Friday, 18 March 2011

(9.30 am)

THE CHAIRMAN: Good morning.

MS DUNLOP: Sir, we are really dealing with two different topics today. We have Dr Hay first, who is going to continue to develop the matter of statistics from the UKHCDO, the haemophilia doctors' organisation. But we are also, after Dr Hay, going to begin topic C1, which is about donor deferral or donor suitability and I'm continuing to deal with the statistics but Mr Mackenzie is going to be dealing with topic C1. So we are both going to be on our feet today.

With that introduction, can we begin with Dr Hay, please.

DR CHARLES HAY (sworn)

Questions by MS DUNLOP

MS DUNLOP: Good morning, Dr Hay. You come to us today in your capacity as chairman of UKHCDO. Before I ask you anything about yourself, I thought I would ask you about UKHCDO. That stands for United Kingdom Haemophilia Centre Doctors' Organisation. Is that correct?

A. Yes.

Q. We have had some difficulty, when we have looked at the documents going further back, in knowing whether the D

has always been "doctors". Was it originally "directors"?

A. It was. They changed the name when we became a charity in, I think it was, 1993.

Q. Thank you. I was going to ask you to have a look at a short section in our preliminary report, which deals with UKHCDO. It should appear on the screen in front of you. The page is [LIT0012352].

I don't know if you have seen this section before, Dr Hay?

A. Hm-mm.

Q. You are nodding. Have you seen it before?

A. Yes.

Q. I don't know if you want just to take a moment to look at it again. Can you have a look at it and let us know if there is anything there that isn't right or that you want to supplement. (Pause)

A. No, that looks correct.

Q. I hope so because, as you will see in the footnotes, a lot of it comes from your own website.

A. Indeed. I recognise it.

Q. Right. I think everybody can see for themselves the aims of the organisation, that it was established in 1968 and that you look after the national haemophilia database, also set up in 1968. Really what you are

going to talk to us about today is material that you have been able to extract from the database. Is that correct?

A. Yes.

Q. Right. Now, can we also have a look at your own CV, which is PEN0120127. Can we scroll down, please? Thank you. If we could just go back up to the present post, we can see that you are a consultant haematologist and you are the director of the Haemophilia Centre in Manchester?

A. Yes.

Q. And you were appointed to that position in 1994?

A. Yes.

Q. If we go to the next page, you have listed your previous posts in reverse chronological order and we can see that you were in Sheffield for quite a long time and you have worked in London and then you went to Liverpool. In fact you were a consultant in the Haemophilia Centre there?

A. Yes.

Q. On the following page you detail your professional affiliations and local, national and international committees on which you have served or are serving. Plainly, we can see a lot of haemophilia-related material there. We can see, in fact, that you have been

the chairman of UKHCDO since 2005?

A. Indeed.

Q. And international committees. Scientific committee of the World Federation of Haemophilia since 1993. Does the World Federation have a headquarters?

A. In Montreal.

Q. Montreal. On the next page your professional affiliations and the fact also that you review articles, material, for six journals in the area and plainly you are still very much engaged in seeing patients too.

A. Yes.

Q. On the following page you begin a very long list of publications of various types: articles, letters, books, chapters. I suppose one that we all noticed is number 2, because, as lay people, we have noticed this particular article too. It is referred to -- and other ones will be also -- in the preliminary report, an article that was published in the Lancet in 1985 "Progressive liver disease in haemophilia: an understated problem". I think, was there a question mark after the word "problem"?

A. That was a question mark. This was actually a poke at another paper published by a different group entitled "Progressive liver disease in haemophilia: an overstated problem" which was published the year before.

Q. Yes, they are something of a matching set really?
A. It was a deliberate take-off because I felt that they understated the problem and we said so.
THE CHAIRMAN: I think this time you were with Dr Preston who is known to have views in that area.
A. Yes.
MS DUNLOP: There was really some vindication for you and your fellow authors as time wore on, Dr Hay.
A. Yes. At that time we had only been following Hepatitis C for a short time, so most of the early papers showed very minor liver disease and a very low incidence of cirrhosis. We did a series of liver biopsies, where we followed patients with biopsies on more than one occasion. Of course they had been infected for longer, so of course we saw a higher incidence of serious liver disease. It became obvious that the natural history of Hepatitis C was more progressive than had previously been appreciated.
Q. Of course, at that time, it wasn't known as "Hepatitis C", you were really addressing non-A non-B --
A. Indeed.
Q. -- hepatitis?
A. Yes.
Q. Which as I think we all understand was a diagnosis of elimination really?

A. At that time, yes.
Q. Hepatitis which was not either A or B.
A. Yes. In fact my MD thesis was in this area.
Q. What was the title of your thesis?
A. "Haemophilic liver disease."
Q. So many, many publications, Dr Hay, very many of which are relevant to our work.
A. Yes.
Q. But lest we get sidetracked into addressing the wider questions, I think we should go and look at the statistics, which UKHCDO has provided for us in an attempt to elucidate the question of how many people have been affected by these issues.

So if I could ask that you have the appendix -- it is really appendix 1 to our preliminary report. There will be now be a short pause because I'm not sure that I have the correct number for it (Pause).

THE CHAIRMAN: I think while that search is going on, could I ask you two, I hope, brief questions, one arising from the evidence of Dr Colvin -- I think you will know who he is -- and it relates to the approach of UKHCDO over time and whether it was reflective of professional opinion as it developed or was a leader of professional opinion. Is there any guidance you can give us on that?
A. In the early 70s I was still a medical student, so it is

a little difficult. I only became a member of UKHCDO in 1987 when I became the director of the Liverpool centre.

I think neither statement really fits. To be honest, I don't think they just reflected opinion; I think, you know, there were members of the group that were conducting active research in the area.

Professor Preston before I joined him, had already published a paper in the Lancet in 1978 on haemophilic liver disease, which is really very early on because non-A non-B hepatitis was first described in 1974 and the first paper about non-A non-B hepatitis in haemophilia was published in 1975. So, you know, they did participate in research at an early stage. So I think they were attempting to lead opinion, at least within the haemophilia community.

THE CHAIRMAN: But that's fine, it just takes it off what could have been a downplaying of the role, at least in your perception.

The other matter that I would like to ask very briefly about is related to an impression of my own. In reading literature at the time that perhaps Sheffield didn't get the immediate recognition as a centre of progressive development of knowledge that Professor Preston might in retrospect have deserved?

A. I did most of my training there and in fact it was as

Professor Preston's houseman that I actually decided to pursue a career in haematology and my impression certainly was that the department enjoyed a high reputation in thrombosis and haemostasis, both nationally and internationally and had done so, in fact, from the time of Professor Preston's predecessor, Professor Blackburn, who had originally established the department as a centre of excellence in the area.

THE CHAIRMAN: Thank you.

MS DUNLOP: Thank you, sir. The interval has allowed us to locate the appendix, which is [PEN0131433] although, in fact I think many of us have hard copies too.

Can we have look at table 1, which is entitled "The use of Factor VIII, Factor IX, cryoprecipitate and blood components by Scottish centres from 1969 to 1991"

I think the reason, we can imagine, that it begins in 1969 relates to what we just saw, that the database began in 1968?

A. Yes.

Q. I should also clarify that you are essentially the compiler of the tables. I think perhaps some of the sums have been done by some other people but you are responsible for the tables. Is that correct?

A. Yes.

Q. If we look at Aberdeen, we can see straight away that

amounts in terms of units used only begin to be shown from 1980 onwards. Now, I think you were saying earlier actually when we spoke that it may be that UKHCDO has some more material in relation to years which are blank. Is that the case?

A. That's the case. When we compiled this table, the Scottish directors came back to us and said, "Well, why have you got these gaps?" we said, "Well, as far as we know we haven't had any data for the missing years." And they said, "Well, we can remember submitting it". And we compiled these tables using the electronic database. And knowing how obsessional my predecessor was, I had assumed that she had entered all the data submitted to her.

So we went back and we looked at the paper record. We have all the paper records going back to 1969. To our surprise we discovered that for most of the missing years, we did have the paper record and indeed have now entered it into the database so would expect to provide you with updated tables. There are some years where there was no data entered and I can only speculate why the data wasn't entered at the time. My suspicion is that it may have been submitted years in retrospect, and indeed, until relatively recently, it took so long to get the data in that the annual reports were sometimes

two or three years in arrears.

I mean, these days we collect the data quarterly and it is never more than three months out of date. But at one time it might have been two or three years out of date. I suspect, having looked through some of the correspondence, particularly with Glasgow, the data took so long to come through that it was already historical by the time it went into the paper archive.

Q. Now, we are in Aberdeen at the moment but I was going to pick up Glasgow as a specific example because we are on the point of missing data. I think you have told us that there were gaps, particularly from Glasgow, who submitted very little data between 1969 and 1976, and I think their explanation for that is that haemophilia care in the West was still a bit fragmentary at that time. Is that right?

A. That's part of it. If you actually look forward to later tables, where I record the number of patients registered in each of those centres, you will see that in Glasgow the number of patients registered with haemophilia doubled in the decade between 1970 and 1980. Now, that's way in excess of the birth rate and I think that what that's actually showing is consolidation because many of those patients, probably as many as half, were managed in the smaller hospitals around the

southwest of Scotland, outside Glasgow and gradually gravitated towards the centre.

UKHCDO as a whole formed partly because the Secretary of State for Health decided that haemophilia centres should be formed and that it was a specialist area and that patients with bleeding disorders should be managed by haemophilia centres. But once they had formed, capturing all the patients was a slower business in many cases. Patients exercise choice and would often prefer to be managed locally and need some persuasion to inconvenience themselves to go to a bigger centre, even though care may be better there.

Q. Yes. And even today, if we look at the West of Scotland, there do appear to be quite a large number of general hospitals in Glasgow and in the areas round about. So that may have contributed to the situation you describe at that time.

Now, to look then at the Aberdeen table, with the figure that we do have, we can see that in 1978 and 1979, Aberdeen were using a commercial concentrate called Hemofil, which was one of the earliest of the commercial concentrates, I think, and then for 1980, however, there is not any record of a use of Hemofil. In fact, the only commercial product that we can see there is F-E-I-B-A, which is Factor VIII inhibitor

bypassing agent, as you explain in your guide. Can we just stop for a minute, Dr Hay, and ask you to explain what Feiba is used for?

A. Feiba is a bypassing agent which is used in patients who have Factor VIII inhibitors, which are antibodies to Factor VIII. Up to 30 per cent of patients with severe haemophilia A will develop inhibitors at some time in their life and those most severely affected will become completely resistant to Factor VIII. The Factor VIII is destroyed in their circulation. So they need an alternative product to stimulate the clotting mechanism to stop them from bleeding and at that time, either very, very large doses of Factorate or Feiba were the only two possibilities.

Q. So that's really an extra complication for people who are quite seriously lacking Factor VIII?

A. Yes.

Q. But the normal means of remedying that can't be used?

A. Yes.

Q. Just looking then at that period, particularly the early 80s, in Aberdeen, the answer we have had from Aberdeen is that they obtained all their material for the treatment of their haemophilia patients through their local Blood Transfusion Service. So that might be one explanation as to why they don't show the purchase of

commercial products, if that was being carried out through the Blood Transfusion Service rather than actually by the Haemophilia Centre. But you wondered if that might be unusual.

A. Well, I would be surprised but, of course, I was not working in Scotland at that time. So I can't be sure if the transfusion service would purchase commercial products. But I know that they didn't in England but it may be different in Scotland. I think you have to ask one of your other witnesses when the time comes.

Q. Yes, indeed. I think just for clarification, we should confirm that the final position from those who were involved in haemophilia care in Aberdeen at the time is that they can't be sure whether they did or didn't use commercial Factor VIII in Aberdeen at that point?

A. Certainly as a broad generalisation commercial products obtained by direct purchase from the manufacturer, either by the Haemophilia Centre or by their pharmacy.

THE CHAIRMAN: Sorry, at this time was Feiba used in England rather than an NBTS product for inhibitors?

A. Feiba became available in about 1977 and was used throughout the United Kingdom.

THE CHAIRMAN: I think I have the impression that there were some initial difficulties in getting licensing for it in this country.

A. I think in 1977 it may well have been a clinical trial product without a full trial licence, so would only have been available to centres participating in clinical trials.

THE CHAIRMAN: But a provided therapeutic method that the National Blood Transfusion Services weren't able or fractionation services weren't able to provide themselves.

A. Indeed.

MS DUNLOP: Passing on from Aberdeen, Dr Hay, and looking, if we could, please, at Edinburgh. So we have to bypass Dundee, which is the next one. If we can go on, I think it is five pages, Edinburgh has appeared. Again looking at 1980 where the records begin, we can see the pattern of usage there is quite a lot of cryoprecipitate and then Factorate, which is a commercial product, I think manufactured by Armour. Is that correct?

A. Correct.

Q. At 164,000 units then, fresh frozen plasma and then the largest amount is Factor VIII from PFC. So NHS Factor VIII at 1.6 million units for Edinburgh. And then, moving on to Glasgow, firstly Glasgow Royal Hospital for Sick Children, which I intend to call Yorkhill because that's how I know it, if you are comfortable with that. Can we look at 1980 for

Yorkhill?

We can see that there is some commercial Factor IX and a small amount of cryo and then Factorate, the Armour product, at 682,000 units, nearly 683. Then some Factor IX and then PFC Factor VIII at 161,000. Then lastly, two pages on, Glasgow Royal Infirmary for 1980, which should appear, one more page, I think, please. Thank you.

Glasgow Royal Infirmary, the 1980 figures, one or two blanks, notably perhaps another commercial product Koate by Cutter. We can see that in 1981 there is a figure for the same product, 76,000-odd. But the actual figure for 1980 is blank. I suppose that might be something that you will find when you enter additional material?

A. Possibly.

Q. Possibly. Then the inhibitor-bypassing agent, then PFC material, Defix, the Factor IX and the Factorate at nearly 1.5 million units.

Now, just flicking back to Yorkhill, if we take it on a little bit beyond 1980, could we go back -- I think it is three pages -- to the Sick Children. We can see if we read down from 1980 -- we saw the Factor VIII usage, the 682,000, then 1981, the Factor VIII, 629, nearly 630,000 units. The PFC has come up a bit in

1981, 453. Then 1982 there is actually more PFC material used at Yorkhill than commercial material, although there is not a great difference, but in 1983 we see that the PFC Factor VIII has more than doubled to reach a level of 1.1 million units and the Factorate is away down at just under 37,000.

Doctor, I'm not going to ask you to do the percentages. I'm going to take what's no doubt a rash step of trying to tell you what the percentages are, having calculated them myself. I hope they are right. But it looks as though, of the total Factor VIII used at Edinburgh Royal Infirmary in 1980, around 91 per cent came from PFC.

Now, for Glasgow Royal Infirmary, which will be supplying the adult care, there was that missing figure for Koate, but if we took the figure for the following year, 1981, the 76,000 figure, and just add that into 1980, we would have a sort of similar picture for adult care in Glasgow, where PFC product was supplying about 88 per cent of the total Factor VIII used. But for Yorkhill in 1980 PFC product was only supplying 19 per cent of the total used, with obviously far and away the largest amount of Factor VIII being commercial Factor VIII.

Now, I can't ask you to confirm the arithmetic of it

but that certainly looks to be the picture that's demonstrated, isn't it?

A. I agree, yes.

Q. Yorkhill was a very heavy user of commercial concentrate at that point?

A. Yes.

Q. What was the expectation by way of reporting at that time in terms of these usages of product? Was each Haemophilia Centre supposed to send you an annual return with a breakdown of total products used?

A. Yes. At that time it was all done on paper and they would be sent a form and that would list all the patients that they had registered with the National Haemophilia Database and ask them to confirm various things: that they were still alive, whether or not they had developed an inhibitor, whether or not they had moved away. They were then asked to provide totals of all the different products that they had used, broken down by diagnosis.

They were not at that time asked to provide totals by patient. We do now collect that. In fact we collect it quarterly, but back in the 1970s and early 80s, that level of detail wasn't collected.

Q. Roughly when did you start collecting that level of detail, that is amounts per patient?

A. The per patient data we have been only been collecting for the last five years.

Q. As matters currently stand, you have very careful identification of individual patients, I think, by a numbering system. Is that right?

A. It is a completely name database. We debated whether to anonymise the database about a decade ago. It had always been a name database but we had to comply with the Data Protection Act of 1968 [sic - 1998] and so that implied that we needed permission from all the patients. So in fact we circulated about 30,000 people.

It was felt that double counting would become more of a problem if we anonymised the database and there were a number of other analytical functions that would suffer if we anonymised the database. So we decided to go the whole hog and each patient has a unique database number. We also have their NHS number and even their GP code.

Q. Can we look, please, at table 2. So we are missing out Inverness. It will be about six pages, seven pages, perhaps, if we could, please, until we see table 2.

A. Yes.

Q. Yes. This table tells us about numbers of patients. You have a little bit of narrative. You say:

"Early registrations may be incomplete."

This is, I suspect, the point you were covering a moment or two ago, particularly when we discussed care in the West of Scotland. You say:

"... hence the apparently rapid increase in numbers of registered patients in the first decade after the database was established. Some patients are registered and managed in more than one centre in a hub and spoke care model and may therefore appear for more than one of these centres."

The hub and spoke model; is that just that they are at the end of the spoke if things are going reasonably well but sometimes they have to go to the hub if there are complications?

A. That's right. That's increasingly the model of care. But you know, if people live in remote areas, then they may get their day-to-day care and their Factor VIII supplies from a more local hospital but perhaps go to a larger centre for, say, surgery or even an annual review. Because to provide fully comprehensive care, you have to have a critical number of patients to justify the facilities and if you are running a small haemophilia centre, you can't do that. You know, if you have orthopaedic surgery and you have got a severe bleeding disorder, you would prefer to be operated on by an orthopaedic surgeon who has seen a few patients with

haemophilia before.

Q. Would that be the case even in Scotland, where all the centres appear to be in the main centres of population? Is there still that kind of differentiation within the six centres?

A. Up to a point I'm sure that that's the case. Now in the West of Scotland my understanding is that most patients would go to Glasgow for a regular review and on the east coast I think that patients from Dundee and Aberdeen may occasionally go to Edinburgh. But you need to ask the clinicians concerned.

Q. Fair enough. Thank you.

THE CHAIRMAN: I wonder if I could ask just a little thing.

Dr Hay, I have a particular interest in finding out whether, in dealing with haemophilia patients, the geographical problem of Scotland was greater or lesser than perhaps was necessary. If one looked at the south-west of England, going down into Cornwall and Devon and so on, and looking at it historically, would it have been the position there that there were haemophilia patients that escaped the net by being treated locally and not going to Truro or wherever they might have found a bigger centre?

A. I think if anything the geographical problems in the south-west may be worst. There are a whole series of

small haemophilia centres there. Truro has a haemophilia centre, all of those centres manage small numbers and the problem there was that until relatively recently there wasn't a good hub for them to go to. The natural geographical hub is actually in Bristol and that's establishing itself as a hub now but was in fact just another small haemophilia centre until recently. So some of those patients went as far afield as Oxford or Cardiff for a tertiary opinion.

THE CHAIRMAN: So if we try then to relate the south-west of Scotland to that sort of background and the earlier period you described when there was fragmentation, is it just the same problem or is it different in nature as you understand it?

A. I think it is slightly different because back in those days you have a situation where haemophilia centres have just been formed. So you have a haemophilia centre formed in Glasgow and many of the patients that attend there would have been going to their local hospital as a matter of choice and sort of slowly mopped up as the service in Glasgow improves. But actually they don't have as far to travel and the roads are not as difficult as I suspect that they were back then in the south-west of England.

