

Science and Technology Committee

Oral evidence: The Work of the Government Chief Scientific Adviser, HC 1205

Wednesday 30 March 2022

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Members present: Greg Clark (Chair); Aaron Bell; Chris Clarkson; Katherine Fletcher; Rebecca Long Bailey; Carol Monaghan; Graham Stringer; Zarah Sultana.

Questions 1 to 91

Witness

I: Sir Patrick Vallance, Government Chief Scientific Adviser.



Examination of Witness

Witness: Sir Patrick Vallance.

Q1 **Chair:** We now invite Sir Patrick Vallance to join us. Sir Patrick is very familiar to everyone on the Committee. He has been extraordinarily helpful in appearing before us on many occasions during the pandemic and indeed on our other inquiries. As everyone knows, Sir Patrick is the Government's chief scientific adviser and is also the national technology adviser.

Thank you very much for coming, Sir Patrick. We have a number of different areas to cover, to which I think you have been alerted. We have just been talking about covid, so perhaps we can start with that, particularly about trying to learn lessons from the most recent wave of omicron and the modelling on that.

You might have seen the evidence of Graham Medley, who has also been consistently helpful to the Committee. One of the things that he said struck the Committee as interesting, namely that the group he chairs, SPI-M—the modelling group—provides a range of scenarios to SAGE, which then provides them to the Government. There is no steer as to which of those scenarios is more likely than others. Is that your understanding of how things are?

Sir Patrick Vallance: The modelling is an input to SAGE, not an output from it, so it is quite important to understand that one of the reasons that we have SAGE is to bring together a range of expertise to consider the inputs and think about what that means in terms of advice to Government. If you look at the modelling inputs, there was a range of scenarios across a series of different assumptions—and one of the things about models, of course, is that they make assumptions which then feed into what the outputs of the models are. Each model will have a slightly different set of assumptions, which is why looking at multiple models is quite important.

If you look at the output from SAGE over that period, I think we said that we thought that by the end of the year there might be something like 1,000 to 2,000 people in hospital every day. The figure was 1,800, and we said that it could go to 2,000 or 3,000 if behaviours or measures did not come into place. It got to 2,600 or something.

In SAGE, we tried to take the models and say, "What do we think is the most likely thing out of all of this?" and that is where we came to at that time point. There were models, for example, the Warwick one, where they assumed 20% severity, 80% generation time—the time between one infection leading to another—which was much closer to the outcome than some of the others. It is right to have a range of models and it is right to understand the assumptions, because in doing that you begin to say, "Actually, if it is moving in the direction we think, that is much less realised severity and looks more like these ones." If that changes, you



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then say, "Actually, I think the other one, probably, is the way this is going."

The job of SAGE is to try to turn that into where we think the central position is, as well as the worst case. It is always good to have a worst-case scenario. You will know, Mr Clark, from your time as a Secretary of State, that that planning tool is used in every situation across Government. That is quite important.

Q2 Chair: Absolutely. I completely recognise that, and it is right to have a range of possibilities and scenarios, based on different assumptions and to understand the reasonable worst case. I guess my question following Professor Medley's evidence, is whether, within that range, you, as GCSA or SAGE, provide to policy makers, to Ministers, a guide within that range of possibilities as to which are the most likely ones? If a policy decision has to be made, you would want to make it on the more plausible, or more likely, scenarios—perhaps to use that word—rather than the more unlikely ones.

Sir Patrick Vallance: Yes. Again, that was exactly the output of SAGE. It did not go with the outlying models, and that is why we said that we thought of perhaps 1,000 to 2,000 hospitalisations per day by the end of the year, perhaps 2,000 possibly going to 3,000 or more if behaviours did not change or there weren't other measures. That wasn't even necessarily central from the models, if you just took all of them and said, "What's in the middle of the models?"

We probably ended up with an advisory position which was down towards the more optimistic end of the models as presented. That is what happens and that is the role, I think, of SAGE, rather than the role of the modellers, which I think is to do what they did, which was to produce a range of scenarios, with possible outcomes, as a result of those different assumptions.

Q3 Chair: The modellers are represented on SAGE, so it's a conversation in which they take part. The modellers are in a position to themselves have a view, presumably, on which are the more likely scenarios—on which are the assumptions that seem to be very unlikely to reflect reality and those that seem to cleave closely to it.

Sir Patrick Vallance: The reason why, I think, SPI-M does what it does is that it takes in models from multiple different groups. They have a discussion among themselves as to what they think are the bounds of possibilities as a result of that and they present that in their papers as the range of possibilities. They don't generally come up with the sort of central case that they all think, but it is the job of SAGE, I think, to try to do that, because we want to integrate other factors as well.

The other thing I would say is that it's very, very important that data trumps modelling, and therefore real-time data flows that allow you to see what is happening are the really important things when you are thinking about decisions. And the modelling is giving you a range of possible



outcomes, depending on whether those assumptions turn out to be true or false.

- Q4 **Chair:** The Committee is very interested in this balance—if it is a balance—between data and modelling and whether, perhaps for understandable and good reasons, more emphasis was placed on the modelling than the data at certain points, but we'll reflect on that.

So there is the question of which are the more likely scenarios, and then there is the question of whether the scenarios were accurate predictors of the future as well. We have had a discussion with some of the Danish modellers, who had a more dynamic response of behaviour and were able to make more accurate modelling predictions of what turned out to be the case.

In our previous report, we thought that there was a case for greater international representation on SAGE and, by implication, its committees. Is this an example of where, given the different approach of the Danes, it might have been good to have the Danes and perhaps some other countries' modellers in the room, so that it wasn't a purely domestic set of people making these assessments and predictions?

Sir Patrick Vallance: First of all, SPI-M is very well internationally connected, and modellers are a group that speak to each other all the time across countries, so I am absolutely sure they were very well aware of models in other countries and other people interacted with them. The CMO Chris Whitty and I spoke to the Danish team in the weeks in December and spoke to them about their modelling. They published some of their modelling. Actually, their projections, when we spoke to them, were very similar to what we were saying from SAGE. They were almost identical, actually.

