on Transfusion Infection	Member
Member of WHO Expert Advisory Panel on Blood Transfusion Medicine	Member
ESTM	Coordinator, lecturer and chairman of scientific committee
Institute of Biology	Member (and latterly Honorary Member)
British Blood Transfusion Society	Member
American Association of Blood Banks	Member
International Society of Blood Transfusion	Member
Royal College of Pathologists	Member; Fellow
Association of Clinical Microbiologists	Member
The Society of Authors (and the Medical Writers Group)	Member

Various international journals	Editorial group member
Journal of Transfusion Medicine	Associate Editor

9. I was also a senior editor of the book '*Transfusion Microbiology*' dated 1986, with Dr Fiona Regan and Dr Marcela Contreras (now Professor Dame). This book covered the huge expanse of how microbiology had developed in blood transfusion and specific extracts have been exhibited to specific questions in my response to the request for evidence by the Inquiry under Rule 9.

10. Extensive measures are taken to ensure that blood transfusion poses a minimal microbiological hazard to recipients. Transfusion Microbiology describes all aspects of transfusion transmitted infections. This comprehensive text covers all medical, scientific, technical, and developmental aspects of this critically important sector of transfusion medicine. A detailed discussion of all infective agents, donor issues, testing and pathogen inactivation is provided. Agents causing major concern at the time, such as vCJD, are considered in the context of historical experience with agents such as HIV. All aspects of risk assessment, regulation, cost benefit analysis and quality management are reviewed. It is relevant to blood transfusion centres, hospital transfusion laboratories, haematologists and microbiologists, medical, scientific, and technical staff, universities, and general training programmes worldwide.

4. Please explain how you kept abreast of medical and scientific developments and research in your field during your career.

11. I kept abreast of medical and scientific developments by being on various national and international committees; working parties; advisory groups,

having national and international professional contacts, attending (and speaking at) various national and international conferences and symposiums, conducting in-house R&D projects, being associate editor of several journals, extensive reading of books and journals (and contributing to them), writing the book 'Microbiology Blood Transfusion (John Wright, 1986), co-editing the book '*Transfusion Microbiology*' dated 1986 and maintaining a supervised Continuing Professional Development (CPD) portfolio (previously, Continuing Medical Education or CME).

5. The inquiry understands that you have provided written and oral evidence in the Hepatitis Litigation in the High Court in London before Mr Justice Burton. Please consider this evidence. Does it remain true and accurate? If there are matters contained in these statements or in the oral evidence you gave to the High Court that you do not consider to be true and accurate, please explain what they are.

12. I have read my written statement and oral evidence provided in the Hepatitis Litigation in the High Court in London before Mr Justice Burton and I consider that the evidence remains true and accurate.

13. I did provide a slideshow during my oral evidence in the Hepatitis Litigation in the High Court in London before Mr Justice Burton on or around 30 October 2000. I do not have a copy of this slideshow and it has not been provided in the Inquiry exhibits. The purpose of the slideshow was to simply introduce his Lordship to basic scientific concepts of blood transfusion microbiology via visual aids

6. Please confirm whether you have provided evidence or have been involved in any other inquiries, investigations, criminal or civil litigation in relation to the human immunodeficiency virus ("HIV) and/or hepatitis B virus ("HBV) and/or hepatitis C virus ("HCV") infections and/or variant Creutzfeldt-Jakob

disease ("Vcjd") in blood and/or blood products. Please provide details of your involvement.

14. I have not been asked to give evidence or opinion in relation to any other inquiries and nor have I been involved in any other criminal, civil or coronial investigations, other than being sued as a patent co-holder of a British anti-HCV assay which was found to infringe the patent on a similar assay developed by Chiron Corporation and Ortho Diagnostics.

15. I also recall providing expert opinion for potential litigation in Australia in respect of how the Blood Service in Australia had handled certain issues. I do not recall if any of the Australian claims materialised and I do not have a copy of the statement provided or any correspondence in respect of this.

Section 2: Your role at North London Blood Transfusion Centre

7. Please describe the roles, functions, and responsibilities you had at the North London Blood Transfusion Centre ("NLBTC") during your period as Head of Microbiology and explain how these changed over time, if applicable.

16. Prior to joining the transfusion service, I had my undergraduate training in natural sciences at Trinity College, Cambridge. I received an MSc in General Virology from the University of Birmingham and a PhD from the University of Reading in smallpox and vaccinia viruses, where I went onto to become a lecturer in Virology.

17. In 1974, I commenced working at the North London Blood Transfusion Centre ("NLBTC") as a Senior Scientific Officer and Head of Microbiology. I was employed to provide a cohesive system of microbiology at the centre, which was then under the directorship of Dr Tom Cleghorn, with Dr David Dane as the Honorary Consultant. Dr Dane was one of the first scientists of

the Middlesex Hospital to recognise the importance of transfusion microbiology and to encourage its development as a discipline of transfusion medicine. Dr Dane and colleagues identified the infectious particle of the hepatitis B virus (HBC).

18. Dr Contreras commenced work at NLBTC at the same time as I did, as a Senior Scientific Officer, and subsequently became Deputy Director and then Director. Although my main responsibilities are set out below, one of my key responsibilities was to provide her with technical updates from the field of microbiology. Although I was providing her with specialist input, she was (and is) undoubtedly a specialist in her own right (and a co-editor of '*Transfusion Microbiology'* dated 1986).

19. My responsibilities as Head of Microbiology at NLBTC evolved over time with the developments in the field of microbiology and included but are not limited to the following:

- The testing of blood for an ever-expanding range of transfusion-transmissible infections (TTIs);
- follow up of reports of post-transfusion infections (PTIs) and investigation of donors involved;
- bacterial checking of plasma for BPL;
- detection of donors with high levels of antibodies to various infections (for provision of 'specific' antibody positive plasma to BPL for production of specific IgG preparations);
- counselling of confirmed-positive donors, production of protocols for all the above, staff training and development, reporting of relevant 'positives' to CDSC;
- R&D in all the above activities; and
- Management of budget and staffing for the department.

20. We did not give any blood transfusions at the centre. We were instead involved in the collection and supply of blood and blood components for use in hospitals and other laboratories. The confusion regarding centres as a place where blood transfusions were given, was I believe one of the reasons why the name changed from National Blood Transfusion Service to National Blood Service.

21. NLBTC was a leading centre. Each RTC (Regional Transfusion Centre) was managed by its own independent medically qualified Regional Transfusion Director (RTD), appointed by and answerable to his or her region (through the Regional Health Authority) and was concerned with meeting the needs of that region.

22. As Head of Microbiology at NLBTC, I would have been managerially and administratively accountable to whoever was head of the RTC or Zone for each period (as they were often re-organised) and professionally accountable to whoever was the medical director.

23. When the service became zonal, I became Head of the Zonal Transfusion Microbiology Laboratories. Similarly, when the Blood Service became National, I became Head of the National Transfusion Microbiology Laboratories. In these posts I was no longer responsible for routine screening of blood for infectious agents and expanded the other aspects of my previous responsibilities. These laboratory structures were comprised of:

- Virology confirmatory.
- Bacteriology and confirmation.
- Surveillance, epidemiology and microbiological risk assessment; and
- Transfusion microbiology research and development.

8. The inquiry understands that NLBTC was the only regional transfusion centre to employ a microbiologist. Is this correct? Why was it thought necessary to have such a post at the NLBTC?

24. NLBTC was the only RTC in England to employ someone with a PhD or equivalent in microbiology to head their microbiology laboratories. Other RTCs had senior technical staff with microbiology experience to head their microbiology laboratories.

25. At NLBTC, Dr Dane was our Honorary Microbiology Consultant and together with Dr Cleghorn (Director), they felt that the microbiological aspect of transfusion medicine would increase significantly. As the microbiological risk from blood increased over time with the identification of the causative agents of existing conditions (e.g., '*NANBH*' later identified as *'hepatitis C'*) or the advent of new agents (e.g., HIV) they were proven more than correct; indeed '*visionary*'.

26. The fact that I was a post-doctoral microbiologist at an RTC was one of the reasons why I was a member and initiated so many committees, associations, working parties, societies, or groups (see my response to question 3 for a full list).

27. As there was significant mass testing going on nationally, there was a huge amount of prevalence and incidence data to be co-ordinated, collated and used as research and a springboard for national projects and development.

9. Please describe the organisation of the NLBTC during the time you worked there, including:

a. its structure and staffing and to whom you were accountable.

28. Please see my response to question 7 above.

29. When I commenced as Head of Microbiology at NLBTC in 1974, there were approximately 6 or 7 microbiologists in my department who would report to me directly. At NLBTC, the microbiology staff were clinical scientists rather than 'technicians' (now classified as Medical Laboratory Scientific Officers or M250s).

30. I then reported directly to the Regional Transfusion Director (RTD), whom I met on average once a week. However, if we were working on a research paper or project on behalf of NLBTC, I may have seen the Director more often but this varied.

31. When Dr Contreras (now Professor) became RTD at NLBTC in 1984, Dr Patricia Hewitt and I took on the medical and clinical scientific responsibility for microbiology. We used to meet often, but I cannot recall how often.

32. In later years when we changed to zonal and national, I reported to a Medical Consultant but with access to the Director of Diagnostics, Development and Research (DDR) as well. As microbiology was such an important part of blood safety, my access to the Director was unfettered.

33. I unfortunately do not recall the details of the structures of the other departments at NLBTC.

b. How the NLBTC was funded and how this changed over time

34. I was not involved in funding at NLBTC and am therefore unable to answer how this changed over time. This would have been a matter for the Director.

c. Its remit, including the geographical area it covered and the hospitals within its area

35. NLBTC's remit was to provide sufficient safe and effective blood and components to the hospitals in our region.

36. I do not recall how many hospitals NLBTC served within its area but it included several major London Teaching Hospitals.

d. How decisions were made, in particular how you incorporated the views of other scientists and experts working at the NLBTC;

37. Decisions were made by reviewing issues as they arose, having weekly Heads of Department meetings, and direct discussions between myself, the RTD and other relevant medical, scientific, and logistical staff.

e. Its place in the NBTS together with information as to whom the centre was answerable to at the NBTS, if anyone. When answering this question, please refer to paragraphs 4-16 of Dr Harold Gunson's statement in A v Others v National Blood Authority and another [2001] 3 All E.R.289 (A & Others) and explain whether you agree with what is said there.

38. NLBTC was one centre within the 15 or so RTCs at the time and the RTD regularly attended the decision-making meetings of the Regional Transfusion Directors (RTDs) group.

39. I have read paragraphs 4-16 of Dr Harold Gunson's statement in *A and Others – v – National Blood Authority and Another* and agree with Dr Gunson's summary. I understand he was Consultant Adviser to the Minister of Health from 1981 to 1988 and then National Director from 1988 to 1994, but I was not privy to the details of these mechanisms.

f. Whether the NLBTC was associated or linked with other Regional Transfusion Centres (RTCs) and, if so, how and for what purpose;

40. NLBTC was associated with other RTCs. Please see my response to question 7 above.

g. Whether the RTC was subject to any form of regulation and if so, what; and

41. RTCs were regularly inspected and regulated.

42. I recall inspections from the Medicines Control Agency (MCA), which was the predecessor of the Medicines and Healthcare Products Regulatory Agency (MHRA).

43. NLBTC was also regulated via product liability.

h. The NLBTCs relationship with the Blood Products Laboratory (BPL) and any other laboratory involved in the production of blood products or processing of blood.

44. NLBTC provided plasma to BPL for the production of fractionated blood products.

Section 3: Services for Donors at the NLBTC

10. What Counselling was offered to donors prior to (i) HIV testing and (ii) HCV testing and (iii) HBV testing taking place? Please describe the process:

45. There was no counselling for donors prior to HBV testing.

46. I initiated counselling for HBV positive donors at NLBTC with the help of Dr David Dane who was our Honorary Consultant and to whom (along with Dr Cameron and Moya Briggs)we dedicated our book '*Transfusion Microbiology*'.

47. There was no specific pre-donation counselling of donors for HIV and HCV screening. However, information was made available to them in the form of leaflets and the '*Aids Questionnaire*'.

11. What counselling and psychological services were available for donors who tested positive for hepatitis or HIV? Were such services delivered by NLBC or were referrals to other agencies made?

48. Counselling for HBV and HIV positive donors was given at NLBTC.

49. We delivered the initial advice but then referred the donors to specialist hospitals/agencies if any clinically significant issues were identified.

50. These specialist hospitals/agencies were able to offer a fuller medical counselling service for conditions such as HIV and hepatitis.

51. This mainly fell within Dr Patricia Hewitt's remit and she would be better able to describe the relevant processes.

12. What counselling and psychological services were available for recipients of infected donations? Were such services delivered by the NLBTC or were referrals to other agencies made? Please describe the process.

52. Recipients of infected donations were cared for clinically (which would have included counselling) at the relevant hospitals/agencies.

13. Please explain your role, if any, in donor counselling and how this evolved over time.

53. I initiated HBV counselling at NLBTC with the assistance of medical colleagues and advice from our Honorary Consultant, Dr Dane.

54. When testing for HIV commenced, my role in HBV counselling was reduced, with other medical colleagues taking over most of this responsibility.

55. Dr Patricia Hewitt set up a counselling committee for NLBTC to discuss the cases. This committee comprised of consultant clinical scientific staff and external specialist counselling input from Psychotherapist, Riva Miller (Royal Free Hospital).

56. I will refer any questions on counselling at NLBTC to Dr Patricia Hewitt, who will be better placed to answer those questions.

14. Were these arranged sufficient in you view. If not, why not? Did your view change over time.

57. These arrangements were sufficient and led the National Blood Service approach.

58. The insufficiency would have been the ability of the blood bank to trace which patient had received the blood, which was one downside of the process discovered during the HCV lookback.

59. Hospital records were the main insufficiency when it came to locating recipients of blood and blood products.

Section 4: Meetings of various committees

UK Advisory Committee on Transfusion Transmitted Diseases

15. In 1989, the UK Advisory Committee on Transfusion Transmitted Diseases ("ACTTD") was set up by Dr Harold Gunson to consider the implications of transfusion-transmitted infections of the transfusion services in the UK and provide advice to the Department of Health. The Inquiry has provided minutes of the meetings of this group that you attended in the below schedule for your assistance. Please explain your involvement in ACTTD.

60. I was a member from February 1989 to October 1993, when the committee changed to Standing Advisory Committee on Transfusion Transmitted Infections (SACTTI), of which I became Secretary until 1995, when I was replaced by Dr Lorna Williamson.

16. What was the function and remit of this committee? In particular:

a. Who did the ACTTD report to, how frequently and by what means?

61. I understand that Dr Gunson as the Chair of the committee reported to the Department of Health as necessary. I'm afraid that I do not recall any further details.

b. Did the ACTTD have any powers or was it purely advisory?

62. I understand that ACTTD'S position was purely advisory.

63. The National Directorate of the NBTS (formed on 28 July 1988) at the time did not have any executive authority.

64. Although the RTCs remained the responsibility of their regions, ACTTD's recommendations would have been incorporated into NBTS practice.

c. Did the Department of Health generally take the advice of the ACTTD? Please set out any instances you are aware of, relevant to the Inquiry's Terms of Reference, where the ACTTD's advice was not accepted.

65. I do not recall the Department of Health's responses to the advice of the ACTTD.

17. In May 1989 the Committee requested that the National Director of the Blood Transfusion Service approach the Minister of Health and advise him of the "*urgent need*" to organise the Blood Transfusion Service's response to the problems of evaluating commercial tests; confirmatory tests; quality control support; and research and development (NHBT0000088_001, page 3). Did you agree with this view? If so, why? If not, why not? Do you know if an approach

was made to the Minister of Health? If so, what was the result of the approach?

66. I understand from document (**NHBT0000088_001)** that I attended the UK Advisory Committee on Transfusion Transmitted Disease on 14 May 1989, however, I do not recall this meeting and what was discussed.

67. I understand from reading the document that I agreed with the need for test kit assessment.

68. I do not recall whether an approach was made to the Minister of Health nor the result of any such approach.

18. At a meeting in June 1991 you were asked by Dr Gunson to chair a sub-committee to review policy decisions made by the Committee (NHBT0000044_003, page 1). Please answer the following:

a. What was the criteria for your appointment as chair of the sub-committee?

69. I understand from document (**NHBT0000044_003**) that I attended the UK Advisory Committee on Transfusion Transmitted Disease on 10 June 1991, however, I do not have any actual recollection of this meeting.

70. On consideration of the document for the purpose of my response to the Inquiry, it is clear that I had been asked to chair this sub-committee to consider the implementation of policy decisions made by the committee and would have been appointed as the only consultant clinical virologist in the Blood Service.

b. Please explain the remit of the sub-committee and whether, in your opinion, the sub-committee was necessary.

71. As contained in the (**NHBT0000044_003)**, the sub-committee had the following structure with specific terms of reference:

    a. To advise the UKBTS/NIBSC Liaison organisation, the NBA and the SNBTS on all matters of concern regarding the possible transmission of infection by the transfusion of blood, its components and, via donor plasma, fractionated plasma products. This advice should also cover the possible transmission of infection by other banked tissues processed by and held at Transfusion Centres.

    b. To commission, conduct and co-ordinate trials of new technology involved in the screening of donors for infectious agents transmissible by transfusion, consistent with the work of the national research committees.

72. I would certainly have agreed that the sub-committee was necessary at the time, otherwise I would have declined the appointment as Chair.

c. Was there an overlap in the work of the Committee and the sub-committee, or the sub-committee and any other committee or group you were aware of?

73. I do not recall whether there was any overlap in the work of the committee and the sub-committee, or the sub-committee and any other committee or group.

Standing Advisory Committee on Transfusion Transmitted Infections (SACTTI)

19. The Inquiry understands that ACTTD was replaced with the Standing Advisory Committee on Transfusion Transmitted Infections ("SACTTI") following the creation of the NBA in 1993 (DHSC0006906_013). The Inquiry has provided minutes of meetings of this group which you attended in the below schedule for your assistance. Please explain the extent of your involvement in this committee.

74. Following ACTTD being replaced with the SACTTI, I was appointed as Secretary and then member until around 2000.

20. What was the function and remit of SACTTI? In particular:

a. Who did SACTTI report to, how frequently and by what means?

75. SACTTI would report to the Executive Committee of the UKBTS/NIBSC Liaison Group, on which both the national medical directors for England and Scotland sat.

76. I understand that there were no formal reporting links between SACTTI and MSBT. The remits of these respective committees were quite different i.e., SACTTI was the expert professional advisory group for the UK Transfusion Services and their respective national medical directors, whereas the MSBT was an expert advisory group advising ministers on policy.

77. Chairpersons of each SACTTI reported recommendations to the executive committee and any recommended courses of actions should have been directed from this executive committee.

b. Did SACTTI have any powers or was it purely advisory?

78. It was an expert professional advisory committee advising the UK Transfusion Services and reporting to the executive committee of the UKBTS/NIBSC Liaison Group.

79. RTCs would be expected to implement instructions from the committee.

c. How, if at all, did SACTTI's remit differ from its predecessor ACTTD?

80. I do not recall whether SACTTI's remit differed from its processor ACTTD.

21. Please explain the relationship, if any, between SACTTI and the NLBTC, including but not limited to:

a. Whether SACTTI made decisions that the NLBTC was required to implement;

81. NLBTC would have been expected to implement decisions made by SACTTI.

and b. Whether, and how frequently, you provided feedback on the recommendations made by SACTTI. Please explain, to the best of your knowledge, the relationship between the SACTTI and other RTCs.

82. I do not recall whether and how frequently, I provided feedback on the recommendations made by SACTTI.

83. RTCs would have been expected to implement decisions made by SACTTI.

22. What was the impact, if any, of there being so many committees in place at around the same time? Was there overlap between them? If so, how did this impact their effectiveness?

84. The number of committees reflected the resolve of the service to make the best decisions regarding all aspects of the microbial safety of blood.

85. Any overlap would have only enhanced this resolve.

NBS Microbiology Test Kit Evaluation Group (KEG)

23. The Inquiry has provided minutes of meetings of this group which you attended in the below schedule for your assistance. Please explain your involvement in this committee.

86. I initiated and chaired this group until in or around 2003 (when I was replaced as Chair by Roger Eglin).

87. The group evaluated candidate microbial screening test kits for sensitivity, specificity, robustness, and compatibility with service needs such as test turnaround times and test process control. This would include computer compatibility.

88. The group worked in conjunction with Dr John Parry from the Central Public Health Laboratory (CPHL) who ran the sensitivity panels for these assays. These comprised panels of known positives and also seroconversion panels for specific microbial agents.

89. Seroconversion panels were crucial in understanding the sensitivity of assays. If you want to assess the sensitivity of an assay, you can do this by taking a positive sample and making serial dilutions of that, running them

through the test and seeing when the test becomes negative. So, if the titre is very high, you can dilute a lot and still have reactivity. This is effective for assessing **antigen** assays such as HBsAg.

90. With **antibody** assays, they will detect the mix of different antibodies in an individual's response. So, one assay may be better for detecting one particular antibody and if you were to make dilutions for testing then you might dilute a relevant antibody more quickly and this could affect the real sensitivity. Testing for the sensitivity of antibody assays is therefore much better done by using seroconversion panels.

91. If we consider commercial plasma collection in the US, the paid donor panel may well contain intravenous drug users who would donate to help pay for their drug dependence.

92. They therefore might well be positive for hepatitis B, hepatitis C and subsequently HIV. To avoid wasting whole pools of plasma, when a donor gave his series of plasma donations (500ml) (two or three days apart) they would be put 'on hold'. This would not be a full quarantine allowing time for any symptoms that might occur, but the donations would be kept together until the end of the donation series. If that donor, after a few weeks, was still healthy and showing no signs of developing infections, then those plasma units would be released for pooling.

93. If during the donation sequence, the donor became ill or became positive for one of the relevant viruses, you then had around 20 units of plasma just two or three days apart and you could take one ml of each of these donations, assemble them into a 'panel', and you would then have a biological resource where if you were to test each of these samples, you would be able to see exactly when the test reacted as a positive.

94. The more sensitive the assay, the earlier you would detect positivity. Seroconversion panels became a commercial money spinner because they were vital for those laboratories around the world who were assessing the sensitivity of different assays.

95. **Slides 11 to 13** of my lecture slides on '*Microbial Threats to Transfusion Safety'* provided on 30 October 2019 at **WITN6989003** illustrate the results from seroconversion panels for HIV, HBsAg and HCV.

96. As antibody assays detect antibodies against several different proteins or components of the virus, you might have to run 10 or 20 seroconversion panels and take an average of the performance, to give a fuller assessment of the overall sensitivity. Therefore, we collaborated with Dr John Parry who was funded to purchase such panels for clinical laboratory use and of course for use for the Blood Service. This was a critical advance in assessing sensitivity of assays.

97. Prior to KEG – the Kit Evaluation Group - individual laboratories would run dilution series to assess sensitivity.

98. When a new test was introduced, as well as *sensitivity* assessment, *specificity* would have to be examined. This entailed recording the rate of reactive samples when testing several thousand donations.

99. For ease of reference, sensitivity is the ability of a test to correctly identify patients with an infection. Specificity is the ability of a test to correctly identify people without the disease. A true positive is when the person has the infection and the test is positive.

100. Armed with sensitivity and specificity data, laboratories would look at the logistics and performance of the assay. For example, how long the test

took, how amenable it was to quality control (QC) and compatibility with computerisation, and automation as this became available.

101. When you had obtained all the data, it would be considered at the next KEG meeting to assess suitability for routine use. The secretary of KEG would send the minutes of the meeting to the National Medical Director.

24. What was the function and remit of the NBS Microbiology Test Kit evaluation group? In particular:

a. Who did the group report to, how frequently and by what means?

102. The group reported to the National Medical Director as often as new assays became available for existing or new microbial agents. This was reported by way of written minutes.

b. Did the group have any powers or was it purely advisory? You may find point 5 of NHBT0005570 of assistance when answering the above questions.

103. The group's findings formed a basis for tendering for assays for purchase. Only group approved assays could be considered for tendering.

Working Party on Transfusion-Associated Hepatitis

25.The Inquiry has provided minutes of meetings of this group which you attended in the below schedule for your assistance. Please explain your involvement in this committee.

104. I was elected as Secretary on 27 September 1982. Prior to that I was a member. Dr Gunson was Chairman.

105. The purpose of this group was to promote the investigation of the epidemiology of transfusion-associated hepatitis, to promote research into the methods of prevention, and to make recommendations to the Directors of the UK Transfusion Service regarding procedures and screening tests necessary for its prevention.

106. The purpose was not extended to include other transfusion-associated infections, although it was recognised that experience gained with the co-ordination of reports etc of transfusion-associated hepatitis could be applied to other infections where appropriate.

26. What was the function and remit of the Working Party on Transfusion-Associated Hepatitis? In particular:

a. Who did the working party report to, how frequently and by what means?

107. I'm afraid that I do not now recall who the Working Party on Transfusion-Associated Hepatitis, reported to, how frequently or by what means.

108. However, Dr Gunson was the Chair and he was also a Member of the ACVSB/MSBT, the Department of Health committee.

Did the group have any powers or was it purely advisory? You may find NHBT0094552 of assistance when answering the above questions.

109. I do not recall whether the group had any powers or whether it was purely advisory.

Working Group on Microbiology

27. The Inquiry has provided minutes of meetings of this group which you attended in the below schedule for your assistance. Please explain your involvement in this committee.

110. I believe that I was a member of this committee from around December 1987.

28. What was the function and remit of the Working Group on Microbiology? In particular:

a. Who did the working party report to, how frequently and by what means?

111. I do not recall who this Working Group on Microbiology reported to, how frequently or by what means.

b. Did the group have any powers or was it purely advisory?

112. I do not recall whether the Working Group on Microbiology had any powers or whether it was purely advisory

29. In January 1988 the Working Group on Microbiology discussed the responsibility for checking the quality of bulk plasma. The working group recorded (at point 2.3 of NHBT0007639) that it was unclear where the responsibility for checking the quality of bulk plasma lay. When did the responsibility for checking this become clear, and who was responsible?

113. I have read paragraph **2.3** of (**NHBT0007639**) which is the minutes from the Working Group on Microbiology on 15 January 1988. I do not have any recollection of this meeting nor what was discussed.

114. I understand from reading the minutes, that it was discussed during the meeting that there was a need for a central authority/body/institution to collect and co-ordinate information and give guidance on quality control matters. It was suggested that possibly a centre could record and provide information on data on supplies and quality of products in various RTCs; on reactions and diseases developing in recipients of blood, blood component or plasma fraction products. Also, advice on special matters such as how to take blood from infected persons could be provided. It was not clear at the time where responsibility lay for checking the quality of blood packs, and for the quality of bulk plasma.

115. The transfusion centres were responsible for the quality of the plasma that they supplied to BPL. Once the plasma was sent to BPL for fractionation in bulk, it was for them to apply their quality control procedure of the plasma from that point.

116. Therefore, a central scientific authority to audit all such work and quality control was desirable at the time.

30. The minutes also refer to a central checking authority, was this ever organised?

117. I do not recall whether a central checking authority was ever organised.

Transfusion Medicine Sub-committee on the Speciality Advisory Committee on Haematology

31. The Inquiry has provided minutes of meetings of this group which you attended in the below schedule for your assistance. Please explain your involvement in this committee.

118. I was a member of the Transfusion Medicine Sub-committee on the Speciality Advisory Committee on Haematology

32. What was the function and remit of this committee? In particular:

a. Who did the group report to, how frequently and by what means?

119. I do not recall who the Transfusion Medicine Sub-committee on the Speciality Advisory Committee on Haematology reported to, how frequently or by what means.

b. Did the group have any powers or was it purely advisory?

120. I do not recall if the Transfusion Medicine Sub-committee on the Speciality Advisory Committee on Haematology had any powers or whether it was purely advisory.

33. At a meeting in September 1995, consent for transfusion was discussed. It was noted that "patients should be made aware that they may be transfused and that written information emphasising minimal risk should be available in a 'user friendly' format. This would be preferable to obtaining written consent to transfusion" (RCPA0000019_018, page 1). Did you agree with this? If so, why? If not, why not? Did a preference for oral consent remain the committee's preference, or did it move towards written consent? Do you have a copy of the leaflet that you agreed to produce (page 2)?

121. I do not recall this meeting the minutes of which are document (**RCPA0000019_018**).

122. It is recorded in the meeting minutes in September 1995 that it was generally considered by subcommittee members that patients should be made aware they may be transfused and that written information emphasising minimal risk should be available in a '*user friendly*' format.

123. It was noted that this would be preferable to obtaining written consent to transfusion. This was agreed by the subcommittee and it was noted that myself, Dr Hewitt, and Dr Contreras would draft an information leaflet, based on leaflets already available from the Colindale and Tooting centres, and this would be circulated to subcommittee members for comment, with a view to piloting the leaflet in selected hospitals. Professor Lilleyman was to ensure that copies were also circulated to members of the SAC on Haematology for comment.

124. I do not recall if these next steps took place and I do not have available to me now a copy of the leaflet that we agreed to produce.

125. In retrospect, the feeling at the time was that if someone came into hospital needing urgent blood, the priority was the '*patient's health*' and we therefore didn't want to waste any time in obtaining written consent for a life-saving procedure.

126. The culture in 1995 in respect of consent was completely different from the culture of consent today. As blood transfusion became microbially so much safer, we became more focused on the ever-decreasing residual risk. This was because we developed more meaningful ways of assessing those residual risks, either mathematically or more directly through

Haemovigilance. As the culture of openness and patient involvement developed, it became appropriate to get patient consent before transfusion, where possible. Paradoxically the openness which better informed the general public may have made them more concerned because they then became aware that transfusion actually carried risks.

Section 5: Information handling by and information sharing between RTCs

34. Please describe the record keeping system in place for blood donations and blood donors at the time of your directorship of the NLBTC. In particular, please explain what records were kept and who recorded them, in what form, where and who had access to them.

127. I have never been a Director at the NLBTC.

128. I was not heavily involved in the record-keeping system for blood donations and blood donors at the time at the NLBTC.

129. I do however recall that details of donors with his/her date of birth, address, preferred donor session and donor history were kept on so called '101 cards'.

130. We had different colours for the different blood groups and there was a line for each donation. The donor session details with donation details, donors accepted and rejected, location of sessions and incidents were kept in '*bleed sheets*'. Whilst the 101 cards were specific to donors, the bleed sheets were specific to donor sessions and had the names of all the donors who attended to donate at that session. These were completed by the session clerks.

131. We had a Records Department and after each donation the donor details were recorded in a new line.

132. The first time a donor gave blood (a 'new donor', ND), a 101 card was made for them. The doctor or nurse responsible for that session signed the 101-card following each donation

133. I do not recall who had access to the records and the process of requesting access to the records but consider that it must have been a member of senior staff at the centre.

134. If my laboratory, under my authority, required access to the records, then I would ask a member of my team to collect the 101-card for the donor of the donation we wanted to hold.

135. If we wanted to hold a donation, we would tell Records and we would have the 101-card. It would be annotated that the donor had been withdrawn, which would have also prevented the donor from donating again at the Centre.

136. When we became zonal, I ceased having responsibility for the routine testing laboratory, so none of this applied. I do not know the testing/record-keeping arrangements when the Service became zonal. Routine testing continued on at the different Centres and it was only later that the testing was condensed into fewer Centres and now, for example, the testing is only done at Bristol and Manchester, whereas there used to be between 13 and 15 centres all doing testing.

137. Paper-based medical record files for donors were eventually replaced with computerised records. I believe NLBTC was the first centre to computerise records.

138. I believe NLBTC was one of the first RTCs to set up the storage of serum samples in a large archive so that we could check back if there were any queries about the initial testing and possible transmissions. We used a format called 'microplate' and it had 96 wells in a 12 by 8 configuration and many of our tests were in a microplate format.

139. I then came across a microplate that was very deep and held 1ml of serum and we would make a microplate full of donation serum samples while we were dispensing the samples for all the other tests, and that microplate could be archived frozen. Please see paragraph 385 of my response for a demonstration of a series of microplates.

140. It had a barcode label on it, and it was convenient for frozen storage. We had a freezer store with banks of freezers and the plates would be stored in the freezers. This was an important innovation as it meant that we could go back to the donation sample and carry out further/more sensitive tests and archived samples could also be used use for research purposes. This was crucial for all the work that was done once new tests, as for hepatitis C, were introduced.

35. Please set out how long these records were kept for.

141. I do not recall how long these records were kept for.

36. Please set out what policy or practice was adopted by the NLBTC in relation to the destruction of these records.

142. I do not recall what policy or practice may have been in place at NLBTC in respect of this.

37. As far as you are aware, did all RTCs follow the same record keeping practices, or did each centre implement its own system?