THE CHAIRMAN: Perhaps coming from the West of Scotland,

I recognise other inhibiting factors that would prevent people from the country areas going to Glasgow but you wouldn't know about that sort of problem.

A. No.

THE CHAIRMAN: No. Yes?

MS DUNLOP: I was just interested, Dr Hay, in looking at some of the changes there have been between 1970 and 2010 because you have given us numbers at five-year intervals for the whole of that 40-year period. In broad terms, numbers of haemophilia A and haemophilia B patients seem to climb steadily until -- if we look at the difference between 1995, 2000, 2005 -- there is a reduction and then back up a little bit again for 2010 but the really big change is von Willebrand's disease where the numbers increase about 450-fold because for 1970 there are two patients shown in the table and then for 2010 excluding duplicate registrations, there are 900. What has happened there?

A. A combination of things. I think that von Willebrand's disease was underdiagnosed. I think we now recognise it's the commonest bleeding disorder. The other thing is that being usually quite a mild bleeding disorder, those patients were statistically more likely to be managed outside a specialist service and that is still a bit of a problem.

If they are managed outside a specialist service, they may not be reported to the National Haemophilia Database at all.

We have put considerable effort into trying to tidy this up but it's a bit like painting the Forth Bridge. Or at least a bit like painting the Forth Bridge used to be.

So I think it's underdiagnosis and underreporting. Our data on severe bleeding disorders is far more solid.

Q. What is von Willebrand's disease?

A. It's either a hereditary deficiency or an inheritance of an abnormal von Willebrand molecule. Von Willebrand factor, it is a very large multimeric molecule that has a number of different functions. It helps the platelets stick together and it is also the carrier protein for Factor VIII.

Q. In the clotting cascade does it play its part around about the same point as Factor VIII?

A. It's a bit more complicated than that really. Because I mean, there are sort of protein elements and cellular elements to the clotting mechanism and the emphasis of one or the other varies in different parts of the circulation. So you get a different bleeding pattern with deficiencies of the different factors, for example, patients with haemophilia don't tend to bruise easily,

whereas patients with von Willebrand's disease characteristically bruise easily and get nose bleeds and have heavy periods. Platelets are more important in arterial thrombosis and the clotting factors more in venous thrombosis. I'm painting with a very broad brush.

Q. Yes, thank you. Another interesting feature from the tables was a small but steady growth in the number of women.

A. Yes.

Q. And of course we are accustomed to thinking of haemophilia as being something that is carried by women and actually experienced by men, but that's, like many of these statements in the area, an oversimplification?

A. Yes. I mean, the growth in the number of women is partly because we do register low level carriers and about a third of carriers of haemophilia do in fact have a reduced Factor VIII or Factor IX level themselves and will have a mild bleeding disorder.

The other reason for the growth in the number of women in our register is that two thirds of the patients registered with von Willebrand's disease are female; two thirds to three quarters. Now, it is an autosomal condition, so you would expect men to be equally affected but in fact since heavy periods are the

commonest presenting manifestation, women are more frequently diagnosed.

Q. I see. Thank you. Moving on through the tables, perhaps we can look at table 3. There is quite a bit of introductory narrative provided for us in relation to table 3. You make an important point, Dr Hay, that the results shown in the tables have the potential to confuse in that sometimes a result is shown against a year and people might think that the test was carried out that year but, of course, the test wasn't available really until about 1985. So all that has been recorded where an earlier year is shown is that there happened to be an archived sample which could be tested and retrospectively it could be determined that HIV was present in a year before 1985. Is that correct?

A. That's correct.

Q. And you say exactly that in your first paragraph. You also tell us that there is no double counting. Interestingly, in relation to the idea of retrospective samples, it is our understanding that Edinburgh had quite an archive of samples and were able to carry out retrospective testing.

A. Yes. And that may not be fully reflected in this table because I don't think we have had access to all of that data but we will be trying to reconcile our data with

the tidied up data from the Scottish directors to try to bring it completely up-to-date.

Q. Yes. It is correct to record, I think, Dr Hay, isn't it, that you have provided data to the Scottish haemophilia directors and they have themselves been working on the data that you have provided and in some cases supplementing it with their own data?

A. That's right, because amongst other things you want to know, as far as is possible to determine, how many patients were actually infected in Scotland. These tables show how many patients are managed in Scotland, who have HIV, which is not necessarily the same thing.

Q. Yes.

A. And going through the data on behalf of Scottish directors, we have been able to provide them with data that shows which centre first reported the HIV.

In a number of cases patients managed in Scotland had their HIV first reported by a centre outside Scotland. That doesn't necessarily mean that they were infected outside Scotland but their first positive HIV test may have been conducted outside Scotland. And without going through each individual's records, it may be impossible to determine exactly where they were when they contracted it and even if you do go through the records, if there are no archived samples, you may never

know for certain.

Q. Yes. If the Scottish directors have done that exercise, and looked at the information they hold on particular individuals, and in some cases they themselves, the directors themselves, have been there for a long time and know stories of individual patients, there must be, at least in some cases, a judgment being made about the likeliest place in which someone acquired their infection. Is that fair?

A. Well, for patients who were managed only in one centre, over a period of years it may become obvious that they may have been infected in that centre. For patients who move around, it becomes very much more difficult. I could illustrate this by telling you that I have a patient who has been compensated for contracting Hepatitis C by both Canada, the UK and Southern Ireland. It is very generous of them all to have assumed responsibility for this but I presume that only one of them was responsible for his infection.

Q. I think we take your point, Dr Hay. I suppose, even patients who are only ever managed by one centre, you know, they might go to visit their cousin in Bristol or something and they might need treatment while they are there. So even they may have isolated episodes of treatment in other parts of Britain or beyond?

A. That's true and to some extent we will have a record of that because there are certain centres that manage large numbers of visitors in the summer and if they treat someone else they report that back to the database.

Q. I see. You actually comment on the Scottish position in the third and fourth paragraphs. You say:

"Scotland accounts for about 10 per cent of the UK haemophilia population but only about 5 per cent of the patients with bleeding disorders infected with HIV."

You give us the actual figures. I suppose the reverse may follow too, that there may be some people registered to an English centre who received some treatment in Scotland and it was in fact, for all we know, that piece of treatment that caused the infection. Is that reasonable?

A. Yes, that's right.

THE CHAIRMAN: Doctor, I think it is clear that absolute accuracy is never going to be possible here. Do you have any view for the margin of error that there might be from your wider knowledge of these things?

A. To be honest with you, at the present time, no.

THE CHAIRMAN: You don't?

A. This is something that we are working through with the Scottish haemophilia centre directors and when they have been through all of our data, I have asked them to

report it back to me so that we can conduct a reconciliation and tidy up the data we have because they have data in far more detail than we collected at that time.

MS DUNLOP: So does it follow, Dr Hay, that if they were to come to the Inquiry and submit different figures based on their review of your data and their own data, you wouldn't particularly want to take issue with them, at least not at this point?

A. No, not at this point.

Q. Right.

THE CHAIRMAN: Are we likely to have this material?

MS DUNLOP: Yes.

A. I think you will. Talking to the people in the database, I know that we provided the Scottish directors with something like 10,300 lines of data. It is a huge amount of data. But it also suggested that there was a potential for a significant number of the patients managed in Scottish centres to have actually been infected outside Scotland. I know that looking through Edinburgh's figures, nine of their HIV positive patients had their HIV status first reported by non-Scottish centres.

Q. Yes. It is the case, sir, that striving for greater accuracy, all the haemophilia centre directors have been

looking at the data and trying, if they can, to develop it and put more flesh on the bones.

THE CHAIRMAN: Will this be worthwhile to you in UKHCDO?

A. Worthwhile to us? That's an interesting question. I'm not sure, to be honest.

THE CHAIRMAN: Yes.

MS DUNLOP: The penultimate paragraph also relates to Scotland and this is written by you, is it, Dr Hay?

A. It is.

Q. You say:

"The relatively low proportion of Scottish patients infected with HIV reflects the fact that Scotland was largely self-sufficient in blood and blood products from PFC during the period of risk."

A. That's a very relative statement.

Q. Yes. I suppose the most obvious comparator is England and you go on to tell us what the position in England was that BPL were able to provide most of England's requirements for Factor IX but only approximately 40 per cent of England's requirement for Factor VIII. So England was far more dependent on imported concentrates than Scotland; imported products being largely manufactured from US-sourced plasma. You say in the final sentence:

"Where English patients were maintained on a single

brand of concentrate during the period of risk, the risk of contracting HIV was much higher, approaching 100 per cent in some centres in those patients using US-sourced concentrates."

I think it is the case, is it, doctor, that Newcastle, for example, had a very high rate?

A. Newcastle and Liverpool. In some centres, including the one that I worked in as a junior doctor, people were kept on one brand of concentrate as long as possible. It was felt that that might minimise their chance of contracting non-A non-B hepatitis. In fact, that proved to be completely false. It didn't really matter which concentrate they got from that perspective but it did provide us with evidence that those that just used English Factor VIII had approximately half the incidence of HIV observed in the group treated with commercial concentrates. I think that that was largely because HIV spread earlier into the US donor population than into the UK donor population. Of course, there may have been differences in the donor population between Scotland and England.

Q. Of course, doctor, we are really talking about the more severely affected patients here, aren't we?

A. Mainly.

Q. Yes, and that's just because of the sheer amounts used

by some of the people with the most severe haemophilia?

A. Yes. There is epidemiological evidence that the heavy users were more likely to contract HIV than those who use smaller amounts of Factor VIII. With Hepatitis C, it's a slightly different matter. People tended to contract Hepatitis C from their first exposure to concentrate, if they hadn't already contracted it through the use of cryoprecipitate.

Q. People whose haemophilia was only mild might at that time only have received concentrate in connection with specific procedure, for example, we have had in the Inquiry described to us somebody in England who was given concentrate for an operation on their toe and developed HIV.

I suppose it is particularly striking that that might happen to somebody who had only mild haemophilia and that very limited exposure to concentrate does appear at the moment, from the data as they have been worked on by the Scottish directors, as though from those in Scotland who acquired HIV, there aren't any people whose haemophilia was mild. Is that something that you knew or is that just the further developments that have taken place in Scotland, is it?

A. I don't think I knew that. I could dissect it out from our data but it is not something I had remarked upon.

Q. Just the other point that you make, doctor, is the very last couple of lines, the point you have said about the risk of hepatitis and really what you are saying here, to spell it out, is that whether patients were taking commercial concentrate or NHS-produced concentrate, in fact the risk of contracting Hepatitis C was the same?
A. That's right.
Q. Yes. You refer to some work by Dr Craske, who was a leading public health physician in this area. Is that right?
A. That's right.
Q. And I think in fact there is some other work -- I think even in Glasgow Professor Forbes did work --
A. There are lots of papers.
Q. There is work from the Royal Free as well?
A. Yes.
THE CHAIRMAN: Is that now the established position in the profession as a whole?
A. Yes, it is the established position and it relates to the way in which Factor VIII was manufactured from very large pools, where they measure the amount of plasma in tonnes and Factor VIII was manufactured from pools of 20 to 50,000 donations. So with a prevalence of perhaps a half to 1 per cent of donors having Hepatitis C, each pool would inevitably be contaminated with a number of

donations that were infectious.

THE CHAIRMAN: That's the result of retrospective analysis.

A. Indeed, it wasn't known at the time.

MS DUNLOP: So even if your donor group overall has a much lower prevalence of Hepatitis C, as it is now known, than in another donor group, the prevalence will still be enough because of the pooling of all those donations?

A. That's right.

Q. It will still be enough to result in infection in the users?

A. That's right. There probably was geographical variation in the prevalence of Hepatitis C but because of the way in which Factor VIII concentrate was manufactured, each pool would be inevitably contaminated regardless of its geographical origin.

Q. Not just geographical but demographical as well. Depending on the particular characteristics of a group of donors, there might be that kind of variation that you are describing. Is that right?

A. Yes.

Q. Okay.

THE CHAIRMAN: Does it come to this: that at the very lowest end of therapy, with a single unit there is some risk that may reflect the prevalence in the society as a whole?

A. Yes, I mean, if you have a blood component, such as cryoprecipitate or plasma, back in the early 1980s and the late 1970s, there was probably about a half to 1 per cent risk of Hepatitis C per donor unit. So patients with severe bleeding disorders, who were treated with many multiples of units of cryoprecipitate would have a very high probability of having contracted Hepatitis C from the cryo before they were ever given concentrate.

THE CHAIRMAN: Thank you. What I was thinking of was a slightly different aspect but thank you for that because again it fits with what Dr Colvin told us. But if one looks at pooling of any kind, as the number of units that are pooled increases, the risk of that pool being infected increases?

A. Yes, that's right.

THE CHAIRMAN: And then one reaches a stage at which the number exceeds the level of probability at which someone must introduce an infected unit, and in reality that applied to all manufactured products?

A. It did.

THE CHAIRMAN: Yes.

MS DUNLOP: Just before we leave your narrative, doctor, I wanted to look back at the second paragraph. You say at the end -- I think this is really UK patients:

"The earliest seroconversions were in 1980."

But I think actually there is a 1969. If we look on to the table 4, another couple of pages. We can see at the top, this is the non-Scottish centres. There is actually one positive result from 1969, which in the context of the discussion we are having seems extremely early. That must be an archive sample obviously?

A. Yes.

Q. But that person is really, I suppose, in statistical terms, quite an outlier?

A. Absolutely. There weren't actually really very many people infected in 1980. The majority were infected from 1981 through to 1983.

Q. As far as we know.

A. As far as we know from those patients who did have archived samples.

Q. Yes. I suppose, if we were thinking of a Scottish centre that didn't have archived samples, or didn't have archived samples going back to the early 1980s or even the 1970s, there could be very early seroconversions in Scotland as well and we just wouldn't know?

A. That's right.

Q. The Scottish table, which is table 3, so if could we go back, please, two pages, you say in your text:

"The earliest seroconversions that will have been

recorded are 1982."

That's one in Aberdeen and one in Glasgow Royal Infirmary but that's just a function of how far back the archive goes, I suppose?

A. Yes.

Q. Right.

A. And for Edinburgh, I'm sure that there is more data available.

Q. Right.

A. Than presented here in terms of year of seroconversion.

Q. I mean, the Edinburgh results we see -- one for 1983, one for 1984 and 11 for 1986 and 11 for 1987 -- that does look as though it has been recorded as the actual year of testing, given that it's after 1985. That's what has been intimated to you anyway?

A. That's right. That's the year of reporting in general.

Q. Right. Yes, I think you had better explain that to us, please, as far as the reporting of HIV to yourselves goes. What was the procedure there? When did it start and how was it done?

A. The test became available in 1985, and in early 1986 we asked centres to report to us on a regular basis, both whether they had a patient that had HIV or whether they had developed an AIDS defining illness. That was monitored and we were required to monitor that by the

Department of Health. This form went through various different iterations. It appears to have been edited and amended practically every year for several years. It had limited data on it. We did ask the year of seroconversion if it was known, but in fact, I think in a lot of cases, the HIV status was reported to us but not the time of seroconversion. Usually that wasn't known.

At these dates, for Edinburgh for example, you have 11 in 1986, 11 in 1987. I would be extremely surprised if those were the actual dates of testing. I would have expected that in Edinburgh we would have tested their patients as early as the test became available, but I'm sure you will have the opportunity to ask Professor Ludlam those details in the fullness of time.

Q. So just so that we know from you what your understanding of those two 11s is, given that this is post the introduction of the test, in publishing the table or in compiling the table, you are recording that it had been reported to UKHCDO that 11 patients had been tested and found to be positive in 1986. That is, the testing had taken place in 1986 and the same for 1987?

A. No.

Q. No?

A. I think that's the date at which the patient's status

was first reported to us.

Q. First reported. I'm obliged.

A. In some cases we had data on earlier retrospective testing and in others not. Most centres didn't have archived samples to do that. So where that data was not volunteered to us, we assumed it wasn't available.

Q. Right. One thing, Dr Hay -- and this is just something that struck me when I looked at the Glasgow data -- it is not here, Dr Hay; it is data that has been provided from a Glasgow haemophilia centre, the Glasgow Royal Infirmary, that every single test is dated to the 15th of a month and I just wondered if you could explain that. Obviously it could be that all the tests did take place on the 15th of a month but I wondered if there was a UKHCDO reason why it is recorded as the 15th of a month?

A. There is no UKHCDO reason that I can think of.

Q. It was speculated, not by us but by Dr Tait -- I think it was Dr Tait -- that perhaps if only a month was supplied to UKHCDO that you would just put it down as the middle of the month but that's not something that you are aware it?

A. It is not something I'm aware of. It is a plausible speculation. Yes. Knowing the working habits of my predecessor, it's certainly plausible because if you

enter something into a computer, it doesn't like gaps.

Q. Yes. I'm sure it is not going to be important, Dr Hay, it was just something that was noticeable. That was all.

THE CHAIRMAN: We have to envisage a very precise person, who would put in a date.

A. Yes. We had similar things with dates of birth. We are constantly chasing dates of birth. We, you know, want to minimise double counting and things like that. Sometimes when the date of birth was not available, she would put in 1900 and this resulted in a surprisingly large number of patients with haemophilia who were apparently 120 years old.

MS DUNLOP: Yes, I don't think, doctor, we are unfamiliar with the concept of just dating something as to the 1st of a month. That's a principle that we have operated ourselves. There has to be a date of some sort.

Can I take you forward, please, to table 5, which is a move to hepatitis. This is your estimate of the number of patients exposed to Hepatitis C based on historical clotting factor concentrate exposure.

You suggest that 85 per cent or so of these patients will have developed chronic Hepatitis C since all recipients of concentrate at that time will have been exposed to HCV, and 15 per cent will clear the virus?

A. That's probably a very conservative estimate. Recent discussions with various experts leads me to think that probably closer to 25 to 30 per cent will remit, leaving about 70 per cent of patients with chronic Hepatitis C.

Q. I see.

A. The other thing you need to recognise about these figures is that they are likely to be conservative because they are based on our records of concentrate exposure and some patients may only have been treated with blood components, plasma or cryoprecipitate, and we feel that our data on that exposure, often in patients with mild bleeding disorders, may be incomplete. That's one of the reasons for conducting the Hepatitis C look-back exercise, because we suspect that there may be a small number of patients out there with mild bleeding disorders who may only have had a few units of plasma, who may have contracted Hepatitis C and have escaped testing.

Q. I see.

A. So we have assumed that everyone who has had concentrate will have been exposed to Hepatitis C if they were treated during the period of risk. But they may in fact have contracted their Hepatitis C before their first exposure to concentrate from treatment with blood components, particularly if they have a severe bleeding

disorder and require regular treatment.

Q. Yes.

THE CHAIRMAN: I wonder if I could just ask the source of the different information you now have. 15 per cent will clear the virus. Was that based on understanding of general data?

A. It was based on an earlier estimate from the literature, based on general data, but I think hepatologists now consider that their remission rate is higher than that, probably of the order of about 25 per cent.

THE CHAIRMAN: Is that 25 per cent again general for all persons who are exposed?

A. That's right.

THE CHAIRMAN: Or does it relate particularly to the young or what?

A. No, it is a general figure.

THE CHAIRMAN: So your up-to-date information is that the remission rate has really got up 25 to 30 per cent rather than the original much lower level.

A. That's right.

THE CHAIRMAN: Thank you. I think that we have information from elsewhere suggesting that age is a significant factor.

A. Yes, I quite agree.

MS DUNLOP: Even gender, in fact. I think we have been told

that young females seem to be more successful than some other groups at clearing the virus.

A. Yes. And it fits with my clinical experience.

MS DUNLOP: Dr Hay, there is work in progress here because the haemophilia directors in Scotland have been working on the data for Hepatitis C as well. You know that?