As you are probably aware, as a result of that, Denmark in fact took rather stronger action than the UK did, in terms of the changes they made. I think the Danish model you may be referring to is the one where they make an assumption that when hospitals fill up to a certain stage, behaviours will change in a certain way. And they make a sort of fixed assumption around that, so it's not a very sophisticated range, but they make that assumption. In effect, that's the same as some of the assumptions made in, for example, some of the Warwick models, and the curves pretty much overlap. So those scenarios were there. I think it would probably not be right to assume that Denmark followed a totally different modelling input. That's certainly not the discussions we had.

On your broader point about international, we have had very regular discussions throughout the pandemic with a series of colleagues around the world—US, Asia, and very regular across Europe with a group that we have pulled together every week or two weeks, depending on the time of the pandemic—where these sorts of things are discussed and shared, so I think there is quite a lot of interchange. Would it be possible to get some of those people on SAGE?



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We did, for example, in November when omicron first appeared in South Africa—we actually asked the two people who had found it in South Africa and worked on it, and they came to SAGE. We had discussions with them and they came to a couple of SAGE meetings; I think they attended SPI-M as well. It does happen. It is quite difficult, as you can imagine, to pull on international people to be standing members of something like SAGE, because the answer, not surprisingly, is, “Hang on, I’m pretty busy in my own country.” We organise separate meetings to do it.

- Q5 **Chair:** I understand that. We know that, for obvious reasons, quite a lot of SAGE meetings were on Zoom and virtual, which makes it easier. Would you not agree that there is a difference between taking evidence from someone—this Committee is perhaps an example—and having someone as part of the discussion and deliberations? Is there not a case for using the technology to have people from a different environment and community to be part of those discussions, as well as to take expert evidence from them, which I acknowledge you did?

Sir Patrick Vallance: It was not expert evidence so much. The people from South Africa were part of the discussion when they came to SAGE. The discussions we had with our European and other colleagues around the world were very much about trying to discuss what differences we were seeing in experiences on the ground: what was happening, modelling, behavioural things, measures, and what difference they were making. They were very discursive and were meant to be trying to share information.

Everyone found them incredibly valuable and an important part of it. On whether we can get more of that in SAGE, I think the difficulty is that they are busy with their own things. These were set times for groups of us to come together very regularly to talk about these sorts of differences.

Chair: I understand that. Let me turn to my colleagues and then I will come back with some questions on other areas of your extensive portfolio.

- Q6 **Graham Stringer:** May I ask a blindingly obvious question? Throughout the pandemic, what do you wish you had done differently? What advice do you wish you had given differently?

Sir Patrick Vallance: It is obviously an incredibly important question, and one on which I think we will also benefit from looking back at what happened and the difference made.

For example, we need to understand which components of so-called lockdown—there were different lockdowns at different times in different countries—made a difference and which were less effective. We need to understand that. Probably one of the big, important points is that SAGE can give science advice; it is not the operational body or policy body. The links between the advice and operations and policy are incredibly important. I think that is something that needs to be looked at: operational delivery of all these things is crucial.



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There will be things, as we look back, where we ask whether we could have said more or less, or gone faster or slower. I am sure there will be things that we look at and say, "Yes, that could have been different."

- Q7 **Graham Stringer:** There is a lot of debate in the scientific and national press about how effective lockdowns were. One stat struck me, and I would be interested in your interpretation of it. Half the infections during the first wave of covid took place after lockdown. What is your interpretation of that, in terms of the effectiveness of lockdowns?

Sir Patrick Vallance: There have been numerous papers so far that have tried to look at the effectiveness of lockdowns. One that got a lot of press was from some economists at Johns Hopkins, which I don't think was peer reviewed, or it hasn't been peer reviewed yet—I don't know.

- Q8 **Graham Stringer:** It wasn't really even from Johns Hopkins, as I understand.

Sir Patrick Vallance: No, exactly. There are several others that have tried to look at this. Wherever you look at it, you do see a temporal relationship with decreased transmission and lockdowns. I don't think there is any doubt that there is an effect there, and that effect is quite big.

Of course, when you look at data, very often you've got a lag, so some of the reasons that you continue to see infections is that infections have entered households and you are getting household transmission, which causes a continuation. Lockdowns tend to occur when the infection rate is on the up, and as a result you see a continued pressure of that post-lockdown, so I am not surprised that you continue to see cases.

I do think it is going to be incredibly important to now look internationally and nationally and try to dissect which components of restrictions were the most important. The world should learn from this, and we should learn from it, so that there is an advice handbook for the future and also to take into account the different characteristics of viruses.

We can see this already across the world: the transmissibility associated with omicron is different from the transmissibility associated with the alpha or Wuhan strain, and probably the measures would make a different effect as well. I think a sophisticated look back at the specific actions in lockdown and which ones had the biggest effect on transmission under which circumstances is an important piece of work to do.

- Q9 **Graham Stringer:** I would like you to put on record a statement, going back again to the discussion that is taking place in the national press. International comparisons are being made, say, between this country and Sweden—which did not have a full lockdown, although it took measures—and looking at fatality rates and infection rates seems to show that those countries that had lockdowns did not do any better than those countries that did not or that had only modified lockdowns. What are your comments and your observations on those comparisons?

Sir Patrick Vallance: Again, it is exactly the sort of thing that needs to be looked at. It is very difficult to compare countries in terms of the

overall mortality rates. Excess mortality is probably better than covid-specific, because of ascertainment issues. Lots of other things in countries will make a difference, such as density of population and population structures, so it is pretty difficult to do those comparisons accurately. Within-country comparisons and looking at timings clearly show effects of lockdowns. Where everyone ends up, of course, depends on the entire picture from beginning to end, plus of course the overall rate, so it is not an easy one.

My final comment on Sweden is that it is quite a significant misconception that Sweden did not do anything. They did not have children in school from quite early on—they were all taught remotely. They had distancing in restaurants quite early on. They had quite significant changes. The difference was that it was a sort of population-led thing with advice, rather than regulation, but if you look at what they actually did, it was quite a lot.

- Q10 **Graham Stringer:** I went to a presentation on Monday evening by a professor of risk analysis from Bristol University, and he seemed to show that if you looked at the number of life years lost compared with what would be expected, and the deaths and life years lost from covid, the impact of the non-covid deaths, the problems with the economy and the health service not being available, there were more life years lost—I am sorry if I am getting the technical terms wrong—because of the impacts of the policies. That is, the cure was worse than the disease, to put it simply. Are you aware of that analysis?