143. I do not know what the record keeping practices were at other RTCs or whether they followed the same record keeping practices.

38. Do you consider that the record keeping measures in place at the NLBTC were adequate to prevent donors who were suspected of carrying blood-borne infections from continuing to give blood donations at that centre?

144. I consider that the record keeping measures in place at NLBTC at the time were generally adequate to prevent donors who were suspected of carrying blood- borne infections from continuing to give blood.

145. If a donor was suspected to be carrying a blood-borne infection, then the donor was suspended. The donor's 101-card would be removed from general circulation and they would be personally contacted to inform them that they could not donate.

146. I believe that we also annotated the donor's 101-card to ensure that it did not return to the records department (and general circulation).

39. In March 1982, Dr Dane wrote to you and stated, "*You should certainly be keeping a list of NANB JE donors and if someone turns up twice you should strike them off the panel*" (NHBT0000056_026). Did you agree with this? If so, why? Was this the approach at the NLBTC? If not, why not?

147. I agree with Dr Dane's statement that you should certainly be keeping a list of NANB JE donors and if a donor attended twice they should be removed from the panel.

148. This was also the approach at the NLBTC.

40. In April 1983 the UK Working Party on Transfusion Associated Hepatitis met (BPLL0009204_005). As to this:

a. What is the UK Hepatitis Knowledge Base that is referred to a point 11 of the minutes?

149. I do not recall what the UK Hepatitis Knowledge Base was, referred to at point 11 of the minutes of the UK Working Party on Transfusion Associated Hepatitis meeting in April 1983 (**BPLL0009204_005).**

b. Was a knowledge base ever set up? If so, how did it operate and how effective was it?

150. I have no knowledge of the UK Hepatitis Knowledge Base, other than that it is referenced in document (**BPLL0009204_005).** I therefore do not recall whether it was set up, how it operated or how effective it was.

41. In July 1985 you co-authored a document on the handling of HTLV-III positive results that states, "*in summary, we are opposed to any annotation regarding anti-HTLV-III testing on donor cards*" (NHBT0053236). Does this document accurately represent how the NLBTC handled positive donor card annotation? Was this document intended to guide other RTCs? If so, did other RTCs follow this?

151. I have considered the document (**NHBT0053236)**, which appears to be an extract of a document with no page numbers or reference to myself having co-authored the same. It is also not cited who the document is addressed/being sent to. It just has Dr Hewitt's handwritten name at the top of the document.

152. If a donor was suspected to be carrying a blood-borne infection, then the donor was suspended. The donor's 101-card would be removed from the general circulation and they would be personally contacted to inform them that they could not donate. I believe this would have been the general practice at other RTCs.

153. I do not recall or know whether document **(NHBT0053236)** was intended to guide other RTC's.

42. What were the record keeping arrangements NLBTC had with the hospital blood banks to whom NLBTC provided blood and blood products? What information were the blood blanks expected to feed back to SLRTC about the use of the products supplied to them, and in what form? Was this information routinely fed back, or were there problems with the hospital's compliance? If so, what if any steps were taken to remedy this?

154. Hospital blood transfusion laboratories had their own record-keeping arrangements and NLBTC was not involved with these. They would have had within their own records what units and what type of units had been transfused to the different patients

155. I do not know what information the hospital laboratories would feed back to SLRTC about the use of the products supplied to them and in what form.

43. At a Regional Transfusion Director meeting on 7 October 1987, it was stated that you would set up a Central Registry of HBsAg positive donors (CBLA0002389, paragraph 12). In particular:

a. The minutes state that the "*proposals were in fact reactivating the scheme of reporting post-transfusion hepatitis which had lapsed some years ago*". As far as you are aware, why did the previous scheme of reporting post-transfusion hepatitis lapse?

156. I was not in attendance at the meeting on 7 October 1987.

157. I do not recall why the previous scheme of reporting post-transfusion hepatitis lapsed.

b. Why was it deemed that a central registry of HBsAg positive donors should be introduced?

158. I consider that it was deemed to be required as there was no central register of all positive donors across the centres. A central registry of HBsAg positive donors reduces the risk of positive donors attending other centres.

c. Did you set up this registry? If so, how did you do this?

159. I believe that I did set up this registry, but I do not recall how I did this or how the data was collated.

d. Once set up, please explain how the registry worked. In your opinion, was the registry a valuable resource for reporting HBsAg positive donors?

160. I cannot recall how the registry worked, but I consider that it was a valuable resource for reporting of HBsAg positive donors.

44. The Inquiry is aware that the Communicable Disease Surveillance Centre ("CDSC") maintained a database to keep track of reporting of blood donors who tested positive for HIV. The Inquiry understands that this database was in existence in 1989, although it is unclear for how long the CDSC operated it. Please answer the following questions regarding this database, as far as you are able:

a. Were you aware of the database? If so, when did you become aware?

161. I do not recall exactly when, but I must have been aware as soon as the database was created.

162. The NLBTC was sited next-door to the CDSC, so when testing for anti-HIV started in 1985 and positive results were found, my team reported all donors found with positive Hepatitis and HIV markers to the CDSC for the weekly CDR reports.

b. Who proposed the creation of the database?

163. I do not recall who proposed the creation of the database

c. Did you ever take charge of the database, or have a role in management of the database? You may find NHBT0000052_017 of assistance when answering this question.

164. I note the contents of the document, (**NHBT0000052_017**). I did not ever take charge of the database but did assist with the management of the database.

d. Did the NLBTC contribute data on HIV positive donors to the database? If not, why not? If so, what data?

165. NLBTC did contribute data on HIV positive donors to the database on a weekly basis.

166. The data were just the number of cases, like the daily number of cases of COVID-19 that are centrally collated at present.

e. Are you aware of whether other RTCs contributed data on HIV positive donors to the database?

167. I understand that all RTCs did contribute data on HIV positive donors to the database.

f. Did the NLBTC maintain a separate, or additional, database to track HIV positive blood donors?

168. NLBTC would have kept their own separate records and produced a file for every positive blood donor.

169. Dr Patricia Hewitt would have managed those records and is better placed to comment upon this.

45. In November 1995 Lorna Williamson wrote a funding proposal for the Serious Hazards of Transfusion Working Party (NHBT0017307_001) which if you would act as a liaison between the NBS and the PHLS Communicable Disease Surveillance Centre. As to this:

a. Was this proposal realised?

170. I understand that this funding proposal was realised.

b. If so, what did your role as liaison entail?

171. Violet Rawlinson carried out this role at Manchester RTC,

172. She would receive data from the other RTCs and PHLS laboratories for the preparation of an annual report.

173. An annual meeting with the heads of laboratories from the different centres, would be held at which they would discuss the data from the annual report.

c. How long did you perform this role?

174. This role was in place during my whole career in the Blood Service.

d. How did the role develop over time?

175. I cannot now recall how the role developed over time.

46. In January 1996 you and Kate Soldan authored a letter to your colleagues regarding a *"new surveillance system"* for HCV infected donors (NHBT0022251). Was this surveillance system different to the CDSC database? If so, how? Please explain how this surveillance system operated and whether it was mandatory for every RTC to provide information.

176. I do not recall whether the surveillance system was different from the CDSC database or how this surveillance system operated or whether it was mandatory for every RTC to provide information.

47. A NBTS departmental memorandum dated 15 May 1989 notes that "it has been decided to re-introduce the original 'J' donor system" to identify donors involved in cases of post-transfusion hepatitis (NHBT0005388). Were you aware of the existence of this system? If so, please answer the following questions regarding this system, as far as you are able:

a. The use of the word "re-introduce" implies that the J donor system had been operational at an earlier time. When was the J donor system first introduced, and why did it stop operating?

177. I have considered the memorandum dated 15 May 1989 (**NHBT0005388**). This was a local memorandum for the Manchester RTC written by Mr Peter Howell.

178. I do not recall when the J donor system was first introduced and why it stopped operating.

179. NLBTC never stopped using a J donor system and it was in place when I joined the Blood Service in 1974.

b. Who proposed the re-introduction of the J donor system?

180. I do not recall who proposed the re-introduction of the J donor system if it was ever re-introduced or if it had ever ceased. It was in place at NLBTC from when I started there in 1974 and remained in place when I left.

c. What was the intended scope of the J donor system? Were all RTCs expected to contribute to it?

181. I do not recall the intended scope of the J donor system,but would have expected all RTC's to contribute.

d. Was the proposal for the re-introduction made to a committee or forum similar to the regional transfusion centre directors' meetings?

182. I do not recall whether the proposal for the re-introduction was made to a committee or forum like the RTD's Meeting.

183. I consider that this memorandum dated 15 May 1989 (NHBT0005388) was a local memorandum for the Manchester RTC written by Mr Peter Howell and refers to a purely local process in Manchester.

e. What was your view of the proposal for the re-introduction of the system? How was the proposal received by other RTC directors?

184. I do not recall the proposal and cannot provide a view on this.

f. What was the purpose of the system and what information was it intended to collect?

185. I was not involved in this system and therefore cannot comment on the purpose and what information it was intended to collect.

g. Was the J donor system re-introduced? If so, when and how did it work?

186. I do not recall whether the J donor system was re-introduced and therefore unable to answer when and how it worked.

h. Was the J donor system widely used after the "re-introduction"? If no, why not? If yes, who was responsible for overseeing the system?

187. I do not recall whether the J donor system was widely used after the *"re-introduction"* and so am also unable to answer why not or who was responsible if it was.

i. As far as you are aware, does the system still exist?

188. I cannot confirm whether the J donor system still exists.

48. In addition to the database(s) mentioned above, did the NLBTC share information with other RTCs about excluded donors, donors that posed a risk to the safety of the blood supply, or infected blood donations? If yes, was this

on a formal or informal basis? Please describe the mechanisms the NLBTC used to share this information, if any.

189. Prior to the computerisation of the Blood Service, I do not believe that there was a mechanism for a centralised database shared with other RTCs about excluded donors.

190. If there was any suggestion that the donor might donate at another RTC, we would have informed the other RTC of this.

49. In his statement in A and Others, Dr Gunson expressed the view that "*there was no central organisation to ensure that...all RTCs operated in a uniform manner*" (NHBT0000025_001; NHBT0000026_009). Do you agree? In your opinion, were the information sharing measures in place between RTCs adequate to prevent donors who were suspected of carrying blood-borne infections from continuing to give blood donations?

191. I agree with Dr Harold Gunson's statement that *'there was no central organisation to ensure that all RTCs operated in a uniform manner.'*

192. With respect to whether I believe the information sharing measures in place between the RTCs were adequate in preventing donors who were suspected of carrying blood- borne infections from continuing to give blood, I do not consider that the systems (prior to computerisation) were adequate as we did not have a system that would have prevented the risk of an infectious donor donating at another RTC.

193. We could only advise donors suspected of carrying blood-borne infections that they should not continue donating, giving them the reasons for this advice.

194. Donors however are well motivated individuals and given the altruistic nature of donating blood, it was extremely rare for them to gratuitously donate at another centre if they had been told to not to donate and why.

50. In December 1996 Dr Dane wrote to you requesting a report each year covering topics such as "*to test or not to test*", as it would be "*helpful to the NBTS when dealing with future litigation*" (NHBT0097176_001). In particular:

a. Did you agree with Dr Dane at this time? Have your views changed over time?

195. I do not now recall this letter in December 1996 from Dr Dane contained in (**NHBT0097176_001**).

196. I would have agreed with Dr Dane's opinion at the time that a report covering topics such as "*to test or not to test*" for a particular virus, would be "*helpful to the NBTS when dealing with future litigation*".

b. Was a report as suggested by Dr Dane ever produced by yourself? If so, please provide copies of all report(s) produced.

197. I do not recall whether a report was ever produced and do not have a copy of any such report.

Section 6: Knowledge of risk of infections while at the NLBTC

HIV/AIDS

51. During your time at the NLBTC, what was your knowledge and understanding of HIV (HTLV-III) and AIDS and, in particular, of the risks of

transmission from blood and blood products? How did your knowledge and understanding develop over time?

198. My knowledge and understanding of HIV (HTLV-III) and AIDS and of the risks of transmission from blood and blood products, developed steadily over time through reading the various publications and speaking with my contacts around the world.

199. At first, I did not link this disease with blood transfusion. I do recall my view shifting when I received a personal telephone call from Dr Roger Dodds, who was the Head of American Red Cross Transfusion Infection Laboratories in or around 1983. He told me that he had received information about the first AIDS cases in two male haemophilia patients and considered that they had acquired it through Factor VIII as they did not report any other risk factors. Following this I realised that HIV (HTLV-III) and AIDS was very likely to have a viral aetiology.

200. There had been significant debate leading up to this as to the cause of HIV (HTLV-III) and AIDS including that it was some bizarre animal virus. There was even a suggestion that it was due to the use of the recreational drug, *poppers*, or due to a suppression of the immune system because of the passive partner in a homosexual relationship being exposed to too much semen from the active partner. All these possibilities were initially highly debated.

201. However, once we strongly suspected that HIV (HTLV-III) and AIDS was transmissible by Factor VIII, we appreciated that it was most probably a viral infection as in the preparation of Factor VIII, parasites and bacteria are inactivated or removed but viruses were not.

202. This was of course prior to the introduction of viral inactivation of Factor VIII in 1985. BPL had been working on this to reduce the risk of hepatitis B being transmitted by Factor VIII. There were delays in its launch with regard to HBV risk reduction due to a reduced yield of Factor VIII caused by the inactivation process.

203. At NLTBC we also started writing our own leaflets, and Dr Tom Davies and I designed the national leaflet, addressing male homosexuality and intravenous drug "abuse" as it was then called. The leaflet "A.I.D.S and how it concerns blood donors" was published by the DHSS on 1 September 1983.

204. Dr Contreras and I visited the New York Blood Centre in 1984 to learn about the approach that Centre was using to exclude prospective donors who were at risk and to reduce the risk of transmission of AIDS by the transfusion of blood components. We learnt from this visit that the New York Centre was using a Confidential Unit Exclusion (CUE) questionnaire for donors to self-exclude. As they were getting high rates of infected donors, they introduced this questionnaire, to ask at risk donors, confidentially, to exclude themselves. Following this visit, we decided to start a confidential donor exclusion questionnaire at the NLBTC, and drafted protocols for this during our return flight to the UK.

52. How and when did you first become aware that there might be an association between HIV/AIDS and the use of blood and blood products?

205. My understanding that there was an association between HIV (HTLV-III) and AIDS, and the use of blood and blood products developed gradually from the early 1980s.

206. Literature from this time was indicating that there were transmissions of AIDS but we were not able to test for the HIV antibody until around 1985.

207. However, my full appreciation or understanding of the association must have steadily occurred between 1982-84 from reading the CDC publications in MMWR and the New England Journal of Medicine when AIDS began to be firmly associated with transfusions.

53. What, if any, enquiries and/or investigations were carried out at the NLBTC in respect of the risks of transmission of HIV/AIDS? What was your

208. It appears that part of the second sentence is missing from the end of this question.

209. As explained in my responses to question 51 and 52 above, NLBTC developed a self-exclusion questionnaire and once anti-HIV screening was in place, we carried out in-depth interviews with donors found to be seropositive, to learn about their lifestyle risks and the reasons for their coming to give blood.

Hepatitis

54. **In 1981, you co-authored an article in the Medical Laboratory Sciences journal. In this article, you conclude "*Probably post-transfusion hepatitis B is more important than the non-A, non-B variety, since not only does it appear to be the more severe infection but, if transmitted to a patient in hospital, it may be the source of more obvious infections among the staff*" (CBLA0001301, page 3). Please explain your view. Has your opinion changed over time?**

210. The extract taken from the article in the Medical Laboratory Sciences journal dated 2 March 1981 has missed the preceding sentence. To fully understand the context, the preceding sentence reads as follows:

211. 'The clinical importance of chronic aspects of non-A, non-B hepatitis is not yet clear, as much chronic non-A, Non-b hepatitis resolves itself within 2 years.'

212. It is important to also consider the following extract from the article which is missing from the question:

213. 'in the past 5 years there has been an average of less than four reported cases of post-transfusion hepatitis B within the North London region although we bleed approximately 17,000 donors annually…From 1974 all donors were tested by reverse passive haemagglutination (RPHA) and 'new' donors were additionally tested by radioimmunoassay (RIA). In 1977 we changed from a standard RPHA (hepatis) to a modified form of the test. This apparent increase in cases over the past 3 years may well be due to our increased requests to the hospitals we supply to inform us of any cases they see, and not exclude any which they consider to be 'non-B'…During the past 5 years the laboratory tests available to us have gradually improved to provide clearer information about the cause of post-transfusion hepatitis…'

214. Our perception from the literature at the time was that hepatitis B was a more severe infection than hepatitis C for the individuals who were infected.

215. A lot of the known cases of hepatitis were asymptomatic. Whilst a proportion of cases of hepatitis B were also asymptomatic, when the infected individual had symptoms of acute hepatitis B infection, these appeared to be severe.

216. I certainly felt that hepatitis C did not have the same long-term characteristics as hepatitis B, until we had the ability to specifically diagnose hepatitis C, which meant having to have the hepatitis C antibody tests. Before that, whilst we knew that hepatitis C (NANBH) existed, it was recognised as a post transfusion risk, but you needed to have a specific test for the agent and that was unavailable till 1990.

217. We were reliant for data on the specialist clinicians/hospitals who had been following up patients. The hepatitis clinics had been the repository of these.

218. When hepatitis B screening started, US data showed that up to 10% of transfusions were causing post transfusion hepatitis.

219. When we screened for hepatitis B and were able to test for antibody to patients, we could eliminate the possibility of recent hepatitis A and hepatitis B and were then left with non-A non- B hepatitis (NANBH).

55. What was your knowledge and understanding of hepatitis (including hepatitis B and Non-A Non-B hepatitis ("NANB")/hepatitis C) and the risks of transmission from blood and blood products during your time at the NLBTC? How did your knowledge and understanding develop over time?

220. Please see my response to question 54 above.

221. When I joined NLBTC in 1974, we were aware that hepatitis B was transmitted through transfusion and recognised that a residuum of post transfusion hepatitis B (PTH B) still occurred because of HBsAg screening not detecting weaker positives.

222. Most of our understanding was from American studies, which had so much higher rates of post-transfusion hepatitis than the UK.

56. How and when did you first become aware that there might be an association between hepatitis (including hepatitis B and NANB/hepatitis C) and the use of blood and blood products?

223. We were aware early on that there might be an association between the use of blood and hepatitis (including hepatitis B and NANB/hepatitis C) because post-transfusion hepatitis still occurred even though most HBsAg positive donations were excluded.

57. Did the NLBTC carry out any further enquiries into the risks of post-transfusion hepatitis? If so, please explain:

a. What enquiries were carried out in respect of the risk of transmission of hepatitis?

224. Whenever a case of post-transfusion hepatitis was reported to NLBTC from hospitals in our region, we conducted full investigations with further testing of the patient samples and of the implicated donors to identify a possible source of infection.

225. At NLBTC we tested for markers of hepatitis B, including anti-HBc and LFTs (liver function tests).

226. If any donor was found to have anti-HBc or raised liver function tests, we would exclude that donor from the panel, ask him or her to come for follow up samples and refer him/ her to a hepatologist if necessary.

227. With regard to donors found to be HBsAg positive, we included them in a panel of donors who were seen annually with full medical examinations and LFTs. This was a long-term project unique to NLTBC under the guidance of Dr Dane.

228. If significant changes in the patients HBV status were found, they were referred to a hepatologist at their local hospital. These investigations contributed a great deal to our understanding of hepatitis B carriage and the long-term effects of the infection.

b. What was your involvement?

229. At NLBTC we carried out a large-scale study **(NHBT0084753**) of post transfusion infection with hepatitis B, hepatitis C, HIV and HTLV. This showed that within 9220 patients recruited, and 5579 recipients of 21,923 units of blood, no transfusion transmitted infections were identified and this informed the view that there was a very low prevalence in this country.

230. A study in the United Kingdom by my colleagues and myself at the NLBTC, before routine donation screening for anti HCV started, showed that the incidence of post transfusion NANBH was **0.26%** [Contreras M, Barbara JAJ, Anderson CC, Ranasinghe E, Moore C, Brennan MT, et al. Low incidence of nonA, nonB post transfusion hepatitis in London confirmed by hepatitis C virus serology. Lancet 1991;30:7537]. This paper is exhibited at (**NHBT0000042_095**).

c. How were procedures implemented and adapted over time?

231. I do not recall how the procedures were implemented and adapted over time.

d. What information was obtained as a result?

232. I do not recall what information was obtained as a result.

e. Was information obtained from enquiries at NLBTC shared with other RTCs?

233. I do not recall whether the information obtained from enquiries at NLBTC was shared with other RTCs. Any published studies would of course been available to other RTCs.

58. What was your understanding of the nature and severity of the different forms of blood borne viral hepatitis and how did that understanding develop over time?

234. Please see my response to question 54 above.

59. In a scientific paper dated October 1986, Dr Gunson stated that the best estimate of the incidence of transfusion-associated NANB hepatitis in the UK from published data at the time was 3% (SBTS0001120). He further noted that "*if one assumes that the 2.3 million donations in the U.K are transfused to 750,000 recipients annually...then one would expect 22,5000 icteric or anicteric cases of NANB hepatitis each year.*" Please answer the following questions

a. Were you aware of this paper and these findings at the time of publication? If yes, when and in what circumstances did you become aware

of the findings of this paper? If no, when did you become aware of it and/or the conclusions set out within it

235. I do not recall this paper or its findings at the time of publication.

236. Dr Gunson does quote results from ALT and anti-HBc for blood donations from NLBTC. However, I do not recall whether I was involved in collating and providing these results.

b. Were these figures regarding the prevalence of NANB post-transfusion hepatitis ever discussed by RTC directors? If yes, please describe the general response to these figures.

237. As stated in my response to question 59a above, I do not recall this paper and do not know whether these figures were discussed by RTC directors.

238. I do not agree with the estimates of 22,500 cases of post-transfusion non- A, non- B hepatitis (NANBH) each year in the UK referenced in the paper.

239. I consider this to be an overestimate and probably derived from US data which showed a much higher prevalence of NANBH than the UK, based on UK studies at the time. The paper itself says that '*the incidence of NANB hepatitis in the UK, could be half that of the lowest estimate of the USA.*'

240. I also consider that the estimate of incidence of transfusion associated NANB hepatitis at 3% is an overestimate. The UK had a much lower risk of PTH than that in the US and if their rates of transfusion associated hepatitis

in the US were between 5.4% to 27.1% (as quoted in the paper) then I consider 3% to be too high and an overestimate.

241. As previously advised in my answer to question 57 b, a study in the United Kingdom by my colleagues and myself at the NLBTC, before routine donation screening for anti HCV started, showed that the incidence of post transfusion NANBH was 0.26% [Contreras M, Barbara JAJ, Anderson CC, Ranasinghe E, Moore C, Brennan MT, et al. Low incidence of nonA, nonB post transfusion hepatitis in London confirmed by hepatitis C virus serology. Lancet 1991;30:7537]. This paper is exhibited at (**NHBT0000042_095**). 0.26% is significantly lower than the 3% quoted by Dr Gunson.

242. We must differentiate between symptomatic and asymptomatic post transfusion hepatitis. Many people with post transfusion hepatitis, if just using raised liver function as the indicator, would not show symptoms or if they did, it was going to take a very long time before you saw it. That makes it difficult to be exact about how much post transfusion hepatitis there was, because a good proportion of it would be asymptomatic in the short and medium term.

60. In February 1990 at an HCV symposium you presented at, Dr Johnson, discussed the link between HCV and liver cancer (PRSE0004402, page 5). Were you aware of the link between HCV and liver cancer before this point? If so, please explain when and how you discovered the link.

243. I do not recall this presentation, but I must have presented at the HCV symposium in February 1990 as it states that I did in the document (**PRSE0004402**).

244. I believe that I was aware of the link between HCV and liver cancer prior to this presentation, but I cannot recall details of when I was aware of this or of how prevalent this complication was.

61. A fax sent from Dr Contreras to you in January 1991 has a handwritten annotation at the bottom which states "*HBV is more important than the HCV*" (NHBT0000052_017). Did you write this annotation? If so, why? Please explain in what context HBV was seen as more important than HCV. Please explain if this opinion has changed over time.

245. I did not write this hand-written annotation at the bottom of this document which states "HBV is more important than the HCV" (**NHBT0000052_017**). I believe that it may have been Dr Contreras' handwriting, but I cannot be sure. I did however agree.

246. Please see my response to question 54 above in respect of the reason why it was considered that HBV was more important than HCV.

62. Please provide details of any other information that informed your understanding of the severity and prevalence of HCV in the UK donor population.

247. I have nothing further to add in respect of my understanding of the severity and prevalence of HCV in the UK donor population.

63. In March 2000 you signed your witness statement for the A and Others litigation (NHBT0100207_002). Referring to point 8, you state *"my perception (shared by others) was that the risk level for PTH was far higher in the US than would have been the case in the UK"*. Why did you hold this belief? Did your belief change over time and if so, when?

248. The important part of this sentence, which has been omitted from the extract in question 63, is '*not least because of the respective composition of donor-panels'*.

249. In addition, at paragraph 7 of the witness statement for the A and Others litigation (**NHBT0100207_002**), I referenced that I published a study with my colleague, Moya Briggs, from Dr Dane's department on 2 March 1981 in the Medical Laboratory Sciences entitled '*Hepatitis of the non-A, non-B type following blood transfusion in the North London region'* (**CBLA0001301).**

250. The risk level for PTH was far higher in the US than it was in the UK, which was supported by the literature at the time.

251. As set out in the paper dated October 1986 (**SBTS0001120**) it is expressed that the rates of transfusion associated hepatitis in the US were between 5.4% to 27.1% (as quoted in the paper). Again, as stated in my answer to Q57b, a study in the United Kingdom by my colleagues and myself at the NLBTC, before routine donation screening for anti HCV started, showed that the incidence of post transfusion NANBH was 0.26% [Contreras M, Barbara JAJ, Anderson CC, Ranasinghe E, Moore C, Brennan MT, et al. Low incidence of nonA, nonB post transfusion hepatitis in London confirmed by hepatitis C virus serology. Lancet 1991;30:7537]. This paper is exhibited at (**NHBT0000042_095**).

252. I am still certain that the risk level for PTH was far higher in the US than would have been the case in the UK.

64. Referring to point 12 (NHBT0100207_002), you state "*Compared with HIV infection, which was a major issue in the 1980s, NANBH was not*

regarded by me and others within the medical scientific community as an equivalently serious clinical problem, but as a relatively milder condition" and that "NANBH continued to be regarded as a relatively mild condition with little evidence of clinical impact in the 1980s". **Please explain when, and on what basis, did you understand HCV to be a serious disease?**

253. Please see my response to question 54 above in response to this question.

254. In the UK, a two-year prospective study by the MRC Working Party on Post Transfusion hepatitis in a London hospital, published in 1974 in the Journal of Hygiene, Cambridge (**PRSE0002988**), concluded that the UK incidence of PT-NANBH was low. A subsequent study by Collins and Bassendine published in 1983 **(PRSE0000766)** in the BMJ reported an incidence of significant chronic liver disease attributable to a NANBH agent as 0.4%.

255. Furthermore, a study published in the UK by Wood et al. in Public Health in March 1989 (**NHBT0000098_002**), reported no significant clinical sequelae in patients with a history of blood transfusions. This study involved a 10 year follow up of patients who had received transfusions.

General

65. How did your understanding of the seriousness of HCV and HIV/AIDS impact the donor selection policies and practice in place at the NLBTC?

256. I consider my understanding and those of my team on the seriousness of HIV and AIDS did have a big impact on NLBTC's donor selection policies and practice.

257. As previously explained, when Dr Contreras and I visited New York Blood Centre in 1984, we saw them using a Confidential Unit Exclusion questionnaire for donors to self-exclude. Following this, Dr Contreras and I immediately started drafting out the instructions for setting up our own questionnaire.

258. Essentially the donors in a private area (booth) could complete the questionnaire to say if they were high risk and we should not use their unit of blood. This was designed so that if donors were too embarrassed to say that they might be in a high-risk group, which then was mainly intravenous drug use or homosexual males with multiple partners, they were able to do so.

259. The questionnaire clerks would go through this and would apply a hold on the blood of anyone who had ticked that they were high risk. The donor would be bled into a single pack to ensure no components would be made and it would be written on the session bleed sheet – '*not for transfusion*'.

260. All the blood from the donations that day would be sent to the laboratory in charge of receiving the incoming blood donations for sorting. They would then see the annotation '*not for transfusion*' and it would be sent to my laboratory for research purposes only. The donation would not enter the UK blood supply.

261. My laboratory at NLTBC had the facility to handle potentially infectious packs of blood. Indeed, at one stage we had a bespoke medical officer who would bleed specified HBsAg positive donors, and we would separate off the plasma in appropriate safety cabinets to send to Professor Arie Zuckerman. He was aiming to provide a British hepatitis B vaccine, although in the end this project never came to fruition.

262. We had the facility, the staff, and the safety resources to handle and carry out research on potentially infectious units of blood. We worked in collaboration with Dr David Dane, the PHLS and the National Institute for Biological Standards of Control (NIBSC) and provided them with confirmed positive plasma for their quality control panels and research purposes.

263. Other Blood Centres did not have these facilities or commitments in their microbiology sections.

66. What advisory and decision-making structures were in place, or were put in place at the NLBTC to consider and assess the risks of infection associated with the use of blood and/or blood products?

264. I do not recall what advisory and decision-making structures were in place or were put in place at the NLBTC to consider and assess the risks of infection associated with the use of blood and/or blood products.

265. I would have had regular meetings with the Director at the time. I don't recall that we had a formal decision-making structure at NLTBC but dealt with specific issues as they arose.

266. NLBTC performed and published significant studies on transfusion-transmitted infections and studied prevalence and incidence where possible of infectious markers in new and repeat donors.

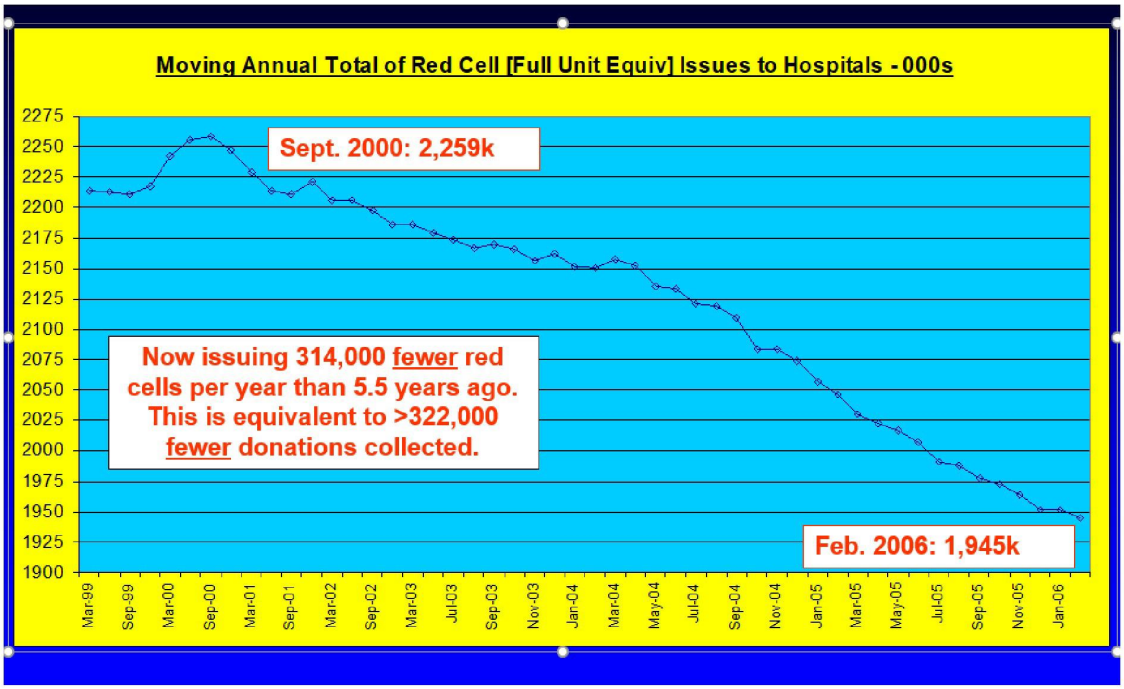
267. I would add that the safety of the recipients was always at the forefront of our minds in any decision-making, and we were always trying to explore ways that we could improve this safety.

67. What if any role did the NLBTC have in advising those hospitals and haemophilia centres that it provided blood and blood products to, as to the risks associated with blood and blood products? Please give details of any steps taken in this regard.

268. We had annual seminars for consultants and Chief MLSOs of the hospitals we served at which we informed them and updated them on the current risks of transfusion- transmitted infections and measures to mitigate these risks.