A. Yes, I know that. Both for this Inquiry and for the UK-wide Hepatitis C look-back. In fact, their work for this Inquiry is, if anything, delaying them giving me the data but since it will be the same data, I'm sure that once they have tidied everything up, I will get that data quite quickly.

Q. If you are seeking accuracy or, as high a degree of accuracy as you can achieve, there really is no alternative to looking at the records of the individuals. Is that right?

A. That's right, absolutely.

Q. I'm not sure, sir, if you have seen them, but there are some very big spreadsheets doing exactly that.

THE CHAIRMAN: You have spared that pleasure so far.

MS DUNLOP: Yes, but not for much longer.

Having noted the caveats, the figure that you have shown on this page is 268 and that's your estimate of the number of patients exposed in the manner that --

A. A conservative estimate.

Q. Yes. Just to be clear, you have taken as the likely date of exposure or the last possible date of exposure, the first use of concentrate?
A. Yes, that's an important distinction. It is the last possible date of exposure.
Q. And that is because of the point we made earlier, that whether commercial or NHS concentrate, there was a very high risk of acquiring Hepatitis C from the product?
A. Yes, 100 per cent.
Q. Yes.
A. But they may have already been exposed through blood components.
Q. We need to look at table 6, if we could, please, and I think that actually requires us to go two pages further on.
THE CHAIRMAN: We will have to have a break for the stenographer quite soon, not immediately.
MS DUNLOP: Right. Can we just record straight away that there is a mistake for Inverness.
A. Yes.
Q. I think we have clarified that already, haven't we, that the total shown as 121 should be 26?
A. Yes.
Q. Now, if all these numbers in bold are added together, the total should, I think, be 310?

A. Yes.
Q. Given that this is a breakdown centre by centre, what's the explanation for the difference between the 268 we just looked at and the 310?
A. This table reflects the number of patients thought to be exposed to Hepatitis C broken down by centre but, of course, some of them attend more than one centre. So in table 5 we have stripped out the double counting that occurs if you present it in a centre by centre way.
Q. Yes. And you say exactly that. You say you have corrected for double counting in relation to table 5.

There isn't very much more to go, sir. I'm entirely in the hands of others but if we can carry on for maybe another five or ten minutes. Is that acceptable?

Table 7. I'm not sure, is the heading of table 7 perhaps slightly misleading because you do go on to give a list of a number of different causes of death. It was just the use of the words "Hepatitis C":

"Patients treated at Scottish haemophilia centres, deceased and cause of death 1969 to 2010."

Would it still make sense if we took out the words "Hepatitis C"?
A. These are not all patients attending Scottish centres and all their causes of death. What we did was we dissected out just those patients that we thought had

been exposed to Hepatitis C and then presented their causes of death.

Q. Thank you. That was my misapprehension.

One figure then which jumps out at us is that of those people who were, you thought, probably infected with Hepatitis C. 47 of them died of AIDS.

A. Yes.

Q. Do you actually carry numbers for how many patients are co-infected or could one simply say, based on the evidence you have been giving, that for any patient who was infected with HIV, they probably had Hepatitis C as well?

A. Yes. All the patients who have got HIV, almost exclusively will have been exposed to Hepatitis C but some of those patients have actually cleared their Hepatitis C.

Q. Right.

A. You know, surprisingly perhaps, but we do have patients who have active HIV and who have evidence that they have been exposed to Hepatitis C in that they have Hepatitis C antibodies but they have cleared the virus.

Q. Is there any saving in treatment between the two. If you are on treatment for Hepatitis C, which we have heard is very unpleasant, does it do anything for the HIV? Or vice versa?

A. Well, if anything, it tends to reduce the CD4 count for the duration of the treatment so it doesn't have a positive effect.
Q. Then the underlying immunodeficiency presumably disadvantages a person trying to fight the Hepatitis C virus?
A. Yes. There are two things I would say. Firstly, to expand on my previous answer, there is an advantage in eradicating the Hepatitis C virus from someone co-infected. Firstly, they are less likely to die from liver disease but, secondly, they are less likely to run into hepatotoxicity from the HIV therapy. So we do try to eradicate Hepatitis C from people who are co-infected. And your next question: could you just remind me for a moment?
Q. I'll read it back to you, actually. I can do that. Yes, I said:

"The underlying immuno-deficiency presumably disadvantages a person trying to fight the Hepatitis C virus."

A. Yes, very much. So in fact there was a lot of work done in Edinburgh looking at this. Our national statistics will show that there was a peak of deaths from Hepatitis C in the haemophilia population in the mid-90s, which was possibly the worst period for AIDS.

In 1995 we lost about 10 per cent of the HIV cohort in a single year and then anti-retroviral triple therapy was introduced and changed the situation dramatically, such that the year before last none of the HIV cohort died and last year we only had one death -- a very dramatic difference.

When you look at those liver deaths in the mid-90s, three quarters of those patients who died were co-infected with HIV and almost all of them had full-blown AIDS at the time of their death. So, as their immunodeficiency progressed, their Hepatitis C progressed at a more rapid rate. Then triple therapy came along and the immune system of the survivors by and large recovered. There are exceptions, but the immune system improved and that has been reflected in a fall in the number of deaths from Hepatitis C, although we are still seeing far more patients dying from liver disease than from HIV.

Q. Right at the start, when we looked at table 2, which is the numbers of patients at five-year intervals, really much of what you have just said explains a leveling-off, if not a bit of a drop?

A. And we saw that nationally, particularly amongst patients with severe haemophilia A, there was actually a drop in numbers around the mid-90s, then it stabilised

and started to grow again. A far less marked change in mild and moderate haemophilia, reflecting the low rate of infection.

Q. Now, table 7 and 8 in a sense go together too. Table 7 has causes of death and I think we can see you have highlighted liver-related causes of death in table 7 and I think actually the number on the second page of table 7, the total number, is possibly 173, rather than 154. No doubt some sort of glitch has crept in somewhere.

Then we would compare that with table 8, which is the list according to each centre, and the total of those numbers is 196. The explanation for that discrepancy -- that is, in the number of deaths -- is that also a correction for double counting?

A. Yes.

Q. Right.

A. We tried to get data on mortality from as many different sources as possible. The centres managing the patient are supposed to report this to the National Haemophilia Database. Over the last decade or so we have also obtained data from the Office of National Statistics.

Q. I think in fact you have a series of specifically-designed forms for reporting of different pieces of information. Is that correct?

A. Yes, it is all electronic now.

Q. And then we should also look at, just for comparison, tables 9 and 10, which are the similar exercise for non-Scottish centres, and perhaps particularly table 10. We can see, I take it, that this is the patients in the rest of the United Kingdom whom you consider were exposed to Hepatitis C and who have died between 1969 and 2010 and what the causes of death were?

A. Yes, I put that in just to provide you with some context and comparison.

Q. Yes. I see that in fact we have printed the same page twice.

A. Yes, I noticed that.

Q. I'm not sure why.

A. No, neither am I. I don't think we did that.

Q. Well, it is much better than not printing it at all.

We can see there far and away the largest number is the 567 who died of AIDS.

A. Yes.

THE CHAIRMAN: Is the impression right that proportionally the number dying of liver failure in table 10 is lower than that in the Scottish experience?

A. Proportionately.

THE CHAIRMAN: 91 out of the total non-Scottish centres. If we could look back just quickly, it is 40 something, I think -- the top line basically -- in the Scottish

experience? I don't have my hard copy here.

MS DUNLOP: Sorry, sir. We can arrange that.

A. It may be different in Scotland. I haven't actually made that comparison. The other thing is that, because the data is so uncertain, we haven't tried to dissect out the effect of alcohol. Alcohol is a co-factor for Hepatitis C progression and we don't regard our data on the patient's alcohol intake as being necessarily accurate. So we have made the conservative assumption that if they died from liver disease, it is attributable to their Hepatitis C.

In isolated instances we do have data and in fact alcohol is sometimes mentioned on death certificates, presumably in patients with very heavy alcohol intake. But what I always tell my patients is that the safe limits for alcohol -- if they have Hepatitis C, the safe limitation don't apply to them because even in people that are drinking towards the upper end of what is commonly regarded as the safe limit, if they have Hepatitis C or indeed any other form of liver disease, that amount of alcohol contributes to the liver damage.

Q. You don't want them to drink at all, do you?

A. Well, I'm not a pur --

Q. I don't mean in any censorious sense. As a physician.

A. I try to be realistic. It is very difficult to tell

people not to drink anything whatsoever because compliance is poor, but I certainly tell them to moderate their alcohol and we return to that aspect regularly.

THE CHAIRMAN: I have just done the arithmetic. The difference is not material.

MS DUNLOP: I think, just for completeness, doctor, you have also provided tables telling us about numbers of liver transplants, both for Scottish centres and non-Scottish centres. Then, finally, table 13, annualised UK deaths from liver disease, again over the whole 41-year period. Will you allow me a moment, sir?

Thank you very much, doctor.

THE CHAIRMAN: We are going to a break at that stage, Dr Hay. The stenographer can only carry on for a certain amount of time.

A. Fine.

THE CHAIRMAN: But you have been on the way for a long time now. If you want a bigger break for your comfort, just let us know.

A. Okay, thank you.

(11.08 am)

(Short break)

(11.40 am)

THE CHAIRMAN: Mr Di Rollo?

MR DI ROLLO: Sir, Mr Dawson.

THE CHAIRMAN: Yes, Mr Dawson.

Questions by MR DAWSON

MR DAWSON: Dr Hay, I have a few questions for you. Could I ask you, first of all, some questions about the data collection system in UKHCDO? Is it correct to say that the numbers you have provided to the Inquiry, insofar as they are numbers relating to patients, relate to numbers of patients registered with UKHCDO?

A. Yes.

Q. And when does a patient become registered within the UKHCDO system?

A. Usually at the time of diagnosis or when the patient transfers into a haemophilia centre's care. So if they move from one centre to another, they should be deregistered from one centre and reregistered with another. Or when they realise that they have forgotten to register the patient. They are provided with lists of registered patients on a regular basis, and these days they can view their list using a secure web link within the NHS net.

Q. You made reference in your earlier evidence to the possibility that they were individuals who could be managed outside a specialist service. Does that mean individuals receiving haemophilia treatment outside the

six recognised centres in Scotland?
A. Yes. I think particularly in the West of Scotland. I wouldn't say could be, but certainly were being managed. At that time they would be encouraged to move their care but they would be managed outside the haemophilia centre and we would not necessarily have any data on them at all during that period.
Q. Would it be fair to say that that category is likely to be comprised of people receiving less treatment?
A. I'm not in a position to answer that question because I don't have any data on their treatment. I do know we have recently made the comparison between the intensity of treatment of patients being managed in small centres compared with those managed in big centres, because we had a bias that the patients managed in big centres were managed more intensively. In actual fact we found that there was no difference in the intensity of treatment. But I can only speculate what the situation might have been back then.
Q. Thank you. So to sum up what you have been saying, as I understand the position, you accept that there is a possibility that there are individuals who have received the treatment, who fall out with your radar, if I can put it that way, on the basis that they are not registered with one of the six Scottish centres. Is

that accurate?

A. That's right, particularly in the early 1970s.

Q. I understand -- and I think you made reference to it briefly in your earlier evidence -- that there is a Hepatitis C look-back exercise ongoing within UKHCDO at the moment?

A. Yes.

Q. Could you give us some information as to why that process was commenced and when it was commenced?

A. For a number of years we wanted harder data, just as you do, so that we are not in the position of having to make estimates, and we wanted to have that data partly so we knew how many people had an ongoing problem, how many had actually been treated. We want to be sure that those people who were eligible for treatment had been offered it and to get some idea of what the future might hold as well as what the past had caused.

Then the Archer Inquiry came along and they also wanted data. We provided the data that we had. But it obviously has its limitations. Finally, we had a concern that there may be some patients, we suspect a relatively small number, particularly those were mild bleeding disorders, who may have had treatment, sometimes in the distant past, and have become lost to follow-up.

The patients with severe bleeding disorders are seen so regularly they tend not to get lost to follow-up. But mild bleeders may have a clinical problem once in a blue moon and many of them expressed the view that they can't quite understand why you drag them up to clinic every year. Some of them don't keep their appointments and some of them are managed in peripheral hospitals.

So every year one or two of these come out of the woodwork and you may discover that they had some plasma back in 1972 and haven't seen a haematologist since and have never been tested and have no awareness. So we wanted to pick them up, partly so that they could be offered treatment if that's appropriate and also so that they could be put in touch with the Skipton fund, for example, and counselled and given appropriate care.

Q. What is the current status of that look-back exercise?

A. The look-back exercise starting was delayed by the incoming administration, who stopped everything, whilst they made a financial review. We were just about to start, in fact we should have received our first payment and the word "go" about the time that the election was held and it was all held up. So that delayed things by six months, we are about six months into the process. We have piloted the software because it is all

electronic data capture through encrypted lines within the NHS net for security. That is running quite well now. We have data on approximately 700 patients, which is pretty good in the first three months.

We have a lot of reports from Glasgow, none from Edinburgh but I think that they are collating the data, partly for this Inquiry and also for us. Once the data has been put together, entering it is very quick. So I think that we will have most of the data by the end of year.

Q. Thank you. Would I be correct to assume that the way in which that exercise is working is for the central administration of UKHCDO to work out who features on its radar at the moment and then to approach the local centres to ask them whether there are any other people who may have escaped its radar who may be included as a result of this exercise?

A. That's right. Collecting the data for Hepatitis C goes hand in hand with trying to make sure that all the patients that they have are registered with us. We have data on approximately 24,000 patients with bleeding disorders at the moment, as it is. And also for them to catch up with those patients they have seen in the past who may be lost to follow-up and to make things easier for the centres, we started by providing them with

a list of all the patients who had attended those centres, who, according to our data, may have been exposed to Hepatitis C. In fact, a lot of those centres responded with some surprise that the list was so long.

Q. So I take it from that that the position is that there is a national haemophilia database, which contains information of individuals with bleeding disorders?

A. Yes.

Q. And that there is a separate database relating to Hepatitis C. Is that correct?

A. No, it will always be part of one database.

Q. So the latter is a subset of the former?

A. That's right.

Q. I think you use the expression there that an individual to be included on the subset, ie the Hepatitis C branch of the database, would be someone who may have been exposed to the virus. Is that correct?

A. Yes.

Q. Does that mean that in order to be included within the Hepatitis C part of the database, certain assumptions are applied regarding exposure based on what treatment you have had.

A. It is an interesting question because it relates to what has been a slightly contentious area, because in fact we have provided them with two lists: those that we know

have been exposed to concentrate, where we think that there is a high risk that they will have been exposed, and then those for whom we may not have any treatment data at all; that is to say, they have a bleeding disorder that may have been treated with plasma products or with blood components but we have made no assumptions about their exposure because we are assuming that our data may be incomplete in relation to very mild patients, very infrequently treated. So we are asking them essentially to check all their bleeders.

Because, you know, occasionally you come across somebody that has not seen a haematologist for 20 or 30 years and you ask them -- and their notes may have been destroyed because they have not seen anyone for so long, or they may have been treated in another town. You ask them what they have been treated with and they may not be able to tell you. You know, "It was something in a syringe".

So you have to test them making no assumptions. They might have been treated with DDAVP in which case they won't have been exposed. But they often can't be sure which of those products they have been treated with. And since, you know, way back in the 70s ten bags of cryo would expose you to a 10 per cent risk, those patients should be tested.

Q. As far as the numbers that you have provided to the Inquiry to this point are concerned, and I think there was a number of 410 --

A. Yes.

Q. -- which was referred to by counsel to the Inquiry, what exactly does that number represent?

A. That number represents the number of patients that we know have been exposed to concentrate. So, as I said earlier, I would regard that as a conservative number.

Q. And what is the timeframe that is being used for exposure to concentrate to produce that number?

A. That number goes up to 1989, which again is very conservative because frankly, I think, it is unlikely that a significant number of patients will have been exposed after 1986, because by that stage we were using heat-treated products and the later date relates to the possibility that unheated products may still have been in use until their expiry date.

In reality, I think that's not all that likely or it may only have happened in isolated instances because when the heat-treated products came in, efforts were made to withdraw any remaining unheated products from centres.

Q. And that number of 410 would, if I understand your evidence correctly, therefore exclude the patients who

fall into the second category you mentioned earlier, ie those who don't appear to have had factor concentrates but may have been infected through some other mechanism, and those people are being tested; is that correct?

A. We are trying to trace them and then test them.

Q. Of course.

A. Yes.

Q. So there is a possibility that there may be additional numbers which come from that category that you haven't at this point been able to consider in your two --

A. Yes, and in fact some of those patients will already have been tested and will be known to centres.

Q. Thank you.

You gave evidence earlier in connection with -- if I noted it correctly -- a patient of yours who had received multiple compensation from a number of different jurisdictions, if you like, and as I understood your evidence, it was to the effect that one could assume that one area only would be the cause of the infection.

A. Hm-mm.

Q. I wish to explore that with you a little bit further on the basis that there has been certain evidence in relation to Hepatitis C infection already in this Inquiry about different genotypes and in particular the

fact that certain genotypes will be likely to be more amenable to treatment than others?

A. Yes.

Q. Is it possible that someone could have been infected with a certain genotype in one place, perhaps one more amenable to treatment, and another genotype elsewhere, making it relevant to look at all of the places where someone might have been infected rather than just the first one?

A. I think it is probably extremely common to be exposed to more than one genotype, particularly if one has severe haemophilia and is exposed many times a year. Other than, what you find is that when you genotype the patient, one genotype predominates.

We assume that an awful lot of these patients will indeed have been exposed to more than one genotype and even in a single batch of concentrate there may be viruses of several genotypes present. But in the end one genotype predominates, you don't find multiple genotypes. So to be honest, thinking about that individual and many others, I think for people who have moved around, it could be difficult, if not impossible, to actually work out where they got their Hepatitis C. But we assume since the concentrate was 100 per cent infective at the time that the latest time at which they

would have got it would have been their first exposure.
THE CHAIRMAN: I think that's a very complicated answer which went beyond the question. I think the question was whether it was relevant to locate all of the places where someone might have been infected, picking up the point of multiple compensation as the entry to that. And I think you have answered both that in the case of any one treatment, you might get more than one genotype and also you could get more treatments in different places that would add to the mix. Is it just one of these complicated factors that the multiple transfused person may pick up the infection in any number of ways and any number of places or what?
A. We don't have longitudinal data, looking at the genotypes. I mean, we have always worked on the assumption that they were infected at the latest when we first got concentrate, to be honest, and have, in any given individual, taken their first exposure to concentrate as the latest possible time of infection, and therefore, where they were at the time as the place in which they were infected.
THE CHAIRMAN: I don't know if my intervention has helped at all, Mr Dawson. I just didn't want to leave it in the air.
MR DAWSON: I'm quite satisfied with the very thorough

answer that has been given on that. I just wanted to explore it for the purposes of clarification.

Could I just ask you another question about a passage of your evidence from earlier. This was when counsel to the Inquiry was taking you to table 5 of appendix 1. I don't think we need to go there again. You gave some evidence on the subject of the percentage of patients who might clear the Hepatitis C virus. I think your evidence was to the effect that a figure of 15 per cent had appeared that was probably now higher in reality.

I think you may have said something about this already but I just wanted to explore with you what the sources for that actually were.

A. Well, to be frank, most recently a conversation with Professor Brian Gazzard in the Department of Health committee that advised the Secretary of State for Health in England on alterations to the conditions relating to the Skipton fund.

Q. Would I be correct in assuming that when you are talking about clearance there, you are talking about spontaneous clearance?