Sir Patrick Vallance: I do not know that I am aware of that specific one, but I am aware that people are looking at that. That is part of the dissection of what the effects were—the effects on transmission and the effects on other things as well.

These are clearly important things to look at for future planning, preparedness and responses. I think the analysis that has been done so far—though it needs to go into much more detail—would overwhelmingly suggest that covid is the major, major direct cause of death. The UK data would support that. There will be detrimental effects of lockdown. That was very clear from the beginning. It was stated very clearly at the beginning. Lockdown is not something to undertake lightly. Indeed, there are gradations of what one means by lockdown as well.

- Q11 **Graham Stringer:** The production of vaccines within a year of start of the epidemic was extraordinary and faster than it has ever been done before. There are good lessons to be learned from that.

When Dominic Cummings came to the Committee, he said it could have been done even more quickly. His view was that if you paid volunteers to be infected or not infected and had a study, you could effectively have dispensed with the community testing that went on in South America and everywhere and we could have got to the position where we knew that the vaccine was safe or not safe much more quickly and gone into production.



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Do you have any sympathy with that idea? Do you think it is practical? Obviously, you would have to look at the ethics and the volunteers in any testing, but do you think that is a future pathway to producing vaccines even more quickly?

Sir Patrick Vallance: The stages of vaccine production—to use your term—include the initial phase of research and the making of the product, which was done remarkably fast, the initial phase of testing in the clinic and then the larger-scale clinical trials. If you look at the history of interventions in medicine, and if you look at the last two years, many claims were made of drugs tested early on small numbers of people, saying that they were going to have miracle effects, but when tested properly they turned out not to. There is a big risk in jumping too quickly from very small numbers to population implementation.

The question of human challenge studies is a very interesting one. Human challenge studies, in my opinion, are a way to think about the rapid testing of drugs and vaccines in this sort of situation. They are not straightforward, because they raise the following questions: is the virus you are giving quantifiable, do you know how much you are giving, and can you measure it properly, so that you are not doing it with an unqualified virus that has not been properly looked at for its properties? It takes a while to do that.

In principle, you can get quite a lot of information from those studies. I will use the example of an antiviral drug. You could imagine that you know very quickly whether your drug did indeed have antiviral properties in a human challenge study. You could then accelerate the process. I do think there is a place for human challenge studies somewhere. It is not easy. It has been shown to be very difficult to get them to actually work properly in practice very quickly, and there are quite a lot of regulatory issues around how you do it in a safe way.

I don't think it would have made any difference to the speed at which the covid vaccine was produced. It was done remarkably quickly and in a way that ended up with pretty good, definitive answers to what was going on and that built trust among the vast majority of the population as a result. There is a huge risk that if you do it wrong, you lose the whole thing.

Q12 **Chair:** Before I turn to Chris Clarkson, I will follow up on what Graham said about this crucial question of how one measures the impact in terms of deaths. It is much contested, as we know, and there are problems with recording deaths with covid versus deaths of covid. You mentioned excess mortality as being the more reliable one, but that is meaningless without a time interval, isn't it?

If a country has a very high level of excess deaths in one period, it follows that it will have a deficit of deaths in subsequent periods. If you take a 10-year period, then everyone is going to even out. If we are to regard excess deaths as the gold-standard measure, we need to have a view as to what the time interval is, do we not?

Sir Patrick Vallance indicated assent.



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Q13 **Chair:** You are nodding. I will go on to the next question, then. Do you have a view as to what that time interval should be for us to make those comparisons?

Sir Patrick Vallance: The standard one that has been used is five years, but there is nothing perfect about that and you could take 10 or some other number. But you are right, you need to take a reference period that is long enough for ironing out all the fluctuations. You actually need to understand within that reference period what the range is and then you need to look at your test period, as it were, in relation to both the average and the range and see what falls outside it. That is what I think the ONS and others have been doing.

Q14 **Chair:** So if it is to be five years, and given this is probably going to be quite a crucial number for the history books and for posterity as to what the impact was in different countries and different places, as the Government's chief scientific adviser, is there work being conducted on what the most rigorous timeframe is on this? How are we going to get to what that period is?

Sir Patrick Vallance: I think the ONS is doing great work on this and is working with international colleagues as well to try and get some standardisation around how to do this. It is also worth saying that it may sound extraordinary, but it is quite difficult to even get very accurate death numbers in some countries—even overall deaths. So, I think it is not going to be perfect.

Chair: Thank you very much indeed.

Q15 **Chris Clarkson:** Sir Patrick, SAGE takes a range of data and uses it to reach a central position among a range of positions and then your output is based on the most likely scenarios among that. In particular, how was your advice and the advice of SAGE incorporated into the Government's living with covid plan and to what extent?

Sir Patrick Vallance: The output from SAGE clearly goes into the living with covid team and taskforce, in terms of the preparation of their documents. My advice on any reduction in measures is that three things are important when thinking what to do afterwards.

Actually, let me take a step back. This virus has not gone away. It is not going to go away. It is going to be a circulating human virus for as long as we can see forward and it has not stopped evolving. It is in quite an unstable period. The virus is changing very rapidly and it has quite a lot of space to evolve into. It is not a foregone conclusion that evolution to increase growth and transmission, which is what the virus does or wants to do, is necessarily associated with reduced severity. It is a mistake to assume that all evolution will drive to reduce severity—it might, as it has done, or it might not. Endemicity, when this reaches a more stable background level, is not there yet but we are on the road to it. However, it is going to be very lumpy and bumpy as we go through it, with further viral evolution.



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As we go through a “living with covid” approach, three things become important. We must be able to detect it. So good surveillance systems with genomic sequencing and the ability to understand what those sequence changes mean. That is absolutely key.

Second, given the uncertainty that I have described, being able, operationally, to ramp things up again if you need to is crucial—don’t allow things to disappear so that you cannot actually start them up. That, in a sense, is also a lesson from the very beginning of the pandemic, where the underfunding of Public Health England for many years had caused a diminution in capacity.

The third is to make sure that the vulnerable are protected during that period, and that means both physical protection but also vaccines and antivirals. Those three things are important. Then, as we move into a period of more stability with this, an annual vaccine cycle is probably where we will end up, but there is a lot of work to be done to answer which vaccine, which vaccine type and making sure that we get durability to enable that. That is how I would see it and that is the sort of advice that we fed into the process.