269. In addition, it was a requirement that cases of probable and possible transfusion-transmitted infections (TTIs) were reported to us at the transfusion centre and were discussed at Hospital Transfusion Committee meetings. We continually encourage hospitals to report potential TTIs to us.

270. Another approach to reducing the risk of microbial transmission by transfusions is to appraise the prescribing clinicians of the importance of



avoiding unnecessary transfusions. The effectiveness of such education in

reducing blood usage in hospitals for the period September 2000 to February 2006 is illustrated in the graph (below), to which Professor Contreras used to refer in her presentations.

271. Professor Contreras was always keen to encourage hospitals treating people with clotting factor disorders to use cryoprecipitate rather than clotting factor concentrate which was gained from huge pools of around forty-five thousand units of plasma being processed to make Factor VIII and obviously one infectious unit would contaminate all the product made from that pool. She therefore recognised very early on, I can't recall dates but from the beginning of concerns about HIV, the potential concerns relating to HIV and transfusion. She was a great advocate of the use of cryoprecipitate because it massively reduced the chances of transfusing an infective unit.

Section 7: Reduction of risk of infections while at the NLBTC

Donor selection

68. What donor screening processes were in place during your tenure at the NLBTC, and how did these changes follow the emergence of:

a. AIDS/HIV;

b. NANB/HCV;

and c. HBV?

272. I believe that there were two elements of donor screening processes in place during my tenure at NLBTC.

273. The first element relates to identifying donor risk. NLBTC implemented notices around the donation sites informing donors of whether they were a

high-risk donor. In addition, the donors would be asked if they had been to areas of high prevalence of diseases such as Malaria or the West Nile fever virus e.g. in the USA when it was occurring there.

274. HIV and AIDS had a profound impact on our donor screening processes. As I have mentioned above, after I visited the New York Blood Centre with Dr Contreras, NLBTC was the first RTC in the UK to introduce a confidential donor exclusion questionnaire (CUE). Because of our geographical location, NLBTC had a relatively high number of homosexual men and IV drug addicts amongst our prospective donors; in those days we felt we needed to give them an 'escape route' if peer pressure 'forced' them to give blood and the confidential questionnaire fitted this purpose.

275. We also introduced a HIV look- back programme, based in our region. To safeguard the blood supply, we insisted to public health authorities that there was an urgent need for alternative testing sites for HIV, so that high-risk donors were not drawn to give blood to get a confidential test (the USA called this the 'magnet effect').

276. The second element of the screening process was the mass routine screen testing of donors. We started testing as and when agents were identified as significant and as and when reliable tests became available. For example, we were testing for hepatitis B in the blood service from the early 1970s and the testing developed from gel immune diffusion through to hemagglutination and the modifications I made to hemagglutination and then radioimmunoassay or ELISAs and then totally automated chemiluminescent assays.

277. The table below shows the identification of real or potential viral threats to the blood supply over time:

Year	Virus		Associated Disease
1980	HTLVI	Human T-cell lymphotropic virus-1	Malignant lymphoproliferative disorders, some level of neuropathy[Poiesz,Kalyanaraman]
1982	HTLVII	Human T-cell lymphotropic virus-2	
1983	HIV-1	Human immunodeficiency virus-1	AIDS[Barre-Sinoussi,Clavel]
1986	HIV-2	Human immunodeficiency virus-2	
1986	HDV	Hepatitis delta virus	Coinfection or superinfection of HBV[Rizzetto]
1989	HCV	Hepatitis C virus	Viral hepatitis[Choo]
1990–91	HEV	Hepatitis E virus	Clinically similar to HAV infection[Reyes,Tam]

Year	Virus		Associated Disease
1994	HFV	Hepatitis F virus	Clinical importance uncertain[Deka]
1994–96	HHV-8	Human herpes virus-8	Kaposi's sarcoma[Boneshi]
1995–96	HGV	GB virus C (so called hepatitis G virus)	Clinical importance uncertain[Sheng]
1997	TTV	DNA virus named after patient	Clinical importance uncertain[Parquet]
1999	SEN-V	DNA virus (related to TTV)	Suggested transfusion associated non-A/non-E hepatitis[Bowden], but not confirmed
2002	WNV	West Nile Virus	Symptoms can range from mild (fever, headaches and body aches) to severe (high fever, disorientation, tremors, convulsions, paralysis and coma)
2003	SARS virus	Severe acute respiratory syndrome virus	Severe acute respiratory syndrome

278. We introduced anti CMV screening for immunocompromised recipients only and then selective screening for West Nile fever virus and for donors with a history of Malaria or Chagas' disease or of exposure in high-risk areas.

279. At that time, in 1988, in addition to strict donor selection criteria, the mandatory routine pre-transfusion screening tests of blood donations were:

a) Forward and reverse ABO typing.

b) RhD typing;

c) Red cell antibody screening;

d) HBsAg;

e) TPHA (syphilis); and

f) Anti-HIV screening.

69. What national guidelines (if any) informed the donor selection policies and processes at NLBTC? In the event that the NLBTC processes departed from any such guidelines, please explain how and why.

280. Policies were set nationally and implemented locally.

281. NLBTC did not depart from the '*Red Book*' which set national standards for the UK Blood services.

282. But NLBTC did have additional measures such as the CUE questionnaire and the AIDS leaflet.

70. How were decisions made at the NLBTC as to which donors were high risk and should be excluded from donating? What was your role in this process? Were these decisions reviewed and, if so, how often? You may find NHBT0097476_014 and JPAC0000140_043 of assistance.

283. I did not make the decisions as to which donors were high risk and should be excluded from donating, However, I would have contributed to the decision making by providing the data and the background microbiology information.

284. The decisions were reviewed continuously depending on the epidemiology reports in MMWR for example as West Nile fever virus spread through the US or, for malaria, where it was endemic or might have spread to.

71. Were there any difficulties in implementing the exclusion of high-risk donors at the NLBTC?

285. I do not recall any difficulties in implementing the exclusion of high-risk donors at NLBTC.

286. NLBTC implemented this in a sympathetic way. For example, after the national leaflets went out requesting homosexual men not to donate, I attended the Terrence Higgins Trust with Dr Contreras and Dr Mahes Da Silver (Consultant at NLBTC), and I gave a presentation thanking individuals for their altruism and public spiritedness in coming to give blood for the good of others, but explaining why it grieved us now to have to ask them not to donate because of the risk from AIDs.

287. I appreciate that there has been a small number of HIV positive men who had donated despite the measures that we had put in place. This might have been their way of getting tested for HIV without the embarrassment of attending a sexual health clinic.

288. We wanted to wait until alternative testing sites were up and running to avoid what the US called the '*magnet* effect'.

289. I believe that 'malicious' donating would be very rare.

72. In March 1983 you wrote to Vox Sanguinis (medical journal) about a donor implicated in NANBH (). The donor had been asked not to donate

after surrogate tests established presumptive NANBH (the donor was positive for anti-HBc and anti-HBs and had abnormal liver enzyme levels (ALT)). The NLBTC withdrew the donor's record from their routine file and the donor was able to donate again seven months later (NHBT0000030_007, page 1). Subsequently, four units of his blood were transfused to a patient, who later developed raised levels of anti-HBs consistent with transmission from the implicated donor. Please answer the following:

a. The NLBTC seemed to have identified this incident by chance. Were there similar instances during your tenure? How were these risks managed?

290. Donors who were suspected of carrying infections were approached and counselled about why they could not donate. It would have been sensitively explained to them that they had been identified as at risk or capable of carrying an infection which could transmit to people and harm or even kill them, and therefore regrettably we had to ask them not to donate again.

291. Donors are generally selfless people and therefore in my experience, if we told a donor that he or she could not donate for any given reason, they would generally abide by the advice and not continue to donate.

292. I believe that the measures we had in place at the time (when it was only paper records) were usually adequate at preventing donors who carried or were suspected of carrying blood-borne infections from continuing to donate.

293. Once the donor records were computerised (and of course computerisation was done in many phases), I believe we were able to link any excluded donors.

294. A rare early experience was when a donor who had been previously excluded and counselled because he was HBsAg positive, had returned as his GP thought that we had made a mistake in our testing. The GP thought that a Reference laboratory result that he had received after taking a blood sample and which was reported as 'HAA positive' meant the donor was hepatitis A antibody positive and would therefore be a useful donor. This confusion was due to the non-standardised early nomenclature for HBV. 'HAA' actually meant 'hepatitis associated antigen'. It was an honest mistake which I explained to both the donor and the GP.

295. I appreciate that a high-risk donor who wasn't adequately counselled to the reasons why they were not able to donate blood could innocently attend another RTC to donate. However, I think this would have been a rare occurrence.

b. Were records routinely removed from donor files? Was this practice the same for other RTC's?

296. Please see my response to question 72c below.

c. Did the NLBTC maintain a record of donors who were asked not to donate blood to prevent such instances? If so, was this information shared with other RTC's?

297. I believe NLTBC would have maintained a record of donors who were asked not to donate blood to prevent such instances. All relevant information regarding an infected donor would have been securely retained.

298. Prior to computerisation, I do not believe that this information was and could have been actively shared with the other RTC's. Given the number of

sessions, teams and donors coming in, with a non-digital donor system, I do not consider that it was operationally possible to be able to identify all excluded donors in all sessions across the various RTCs if the donor chose to re-attend after being asked not to.

299. Once again, the screening of donors depends on trust and the donor's honesty. This dependency on trust with blood donors is still required today, but donor exclusion for example can now be picked up on a computer; in those days, we were largely reliant on donors being honest.

d. The donor was able to give blood just 7 months after being informed that they had suspected NANBH infection. How could this incident have been prevented?

300. I do not consider that this incident could have been prevented at the time as set out in my responses to questions 72a -c above.

301. Donors who were suspected of carrying infections were approached and counselled about why they could not donate. If a donor was told that they could not donate for any given reason, given the altruistic nature of blood donation, they would abide by the advice and not continue to donate. If they continued to donate, they would be a dishonest donor – unless they had been poorly counselled and had not understood what they were being told, but I think that would be rare and unlikely at NLBTC.

302. Prior to computerisation of records, I believe that the measures we had in place at the time were good at preventing donors who carried or were suspected of carrying blood-borne infections from continuing to donate.

303. Before computerisation, it was possible that a donor could have said they had not donated before (and then been bled as a new donor) or have said they didn't know why their 101 card was not at that donation session.

304. When the Blood Service stated to move to computerisation, we could check different donor sessions at an individual RTC. When the whole service was computerised, even if a donor had donated at another Blood Centre, this would have been detected.

73. In May 1983 Dr Kraske wrote to you suggesting that he was doubtful that screening blood for HBc antibody would help to detect transmission of AIDS but that a questionnaire based on "*altruism and honesty*" in relation to the donor's homosexual exposure may be effective (NHBT0017448_004). Had you considered using donor questionnaires to reduce the transmission of AIDS before this correspondence? What action, if any, was taken as a result of this letter?

305. I do not recall the document (**NHBT0017448_004**), a letter from Dr Craske to me of 12 May 1983. The letter refers to the enclosure of a letter written by the Bureau of Biologics to Plasmapheresis Donation Stations in the USA, but no copy of that has been provided.

306. I do not recall whether we had considered using donor questionnaires to reduce the transmission of AIDS before this correspondence or what action was taken specifically in response to this letter. This was early in the context of understanding the risks from HIV, but it may have influenced the efforts to introduce our questionnaire.

307. In the question it says that Dr Craske wrote to me suggesting that he was doubtful that screening blood for HBc antibody would help to detect

transmission of AIDS but that a questionnaire based on "*altruism and honesty*" in relation to the donor's homosexual exposure might be effective.

308. I did not agree entirely with his comment on anti-HBc screening. I felt that screening blood for HBc antibody would help to detect transmission of AIDS. HIV was transmitted by homosexual intercourse and by intravenous drug use. Those were the two key, natural ways of transmission and of course, that's how hepatitis B can be transmitted. Therefore, testing for evidence of hepatitis B transmission at some point may have correlated with the risk of HIV transmission. We used to say, these viruses 'hunt in packs' and so it could correlate with the risks of co-infection. But I agree that a questionnaire might be of value to help detect transmission of AIDS (and we did, of course, develop one).

309. Testing for anti-HBc would give some evidence of a past hepatitis B infection. Anti-HBc positivity might reflect a shared route of infection by HBV or HIV. However, HBV would also commonly be transmitted at birth or shortly after.

310. In respect of the possible benefits and disadvantages of anti-HBc testing, these are discussed in Transfusion Microbiology, the book that I co-edited, specifically chapter 2 by senior Editor, Dr Joan O'Riordan.

74. What information (either written or oral) was given to donors about the risk of them transmitting infections via their blood? In particular:

a. When was such information provided?

311. I understand that information written and orally was given to donors about the risk of them transmitting infections via their blood.

312. At NLTBC we started preparing our own leaflets and, with Dr Tom Davies, then Director and Dr Contreras (now Professor), we designed and tried the first very simple national leaflet, addressing male homosexuality and intravenous drug "abuse". The leaflet *"A.I.D.S and how it concerns blood donors"* was published by the DHSS on 1 September 1983. I do not recall exactly how these leaflets were provided for donors, presumably made obviously available at the donor session.

313. As I have explained, in 1984 I went to the New York Blood Centre with Dr Contreras to learn about the approach that Centre was taking with donors, to try to prevent the transmission of AIDS by the transfusion of blood components.

314. New York has in these respects a similar demographic to London, and we were able to see how the self-exclusion questionnaire was working and that this would be operationally feasible at NLBTC. There were huge ethical debates prior to this visit about invading the sexual privacy of donors, offending and then causing a loss of donors. However, from the visit we learned that they were not offended by the questionnaire which asked private life-style questions. We saw how it operated and with additional resources we would be able to set this up at NLTBC.

315. On the return flight from New York, Dr Contreras and I drafted all the instructions, protocols and requests for permission to employ the additional staff to get the questionnaire into operation and designed the first draft of our own self exclusion questionnaire based on what we had learned from our trip. We implemented this upon return to the NLBTC.

316. I believe that the questionnaire was a success and was eventually taken up by the other RTCs.

317. When comparing the samples from donors who ticked the box saying *don't use my blood for donation* (as in the questionnaire) with those from routine donors, we found a higher number of anti HBc positives (which was a surrogate for blood borne infections). This demonstrated the usefulness of the questionnaire.

b. Was there a nationally agreed leaflet or did each RTC produce its own leaflet?

318. NLBTC drafted it and it was then circulated nationally by the DHSS.

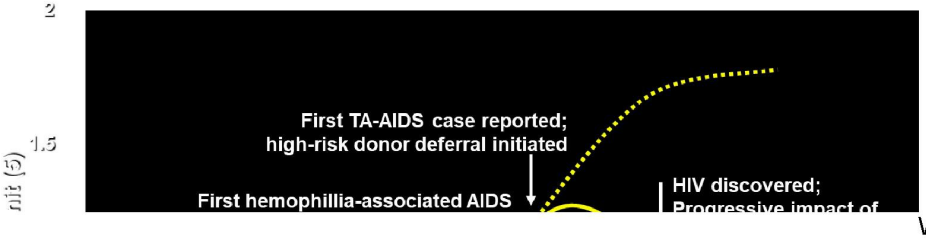
c. Did RTCs receive guidance on how information should be given to high-risk donors? You may find page 3 and 4 of CBLA0001707, page 3 of PRSE0001299 and page 10 of NHBT0107985 of assistance.

319. I do not recall whether RTCs received guidance on how information should be given to high-risk donors.

320. The '*guidance'* given in the questionnaire was simply if you think you are at risk of transmitting HIV (either a homosexual male or an intravenous drug user) please don't donate or if you do have to donate then indicate that your blood shouldn't be used, and your donation would not be entered into the blood supply.

75. How effective, in your view, were leaflets and other communications at reducing the risk of donations from high-risk individuals?

321. The graph below shows how post transfusion AIDSs could be significantly reduced by the use of donor selection via self-exclusion– prior to the introduction of anti-HCV testing.



322. The dotted line is a projection of the HIV risk if high-risk donor deferral had not been initiated.

323. Despite the very active research, the agent/virus responsible had not then been identified, so we did not have an available test when the leaflets were prepared. Therefore, the most effective way that we could protect our recipients was to exclude high risk donors, through education of our donor panel.

324. The NLBTC would perform audits on the usage of blood and queried with hospitals when there were significant apparently unjustified usages.

76. How often were these leaflets updated, and how was their content decided?

325. I do not recall how often the leaflets were updated but they would have developed according to the change in knowledge of the risk factors identified.

326. I do not recall how their content was decided but possibly by the RTDs at their meetings.

77. CBLA0001707 refers to minutes of a Regional Transfusion Directors meeting held on 18 May 1983 which you were present at. At this meeting, Directors rejected proposals to question donors and discontinue sessions in high-risk areas. Did you agree with this decision? Please explain your answer.

327. I attended as the representative of the Working Party on Transfusion Associated Hepatitis, although I do not recall this meeting. I was a

microbiologist and not a regional transfusion director and therefore did not have much input into any general decisions. I appreciated being invited to attend relevant meetings, but I would have mostly answered their questions to the best of my abilities and given general advice within my knowledge and experience at the time.

328. Dr Wagstaff referred to a letter from Dr Gunson (not dated) giving four options that RTDs could accept. 1. Questioning of donors at sessions 2. Sessions to be discontinued in areas of high-risk donors. 3. Pamphlets explaining AIDS to donors. 4. Publications in newspapers.

329. Looking at this with hindsight, I would have been inclined to be more proactive about questioning the donors, but I was fully aware that face to face questioning of a very personal aspect of persons' lives, such as '*do you practice homosexual intercourse'*, wasn't likely to be agreed.

330. I do not agree with discontinuing sessions in high-risk areas as this would have closed important parts of the blood supply that North London provided for hospitals and events vindicated this as when testing was introduced it was clear that the overwhelming majority of at-risk donors had excluded themselves.

78. At a meeting of the SNBTS in May 1983 it is recorded that Dr Cash would contact you asking that you produce a leaflet for donors on AIDS to be distributed at transfusion centres (paragraph 15.b PRSE0003620). Did you produce leaflets on AIDS for the SNBTS? If so, what did they contain and how did they differ and develop over time in comparison to the leaflets in England and Wales?

331. This was a meeting at the Scottish National Blood Transfusion Service, and I was not in attendance.

332. It was agreed after the discussion that Dr (subsequently, Professor) Cash (Chair) should contact me for information about the proposed leaflet that I was preparing with Dr Davies.

333. I do not recall whether Dr Cash did make contact, nor do I recall sending him a copy of the leaflet.

334. I also do not recall whether the version of the leaflet at the time, differed from those in Wales and Scotland.

79. In September 1983, the publication of a UK-wide leaflet on AIDS and blood donors (BPLL0007247, NHBT0020668, CBLA0001707) was distributed to RTCs. Please explain your contribution to the production of this leaflet?

335. I drafted the first version of this with Dr Tom Davies who was then the Regional Transfusion Director at NLBTC.

80. At a meeting of the Working Party on Transfusion-Associated Hepatitis in September 1983, it is noted that "*a common policy on the distribution of this leaflet was highly desirable but failed to reach any agreement on what that policy should be*" (PRSE0003121). Why was there a failure to agree on what the policy should be? Which view did you hold? How was the leaflet eventually distributed? Was it agreed or left to the RTCs to decide?

336. I do not recall this meeting and therefore cannot answer why there was a failure to agree on what the policy should be, what my view would have been at the time, how the leaflet was distributed or whether it was agreed or left to the RTCs to decide.

337. The agent/virus responsible had not been identified/ discovered and knowledge was still evolving, so naturally there were different views about the best way to proceed.

338. I would have wanted a uniform approach on how the leaflet was distributed.

81. The 1983 AIDS leaflet excluded homosexual men from donating blood who had *"many different partners"* (BPLL0007247, page 1). What did you understand was meant by "many different partners"? Do you think this would have been hard to understand for the reader? Did this leaflet reduce the number of homosexual donors coming to give blood at NLBTC? You may find [NHBT0036250_025] at page 3 of assistance when answering this part of the question.

339. I understood many different partners to refer to someone who was not in a stable relationship, or was in an open relationship, who would have had sex with numerous partners.

340. I consider that this was a reasonable expression, which would have been derived from the evidence as we understood it to be at the time from reading and hearing first-hand of the behaviour in the US. NLBTC worked closely with various interest groups in our district to try to understand behaviour and how best to appreciate and address the risks.

341. I do not recall data on whether this leaflet reduced the number of homosexual donors coming to give blood at NLBTC although I believe this would have been the case.

82. The 1985 AIDS leaflet (NHBT0096480_022) excluded all homosexuals from donating blood. What was the reason for changing the criteria from

the earlier leaflet? You may find NHBT0000030_015 (in particular, page 3 to 4) helpful in explaining your answer.

342. I do not recall the reason for changing the criteria from the earlier leaflet. I can only presume that it was changed as the understanding of the risks of AIDS from transfusion developed.

83. In October 1987 you presented on laboratory aspects of AIDS (NHBT0052305). You stated that "in the UK, donor education has reduced the otherwise expected rate of donors found positive for anti-HIV by up to 90%". Please explain the process of donor education and self-exclusion at the NLBTC. Did every RTC follow the same procedure?

343. Donor education included the use of leaflets, CUE questionnaire and working alongside interest groups.

344. I do not recall whether every RTC followed the same procedure.

84. On 15 May 1989, a National Blood Transfusion Service (NBTS) memorandum stated that the 'J' donor system was to be re-implemented. The system would identify donors implicated in post-transfusion hepatitis and test serum if available, or otherwise mark the donor's documents 'J' so the donor could be tested at their next session. Once complete, the RTC would either withdraw or restore the donor, or retain the 'J' marking (NHBT0005388, pages 1 to 2).

a. At what point, for what reason and by whose order was the J system first suspended?

345. NLBTC always ran the J donor system (from the early 80s) based on the advice of honorary consultant, Dr Dane and I therefore do not believe that it was ever suspended at our Centre.

346. I do not recall whether NBTS suspended in other Centres, but the J donor system was always in place during my time at NLBTC.

b. Was this a uniform system or did each RTC design its own?

347. I do not know whether it was a uniform system or whether each RTC designed their own. I presume each Centre would design its own.

c. What tests were done on a 'J' donor who arrived at the next session to donate blood? As HCV testing was available from 1989, were 'J' donors tested for anti-HCV ahead of the routine introduction of the test in 1991?

348. As far as hepatitis B was concerned, we would test for anti-HBc and anti-HBs.

349. For hepatitis C testing, we wouldn't have tested for anti-HCV until we had the second-generation tests. We didn't try and put a first-generation test in place because we were worried about the specificity. But we would have done anti-HBc, ALT and AST, and we would have done liver function tests and anti-HBc as surrogates for hepatitis C.

350. We had always dealt with reports of PT-jaundice by obtaining samples of the recipient which we could send to the reference laboratory to confirm the findings. Alternatively, we would ask for sight of the test result of that recipient. This was to confirm a real post transfusion infection in the

recipient. We would also urgently request details of the donations involved and link that to the relevant donors whose future donations would be held.

351. If we were satisfied that the recipient was genuinely newly infected, we would test archive samples, do supplementary tests, and repeat the screening test. If any significant results were found, we would ask relevant donors to give us a further blood sample. If no indication of infectivity could be found in the 'implicated' donors, we would inform the hospital and ask them to investigate other possible routes of the recipient's infection i.e. 'hospital acquired infections'.

352. When we had received the recipient's sample it would be tested for anti-HBc IgM to confirm that any HBV infection was recent.

353. The hospitals and CDSC would routinely be informed of the outcome of these investigations.

354. Dr Patricia Hewitt would be involved in liaising with the hospital.

Introduction of virally inactivated products

85. What role did you consider the NLBTC had (or should have had) in pushing for factor concentrates to be virally inactivated in the late 1970s and early 1980s?

355. I would not have been involved in any role NLBTC had (or should have had) in pushing for factor concentrates to be virally inactivated in the late 1970s and early 1980s. This would have been a matter for the RTDs at the time who would have discussed this with the director of BPL if this had been considered part of their role.

356. I do understand that factor concentrates should be virally inactivated if possible and I was aware that BPL had been researching inactivation of hepatitis B, but I had no contact with them on that. As I understood it (from talking to colleagues at the time), the reason they didn't roll it out for hepatitis B was that you lost some Factor VIII activity. I don't know exactly when in 1985 they introduced it (because of HIV) nor whether they got round losing activity or whether they just accepted some loss of Factor VIII activity.

86. Was the need for safe products raised by you or anyone else at the NLBTC with BPL and/or pharmaceutical companies (or anyone else) during this period? If so, please give details. If not, why not?

357. Not that I recall. It was a 'given', that if you could have virally inactivated product, it would be safer. However, I do not recall any formal meetings or communications on this and it was really outside my role to be involved.

87. Please refer to DHSC0020720_082. The document recalls that during the course of the Hepatitis C Litigation you stated it was "*vital to balance the concept of maximum safety with the need for continuity of blood supply.*" How would striking this balance have affected progress in relation to viral inactivation, if at all?

358. My statement '*vital to balance the concept of maximum safety with the need for continuity of blood supply*' would have been about blood *components* rather than blood *products*. A blood component is simply separated mechanically, for example, separating out red cells, plasma, platelets and white cells. A blood product would be manufactured from a pool of plasma and would require fractionation at a facility such as BPL.

359. It would also have applied to the continuity of supply of Factor VIII for treating acute episodes in haemophilia patients.

360. It was a question of whether you withhold a blood component/blood transfusion from somebody who might become very ill or even die if you withhold it - such as someone who came in with stab wounds and was bleeding and needed urgent blood transfusion. Would you withhold that because of a possible risk of transmitting NANB hepatitis? Therefore, it was vital to balance the concept of maximum safety with the need for continuity of blood supply and urgency of the need for transfusion.

361. I cannot see how striking this balance would have affected progress in relation to viral inactivation, if at all. People were aware that there were times when an un-inactivated product or component had to be transfused but it was preferable if it could have been inactivated, which they continued to strive to achieve.

Donation testing for HBV

88. In the May 1991 meeting of the ACVSB, Dr Tedder said donors with a history of jaundice were the wrong group to consider for anti HBc screening as it was not a useful test in populations with a low prevalence of HBV (NHBT0000042_080). Did you agree with this statement? Please explain your answer.

362. I was not in attendance at the meeting on 21 May 1991 of the ACVSB. I do not recall this meeting, nor do I recall having sight of the minutes contained in (**NHBT0000042_080)** prior to the Inquiry.

363. If you have a donor with a history of jaundice and they were anti-HBc positive without a positive hepatitis A antibody I would have considered

them at greater likelihood of having had hepatitis B, so I am considering the issue from a different perspective to Dr (subsequently Professor) Dr Tedder.

89. Between at least 1994 and 2001, you and Dr Tedder produced multiple papers for SACTTI on whether anti HBc testing should be introduced. The issue was repeatedly discussed but the test was never introduced.

a. What do you recall of the arguments for and against its introduction? You may wish to refer to NHBT0000088_030, NHBT0000088_006 and NHBT0003407.

b. What was your personal view on this matter and how did it develop over time?

c. For what reasons, in your view, did this issue keep returning to committees without a final decision being made? Do you feel that this continued reassessment was appropriate?

d. Why, in your view, was routine anti-HBc screening not introduced

364. Anti-HBc is a long-lasting serological marker of infection (often at birth) with HBV. It could relate to somebody who has had the infection, cleared it, and developed anti-HBc; and by the time you see them the HBsAg has become undetectable, or it could relate to somebody who has had hepatitis B and has become a carrier of hepatitis B, but by the time you see them the HBsAg had become undetectable. In the first instance the blood was unlikely to be infectious but in the second instance the blood could retain infectivity.

365. In the absence of nucleic acid testing (NAT), you wouldn't be able to increase the chance of detecting HBsAg, so you were faced with the problem of what that anti-HBc result meant.

366. Referring back to the response to question 88 above, if you had a donor with a history of jaundice and who was anti-HBc positive, that strengthened the evidence for possible hepatitis B infectivity, especially in the large volume of inoculum that a unit of blood comprised.

367. Another question was how would you confirm the anti-HBc result? You could get an idea of the reliability of the anti-HBc result if the titre was high, and/or if alternative anti-HBc assays were also positive. Another marker of infection with HBc was anti-HBe. This could be tested for at Reference laboratories.

368. Then you would have a potential problem in assessing the specificity of that result. If we did start screening for anti-HBc you would then have to test all the positives for anti-HBs indicating immunity and then you would have to determine the titre (strength) of the anti-HBs reactivity. If the anti-HBs titre was greater than or equal to 100 miu/ml one could be reasonably certain it represented immunity (although exceptions had been reported in the literature).

369. Another question was the titre of the anti-HBc reactivity. If anti-HBc was at a very low level did this indicate residual or falsely positive reactivity. In the absence of nucleic acid testing this was not straightforward.

370. My view developed over time, from speaking with colleagues and attending meetings. In the event nucleic acid testing rather superseded the question of anti-HBc because of its extra sensitivity.

371. These 'unknowns' were the reason why it was so repeatedly debated without a final decision. Continued reassessment was appropriate. We always kept trying to see how we could improve the microbial safety of blood. These issues are discussed in Transfusion Microbiology, the book that I co-edited, specifically chapter 2 by senior Editor, Dr Joan O'Riordan.

372. It was going to be difficult to predict the level of safety achieved by anti-HBc testing compared with the loss of blood; the complications it might have for donors who would be 'labelled' or who could be construed as being potentially infectious when they might not be and of course there was a cost involved. In terms of costs and benefits I think the conclusion was that it wasn't going to be cost effective and would cause concern for donors often unnecessarily.

90. In a 1991 letter, Dr Gunson says that he will invite you to prepare a centralised analysis of HBsAg statistics (NHBT0006351). Did this go ahead?

373. I do not recall the letter from Dr Gunson in 1991 contained in (**NHBT0006351**) and I was unable to locate a copy of this document.

374. I understand that I did prepare a centralised analysis of HBsAg statistics.

375. I cannot recall how it was started and what data we used to put in it, but I believe I did a simple collation of the HBsAg statistics.

91. The NHS Management Organisational study in 1987 had recommended more sharing of evaluation responsibilities and statistical information. In your view, was the three years between these recommendations and Dr Gunson's centralised analysis proposal appropriate? Please explain your answer.

376. I have been unable to locate The NHS Management Organisational study in 1987 as referred to in this question.

377. I do not recall this study and therefore I am unable to answer whether the three years between these recommendations and Dr Gunson's centralised analysis proposal was appropriate.

Donation testing for HIV

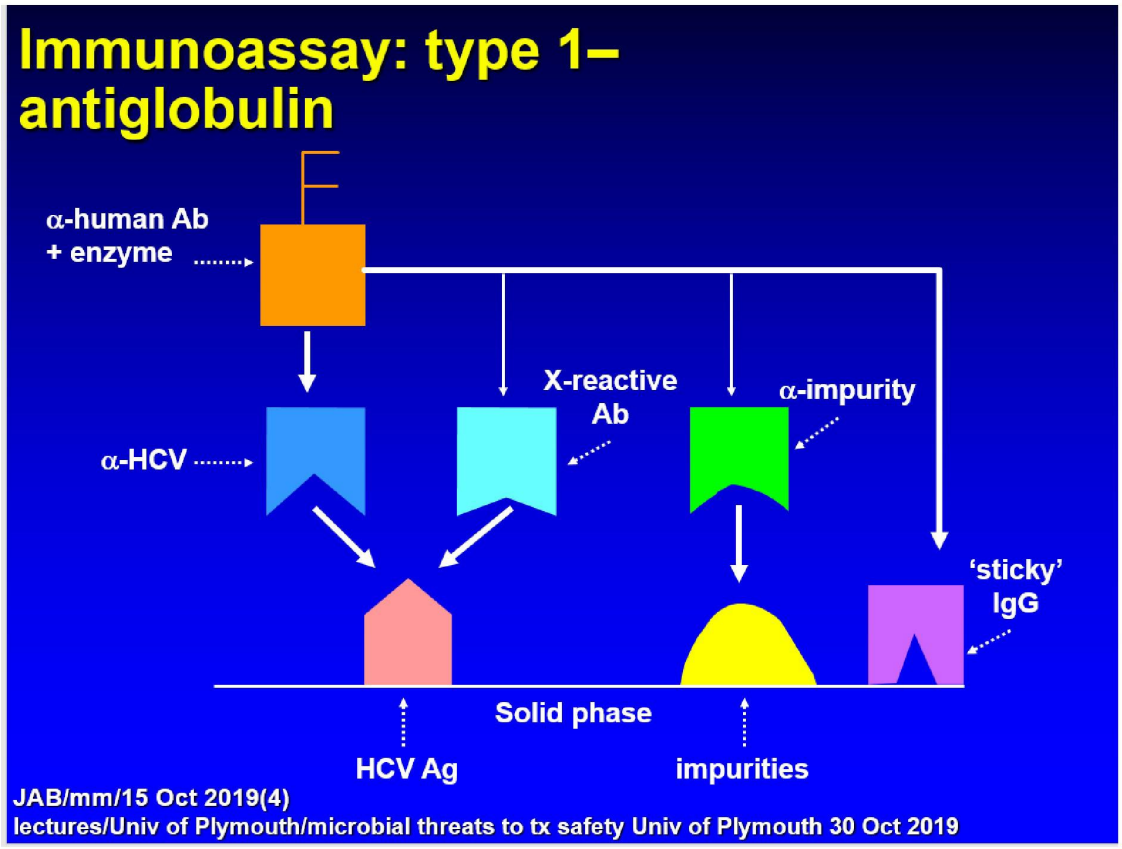
92. The Inquiry understands that the second stage of the evaluation of HTLV-III screening tests took place at the NLBTC between August and October 1985 (PRSE0003165, page 7). Please explain:

a. What made the NLBTC particularly suitable to undertake the second stage of the evaluation programme?