A. Spontaneous clearance.

Q. And there would be a separate category of those who clear as a result of treatment?

A. Absolutely.
Q. Over and above that figure.
Could I just ask a few questions moving on from Hepatitis C to HIV. What information is kept within UKHCDO about haemophiliacs who have HIV infection?
A. Well, we have the date that they were first reported to us as having HIV. In some cases we have the date of the first positive test. And we have data on any AIDS-defining illnesses and if they have died, the cause of death.
Q. And --
A. And of course we have got their normal demographics, their date of birth, their diagnosis, the severity of their diagnosis and treatment statistics.
Q. Whereas the people who register within the appropriate section relating to Hepatitis C feature there on the basis of an assumption that they have been exposed to the virus due to the date of factor concentrate administration, as far as HIV is concerned, is the position that those who feature in the relevant parts of the database for HIV have actually tested positive?
A. Yes.
Q. So no such assumption would be applied --
A. That's right, and the Hepatitis C look-back aims to get similar, if not more detailed, data, because we want

data also on their treatment and, of course, the development of any complications.

Q. Counsel to the Inquiry has made it quite clear that we will be hearing from some of the Scottish UK centre directors in due course about the specific figures but on HIV there was one specific figure that I wanted to ask you about, and of course if the position is that this is a Scottish matter, then you should say so. If we could have up the preliminary report at page 47, please. Thank you.

The table which appears at the top of that page, as I understand it, is broken down by the six Scottish haemophilia centres, the number of haemophiliacs registered at those centres or individuals with blood disorders registered at those centres who have tested HIV-positive, and it is given a total of 72.

There is a footnote in connection with this, which says that the Scottish Centre for Infection and Environmental Health Data record 87 HIV-positive haemophiliac patients to 30 September 1999. It is suggested there that the discrepancy between those figures is based on the fact they are looking at slightly different dates on the basis that the latter figure is for a period to September 1999, whereas the figures in the table are for the period 1982 to 1995.

I just wondered whether, given that these are, I think, relative to some of the other numbers we have seen, relatively manageable numbers given that both fall under 100, you could make any comment as to the accuracy of these figures and why there is a discrepancy there?

A. I can't really because I don't know how the Scottish Centre for Infection and Environmental Health derived their data. So I don't know the answer to that, I'm sorry.

Q. I'm sure that's something we can look into in more detail with the Scottish centre directors.

Thank you very much.

Thank you, sir. I have no further questions.

THE CHAIRMAN: Mr Anderson, have you questions?

MR ANDERSON: Thank you, sir, I have no questions.

THE CHAIRMAN: Mr Sheldon?

MR SHELDON: No question, thank you.

THE CHAIRMAN: Dr Hay, thank you very much for coming and thank you for the work of the doctors' organisation in this. As I understand it, we do have to try to get reasonably accurate figures as a base for considering other issues in the Inquiry and you have been very helpful. Thank you.

A. Thank you.

THE CHAIRMAN: Ms Dunlop?

MS DUNLOP: Yes. Mr Mackenzie and I are going to change places now, sir, because Mr Mackenzie is going to conduct the examination of the witnesses in relation to topic C1.

THE CHAIRMAN: Can I begin with a bit of housekeeping, Mr Mackenzie?

The staff include people who have to get out of Edinburgh for the weekend, if their sanity is to be preserved, and I understand that we really must stop before 4 o'clock. Is that correct?

I'm sure we will benefit in the long run from ensuring that people don't miss their planes home for the weekend.

MR MACKENZIE: I'm grateful, sir. It may be that we don't complete the witness today but it may be that we ask the witness to come back.

Sir, wonder if I might start with a brief introduction to the topic C1, given we now turn to this new topic. The formulation of the topic is the acceptance of blood from higher risk donors and particularly prisoners.

THE CHAIRMAN: Can I interrupt you again. I'm hearing you directly which means you are not being picked up properly by the microphone. You are being heard.

MR MACKENZIE: Thank you, sir.

The formulation of this topic is the acceptance of blood from higher risk donors, in particular (a), prisoners and (b), donors with a history of jaundice and who are negative for Hepatitis B at a time when the existence of non-A non-B hepatitis was known and its presence could not be excluded.

Dealing with the prisoners' leg, in a sentence blood was collected from prisons by each blood transfusion service region in Scotland through the 1970s and into the early 1980s. There are two helpful documents which have been provided by the Blood Transfusion Service. I won't take up time with them now because we have a witness waiting, but in short their reference numbers are [PEN0100026] and also [PEN0100003]. They give help for the statistics and dates on this topic. I propose perhaps looking at these documents at a time next week, when we don't have a witness waiting.

The second leg, sir, of this topic is the question of donors with a history of jaundice. I think the factual position can be summed up briefly thus, that in the early 1970 donors who gave a history of jaundice were excluded as blood donors but that policy changed in the mid 1970s following a recommendation contained in the second report of the advisory group on testing for the presence of Hepatitis B surface antigen and its

antibody, with the result from the mid 1970s, donors who gave a history of jaundice were accepted as blood donors, if firstly they did not test positive for Hepatitis B antigen, using a sensitive test, and secondly, the donor had not suffered from hepatitis or jaundice during the previous 12 months.

With that preamble, sir, I would now propose calling Dr Brian Dow.

DR BRIAN DOW(sworn)

Questions by MR MACKENZIE

THE CHAIRMAN: Mr Mackenzie?

MR MACKENZIE: Thank you, sir.

Dr Dow, good afternoon.

A. Good afternoon.

Q. Could we look first, please, at your CV, which is number PEN0130421? If we look at the second page of your CV, please, doctor, I'm going to take this shortly because we looked at your CV more fully when you gave evidence last week. We can see from page 2 of your CV that in terms of your qualifications you started off with a veterinary degree?

A. I didn't get a veterinary degree, I studied veterinary medicine but came out of it.

Q. I see. You did then complete a bachelor of science honours degree in bacteriology between 1971 and 1974?

A. Correct.
Q. And then between 1980 and 1985 you completed a PhD thesis on the subject of non-A non-B hepatitis in the West of Scotland. Then in 2004 you obtained your chartered scientist status. Then in 2009 you obtained a fellowship in the Royal College of Pathologists?
A. Correct, yes.
Q. Looking to your working career, Dr Dow, we see that in 1974 you joined the Glasgow and West of Scotland Blood Transfusion Service?
A. That's right.
Q. As a basic grade scientific officer and you held that post until 1979. Then between 1979 and 1991 you became a senior grade scientific officer with the same Blood Transfusion Service. To pause there, doctor, can you give us an indication of your day-to-day duties and responsibilities between 1974 and 1991?
A. 1974 to 1991, really I was a research scientist put into the hepatitis lab, screening lab, to actually help develop a test for screening donors for Hepatitis B surface antigen, using radioimmunoassay. We didn't quite manage that, we managed to actually develop an assay to actually test our anti-natal specimens for Hepatitis B surface antigen using radioimmunoassay, and we also developed tests for tetanus antibodies and

various other things -- diptheria antibodies -- and also tests for anti-HBs.

Q. So between 1974 and 1991 did your work involve entirely research or were you involved in any of the day-to-day testing of those samples?

A. We did do testing of day-to-day blood samples, particularly in 1985. I had finished my PhD and come back to BTS at Law to run an HIV screen lab.

Q. I think you commenced your PhD in 1980. How about the period from 1974 to 1980? Was that largely research work or rather day-to-day work in a laboratory?

A. It was a bit of everything because everybody sort of helped get the actual routine set up early in the morning, and after that was completed, usually about half past 10 or so, I could then go and do research work after that. Particularly we were developing tests for detecting tetanus antibodies at the time. So obviously we would spend the rest of the day trying to do that.

Q. Thank you, doctor.

Then just fast forwarding to the final post you held, we can see that between 1999 to 2010 you were the head, as consultant clinical and microbiologist, of the Scottish National Blood Transfusion Service microbiology reference unit. Just in a sentence or two, doctor, what were your main duties and responsibilities there?

A. My responsibilities there were a bit greater because I then had an team of people working under me to actually do, obviously, the lab work, and really I was doing mainly paperwork and also on committees et cetera.

The unit's main task was actually to take anything that was repeatedly reactive in any of the tests, the microbiology tests in either the SNBTS or the Northern Ireland blood transfusion service and determine whether they were true positives or false positives. That was the main thrust of what we had to do in that unit.

Q. I see. If we turn to the next page, please in your CV, we can see a long list of publications. I'm not going to go through any of these because we have done that previously, but one question, doctor. We can see the authors of various publications. Is there any way in which the authors of a scientific or medical publication are listed in terms of whether the order means anything?

A. The order quite often was alphabetical. You probably noticed that on quite a number of occasions. Usually the first person is the main author but obviously you have to go into these publications to actually see who the main author is, and that's when you sometimes see that the last person is the main author of some publications. It just depends what group you are in

when you do it.

Q. What do you mean by the "main author"? The person who did most of the day-to-day work?

A. Its main author is the person who actually writes the article and timely submits it to the journal and obviously does the follow-up work as far as doing amendments et cetera.

Q. Thank you. We can put your CV to one side now, thank you, and move on to the next document, which is a statement you have helpfully provided to the Inquiry on this topic. The number is [WIT0030094] if we could have that, please.

What I would like to do, doctor, is to simply go through the statement and at various passages bring your attention to various other documents which relate to matters contained in your statement.

So we can see in paragraph 1 at the bottom of page 1 you set out some personal background and we can see that your honours thesis involved devising a radioimmunoassay test to subtype Hepatitis B surface antigen?

A. That's correct.

Q. And you explain that that led to your employment in 1974 with the SNBTS, which we looked at. Over the page at page 2, we can see at the top of that page that on commencement in 1974 with the BTS, you were placed

within the hepatitis screening laboratory, where you also became involved with the routine screening for Hepatitis B surface antigen and anti-Hepatitis B. As you explained, you also developed certain screening tests for tetanus and diptheria antibodies.

Paragraph 2, we can see that during 1979 Dr Mitchell, who was then director of the Glasgow centre, encouraged you to begin a PhD study on non-A non-B hepatitis in the West of Scotland with Dr Follett at the hepatitis reference laboratory at Ruchill Hospital.

A. That's correct.

Q. We can see that was a part-time PhD. Then towards the second half of paragraph 2 we see that once you had completed your PhD in 1985, you returned back full-time to the Glasgow centre and this period was around the time of the launch of the first generation ortho HCV test?

A. Where are we here, sorry?

Q. Sorry. It is paragraph 2, just over half way down. You say:

"This period was around the time of the launch of the first generation ortho HCV test."

A. Yes.

Q. We will come back to look at that question after this

summary, on a different topic. So I won't go into that. Paragraph 3 of your statement. You explain the PhD which you performed, utilised the higher risk groups, such as prisoner donors with a history of jaundice. I'll come back to look at that. At the very last line in paragraph 2 you explain that the aim of the PhD was to try and identify the agent or agents that caused the disease, non-A non-B hepatitis, and to develop an assay that could specifically diagnose the disease.

A. Correct.

Q. As you explained, this aim was also being pursued by countless scientists throughout the developed world and all were doomed to failure until Chiron succeeded. You then say:

"My PhD was to [your] surprise asked to be read by Dr Dan Reid, who was head of the Communicable Disease Scotland unit, and Dr Forrester in the Scottish Home and Health Department and Professor John Cash."

Why were you surprised in 1985 when --

A. Was that in 1985? It was obviously at some point after 1985, the PhD was obviously read by these people because the PhD wasn't awarded until probably March 1986. So it would really be some time after that that these people had asked for my PhD. Obviously there are other copies of the PhD. I think there were about six or seven

copies of it left with, obviously, three supervisors. Two are left at Wadsworth University and I always had a couple of copies myself. So really I heard from Dr Follett that obviously some people had asked for my PhD and he had obviously -- I had given him his copy of the PhD to look at.

Q. Why were you surprised?

A. I was quite surprised that some people were that interested to look at it. Professor Cash, I was quite happy he did but obviously he is the national medical director, way above me.

Q. Yes. Then paragraph 4, I think it is quite an important paragraph. You state that:

"With regard to the acceptance of blood from the various high risk groups, I had little influence other than using science to prove or disprove various assertions. Policy decisions were generally made by directors at their confidential meetings or by advisory committees that influenced Government."

Can you just expand that a little for us?

A. Well, literally I really had no real sway at making decisions about using the likes of prisoners -- to continue going to prison sessions et cetera. All I had tried to do was actually do the science that was involved, and hopefully the science would eventually get

through to people. But obviously what we are doing may well not be right or otherwise.

I mean, obviously, I realised that the likes of prison donations, we needed these to actually keep our stocks up. Without them, obviously, we would run into difficulties of supply.

Q. Dr Dow, in my questioning, I will try to keep to your experience and expertise, which, as I understand it, in short is more science and laboratory-based rather than wider policy or operational matters, but if I take you out of the area you are comfortable with then please tell me.

A. Yes. Obviously I'm not comfortable with any policy decisions that were made at the time because obviously I had no real sway on that at the time.

Q. Thank you. Of course we have other witnesses coming along next week who I'm sure can assist us in those areas.

A. Yes.

Q. Now, in paragraph 5, just to complete this part, about half way down paragraph 5 you state:

"In the 1980s the chronic nature of HCV had not been proven and therefore most considered non-A non-B hepatitis to be relatively harmless."

We may come back to that later:

"With regard to the use of prisoners and donors, the history of hepatitis, as we in Glasgow had used sensitive third generation HBsAg tests since 1975, it was felt that we had prevented the maximum number of post-transfusion hepatitis cases, as borne out by the reduction in post-transfusion hepatitis cases reported to the centre."

We will come back to that later today as well. Then in paragraph 6 I think you give some overview. You say:

"With hindsight, HCV is a chronic disease and the use of surrogate tests, such as anti-HBC and SGPT, otherwise ALT, would have reduced the number of individuals infected with HCV through transfusion."

The question of surrogate testing we will come back to after this summer as a separate topic. You said:

"The use of prisoners did help to maintain stocks of blood over holiday periods but again, in hindsight these individuals were high risk. The use of history of jaundice donors has not really been established as a source of transfusion-transmitted HCV infection. This is partly as HCV is a mild disease with regard to SGPT and ALT elevations with relatively few infected patients actually becoming clinically jaundiced."

Pause there for a moment, Dr Dow. Are you making a distinction that in hindsight prisoners were higher

risk donors?

A. I mean, now, looking now, obviously in 2011 when I have written the statement, obviously looking back and admitting that obviously prisoners were higher risk obviously because the Hep C was amongst them at the time.

Q. As regards the other group we are looking at, donors who had a history of jaundice, is it your position that even with the benefit of hindsight --

A. Yes, even with the benefit of hindsight, we currently accept people with a history of jaundice so long as it is at least one year since that jaundice episode, because we have tests currently around that are able to detect all the infections that could actually cause the jaundice as far as Hepatitis B/Hepatitis C goes.

Q. In the last sentence of paragraph 6 you give the explanation:

"This is partly as HCV is a mild disease with regard to ALT elevations with relatively few infected patients actually becoming clinically jaundiced."

What exactly do you mean by "clinically jaundiced"?

A. Clinically jaundiced is when people go very yellow.

Q. You use the expression as meaning yellow?

A. Yes.

Q. I think we heard various evidence about the number of

patients who contract Hepatitis C who may clear the virus. Anything between, I think, 15 and 25 per cent. Is that the group who are likely to have an initial acute episode of hepatitis and perhaps develop jaundice?

A. It is quite unknown. It is the same with Hepatitis B. Individuals with Hepatitis B we know more about.

Obviously somebody getting Hepatitis B as an adult will probably have an acute episode and they will have hepatitis. They could be jaundiced and they will get over it. Very few will actually become chronic carriers if they get infected as an adult, whereas if they are a child, they will have probably no actual hepatitis or jaundice at the time of infection and they will become chronic carriers. So chronic carriage is kind of related to not having a bout of hepatitis initially.

Q. So with Hepatitis B we know that the majority of adults who contract that infection --

A. Will get over it.

Q. -- will have an acute episode of hepatitis?

A. Yes.

Q. And are likely to develop jaundice at that time?

A. Some of them will actually be jaundiced. It will only be a small proportion of them.

Q. But in short, as regards Hepatitis A, the majority of people who become infected have an acute episode of

hepatitis at the time?

A. You are talking about --

Q. Hepatitis B?

A. Sorry, yes.

Q. They have an acute episode of hepatitis at the time. They clear Hepatitis B, the majority, and they are not carriers of Hepatitis B?

A. That's right. Most of the adults, when they get Hepatitis B, if they have an acute episode, they will get over it and they will not become chronic carriers. That's 80 per cent of these adults.

Q. 80 per cent?

A. Yes.

Q. Whereas I think we know now that with Hepatitis C the reverse is the case: there may be say, 20 per cent of people who get Hepatitis C who have an acute episode of hepatitis, who clear Hepatitis C and who no longer carry Hepatitis C. Is that correct?

A. That seems to be the case.

Q. But the majority of people who get Hepatitis C don't have an acute episode of hepatitis. They don't clear the virus and they continue to carry the virus.

A. The level of ALT upset in somebody with Hepatitis C is considerably less than anybody that gets Hepatitis A or Hepatitis B. A very, very mild elevations.

Q. So going back to Hepatitis B. For those who contract Hepatitis B and have an acute episode of hepatitis, they are likely to have very elevated ALT levels?

A. They will have really high spikes in the thousands.

Q. We are likely to come back to this whole topic at a later block, but it is perhaps helpful just to have some comments on this now, thank you.

A. Thank you.

Q. Going over the page, please, doctor, to page 4 of your statement. This is all now on the question of collecting blood from prisoners. In paragraph 7 you start by saying:

"In 1974 on entering employment with the SNBTS, it was common practice as in other UK blood services to collect blood in prisons, especially around holiday times when donors seemed reluctant to volunteer."

You move on to the type of test which was initially used for Hepatitis B and you say that:

"At that time, blood was screened for the presence of syphilis antibodies and Hepatitis B surface antigen and anti-Hepatitis B by counterimmunoelectrophoresis or CIEP"?

A. Correct.

Q. "... or immunoelectro-osmophoresis, IEOP".

Are you able to explain in simple terms what the

difference between CIEP and IEOP were, and perhaps more pertinently in respect of their respective sensitivities?

A. CIEP and IEOP were really the two terms to mean the same. What was actually happening there, there was an agarose gel and we actually had a trio of wells. The top well actually had Hepatitis B surface antigen in it, the middle well had test sample and the bottom well had anti-HBs. And we then applied a current going from the top to the bottom and that forced antigen to go towards antibody and you would get a precipitin line.

So if the test sample had antibody in it, it would form a precipitin line between itself and the top well if there was antigen in it. And if there was antibody in the test sample, obviously that's what would happen. You would get that between the top and the middle. If there was antigen in the sample, we would obviously have a precipitin line between the middle well and the bottom well.

Q. I think doctor, that screening for help --

THE CHAIRMAN: I'm not sure that that is as clear as it might be. When you talk about three wells, are these three distinct vessels in a column or are they part of a single column or what?

A. Each plate had 1 per cent agarose on the plate. We had

three rows of tiers of wells. So 30 test samples went on each plate.

THE CHAIRMAN: Can we just stop there a bit. You have changed the terminology just a little from well to plate to well. So one shouldn't envisage a glass container full of a liquid. It is a specimen plate with the agarose gel spread on it.

A. Correct, yes.

THE CHAIRMAN: That's the first thing. So we have a sequence of plates, each of which has had agarose applied to it. Agarose is what.

A. 1 per cent agarose, it is obviously from seaweed. Agar A sugar form of it.

THE CHAIRMAN: What does it do? Does it support something else?

A. It allows the precipitin lines to actually form. You can actually visually see them. It is a --

THE CHAIRMAN: Precipitin lines are not going to be easy for people to take in either. If you do it once doctor, we may actually get the picture.