Q16 Chris Clarkson: And how do you feel that was received? Was it incorporated effectively? Do you think it has formed part of the ongoing plan, or would you like to see more done?

Sir Patrick Vallance: It has clearly been heard, and I think those three things are what we need to keep looking at and asking, “Are they in place?”

On the surveillance system, I am very pleased that the ONS survey is continuing to be funded—that is a very important surveillance system. We have other studies, such as the SIREN study and the VIVALDI study, which look at healthcare workers and care homes and allow other forms of surveillance. There is also a GP surveillance system. UKHSA need to define the surveillance system they need to give enough granularity and to make sure there is enough sequencing to pick up variants. We need a—I have called it “predictive vaccinology”—group of people who are able to take sequence data and turn it into understanding of viral behaviour and antigenicity, meaning how the immune system sees it and what that might mean for vaccines.

On the second point about being ready to ramp up, it is a key operational requirement of UKHSA and the system overall to make sure that there is enough in place to know how you would ramp that up quickly. It is something that they are obviously going to have to make sure they have defined well.

Q17 Chris Clarkson: So essentially it is keeping those three pillars under constant review, as far as you are concerned?

Sir Patrick Vallance: Yes.

Q18 Zarah Sultana: Sir Patrick, we saw over 80,000 infections recorded



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yesterday, and 303 deaths. On Monday there were over 19,000 patients in hospital with the virus, and the Government's metric of patients in hospital has been increasing every day since 5 March. Are you concerned about the recent uptick in cases, transmission and hospitalisation?

Sir Patrick Vallance: We have very high levels of infection at the moment, as do many other countries. It is very important that at the moment the realised severity, because of vaccines and other things, is being kept under control. I think the numbers of infections are beginning to turn; we may be quite close to, or at, the peak and it may start coming down shortly.

I expect to see further hospitalisations because of the lag time, and further deaths with this. That is the consequence of high levels of infection rates. We should also be aware that there may be longer-term problems with covid infection—long covid is still being studied. It is not a completely stable situation, and it is not a risk-free situation, to run very high levels of infection.

Q19 **Zarah Sultana:** A recent ONS survey shows that the proportion of people self-isolating after a positive test has fallen significantly. Around 64% of people are following full advice, which is down from 80% in early February when isolation was legally required. Do you envisage that the Government will need to send stronger messaging to the public about undertaking these preventative measures when it comes to isolating?

Sir Patrick Vallance: I think the UK Health Security Agency is providing guidance later this week on what needs to happen across the population. That is appropriate—they are the competent public health authority to do that. I think people would like to receive guidance so that they know what to do to look after themselves and others. It is not surprising that we are where we are now in terms of rates, because behaviour is returning to normal.

It is very striking when you look at the effects before Christmas with Omicron. I think it was Jenny Harries who first gave a warning that people should actually take precautionary behaviour to look out for it; she got into quite a lot of trouble for that from the press, but it was the right advice. That led to a capping of the rates in the run up to Christmas,¹ which was very important. We are now in a situation where we have got increased cases, but they will come down—I think they are beginning to turn down. There are consequences of high rates, even with a relatively low relationship to hospitalisation.

Q20 **Zarah Sultana:** With the uptick at the moment, and its implications, do you think it was the right decision by the Government to scrap free testing in the way that they have in England?

Sir Patrick Vallance: Testing, in effect, does three things: it is very important for surveillance, and I have talked about that; it enables

¹ Witness comment: People taking precautionary behaviour also allowed time for accelerating the vaccine booster programme.



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precautionary behaviour; and it is useful to protect those who are most vulnerable. In thinking about removing testing, depending on which bits you remove, you will have consequences. Reducing testing too much in the surveillance space will lead us to vulnerabilities in terms of future infections and detection of variants.

On the precautionary side, there is no doubt that if you massively reduce testing across the population, precautionary behaviours are likely to decrease at the same time. That will lead to increased transmission, so that is a transmission risk.

On the protect side, making sure that those people who are most vulnerable are protected from people who might be positive is important. That is in the UKHSA guidelines. There are three different categories in which one should think about the effects of reduced testing, and that is the advice that has been given.

- Q21 **Zarah Sultana:** I hope the Government heed that advice, because the most vulnerable in our community cannot afford to pay for tests, and that has a heavy impact on surveillance and all those things. You touched on the importance of looking at vaccines, the vaccine type and how regularly people are vaccinated. What do you think our future vaccine strategy should look like?

Sir Patrick Vallance: I think it will probably look like annual vaccines for a certain part of the population, as we have for flu. What we need to move to, though, is a better understanding of how to predict which vaccine is required each year. There are lots of possibilities. You could choose to go after the latest variant or try to design a vaccine that fits somewhere in the middle and seems to cover everybody. You could create so-called bivalent or polyvalent, where vaccines have multiple different variants they are going after. There is a decision that needs to be made on that in concert with industry and others.

There is a decision that needs to be made on the type of vaccine. Messenger RNA vaccines have been unbelievably important during this, as have viral vector vaccines, because they have been quick to get off the ground and it has been relatively easy to dial up the design of them and get them out. They may be the right ones for annual vaccines; they might not. It may be that other technologies—protein adjuvanted vaccines, other approaches, even live attenuated vaccines—may be things to look at.

What we now need to think about is what gives you a durable response. What is not credible is to start having vaccines every four months for everybody. That is just not a way that this thing works. We have to move to a sensible annual cycle, in my view.

- Q22 **Zarah Sultana:** Do you believe that the UK has the infrastructure to conduct predictive vaccinology?

Sir Patrick Vallance: We have great people here who have self-assembled to do this. They have been incredibly important and influential across the world. It needs, in my opinion, to turn into a sort of formal



structure to allow that to continue going forward, which UKHSA would need to look at. We need to continue research in this area, because methods and approaches will continue to improve.

- Q23 Aaron Bell:** You said that data should trump modelling. Is that what happened with omicron in the run up to Christmas? We were clearly being given a steer from those high-level scenarios that SPI-M produced in mid-December that we would have to introduce the equivalent to either step 2 or step 1 of the road map again. In the end, we did not. We heard a little bit about why from Raghieb Ali in our previous session. Did the advice from SAGE to Government change as a result of the data that was coming in?

Sir Patrick Vallance: I think I said, if you look at the numbers in the SAGE papers, which are the advice that comes out, they are different from the numbers in the modelling. That did take into account all sorts of other things, including what was happening with data and it is appropriate that it should do so.