378. NLBTC had the expertise, resources, and close contacts to undertake the second stage of the evaluation programme.

b. How the field evaluations were run at the NLBTC, including whether all donations were tested and whether any confirmatory testing procedure was used. How were the decisions made as to how the field evaluation was run?

379. To assist with answering this question, please see my diagram below extracted from my slides to students at the University of Plymouth (**WITN6989003**):



380. There are four types of immunoassay: the **antiglobulin** assay, the **competitive** assay, the **antibody-capture** assay and the **sandwich** assay.

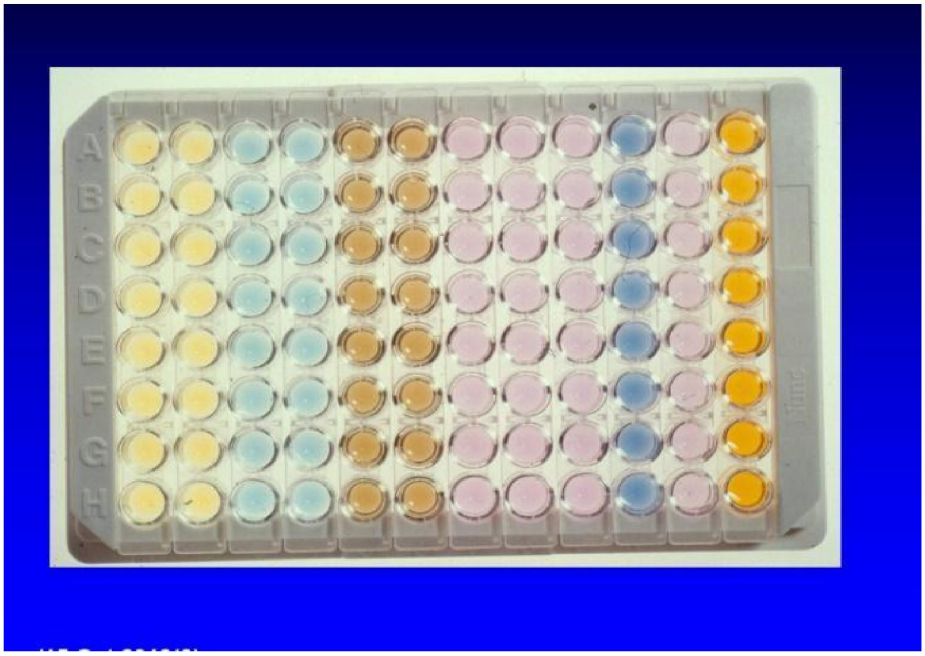
381. The **sandwich** assay allowed you to test for antigen and antibody at the same time.

382. In the diagram, the top left-hand square 'block' with an E on top of it represents the 'conjugate' i.e., an anti-human antibody with an enzyme linked to it. This enzyme will drive a chemical reaction to produce colour if there is anti-HCV in the test sample.

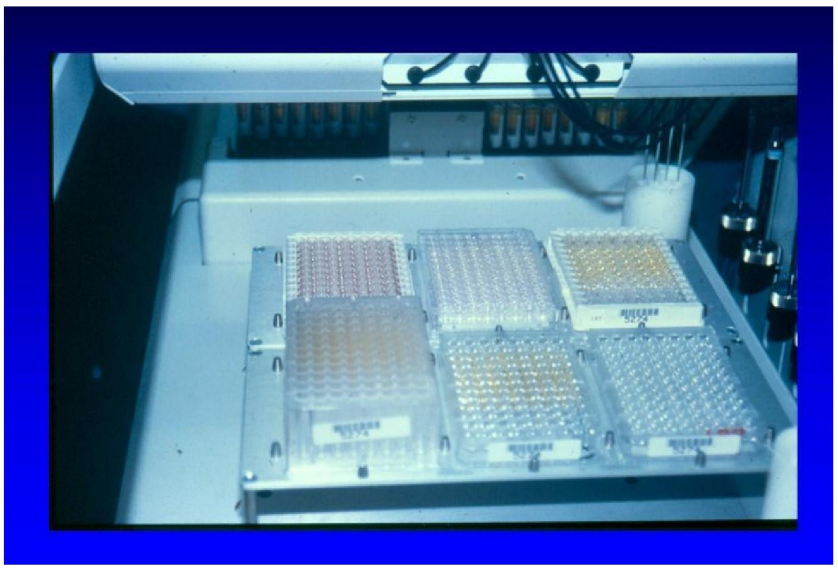
383. Although this diagram above is for hepatitis C, the same principle would apply for HIV.

384. At the bottom line of the diagram it says, '*Solid phase'*. This just means the plastic surface on which the test is performed. This could be a little bead, or a tube, or a 'microwell' in a 'microplate' of 12 x 8 (96) microwells.

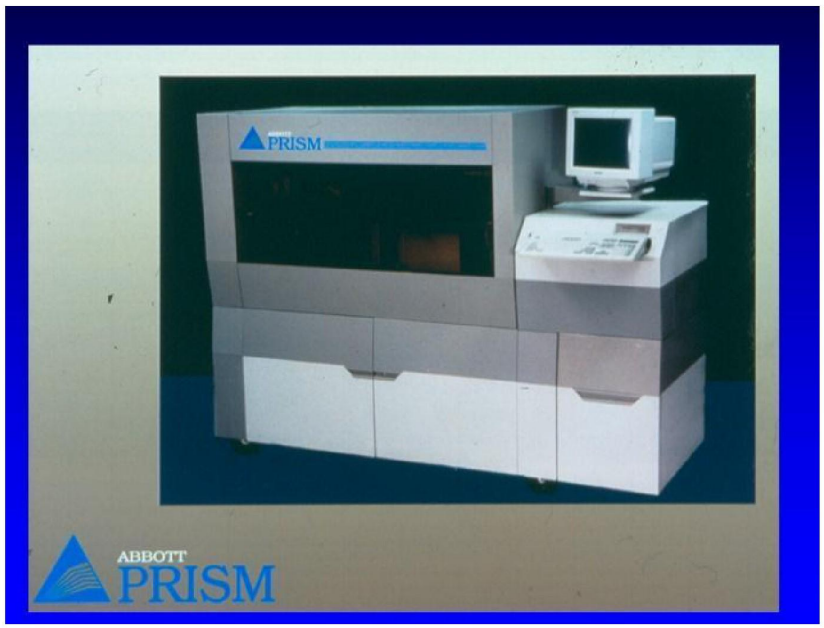
385. **Slide 8** from my slideshow to students at the University of Plymouth (**WITN6989003**), shows a plastic microplate (approx. size, 6in x 4in) and you can see the different dyes (which did not interfere with assay) but showed when a reagent had been added to a well. The first four vertical rows of wells illustrate the colour change, when for example, 20 microlitres of serum test sample are added to 100 microlitres of colourless diluent. The colour change confirmation was necessary for tests to detect antibodies because only a small volume of serum sample was pipetted into a large volume diluent. Unlike with the 100 microlitre sample of clearly visible serum (as in tests for anti-HBsAg), one could not see when small volumes of serum to be tested were added to colourless diluent. Other reagents in the test had different colours to show that all stages in the test had been completed. This system was called 'Sample Additional Monitor' (SAM) or 'Sample Addition Verification' (SAV). Different kit manufacturers used different names.



386. **Slide 9** (**WITN6989003**) is a demonstration of a set of microplates, each plate being a test for a different agent. The bar code identifies the test and the series of samples in that plate. In the bottom left-hand corner, you can see a deep well (1ml) microplate for storing the frozen serum archive samples. This barcoding allowed sample tracking e.g. for subsequent retrieval of a given sample.



387. **Slide 10** (**WITN6989003)** photograph of the original ABBOTT laboratories 'PRISM automated sample testing system.



388. Plastic will absorb protein, non-specifically but very tightly, so you add your antigen, say it was HIV antigen, into fresh plastic wells and it would bind to the plastic well. It would then be ready for testing. The 'coating' of the wells with antigen would be part of the kit manufacturing process.

389. If you add a serum sample and it contains anti-HIV, the anti-HIV binds with the HIV antigen and the next stage after washing away excess sample is to add conjugate, ie, enzyme linked to the antihuman antibody. This binds onto the anti-HIV and then you run your enzyme reaction. A 'positive' sample will produce a coloured reaction.

390. Antiglobulin type assays, were usually the first type assay available commercially because they are the easiest to produce as the anti-human antibody conjugated to an enzyme is an 'off-the shelf' reagent. The plastic solid phase would be coated with whatever viral antigen was appropriate. However, this type of assay was prone to generating false-positive reactions for several reasons.

391. Firstly, if your sample contained a cross-reactive antibody which was not anti-HIV but was structurally similar and was similar enough to bind to the antigen, possibly to a lower level, then the conjugate would detect it, causing a false positive reaction.

392. Another cause is that the plastic will absorb protein in general and if your preparation contained impurities, then those impurities could bind to the plastic. An example is the HLA antigens in the H9 cell line which Dr Gallo licensed several US anti-HIV test kit manufacturers to use. Anyone with antibodies to HLA antigens (a not uncommon occurrence) would produce false positive test results. The same applied to other 'impurities' in the cells from which virus was extracted. Because HIV buds through the cell wall as it

is released from the cell, cellular antigens would always comprise some of the virus's outer coat.

393. The third problem was from people with 'sticky serum'. These are people who typically would come from countries with high prevalence of viral infection or parasitic infections. They would have high resting levels of IgE and IgG, high enough for their serum to bind directly onto the plastic well. The anti-human antibody in the test could bind directly to them to produce a (generally weak) false positive reaction.

394. So, one has four ways that you can get a positive reaction. A strong positive would most likely be real, although if you are early in the acute infection and your anti-HIV was at low level you could get quite a weak reaction. The strength of cross-reactive antibody could vary; generally (but not always) it would not be high. Your anti-impurity reaction level could vary, and your sticky IgG reaction would typically be quite low level.

395. To summarise, antiglobulin assays were prone to false positivity and practitioners were aware of that.

396. So, in the absence of a confirmatory test, it was very difficult to interpret what a positive reaction meant.

397. In **competitive** type assays you would have, for example, HIV antigen on your solid phase. You would use an anti-HIV antibody that itself was conjugated to an enzyme. Since (unlike anti-human antibody conjugate) this was not an 'off the shelf' reagent manufacturers preferred to produce anti-globulin type assays to get test kits on sale more rapidly.

398. In the competitive assays you would add your sample which might contain anti-HIV and then you immediately add your conjugate (anti-HIV

with an enzyme label). The two types of antibody would compete for binding to the HIV antigen on the plate well. When the test is completed a coloured reaction indicates a negative sample, but a colourless reaction indicates the presence of anti-HIV in the sample. This system avoided the problems of false positivity seen in antiglobulin tests and was shown to be 10x more specific than antiglobulin type tests.

399. With any screening test, in the absence of confirmatory tests, you wouldn't know what your repeat reactivity meant.

400. The confirmatory testing that was developed for HIV was a system called Western blot and was a form of immunoblotting technique. It separated out the different antigens of HIV onto a strip to which you added your sample. The different antibodies would then bind to the different antigens, showing you the 'anatomy' of the antibody response - i.e. which antibodies were present against the various different components of the virus.

401. The **antiglobulin** or other type of screening test just told you 'positive' or 'negative', whereas the Western blot told you what the individual antibodies were. I think that if you got two lines or more coming up you would consider that that was a confirmed positive.

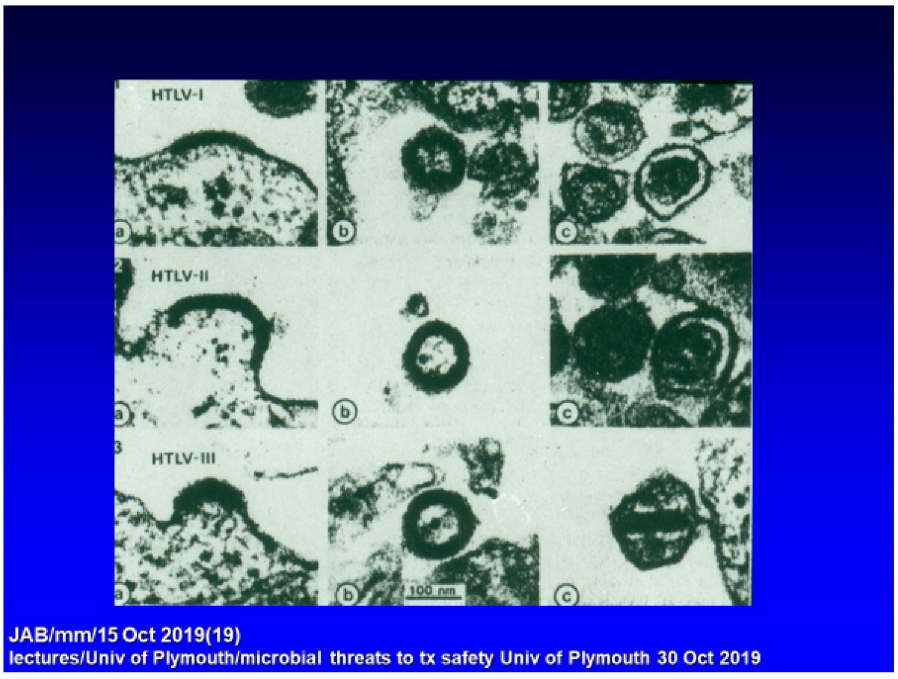
402. If a donor had 'sticky serum' they would give very weak reactions to all the lines of the Western blot.

403. If doing a test for detecting, for example HBsAg, that's relatively easy to confirm (apart from looking for anti-HBc which would also come up in parallel with surface antigen), you could do a 'neutralisation test'. For this you take your sample believed to contain antigen and add specific anti-HBs and retest. The antibody would bind to antigen and block its reactivity. You were not able to do that for antibody tests because you couldn't be sure

that what you were detecting was not non-specifically binding to the antigen and blocking it. So that is why looking at the 'anatomy' of the antibody response was developed.

404. When the search for tests to detect anti-HIV in blood samples began there was only one HIV agent extant, namely what subsequently became known as *'HIV 1'*. This virus was thought to have originated in Africa, probably due to de-forestation allowing human contact with previously undescribed species of monkey presumed to carry AIDS-like viruses. Certain tribal practices such as scarification and even injection of monkey blood into male genitals to enhance virility may well have allowed the AIDS virus to enter the human population.

405. When Dr Gallo published his description of the virus causing AIDS which he mistakenly called 'HTLV III' one could see that the virus exited the infected cell after replication by budding through the cell wall. Please see **slide 19** (**WITN6989002**) below:



406. This also applied to the two 'true' human T cell leukaemia viruses which he had previously discovered. But, as we know, HIV (or 'LAV' for lymphadenopathy virus as named by Prof Montagnier, the co-discoverer of the causative agent of AIDS) is a human immunodeficiency virus.

407. In **slide 19** (**WITN6989002**) (above) one can see the viral components aggregating at the cell wall margin with its antigens inserting in the cell wall seen as a dark thickening, before budding through the cell wall as a free virus. Since Dr Gallo grew his cultures in the H9 cell line, rich in HLA antigens, some of these antigens would inevitably have been present in the viral 'coat'. When he licensed companies to develop anti-HIV assays he stipulated that they use his cell line. This is very significant with regard to specificity. In the antiglobulin format of immunoassay which I have described previously the viral antigen coated on the plastic 'solid phase' was (in the first developed assays) the HIV grown in H9 cells. This would mean that HLA 'impurities' **(as shown in yellow in slide 4 of (WITN6989003))** would, again inevitably, have been present on the plastic. This provided a significant cause of HLA antibody- containing test samples causing repeatable false -positives.

408. The competitive format, although also coated with HIV antigen, relied on competition between any anti-HIV in the test sample and an enzyme labelled specific anti-HIV reagent added. This therefore provided an approximate 10-fold increased specificity when testing samples, due to the direct immunological competition for the HIV antigen binding site.

409. When HIV-2 was subsequently discovered (mainly in West Africa and closely related to a Simian AIDS-like virus) there was an obvious need to ensure that any anti-HIV-2 positive donor samples could be detected. The exquisite specificity of the competitive format for detecting anti-HIV 1 meant that it could only detect approximately one third of anti-HIV 2 positive samples through a slight degree of cross- reactivity between the two

viruses. This necessitated changing to a sandwich immunoassay format which coated the plastic solid phase with both HIV 1 and HIV 2 antigens. After the test sample was added, enzyme labelled HIV 1 and HIV 2 antigens were then added to see if they bound to any antibodies 'captured'. This, of course, was a more complex assay to manufacture as it entailed enzyme labelling the two viral antigens but it too was a very specific assay. I presume the antiglobulin format assays also had to be modified to have both viral antigens coated on the solid phase. In the event we detected very few anti-HIV 2 positive samples in our donor population.

410. I believe that the reasons HIV testing were not introduced sooner in the UK were the predicted (and demonstrated) poor specificity of the antiglobulin format assays; the lack of any confirmatory assays until Western blot, similar in principle to RIBA) became available; and our real concern that worried individuals would attend to donate blood simply to get tested, the so called 'Magnet effect'. These points are also outlined in (**WITN6989008**).

411. I do not recall how the decisions were made as to how the field evaluation was run, but I probably discussed the results with the RTD, who made the decisions.

c. What were the results or conclusions drawn by the NLBTC and were these submitted to either PHLS, the DHSS or another relevant body?

412. Other than my response to question to 92b above, I do not recall what results or conclusions were drawn by the NLBTC and whether these were submitted to either PHLS, the DHSS or another relevant body.

d. Was an official report ever published and circulated detailing the conclusions of the second stage of evaluation? If not, why not?

413. Although I was not directly involved, I understand that on testing the first-generation screening kits, they were very unreliable and there was no confirmatory test. By the time the second-generation kits were available and evaluated the situation was better but still not straightforward as the report on the preliminary analysis of the results trial shows **(NHBT0017536).** The outcome of the tests depended to an extent on which test was used and there was a difference depending on the combination of the first and second test and the order in which the tests were done. It might help to illustrate the difficulties we faced, and that this was not as straightforward as it might appear, if I set out here the comments and conclusions from that report (with my highlighting in the hope that this assists):

1. *'COMMENTS AND CONCLUSIONS*

   a. *This study has generated a considerable amount of data. Until this has been fully analysed and further testing performed, particularly using PCR on a selective basis,* ***it is inappropriate to draw anything other than tentative conclusions****.*

   b. ***As a preliminary to defining true positive results*** *it is important to define this term. On the evidence available from two previous U.K. studies a positive result with RIBA II denotes* ***potential*** *infectivity. In Craske's evaluation of anti-HCV screening of blood donations 16 of 16 RIBA II positive samples were PCR positive; in the SNBTS study (attached) of anti-HCV testing during September and October 40 of 45 (89%) of RIBA II positive samples were PCR* positive.

   c. *There appears to be little doubt from the results presented in this paper that samples which are positive with two ELISA screening tests*

are ***more likely*** *to be RIBA II positive. The predictive value using three ELISA screening tests when all are positive is even greater.*

d. ***All ELISA screening tests apparently gave false positive results****. Using two screening tests* ***the data strongly suggests that Abbott/UBI, UBI/Abbott or UBI/Ortho will outperform any of the other three combinations*** *(Fig. 8).* ***This conclusion assumes that false negatives are not a significant factor*** *and it is* ***essential that the four RIBA II positive samples, which were negative with either Abbott or UBI, are further investigated.***

e. ***RIBA II indeterminates present a problem****. Again, from the SNBTS study 6 of 78 RIBA II indeterminates were PCR positive. On further analysis it can be seen that those which were PCR positive were strongly reactive with anti-c22. No PCR positives were found with RIBA II indeterminates reacting with anti-5-1-1, anti-c 100 or* anti-c 33c.

f. *In Table 3, an analysis of the RIBA indeterminate results for three selected test pairings demonstrated quite different patterns. Particularly, an initial positive result with Abbott followed by a negative result with UBI may be significant due to the higher number of anti-c22 positives in RIBA II of which 5 were strong reactors. It is clear that further investigations of RIBA II indeterminate results are required before firm conclusions are drawn.*

g. *The fact that not all repeatably positive results at the RTC could be confirmed at the reference laboratory when they were subjected to the same ELISA test has been noted in a previous study and may be due to one or more reasons.*

h. *If, after further investigations have been completed, it is possible to recommend that samples are referred for confirmatory testing only if they are positive with two ELISA screening tests, it seems preferable to perform both of these tests at the RTC. This will be cost-effective since this policy would save a considerable number of confirmatory tests. Using the Ortho/Abbott pairing only 40% of initial positive samples would need to be referred. Comparative figures for the other pairings are: Ortho/UBI 22% Abbott/Ortho 74%, Abbott/UBI 38%, UBI/Ortho 23% and* UBI/Abbott 21%.

From the results it can be seen that it would not be appropriate at present to give definitive advice.

An answer can be given to the question posed in paragraph 1.41. Since 2 samples negative with UBI and 2 negative with Abbott were RIBA II positive one cannot assume that a positive result with only one ELISA screening test indicates anti-HCV negativity. The current policy of disposing of the donation and all its constituent parts when the initial screening test is positive must remain. Further investigations are required before a policy decision can be made with respect to the questions raised in paragraphs 1.42 and 1.43.

93. The Inquiry understands that although HIV screening was to commence on 14 October 1985, the NLBTC started screening on the 23rd September 1985 (NHBT0019621, page 18).

a. Please can you confirm that this was the date that testing commenced at the NLBTC.

b. What steps were taken to ensure that the NLBTC could begin screening on this date?

c. Please explain how the NLBTC were able to commence screening of all donations on this date and why the NLBTC chose to commence screening early rather than wait for the date of national roll-out.

414. I cannot recall that this was the exact date when testing commenced at the NLBTC or what steps were taken to ensure that the NLBTC could begin screening on this date.

415. I also cannot exactly recall how the NLBTC were able to commence screening of all donations on this date and why the NLBTC chose to commence screening early rather than wait for the date of national roll-out.

416. The NLBTC would have had to ensure that all the staff, the equipment, the re-agents, and the training was ready to commence screening. In addition, all inventory would have needed to be screened prior to commencing.

417. I understand that we carried out the first trial, so would have been familiar with the testing protocols and in a better position to commence screening before the national roll-out.

94. Please describe the implementation of HIV screening testing at the NLBTC. In particular:

a. What was the process for testing screening donors and/or blood donations, including the confirmatory testing procedure used?

418. Please see my response to question 92b above.

b. What happened to all the unscreened blood that had been collected prior to HIV screening being implemented?

419. I was not involved in the safe disposal of the unscreened blood that had been collected prior to HIV screening being implemented. That would have been dealt with at RTD level.

c. What happened when a donation was found to be infected with HIV? Please set out the steps that had to be taken, both with respect to the donor, the donation, and in terms of passing on information to third parties and/or identifying recipients of previous donations from that donor.

420. If a donation was found to be infected with HIV, the donation would have been held and would not enter the blood supply.

421. Initially you have an initial reactive (an IR), on the serum sample, and then that serum sample would be tested in duplicate and if one or both of those duplicate tests was reactive, it would then be called an RR (a repeat reactive).

422. We would then have collected the unit of blood from inventory and any components that might have been prepared and we'd have taken a sample from the blood bag and we'd have tested that again to confirm that it was reactive. If reactive, a sample would have been sent to, at that time, the Middlesex Hospital who would do the confirmatory testing. We would then have done the Western blot (see my response to question 92b above) and await the result of that.

423. If positive again, the donor would have been contacted and asked to come in to discuss the results. I was less involved in this, which was more

the responsibility of medical staff who would have looked up the donor's previous donations to identify the recipients of previous donations and the hospitals would have been informed.

424. We would have asked the hospitals to test the recipients and if they agreed (and we would have preferred it), to also get a sample from those recipients and then we would test them. It was a complex process.

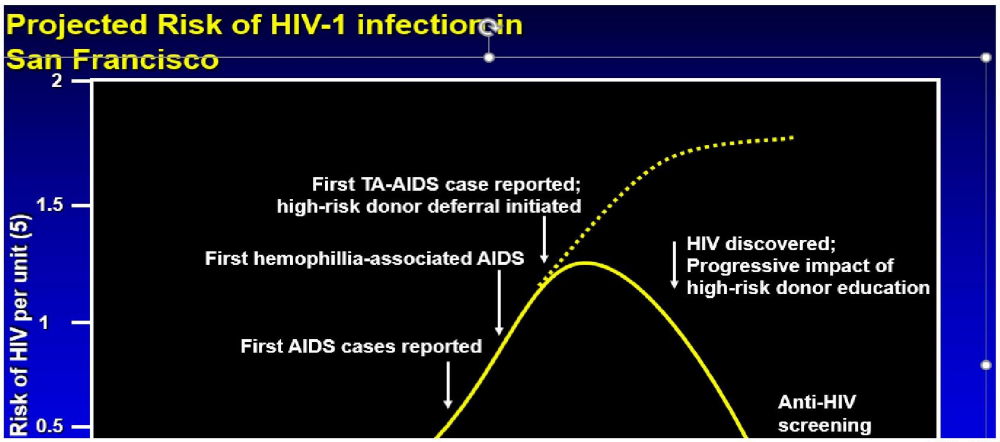
d. What impact did the introduction of HIV screening have on the NLBTC, including but not limited to the financial impact of screening, the impact on those working at the NLBTC, and the impact on the risk of transmission of HIV through blood donations?

425. The issue of false positive test results did influence the implementation of HIV screening.

426. The financial and staffing implications are self-evident.

427. If we got a reactive reaction, then immediately we would hold it. But at the time, there were possibly concerns about staff handling and the possibility of transmission, so we would want to avoid needlestick injuries to staff. Those working at the NLTBTC would have to be trained to reduce the risk of transmission of HIV from handling potentially infectious donations.

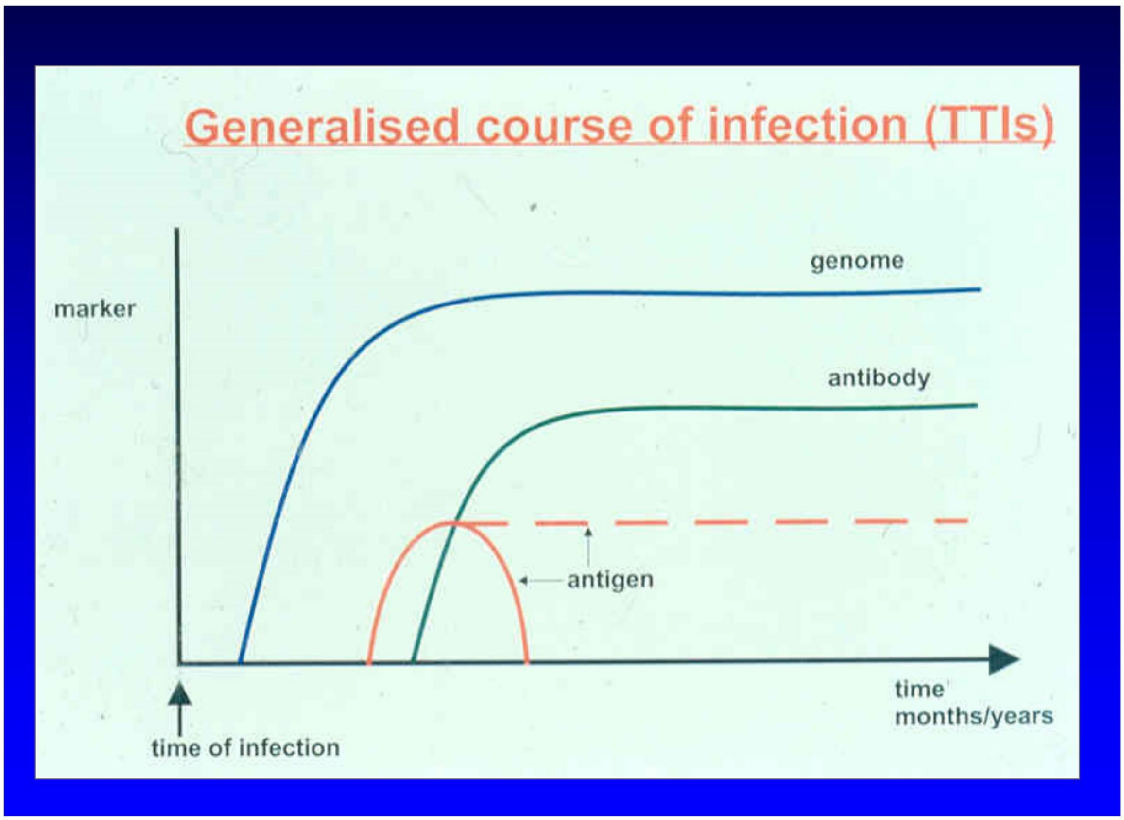
428. As to its effect, I refer again (as mentioned in question 75 above) to **Slide 7** from my University of Plymouth lecture (**WITN6989002**) below:



429. This was the projected risk of HIV-1 infection in San Francisco. This is American data, but the dates and pattern would have been similar in England, apart from the daily exclusion rates.

430. A large proportion of the residual risk of HIV transmission after infected donor self-exclusion had been eliminated by anti-HIV screening. We favoured a competitive type assay which was very sensitive and specific. However, there was still some residual risk from what is called 'window period' donations, where a donor donates and is infected but has not yet developed antibody. There would still be virus in the blood, but at lower levels in the initial phase of infection and therefore eliminated.

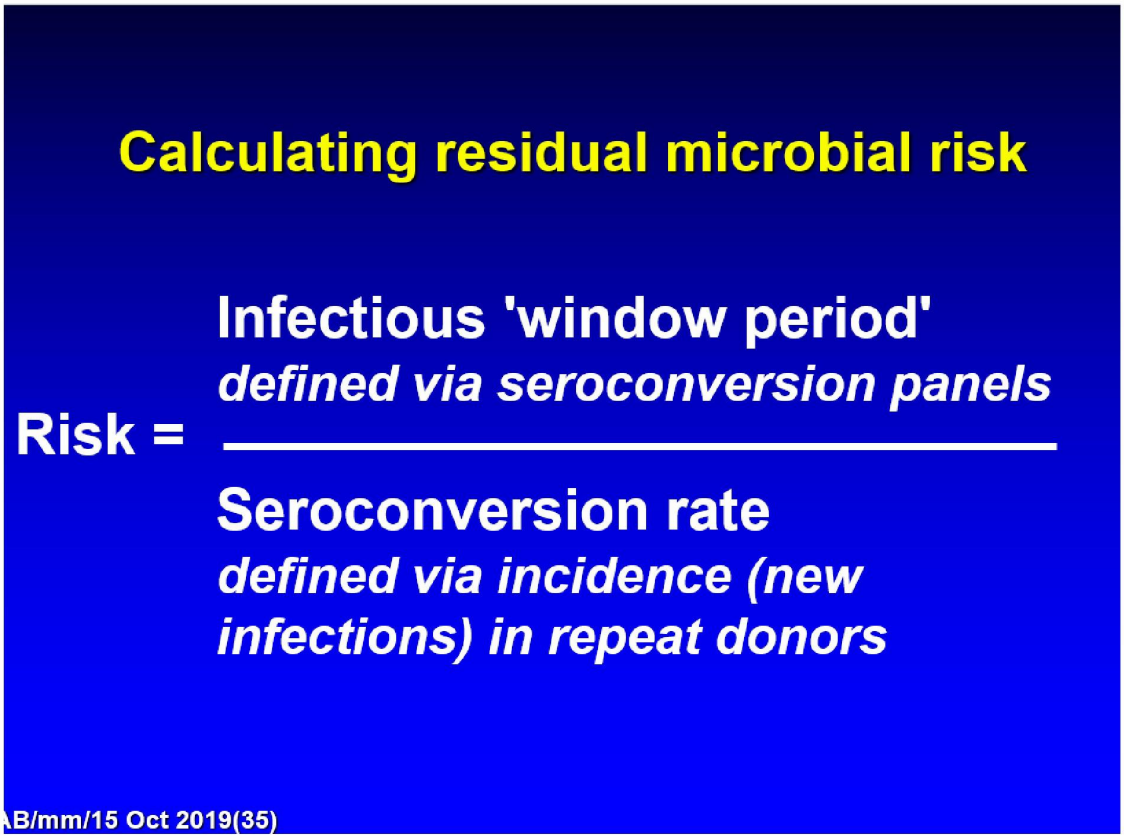
431. **Slide 2** of **WITN6989003** below shows the kinetics of the different types of 'marker' and the generalised course of infection:



432. From the time of infection (y axis) to the blue line shows the 'eclipse' period when the infection is not detectable. The early part of this period might not be infectious.