A. You are looking at something that was kind of milky coloured agarose, and what you are seeing was a distinct white line between two wells and that was the precipitin line we were looking for. That precipitin line was antigen, antibody, where they came together they formed

this lovely line that you could actually visualise.

Obviously a very subjective test and we needed two people to actually look at these test results and if there was obviously disagreement, you would get a third person in to actually be an arbiter.

THE CHAIRMAN: We may have to learn a little bit more about subjective tests more generally. I'm interested in them, I think, when we look back at some of the charts you produced earlier, where the sensitivity gives you a different strength of response. Should one understand then that what you are doing is setting up a series of plates that have been treated? You then apply an electric --

A. An electric current.

THE CHAIRMAN: -- current to them. The electric current agitates in some way the material.

A. It actually forces antigen towards antibody and the antibody obviously moves the other way by osmosis.

THE CHAIRMAN: So when you bring the two together, you define a line on the plate and that then requires interpretation and the interpretation it a subjective visual exercise.

A. Correct, yes.

THE CHAIRMAN: And that's why some people will see the line and some people won't.

A. I am afraid so, yes. The test itself wasn't very sensitive. The test would detect down to about 100 micrograms per mil of surface antigen, whereas the radioimmunoassay test could get down to nanogram levels of Hepatitis B surface antigen.

THE CHAIRMAN: I'm not going to follow that but I think that even that might challenge some of us.

Mr Mackenzie?

MR MACKENZIE: Dr Dow, how do we spell agarose?

A. A-G-A-R-O-S-E.

Q. In short, why a line appears; is it something to do with antibodies travelling towards antigen and being repelled or vice versa?

A. It is where both antigen and antibody meet, they all combine together and form the line.

Q. Thank you.

On the question of sensitivity of this test for Hepatitis B surface antigen at the time, could we look at a document, please, which is number [SNB0021339]. Once this comes up on the screen, I think we will see this is the first report of the Maycock group. We can see that the full title is "The report of the advisory group on testing for the presence of Australia hepatitis associated antigen and its antibody". I should perhaps say that Australia antigen was the initial name for

Hepatitis B surface antigen?

A. That's correct, yes. It was quite often known as Australia AU(HA) for hepatitis associated antigen.

Q. This report is dated September 1971. Could we look at page 3 of the report, please? I think that the third page of the report --

Is it possible to forward a couple of pages? Thank you.

If we can look at paragraph 8, please, we can see that it states:

"Although the hepatitis agent may be less widely dispersed in the UK than in some other countries, the institution of testing blood donations for Australia antigen should reduce the incidence of serum hepatitis, which is the most serious complication of transfusion, and so avoid suffering and disablement and even death. It would also lighten the load on the NHS. Estimates of the reduction vary but it should be about 25 per cent of the present incidence."

There is a reference to a World Health Organisation memorandum of 1970. So this report seems to suggest that the initial Hepatitis B screening tests were approximately 25 per cent sensitive. Does that accord with your recollection?

A. No. As I said, it was a bit more than that. Certainly

the test that was being used within the Glasgow centre, they used to send samples to the hepatitis reference lab at Ruchill. Quite often the hepatitis reference lab at Ruchill found them negative by their counterimmuno-electrophoresis test, but obviously are reactive by a more sensitive complement fixation test. Obviously, if they were using radioimmunoassay [sic - reagents] they found it positive by radioimmunoassay. So the test varied according to who was doing it and what agents were actually being used.

Q. This, however, is the official advisory group which advise --

A. That was Maycock in 1970, 1971 when this was written, but obviously when the counterimmuno-electrophoresis was being used by the BTSs, each centre would vary according to others because they were all using different reagents at the start.

Q. So testing for Hepatitis B surface antigen, I think, was introduced in Scotland in 1970 or 1971?

A. 1970 was when the Glasgow centre went --

Q. Do you know whether the other Scottish regions started in 1970 as well?

A. I'm unsure about that. Certainly by 1971 they were all doing it.

Q. Thank you. When Glasgow were testing in 1970 and 1971,

Glasgow were using a CIEP test or IEOP --

A. Glasgow actually called it IEOP but everybody else called it CIEP.

Q. I see?

A. You can see why they called it by abbreviations because it is quite a tongue twister.

Q. When Glasgow were screening using that test in 1970, this paper would suggest that the sensitivity of that test was about 25 per cent, ie the test would detect about 25 per cent of true positive donations. Would you quibble with that?

A. I would say it was more than that.

Q. Do you have any idea how much greater it may have been?

A. Certainly 30 to 50 per cent, I would have said, at least.

Q. 30 to 50 per cent?

A. Yes.

Q. And what's that figure based on?

A. Experience.

Q. Experience and recollection?

A. The recollection, yes. The test was actually a good one that they used. They actually made sure they had good reagents. It all depended on the reagents you used.

Q. And doctor, when you say your recollection was a sensitivity of between 30 and 50 per cent, do you

think that was from the outset, ie in 1970, or is it possible that may have been at a slightly later stage, perhaps when the test was improved for whatever reason, or even a different test was used?

A. I think most of the reagents were fairly static in the Glasgow centre. I mean, I started work there in September 1974. So obviously I recollect what was being done at that particular time, but I know that a lot of reagents had obviously been used for quite a considerable time, since 1970. Obviously they went back to donors and bled them et cetera, to get reagents to actually do this.

Q. So that's your recollection of the sensitivity of the initial Hepatitis B screening test?

A. Yes.

Q. Now, going back to paragraph 7, please, of your statement, and about half way through --

A. Unfortunately there are two paragraph 7s.

Q. I'm sorry.

A. We are on paragraph 7 still.

THE CHAIRMAN: I think that we are still on the Maycok report at this point and unfortunately it has a paragraph 7.

MR MACKENZIE: We would like to bring up the statement, please, I think. Thank you.

So back to paragraph 7 and about half way through you state:

"It was already known that the incidence of Hepatitis B surface antigen from new donors who donated at prison sessions was higher than new male or female donors in the general donor population."

You say:

"Of 1,835 institutionalised donors, 12 were positive ..."

That's 1 in 153:

"... whereas other males was 1 in 803 and females, 1 in 2,019 based on IEOP testing of 105,724 donations between October 1970 and October 1971."

Could we go to that paper, please? The reference is [SGH0029831].

THE CHAIRMAN: Dr Dow, while it's being found, was that all of the donations in that year?

A. That would be -- it seems quite a small number, 105,000.

THE CHAIRMAN: No, the 105,724 -- or is that some sort of sample? I just want to know what the database was --

A. We have it in front of us in this 1972 paper.

THE CHAIRMAN: Yes, all the 105,000.

A. Yes.

MR MACKENZIE: This is a paper published by Dr Wallace who I think was the director of the Glasgow and

West of Scotland Blood Transfusion Service at the time with two others.

A. That's correct.

Q. In the British Medical Journal. We can see from the summary it states that during a period of one year all of the 105,725 blood donations were tested for Australia antigen and its antibody by IEOP. We can see that 86, 1 in 2029, were positive for antigen; and 67, 1 in 1,578, were positive for antibody. It then goes on to state:

"Men prisoners have a significantly higher incidence of Australia antigen, 1 in 153, than non-institutionalised men, 1 in 803."

Pause there, doctor. The incidence of, if I may call it Hepatitis B antigen in male prisoners was approximately five times greater than that in males who were not prisoners. Is that correct?

A. That's correct. That's what the paper showed.

Q. If we then can go, please, still on this page, the right-hand column, about half way down, we see that there is a reference to table 2 that shows the incidence of antigen and antibody at the first time of testing men prisoners and non-institutionalised men and women. The authors state that the higher incidence of Australia antigen in prisoners compared with other men is highly

significant.

Again, at the very bottom of that page, the right-hand column, we see under the word "discussion":

"While the bulletin of the World Health Organisation in 1970 advocated total screening of donations, it emphasised that the application of the present relatively insensitive tests may reduce the risk to recipients by less than 25 per cent."

I think if we go over the page I hadn't picked up, I have to say, on there being any reference in this paper to the sensitivity of the test being greater than 25 per cent. Do you want to just take a minute or two, doctor, just to look at this page to see if I'm missing anything?

A. I don't think that you will actually see anything within that particular work because literally at the time they didn't know how they were going to actually reduce the number of post-transfusion hepatitis cases. That's what they are actually showing with that 25 per cent. It is a reduction of the number of cases, based on -- you know, broadly, the bulletin of the World Health Organisation stated that 25 per cent. I know that the test they were using in Glasgow was actually quite a good IEOP test, it was better than some of the other centres that had developed their own

counterimmunoelectrophoresis test.

Q. So the question one has to consider is whether the reduction in 25 per cent relates to a reduction in cases of post-transfusion viral hepatitis generally or a reduction in cases of post-transfusion Hepatitis B surface antigen hepatitis cases?

A. Yes, there is a bit of that within that. I mean, I would expect that would be the total number of post-transfusion hepatitis cases, the way that was written at the time.

Q. I see.

A. They would include allegedly Hep A -- there were very few of them, obviously -- and some of the non-A non-Bs that were unknown at the time in 1972.

Q. It may be helpful, just while we are on that point, just to try and clear that up. Could we go back, please, to the first Maycock report, which was the previous number, [SNB0021339], just to see again what that report actually said. I think it was page 3. Thank you. Paragraph 8.

A. They have taken that sentence directly as a quote from the bulletin of the World Health Organisation. You can see it is the same reference.

Q. Does paragraph 8 assist us in working out whether the figure of 25 per cent related to post-transfusion

Hepatitis B surface antigen or to post-transfusion serum hepatitis generally?

A. I think it says general.

Q. I see, thank you. We can put that document to one side again, please. Thank you.

So, doctor, when you gave evidence that in your experience the sensitivity of this initial screening test was perhaps between 30 and 50 per cent, what exactly did you mean by that?

A. I meant from the point of view of the number of cases it should have prevented.

Q. Cases of what?

A. Of post-transfusion hepatitis.

Q. Post-transfusion hepatitis generally?

A. Generally.

Q. Or post-transfusion Hepatitis B?

A. Just post-transfusion hepatitis, general.

Q. Thank you.

A. The cases that were actually reported to the centre.

Q. Thank you. Now, if I may return then to the 1972 Wallace article -- and that was [SGH0029831] -- and if we can go, please, to the second page of that article, in the right-hand column, about a third of the way down, the paragraph beginning:

"The high incidence of Australia antigen of 1 in 153

in men prisoners has no obvious explanation. Viral hepatitis is not a serious clinical problem in the two institutions concerned and the positive donors are not drug addicts. What is not known is whether or not these men were Australia antigen-positive at the time of their first imprisonment. The high incidence may be related to social habits and to hygiene."

I appreciate, doctor, you weren't an author of this paper and indeed weren't working in the service at the time, but I'm interested in the reference to the positive donors are not drug addicts. What does that suggest to you as to what the authors were thinking at the time?

A. Obviously, at the time drug abuse was known to be related to Hepatitis B because a lot of drug abusers would be getting Hepatitis B and would be known to clinicians, et cetera. I would imagine that at the sessions themselves anybody that admitted to drug abuse would have been deferred.

Q. And why was there thought to be a link between drug abuse and Hepatitis B? What was the link?

A. I just presume the link was that they were finding in the clinical labs that a lot of drug abusers were coming down with Hepatitis B and were obviously positive within the counterimmunoelectrophoresis test within the

clinical labs.

Q. Are you aware whether in the early 1970s there was any thought as to the explanation for the link between drug abuse, or drug users, having a higher prevalence of Hepatitis B? Why did people who used drugs have higher prevalence of Hepatitis B?

A. Obviously because it is a blood-borne virus. Obviously, any blood-borne virus in drug abusers would spread in amongst drug abusers, especially if they share needles, et cetera.

Q. I see. I won't ask you any more questions on this particular paper, doctor, so can we put that to one side?

THE CHAIRMAN: Before you leave that, do you have a concern about the expression that the prisoners are not drug users? What would the source of that information be?

A. Pardon?

THE CHAIRMAN: What would the source of information be that they weren't drug users?

A. Obviously, the source would be the session staff themselves. The session staff would obviously be questioning these individuals, I reckon.

THE CHAIRMAN: So the source would be the individuals?

A. The session staff at the session would obviously be looking for signs of tracking on arms, et cetera, and

would also be asking individuals if they had been drug abusers, I would have thought. I don't know; I wasn't at the sessions.

THE CHAIRMAN: No, indeed. It just gives rise to an interesting thought, that if they were not involved in the abuse of drugs, there must be some other mechanism common to prisoners that raised the rate of infection in their case.

A. That's why Dr Wallace said that it may be related to social habits and to hygiene. You could obviously have shared razors, I don't know, and you could obviously have potentially men who had sex with men.

THE CHAIRMAN: I see, that's what they have in mind, is it?

A. Well, perhaps.

THE CHAIRMAN: Perhaps.

MR MACKENZIE: Sir, when we come to the early 1980s, I think Dr Dow did author a similar paper and we will come to explore the various linkages then.

Dr Dow, this may be one of these questions where I'm at risk of inviting you to comment on something outwith your experience and expertise, so please say so if I am. But from what we have heard so far, we know that the initial testing for Hepatitis B detected, from your recollection, perhaps 30 to 50 per cent of positive donors. That, coupled with what we know from --

A. That's slightly different, the way you have just put it. That's how you have twisted it round to mean something else. I would kind of object to the way you have actually said that. When we talk about 30 to 50 per cent, we are talking about the number of -- the reduction of the actual cases. When we actually look at the number of donors, that's a totally different thing.

Q. I apologise if I have been inaccurate in your evidence but, taking what you've said, that the initial screening tests may reduce the incidence of post-transfusion hepatitis by between 30 and 50 per cent, does it suggest from that that the initial tests were -- what could one imply from that as to the sensitivity of the initial tests in terms of the percentage of truly positive donors they detected?

A. Right. The IEOP test or counterimmunoelectrophoresis tests that were being used detected down to 1 microgram per ml of Hepatitis B surface antigen, whereas the tests we are currently using just now for our donors will get down to picogram levels of Hepatitis B surface antigen. So that difference is suddenly a thousand-fold more sensitive, the tests we are currently using, than what we were originally using in 1970 to 1975.

What we are not detecting: 1,000 times more donations. We are not detecting 1,000 times more people

with Hepatitis B surface antigen. That's the point I'm trying to make, that, obviously, the Hepatitis B surface antigen is produced in huge amounts and is easily detected by even a precipitin test, which is quite unusual in virology, but obviously it happened. To actually use really very sensitive tests, all you are detecting is a few that are undetectable by the counterimmunoelectrophoresis test.

Q. Doctor, going back several steps, one would imagine that when the IEOP test -- or rather before, when it was introduced in 1970, there must have been some evaluation of its sensitivity, for example taking ten or 50 or whatever number of known or believed to be Australia antigen-positive samples and seeing what percentage of those known or believed to be positive samples the test detected. Is that sort of evaluation likely to have occurred?

A. I think really away back in the 1960s, the end of the 1960s anyway, when this happened, it was a case of reagents came across from America that allowed people to actually just use plain immunodiffusion to try and get precipitin lines, and that was a very, very insensitive test. I don't think I can actually say that there was a full evaluation as such of these tests. It was a case of if the test worked, use it.

Q. What I'm struggling a little with: I understand your evidence that the initial IEOP test was thought to prevent between 30 and 50 per cent cases of post-transfusion hepatitis. What I don't really have a clear understanding of is what was thought to be the sensitivity of that test in 1970/1971 in terms of the percentage of Hepatitis B surface antigen donations that were detected. Are you able to assist with that at all?

A. Well, as I said again, the counterimmunoelectrophoresis test or the IEOP test could detect down to 1 microgram per ml of Hepatitis B surface antigen. That's quite an important figure, whereas the likes of radioimmunoassay test will go down to roughly 1 to 2 nanograms per ml of Hepatitis B surface antigen. But you are not detecting a whole lot more. Although that test is 50 to 100 times more sensitive, the RIA test, than the IOEP test, you are not detecting 50 to 100 times more Hepatitis B carriers.

Q. One final question, if I may, before we pause for lunch. With the benefit of hindsight, Dr Dow, if one has, say, 100 donors who theoretically we know are Hepatitis B surface antigen-positive, what percentage of them do you think the initial 1970s test is likely to have detected? It won't be precise, it won't be a science, but just so we can have some feel for that.

A. 100 nowadays or 100, when, in 1975 or ...?
Q. If the 1970 test was used?
A. Oh, in 100 that you get now?
Q. Well, does it matter?
THE CHAIRMAN: No, I think the hypothesis is that you get 100 people who are positive and you are testing them as at 1970 with the means available then. What would the result --
A. What I'm saying is obviously you determine, working back from now, back to 1970, how sensitive that test would be.
THE CHAIRMAN: At the time.
A. And certainly it would be in the region of 70 per cent. It would be higher to up to 70 to 90. I don't -- I would have to go back and do some sums.
THE CHAIRMAN: I don't know that we are talking about the same thing here. I think that we will stop for lunch and see if inspiration dawns.
(1.00 pm)
(The short adjournment)
(2.00 pm)
THE CHAIRMAN: Dr Dow, at the end of the day, I have to understand what you are saying and I wonder if we could look just briefly at the first Maycock paper, please, and get a context. I think that you will remember

enough of what it is perhaps to answer my questions.

I think the first matter that is dealt with in paragraph 7 on general principles was the finding that on some tests, one to two people per thousand among the donor population were, on first test, found to be antigen positive.

A. Yes.

THE CHAIRMAN: And if we look over to a page we have not looked at, paragraph 11, it appears that there was Glasgow data for that.

A. I think that's correct. It is not on the screen.

THE CHAIRMAN: I know it is not on the screen at the moment but I can tell you what it is. The Glasgow and West of Scotland transfusion centre, testing at that stage 13,950 donations, found antigen in 1 in 820. So we are in the range.

Then towards the end of paragraph 7 there are two different bits of information about the effect on patients who were transfused. First of all, that in the 1954 study 0.2 per cent of patients were found to have icteric hepatitis. Would that broadly be jaundice?

A. That would be jaundice, yes.

THE CHAIRMAN: Then the following survey from the Medical Research Council working party was suggesting at that stage that 4 to 5 per cent would be either icteric or

anicteric.

A. Correct, yes.

THE CHAIRMAN: So you had a picture there of two different things. One was the incidence of hepatitis in patients who had been transfused and the other was a measure of the prevalence of Australia antigen in the donor population.

A. Yes.

THE CHAIRMAN: Then we go on to look at paragraph 8, where it talks about the prospect of reducing the risk of transmission by testing. Is that right?

A. Yes, that's right.

THE CHAIRMAN: What it says there is that on the WHO assessment you could get about 25 per cent reduction by using the then current available test.

A. That's the WHO estimate, yes.

THE CHAIRMAN: Now, that's 25 per cent, as I understand it, in the 1 to 2 per thousand, for example. You are taking people out of the donor population.

A. There are several things within all this that I should explain. Not everybody will actually come down with Hepatitis B after getting a transfusion.

THE CHAIRMAN: With the greatest respect, if we get sidetracked, I'm certainly going to lose it and at the moment all I'm trying to do is to find out what figures

we are dealing with.

Now, we can expand is as much as possible. If we get things into the right chapters, we might get somewhere. So we are talking about a 25 per cent reduction in the blood that might be brought into the system that carries the Australia antigen, if it is tested. Is that right?

A. Well, we are assuming that that 25 reduction was a reduction on post-transfusion hepatitis, which included Hepatitis B but also possibly other hepatitis.

THE CHAIRMAN: I wonder, with respect, if that is so. The hepatitis agent is described and they talk about it being the most serious complication, and then they say:

"Estimates of the reduction vary."