It is quite important to recognise the degree of behavioural change that took place. In effect, in the run up to Christmas, a very big change in behaviour occurred. We all saw that. It was pretty much equivalent to some of the things that the people were modelling and saying, "That is what would need to happen." The outcome was influenced heavily by a set of behavioural changes that were very similar, in effect, to the added restrictions that the SPI-M papers were talking about.

- Q24 Aaron Bell:** You then gave advice to the Prime Minister and the Cabinet that it was no longer necessary to take those measures, because people had, in essence, taken them for themselves.

Sir Patrick Vallance: Initially, before what happened, we thought that it would be necessary to take certain further measures, particularly around hospitality. The feeling was that that was probably going to be necessary. In the event—again, I would call out what Jenny Harries said and got a lot of criticism for, and Chris Whitty repeated it two weeks later—people did change their behaviours as a result. Those behavioural changes did massively affect the transmission possibilities for the virus,² because of us all deciding not to go to pubs and restaurants and deciding to reduce contacts. At that stage, effectively you've done what needed to happen.

- Q25 Aaron Bell:** And was that the advice you then gave—as the CSA, rather than SAGE, because—

Sir Patrick Vallance: By the time that had happened, it was obvious that we had got through it. I cannot remember the exact timings, but I want to be clear that we were saying, in the run-up to that, that we did think extra measures around hospitality in particular were likely to be necessary, so we did think it was going to be necessary to do something. As I say, in the end it happened spontaneously.

² Witness comment: Behavioural changes also allowed time for accelerating the vaccine booster programme.



- Q26 **Aaron Bell:** I don't know if you saw Dr Ali's evidence to us, but it seemed to suggest that he was giving advice to Nadhim Zahawi, who was feeding that into the Cabinet discussion, which seemed like a slightly unusual way to have a contrary view put into this ultimately political decision. Do you think there should have been a more formal role for a contrary view to be put into that process? Or is that something that you think happens through the SAGE process?

Sir Patrick Vallance: The job of a science adviser is not to give a single position; it is to give a range and to try and explain the uncertainties. Contrary views are part of the system. What will never stop, and probably shouldn't, is the idea that individual Ministers and others are getting advice from all over the place. That is going to happen, and they will come with their opinions.

As you know—it has been clear throughout this pandemic—there have been completely polarised views in all sorts of areas. My experience is that the voices have been loudest when the evidence has been lowest. Some of the contrary views have been held by the same individuals at different times, or sometimes even at the same time. I think we have quite a range of things that we've heard.

- Q27 **Aaron Bell:** I think the Committee has noted that as well, Sir Patrick.

Overall, as the CSA, what are your priorities for our future pandemic preparedness? What do we need to do? Obviously you answered Ms Sultana a moment ago about vaccines and so on, but what about more generally?

Sir Patrick Vallance: The road map that we pulled together as part of the G7 is really important. Step 1 is a global surveillance system, and WHO and others are picking up on that, and we need to play our part. The other thing I would highlight is the 100-day mission that I co-chaired with Melinda Gates to try to ask this question: is it possible that within 100 days of a future infectious disease being identified you could have vaccines ready for production at scale, an initial regimen of therapeutics, and approved and reliable diagnostics, which we definitely did not have in this situation?

There are 25 recommendations in that report, which are being followed up by industry, WHO and various countries around the world³. We are trying to put a system in place to ensure that it gets properly monitored as it goes through and reports back to the G7. I think that is going to be crucial—linked to equitable distribution of those things across the world.

- Q28 **Aaron Bell:** In our lessons-learned report we acknowledge that we were very well prepared for flu, but not for what we got. Is there a danger that we get ourselves very well prepared for covid, and not for something else?

Sir Patrick Vallance: Yes, that is precisely why the 100-day mission is not about covid. It is about how you would look at classes of infectious

³ Witness comment: CEPI is also following up on the recommendations.



agents in order to prepare for them within 100 days. We know we can do covid within 100 days. It is the others we need to know about.

There is an important point about interventions that comes back to the point that Mr Stringer asked about and how we think about viewing lockdown. I think we need to learn the lessons from this pandemic, document them, be very clear what is covid-specific versus not covid-specific, and try to get a handbook for the future that helps people in a similar situation to know where there is a strong evidence base and where there isn't.

Q29 Aaron Bell: Thank you. Just a few technical questions about SAGE. Can you confirm whether SAGE for covid-19 has now been stood down? If not, is that planned, and if so, when?

Sir Patrick Vallance: We are not meeting. Normally, SAGE is stood up when Cobra calls it—Cobra or equivalent—or, if I or the CMO wanted to create a precautionary SAGE to look at data as it was coming in, we would stand it back up again. It would not necessarily be with the same people; it may be a different group of people that we would pull together, depending on the situation.

Q30 Aaron Bell: There have been some examples recently where SAGE minutes and papers have been published in less than 48 hours after the meeting. Do you think that could become the norm for future activations of SAGE?

Sir Patrick Vallance: I am very keen to get as much of the information out as quickly as we can. The papers are slightly trickier, because we get papers to SAGE that people are prepared to put into it and then they want to quality control them and get them right—ready for proper publication, which can take a bit of time afterwards.

These are independent academics putting their work in, so I don't think that we can guarantee to get those papers out in 48 hours for sure; otherwise, the risk is that people would not put papers into SAGE until they knew they were absolutely polished and ready to go, and that would be a big problem for SAGE. I don't want to go down that route, but I do want to try to get things out as quickly as we can, and I want to pay credit to the team in GO-Science who have done a brilliant job of getting those minutes out really quickly.

Q31 Aaron Bell: Hear, hear. Finally, as CSA, how do you provide your advice to the Prime Minister on what SAGE and the scientific input is saying? Is that in writing, orally or by briefing the civil service or the special advisers?

Sir Patrick Vallance: The minutes of SAGE are the formal record. In meetings with the Prime Minister, Ministers and others, both I and the CMO would then bring more of the colour behind the minutes and try to give any other bits of information that we thought were important.

Q32 Aaron Bell: So that is an oral discussion, rather than a short summary paper of your position and that of the CMO?



Sir Patrick Vallance: Correct.