433. The 'window period' is the generic phrase for the gap between infection and detection whenever you test, so the window period with nucleic acid testing is quite small. As shown, the genome appears early, then antigen and then antibody. Until immunoassays were well developed, antigen detection was not a feasible system, except for HBsAg which was produced in large excess by the hepatitis B virus. It later became feasible and was very useful, e.g for hepatitis C.

434. When considering residual risk, see **slide 35** of **WITN6989003** below:



435. This shows how you calculate the residual microbial risk by dividing the window period (defined via seroconversion panels) by the seroconversion rate defined via incidence (new infections) in repeat donors.

436. To measure the 'window period' one would use 'seroconversion panels' (please see my response to question **23** above) and, for a given virus, determine when a particular type of marker (nucleic acid, antigen or antibody) can first be detected.

437. If, as in the UK, approximately 90% of your donors are repeat donors, 10% are new. When you test new donors you usually find that positivity reflects past infections and is simply because they haven't been tested before. I studied HBsAg positive donors and found that between 10 and 16% of HBsAg positive donors, had new or recent infections. This was mainly in repeat (and therefore, previously tested) donors.

438. In repeat donors, unless you've made a mistake in their previous donation, which was very rare, when you detect a positive, it is because they've just become recently infected. In a large study at NLBTC we tested donors by both RPHA and RIA and showed that errors in testing were extremely rare.

439. The calculation of the window period, the gap between infection and detection divided by the rate at which you get new infections, gives you a measure of the residual risk.

95. In December 1985 you co-authored an article in the BMJ on AIDS antibody testing and counselling (NHBT0057362), in which you addressed the issue of false-positive test results.

a. What impact, if any, did the issue of false positive test results have on the implementation of HIV screening?

440. The issue of false positive test results did influence the implementation of HIV screening.

441. I did an analysis of the impact of false positives and specificity of tests taking into account the important factor of the rate of positives detected by the screening test.

442. If you have a high prevalence of infection such as one in ten or one in a hundred, then false positive tests do not present a large problem. But if you have new donors with a prevalence of one in a thousand (e.g. UK new donors) or repeat donors with infection rates of one in a hundred thousand then even with a test of 99.9% specificity the vast majority of reactives will be false positives.

443. This means that without confirmatory tests, the impact of "non-specific" tests was considerable in terms of blood supply (and logistics).

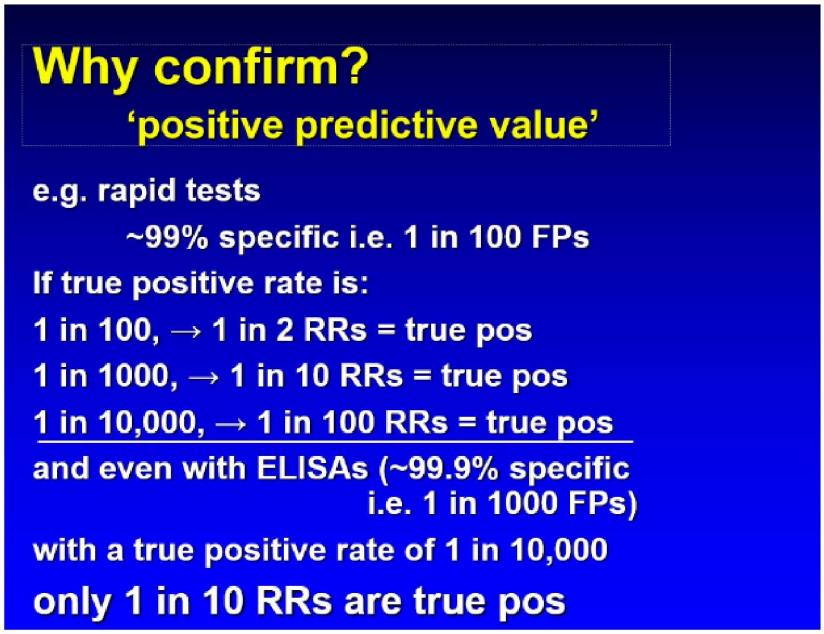
444. The impact on cost was also significant (staff time, assay costs).

445. The impact on those working at the NLBTC would be in the need for training to be in place to ensure safety. There were concerns at the time of possible transmission through staff handling and therefore staff would be trained for example to avoid needlestick injuries etc.

b. What considerations went into deciding on an acceptable level of false positive test results? Who made these recommendations? Did you agree with this recommendation?

446. **Slide 16** from **WITN6989003** shows an analysis of the impact of false positives and specificity of tests and the crucial factor in assessing that is

the prevalence of the marker that you're screening. The overall concept relates to 'positive predictive value'.



447. In the above IR refers to 'initially reactive', RR refers to 'repeatedly reactive' and FPs refers to 'false positives'.

448. In respect of who made the recommendations on deciding on an acceptable level of false positive test results, these would have been discussed at the committee meetings and members would have made the recommendations through consensus. The consensus would have evolved from discussion and could modify overtime.

c. What impact did the issue of false positives have on recording those individuals who were ultimately found to be anti-HTLV-III positive? You may find NHBT0053236 at paragraph 1 of assistance. Please expand on your concerns raised in paragraph 9 of NHBT0089119_029.

449. We would only record them as positive if they were confirmed to be anti-HTLV-III positive through confirmatory testing.

450. I was not in attendance at the meeting of the Eastern Division Consultants in the Blood Transfusion Service Meeting held on 4 July 1985 as contained in (**NHBT0089119_029**). The questions assert that I raised concerns in paragraph 9. This was not me. It appears to be a Dr Blagdon.

Provision of diagnostic screening kits

96. Please describe the arrangements in place at the NLBTC in regards to the provision of diagnostic testing kits for donation screening ("screening kits").

451. NLBTC would assess, evaluate, and liaise with Middlesex and Colindale and decide which tests we were going to use. We would then contact the manufacturers. Acceptable tests were latterly determined by the KIT Evaluation Group.

97. Did you, or anyone else at the NLBTC, contract directly with any pharmaceutical company involved in the manufacture and/or sale of screening kits, or were contracts negotiated on a national basis?

452. Contracts were not negotiated on a national basis.

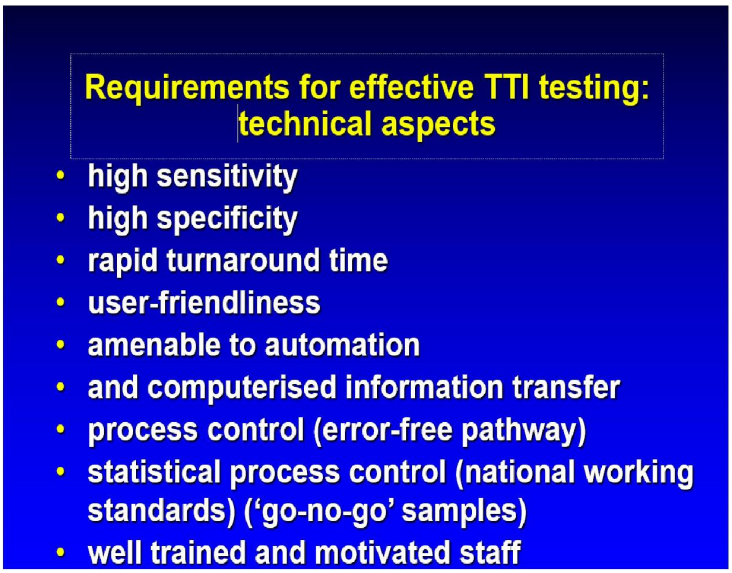
453. One of the advantages of going national would be to get the bulk purchase economies. However, I cannot recall if I had my own department budget or whether it was part of NLBTCs budget. I would have discussed it with the RTD, and a request would have gone out to the 'purchasing' department to buy these kits.

454. I was later involved in setting up pre-donation test or pre-batch acceptance, by which we would ask manufacturers to give us a sample of what was going to be the next batch of test kits to make sure that it fulfilled our requirements.

455. I would have basically decided and recommended which tests we should use and then they'd have been ordered through procurement/purchasing.

98. What were the key factors influencing the choice of screening kit and/or pharmaceutical provider?

456. Please see **slide 23** of **WITN6989002**.



457. The key factors influencing the choice of screening kit and/or pharmaceutical provider, included that a screening kit should be:

a. sensitive
b. specific
c. timely (you need to get the results within half a day because we used to test twice a day and blood results had to be out within half a day because of issuing the blood;

d. they had to be optimal for quality monitoring;
e. compatible with whatever level of automation that you had in place;
f. as simple as possible for training; and
g. Systems to minimise errors in operations.

99. What influence did pharmaceutical companies retain after supplying screening kits to the UK? For example, can you recall whether pharmaceutical companies provided advice on the implementation or use of the screening kits?

458. I had very good relations with manufacturers of the different screening kits and the suppliers. It was important to have a good working association so that you were able to provide feedback on any potential problems, and also to be able to suggest ways of enhancing the tests (see my response to question 100 below).

459. The manufacturers may have come and run the assays with the staff at the centre to make sure they were familiar with them and we would want to be able to contact them immediately if we thought there was a problem. We also needed their cooperation for pre-batch acceptance testing.

100. How closely, if at all, did you work with pharmaceutical companies to refine products and screening kits?

460. I worked closely with pharmaceutical companies to refine products and screening kits.

461. As previously explained, I would ask manufacturers to provide sample addition monitoring (SAM) or sample addition verification (SAV).

Surrogate testing

101. The UK Working Party on Transfusion-Associated Hepatitis met for the second time on 18 January 1983 (NHBT0000023_002). The minutes stated, *"It was agreed that some form of study was needed so that the UK is equipped to answer queries about any specific or non-specific tests for NANB offered from abroad."* Please explain:

a. Was any such study conducted after this meeting? If so, please provide details. If not, why not?

462. I understand that a study was conducted by myself and Dr Contreras and can be found in (**PRSE0001444**).

463. I am not sure whether this was the study as referenced in The UK Working Party on Transfusion-Associated Hepatitis meeting on 18 January 1983 (**NHBT0000023_002**).

b. Did you subsequently feel that enough data was available to you to decide whether either anti-HBc or ALT testing should be introduced? Please answer in relation to NANB hepatitis and AIDS.

464. It was my opinion at that time that not enough data was available to decide whether either anti-HBc or ALT testing should be introduced, especially as the data on clinical impact were not clear.

465. With the benefit of hindsight, I can see that very significant sequelae in a small proportion of cases occur. However please see page 326 from the book Transfusion Microbiology. This contains a diagram from a study by Helen Harris that as even as late as 2002, the clinical significance of hepatitis C in most cases was not striking. Please see extract below:

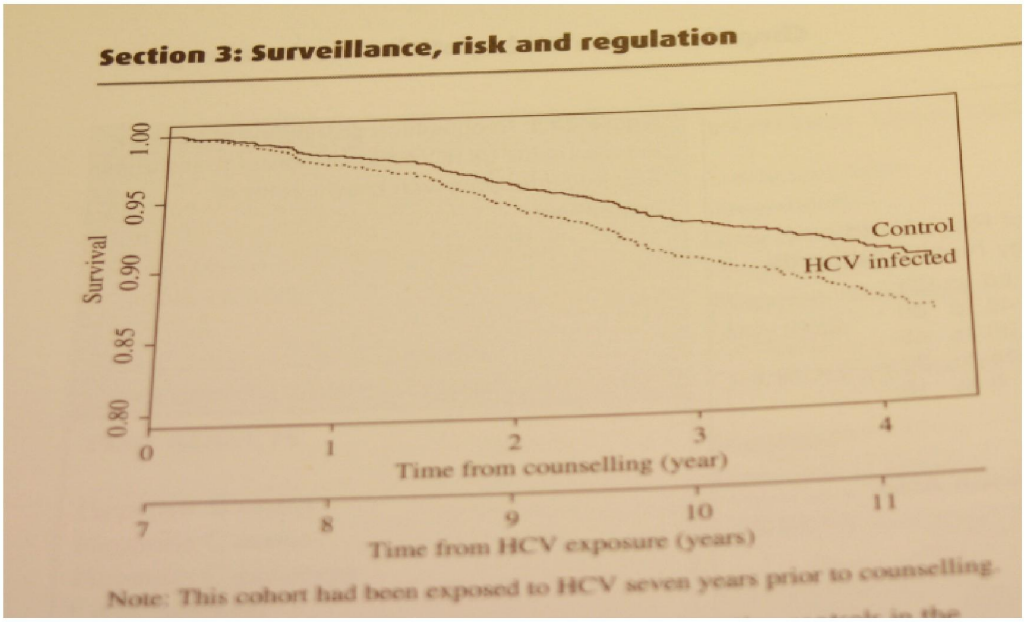


*Figure 24.3 Survival of HCV positive cases and HCV negative controls in the UK HCV national register: Cox's proportional hazards model (BMJ 2002, vol324, p451 Reproduced with permission from the BMJ publishing Group (***DHSC0041457_044***)*

102. The UK Working Party on Transfusion-Associated Hepatitis met for the fourth time on 27 September 1983 (PRSE0001299). At this meeting, you commented that the anti-HBc test "*had the value of association with hepatitis B and non-A, non-B hepatitis as well as AIDS. However, it provided problems because of the need for anti-HBs testing, apart from logistical problems.*" Please explain:

a. What was the relationship between anti-HBc and anti-HBs testing? Specifically, why would the introduction of anti-HBc testing lead to a need for anti-HBs testing?

466. During an infection with hepatitis B the first antibody to appear is anti-HBc. Overall, the presence of anti-HBc indicates current or previous hepatitis B infection. It appears at the onset of symptoms in acute infection and persists for life. It may be absent very early in acute infection.

467. The class of IgM antibody to hepatitis core antigen (anti-HBc IgM) indicates recent (within the last six months) HBV infection. It is replaced gradually by the more specific and effective IgG class of antibodies (anti-HBc IgG).

468. When the infection is cleared the protective anti-HBs appears which is the marker of clearance of the virus. Anti-HBs does not appear in those 5 to 10% of infections that progress to a carrier state.

469. In respect of why anti-HBc testing would lead to a need for anti-HBs, you would want to differentiate between the two outlined above.

470. If someone had an acute infection, you would want to carry out the appropriate follow up steps including taking further samples to see if anti-HBs developed. If testing for anti-HBc and finding a positive result you would then test as well for anti-HBs. The strength of anti-HBs is important in assessing clearance or potential residual infectivity.

471. I do not recall exactly what the different 'cut-off' levels of anti-HBs were significant. If there was too low a level of anti-HBs, we wouldn't be certain it wasn't non-specific. We would have to do anti-HBs after we detected anti-HBc to decide whether the donor might still have residual virus or whether the anti-HBs indicated that they had cleared the virus.

b. What logistical problems did you anticipate when you made this comment? Please answer in relation to NANB hepatitis and AIDS.

472. We would need to know that we had reliable anti-HBc and anti HBs tests so we would need evaluation testing for these antibody assays. This is not quite as straightforward as testing for *antigens* which can be confirmed by specific neutralisation. We would need to know what cut-off levels we were going to use, to be assured that we had a specific effect.

473. If the antibody tests weren't as well evaluated, we would have to set up the testing protocols and staff would need to be able to do that as well.

474. This shows the importance of having a reliable test to justify that all the logistical requirements are in place and work effectively.

c. Did you believe that the advantages of introducing anti-HBc testing outweighed the disadvantages? Please answer in relation to NANB hepatitis and AIDS.

475. It was not clear cut whether the advantages of introducing anti-HBc testing outweighed the disadvantages, and this remained a big grey area. This was why it was discussed so often and wasn't introduced.

476. My understanding would have been if we were going to introduce anti-HBc testing it would be in support of the HBsAg testing to detect what I used to describe as 'tail-end carriers'. These were carriers of the virus where the HBsAg level had dipped to just below detectability but where there was still virus there and anti-HBc would have remained positive. Because there would have been continual (albeit low level) viral replication the anti-core would have been at quite a high level. We would have to decide on what the cut-off would be i.e. what was going to be reliable, and these were the logistical problems. Paradoxically I felt that anti HBc would

be of most value in making HBsAg testing and hepatitis B safety better. This was prior to the availability of HBV DNA testing.

477. In respect of AIDS, we would have recognised an association and when we got questionnaire positive donors, we would look at anti-HBc because HIV was transmitted sexually but also by IVDU and hepatitis C and hepatitis B would also be transmitted sexually and by IVDU - hepatitis C not so much sexually. The phrase we used was that these viruses 'hunt in packs'.

103. In November 1986 you attended the first meeting of the reconvened that was set up to address future anti-HBc and ALT donor screening (NHBT0000023_007). In particular:

a. On page 2 it states that the "US experience [hepatitis] did not relate to the UK". Please explain if you agreed with this and why;

478. As explained in the preceding sentence from the above:

'The HBV rates in the USA were higher and any NANB viruses prevalent in one country were not necessarily going to be equally prevalent in the other.'

b. At point b it is stated that the UK data was limited. Please explain how the differences between hepatitis infection in the UK and USA were compared if UK data was limited;

479. Please see my answer to 103a above.

480. What wasn't limited was the knowledge of the prevalence of the hepatitis infections. The prevalence of positive markers was much higher

in US donors than in the UK. I consider that the UK data being limited was in relation to studies on anti-HBc.

c. Did you agree with gauging the position of the UK by comparing it to the USA?; and

481. I agreed with the value of looking at the situation in the USA as they are a comparable population demographically, but they were quite different in their approaches to payment of (especially plasma) donors. I cannot say whether I agree with gauging the position of the UK by comparing it to the USA.

d. Did you believe that there was a more suitable country or demographic that the UK hepatitis infection could have been compared with, if so, please explain why?

482. Whichever country you compared with, there would always be some demographic differences. In the more northern climates, HBsAg positivity was approximately 1 in 1000. In Mediterranean areas the rate could be as high as 1 in 100 and in Africa and parts of Asia, 1 in 10. Anti-HBc rates reflected this. In the UK anti-HBs rates would be something like 2% whereas in the Mediterranean - Italy and countries like that - there would be anything from 10/20%. Japan was around 30% and Africa could be up to 90%.

483. Therefore, the choice of a comparable country was not as valuable as for example knowing what their experience was if they did routine screening for HBV markers and assessing the rates in the context of their demographics.

104. In August 1987 you co-authored an article with Dr Contreras expressing arguments against surrogate testing for NANB hepatitis, stating "*the longer an unproven test is used, the greater becomes the pressure to use it. This is not an argument that's hould commend itself to those practising transfusion medicine" (PRSE0003767*). Has your opinion changed over time? If so, please explain when and why your opinion changed?

484. My opinion has not changed over time.

485. I understand that we were trying to say that the emphasis on 'we should stop all this and just start using it' was not right. That was not a good reason for introducing a test; only appropriate testing should be carried out.

105. In June 1988, you attended a meeting at which there was discussion about two referees' comments on a proposed study focusing on prevalence amongst blood donors for raised ALT and anti-HBc (NHBT0000187_020). Please explain:

a. Whether the study went ahead. If so, were any changes made following the referees' comments? What were the results and significance of the study;

486. I cannot recall whether this study went ahead and am therefore unable to answer whether any changes made following the referees' comments and the results and significance of the study.

b. Whether donors were made aware of any infection status and what follow-up there was if any; and

487. I cannot recall whether this study went ahead and am therefore unable to answer whether donors were made aware of any infection status and what follow-up there was if any.

c. Why recipients of any infectious blood were not to be followed up and what impact this may have had on the recipient.

488. I cannot recall whether this study went ahead and am therefore unable to answer why recipients of any infectious blood were not to be followed up and what impact this may have had on the recipient.

106. A report prepared by Dr Gunson in August 1987 set out the conclusions of a Working Group established by the Council of Europe Committee of Experts on Blood Transfusion and Immunohematology to consider the introduction of routine surrogate testing ('the Working Group report') (NHBT0008816_002). The Working Group concluded it could not provide a recommendation on the introduction of surrogate testing in light of the following considerations:

a. the use of surrogate tests to reduce the incidence of transfusion associated non-A non-B Hepatitis (NANB) and its possible value as a public health measure remained controversial;

b. there was no guarantee, in each country, that there would be a significant reduction of NANB.

c. the introduction of surrogate testing in some countries could lead to a severe depletion of donors which could compromise the blood supply; and

d. if surrogate testing was introduced, provision would have to be made for interviewing, counselling, medical examination and treatment of anti-HBc positive donors and donors with raised ALT.

Were you aware of the Working Group's report? If you were, did you agree with the conclusions reached by the Working Group? If not, why not?

489. I cannot recall being aware of the Working Group's report, but I agree with the conclusions reached by the Working Group.

107. The Working Group's report from 1987 states: "If a stance is taken that blood should have maximum safety then the tests would be introduced" (NHBT0008816_002). Did the decision not to introduce routine surrogate testing indicate a decision not to provide "maximum safety"?

490. All healthcare was and is in effect rationed. The procedures and options to enhance healthcare are practically endless, but it is not possible to do all those things and hard choices have to be made to choose the ones that are going to give optimal safety in an affordable way and that doesn't detract from other more pressing problems in healthcare.

491. It's a careful balance between risk and benefit. We always strived for maximum safety of blood; if there was a clear-cut benefit of an intervention taking into account costs, it would have been done.

108. In June 1988 you were part of a steering group that undertook a study into the introduction of ALT and anti-HBc screening of blood donations (NHBT0000014_015). Please describe:

a. the purpose of this study.

b. what the outcome of the study was, including what recommendations were made and whether the recommendations were implemented.

492. I do not recall the purpose of this study and/or what the outcome of the study was, including what recommendations were made and whether the recommendations were implemented.

109. In June 1988 you and others initiated a study to assess the incidence of acute NANBH post-transfusion and the likelihood of chronic disease in patients undergoing surgery (NHBT0000030_027). Please outline:

a. The results of the study; and

b. What, if any, changes to screening were made after publication of these results?

493. The documents (**NHBT0000030_027)** to date there has been no ALT elevation above 2.5 times the upper limit of normal on two consecutive occasions in any patient.

494. I am not sure what study this question is referencing, but I consider that it maybe I think this may Contreras Marcela, Barbara JAJ, Anderson Catherine C, Ranasinghe E, et al (1991) Low incidence of non-A, non-B hepatitis in London confirmed by hepatitis C serology. Lancet; 337: 753-757 (**NHBT0000042_095**).

495. In this paper, it confirms the follows:

We have initiated a study to assess the incidence of acute NANBH post-transfusion and the likelihood of subsequent chronic liver disease in patients undergoing elective surgery. The first blood sample was obtained from each patient as soon as possible following transfusion, with subsequent samples at fortnightly intervals for 3 months and then monthly for a further 3 samples. Sera were separated and stored at -20°C. ALT levels were measured on an EPOS analy7Pr at 37°C. Fifty-six patients

have so far been entered into the study with follow up to a maxi 1_m of 5 LLAlths. Twenty of these have been followed for 3 months or longer. To date there has been no ALT elevation above 2.5 times the upper limit of normal on two consecutive occasions in any patient. Although the study is at an early stage, we are encouraged by the lack of any evidence of NANBH in this group of patients. This study will be pertinent to consideration of the introduction of surrogate testing of blood donors in an attempt to reduce the incidence of NANBH post-transfusion in the UK.

496. In (**NHBT0000047_002)** there is a paper by John Craske summarising many of the surrogate testing studies including one in the Netherlands and the relevance of testing in a low prevalence population and Finland.

110. In October 1989, Dr Gunson, the Chairman of the Advisory Committee on Transfusion Transmitted Diseases ('ACTTD'), recommended: *"The routine introduction of non-specific tests should be deferred, unless this is necessary for the acquisition of product licences in the UK for fractionated plasma products"* (NHBT0000188_072, paragraph 7.5). Then, in November 1989, the ACVSB concluded that there was no case for using surrogate testing for non-A non-B Hepatitis (NHBT0005043). Did you agree with the decisions made by ACTTD and ACVSB? If not, what were your objections?

497. I would have agreed that "the routine introduction of non-specific tests should be deferred, unless this is necessary for the acquisition of product licences in the UK for fractionated plasma products" as contained in (**NHBT0000188_072**), paragraph 7.5).

498. I was not in attendance in the November 1989 ACVSB meeting at which they concluded that there was no case for using surrogate testing for non-A non-B hepatitis (**NHBT0005043**), but I agree with the decisions made.

111. In 1991 you participated in a published debate in Medical Virology Volume 1:67 - 71 as to whether the blood service should have begun HCV screening at the time of the first assays. Do the views expressed there remain your views or have they changed over time?

499. In this publication in Medical Virology in 1991 Volume 1: 67-71 (1991), I participated in the debate on whether the blood transfusion service should have begun screening for hepatitis C when the first assay became available. I summarised my reasons for not supporting the introduction at that stage and for a cautious and considered approach to the introduction of screening. The reasons were as follows:

a. There was no clear evidence for a significant association of chronic liver disease with a history of transfusion in the UK.
b. there was a low rate of PTH or transfusion transmitted HCV infection in the UK and this had to be considered when in relation to the cost-effectiveness of anti-HCV screening of blood donations.
c. the first available assays were of a low predictive value. As a result, in a low prevalence population, they produced a significant number of false negatives and positives.
d. there was a need for reliable 'confirmatory' tests which did not exist at the time, and
e. the introduction of the test would have produced enormous workloads and cost implications with a risk of diversion of resources from existing screening programmes and would result in a dilution of their efficiency. Also the blood supply would have been adversely affected and 'reactive' donor management would have been a significant problem.

500. The views I expressed in that article in relation to the reasons against earlier introduction of screening remain my views today for the situation at the time.

112. Please advise whether surrogate testing (namely ALT or anti-HBc testing) introduced at the NLBTC during your tenure.

501. Surrogate testing (namely ALT or anti-HBc testing) was not introduced routinely at the NLBTC during my tenure.

502. At NLBTC we carried out ALT testing for plasmapheresis donors.

113. If surrogate testing was introduced at NLBTC, please explain what impact this had on the North London RTC. In particular:

a. How was the surrogate testing performed?

b. What was the process for screening donors and/or blood donations?

c. What happened to the unscreened blood that had been collected prior to surrogate testing being implemented?

d. What happened when a donation tested positive? Please set out the steps that had to be taken, both with respect to the donor, and in terms of passing on information to third parties and/or identifying recipients of previous donations from that donor. Please refer to NHBT0000056_01 and NHBT0005376_002 in your answer.

e. What were the circumstances in which the NLBTC stopped surrogate testing?

503. Routine surrogate testing (namely ALT or anti-HBc testing) was not introduced at the NLBTC during my tenure.

Donation testing for HCV

114. In December 1989 you wrote a note to Dr Contereas discussing the Abbott test which states that "*although expensive, is there any merit in us*

'going at it alone' like usual?" **(NHBT0000049_003). What was meant by '*going at it alone like usual*'? What did you believe was the best way of studying tests?**

504. I do not recall this handwritten note to Dr Contreras from December 1989. However, I consider that this was just an 'off the cuff' remark and had nothing to do with HIV or hepatitis C, but actually referred to a test for HTLV1.

505. NLTBC did '*go it alone*' to an extent e.g., CUE questionnaire.

506. The best way of studying tests was described above and includes sensitivity, specificity, speed of use, ability to process control and the ability to incorporate validation of process and results.

115. In June 1989, a meeting to discuss the national study on surrogate NANBH markers in blood donors was held (NHBT0000076_037). Referring specifically to page 4 of the minutes please explain why it is noted that "we feel that the anti-HCV results should not be withheld from the donor at counselling" but that "Provided Ortho Diagnostics allow us to do so, we think that the GP should also be informed". In particular:

a. Why was it necessary to consider the opinion of Ortho Diagnostics when determining whether the GP of a patient showing anti-HCV in their blood would be told?

b. Did Ortho Diagnostics allow you to give information to GPs? If not, why would they not allow this and what impact did this have?

You may also find NHBT0000017_006 of assistance.

507. I do not recall specifically why it was necessary to consider the opinion of Ortho Diagnostics when determining whether the GP of a patient showing anti-HCV in their blood would be told.

508. Ortho Diagnostics did have a very tight patent on the assay, but once we had done the assay, they did not have much influence on what we did with the results.

509. It's possibly because they had loaned the equipment for the purposes of the study or because the GPs would be being informed of the results described in the document 'as research findings' and there might be possible implications for the manufacturers if advising results which turned out to be wrong, but I'm afraid I cannot remember.

510. Also, it maybe that Ortho Diagnostics were concerned about any repercussions from false positive reactions.

116. In June 1989 you attended a meeting at which anti-HCV positive donors and '*anti-HBc only*' donors were discussed (NHBT0000014_057). In particular:

a. Under the heading 'Anti-HCV Positive Donors', point 4 states that the *"fate of positive anti-HCV donations will not be followed up".* Why not? Does this mean that donations that were known to be anti-HCV positive continued on the path into the blood system?

b. Please explain why the workload was deemed "too extensive" for following up Anti-HBc only positive patients? What would this have entailed? Has your opinion changed over time?

511. I do not consider the meaning of the description that the "*fate of positive anti-HCV donations will not be followed up*" to be that donations that were known to be anti-HCV positive continued on the path into the blood system.

512. I interpret this as the donors were being counselled but that no look-back operation (and therefore follow-up) was in place at the time.

513. I am unable to comment why the workload was deemed "*too extensive*" for following up anti-HBc only positive patients.

117. In December 1990 you wrote to Dr Gunson regarding routine anti-HCV screening and the requirement of the NBTS to produce a formal policy for repeatedly reactive anti-HCV positive donors (NHBT0000052_008). Please answer the following questions:

a. Why did you raise this issue? Were you concerned by the lack of formal policy at the time?

514. I have considered my letter dated 14 December 1990 to Dr Gunson, Medical Director, of National Blood Transfusion Service with Dr M Contreras, Dr R Tedder and Dr M Brennan copied into the correspondence.

515. In the letter, I explained that with the approach of routine anti-HCV screening, I considered that the Blood Service would require the NBTS (now NBS) to produce a formal document setting out the details of policies for handling repeatably-reactive anti-HCV positive donors. I understood as per my letter that this would include guidelines for 'confirmation', re-entry of false-positive donors and handling known repeatably-reactive but previously '*false-positive*' donors.

516. I asked whether at the same time the rules for syphilis and anti-HCV reactives could be formalised and covered in the same document. In addition, the question of HBsAg reactive donors would need be addressed.

517. I raised the issue as I considered that there needed to be a formal policy in place to ensure a consistent approach nationally.

b. Was a formal policy adopted? What were its terms?

518. I do not recall whether a formal policy adopting my recommendations was put in place or if so, its terms.

519. Donors whose donation has been found repeatedly reactive for anti-HCV and confirmed by the reference laboratory were contacted by letter.

520. Donors were then asked to contact the BTS Colindale for an appointment to have a repeat blood sample taken and to discuss the results obtained on their donation. Donors whose donation had been found repeatedly reactive for anti-HCV and not confirmed were contacted for counselling on the results of at least two donations. The aim of the counselling was to explain to the donor why further donation was not possible; to explain the meaning of the test result (as far as is possible) and the implication(s) for the donor; to arrange further medical care/follow up and to obtain epidemiological data.

118. The Inquiry understands that you were involved in the comparison between the first- and second-generation tests, please explain:

a. The role you played in the comparison of the generation tests

521. In 1989 a breakthrough was announced by Chiron with the cloning of hepatitis C. All subsequent laboratory work on the virus was bound by the patent to be based on this clone. The first-generation tests for anti-HCV were susceptible to a significant number of false positives (for every true positive found there were approximately seven false positives). That would mean telling seven people that they may have the virus, requiring investigation for liver compromise etc, when in fact only one of those would truly have the virus.

522. By the time the second-generation tests were introduced, it was considered prudent to evaluate all the second-generation tests available prior to introducing the test routinely.