Now, is 25 per cent related to the 4 to 5 per cent or is it related to the blood coming into the system? Because what's being tested here is blood donations.

A. I would have thought the estimates for the reduction was the reduction in actual cases of hepatitis.

THE CHAIRMAN: Of transmission. Can I put it this way then: it's 25 per cent reduction in the 4 to 5 per cent, just to pick that up --

A. Yes.

THE CHAIRMAN: -- which in itself is a much smaller percentage of the total blood coming into the system.

Is that the way one should build it up?

A. It's quite hard to actually envisage all this. This is the problem.

THE CHAIRMAN: The difficulty for us is not only are we looking at something that's very old against a background of knowledge that there have been huge changes, but none of us really know what we are talking about unless you help us.

A. The trouble is the definition of these various things. It hasn't been clearly defined what, you know, they are actually talking about, whether it is all hepatitis or whether it is purely Hepatitis B.

THE CHAIRMAN: Of course, this is 1970/71 and it couldn't have been anything other than --

A. It would all be hepatitis.

THE CHAIRMAN: -- Hepatitis B.

A. No, they would just be talking about hepatitis, probably.

THE CHAIRMAN: You mean they wouldn't have distinguished Hepatitis A either?

A. I think they were unable to do that really at that time.

THE CHAIRMAN: I suppose that's right. 1973, Feinstone and Prince before we get to that --

A. There weren't decent tests until 1978.

THE CHAIRMAN: Yes. I do wonder whether there is a great

deal of use in this paper.

A. I don't see the line of questioning actually, to be honest.

THE CHAIRMAN: You and I are in the same boat on that. We don't really have to so long as Mr MacKenzie takes us there but I'm anxious that we shouldn't use your time or indeed the Inquiry's time if it is not really going to help.

A. I fear that -- I mentioned that I was actually asked about the sensitivity of the counterimmuno-electrophoresis test compared to the 100 donors that we get probably nowadays. I would probably revise that downwards, about the 60 per cent would be its sensitivity. It would detect 60 out of the 100 that we get nowadays.

THE CHAIRMAN: That's still quite a high proportion compared to 25.

A. That's high compared to your 25 per cent there. I can see the 25 per cent if you are relating it to all hepatitis. That would then fit in.

THE CHAIRMAN: This might help us then to understand where there is a difference between all of us really in trying to understand it. What I understand you to be saying is that at this time in the early 1970s, Glasgow was actually using a relatively sensitive test that was

capable of picking up more --

A. Yes, slightly more.

THE CHAIRMAN: -- of the potential.

A. Yes.

THE CHAIRMAN: And how one expresses this is perhaps less important than the fact that there is variation in sensitivity among tests and Glasgow was doing quite well.

A. That's right because the reagents that were being used weren't the same throughout the country.

THE CHAIRMAN: I think reagents you have mentioned several times and we have avoided, actually, asking but is that the sort of chemical product that's stuck in, as it were, to get a reaction when you bring the things together, or what?

A. In the counterimmuno-electrophoresis test it was a case of testing a serum against a serum. So one serum was actually a donor that had Hepatitis B surface antigen, another was a donor who'd had good antibody against Hepatitis B and we put a test sample. Our donor samples or donation samples were put in between and electrophoresed against both different reagents.

THE CHAIRMAN: What did you get? A migration one way or the other?

A. You either got a negative result, which was what we

wanted, or we got a reaction against the antigen which showed the test sample had antibody, or you got a reaction against the antibody which showed that the test sample had antigen.

Q. Together that gave you a more sensitive test than what Maycok is talking about here?

A. Slightly more sensitive than what Maycock had, that's all.

THE CHAIRMAN: Mr Mackenzie, I don't know how much further you want to go on this but I have just suddenly realised I have made a terrible mistake of my own; I have come in without my notebook.

Mr Mackenzie, I don't know if this has helped at all.

MR MACKENZIE: I think it has, thank you, sir. I was just going to ask two or three very brief questions to ensure I hadn't confused myself before lunch when I come back to read this transcript in due course. Maybe I could start now.

Dr Dow, when, before lunch, I talked about the sensitivity of a test, it seems to me that word "sensitive" may be used perhaps with two different meanings: firstly sensitivity in the sense of a test which can pick up very low levels of a virus?

A. Correct.

Q. And you gave us various figures for the early Hepatitis B tests compared to the current tests in terms of the quantity, or amount, of virus that the test could detect?
A. Yes.
Q. So that would be one use of the word "sensitivity". Another use of the word "sensitivity" would be the percentage of positive donors or samples that the test will detect?
A. That's right.
Q. Yes. And also departing slightly from the word "sensitivity" another way of looking at things is to look at the percentage reduction in the number of cases of post-transfusion hepatitis in recipients, that introduction of screening will lead to?
A. Yes.
Q. So we should perhaps be aware of the different senses in which one can use the word "sensitivity" and exactly what we are talking about?
A. That's right.
Q. I think I can move on from all of that now.

So going back to your statement, please, which is [WIT0030094], I think we had moved on to paragraph 8. In paragraph 8 you then refer to Hepatitis B surface antigen RIA testing being introduced in Glasgow in 1975.

You say that the incidence of Hepatitis B surface antigen remained high in prison sessions when compared with the general population.

You then go on to tell us that in 1977/78, the west centre moved to reversed passive haemagglutination, RPHA testing for Hepatitis B surface antigen, which was a less sensitive and more subjective test?

A. Correct.

Q. I assume you mean by less sensitive, less sensitive when compared with the RIA test?

A. Correct, yes.

Q. And in what sense are you using the word "sensitive" there?

A. The sensitivity of the RPHA as far as detection of Hepatitis B surface antigen would be in the region from 20 nanograms up to about 100 nanograms per mil.

Q. So you used the word "sensitivity" in terms of the level of virus a test can detect?

A. And if you are looking at it against, let's say the 100 Hepatitis B positives that Lord Penrose talked about, it would be roughly 80 per cent to 90 per cent of these.

Q. Which test would be the 80 to 90 per cent?

A. The RPHA against the RIA.

Q. I see. And you then go on in your statement to explain the use of a pooling system to pool, screen RPHA

negative samples. And pools of no more than ten was used in plasma destined for fractionation and around four extra HBsAg positive samples were found using RIA in a period of one year.

Now, the system of using RIA tests to screen pools of ten samples destined for fractionation. Why was that introduced?

A. That was introduced because we knew that the RPHA test was not as sensitive as the RIA test. Dr Wallace obviously had written already to all his consultant haematologists in the West of Scotland declaring that fact, that he was worried that he had to move to this less sensitive test because he hadn't been funded to do it.

Q. So this was an effort to introduce a further screening of plasma destined for fractionation and for blood products?

A. Really because in fractionation they are pooling all these donations together, it was felt that was the best use of using a small number of RIA tests because we weren't funded to do it properly.

Q. We will come to that very shortly, doctor, but to finish paragraph 8 in your statement, you say:

"This scientific report ..."

Which we will come to:

"... also highlighted that in the period when RIA was used as the main screening test, no confirmed HBsAg post-transfusion cases were reported. Therefore the use of sensitive HBsAg assays led us to believe that we detected all HBsAg positive donors, whether they were prison donors or otherwise."

A. Correct.

Q. You say "detected all HBsAg positive donors," is that consistent with what's said a few lines up: when RIA testing the plasma destined for fractionation four extra HBsAg positive samples were found in the period of one year?

A. That was after obviously we stopped. We were screening by RPHA at that time. What I'm saying there in the period prior to that when we were screening RIA, we had no cases reported to us.

Q. I understand. Between the introduction of RIA in 1975 and then the introduction of RPHA in 1977/1978 there were no reported cases of HBsAg-positive donors?

A. Correct.

Q. I see?

A. No cases of post-transfusion hepatitis reported to us.

Q. I understand.

If we could perhaps look at some documents which form part of the background of your evidence in this

matter, firstly the second Maycock report of September 1975. That's number [SGH0030079]. We can see on page 1, the membership of the committee. We can see, second from the bottom, Dr Wallace was a member of the committee. I think in fact his Lordship pointed out the reference in the first report where we could see that much in fact of the work for the content of the first report came from the research and work carried out at Glasgow, I think. So I think it would be fair to say that Glasgow was a leader in the field on the question of Hepatitis B testing.

A. Yes, I think they were at the forefront, yes.

Q. If we could then, please --

A. There is also another person from Scotland on that list there. Barry Marmion was actually a professor of bacteriology at Edinburgh University just two up from that.

Q. Thank you. Go on to page 2, please. At the very bottom of the page we can see this report is dated September 1975. If we could then, please, go on to page 8 of the report, which is number SGH0030088. I'm not going to spend too long on this, doctor, but we can see in paragraph 30 a reference to the reversed passive haemogglutination test and about half way down paragraph 30 the sentence:

"The sensitivity of RPHA test systems varies but in general it approaches that of radioimmunoassay."

A. I see that there but -- it was approaching it, yes, but never reached it.

Q. We will come on to look at Dr Wallace's correspondence fairly shortly but sticking with this report in paragraph 31. A few lines down, there is a phrase that in terms of RIA they are the most sensitive methods available for detecting HBsAg. I think it is consistent what you said earlier. But then four lines from the bottom of the page we can see that the technique is relatively slow and tedious to carry out on a large scale?

A. That was true with in-house tests. They tended to be two or three days to actually do a test whereas the Abbott test that the Glasgow centre used could be all done within four hours, which is quite acceptable for screening blood donations.

Q. I see. Then over the page at page SGH0030089 in paragraph 34, we see the recommended method of testing from the committee:

"In light of the developments which have occurred since the publication of our last report, we no longer consider that CIE should be the recommended technique for the routine screening by RTCs for the presence of

HBsAg. The choice for a replacement method lies in our view between RPH and RIA."

Missing one sentence:

"RIA is admittedly more sensitive than RPH but even so cannot be relied upon to detect HBsAg in every donation in which it is present. In our opinion the extra degree of sensitivity which RIA affords is outweighed by the considerable advantages which RPH offers in other no less important respects."

Missing again a sentence:

"We therefore recommend that RPH should be adopted as soon as possible by all RTCs in place of CIE to screen every blood donation for the presence of HBsAg."

I think we can then leave that report. So that was the recommendation of the expert committee in September 1975. Could we then, please, go to document [SGF0012841]. This, if we go to the bottom right-hand corner of the page, is a memo from Dr McIntyre of the Scottish Home and Health Department dated 24 March 1976. It is not particularly legible but I think that is what it states. We can see the heading of the memo, "Testing for Hepatitis B surface antigen, the Maycock report." then in the middle of the page, the paragraph begins:

"In Scotland sensitive tests for the detection of

HBsAg are now being used in all five Regional Transfusion Centres."

So certainly, as at March 1976 the centres had moved on from the first generation test to the sensitive tests.

Now in Glasgow --

A. They are call third generation tests by that time.

Q. I will perhaps avoid the use of the phrase "generation" and simply say that the original tests were not being used in 1976?

A. Yes.

Q. And rather more sensitive tests were being used in Glasgow. You describe RIA --

A. Correct.

Q. -- having been introduced in 1975. Do you know which test the other centres in Scotland had used at this time? Was it RIA or was it the RPHA?

A. I can't be certain what was actually being used. I know that Edinburgh at one point did use an RIA test which was a modified RIA test.

Q. But even if they were using RPHA, that would still be in line with the recommendations of the Maycock report?

A. Correct, yes. The recommendation was a minimum to go into RPHA. I think the recommendation also went on to say that -- recommended to actually try out RIA as well

as RPHA.

Q. Thank you. Could we leave that document, please and go on to document [SGF0012836] which I think is a letter from Dr Wallace, which you referred to earlier.

Now, we can see from the top of this letter it is dated 22 June 1976. It is from Dr Wallace to Dr McIntyre in the SHHD. The subject matter, we can see from the heading, is "Total screening of donations from HBsAg". If we go to the second paragraph, please, the sentence:

"It was acknowledge that RIA was the most sensitive method available for the detection of HBsAg but in practical terms both expert groups recommended that RPHA should be introduced as the method of total screening because RPHA could be introduced much more rapidly than the more sophisticated RIA technique."

Now, over the page I think we can see about four lines down from the top of the page, reference to the RIA testing having been introduced by Glasgow:

"The exercise was started in the middle of August 1975 and is therefore due to end in the middle of August 1976. I will present the salient views on the exercise to date."

Then various figures are given from which, in the paragraph beneath the figures, Dr Wallace concludes:

"The lack of sensitivity of the IEOP method is shown in the above figures."

So when one looks at the figures, one can see a category for donors which goes across the page and beneath that the letters "HBsAg". I think this detects testing for Hepatitis B using RIA testing. We can see that using RIA testing, under "new donors", there were 22 additional positive donors and then 14.

A. Using these figures, you'd have to actually say that the IEOP technique was roughly about 35 to 40 per cent sensitive as opposed to the 60 per cent I had estimated.

Q. Right. So in terms of use of the word "sensitive" that would of the 100 known positive donors?

A. Yes.

Q. IEOP?

A. That's based on these 36 examples he has in the letter.

Q. Did you say 30 to 40 per cent roughly?

A. Yes.

Q. Thank you.

Then the paragraph beneath that in the middle:

"Of these 36 samples of HBsAg, only 13 were detectable by IEOP and only 24 were easily detectable by RPHA. Another five specimens gave doubtful positive reactions by RPHA. This means that if we had been relying on RPHA for total screening we would have

missed, in a period of nine months, at least seven examples of HBsAg positive donations and perhaps as many as 12."

I think in short, what Dr Wallace is asking for is funding to allow him to continue to screen using RIA. Is that correct?

A. Yes.

Q. Because in short, Dr Wallace is providing evidence that RIA is more sensitive than RPHA.

A. Yes. And again using these figures, I would have to revise my RPHA figures to be roughly 67 to maybe about 85 per cent sensitive, compared to RIA, using these figures.

Q. Yes. The last paragraph on page 2 Dr Wallace states:

"There is, in my opinion, substantial evidence in favour of total screening by RIA rather than by RPHA."

I won't go over the page but Dr Wallace was asking for more money to continue the more sensitive screening.

I think the next document we should look at just to complete this chain is document [SGF0012834]. Now, if we look towards the bottom of this page, we can see this is a typed memo by Dr McIntyre of SHHD dated 28 June 1976. If we go back up and stop there, we can see the paragraph beginning:

"Dr Wallace has been involved in the problems of

hepatitis right from the beginning and knows that the problem is complex and that Hepatitis B is only the tip of the iceberg."

Then if we scroll down the memo, please, to the handwritten passage, the first handwritten passage, I'm not sure who the author is, that my be explained next week, but I think we can just see in the first handwritten passage, the second sentence:

"We should rest on the Maycock report."

A sentence I can't read but we may have assistance next week:

"They knew that RIA has marginally more sensitivity."

A. It looks like "sensitive".

Q. Perhaps RIA was marginally more sensitive but did not perhaps recommend as a routine.

We may have assistance with that next week.

We can then put that document to one side. The next document is [SGF0012827]. This is a letter dated 26 July 1976 from Dr Wallace to chief administrative medical officers and others in his health board area. I think Dr Wallace is explaining that he hasn't received the funding he requested with the result that he required to introduce RPHA rather than RIA screening for Hepatitis B, with the result that some positive

Hepatitis B donors would slip through the net. Is that a fair summary?

A. I think that's what he is saying, yes.

Q. The very last paragraph of that letter, for example, Dr Wallace states:

"The reply from SHHD states that RPHA is the recommended method of testing and is the method which should be employed in this region after the middle of August 1976. Accordingly, RIA testing of donations for the presence of HBsAg will cease from 14 August 1976 and thereafter RPHA will be the method used for total screening. In the light of the evaluation, it is estimated that in the course of one year, from nine to 16 donors who are chronic carriers of HBsAg detectable by RIA will not be detected by RPHA".

We can see that there. Could I finally on this point, doctor, please refer to you document [PEN0130393]? I think this is the paper you referred to in paragraph 8 of your statement. Is that right?

A. Yes, I have referred to it on several occasions in the statement, I think.

Q. I'm grateful. And this is a 1979 paper by, is it, Mr or Dr Barr?

A. Mr Barr.

Q. Mr Barr, yourself and I McVarish?

A. Ian McVarish, yes.
Q. I'm grateful. If we can look, please, at the summary or abstract on the first page, we can see that:

"At present in the UK, RPHA is recommended for total screening of blood donations for the presence of Hepatitis B surface antigen. A comparison was made between RPHA enzyme immunoassay and radioimmunoassay with a view to assessing the suitability for routine screening of large numbers of samples. RIA was shown to be the most sensitive and specific method, followed closely by EIA, whilst the RPHA methods varied greatly in their degree of sensitivity and specificity."

I should perhaps just pause at this stage to ask: what is meant by sensitivity in this context?
A. Is sensitivity to detect as many Hepatitis B positives that RIA could actually detect. So it would be against the ones that RIA actually saw. I think that's shown within the tables, within the paper itself.
Q. So essentially, the sensitivity used here is the number of truly positive samples detected?
A. Correct.
Q. And specificity. What does what mean?
A. Specificity is really a measure of the number of false positives you will get with a particular test. Obviously the more false positives you have, the more

donations you then have to put into quarantine until you can actually successfully either deem them negative or positive. So really you don't want a poor specificity. Anything above 0.2 per cent we would say is poor nowadays.

Q. Another way of looking at specificity is that if one has a group of 100 known negatives, true negatives --

A. Yes.

Q. -- then specificity is the percentage of the number of known negatives which result in a negative result?

A. Yes, you want 100 per cent in that situation.

Q. Yes.

A. I sometimes talk in reverse, that the 0.2 per cent I was talking about would make yours 99.8 per cent.

Q. It is easy to get confused in this territory. I think I'll stop that bit there.

Sticking with page 1 of this paper, if we look about two thirds of the way down, since 1970 all blood donations in the West of Scotland have been screened for the presence of HBsAg, and as you have told us in the first five years, the method of testing was CIEP. During this period several cases of proven viral Hepatitis type B were notified and that would be entirely consistent with what you told us about this test not be 100 per cent sensitive.

A. Yes.
Q. Then, if I may go, please, two pages on. We see a table there and just under the table we see:
"In the last 12 months of this period, 8,589 plasma pools were tested by a long incubation RIA method and four positive results were obtained."
Is this a reference to what we saw in your statement earlier?
A. It is more or less what I'm saying. My statement was probably extracted from this.
Q. You then go on to say:
"These four examples of HBsAg were RPHA negative and RIA positive."
You then go on to say:
"It is possible that this is an underestimate as factors such as neutralisation and dilution of HBsAg in the plasma pools could have influenced the number of positive results obtained."
A. Correct.
Q. Are you still of that view?
A. Yes.
Q. I should actually go on two pages again, please. Under "discussion" we can see, the third line down:
"The RPHA systems tested showed remarkable variation in both sensitivity and specificity. Of the

three techniques investigated, RPHA Auscell appeared to be the most sensitive and specific, although it did fail to detect some antigens present in blood donors. From our results of one year of testing using RIA, 12 of the 61 antigens detected failed to give a positive reaction when tested by RPHA."

A couple of sentences down --

A. Can I just come in there and say that the Hepatest was the British manufactured test by Wellcome Diagnostics and Auscell was actually manufactured by Abbott Diagnostics in the United States. The Hepatest obviously was a bit cheaper than the American based system.

Q. I see. Returning to the paper, you state:

"This finding of RPHA negative RIA positive HBsAg carriers therefore appears not to be a rare event. It is likely that a considerable number of such donors exist and can transmit type B hepatitis."