- Q33 **Aaron Bell:** Do you think there would be some merit in your formally publishing your advice to the Prime Minister—the summary—so that that can then be published and subject to external challenge?

Sir Patrick Vallance: The minutes of SAGE are that; that is the core evidence on which our advice is based. The discussion that takes place is obviously interactive, as any discussion should be, and so it comes up as trying to get more under the skin of some of that. A matter of whether those sorts of records should be in the public domain is really one for Ministers and the civil service to decide. But the science advice⁴ is in the SAGE minutes.

- Q34 **Aaron Bell:** And if you've got a fast-moving situation as we had before Christmas, and if you and Professor Whitty's opinions change between SAGE meetings based on the data and you are giving that personal advice, is that minuted in any way?

Sir Patrick Vallance: Well, it would be minuted in those meetings. But given how frequently we were meeting as SAGE, I don't think that that was really happening.

Aaron Bell: Right, thank you very much.

- Q35 **Chair:** That is a very important point about the conclusions of SAGE. Perhaps it is a pedantic point, but it has been said that advice to Government is different from the conclusions of SAGE, and that SAGE is there to come up with a view and advice is given to Government. You have said, however, that in practice, SAGE conclusions are that advice; it is not literally the advice because it is a record of a meeting, but there is a reliable relationship, if I may put it that way, between the SAGE conclusions and what constitutes advice to Government.

Sir Patrick Vallance: Let me be clear: the SAGE minutes provide the evidence base from which I feel able to give advice. There are many other sources of advice into Government, and there is a huge agency and there was at the beginning—Public Health England, now UKHSA—that feeds in advice. There is medical advice that comes in from other places; there is economic advice that comes in. There are many different forms of advice that come in. The SAGE minutes, though, are an accurate reflection of the evidence base from which advice can be given on those aspects of the pandemic, or any other situation.

Chair: Thank you.

- Q36 **Carol Monaghan:** Sir Patrick, may I take you back to questions that the Chair asked about excess deaths? Perhaps I did not understand properly what was said and perhaps I missed it, but when we look at the period of the pandemic, we will see some excess deaths. How will they be accounted for in future? At some point, those deaths will become

⁴ Witness clarification: When I said science advice, I was referring to the science evidence.



subsumed within average deaths over a five-year period. How will we take account of the fact that there would have been additional deaths at that time?

Sir Patrick Vallance: I think what people will do when they look at it is this. If you view, say, three years as being the pandemic period, you would compare those to the previous five years. You would probably start the clock, in a sense, at the end and say, "Okay, when I look at my next five-year period, I probably need to compare it to the five years before covid."

Q37 **Carol Monaghan:** So the covid period will be considered an outlier.

Sir Patrick Vallance: That is what I think would make sense. People will do all sorts of different analyses, but that is the logical thing to do—to say, "There's the outlier period. How does it compare with the five years before and the five years afterwards?"

Q38 **Carol Monaghan:** I think it is just important that we understand that, because if we are looking at other implications on death rates, we need to get a proper, accurate picture of that. That is fine; thank you for that.

I also want to follow on from my colleague Chris Clarkson's questions about omicron and its severity. Do we have data yet that shows that omicron is a less severe strain, or are there too many factors? Is it the vaccination, or do we have a certain amount of immunity within a population? Is there anything that we can make a like-with-like, fair test comparison with?

Sir Patrick Vallance: If you bear with me just for a minute, I will be a bit technical on this. There is intrinsic severity—how severe the virus itself is—and there is realised severity, which is what you see in a population.

We can be very confident that the realised severity is much lower in the context of a well-vaccinated UK population, which has also been exposed to quite a lot of infection. If you look at cities in the US, omicron was pretty devastating. If you look at Hong Kong, omicron is causing big problems. It does have some intrinsic reduction in severity, but it is not nothing. It is not a virus that you can just shrug off.

Q39 **Carol Monaghan:** So if omicron had been the virus that appeared two years ago, rather than Wuhan, we would have been as concerned as we were about Wuhan.

Sir Patrick Vallance: Probably. If you look at what happened, Wuhan was probably less severe than alpha and then delta, and omicron is now back down towards Wuhan. I don't know exactly what the comparison is with Wuhan, but what has happened over the meantime is that population immunity has changed very dramatically, and the ability of doctors and the healthcare system to deal with it has changed dramatically. The realised severity is very much reduced, but omicron is not a completely benign virus by any means.

Q40 **Carol Monaghan:** Are you concerned about a general complacency in our



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response to omicron? You have spoken about the pre-Christmas period, and I would agree—I did see a change in behaviour—but I mean more now.

Sir Patrick Vallance: In a decision to say, “We are going to go completely back to normal”—there are all sorts of reasons to do that, including that people want to do it, society, the economy and so on—I reiterate that three things need to be true. You must have a great surveillance system, because the next variant might not be anything like as okay as omicron was; you need to have the ability to ramp up responses very quickly; and you need to protect the vulnerable during the process. Those three things are really important as part of a safety net for being able to allow things to go back to normal with very high infection levels.

Q41 **Carol Monaghan:** Following on from my colleague Zarah Sultana’s question, does taking away free lateral flow testing not have implications for the three measures of confidence you have just spoken about?

Sir Patrick Vallance: Testing for surveillance is something that has been assured; UKHSA is getting that into the right place to ensure we have good surveillance systems going forward. Testing for protection is also in place for the most vulnerable—immunocompromised and other patients.

Testing for precautionary behaviours will clearly decrease if you remove testing, and therefore precautionary behaviours will probably be less, and therefore transmission rates will be higher. That is a consequence of that. It is worth noting that, across Europe, most countries now—in fact, almost all through the pandemic, they were not giving out free testing. Those are political choices as to what people want to do, but the consequences are that, as you reduce precautionary behaviours, you will see an increased transmission pressure.

Q42 **Carol Monaghan:** Thank you. I will now ask a couple of questions on SAGE. If SAGE had to be stood up again in the event of a future pandemic or emergency, what would be the implications? Most SAGE members are volunteers, mainly from academic institutions, I think—perhaps you can confirm that. What are the implications for their academic institutions or their workplaces?

Sir Patrick Vallance: Can I just distinguish between SAGE for covid and SAGE for other things? SAGE can be called for all sorts of things as emergencies. It was called for the Toddbrook dam issue, obviously for Salisbury/Novichok, and so on. There is no such thing as a member of SAGE; there is a group of people who are brought together for whatever the problem is, and it will be different for different problems.