523. I was involved in the studies on the second-generation anti-HCV tests in a three-centre trial in April and May 1991. The second-generation tests contained, in addition to C100-3, two structural antigens, the C22 and C33 antigens. The tests were introduced in early 1991 by the companies which had marketed the first-generation tests. Other manufacturers had independently cloned HCV, one from known carriers of transfusion transmitted non-A non-B hepatitis in London. Peter Glazebrook published a paper in 1992 in the Archives of Virology which I co-authored, on data which had been informally reported within the scientific community previously. This paper is attached at **WITN6989005**. I (and others) expected the tests to show significantly improved sensitivity and specificity compared with the first-generation tests because they included structural and extra non-structural antigens and indeed, this proved to be the case (see my response to question 118 (b)).

524. After the trials, testing for anti-HCV started in September 1991 when a more specific Ortho second-generation test, with more antigens, other than C-100 was available and a confirmatory assay (RIBA I) was in place.

525. I do not recall who asked me to carry out the comparison of the second generation tests but assume it would have been Dr Gunson.

b. Key findings and conclusions you came to when comparing the test

Supplementary tests -RIBA

"Confirmatory" testing of the serological antibody test results

526. It is important to appreciate the distinction between a *supplementary* test and a *confirmatory* test. A *supplementary* test detects additional antibodies to parts of the virus antigens and will therefore enhance understanding of the initial screening result. On the other hand, a true *confirmatory* test is a test in which an antigen is specifically neutralised. There was an anti-HCV 'neutralisation' ELISA which was described as such by its manufacturers Abbott Laboratories. However, this was in fact a blocking assay. It was not a truly confirmatory test. Strictly speaking, a PCR test, which I describe more fully below, is also not a confirmatory test in the context of confirming antibody (or antigen) reactivity because it tests for presence of part of the viral genome and is not a serological test. It cannot therefore confirm a serological antibody screening test and is only definitive when positive. It nevertheless, in general parlance, has become common to describe PCR as confirmatory because it detects the infectious agent by an independent mechanism and is extremely sensitive because the nucleic acid levels are enormously amplified.

527. Initially, a first generation of Recombinant Immunoblot Assay (RIBA) was produced by Ortho Diagnostics during 1990. This was a supplementary test.

528. RIBA I was described by the manufacturers (Ortho) as comprising of two cloned antigens, CI00 and 5-1-1, with a control, banded onto strips of nitrocellulose. My perception, shared by others, such as Dr Brian Dow and Dr Eddie Follett, was that because one antigen was contained within the other on the genome sequence the test was effectively based on one antigen and did not therefore add much value to the first-generation anti-HCV test, save that it might exclude the false positivity due to a cross reaction to either yeast or *Escherichia coli*.

529. The Ortho criteria for positivity on RIBA I was that two specific bands were compared with two controls. The control strips were used to demonstrate whether serum had been added. The positive scale ranged from I+ to 4+, per line. A plus meant that a line was seen. However, a weak line was to be recorded as a negative result if it was fainter than the low-level IgG control line. A single anti-viral line was to be regarded as an *indeterminate* result. The chances of excluding false positive results were minimal. Despite an attempt to make the reading objective, there remained an element of subjectivity.

530. The RIBA 2 test (available in 1991) enabled the specificity of the reactions of sero-positive samples to viral antigens to be more readily determined. It had four HCV antigen bands: 5-1-1, cl00, c33 and c22, of which the c22 (core) was structural. I attach at **WITN6989006** a paper I wrote for Postgraduate Doctor Middle East, which discusses this in more detail.

531. With RIBA 2, there was now a means for accurate serological screening, and I believed that second generation screening tests were likely to show a significantly improved sensitivity and specificity. The expense of the supplementary test was significant.

The PCR tests

532. PCR (polymerase chain reaction) testing is a method for detecting nucleic acid (either DNA or RNA). The process is used to detect several viruses including hepatitis C by a process of amplification of viral DNA or RNA of the virus (in the latter case via a step involving reverse transcriptase). However, the test only identifies a sequence of the viral DNA/RNA and not the whole virus. An assumption is made that a positive PCR denotes infectivity, but this in fact may not necessarily be the case as I discussed in a paper co-authored with Dr Garson, and published in Vox Sanguinis in 1993, which is attached at **WITN6989007** and which I refer to in more detail below.

533. If a PCR test is positive, it 'confirms' the serological antibody tests, because it correlates with the positive serological tests, (but it may be false-positive or cross contaminated).

534. A negative PCR test tells you little about the serological reactivity. The PCR test may be negative for several reasons, such as low copy number of the virus so that the assay is unable to detect it, or false negativity due to a low sensitivity of the system or due to inhibition of HCV RNA because of poor extraction or the presence of ribonucleases, e.g., from sweat that could lyse the extracted nucleic or because the patient is simply not infected i.e., there is no virus present. There may be no virus present either because the patient has not been exposed (and therefore the serological antibody reaction was falsely positive), or because the patient has cleared the infection, i.e. the HCV antibody reaction is real and demonstrates evidence of past infection. Hence, a negative PCR result is not confirmatory of the serological antibody test.

535. The prevalence of anti- HCV was found to be one tenth of that found in the USA, i.e., one in one thousand of previously uninfected donors, compared to the USA figure of one in one hundred.

536. The prevalence was found to be much higher in new donors than in established donors and this became more pronounced after repeat donors were anti-HCV tested and any positives excluded.

c. The difference(s) in specificity between the tests and whether this was sufficient You may find NHBT0000191_011, NHBT0006344, NHBT0000030_084 and PRSE0000316 of assistance.

537. Document (**PRSE0000316**), includes a NLBTC study that found 7 out of 1283 samples from blood donations in the study to be repeatably reactive for anti-HCV by first-generation ELISA (ortho diagnostics).

538. Only 1 of the 7 donations was positive for RIBA and PCR and it was this donation that transmitted NANBH. The other 6 donor samples were negative by RIBA and PCR, and so were the recipients of their respective units of blood who showed no evidence of PT-NANBH. The low predictive value of first-generation ELISA of 1 in 7 (14%) was remarkably like the value reported in the Dutch study (Van der Poel C L Resnik H W, Schaasberg W Ct I 1990 Infectivity of blood seropositive for hepatitis c virus antibodies, Lancet 335: 558-560.

119. In a letter written to the Editor of The Lancet in August 1989 (NHBT0000188_017) you and Dr Contreras describe the potential impact of responding to a positive test of the new Ortho ELISA anti-HCV test as an *"enormous and costly undertaking".* Please explain what was meant by an "enormous and costly undertaking". In what circumstances would you have

recommended the implementation of the Ortho ELISA anti-HCV test for routine donor screening?

539. I do not recall this letter to the Editor of The Lancet on 8 August 1989 (**NHBT0000188_017)** that Dr Contreras and I co-authored.

540. On consideration of the letter for the purposes of the Inquiry, Dr Contreras and I agreed that the new ortho Elisa for anti-HCV appeared to be a specific assay for the major agent causing post transfusion non-A, non-B hepatitis.

541. We explained that in the context of donor screening, precipitate action should be avoided. As with any other assay, the predictive value of a positive result hinges on the prevalence of the marker in each population. While the test scored well in panels of well characterised NANBH sera and in the samples from patients with a diagnosis of NANBH, we did not know the predictive value of the test in low prevalence populations, such as UK blood donors. Therefore, we advised that it was essential to have confirmatory assays to eliminate for example, the possibility of cross-reactivity with yeast antigens, before sensible polices for generalised screening of blood donations were implemented.

542. At the request of the National Director, NLBTC carried out an evaluation of the Ortho ELISA for anti-HCV on behalf of the NTBS. Between 0.5% and 1% of blood donations were found to be repeatedly reactive (unpublished observations). We related this to the annual 2.5 million of blood donations in the UK and explained that contacting and counselling **12,500 to 25,000** blood donors would be an '*enormous and costly undertaking'* especially when the significance of a positive test in a healthy person was not yet known.

543. The current test at the time took more than 3 hours and its introduction in routine donor screening would have been logistically difficult given the requirement of speedy release of blood for availability for issue to hospitals. Therefore, considerations of the cost-effectiveness of routine donor screening must await the advent of reliable confirmatory tests as well as faster screening tests.

544. I consider that the phrase "*enormous and costly undertaking*" was in relation to contacting and counselling as explained above.

545. I would have only recommended the implementation of the Ortho ELISA anti-HCV test for routine donor screening if there was good evidence of sensitivity within the test and a reliable confirmatory test.

120. At the end of 1989 in a letter written to the Editor of the Hospital Doctor you and Dr Contreras expressed concern over "*jeopardy to the already stretched blood supply*" (NHBT0000072_055). Why did you deem the blood supply as already stretched? If resources and/or bloody supply were not stretched, would your opinion on the introduction of the Ortho diagnostic test/anti-HCV screening have been different at the end of 1989?

546. I have considered the letter dated 15 November 1989 (**NHBT0000072_055**) to the Editor of the Hospital Doctor written by Dr Contreras and me. To consider the context of your question, it is important for you to include the opening sentences of the letter (**NHBT0000072_055**) which states:

'the 'simple' blood test for hepatitis C referred to in the Hospital Doctor article of 21 September 1989 posed some far from simple questions in the context of blood donor screening. While not denying the unparalleled advance that the Chiron/Ortho assay for anti-HCV represents for research

into non-A, non-B hepatitis NANBH), these questions have to be acknowledged and addressed'.

547. I have unfortunately not been provided with and do not have sight of the Hospital Doctor article of 12 September 1989, as referred to in the letter.

548. The letter (**NHBT0000072_055**) also expresses the following:

One of the questions in the letter was why the UK donor prevalence of anti-HCV (0.7%) is so similar to the overall US prevalence of less than 1% (not 3% as stated in the article) when historically the US has reported up to 3 times as much post transfusion NANBH than the UK. If this reflects the current lower rates of post-transfusion hepatitis (PTH) in the US, after self-exclusion by donors at risk of contracting HIV infection, then some of the 'urgency' for introducing a new screening assay must be diminished. In Canada, where a prospective study of PTH has been underway for some years, the rate of PTH has fallen from 9% to 2%, even though 'surrogate' screening for anti-HBc and alanine aminotransferase is not performed on blood donations. The anomaly is even more striking if the UK is compared with Japan which has a rate of 10% PTH although the anti-HCV prevalence is 1.5%.

The precipitate introduction of anti-HIV screening of blood donations in the UK would involve supplementary testing, follow up, counselling, deferral, and replacement of up to 20,000 donors annually, a less than 'fortunate' statistic. Without any form of confirmatory testing (essential when considering 'healthy' donors as opposed to at-risk patients where the predictive value of a test is likely to be very good) counselling reactive donors is fraught with difficulties (What should the donors be told? Are they infectious? What effect will the positive finding have on their health? Will they infect others and if so, by what route? etc etc). As yet, there is still no evidence to relate the actual number

of patients with chronic sequelae of NANBH with the numbers of the population expected to be infected with the hepatitis C virus.

Certainly, even one patient developing chronic hepatitis after transfusion is one too many, but the realities of introducing anti-HCV screening before the facilities for supporting the consequences are available, merit careful consideration, not least, as regards resource implications. Although the UK National Blood Transfusion Service is planning for the introduction of this test and the preliminary background studies have already been performed, in the tightrope of balancing risks, any potential jeopardy to the ***already stretched blood supply*** *should not be considered lightly.*

549. The demand for blood was always very high and that is why it was considered that it was '*already stretched*' as quoted above.

550. If resources and/or bloody supply were not stretched, my opinion on the introduction of the Ortho diagnostic test/anti-HCV screening at the end of 1989 would not have been different, as explained in my answer to question 119 above.

121. In 1991 you contributed to an article based on hepatitis C screening where you put forward an argument against introducing the first assays for Hepatitis C screening (NHBT0088770). Why did you feel this way? Has your opinion changed over time?

122. Please see my response to question 111 above.

122. In April 1990 you contributed to a paper that suggested "*it is generally accepted that there is a need to test donated blood for the presence of the*

***agent or agents which cause PTNANBH*" (PRSE0000396). Please explain this view.**

551. I have considered the paper '*Detection of hepatitis c viral sequences by 'nested' PCR predicts insensitivity of anti-c100 positive blood donors'*, (**PRSE0000396**), revised version dated 10 April 1990.

552. I do not recall this paper, but note that I co-authored it with JA Garson, RS Tedder, M Briggs, P Take, JA Glazebrook, A Trute, Dr Parker, M Contreras and S Aloysius. There is a handwritten note at the top of the document that this paper was in confidence and not for publication (this is a pre-publication copy).

553. Prior to considering the sentence, it important to consider the preceding sentence as well:

It has been estimated that transfusion associated NANBH gives rise to approximately 75,000 cases of chronic hepatitis per year in the USA, 20% of which progress to cirrhosis. Although comparable figures are not yet available in the UK, it is generally accepted that there is a need to test donated blood for the presence of the agent or agents which cause PTNANBH.'

554. This view was taken from data in the United States and although we knew less in the UK at the time, it was generally accepted there was a need to test donated blood for the presence of the agent or agents which caused PTNANBH. This was dependent on whether there was a reliable test available.

123. A year later in April 1991 Dr Contreras wrote a letter to Dr Gunson after consulting Dr Hewitt and you stating that "*the more we think about it, the*

***more we think we are going over the top with this testing for a virus that has not been shown by anybody to cause immense healthcare problems in the U.K.*" (NHBT0006421_002). In particular:**

a. Did you agree with Dr Contreras's view? Please provide details. If so, why did the opinion of the need to test appear to change?

555. I have considered this letter dated 22 April 1991 from Dr Contreras to Dr Gunson, although I do not recall this letter.

556. It appears from the letter that Dr Contreras' response using the phrase '*over the top'* was in relation to the proposal and method of the introduction of screening and the complex, expensive and time-consuming protocol that was recommended in Dr Harold Gunson's Minutes of the ACTTD and letter from Dr Mortimer. She was not referring to the introduction of testing but to the complicated process proposed. I have not had sight of the letter from Dr P Mortimer. If the letter is referring to Minutes of the ACTTD on 8 January 1991 (**NHBT0000073)** I was not in attendance at this meeting.

557. Dr Contreras in her letter provided reasons why the proposed confirmatory algorithm by Dr Mortimer for donations found to be initially reactive for anti HCV was unworkable, which can be set out as follows:

a. the proposal would be more cumbersome, laborious, and expensive than any other screening test for blood donations in the UK – including anti-HIV and HBsAg.
b. The Department of Health had declined to fund the proposal, so user hospitals would need to find the monies to cover the extra cost of blood components.
c. The confirmatory testing proposed was very laborious and expensive, requiring extra laboratory and clerical staffing. The proposal would have led to mistakes and confusion for clerical and laboratory staff.

d. The counselling and referral of donors found to be anti-HCV positive was more complex than for all the other agents, considering that some centres did not do anything for hepatitis B carriers.
e. The complexity of the procedures in the proposal was bound to lead to errors that might lead to the release of units of blood found positive for infectious agents other than the hepatitis C virus.
f. The proposal for dealing with plasma for fractionation, suggesting that repeatedly reactive donations should undergo ALT testing, had no justification and was, in her opinion, unworkable.
g. Not enough attention was given to the monitoring and quality control of HBsAg screening of blood donations and pools of plasma were being discarded because of poor quality screening at some Centres.
h. The proposal did not consider that RIBA could have been done at RTCs.
i. It seemed that the proposal was written by people who had little or no experience in dealing with testing 1000 donations a day in a busy blood Centre, having to release life-saving blood components, such as platelets, on many occasions as soon as they were tested. The delay entailed in Drs Gunson's and Mortimer's proposal for anti-HCV screening would have jeopardized the prompt release of platelets and blood for exchange transfusions and intrauterine transfusions.

558. I agreed with Dr Contreras that the proposed confirmatory algorithm by Dr Mortimer for donations found initially reactive for anti HCV was unworkable.

559. I understand that this proposed confirmatory algorithm was not implemented in the manner set out in Dr Phillip Mortimer's and Dr Harold Gunson's proposal.

b. Why was anti-HCV testing considered '*over the top*'?

560. Again, I do not consider that Dr Contreras was suggesting that anti-HCV testing was '*over the top*'; her view in the letter dated 22 April 1991 was in the context of the proposed confirmatory algorithm by Dr Mortimer for donations found initially reactive for anti-HCV being unworkable.

561. I understand that screening was not introduced based on that proposal but in a much simpler manner, in accordance with procedures used for other screening tests.

c. How, if at all, has your opinion changed over time? You may find NHBT0000191_142 of assistance.

562. When the proposed system for dealing with reactives changed to one that was workable, then my view did change, and I have already explained how my views evolved over time.

124. The Inquiry understands that you were involved in the first multi-centre trial of anti-HCV tests in 1991 (PRSE0001821, page 3). Please explain how the results of the multicentre trial of August 1991 impacted the rollout of routine anti-HCV testing at the RTCs?

563. I do not recall being involved in the first multi-centre trial of anti-HCV tests in 1991. However, the results of the multicentre trial of August 1991 would have provided the individuals doing the testing with the information which they needed regarding the performance of the assays and the likely rates of reactivity, ahead of the rollout of routine anti-HCV testing at the RTCs.

125. When did the RTC officially begin anti-HCV screening and what adaptations did the RTC need to make to enable screening to commence? You may find NHBT0000057_012 of assistance.

564. I understand that anti-HCV screening began in or around September 1991, but I cannot recall the exact date.

126. Dr Gunson wrote a letter to all RTC directors suggesting a delay in commencing anti-HCV screening from July to September 1991 so that "'*second-round*' comparative evaluation" of the testing kits could take place (NHBT0000073_065). Did you agree or disagree with Dr Gunson's suggestion to delay testing to undertake this comparative evaluation? Please explain the basis for your answer.

565. On 3 April 1991, Dr Gunson wrote a letter to all RTC directors suggesting a delay in commencing anti-HCV screening from July to September 1991 so that "'*second-round' comparative evaluation*" of the testing kits could take place (**NHBT0000073_065).**

566. I agreed with Dr Gunson's suggestion in his letter because we needed to complete the second-round comparative evaluation of test kits and gain more experience in confirmatory assays (RIBA and PCR) before reliable and more accurate and specific testing could begin with workable methods for determining the infection status of the donor.

567. It is unsafe to inform blood donors of a false positive test that would 'label' them as (probably) infected hence the need for confirmatory testing.

568. The Microbiology Reference laboratories as well as Blood Centres did not have experience of RIBA or PCR. These tests needed a new approach

and specialised equipment that needed to be installed. In addition, staff needed training in these new techniques.

127. In response to Dr Gunson's letter, some RTC directors suggested a staggered start date for the implementation of testing (i.e. different start dates for different RTCs) while others supported a uniform start date. How, in your opinion, should testing have been introduced?

569. I supported a uniform start date because we were a national blood service, all serving NHS patients and we needed a consistent quality of product available throughout the country.

128. Despite Dr Gunson's suggestion to delay the introduction of screening, the Northern RTC led by Dr Lloyd introduced routine testing in April 1991, becoming the first centre to do so. Dr Lloyd's view, in contrast to that of Dr Gunson's, was that, the *"Second Generation HCV tests were acceptable tests for donor screening"* by June 1991 (NHBT0000076_009), and that deciding not to implement testing despite having the capability "*would be indefensible under the current Product Liability Legislation*" (NHBT0000074_014). In particular:

a. Did you agree or disagree with Dr Lloyd? Please explain the view you had at the time.

b. Have your views changed since then? If so, why? You may be assisted by NHBT0088813_002.

570. No, I disagreed with Dr Lloyd's view, as I believed that all UK routine blood donations should be tested uniformly for the same mandatory agents and adhere to the same regulations to ensure there was a consistent

quality of product available throughout the country (see my reply to question 127 above).

571. I also believed that you should never introduce a new test until you were sure of its performance.

572. We covered a lot of these issues when we did evaluations on first versus second generation tests; the second generation was better because it had structural antigens in, but it still wasn't very specific. We did have RIBA and then RIBA 2 came in later. The timing was complex, but second generation screening tests backed up by RIBA 2 was workable.

573. NLBTC at the time had a much higher prevalence of HIV in their 'donations' than other RTCs across the country, who sometimes had no HIV cases at all. In addition, HIV was so much more 'dramatic' than HCV both in terms of the immediacy of the epidemic and the sequelae of infection and the capacity of the virus to spread sexually.

129. In February 1991 Dr Gunson wrote to you regarding Dr Lloyd's unilateral decision to introduce anti-HCV tests in April 1991 (NHBT0088807). In particular:

a. Did you agree with Gunson that the introduction by Newcastle RTC in April 1991 was "*maverick and immature*"? If so, please outline the main arguments against Newcastle's introduction of screening in April 1991; and

574. The letter (**NHBT0088807**) is dated 22 February 1999. This letter was written 8 years after the relevant events in the context of litigation.

575. The letter itself (which I do not recall) refers to lawyer, Simon Pearl, of David Arnold Cooper, who asked Dr Gunson to expand his report. The

words *"immature"* and *"maverick"* appear to be the lawyer's characterisation of Dr Lloyd's actions and are not Dr Gunson's words. In my view, Dr Gunson would be very unlikely to use such words. It is quite clear from the letter that they are not his words but the characterisation of Dr Lloyd's action by the lawyer.

576. Dr Gunson in his letter appeared to have had some doubts and suggests that the second-generation screening should have been introduced with the testing running in parallel. My own view remains that scientifically it was more appropriate to do the trialling before mass use for donor screening but with hindsight I believe that it would have been better to have tried to introduce screening with second-generation tests plus RIBA sooner.

b. Were you aware at the time that Newcastle RTC had put money aside for anti-HCV testing and that other RTCs had not?

577. I was not aware at the time that Newcastle RTC had put money aside for anti-HCV testing and that other RTCs had not.

130. What impact did HCV testing have on the North London RTC? In particular: a. What was the process for screening donors and/or blood donations?

578. If I recall correctly, we tested each donation. If we had an initial reactive, we would do repeat testing in duplicate. If one or both of those repeat tests was/were reactive, it would be called 'repeat reactive' and it would then go to the Middlesex Hospital for confirmatory testing. Based on the results of the confirmatory testing we would then counsel the donors and their donation would not enter the blood supply.

579. If the test following confirmation testing was determined to be a false positive, then the donation would be allowed to enter the blood supply.

580. It is important to note that even though the laboratories wanted to be as clear as possible whether a sample was positive or negative, you would always have a small number of tests which were indeterminate (inconclusive as positive or negative). These inconclusive results were treated as positive results and the donation would not enter the blood supply.

b. What happened to all the unscreened blood that had been collected prior to the HCV testing being implemented?

581. I do not recall what happened to all the unscreened blood that had been collected prior to the HCV testing being implemented. I believe that this would have been a decision to be taken by the Director.

c. What happened when a donation tested positive? Please set out the steps that had to be taken, both with respect to the donor, and in terms of passing on information to third parties and/or identifying recipients of previous donations from that donor.

582. I do not recall exactly the steps taken in respect of a donor when a donation tested positive, other than that they were informed and counselled. This would relate to 'confirmed' positives.

583. If a donation was identified as positive rather than an initial reactive positive, then I consider that the hospitals would have been informed. However, Dr Hewitt may have a better recollection of this.

131. In June 1993 Dr Contreras and you wrote to Mr Walker at BPL expressing your views following anti-HCV infection in a plasma pool (NHBT0000060_015). As to this:

a. On page 2 you have written that you were "*certain that if all donations given within one month in England were retested at a single site with the in-house test, the results would be different from those obtained by the individual RTCs*". Why did you think this? Was there a solution to this?

584. The results of the first-generation testing, especially for reactivity near the cut-off value where slight variations in the test performance might influence whether a result was positive or negative, was likely to be variable in the different RTC's.

585. On the one hand a low-level reactivity could well be falsely positive but on the other hand it could signify early infection, so it was a grey area as to what a RTC decided was a cut-off.

586. Even using different batches from the same manufacturer tests might give slightly different levels of initial reactivity. It was therefore very difficult to interpret what the early HCV tests were showing.

b. What was it that you were suggesting should be done and why?

587. I do not consider that we were suggesting that anything should be done, but just emphasising that results could vary even when carried out correctly.

132. In 1994, you co-authored a paper which stated, "*the overall cost-effectiveness of the screening programme [HCV screening] has been a*

***matter of some debate*" (NHBT0000045_043). Please expand on this statement. Has your view changed over time?**

588. I do not recall the paper contained in (**NHBT0000045_043**).

589. There was considerable debate internationally on cost effectiveness of the first-generation tests. In the UK, we decided not to use them for the reasons explained above. Debate continued even with second-generation tests, partly because they were so expensive.

590. I remember most of the other tests that we used were under 50p a test. The hepatitis C test was about £2 per test, and there were approximately 2 million donations per annum that would need to be tested.

591. In terms of effectiveness, it took time to see the significant clinical impact of hepatitis C infections, although I acknowledge that in a minority of cases, it can have very serious consequences.

592. My view has not changed over time, although it was a debatable intervention. As previously explained, the first-generation test was unworkable, in our context, given the sort of quality and donor care and impact on the blood supply that we would want to have.

133. Please explain your involvement in the introduction of nucleic acid testing ("NAT") to detect hepatitis C ("HCV") in blood donations made in the UK, including:

a. reasons for its introduction.

b. which organisations and/or committees were involved in deciding to implement NAT testing;

c. which pharmaceutical companies were contracted to manufacture NAT tests;

d. the details of any trials that were conducted in the UK;

e. how it was decided on the amount of funding to be made available to NSBT to implement NAT testing, and how this funding was distributed; and

f. whether the Department of Health produced guidelines and/or policy material related to the introduction and use of NAT testing.

593. I was not involved in introduction of nucleic acid testing. My involvement would have just been in implementing it once it was introduced.

594. I understand that the reason for its introduction was to minimise the 'window period', where you could have inapparently infectious donations which would not have been detected by the serological testing in use.

595. I cannot recall which organisations and/or committees were involved in deciding to implement NAT testing; which pharmaceutical companies were contracted to manufacture NAT tests; the details of any trials that were conducted in the UK; how it was decided on the amount of funding to be made available to NSBT to implement NAT testing, and how this funding was distributed; and whether the Department of Health produced guidelines and/or policy material related to the introduction and use of NAT testing.

134. In 1999 when meeting with your solicitors to work on your witness statement for the A and Others litigation it was recorded that you thought "*the gap between the introduction of second-generation tests and screening which had been introduced was indefensible*" (NHBT0036250_025). Please explain if this is still your opinion.

596. **(NHBT0036250_025)** is a solicitor's note of my private and confidential conversation with my instructed solicitors on 7 December 1999.

597. This is not my note of the meeting and it is the solicitors' note of our in-person conversation which was recorded as having lasted over 4 hours into a 7 page note of the same. As I do not recall the conversation and the quote provided in this question, I am reliant solely on the solicitor's note being an accurate account of what was discussed.

598. I would also add that this attendance was discussing the events in retrospect in the context of litigation.

599. I consider that the quote the '*gap between the introduction of second-generation tests and screening which had been introduced being indefensible'* was my view as to what the legal view would be. I did (and still do) believe that second generation anti-HCV tests with confirmatory back up should have been introduced as quickly as possible after they became available.

135. You also during that consultation stated that you thought that the transfusion did not want to test for HCV, and 'that they were making up the reasons for it retrospectively'. Why was this?

600. Once again, (**NHBT0036250_025**) is a solicitor note of my private and confidential conversation with my instructed solicitor on 7 December 1999.

601. This is not my note of the meeting and it is the solicitor's note only of our in-person conversation which was recorded had lasted over 4 hours into a 7 page note of the same. As I do not recall the conversation and the quote provided in this question, I am reliant solely on the solicitor's note being an accurate account of what was discussed.

602. I would also add that this attendance was discussing the events in hindsight and in the context of litigation.

603. In any event, the paragraphs in full reads:

'He said the problem was that the service did not want to screen and that they were making up the reasons for it retrospectively. They need from the previous Bassendine & Zuckeman papers that the prevalence of Hepatitis C was lower. The transfusion services perception of Hepatitis C would have been different from that of the hepatologist at the time. They always felt that America was more at risk and from the TTV Moseley paper showed a 10% post transfusion rate.'[sic]

We discussed the incidents as described by Bassendine which seemed to show that there was an incidence of 7 in 1000. Of these, Dr Barbara said that 1-2 per 100 would become infected. He said that because there were no reports of post transfusion hepatitis like the US and in hospitals, they if we were getting rates of complications at predicted by the worst case then the wards would have been littered with non a nob b due to transfusion and that there was a bias in the percepttion of Hepatitis c as a problem, depending on practice.' [sic]

604. On consideration, my alleged comment that the service was '*making up the reasons for it retrospectively'* for not testing HCV may appear flippant.

605. My attendance at the office for over four hours has been condensed to a 7-page note.

606. The service had several valid reasons why it wasn't introduced sooner. It was therefore a question of putting all those reasons together in a list, so

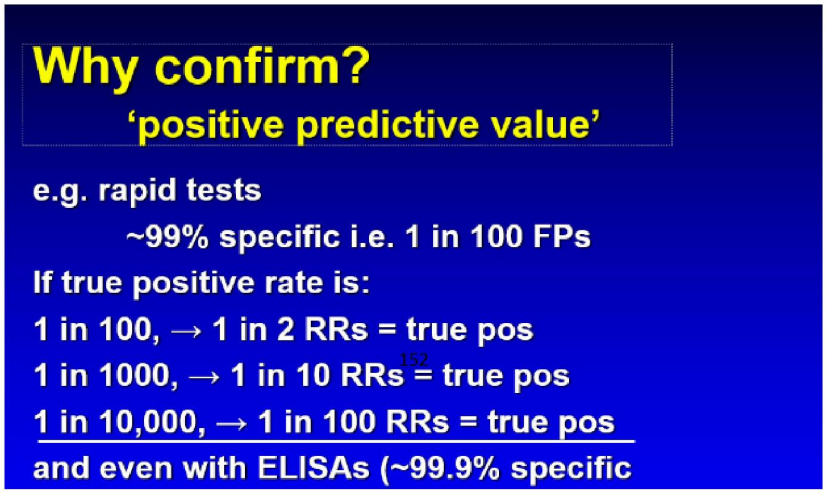
that we would be able to present a cogent argument if subsequently asked about it.

607. It was not a conversation that was expected to be published, but the papers, references and reasons provided still apply today. Given the opportunity again, I would phrase the unguarded comments differently.

Requirement of confirmatory testing

136. In February 1990 a report on the HCV symposium gave the summary that *"the overall impression, reinforced with informal discussion with delegates, is that the test is not sensitive or specific enough and, in the absence of appropriate confirmatory testing, is unable to give data upon which appropriate clinical decision-making can be reliably based"* (PRSE0004275, page 1). Please explain why confirmatory tests were required and the difficulties, if any, from evaluating them. You may find NHBT0000188_017 and PRSE0004661 of assistance.

608. Again, please see **slide 16** from **WITN6989003** from my presentation on '*Microbial Threats to Transfusion Safety*' at the University of Plymouth below:



609. As presented on slide 16, you will see that with a test that is 99% specific, which the first-generation hepatitis C test was certainly not, then one in a hundred of the reactives will be falsely positive.

610. If the true positive rate in your test is 1 in 100, then one in two repeat reactives will be truly positive, but 1 in 2 will be falsely reactive.

611. If the true positive rate in your test is 1 in 1000, which is what we suspected for previously untested ('new') UK donors, then one in ten repeat reactives would be truly positive. So, without a confirmatory test, nine out of ten reactives that you are finding would be falsely positive and you would have no way of knowing which reactive was truly positive.

612. The background rate of an infection in the population is intrinsically linked to the relevance of a given specificity of an assay. If there is a high frequency of an infection in a population, then a test of low specificity would be of more value than if there was a low frequency of infection in that population. UK blood donors had low frequencies of infection so one would expect to find fewer 'real' positives.