Putting that paper to one side and returning, please, to your statement, in paragraph 8 of your statement in the last sentence you state:

"Therefore, the use of sensitive HBsAg assays led us to believe that we detected all HBsAg positive donors, whether they were prison donors or otherwise."

Is that sentence consistent with the documentation

looked at from Dr Wallace, that RPHA would miss some positive donations and also the paper we have just looked at?

A. It is referring actually to the years we were using RIA as the main test.

Q. I see. So the final sentence of paragraph 8, that would refer to between 1975 and 1976?

A. Yes, and also we moved back to RIA -- I can't remember when but there was a period of about 18 months when we were using RPHA, and then we moved back to RIA. That's when -- I'm relating to that period when we were using RIA. And the period when we are using RPHA, because of the pooling exercise we probably detected a fair proportion of the ones that we thought had been missed, using the pooling system.

Q. Yes. But a fair proportion wouldn't be all?

A. Pardon?

Q. Sorry. A fair proportion wouldn't be all?

A. Obviously.

Q. Yes. But the point is that the final sentence in paragraph 8 of your statement refers to the period when you were RIA screening and there was only a period of roughly 18 months perhaps in Glasgow when you were RPHA screening --

A. Correct.

Q. -- and not RIA screening?
A. Yes, something like that. I can't remember the exact dates. It should be within that paper, though.
Q. Thank you. Now, Dr Dow, I will now leave the question of testing for Hepatitis B and move on to paragraph 9 of your statement. In paragraph 9 you state:

"I was not aware of the existence of non-A non-B hepatitis in Scotland until 1979, when Dr Follett, the head of the hepatitis reference laboratory, had raised the issue with Dr Mitchell."

Can you just explain that sentence to us, please?
A. Obviously I was aware of reports of non-A non-B hepatitis elsewhere in the world but I was unaware of any non-A non-B hepatitis in -- certainly in the West of Scotland at that point -- until 1979 when obviously Dr Follett had a discussion with Dr Mitchell about it.
Q. And what was the nature of the discussion or the gist of it?
A. Well, Dr Follett actually recognised a few cases of post-transfusion hepatitis, which obviously he had tested and found were definitely not B. And because he had tests for Hepatitis A at that point, he reckoned he had tested them through the Hep A test and obviously they became non-A non-B potential cases.

Q. Now, doctor, if you can't remember just tell us but from when you started with the transfusion service in 1974 up until this conversation, can you remember at least in your experience, to what extent non-A non-B was discussed or on the radar or what?

A. It was obviously discussed at some meetings but I can't really remember much about it to be honest because it -- I didn't really know of any cases offhand that I could relate to in Scotland.

Q. Yes. Returning to paragraph 9, you tell us that during 1978 reliable RIA tests for Hepatitis A virus had become available. Now, just pausing there, I think we mentioned earlier that Feinstone and others in 1973 I think, reported the isolation of Hepatitis A and yet it is not until 1978 that reliable RIA tests for Hepatitis A virus become available; a gap of about five years?

A. Yes, that's going to happen.

Q. Is that surprising or unsurprising?

A. We are waiting for some good tests for various reagents and they can take quite a long time. Like cytomegalovirus took several years before it became commercially available.

Q. But in short it took five years in any event between the Hepatitis A virus being reported to reliable tests

becoming available?

A. I don't know when the test was launched. Hep A was -- HAV-Ab was the test that was initially launched for Hepatitis A, but we needed HAVAB-M. It was an IgM antibody test required to actually differentiate Hepatitis A and B. Acute cases. And it certainly wasn't until about 1978 that came along. That was an IgM test for Hepatitis A that showed acute infection.

Q. As you say in your statement, that allowed the investigation of viral hepatitis to include screening for both Hepatitis A and B samples?

A. Correct.

Q. With negative results being potentially non-A non-B hepatitis. You explain that tests were performed on donors and hepatitis patients with histories of jaundice in an attempt to identify if non-A non-B hepatitis was a problem in the West of Scotland. That subject was offered to yourself to pursue with Drs Follett, Mitchell and Professor Norman Grist.

In paragraph 10 of your statement -- I'm not going to go into that. That relates to the question of surrogate testing, which we will look at over the summer but then paragraph 11, I saw that:

"Also in 1980 Dr Bob Hopkins, a senior scientist in Edinburgh, was also researching non-A non-B hepatitis,

together with a PhD student Sonia Field and that a hepatitis winter workshop was held in Stirling."

You say in early 1991, is that 1981?

A. It should be 1981. That's a typo, I'm sorry.

Q. I'm grateful.

You refer to a presentation of yours, which was published. If we could perhaps look at that paper, please. The number is [PEN0140074]. Could we, please, go to the third page of that paper.

We can see about two thirds of the way down, under the heading "Prevalence of FR-type antigen", the last sentence of that paragraph:

"The donor population used included 352 prison donors, among whom Hepatitis B infection is much more prominent than among the ordinary blood donor population and among whom it was expected that markers of non-A non-B hepatitis might also be more common."

Now, what is meant by the last part of that sentence:

"... among whom it was expected that markers of non-A non-B hepatitis might also be more common."

A. It was basically because non-A non-B hepatitis was thought to be a blood-borne virus similar to Hepatitis B. We were just assuming that it was very similar to Hepatitis B.

Q. Thank you. If one goes over the page, please, we can see a table, table 3, "SGPT testing of blood donors". What does SGPT stand for?

A. Serum glutamic pyruvate transaminase. It is the same as ALT really.

Q. The same as ALT. Thank you.

A. It also shows in figure 2, the IEOP test that we were talking about before lunch, showing that what you get in these circumstance is actually two different precipitin lines before you move the things apart.

Q. I think I won't delve back into that territory.

A. It gives you a visual explanation of what we are seeing.

Q. Sticking with table 3, we can see in the left-hand column, category prison donors and also other donors. We can see prison donors: 352 were tested, eight had ALT levels greater than 35. We need to know what 35 stands for?

A. 35 was the upper limit of normal that was defined for that particular test. There is different makers of the test and obviously that was deemed to be the upper limit of normal. 3 per cent of donors were supposed to be above that upper limit of normal.

Q. I see, thank you.

A. Normally.

Q. So eight out of 352 were above 35 prison donors, six

were above 42 and one was above 125?

A. Yes.

Q. And dropping --

A. To define hepatitis, you would actually have to go two and a half times or 2.25 times the upper limit of normal, to define hepatitis.

Q. So where would that take us?

A. Roughly about 92.

Q. 92, yes. And the line below that:

"With other donors, 164 were tested."

We can see one ALT over 35, one over 42 and none over 125. So in short, does that indicate that prison donors are likely to have an incidence of raised ALT?

A. That's what we took from that particular -- that was a very, very small study, obviously.

Q. Yes.

A. And to be honest, other donors, it was quite surprising that there was only one out of the 164. We would have expected about eight or nine because it is supposed to be 3 per cent. It shouldn't be above the upper limit of normal.

Q. If we could put that paper to one side, please, and return to your statement, at the bottom of paragraph 11 I think we see the same table reproduced as we saw in the paper.

A. Yes.
Q. In paragraph 12 you say:
"This showed the prison sessions had more donors with elevated levels of SGPT compared to normal sessions."
You also say that:
"At the Stirling workshop Stuart Houston also presented data showing that the West of Scotland prison sessions had an increased incidence of both HBsAg and Hepatitis B antibodies compared to general donor population."
And you referred to that paper. We should also go to that, I think. That paper is SNB0080002.
I'm sorry, my reference is SNB0080002. It may be this paper is not in our document management system but I can read the relevant extracts.
Certainly, I think it will be very familiar to you, Dr Dow. In short this is a paper published in 1981 headed "Hepatitis B virus markers in blood donors in the West of Scotland." Essentially it is similar to the paper we looked at from Dr Wallace in 1972, I think, isn't it, and testing the prevalence of Hepatitis B surface antigen in different types of donors, including in male prisoners and in males outwith prisons?
A. From what I remember of the paper, we actually tested

prisoners and also our control group, we were testing for anti-Hepatitis B surface and also anti-Hepatitis B core. And actually we looked at the prevalence of the antibodies in prison as against our normal donors and found there was a higher incidence of the Hepatitis B antibodies amongst the prisoners.

Q. Yes. Just reading from the paper -- I think we may actually have it. I think I have given the wrong number. It is [PEN0140068]. I'm grateful.

We can see, I think, doctor, that you were one of the authors of this paper?

A. Correct.

Q. We can see from the beginning of the paper that the Glasgow and West of Scotland Blood Transfusion Service collects in the region of 140,000 donations annually. The next paragraph:

"The incidence of Hepatitis B surface antigen in our blood donors is shown in table 1. In over ten years of total screening we have tested in excess of 1 million blood donations."

Then it stated:

"Despite the high incidence of HBsAg in male prisoners, 1 in 145, viral hepatitis is not a serious clinical problem in the institutions surveyed and the positive donors are not drug addicts. This high

incidence is probably related to social habits and hygiene."

I'll come back to this in a second but if one then look at table 1, the incidence of HBsAg positive donors, we can see under "Institutionalised males", the incidence is 1 in 145 over this ten-year period. Compared with non-institutionalised males the incidence is 1 in 693.

A. That's about five times greater. It is also quite important to notice there as well that in the ten years, as far as donors tested for the first time, we only had 6,234 institutionalised donors tested for the first time. And you would expect that sort of figure in roughly two years, when you think about it. So we had a lot of repeat donors from prisons. And they had obviously been screened and, you know, obviously if they had been screened they were negative.

Q. I'm not sure I understood that point, doctor, could you repeat that, please?

A. What I'm trying to get across is when you go to prisons, they are not all new donors. When we go to prisons, some of them have actually given before. So what we are talking about in the 1 in 145 is that if you had, let's say 290 blood donors actually donated at a prison session, you aren't going to get two Hep B positives

there, you are probably going to get maybe 0.5.

THE CHAIRMAN: Dr Dow, I wonder if I could just have a little bit of help. I think superficially one might have expected, on a totally random sample of institutionalised prisoners, over this period to find some who were drug users.

A. Oh, yes.

THE CHAIRMAN: Have they been screened out of this?

A. They have been asked the questions whether they have been drug abusers, I take it, at the session. I wasn't at the session.

THE CHAIRMAN: I appreciate that. But it does appear to me at the moment that the only way one would get a population that was completely free of drug use would be by getting them out of the way first.

A. Yes, I mean, I don't know how they managed to screen them at the session themselves. But I presume they were asked questions. It is not everybody at prison that actually gave a unit of blood. They weren't all frogmarched to give a unit of blood. So I would expect it was a voluntary ...

THE CHAIRMAN: But if it is indeed the case that one has already removed from the total prison population, those who have signs of intravenous drug abuse or those who admit to having used intravenous drugs, this must be

just a proportion of the total prison population.
A. It is a proportion obviously, yes.
THE CHAIRMAN: And would the chances be that among those who were intravenous drug users, there might be a relatively high prevalence of HBsAg?
A. You would expect that if there were a large number of drug abusers.
THE CHAIRMAN: With the result that taking blood indiscriminately from prisons might increase the risk beyond what is reflected here?
A. What do you mean by "indiscriminately"?
THE CHAIRMAN: Without screening them out.
A. I thought that they would be screened out. I don't think -- if there were intravenous drug users there, you would expect some sort of tracking on their veins and the donation staff would reject these individuals.
THE CHAIRMAN: I'm just thinking of arithmetic.
A. Yes.
THE CHAIRMAN: And almost inevitably, I think, the rate would go up.
Yes, Mr Mackenzie?
MR MACKENZIE: Thank you, sir.
Doctor, going back to the comment on the paper that despite the high incidence of HBsAg in male prisons, viral hepatitis is not a serious clinical problem in the

institutions surveyed and the positive donors are not drug addicts; by the phrase "drug addicts" does that mean current drug addicts, ie at the time the blood was taken, or does that include whether a prisoner had at any time injected drugs?

A. I think at the current time it would be, I think. At that current time.

Q. It may be, doctor, that I have to ask others what actually happened at a donor session.

A. I think you would have to ask others but I certainly didn't attend any of the sessions at any of the institutions.

Q. I understand but you are one of the authors who have said that the positive donors are not drug addicts. What exactly was meant by that and what was the basis for saying that?

A. I think that would have been on the basis that they would have been asked that at the session and would have been excluded from donation.

Q. They would have been asked, "Are you a drug addict?"

A. Yes.

Q. And presumably arms may have been examined --

A. They probably were, yes.

Q. I see.

A. You have obviously got to take the blood from an arm and

the donor attendant would obviously see any tracking there.

Q. There may be a question mark as to how reliable the answer to that may be but that may be something we can consider another day?

A. I think others should be able to answer that better than I can.

Q. We are perhaps moving into matters of policy perhaps to some extent?

A. Perhaps, yes.

Q. Or judgment, perhaps?

A. Yes.

Q. You also say this high incidence is probably related to social habits and hygiene. What's meant by that?

A. The same as John Wallace said in his previous paper.

Q. And what did he mean?

A. I think we explained that to Lord Penrose.

THE CHAIRMAN: Certainly social habits you did. Hygiene is less easy.

A. As regards hygiene, it can have been oral hygiene, because they are sharing tooth brushes et cetera.

MR MACKENZIE: Social habits means homosexuality?

A. Possibly.

Q. I understand.

Could we, for comparison purposes, look at

Dr Wallace's 1972 paper, which is [SGH0029831]. Can we do a split screen? I think I saw that last week perhaps. I think it might be the next page, I think. I'm going to have to get my hard copy to find the passage I'm interested in.

I apologise, it is the right-hand column about a third of the way down. We see the similar phrase: The high incidence "may" be related to social habits and to hygiene.

If we can compare that with your paper, Dr Dow, in 1981, we see this high incidence is probably related to social habits and hygiene. Now, it may be a small point but in the 1972 Wallace paper, the high incidence may be related to social habits and hygiene and yet in your paper, of which at least you were an author, it states that:

"The high incidence is probably related ..."

Does anything turn on that difference between "may" in 1972 to the use of the word "probably" in 1981?

A. I don't think you can make anything of that. It is just a choice of words at the time when we wrote the paper.

Q. Well, there is a difference between "may" and "probably", isn't there?

A. Subtle.

Q. May is a possibility, probably is a likelihood?

A. Correct.
Q. Looking back, with the benefit of hindsight, at your 1981 paper, what do you think is the likely explanation for the higher prevalence of Hepatitis B in male prisoners?
A. Probably drug abuse of some sort.
Q. But that link wasn't made at the time?
A. Not at the time, no.
Q. Can you give any explanation for that?
A. Not really.
THE CHAIRMAN: You say that the high prevalence now would be recognised as drug abuse but this is why I was asking you questions earlier about the identification of the population. If indeed steps had been taken to remove people who showed signs of intravenous drug use from the panel tested, then, of course, you have got a skewed result in these early papers.
A. Correct.
THE CHAIRMAN: And in particular neither of them appears to have addressed the question of the total prevalence of Hepatitis B antigen in the prison population as a whole.
A. Yes.
THE CHAIRMAN: You didn't take people from every cell in Berlinnie and test them.
A. No.

THE CHAIRMAN: I think it is quite important, Mr Mackenzie, to bear in mind that we are talking about something that, for very good reasons no doubt, does give rise to a skewed result historically, which would be different from the perception you would have now. Is that fair?
A. That's fair.
MR MACKENZIE: Just to complete this passage, doctor, could we look at one further paper, please? This is document [PEN0020515].

I refer to this paper as forming part of the general background of what was happening at the time. I should say first this is a special report, "Drug abuse and Hepatitis B infection". If you look at top right-hand corner we see "CDS7721".
A. That's a report from the CDS unit of Health Protection Scotland.
Q. Yes, Communicable Diseases Scotland 1977. So would 21 be --
A. The 21st week, yes. So it would be a June/July.
Q. We can see the authors are Dr Follett of Ruchill Hospital and Dr Chaudhuri of Belvidere Hospital?
A. Yes.
Q. Were you aware of this paper at the time, doctor, or is it too far in the past to answer that?
A. I wasn't aware of this at the time. I didn't personally

get a copy of the CDS report at the time.

Q. I see. I think we can see the beginning of the paper. It says:

"In 1976 at the regional virus laboratory, Ruchill Hospital, Glasgow, Hepatitis B surface antigen was detected in the sera of 108 patients. Of these, 52 were found to be suffering from acute Hepatitis B infection. The remainder being long-term carriers of the antigen. As has been seen in previous years, in acute hepatitis, males greatly exceeded females and the majority of patients were in the younger age groups."

When we go underneath figure 1 and pick up the text, again it states:

"Drug addiction, drug abuse or association with a drug addict was noted in 15 of the 52 patients with acute hepatitis. Almost all of these 15 were in the younger age groups and 14 were of the ay subtype of Hepatitis B surface antigen which predominates in drug addicts with Hepatitis B infection. An examination of the 1976 returns of Hepatitis B detection in the whole of Scotland showed a remarkably similar picture. There were 154 cases of acute Hepatitis B of which 42, 27.2 per cent, were in patients where drug use was noted. The age distribution of the 154 cases and the 42 drug associated cases was little different from that

seen in Glasgow."

Over the page:

"It is apparent from these observation that drug abuse has given rise to a very significant number of the total cases of acute Hepatitis B in Scotland. The noted percentage for 1976 is very likely an underestimate as several patients may not be asked about or admit to drug abuse or association with drug abusers. It is also evident that this is not another problem peculiar only to the West of Scotland; it occurs throughout Scotland, and what is seen in Glasgow reflects but does not magnify what occurs in the whole of Scotland."

I refer to this, doctor, as part of the background but is this the sort of information and evidence that you would have been aware of when producing your 1981 paper or is this a different discipline you wouldn't have been aware of?

A. Dr Follett was my supervisor so he was obviously aware of it, and he obviously related it to perhaps there was more drug abuse in the prisons than we obviously perceived. And obviously in my PhD I realised that there were a number of the ones that I found with high ALTs. I recognised their names and they were going through hepatitis reference lab and were in because they were intravenous drug users.

Q. Thank you, doctor, I will turn now to your witness statement, if I may. I think that completed paragraph 12. I'll skip paragraph 13. That's again more surrogate testing, which are we are able to come back to after summer. If I may pick up again, please, at paragraph 14. You say:

"Prospective studies were considered within my PhD studies ..."

That will be prospective studies into non-A non-B hepatitis?

A. These are mainly to actually ascertain -- the same way that the two papers from America by Alter and Ach(?), they were able to do prospective studies. Really, a lot of UK people were wanting to do the same, to organise a prospective study to see if there was a problem with non-A non-B hepatitis.

Q. Can you help us briefly with what is meant by "prospective study".

A. It was really to follow up a group of patients who had been transfused; to get follow-up samples from these patients and to ascertain whether at follow-up you can actually identify some of the surrogate markers.

Q. So a group of patients would be tested before the transfusion?

A. Correct. There would be a baseline sample before

transfusion and then a follow-up sample, or several follow-up samples, to try and capture them at the time of potential hepatitis. That was fairly costly to try and do that.

Q. Yes. Going back to paragraph 14, you explain that an attempt was made using heart bypass surgery patients at Glasgow Royal Infirmary, but from your recollection, this study gives such a poor return with only two or three patients returning at around six months post surgery:

"... it was realised that a proper prospective study would have required active participation by all heart surgeons and their clinical staff and using the six month timing would, in retrospect, not have identified many people with non-A non-B hepatitis."

Can you explain that last sentence a little to us?

A. As regards the timing?

Q. Yes, the six months timing?

A. Oh, the six months timing would have been out because we reckon that non-A non-B hepatitis had a seven week incubation period.