It is extraordinarily unusual—in fact, completely unprecedented—for SAGE to meet 105 times, which is what has happened over the course of this pandemic. That has taken a big toll on the academics there, who have done all of that in their spare time. Their institutions have supported them, and we have done what we can to try to provide some support to them back in their institutions.



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If we recall SAGE because, let's say, a new variant causes such problems that UKHSA does not want to deal with it on its own but would like external advice from SAGE, we may well decide that we want slightly different members to come back. Some of them will be the same, and they will need support.

Q43 Carol Monaghan: Who should provide that support? Should there be funding into the academic institutions?

Sir Patrick Vallance: During this pandemic, we did provide some support back into institutions for some people, when there were teaching needs back in the university that could not be covered by them. There were bits and pieces, which I think made a difference. I wrote to the vice-chancellors of the universities saying, "This is really an important national endeavour. Can you please make sure these people are looked after?" and got very positive responses back, so there is a mechanism to do that.

The reason I am being a bit cautious about how I answer this is that I do not want to get into a situation where people are effectively given a remuneration, by default, for being on SAGE. That is not how it works, and I do not think that is necessarily the right way to go.

Q44 Carol Monaghan: Thank you. We heard evidence that a narrow number of disciplines was represented on SAGE, and particularly that SAGE would have benefited from, for example, product design engineers and manufacturing experts. Do you agree with that? Should other areas have been considered when SAGE was being set up?

Sir Patrick Vallance: I will take those two specific examples. When I set up the vaccines taskforce, I brought in product design people and manufacturing experts, because that is what was needed for that particular problem. For the sorts of topics covered at SAGE, having a manufacturing person around the table would not be right.

Q45 Carol Monaghan: Perhaps a social scientist?

Sir Patrick Vallance: Oh, we had lots of social scientists. I think we had a rather broad membership, and we changed it depending on who we needed. We had lots of social scientists, and we had virologists, immunologists, public health experts, clinicians. We did have engineers around the table, with expertise in ventilation and flow. I think we had a rather broad range.

Q46 Carol Monaghan: If I took you back to two years ago, and you could take your pick of whoever you wanted on SAGE, would you have added any additional people to it, and what would their disciplines have been?

Sir Patrick Vallance: Early on, I think we could have done with somebody on the ground in public health. We did have lots from public health—the chief medical officer is essentially from a public health background, and we had lots of people from Public Health England there—but it would have been quite good to have had somebody actually out in some sort of regional place. We did bring somebody on with that, but that would have been helpful. Otherwise, I think we had a pretty good



spectrum of people on SAGE, and I am not sure I would have necessarily changed much about the early composition.

- Q47 **Chair:** Before I come to Rebecca Long Bailey, in answering Carol, you mentioned the stance that we need to have to be prepared for any—God forbid—new variant that requires a testing response. As the Government’s chief scientific adviser and national technology adviser, have you satisfied yourself that we are capable of having that immediate, explosive deployment of testing capacity in that event?

Sir Patrick Vallance: I am waiting to see exactly what the UKHSA system is going to be to do that. The key person looking at that will be the chief scientific adviser in the Department of Health and, obviously, the CMO, but I will be looking at that as well.

- Q48 **Chair:** Is that not something that should have been looked at before we made the changes that rest on that?

Sir Patrick Vallance: UKHSA has been set up to do just this. It is a competent authority with lots of scientists, operational people and public health experts. The requirement is clear; they know what is expected, and I imagine they will be able to deliver against that. We will look and review.

As you are well aware, when organisations have a remit to do something and are set up to do that, it does not always help to have 15 different groups looking at it endlessly, saying, “Have you done this? Have you done that?” They know what they need to do, and they have been extremely good at getting the testing sorted out to date.

- Q49 **Chair:** It is nevertheless useful to check that it is able to do that and to have some independent validation of that, given how important it is. The truth is that everybody, including the Secretary of State at the time, acknowledges that under the predecessor body—Public Health England—the initial expansion of testing capacity was inadequate. Lessons were learned and it was done in a different way.

One of the lessons that we can learn and apply now is to make sure, in advance, that the system is calibrated to be able to respond explosively if needed. Without showing any disrespect to the people whose responsibility it is, I would be reassured if someone else could have a look, just to make sure that it is in order.

Sir Patrick Vallance: There are two things about the years before the pandemic: underfunding and operational performance. It is clearly important to make sure the operational side of this is working properly, I completely agree. However, I’m not sure it is a science question; it is an operational question. In other words, what needs to happen is clear and there is advice on that. Operationally, somebody needs to check that this can be stood up quickly.

- Q50 **Chair:** Absolutely, but one of the conclusions we made in our joint inquiry report was that although the science was excellent, the operational performance in the early weeks was deficient. I don’t want to anticipate that we might repeat it, but I am very keen that we should be collectively



reassured that that can't happen.

As you and Carol mentioned, you convened and brought into existence the vaccine taskforce. That was scientific, but it was also operational. It was a brilliant success, and it was your initiative. We know that; we have heard that in evidence. It seems that it would be helpful to know that someone—whether that is you, as GCSA and National Technology Adviser, or someone else—has looked at these arrangements and satisfied themselves and the Government that they are fit for purpose.

Sir Patrick Vallance: I agree that it needs to be looked at. I am just questioning whether it is the GCSA who does that.

Chair: We may follow up on the question of who should do it.

Sir Patrick Vallance: You could argue that the operational setting up of the vaccine taskforce was outside my remit at GCSA but, given my background, it was something that I knew how to do.

Chair: So—given your experience and background—I'm trying to lure you into applying your talents and expertise even further.

Sir Patrick Vallance: I can see what you're doing, Chair.

Q51 **Graham Stringer:** Can I just ask one question? There will be another epidemic of some sort. In that epidemic, would we expect not to have to import our home testing kits from China? Would we be able to do it ourselves?

Sir Patrick Vallance: There is a whole piece of work going on about where the supply chains for testing kits are.

Q52 **Graham Stringer:** That is a distinct vulnerability, given the world situation, is it not?

Sir Patrick Vallance: It goes back to my comments about the 100-day mission and making sure there is an appropriate supply chain with security across the world for rapid testing. The UK lateral flow test situation is much better now than it was.