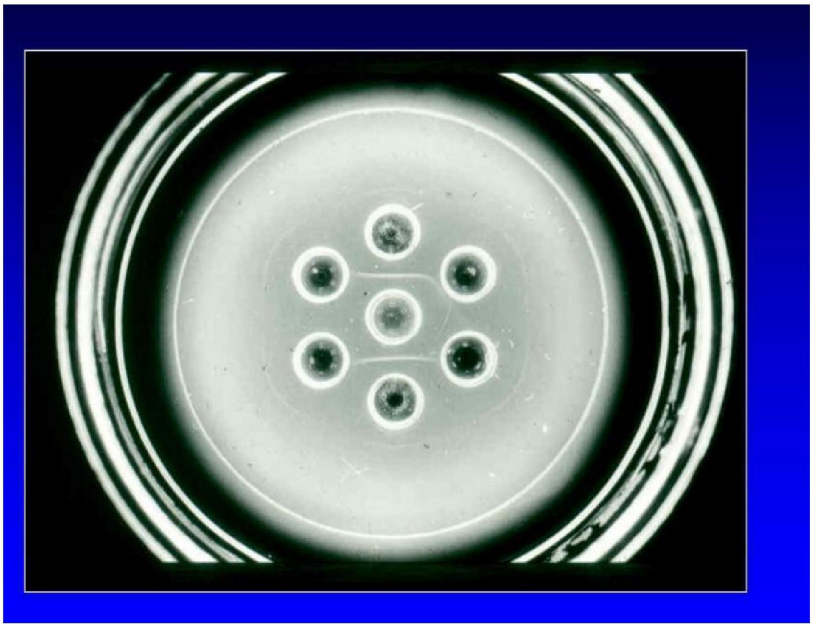
613. It is therefore very hard to manage donor testing in the absence of a confirmatory test. The screening tests available commercially needed to be evaluated in trials, together with appropriate confirmatory testing of screen-positive samples, before a donor would be approached, as we would

not know whether a reactive test meant that the donor was infected with 'NANBH'/HCV.

614. I have previously explained the terms 'supplementary' and 'confirmatory' in response to question 188a above.

615. The original screening test for HBsAg can illustrate the value of methods to confirm a positive reaction.

616. Please see **slide 24** from **WITN6989002** from my presentation on *'Microbial Threats to Transfusion Safety'* at the University of Plymouth.



617. This is a circular dish which would be about an inch and a half in diameter. The grey material is the agar which is like a set jelly. You then punch holes in that agar and then you put the test sample or antibodies into those holes which are called wells. The middle well is where you would put anti HBs, an antibody to the surface of hepatitis B. The outer wells are where you put your test samples, dropped in with a pipette.

618. Between the top well and the middle well, you can see a white line. That is an immunoprecipitation line, showing that there is hepatitis B surface antigen (HBsAg) in that top well and it has radially diffused through the gel until it meets the anti-HBs which has diffused from the middle well.

619. Originally we used the serum from haemophilia patients who had been infected with hepatitis B and had developed antibodies. Where the antigen and the antibody interact, you see an immunoprecipitation line.

620. Now looking anti-clockwise, the next well doesn't have any HBsAg. The bottom well also contains HBsAg, so you get another immunoprecipitation line. Then the next one along doesn't have any HBsAg, but in the next well along there is a bending of that top line. This illustrates several important things. The first thing is that there is a weak reaction i.e., a low concentration of HBsAg in that well, so you are not getting a clear cut immunoprecipitin (scientific term) line and you are getting a rather faint whiskery one. Because the line is near the well, it shows you that the antigen is at low concentration and therefore the diffusion rate is much slower. The antibodies in the middle well have had to diffuse out all the way along before you get immunoprecipitation.

621. The third thing that this slide shows you is what is called a '*line of identity*'. As the two immunoprecipitins form, because they are both from immunoprecipitin lines that come from an HBsAg and anti-HBs reaction, they fuse, and you get a line of identity. This confirms the identity of the line. If the immunoprecipitin lines crossed over (a 'spur' this would show that the respective antigens were different.

622. So even with the very simple, primitive if you like, first HBsAg screening test that we had (immunodiffusion) important information was obtained and the tests became increasingly refined and more amenable to mass testing.

623. We were therefore able to confirm HBsAg test reactives and so I was able to refute Dr Carman in the High Court when he said "*you started screening for hepatitis-B without confirmatory tests*". We had a confirmatory test even without specific antibody neutralisation, which is the benchmark confirmatory test for any antigen. You could also neutralise reactivity with specific antibodies as confirmation. Supplementary testing for anti-HBc could also increase confidence in the validity of a reaction.

624. I remember that I wrote to Dr Sue Skidmore, where I suggested that we could test two variables at the same time, which you never do in science. That was to take haemophilia patient samples and samples from non-multi-transfused blood recipients and test them with the first-generation anti-HCV assay. When we decoded it, half the microplate wells came up positive and half were negative. All the positives were from haemophilia patients who had clearly been infected with HCV. That was a 'eureka moment' because it said (a) that haemophilia patients were being infected by Factor VIII and (b) that the Chiron/Ortho tests did indeed detect anti-HCV. Now that was the first-generation test, but, of course, it was testing samples from patients likely to be positive so that specificity issues would not be evident. In the event, the experiment was able to successfully examine two 'variables' simultaneously on this occasion.

137. Did the RTCs have a coordinated approach to anti-HCV confirmatory testing? If not, please explain the differences you were aware of including why there may have been differences in the cost of reference tests. You may be assisted by NHBT0113642 when answering this question.

625. All RTCs would have agreed that a confirmation test was required. However, each RTC would have had its own arrangements for the testing and confirmation and the operational detail would vary.

626. Confirmatory work was expensive especially when you refer samples for PCR or other forms of nucleic acid testing. There may have been differences in the cost of reference tests as different laboratories would have different reference labs and would have approached the testing differently. A current example would be looking at the different laboratory costs for PCR testing for covid-19.

138. Please explain the key stages of confirmatory testing and how they developed over time. You may find NHBT0000073_028 of assistance.

627. (**NHBT0000073_028**) is a UK Advisory Committee on Transfusion Transmitted Diseases dated 8 January 1991. I was not in attendance at this meeting.

628. As far as I can recall, I consider that paragraph 4.3 of the minutes summarises the key stages of confirmatory testing as set out below:

629. At the reference laboratory, confirmation of the original screen positive results at the RTC will be undertaken. New/improved tests will also be used as part of an evaluation process.

630. The RIBA test will be performed by reference laboratories and used as the standard test to confirm seropositivity.

631. The PCR test is the only one which will detect viral RNA: hence PCR tests should be performed on all RIBA I positive sera.

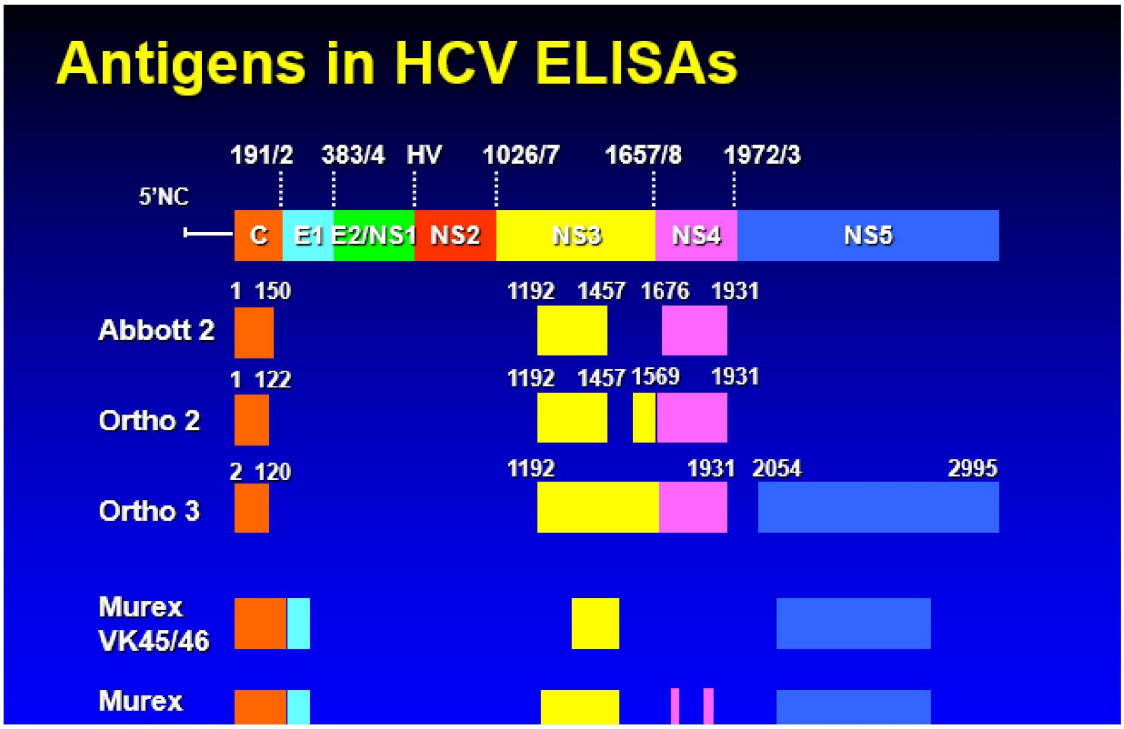
632. RIBA positive PCR positive results would be reported to the RTC as anti-HCV positive with detection of viral RNA.

633. RIBA positive, PCR negative will be reported as anti-HCV positive with no evidence of viral RNA and a request for a further sample at the next attendance will be made.

634. In respect of anti-HCV testing of blood donations, the meeting refers to a flow-chart prepared by Dr Mitchell; however, this has not been provided.

635. Please see **slide 24 and 25** of my presentation on a '*Tale of Two Entities'* at **WITN6989004**. These slides will assist in explaining how confirmatory testing developed over time.

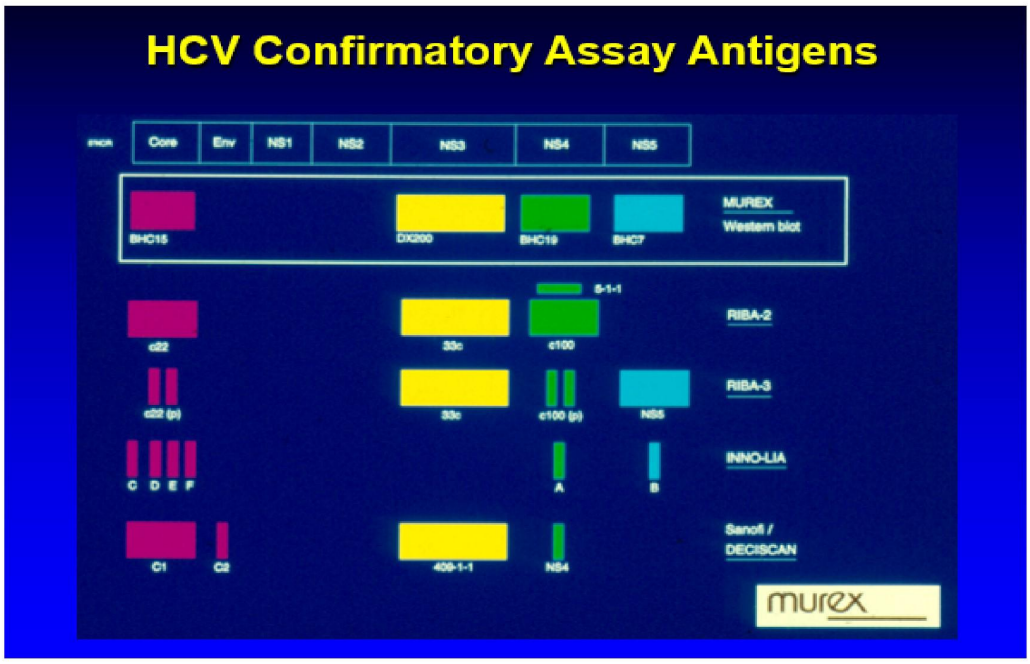
636. At the top bar of **slide 24** (below), you have a pictorial representation of the different antigens in HCV ELISAs.



637. There is the C antigen (the core) and then you have E1, E2/NS1, NS2, NS3, NS4 and NS5. 'E' refers to 'envelope' and 'NS' refers to 'non-structural'.

638. The first-generation test had just c100 antigen. So, when you did your screen tests you were using an assay that did not have E1 and E2 envelope antigens and therefore did not have structural antigens. It's the structural antigens that elicit the best antibody response. As the virus is replicating the structural/surface antigens are the ones most exposed to the host's immune system. In the second generation ELISAs extra antigens are included and in the third generation even more antigens, so the test became more specific more sensitive and detected a wider range of antibodies. Wellcome Diagnostics was taken over by a company called Murex who added even more antigens, so it was a superior test.

639. **Slide 25** (below) shows the confirmatory assay antigens. These are what you would put onto a RIBA strip. This is the one that Murex used, and you can see that there is a whole range of antigens that are on the strip. There was also the INNO-LIA and Sanofi. The tests therefore developed and were able to put in subparts of an antigen (the pink lines on the left). This was done to improve specificity. The reliability varied considerably between the different tests.



139. Please explain how information from confirmatory testing was used to reinstate donors that had been flagged with infection by anti-HCV testing. How quickly could a donor be reinstated after confirmatory testing? You may find page 2 of NHBT0047212_002 of assistance when answering this question.

640. I expect that Dr Hewitt has addressed donor reinstatement in her evidence and I therefore respectfully defer this question to her.

Plasma pool size

140. When did you first consider and/or raise concern regarding the size of plasma pools and the contamination that could result from one infected contribution? You may find NHBT0000030_037 of assistance.

641. In was generally understood for some time that pooling of blood components would increase the risk of an infectious unit rendering the whole pool infectious. To illustrate this, we can consider viruses such as HBV or HIV, where an infectious unit of blood might contain up to 100,000,000 virus particles per ml. If a single infectious pack of plasma (125ml) is included in the pool the whole pool will contain more than 100 x 100,000,000 virus particles. If the pool consists of 10,000 packs of plasma there will be a million virus particles per ml in that pool.

642. Furthermore, it is apparent from this that even a small number of HIV infected donors in our donor panels would pose considerable risk of rendering large plasma pools infectious. Therefore, even if the UK was self-sufficient for the production of clotting factor concentrates, the inevitable global spread of HIV could only have made UK pooled products safer than US pooled products regarding HIV for a limited period of time.

643. It is also worth noting that plasma from a vCJD individual would contain 10 to 100 infectious units per ml. The risk of rendering a whole pool infectious for vCJD is therefore very much less.

644. I do consider that the above simple calculations are of great importance to the Inquiry.

141. In September 1991, Dr Contreras wrote to Dr McClelland and stated that after discussions with you it appeared that "*BPL could not have detected all the positive donations missed simply because of the low sensitivity of the tests and the mass pooling that takes place prior to fractionation*" (NHBT0001332). Do you agree with this statement? If so, why? What could RTCs and BPL have done to reduce this risk?

645. The letter **(NHBT000133)** appears to be in response to Dr McClelland's letter to Dr Hewitt dated 2 September 1991 regarding small pool testing of donations. I do not have sight of this letter.

646. I do not recall this letter, but I note that I have been cc'd into the correspondence. I may be able to say more if I was able to see this letter.

647. The RTCs would have been testing the individual samples and making sure they were safe as possible before submission. If BPL were testing in small pools then that would also have reduced the risk.

142. In January 1994 the SACTTI discussed testing plasma pools (page 4 NHBT0000088_006). In particular:

a. Is this the first meeting where SACTTI considered testing pools of samples?

648. I do not recall the meeting on 18 January 1984 (minutes contained in (**NHBT0000088_006**) and therefore cannot confirm that this was the first meeting where SACTTI considered testing pools of samples, without considering every single SACTTI meeting.

649. I do consider that it probably was, but I cannot confirm for certain.

b. SACTT expressed that "*pragmatic approaches to enhancing cost-effectiveness should be explored in view of the financial constraints*" that were being experienced. Please explain the effect of such financial constraints on the safety of the BTS in relation to plasma pool testing.

650. This did not relate to testing plasma pools for BPL. It was being explored as a way of reducing the cost of the Blood Centre individual donation testing. It wasn't used for blood donor screening except for HTLV-I, and it was used for PCR testing which of course was exquisitely sensitive, so any dilution was likely to have a minimal effect on sensitivity.

Communication with hospitals regarding viral transmission

143. In September 1982 you wrote to Dr Playoff regarding the process of reporting information obtained from hepatitis B enquiries to hospitals (NHBT0000056_016). Please explain:

a. What was the system for investigating hepatitis B infections reported by hospitals at this time?

651. For hepatitis B infections we would get a report from the hospitals that the recipient had got hepatitis B.

652. I would then ask for samples or sight of the hospital Reference laboratories results but generally I would like to get actual samples of the patient's serum. This could then be retested and titrated for HBsAg and my laboratory would send some of that sample to the Middlesex Hospital where they would perform anti-HBc IgG and IgM testing to differentiate between a longstanding infection or new infection.

653. If the hospital did not have a pre-transfusion patient sample but had only detected HBsAg after the transfusion, the post-transfusion sample would need to be tested for anti-HBc IgG and IgM to determine if it was a new or longstanding (pre-transfusion) infection.

654. An IgM antibody is what the body makes to combat the virus quickly and it's not as good at neutralising as IgG which is more neutralising and develops later.

b. What was the outcome of this letter?

655. I cannot recall the outcome of this letter. However, presumably I would have received a response with advice at the time.

656. However, all the donors were negative, so there must have been some other source for the infection

Recall practice and procedure at NLBTC

144. Please give an overview of product recall practice at NLBTC, and how this changed during your tenure.

657. I was not involved in product recall practice at NLBTC and therefore unable to provide an overview and how this changed during my tenure.

145. What, if anything do you remember about any formal recall or notification procedures in place?

658. I was not involved in product recall practice at NLBTC and therefore unable to provide any information on formal recall or notification procedures in place.

146. In your opinion, were such practices and procedures effective? From your experience, did clinicians generally comply with recall requests and if not, do you recall why not?

659. I was not involved in product recall practice at NLBTC and therefore unable to provide any opinion on whether such practices and procedures were effective. I presume they were.

General

147. Please describe all other steps or actions taken at the NLBTC during the time you worked there to ensure blood safety and to reduce the risk to recipients of blood or blood products of being infected with a transfusion transmitted infection.

660. Please see my list of publications and textbooks to describe all other steps or actions taken at the NLBTC during the time I worked there to ensure blood safety and to reduce the risk to recipients of blood or blood products of being infected with a transfusion transmitted infection.

661. NLBTC and most other RTCs would carry out the following to ensure blood safety and to reduce the risk to recipients of blood or blood products of being infected with a transfusion transmitted infection:

1. First, it is very important to consider and celebrate the fact that the UK had voluntary blood donors. No donor was paid.
2. Donor education and self-exclusion.
3. Testing and confirmation testing.
4. The development of computerised and automotive systems with bar coding to reduce the chances of errors in sampling and testing.
5. The motivation and education of all staff in the centre.
6. Education of clinicians in the region (i.e., North London) including annual seminars to only prescribe transfusion when really needed.
7. The follow up of any reports of transmission and lookbacks when we introduced new tests or if a test or the development had improved and the sensitivity had increased, and if we then find a repeat donor who was positive, we will look back at the serum archives (stored samples), and retest that donor's previous donations.
8. Holding a serum archive of all donations.
9. Obtaining statistics, for the significant steps that were taken in relation to variant CJD e.g. leucodepletion.
10. Internal and external audits and inspections and development of detailed SOPs (Standard Operating Procedures).
11. Attending international conferences and keeping up to date with what was happening internationally. For example, exclusion questions and attending the New York Centre to see how their questionnaire was working.
12. Keeping abreast of the literature and doing CPD (Continuing Professional Development) which was originally CME (Continual Medical Education).
13. Having access to all relevant recent publications.
14. Secure record keeping and secure data transfer.

15. Research, development and surveillance.
16. Assessment of reactivity to look for patterns that might reveal inconsistencies.
17. Development of the confidential unit exclusion or what we called the AIDS questionnaire.
18. Strive for the consistency in the quality of the blood supply across the RTCs.

148. Was blood safety ever subject to cost, time, staffing or any other constraints? If you felt a particular course of action needed to be taken to ensure blood safety, were you free to take it?

662. Blood safety had to be considered in the context of healthcare overall which is subject to cost, time, staffing or any other constraints.

663. As previously discussed, NLTBC undertook many studies to attempt to assess whether interventions would be cost effective.

149. In your opinion, how did the desire for consensus across the RTCs impact efforts to achieve blood safety at a local level?

664. I considered that NLBTC was sometimes held back by slower centres. If we felt there was a local issue, as for example in the West End Donor Centre where we might have more homosexual men than other Blood Centres, we considered that a system like the Aids Questionnaire would help to improve safety in a local situation and we could do that. Often, we led locally interventions that became national practice.

665. I did and do still believe we should have a consistent service. I do not think we should have separate paths for the blood supply. There were

instances where it was appropriate for individual centres to augment extra safety measures as for example using a questionnaire. Overall, I do not think desire for consensus affected blood safety.

150. In your opinion, to what extent was the NLBTC and other RTDs reliant on the decisions of other bodies (advisory committees, directorates, NBTS, DoH) to achieve blood safety? Who or what was responsible for defining what constituted safe blood? What happened if your own opinion conflicted with the decision or advice of that person or body?

666. Very reliant to a large extent. You bring together a group of experts whose sole remit is to examine a question and come up with the best answer to it. You would rely on the Blood Services, Department of Health, hospitals who were receiving our blood, international reports, CDSC, Council of Europe, WHO, AABB, ISBT, BBTS, Royal College of Pathologists etc. There was no single person or single body – all fed in. There were continual seminars, conferences, and updates. Feedback from SHOT came later. The aim was to reach a consensus. You would look at the evidence and generally if the majority concurred and a collective decision was made, you would go along with it.

667. I was never in a situation where I felt I needed to resign. That is why you had debates, conferences, seminars etc., to evolve what was the best practice consistent with needs and resources.

151. In August 1991 you wrote to the National Directorate of the NBTS (NHBT0000073_028). In particular:

a. You wrote to suggest "it would be useful to formalise the rules for testing for syphilis, anti-HIV and HBsAg" (page 4 point 5). Why was it necessary for

you to write to the ACTTD to suggest that rules were formalised for the testing of syphilis, anti-HIV and HBsAg?

b. Why, in your opinion, do you think that such formalisation of rules had not yet taken place?

c. Was the UK NBTS and Reference Centres Committee mentioned by Dr Contreras ever convened by yourself? If not, why not? If so, please explain the remit of the committee and what you achieved.

668. Document (**NHBT0000073_028**) is the National Directorate of the NBTS, minutes of sixth meeting of UK Advisory Committee on Transfusion Transmitted Diseases (UK ACTTD) on 8 January 1991. I was unable to locate a copy of the letter that I allegedly wrote to the National Directorate of the NBTS.

669. I have no memory of it now unless something is mentioned in later minutes so I cannot comment.

152. In January 1992, you and Dr Marcela Contreras wrote, ahead of an ACTTD meeting, that "*the attitude towards transfusion safety has veered away from the concept of 'maximum benefit at minimal cost' towards the notion that if a procedure shown to prevent transfusion-transmitted infection and disease is available, it should be introduced*" (NHBT0000044_095). Do you agree that this was a shift that the BTS made? Please explain the reasons for your answer, including any relevant references to discussions with colleagues and official policy within the BTS. If you do agree:

a. When, in your view, was this shift made?

b. Who was responsible for the original policy and who for the change in policy?

c. What caused the change to occur?

d. What is your opinion of the merits of a cost-benefit approach to blood safety as opposed to the latter approach?

e. Was the introduction of anti-HCV testing affected by this prior approach? What about other transfusion transmitted infections?

670. This relates to the Precautionary principle. I refer the inquiry to **slide 48** of exhibit '*A tale of Two Entities*' (***WITN6989004)*** which notes the following:

a) Management of possible vCJD risk of transfusion did include the 'precautionary principle'. I would not call it a shift, that implies a formal change of attitude and direction. It was more a drift. I don't remember specific discussions, but it was not a shift, it was a gradual process and more and more would need to be done without necessarily knowing the level of benefit and what it would be.

b) There was no original policy, and it was an approach.

c) There was a steady accretion of evolving microbial safety seps. In **WITN6989002** and **WITN6989003**, I discussed persistent infections, inapparent or mildly symptomatic, carrier or latent state, over time we recognised there was also a risk from acute short-term infections, where in a previously unexposed population, there was a rapid increase of infections, West Nile virus getting to the East Coast of the USA and moving to West Coast. HIV was a new infection; currently 'horizon scanning' for new infections and threats is obviously very pertinent.

d) A cost benefit approach is a practical way of deciding on interventions. However, factors such as the severity and incidence of a microbial threat might make one lean towards 'benefit' rather than 'cost'.

e) Yes, it was. With vCJD, fortunately the early projections of millions of UK citizens becoming infected did not materialise. In the event these have been 171 cases in the UK.

153. In January 1995 you were featured in a BBC Panorama 'Bad Blood' (NHBT0040622). Did the Panorama accurately represent your view at the time? Has your view changed over time? You told the solicitors during a conference concerned with the Hepatitis Litigation in the High Court, that the answers you gave in that programme were responses to the wrong questions [NHBT0036250_025]. What did you mean by that?

671. My view has not changed over time.

672. I was asked a question to the effect 'what was the practical impact of using the first available tests' and I explained the logistical, administrative, blood wastage and donor counselling impact. They used this reply to answer their question 'why did the Blood Service' not start testing with the first available tests?'. The implication then was that the Service could not be 'bothered'. This was blatantly incorrect. Our perception of a 'stitch up' was shared by our communications officer and by Dr Angela Robinson (then Medical Director of the Service) who was also being interviewed.

Section 8: Look back programme at the North London RTC

154. Were you involved in setting up any national or local HIV look back programmes during your time at the NLBTC? If so, please describe this

process and your role in it and how it was funded. You may find NHBT0005597 and NHBT0057880 of assistance.

155. Were you involved in implementing any HIV look back programmes during your time at the NLBTC? Please give details.

673. I was involved as a microbiologist. We could look at archive samples from previous donations and test with new or improved tests and we could ask the hospitals. Records would be checked to see where units went to and check if recipients have any evidence of infections, get samples to be sent to for re-test. Reference laboratories could do extra testing.

674. My role was as a microbiologist was getting samples back, Dr Hewitt and her team would contact the hospitals. I can't remember how it was funded. With vCJD there was the 'transfusion medicine epidemiological reviewer' (TMER) led by Dr Hewitt.

155. Were you involved in implementing any HIV look back programmes during your time at the NLBTC? Please give details.

675. I was not involved in implementing any HIV look back programmes during my time at the NLBTC other than as a microbiologist.

HCV

156. In August 1994 you attended a meeting at the West Midlands BTS to consider the merits of a HCV look-back policy (NHBT0057381_004). It was considered that there was a "serious case for considering the implications of a 'HCV Look-Back' policy" and that it would be referred to MSBT with a recommendation for implication. Please explain:

a. Your involvement in setting up the look-back programme, your role in the programme and how it was funded; and

676. I do not recall this meeting at the West Midlands BTS (**NHBT0057381_004**) and do not recall whether I had any involvement in setting up the look-back programme, my role in the programme and how it was funded.

677. I would defer to Dr Patricia Hewitt, who may be better placed to answer this question.

b. Your involvement in implementing the look-back programme, your role in the programme and how it was funded. You may find PRSE0001236 of assistance.

678. I do not recall document (**PRSE0001236**), which is a discussion paper by Dr JD Cash on HCV Lookback titled "Recommendations of the Standing Advisory Committee on Transfusion-Transmitted Infection to the MSBT Concerning the Merits of Adopting an HCV Look-Back Policy".

679. I do not recall my involvement, other than being a member of the ad-hoc committee, in implementing the look-back programme and how it was funded.

680. I would defer to Dr Patricia Hewitt, who may be better placed to answer this question.

157. How did you manage recipients of transfusions that requested anti-HCV testing after the HCV look-back programme was publicised? Please consider the document NHBT0002761_003 when answering this question.

681. Paragraph 5.3 of the document (**NHBT0002761_003**) referred in this question I what would have been done to manage recipients of transfusions who requested anti-HCV testing after the HCV look-back programme was publicised.

682. This includes, if possible, trace (via hospital records), the identity of the relevant donors. Then check if they have subsequently been screened or test archive samples if they are available.

683. I would defer to Dr Patricia Hewitt, who may be better placed to answer this question.

158. Were you involved in setting up any HCV look back programmes during your time at the NLBTC? If so, please describe this process and your role in it and how it was funded. You may find NHBT0005597 of assistance.

684. I do not recall being involved in setting up any HCV look back programmes during my time at the NLBTC. Dr Patricia Hewitt may be better placed to answer this question.

685. I would defer to Dr Patricia Hewitt, who may be better placed to answer this question.

159. Were you involved in implementing any HCV look back programmes during your time at the NLBTC? If so, please describe what this involved.

686. I do not recall being involved in implementing any HCV look back programmes during my time at the NLBTC. Dr Patricia Hewitt may be better placed to answer this question.

687. I would defer to Dr Patricia Hewitt, who may be better placed to answer this question.

160. In January 1996 you attended a SACTTI meeting (NHBT0009458_002, page 3). When discussing the national HCV lookback programme the minutes show that the MSBT had expressed concern at the slowness of the progress specifically in identifying implicated components; delays with finding records; difficulty in extracting information from case records; counselling time; and delays with hepatologist appointments. Did you agree with the view of the MSBT? If so, please provide details. If not, why not?

688. I do not recall being involved in implementing any HCV look back programmes during my time at the NLBTC. Dr Patricia Hewitt may be better placed to answer this question.

689. I would defer to Dr Patricia Hewitt, who may be better placed to answer this question.

General

161. Please confirm whether you were involved in a look back process relating to any other infection during your time at the NLBTC. If so, please provide an overview of the relevant programmes and detail your involvement.

690. For HIV, hepatitis C, where any screening tests were upgraded to be more sensitive. If a donor who presumably tested negative was tested positive we would have followed a lookback process and obtained samples from recipients on a case-by-case basis.

162. Did you consider there was an ethical obligation to inform patients who may have received transfusions from infected donations? If not, why not?

691. Yes, I consider that there was an ethical obligation to inform patients who may have received transfusions from infected donations.

163. To what extent could an RTC implement its own local look back programme? Did the NLBTC do this? If so please give details. If not, why not?

692. Please see my response to question 161 above.

Section 9: Your relationship with commercial organisations

164. Have you ever:

a. Provided advice or consultancy services to any pharmaceutical company involved in the manufacture and/or importation and/or sale of blood products?

b. Received any pecuniary gain in return for performing an advisory/consultancy role for a pharmaceutical company involved in the manufacture, sale and/or importation of blood products?

c. Sat on any advisory panel, board, committee or similar body, of any pharmaceutical company involved in the manufacture, importation or sale of blood products?

d. Received any financial incentives from pharmaceutical companies to use certain blood products?

e. Received any non-financial incentives from pharmaceutical companies to use certain blood products?

f. Received any funding to prescribe, supply, administer, recommend, buy or sell any blood product from a pharmaceutical company? If so, please provide data

693. I was not involved in any of the above (cited in 164a to 164f) and therefore unable to answer this question. This was outside my remit.

165. What regulations or requirements or guidelines were in place (at any time relevant to your answers above) concerning declaratory procedures for involvement with a pharmaceutical company? If you were so involved, did you follow these regulations, requirements and guidelines and what steps did you take?

694. I was not aware of any such regulations or requirements or guidelines concerning declaratory procedures for involvement with a pharmaceutical company. This was outside my remit.

166. How did you build and maintain relationships with the pharmaceutical companies?

695. I did not have a close relationship with the pharmaceutical companies.

696. However, I did build and maintain relationships with the manufacturers and suppliers of test kits. This was to improve tests and quality control for the benefit of blood recipients (e.g. the development of sample addition monitoring).

167. Have you ever undertaken medical research for or on behalf of a pharmaceutical company involved in the manufacture, importation or sale of blood products? If so, please provide details.

697. As above, I have never undertaken medical research for or on behalf of a pharmaceutical company involved in the manufacture, importation, or sale of blood products.

168. In September 1992, Dr Cash wrote to Dr Gunson to suggest that you "may be inappropriately associated with certain commercial manufacturers of microbiology donation test kits, such that their professional advice is being influenced by the interests of the commercial organisations with which they are associated" (SBTS0000067_087). Do you agree with this statement? If so, why? If not, why not? Were you made aware of these comments by Dr Gunson at the time they were made?

698. I have no knowledge of Dr Cash's letter to Dr Gunson in September 1992 at (**SBTS0000067_087**). If I had, I would have strongly refuted the contents of this letter which I consider was untrue.

Section 10: Blood and plasma collection

The Inquiry is unaware of the extent to which you were involved with issues such as blood and plasma collection in your capacity as the Head of

Microbiology at the NLBTC. Please answer the following questions as far as you are able.

Blood collection

169. Please explain the system for blood collection at the NLBTC during your employment there and how it changed over time.

699. I was not involved in the collection of blood at NLBTC.

700. I am aware broadly of how blood was collected from donors, but this is outside my remit as a microbiologist and there are other people better placed to comment.

170. Please describe the way in which donations were collected at the NLBTC during your time there. In particular:

a. Where did these sessions take place?

b. How frequently could a person donate blood?

c. How were blood donors recruited?

a. What information, if any, was presented to prison donors before they gave blood?

d. Did any of these matters alter during your tenure? If so, how?