Q. Yes.

A. So at seven weeks following transfusion, that's when you would start to see the LFTs going upward. And the LFTs could be back down within a week, two weeks sometimes in

some of these individuals. So to sample somebody at six months, as far as ALT would go, wouldn't be very productive.

Q. I understand.

A. Anti-core would be something different because anti-core would have been lifelong but that would be related to Hepatitis B.

Q. In this particular study patients weren't tested until six months after --

A. Correct. Because there was a six-month follow-up with what was actually happening to these patients. They were only coming to their clinician for that six-month follow-up.

Q. I understand. In paragraph 15 of your statement you explain:

"Throughout the 1980/85 period [you] performed SGPT testing on a sporadic basic."

You explained:

"The use of prison sessions was intentional as they had already been shown to have a high incidence of HBV, and as non-A non-B hepatitis was also thought to be blood-borne, prison sessions were an obvious target population as were haemophiliacs, intravenous drug users and renal dialysis patients."

I think you explained to us earlier why prisoners

were an obvious target population for markers of -- at least surrogate markers -- non-A non-B hepatitis, because you, I think, explained that it was envisaged that non-A non-B hepatitis would be similar to Hepatitis B virus, at least in the sense that both were blood-borne?

A. Both were blood-borne, yes.

Q. You then go on, in paragraph 15, to explain that by early 1984, media revelations regarding the number of IV drug users in Scottish prisons eventually led to no more blood being taken at prison sessions. This, however, did not prevent former prisoners on release coming along to donate at any of the blood sessions.

I think I had asked you previously why the link didn't appear to have been made in 1981 between drug use, at least in prisons, as an explanation for the higher prevalence of Hepatitis B in prisoners. You refer here to early 1984 media revelations regarding the number of IV drug users in Scottish prisoners. Do you remember which report or reports you are referring to?

A. I certainly remember a report in a Sunday paper that actually revealed that there was a lot more drug abuse in prisons than I ever thought, and that was in the early March that came out.

Q. March 1984 do you think?
A. March 1984.
Q. Yes.
A. I was totally unaware of the amount of intravenous drug users that were in prison up to that time.
Q. So that was brought to your attention by a report in a Sunday paper?
A. Yes.
Q. I see.

Now, could I also, please, at this stage pause to refer to another document which I think you will be familiar with. It is document number [SGH0028040]. Now, I think you had referred previously to your PhD project on non-A non-B hepatitis in the West of Scotland and I think this is a final report to the body which provided the grant. Is that correct?

A. Correct, yes.
Q. That's the Scottish Hospital Endowments Research Trust?
A. That's right, yes.
Q. And we can see from page 1 of this document that the grant holders were yourself and Dr Follett. You see the project title. We see it was a three-year project. It started on 1 September 1980. It ran until August 1983. If we go over the page, please, we can see the date of this report is July 1984. If we can go over the page

again, please, we see a summary, which provides:

"In the West of Scotland non-A non-B hepatitis determined by exclusion of acute Hepatitis B and Hepatitis A markers is not a major problem. Cases of post-transfusion hepatitis are rare but haemophiliacs and drug users do present with unexplained jaundice episodes."

When, in the first sentence, you stated that non-A non-B hepatitis as determined by the exclusion of acute Hep A and Hep B markers is not a major problem, does that really depend on the reports of post-transfusion hepatitis which were made to the Blood Transfusion Service?

A. Yes, that's what we were referring to at the time.

Q. So this is really a difference between a study based on prospective follow-up of recipients?

A. -- it is also dealing with patients that are coming through the hepatitis reference lab, because obviously that was where we were looking to try and identify individuals. And then through that I was actually asking if these people had been transfused. So we were actually kind of prospectively trying to recruit more.

Q. I understand. So this study wasn't limited to post-transfusion hepatitis, rather it was the prevalence of non-A non-B hepatitis in the population generally?

A. Correct, yes.

Q. I'm grateful, yes.

Then over the page at page 4, we can see the main aim of the project was to determine:

"... whether unrecognised viruses are circulating in the Scottish population resulting in cases of hepatitis which at present cannot be categorised. Other aims include identifying whether such viruses have a carrier state and whether diagnostic tests can be developed to identify these viruses."

If we can go over the page again, please, this is really by way of background. Under "Introduction" you can see halfway down, now that the very sensitive and specific tests are available --

I think we can pause at this stage, perhaps, doctor.

THE CHAIRMAN: A bit of a short break at this stage, doctor.

(3.22 pm)

(Short break)

(3.30 pm)

MR MACKENZIE: Dr Dow, I think we were looking at your final report in 1984, and we were looking at page 8044 in our numbering system, subheading "Post-transfusion hepatitis". It states that:

"In the past four years, only 14 cases of non-B post-transfusion hepatitis have been notified to the

Glasgow and West of Scotland BTS. Of these 14 cases, four were haemophiliacs who had been multiply transfused with Scottish and imported blood products. It would, therefore, appear that post-transfusion hepatitis is not a significant problem in this region, although subclinical forms of post-transfusion hepatitis probably occur but are not being notified."

Do you have any comments on that last sentence with the benefit of hindsight?

A. Well, not really, apart from that, you know, obviously for post-transfusion hepatitis to be actually notified to us, that would have to be something that a clinician was quite happy that was related to transfusion and obviously a person was so clinically ill to be reported to us.

The thing about Hepatitis C is that quite a lot of the people infected with Hepatitis C probably didn't even know they had been infected. There was no acute episode of hepatitis with them.

Q. So with Hepatitis B the majority of people who get the virus display clinical symptoms?

A. I wouldn't have said the majority, no, I would say just a proportion.

Q. I'm sorry?

A. I would only say a proportion.

Q. In Hepatitis B only a proportion of patients display clinical symptoms?
A. Correct, yes.
Q. Would you agree that with Hepatitis B a majority of people who get the virus have an acute phase of hepatitis?
A. In adults, yes.
Q. You said "yes" to that statement?
A. Yes. But they don't all come down and actually see even their general practitioner.
Q. No.
A. It is only if they feel unwell, they will go to a GP.
Q. Is the problem in short not that if one is relying on the reporting of acute or clinical cases of Hepatitis C, the difficulty is that the majority of people who have Hepatitis C don't have clinical or acute forms of the disease?
A. They are not yellow. They don't generally go yellow.
Q. Yes. You mentioned previously they may only have mildly elevated ALT levels?
A. Correct, yes.
Q. And may be unaware they have symptoms?
A. Totally unaware, most of them.
Q. At least we know now, in any event, with the benefit of hindsight that if one was seeking to determine

prevalence of post-transfusion Hepatitis C by the number of cases reported, it is likely to be an artificially low number?

A. Correct.

Q. Because the majority of post-transfusion Hepatitis C recipients won't report?

A. Correct.

Q. Yes. Was that known at the time when you wrote this report in 1984?

A. No.

Q. Yes, and I think you allude to at least the potential problem in this sentence, where you state:

"It would, therefore, appear that post-transfusion hepatitis is not a significant problem in this region ..."

You do then go on to qualify that by saying:

" ... although subclinical forms of post-transfusion hepatitis probably occur but are not being notified."

A. Going back to that time, we knew with Hepatitis B, for instance, that 2 per cent of the population have evidence of antibodies to hepatitis B at that time, yet the number of individuals that were reported to us were considerably a lot less than what you would expect.

Q. Yes. And then the next subheading is, "Donors' SGPT or ALT testing," and this brings us back to the early

American papers and surrogate testing for non-A and non-B. You say:

"Evidence from the USA would suggest that if ALT testing is performed on all blood donations and those with high levels excluded, around 29 to 40 per cent of non-A non-B PTH cases could be prevented, with a loss of around 3 per cent of blood donations."

Over the page, please:

"A total of 10,655 West of Scotland blood donors have been tested for elevated ALT levels. Table 1 shows that screening prison sessions resulted in detecting ten times more donations with grossly elevated SGPT levels compared to other sessions."

That, I think, is consistent with the paper we looked at earlier, where we saw that prison donors were more likely to have elevated ALT levels. Is that correct?

A. Yes.

Q. And then at the end of this paragraph it states:

"Of the prisoners with high ALT levels, nine were found to be known drug abusers. These results have discouraged the SNBTS from visiting prisons to obtain blood for transfusion purposes."

To pause there, doctor, we saw in your statement a reference to -- you mention an article in a Sunday

paper as having eventually led to no more blood being taken at prison sessions, but the results of your study in respect of the raised ALT levels in prisoners, was that another factor?

A. It was another factor, obviously, that probably helped the cessation of going to prisons and certainly in the West of Scotland because we were probably the last region to, obviously, stop the process.

Q. And we can ask other witnesses about that more fully next week?

A. Correct, yes.

Q. I see.

A. I don't know if any of these actually influenced the final decision.

Q. And simply for completeness on this question of prisoners, could we go, please, to page 8051 in this document? It is headed, this page, "Drug abusers". The first paragraph says:

"Over the past two years the hepatitis reference laboratory has seen a steady increase in samples from drug abusers. HBV accounts for the majority of jaundice episodes in this group but there are numerous cases where clinicians have mistakenly diagnosed non-A non-B Hepatitis on the evidence of an HBsAg negative result."

Then, at the bottom of the page, just above the

table, we see the passage:

"The vast majority of abusers with elevated ALT levels admitted being heroin addicts and a considerable proportion were prisoners. These facts have also helped dissuade the SNBTS from visiting prisons to obtain blood for transfusion purposes."

So we see there a recognition of the link between drug use and prisoners.

A. Yes.

Q. Thank you. I think we can put this document to one side, thank you. Returning to your statement, please, doctor, paragraph 16 of your statement develops a little of what we have just been looking at in the final report. It states:

"Working with both blood donor samples and patient samples led to a recognition of certain names within the PhD. A number, 15, of the prison donors with grossly elevated SGPT levels were also found in patient referral samples with a group of intravenous drug users. These individuals were associated with anti-HBV positivity, indicating past HBV infection."

If we go over the page, please, the table at the top, I think, is just another illustration of what we discussed before, about increased ALT levels in prison donors?

A. That's right, it is a more up-to-date one. I think that was the one that was taken from the thesis at the end, 1985/86. It was just an extension. Obviously, there were no further prison sessions after 1984 anyway.

Q. Yes. In paragraph 18 there is a listing of the institutions visited. I won't read that out. Then, to pick up the text half way down this page, you state:

"Within the PhD study most of the donations that exhibited across the elevated SGPT levels greater than 92 SF u/ml ... "

I should pause to ask what does SF u/ml mean?

A. That was an unitage that was used within the SGPT test that I was using, which was Sigma Frankel units. That's a German unitage.

Q. You should perhaps spell, I think, SF --

A. S-I-G-M-A, and Frankel. I think it was F-R-A-N-K-E-L.

Q. Thank you. So:

"These particular donations were physically removed from the blood bank, the plasma separated and stored frozen for research purposes and by around 1993, after Hepatitis C donor testing had commenced, samples from 32 of these units were tested in second and third generation Hepatitis C assays and also tested for the presence of Hepatitis C virus RNA by polymerase chain reaction."

You then tell us:

"The results of this exercise were published."

And you state:

"26 of the 32 donations were confirmed HCV antibody positive and a further two were shown to be only HCV PCR-positive, with only four negative for HCV."

I'll come to the paper in a second. And you conclude:

"In hindsight, therefore, SGPT testing of prison donations, using an elevated cut-off, would have removed some potentially HCV-positive donations."

I think the article is of interest, if we may turn to it. The number is [PEN0140072]. I think it is perhaps of interest, in that in a way it completes the story. We have gone over the early reports of the higher prevalence of Hepatitis B in the prison population, you then have looked at the higher incidence of elevated ALT in the prison population, and this then, I think, really answers the question, at least in respect of these samples: did the prison donors carry Hepatitis C or not.

This is a report of a letter to the journal Vox Sanguinis by yourself and a number of other authors as well, printed in 1994. We can see from the left-hand column a few lines down -- it is quite hard to read,

I am afraid. It might be possible to magnify it a little.

Yes. Left-hand column, about eight lines down:

"A total of 54 donations, 50 from prison donors and four from other donors, were found to have ALT values in excess of 2.5 times the upper limit of normal criteria used by many to indicate hepatitis. All 54 donations were HBsAg negative by RIA."

So they weren't Hepatitis B:

"32 of the 54 plasma donations were stored at minus 20 degrees centigrade and aliquots were used with presence of antibodies to Hepatitis C, Hepatitis C RNA and anti-Hepatitis B core antigen in 1993. All 32 were male donors and all but one were prisoners, all fulfilling the 1984 criteria for donors."

What does that mean, "All fulfilling the 1984 criteria for donors"?

A. Obviously, that was meaning that they all answered the donor selection questions at that time.

Q. I understand.

A. Accordingly.

Q. Moving on:

"Anti-HCV screening was performed using the second and third generation HCV ELISAs. 26 of the 32 donations were reactive with all four ELISAs, while the remaining

six were non-reactive with all four ELISAs. In the RIBA 2 assay 23 of the reactives were positive and three were indeterminate."

Bottom of the left-hand column:

"The three RIBA 2 indeterminates became positive, suggesting that all 26 of the donations that were reactive with second and third generation anti-HCV ELISAs were potentially infective for HCV."

Then just a few lines down from that, the middle column, we can see 21 samples were shown to be PCR-positive."

So I think, in short -- and tell me if I'm wrong, but I think, in short, from this paper, 26 of the 32 samples, when tested by HCV ELISA and RIBA, were potentially infective, ie they detected antibodies to Hepatitis C, and that 21 of the 32 samples were infective when tested for DNA using PCR testing.

A. I think that's probably shown in the next page. There is a nice table that is sometimes better than the writing.

Q. Looking at that table, doctor --

A. That table actually shows to me that --

Q. So does that suggest that, of the 32 samples, 26 were antibody-positive on ELISA and RIBA testing?

A. That's right, there's 26 were actually confirmed

antibody-positive and there was a further two that were actually PCR-positive. We can see there is a (i), that actually on the right-hand side those ones that were actually negative in the both second and third generation tests were actually PCR-positive. These are donations that nowadays we would have to screen something like just under 2 million donations to get one of these in our donor population.

Q. If we go back to page 1, I can see the purpose of this letter was, as the heading states, to report the failure of the second and third generation HCV ELISA and RIBA to detect HCV PCR-positive donations. One or two had slipped through --

A. That's correct.

Q. -- even the second and third generation ELISA and RIBA.

A. We used these samples way back in 1980 to 1985 to actually show that the existing tests that we were using in 1993/1994, even though they were third generation, were not 100 per cent perfect.

Q. True, but what seemed to me, doctor, to be of interest for today is that, of those 32 samples, all of which bar one were from prisoners, 21 were PCR-positive?

A. Yes, the 21 that are PCR-positive are the 21 that would infect. Obviously, the ones that are PCR-negative are highly unlikely to infect anybody.

Q. Thank you. Sir, I think that completes that particular chain?

THE CHAIRMAN: Mr Mackenzie, if you bear in mind the time --

MR MACKENZIE: Yes, sir.

THE CHAIRMAN: -- if you are starting a new topic, do we have time for it?

MR MACKENZIE: Certainly, sir, I won't finish today with Dr Dow. What I had hoped to do were to put four papers to him to do with the --

THE CHAIRMAN: In less than ten minutes?

MR MACKENZIE: No, which would complete prisoners, but I appreciate that it may be overly optimistic to get through four papers in ten minutes.

This may be a suitable time to break and then come back with Dr Dow at a later stage.

THE CHAIRMAN: You might wish to consult. (Pause)

MR MACKENZIE: Yes, sir, maybe I could take a break from this topic now. I think Ms Dunlop has very short questions in respect of Mr Laing, whom we looked at last week, I think. It may be that that could complete today's business.

THE CHAIRMAN: Yes. Is this on ALT?

MS DUNLOP: Yes.

THE CHAIRMAN: Perhaps I could just do a little introduction of my own but try to keep it very short.

MS DUNLOP: I'm not going to ask any questions if that helps.

THE CHAIRMAN: That will help.

Dr Dow, as I hope you would expect, I have been reviewing your evidence from last week and, fascinating though the whole idea of genome enquiry might be, it might be that eventually I will have to cut it down for general consumption. But there are one or two things that did concern me just a little that we didn't follow up.

One was that, possibly at my invitation, you rather agreed that the good fit between the Abbott first generation and the American problem was casual, but would the test have been developed using America blood or plasma as the reference material?

A. I presume it was American material that was initially used by the Chiron Corporation in California.

Q. So it is perhaps not as likely to be as purely casual as perhaps I suggested?

A. No, it is probably practically impossible to be anything else but genotype 1, I think. There's probably a 90 per cent chance that it would be genotype 1.

THE CHAIRMAN: Good. Thank you very much. That will stop me committing a solecism in that respect.

The next short point is that if we forget the

specific donor characteristics and look just at your general analysis of the pie charts, that showed roughly 30 per cent being thrown up for genotypes 2 and 3 -- looking at that alone, would one say that it was unlikely that the application of an Abbott first generation to any sample at that stage that was genotype 3 would have shown a positive result? Less than 50 per cent?

A. The 30 per cent is what we came up with when we challenged them, obviously. What I should have said is that the ones that were reactive were quite weakly reactive.

THE CHAIRMAN: That's a different point, which I was going to ask next. But just looking at the crude arithmetic of it, one has a less than 50 per cent chance?

A. Definitely.

THE CHAIRMAN: If in fact one looks at the tabulations that follow, not only was it a small proportion, but the reading was very weak relative to the reading in genotype 1?

A. The ones that were reactive were obviously a lot weaker, yes.

THE CHAIRMAN: And the third point is that, so far as the evidence goes so far, I think that your clinch point, as it was, as it might be called, was, when one looked at

the actual donor and applied retrospectively the Abbott 1 test, it did not produce a positive result.

A. It was a negative -- I did actually tell counsel the actual readings at the time --

THE CHAIRMAN: Yes, indeed.

A. -- I met her.

THE CHAIRMAN: Is that the essence of it in Mr Laing's case so far?

A. No, because we have also uncovered from follow-up of the donor that the donor himself has actually been followed up on four occasions for ALT.

THE CHAIRMAN: Yes, I was about to emphasise the words "so far".

Ms Dunlop?

A. Sorry.

MS DUNLOP: Yes, I was just going to save Dr Dow from actually going into it at all, sir, by narrating that since last Friday Dr Dow has slightly expanded his paper. The stimulus to do that came from the reference in evidence to the possibility of the donor being detected by abnormally elevated ALT levels.

As you will recall, sir, from last Friday, that was the missing piece of information about this particular donor but, because of a concern in SNBTS that the Laing family have been left thinking that on the balance of

probabilities ALT testing would have picked up this donor, some further research has been done and I gather that Dr Gillon has ascertained that the records -- medical records, I assume -- of this particular individual, who was T2103, do contain some ALT measurements and in fact they are very low. So, although it is only a minority of genotype 3 individuals who have normal ALT levels, this donor was one of that minority.

THE CHAIRMAN: I think, Ms Dunlop, I did know that, Dr Dow, but I think, before it is discussed more widely, if it is to be, I think that the supplementary paper should be distributed.

MS DUNLOP: Well, Mr Di Rollo has a copy and it is fair to say he has only seen it very, very recently, so I can't take matters any further or indeed expect him to express a finalised position on it. It was just as much to get it into the transcript as anything else.

THE CHAIRMAN: I don't want to go any further today, Mr Di Rollo. I think that it is quite a significant bit of additional information. It may have to be discussed but now that it is in the public domain, as it were, you can decide among you to what extent it has to be examined later.

MR DI ROLLO: Very good.

THE CHAIRMAN: Dr Dow, thank you very much so far.

A. Okay, thank you, sir, so far.

(3.56 pm)

(The Inquiry adjourned until 9.30 am on Tuesday, 22 March 2011)