701. I am aware broadly of how blood was collected from donors, but this is outside my remit as a microbiologist and there are other people better placed to comment on this.

171. The Inquiry understands that the NLBTC ceased collections from prisons in 1972 (NHBT0016123, page 9). As far as you can recall, did NLBTC continue to collect blood from any prisons, borstals and similar institutions after this date? You may find JPAC0000002_193 and NHBT0086896_002 of assistance.

702. I cannot recall whether NLBTC continued to collect blood from any prisons, borstals and similar institutions after this date.

172. Further to question 176, if the NLBTC did continue to collect from such institutions, please identify and set out the number of institutions from which blood was collected and the frequency of sessions. In particular:

a. What were the staffing arrangements during blood donation sessions? Were staff medically trained?

b. Why was it considered that prisons were a high-risk population?

c. When did you become aware that prisons should be avoided as a donor source?

d. What role, if any, did you have in this practice? You may find PRSE0001299 of assistance.

e. What were the relative costs of collecting blood from prisons as compared to collecting blood at the NLBTC?

f. Were prisoners in England and Wales provided with any form of incentive to donate blood? If so, what?

703. Please see my response to question 169 to 171 above. The collection of blood was outside my remit as a microbiologist.

704. I do not recall if NLBTC did continue to collect from such institutions and I am therefore unable to identify and set out the number of institutions from which blood was collected and the frequency of sessions.

Plasma production

173. The Inquiry understands that the NLBTC procured plasma from blood donor sessions to produce fresh frozen plasma ("FFP") to provide to BPL (CBLA0001762, page 2). Please explain:

a. where the production of FFP took place within the NLBTC;

b. broadly, the process that was undertaken, the capacity of the NLBTC to manufacture FFP and whether this changed during your tenure and why

c. whether, in your opinion, the facilities were sufficient to produce FFP; an

d. how quickly the NLBTC could have increased its manufacture of FFP, had it wished to.

705. This is outside my area of expertise and there are others who are better placed to answer this question.

174. As far as you are aware, how was plasma procurement at NLBTC funded throughout the 1980s

706. I do not know how plasma procurement at NLBTC was funded throughout the 1980s.

Self-sufficiency

175. During your time at the NLBTC, what did you understand the term 'self-sufficiency' to mean? Did this change over time?

707. That we would have enough blood to supply hospital needs. There was adjustment. A medical officer would make decisions on what blood was issued. Self-sufficiency of plasma in reduction to Factor VIII production was a separate issue and I was aware that the UK was not self-sufficient.

176. What was your view on the prospect of the UK achieving self-sufficiency?

708. Not likely unless sufficient funding and commitment from Government.

177. As far as you are aware, did your views on self-sufficiency accord with the views of your peers and the Blood Transfusion Services?

709. We couldn't do it without government commitment. I believe my views did accord with my peers' views.

Plasma targets

178. The Inquiry is aware that the NLBTC had targets for the amount of plasma that had to be collected by the centre (DHSC0002291_049). Who set these targets and what were they? What was the purpose of the targets?

710. I was not involved in the targets for plasma that had to be collected by the centre (**DHSC0002291_049**). This is within the remit of the RTD.

179. What impact did the setting of targets for the collection of plasma have on decision-making at the NLBTC? Were there any consequences if the targets were not met? Were there any benefits if the targets were exceeded? Plasmapheresis

711. I was not involved in setting of targets for plasma and therefore unable to answer the impact this had (if any) on decision-making at the NLBTC. This is within the remit of the RTD.

180. The Inquiry is aware that the NLBTC used plasmapheresis throughout the 1980s (NHBT0003369_001, NHBT0003369_002). Please explain, as far as you are able, what consideration the NLBTC gave to implementing plasmapheresis, including:

a. whether manual or machine plasmapheresis was preferred;

b. the infrastructure, expertise and capacity of the NLBTC to introduce plasmapheresis; and

c. whether, in your view, plasmapheresis would increase the amount of available plasma.

712. I was not involved in use of plasmapheresis throughout the 1980s during my tenure at NLBTC and therefore unable to answer this question.

Use of plasma reduced blood and red cell concentrates

181. What steps, if any, did the NLBTC take to persuade hospital clinicians to use less whole blood and more red cell concentrates and/or plasma reduced blood to release more plasma for fractionation? Did you play any role in this?

713. I did not play any role in NLBTC taking steps (if any) to persuade hospital clinicians to use less whole blood and more red cell concentrates and/or plasma reduced blood to release more plasma for fractionation. However, I believe this was done.

714. I did participate in update seminars for hospital staff attending at the Centre when only appropriate use of blood would be encouraged as part of enhancing blood transfusion safety.

182. In February 1990 you and Dr Contreras co-authored an article on infectious complications of blood transfusions (NHBT0000061_107). The conclusion stated that "*patients are at a much greater risk if they do not*

have transfusions when they genuinely need them than they are from the possible complications of transfusion". **Did you consider that there was over transfusion of patients? Please give details?**

715. This was outside my remit and I am therefore unable to answer this question.

Arrangements for obtaining blood products

183. Did you, or anyone else at the NLBTC, contract directly with any pharmaceutical company involved in the manufacture and/or importation and/or sale of imported blood products? If so, please describe:

a. how and by whom the decision was made to contract with the particular pharmaceutical company;

b. whether you were consulted on the manufacture and/or importation and/or sale of imported blood products; and

c. the factors taken into account when determining whether to contract with one pharmaceutical company over another.

716. I was not involved in the manufacture and/or importation and/or sale of imported blood products and therefore unable to answer this question.

184. Was the NLBTC in any way responsible for decisions about the choice of product used to treat patients in haemophilia centres and/or hospitals, for example the choice between one imported factor concentrate over another? If so, did you play any role in this decision?

717. I was not involved in the choice of product used to treat patients in haemophilia centres and/or hospitals and therefore unable to answer this question.

185. What, in your view, were the key factors influencing the choice between NHS blood products and imported blood products?

718. My opinion would be to use NHS blood products where available as a first choice.

186. As far as you are aware, what influence did pharmaceutical companies have in the way that the imported blood products they supplied to NLBTC were used? For example, can you recall whether pharmaceutical companies provided advice on the use of the products?

719. I was not aware of the influence pharmaceutical companies had in the way that the imported blood products they supplied to NLBTC were used.

Production of cryoprecipitate

187. Did the NLBTC produce cryoprecipitate? If so, please describe:

a. where the production of cryoprecipitate took place;

b. broadly, the process that was undertaken, the capacity of the NLBTC to manufacture cryoprecipitate and whether this changed during your tenure and why;

c. how quickly the NLBTC could have increased its manufacture of cryoprecipitate, had it wished to, during the early 1980s.

720. NLBTC did produce cryoprecipitate in the Components laboratory.

721. I do not know in detail the process that was undertaken, the capacity of the NLBTC to manufacture cryoprecipitate and whether this changed during my tenure as this was not my department.

722. I do not know how quickly NLBTC could have increased its manufacture of cryoprecipitate, had it wished to, during the early 1980s as this was not my department.

188. Please explain what consideration, if any, the NLBTC gave to increasing the production and use of cryoprecipitate in response to the growing awareness of the risks associated with Factor VIII concentrate products in the 1980s. If not, why not?

723. I do not know what consideration, if any, NLBTC gave to increasing the production and use of cryoprecipitate in response to the growing awareness of the risks associated with Factor VIII concentrate products in the 1980s.

Section 11: Organisation of the blood services

189. In his witness statement for the A v Others litigation, Dr Gunson discussed the creation of the National Directorate to oversee the work of RTCs, although he noted that the Directorate "*did not have executive authority and its successes came about by persuasion*" (NHBT0000026_009). What are your views on the success or otherwise of the National Directorate?

724. RTCs remained the primary responsibility of the RHAs.

725. There were inevitably difficulties when proposals from the National Directorate for a change in national policy required additional resources since these had to be found from the budgets of the various RHAs.

190. In the same statement, Dr Gunson commented that the work of the National Directorate became marginalised because of the devolution of health budgets to District level and eventually replaced by the creation of the National Blood Authority (NBA), which had responsibility for "*both the central laboratories and the RTCs.*" What are your views on the need for centralised responsibility for RTCs?

726. The devolution of budgets to Districts proposed in the NHS and Community Care Act 1990 meant that RTCs had to recover their operating costs through reimbursement for products and services'.

191. What in your view were the strengths and weaknesses of the NBA?

727. The strength of the NBA was that it provided a consistent and co-ordinated delivery of methods and services across all Blood Centres. It also had the potential to optimise funding and spending.

728. The weakness of the NBA was, as in any large organisation, some elements of individuality were lost and certain aspects of bureaucracy increased.

Section 12: Variant Creutzfeldt-Jakob disease (vCJD)

192. When and in what circumstances did you first become aware of the risks of transmission of vCJD associated with the use of blood and blood products? How did your knowledge develop over time? What if any involvement did you have in addressing or responding to these risks? You may find page 6 of NHBT0000088_013, NHBT0007197, DHSC0020783_088, NHBT0088601 and DHSC0041270_144 may be of assistance.

729. I understand that the first cluster of 10 vCJD cases in the UK population was in April 1996 (Will et all 1996, Lancet 347, 921 (**HSOC0010099**). At the time there was no evidence that it was transfusion transmitted.

730. I first became aware of the risks of possible transmission of vCJD by cellular blood components when, at autopsy, it was shown that the abnormal prion was present in the lymph nodes and spleen of patients who had died of vCJD.

731. If the abnormal prion was present in lymphocytes, which are abundant cellular components of blood, then we assumed that it would be possible that the abnormal prion could be transmissible by the transfusion of blood and cellular blood components, such as red cells and platelets.

732. A study was set up by the UK blood services and the national CJD Research and Surveillance Unit to investigate whether there was an association between variant CJD and blood transfusion. Eventually, it was shown in December 2003 that an individual who had died of vCJD, had been a donor in the past and had donated blood which was transfused to a patient who later developed CJD.

733. The study later showed a further transmission of two cases of vCJD via blood transfusion.

734. A haemophilia patient who died of causes other than vCJD and who did not show signs or symptoms of vCJD was shown to have, at autopsy, abnormal prion in a section of his spleen. Hence, as far as I know there have only been four cases of vCJD transmitted by transfusion, all by cellular blood components and possible one by fractionated plasma products.

735. No proven cases of vCJD transmission by fractionated blood products have ever been reported.

736. Dr Patricia Hewitt carried out the Transfusion Medicine Epidemiological Review (TMER) and this would have been linked to the vCJD Surveillance Unit set up in Edinburgh who provided quarterly reports.

193. In July 2000 Dr Lorna Williamson wrote to you and Dr Snape asking for some "*expert help*" on the risks of vCJD from a single unit of UK plasma (NHBT0041829). Did you provide this help? Please provide an

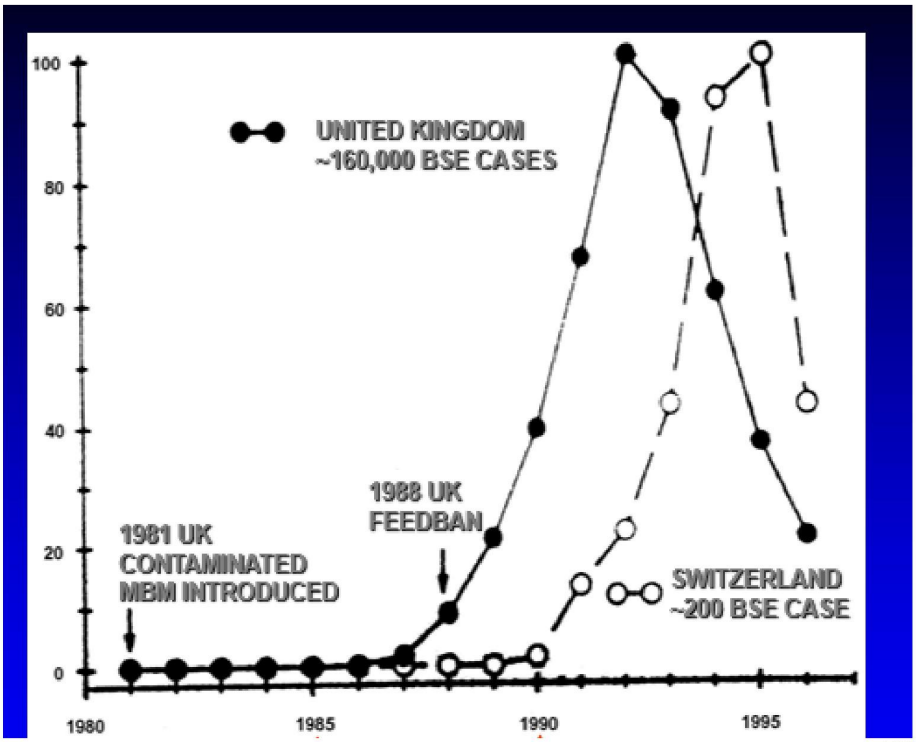
account of your understanding of the relative risks of vCJD infection from the use of domestically sourced blood and blood products.

737. I recall the request on 10 July 2000 for guidance on the risks of vCJD from a single unit of UK plasma contained in the document NHBT0041829. However, I don't recall anything regarding the outcome.

738. In July 2000, we did not have any cases of transmission of vCJD via the use of blood and blood products. As explained above, the study set up by the UK blood services and the national CJD Research and Surveillance Unit to investigate whether there was an association between variant CJD and blood transfusion, was not commenced until around December 2003 and the study was not reported until 2004.

739. There was a potential risk of blood or pooled products transmitting vCJD and the UK had the largest outbreak because of the large outbreak in the cattle.

740. Please see **slide 36** of my lecture to the University of Plymouth of '*A tale of two entities'* contained in WITN6989004 .



741. The graph contained in the slide illustrates the situation in the UK in comparison to Switzerland in respect of vCJD infection. Switzerland had a smaller outbreak in respect of cattle, but the shape of the vCJD epidemic development curve was strikingly similar to the UKs.

194. Please provide an outline of any proposals, whether accepted or not, that were made in an effort to protect the blood supply from the risk of vCJD, including but not limited to:

a. Development of screening or diagnostic tests;

b. Filtration policy;

c. Quarantine of batches;

d. Donor selection and exclusion policies;

e. Product recall;

f. Recombinant blood products;

g. Importation of product from the USA or elsewhere;

and h. Surveillance.

742. The measures put in place to protect the blood supply from the risk of vCJD include, but not limited, to the following:

743. 1997: withdrawal/recall of blood components/plasma derivatives/ tissues from donors who developed vCJD

1999: fractionation of plasma from UK donors ceased

1999: (October): leucodepletion of all components

2004: (June): imported FFP for patients born after 1 January 1996

2004 (April): deferral of whole blood donors (WB) with a definite h/o blood transfusion since 1 January 1980

2004 (August): deferral extended to WB and apheresis donors with possible h/o blood transfusion

2004 (September): deferral extended to recipients of UK-derived coagulation factors, IVIg and plasma exchange

744. I understand that considerable efforts were made by various laboratories, not just in the UK, for the development of screening or diagnostic tests. This included Professor John at St Mary's Hospital, the vCJD Surveillance Unit in Edinburgh and Dr Paul Brown in the USA.

745. I understand that it was the filtration of red cells for excluding prion, but I do not think it has so far proved to be workable.

746. I was not aware of what happened with the quarantine of batches.

747. I do not know the details of donor selection and exclusion policies or product recall. I can presume it excluded anyone with a history associated with Creutzfeldt-Jakob disease, including family members. Dr Patricia Hewitt is the most suitable person to answer this question and she carried out the Transfusion Medicine Epidemiological Review (TMER) (see above).

748. Significant work commenced on recombinant blood products and eventually commercial companies were able to produce recombinant Factor VIII, but I don't know the dates.

749. The importation of fractionated plasma products from the USA, but it wouldn't have been feasible or workable for cellular components. Again I don't know the dates.

750. I understand that there was surveillance of cases in current or past blood donors

195. In providing this outline, please state:

a. When and by whom any proposals were made;

b. The factors considered when deciding whether to implement these proposals;

c. Decisions made on such proposals, including the date on which they were made or rejected; and
d. How any such measures were implemented in practice, including efforts made to monitor their effectiveness.

751. I cannot recall when and by whom any proposals were made, nor any decisions made on such proposals.

752. Factors considered when deciding whether to implement any proposals include feasibility, availability of systems (such as testing), likely effectiveness and to a lesser extent cost.

753. I do not recall how any such measures were implemented in practice, including efforts made to monitor their effectiveness.

196. Please provide your opinion as to whether the risk of secondary transmission via blood and blood products was adequately mitigated in the UK in line with what was known about the potential risks of vCJD at that time.

754. We believed that we had done what we could within our powers to mitigate the risk of secondary transmission via blood and blood products. In this instance, the precautionary principle came to the fore, as advocated by Frank Dobson, the then Health Secretary.

197. In August 1995 you wrote to Dr Metters to "*urge that MSBT reconsider this matter [considering vCJD] so that the UK blood services can maintain their record of honestly and sensibly monitoring the safety of the blood supply*" (NHBT0008001). Why did you hold this view? Did the MSBT take your advice? Please explain your view as to whether any decisions or actions could and/or should have been

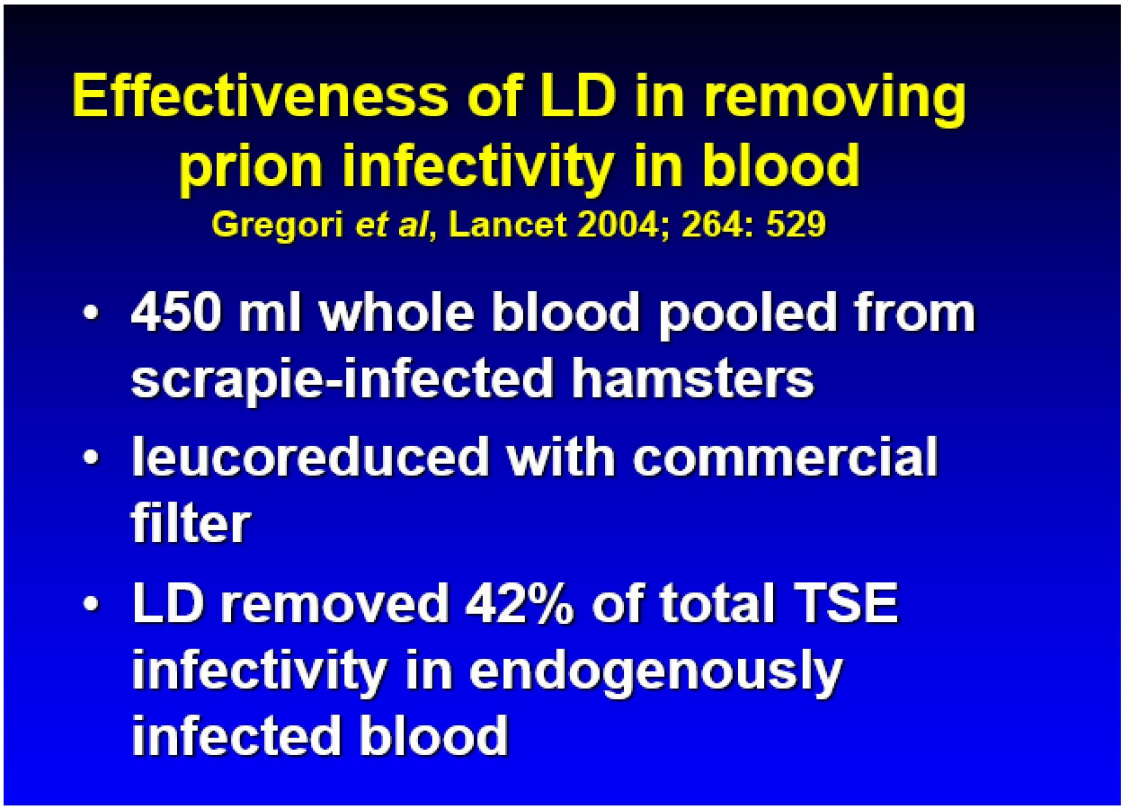
made earlier and how this might have impacted the number of individuals considered to be at risk of developing vCJD.

755. Document (**NHBT0041829)** is a draft letter on the advice of SACTTI. I do not recall this letter and cannot confirm whether this draft letter was ever circulated. The handwritten annotations on the letter are not my handwriting.

756. In any event, some form of "*look back*" regarding vCJD, would have been consistent with our policy for previous infections like HCV, HIV and HCV (see my previous comments regarding TMER).

757. Dr Patricia Hewitt may be better placed to answer this question. All I can say is, seems to be more than coincidence that the four cases of transfusion transmitted VCJD occurred before the implementation of filtering white blood cells of all units of blood in 1999.

758. Please see **slide 49** of my lecture, *'A Tale of Two Entities'*, **WITN6989004:**



759. This is limited experimental data on the effectiveness of LD in removing prion infectivity in blood. Given the low levels of infectious prion (100 units), vary low compared with the many millions of virus particles with HBV, HIV or HCV, even a 42% reduction of infectivity in filtration might be sufficient to prevent transmissions via blood components. This seems to be the case.

vCJD Product recalls

198. The Inquiry is aware of a series of product recalls between 1997-2000 upon instruction from the Medical Controls Agency in relation to concerns of the possible risks of vCJD transmission from the use of vCJD implicated blood products. The Inquiry seeks to gain an understanding as to what, if any, information was relayed to the recipients of blood and blood products which were recalled. Please provide the following:

a. What knowledge, if any, did your organisation hold and what involvement did they play in any of the product recalls by BPL between 1997-2000? You may find NHBT0004563 of assistance when answering this question.

760. Document (**NHBT0004563)** is a memorandum dated 6 November 1997 from Sue Cunningham to Dr Peter Flanagan, Dr Sue Knowles, Dr Tim Wallington, Carlene Dias, Dr Mary Brennan and Jim Moir. I was only cc'd into the communication and not directly involved in this issue and so am unable to answer this question.

761. I presume that I was just copied into this correspondence as a microbiologist.

b. What steps, if any, were taken by your organisation and by whom in response to information that a particular donor/group of individuals or a particular batch/product was implicated with vCJD?

762. The steps would have involved TMER and therefore defer to Dr Patricia Hewitt, to answer this question.

c. What advice was given to other organisations and by whom in respect to patient notification following the BPL product recalls?

763. The advice provided would have involved TMER and therefore defer to Dr Patricia Hewitt, to answer this question.

199. In a note from Dr Angela Robinson to you in February 1999, Dr Robinson states that "*even if a test comes in for nvCJD, until we know what that test means I think we might still be in the position where it might still be considered morally, ethically and legally wrong to inform*

the individual that they have a positive test for vCJD" **(NHBT0002059). In particular:**

a. What ethical advice was sought on the issue of whether or not recipients of vCJD implicated blood and blood products should be notified? How did this change over time?

764. I was again not involved and therefore unable to answer this question. I would defer to Dr Patricia Hewitt, who maybe better placed to answer this question.

765. In this context, the meaning and confirmation of any positive result of such a test would be extremely tentative. To inform a donor on the basis of a preliminary test that could not be confirmed would be an extremely delicate matter.

b. Which individuals, committees, groups or organisations held responsibility for issuing the ethical advice?

766. I was not involved and therefore unable to answer this question. Dr Patricia Hewitt may be better placed to answer this question.

200. Which individuals, committees, groups or organisations held responsibility for decision making as to whether such recipients would or would not be informed?

767. I was not involved and therefore unable to answer this question. Dr Patricia Hewitt may be better placed to answer this question.

201. What efforts were made to maintain any database or record of any such recipients?

768. Considerable effort went into maintaining a confidential TMER, which Dr Hewitt is better placed to answer.

202. What records were collated in relation to any concerns and/or issues raised by individuals arising out of product recalls? Was this information shared with any other individuals, committees, groups or organisations?

769. Considerable effort went into maintaining a confidential TMER, which Dr Hewitt is better placed to answer.

203. In your view should additional steps have been taken at any stage and if so, what steps should have been taken?

770. I am not in a position to respond to this question, but I am aware that considerable efforts were made to make TMER complete and effective.

vCJD Notification exercises

204. The Inquiry has heard evidence of the experiences of a number of infected and affected individuals who were notified of their 'at risk' status of vCJD. The Inquiry seeks to gain an understanding of the rationale behind policy decisions made in relation to notifying at-risk individuals and how this changed over time. Please provide the following:

a. A chronological summary of the knowledge held within your organisation in relation to the issues surrounding notification of risk to individuals deemed to be at risk of vCJD.

b. A summary of the views, opinions and decisions regarding notification arising from the CJDIP consultation process in 2000.

c. An outline of any policies and practices which were implemented across the U.K. in relation to patient notification and de-notification.

d. Details as to whether your organisation was aware of any circumstances where individuals were not informed of their risk status or at a later date and if so, why.

e. An account of what, how, when and where patients were told that they might have been exposed to a greater risk of vCJD.

f. A summary of information or advice given to partners or family members of patients who were at risk of infection with vCJD.

771. I was not involved in the vCJD Notification exercises and would defer to Dr Patricia Hewitt, who will be better placed to answer this question.

vCJD Scale of Exposure

205. Please provide a summary of any research studies or papers, reports, recommendations, look back exercises and databases which have addressed the prevalence of the transmission of vCJD in blood and blood products. You may find DHSC0042301_155 of assistance.

772. I do not recall any specific items addressing this question and the document referred to is a merely a general review.

206. What is your view on the effectiveness of any look back studies, in particular TMER, to trace recipients of vCJD infected blood and blood products?

773. I understand that TMER was very thorough and effective, but I would defer to Dr Patricia Hewitt who is better placed to answer this question.

207. Are you aware of any studies which provide a regional comparison of the prevalence of vCJD in the UK?

774. I believe that the vCJD surveillance unit in Edinburgh did record and monitor regional prevalence's of vCJD in the UK, but I am not aware of the details.

208. As far as you are able, please outline the system of recording the cause of death from vCJD infection from blood or blood products in the UK. Please provide your views on the accuracy of information captured about the cause of death and any areas of weakness or failures in this system to investigate, certify or record the cause of death where it was potentially linked to vCJD.

775. I have no knowledge of the system of recording the cause of death from vCJD infection from blood or blood products in the UK. Dr Patricia Hewitt may be better placed to answer this question.

Section 13: Other matters

209. Please provide a list of any articles you have had published relevant to the terms of reference. You may find NHBT0100207_005 and NHBT0100207_006 of assistance.

776. I would refer to documents (**NHBT0100207_005)** and (**NHBT0100207_006),** which contain a list of published articles relevant to the terms of reference.

777. Other papers include:

'Delay' in 'AIDS testing' (New Scientist, issue 29th Aug 1985, p57) (**WITN6989008**)

Current Anti-LAV/HTLV-III Screening Methods (and some of their problems) (Eds, Petriaccini et al, 1987 (**WITN6989009**)

Barbara et al J Clin Pathol 1979 vol 32 pp1180-3 (**WITN6989010**)

Barbara et al. Proceedings of International Hepatitis Workshop, Edinburgh 1 sep 1982. (**WITN6989011**)

Markers in blood donors with a history of jaundice. Tedder et al, Lancet (letter) March 15, 1980 pp395-6 (**WITN6989012**)

778. Once again, I was also senior co-editor of the book '*Transfusion Microbiology*' dated 1986, alongside Dr Fiona Regan and Dr Marcela Contreras (now Professor Dame). This book covered the huge topic of how microbiology had developed in blood transfusion.

210. Please explain, in as much detail as you are able to, any other issues that you believe may be of relevance to the Infected Blood Inquiry. To assist, we have provided a list of issues (attached).

779. I am not aware of any other issues that may be of relevance to the Infected Blood Inquiry.

211. During Parliamentary questions on 10th December 1985, Mr Hayhoe stated that 'supplies of whole blood are not imported since the United Kingdom is self-sufficient in its needs for blood for transfusions; it is only certain blood products which are imported' (HSOC0018830). To your knowledge, was the UK self-sufficient in its need for whole blood for transfusions?

780. The UK was self-sufficient in its need for blood for transfusions. It is possible that a rare blood group unit may have been obtained from other countries.

212. During your tenure at NLBTC, were you aware of patients being given blood transfusions with red blood cells imported from the USA? If so, was there any concern about its use at the time?

781. I was not aware of patients being given blood transfusions with red blood cells imported from the USA.

782. I would like to finish by saying that I have tried to the best of my ability to assist the Inquiry on behalf of infected blood recipients and those who have been adversely affected. The only goal of myself and my colleagues was to help patients who might require blood, as best we could. As a lifelong blood donor (accredited with more than 250 donations of blood and platelets), this too reflects my goal to help patients.

783. Naturally I completely sympathise with any recipients of blood who have been harmed by transfusion of blood components or products. I deeply regret the suffering or harm caused to patients and their families by any inadequacies in the provision of what was intended to be lifesaving or life enhancing transfusions. I would have wished that this Inquiry could have happened sooner. This would have enabled the inadvertently but tragically harmed patients to have some redress and justice for what happened to them. During the course of the Inquiry the injury they have suffered has been made so movingly clear.

784. I wish it could have been possible for me to attend the Inquiry in person. I very much hope that my evidence will have helped the Inquiry along the path to completing its crucially important work.

Statement of Truth

I believe that the facts stated in this witness statement are true.

Signed GRO-C

Name JOHN BARBARA

Dated 6th Jan 2022

Table of exhibits:

Date	Notes/ Description	Exhibit number
30 October 2019	*Lecture slides on 'Microbial Threats to Transfusion Safety' part 1*	**WITN6989002**
30 October 2019	*Lecture slides on 'Microbial Threats to Transfusion Safety' part 2*	**WITN6989003**
12 December 2017	*Lecture slides on 'A Tale of Two Entities'*	**WITN6989004**
12 February 2000	Paper from TTI Study Group, title "Prospective Investigation of Transfusion Transmitted Infection	**NHBT0084753**

	in Recipients of over 20,000 Units of Blood" by Fiona A. M. Regan; Precticia Hewitt, John A. J. Barbara; Marcela Contreras, Vol 520	
30 March 1991	*Contreras Marcela, Barbara JAJ, Anderson Catherine C, Ranasinghe E, et al (1991) 'Low incidence of non-A, non-B hepatitis in London confirmed by hepatitis C serology.' Lancet; 337: 753-757*	**NHBT0000042_095**
21 February 1974	Journal of Hygiene, Cambridge - 'Post-Transfusion Hepatitis in a London Hospital - Results of a Two Year Prospective Study' by the Medical Research Council Working Party, dated 21 February 1974.	**PRSE0002988**
12 November 1983	Article titled "Prospective study of post-transfusion hepatitis after cardiac surgery in a British Centre" published in the British Medical Journal by J D Collins et al.	**PRSE0000766**
1989	The Society of Community Medicine Journal "on chronic liver disease. A case control study of the effect of previous blood	**NHBT0000098_002**

	transfusion." by G M Wood, Lesley J Levy, M S Losowsky, D I Cooke, A E Read, M H Hambling, Suzanne K R Clarke, Pauline Waight and Sheila Polakoff	
01 September 1991	Trial of Anti-HCV Tests on Blood Donations in England and Wales September - October 1991, re: Preliminary analysis of results	**NHBT0017536**
04 July 1987	Testing Blood Donors for Non-A, Non-B Hepatitis - Irrational perhaps but inescapable, The Lancet	**PRSE0001444**
28 February 2002	*BMJ 2002, vol324, p451 Reproduced with permission from the BMJ publishing Group*	**DHSC0041457_044**
13 March 1998	'Blood donor screening to reduce the incidence of transfusion associated NANB hepatitis- a history of surrogate marker tests' by Dr John Craske	**NHBT0000047_002**
1992	*A paper published by Peter Glazebrook and I in the Archives of Virology*	**WITN6989005**
	Paper for the Postgraduate Doctor Middle East	**WITN6989006**
1993	*Paper co-authored with Dr*	**WITN6989007**

	Garson, and published in Vox Sanguinis	
06 April 1996	Article, from the Lancet, entitled 'A new variant of Creutzfeldt-Jakob disease in the UK.' Will et all 1996, Lacet 347, 921	**HSOC0010099**
29 August 1985	*'Delay' in 'AIDS testing' (New Scientist, p57)*	**WITN6989008**
1987	*Current Anti-LAV/HTLV-III Screening Methods (and some of their problems) (Eds, Petriaccini et al, 1987)*	**WITN6989009**
1979	*Barbara et al J Clin Pathol 1979 vol 32 pp1180-3*	**WITN6989010**
01 September 1982	*Barbara et al. Proceedings of International Hepatitis Workshop, Edinburgh*	**WITN6989011**
15 March 1980	*Markers in blood donors with a history of jaundice. Tedder et al, Lancet (letter) March 15, 1980 pp395-6)*	**WITN6989012**