Q53 **Rebecca Long Bailey:** On the issue of roles and responsibilities, what are your top priorities for your role as GCSA over the next 12 months?

Sir Patrick Vallance: I have three things that I'm concentrating on most, but there are other things as well. Obviously, the current Ukraine-Russia situation will change some of that. I have said that I want to concentrate on three things. First, there is the science system in Government. Essentially, one of the things I came in to do was to strengthen that right the way across the board.

We published a report in 2019—the science capability review—which had 15 recommendations. We are working our way through to get those going. They range from the science system in each Department, the recruitment of scientists and engineers into government and the capability of those already in government, through to the tools to do it, and the public sector



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research establishment. That is a piece of work that I really want to ensure that we land this year. It is also part of the Government reform agenda.

The second area must be, and is, climate—net zero, plus the biodiversity association with that, is a key area, both in adaptation and mitigation—building on some of the things that we did at COP26, which I think have landed in quite a good place internationally and nationally. We need to follow up.

The third area that I am spending a lot of time looking at, I am going to call “innovation”. What I mean by that is the ability for the very strong science base in the UK, which must be maintained, to also translate into public good and benefit for the country—economic security and health and wellbeing—and to look at a number of the things that stop us doing that as effectively as we can. Those are my three priority areas over the year.

Q54 Rebecca Long Bailey: Thank you; that’s very good. What will be your priorities as national technology adviser over next 12 months, and is there any overlap?

Sir Patrick Vallance: There is a very big overlap with the last of those, on innovation, for sure. My priority as the national technology adviser is to get the system set up so that it becomes a stable, secure system for every Government, not just this Government.

By that I mean that, given what is happening across the world—the advances in science and technology, and the recognition that growth and security in countries is highly dependent on that—any incoming Prime Minister should, on his or her first day, look at the security file, the economy file, and the science and technology file. I would like the national science and technology council to be an all-party recognition that this is the way we need to do things to get science and technology properly joined-up across Government.

Q55 Rebecca Long Bailey: Excellent. The two roles are very extensive and detailed. Can you set out how you are balancing the two roles at the moment?

Sir Patrick Vallance: To make it over-simplistic, the GCSA role is science for policy and for emergencies, so it is about making sure that there is a system to feed science into policies, while the national technology adviser role is more about policy for science—that is the distinction.

As I do slightly less on covid because UKHSA and other bodies are picking it up, I am focusing much more on the national technology adviser role and the formation of the national science and technology council. I think there is a legitimate question going forward as to whether this is one or two roles, and as we get it set up, we need to ask the question, “Is it better that these are separated or together?”

Q56 Rebecca Long Bailey: Do you know whether Ministers are expected to make a decision on that soon?



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Sir Patrick Vallance: It is too early; we need to set it up and get it running first. There are pros and cons. I think it is clear that there are two distinct functions and somewhere in government, science and technology need to join up. It is not as straightforward as saying whether it should be two individuals or one, but I am very conscious of the fact that that needs to be thought about and a decision needs to be made.

Q57 **Rebecca Long Bailey:** You have a huge amount of experience, and I am sure you are in very high demand. Are you planning to take any further roles on top of the two that you already have?

Sir Patrick Vallance: I am hoping not to take on too much, actually, but the only other role that I have taken on—this is in the public domain—is that of chairman of the Natural History Museum, from April next year.

Q58 **Rebecca Long Bailey:** In your evidence to the Lords Science and Technology Committee last week, you explained that the rationale for creating the office of science and technology was to join up Departments and Government levers. Why could that function not have been carried out by an expanded Government Office for Science?

Sir Patrick Vallance: It is a great question. Again, in the long term, we need to think about the structures here. The reason it was set up as a separate thing was that the Government Office for Science is about science for policy, and it provides a completely independent view. You do not want your policy accountability mixed with your independent advice, and many Committees—it may even have been this one at some point—recommended that those two things stay a bit separate. The question is how you can create that independent advice.

I will give you a specific example. One of the things we are doing in GO-Science, which is for OSTs, is that we have set up a science and technology insights function, which gives an objective view of how well we are doing in various aspects—not of the basic science, but of the application of science in patents, company formation, skills and so on—and does an international comparison. It is quite useful to have that separate, so that the people who are leading the policy—as we all know, there is a tendency to want to say things like, “We’re world leading”—can be told, “I’m sorry, we’re not”, “We are”, or whatever the answer is. So I think there is a separation point, which needs to be thought through.

Q59 **Chair:** On this area of the other part of your job—the things that you were doing before the little matter of covid arose—there was the capability review you mentioned, which was published in November 2019 and which included a very thorough and extensive set of reforms. One of the recommendations was that “all departments should publish, and refresh annually, Areas of Research Interest documents”, so that the public and scientific community can see what areas they are going to be commissioning research in. How is that going?

Sir Patrick Vallance: Every Department has signed up to do that, and everyone has an area of research interest. They probably will not be changed annually in every Department, because some of the cycles of



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research will be longer than that, but the requirement is that they should at least be signed off every year, so that people say, "Yes, this remains what we are going to do."

Different Departments have taken different approaches to it. Actually, DWP took a really interesting approach to it. They wanted to do a roadshow across universities and said, "These are the things we are interested in". They drummed up a lot of people saying, "They're quite interesting questions, and we'd like to help answer them," which is the point of it.

During covid, we set up national core studies, which were in six themes that were trying to answer questions around surveillance and transmission in certain environments, and they also pulled together academics from many universities who had never worked together before. The reason for telling you that anecdote is that a lot of them have said, "It's very interesting to be given a problem that obviously matters, which means that we have to come together to answer it." I hope the ARIs will do that. We did a refresh of the ARIs during the covid period, including asking what post-covid priorities for ARIs look like. That document has been published.

Q60 Chair: Very good. Given its importance, will you take the good practice that you have described for DWP and either commend or nudge other Departments into following that, so that the whole system improves?

Sir Patrick Vallance: Yes. We have had workshops on this, even during the covid period, to try to get this going. I have certainly shared exactly that situation. It will vary between Departments, as you know, because Departments will make their own decisions. But the chief scientific advisers meet every week, and we try to share best practice across all of them.

Q61 Chair: Most, if not all, Government Departments can benefit from research, and one of the observations you made at the time of the capability review was that there were wild differences in the research budgets of particular Departments—some frankly negligible, and some substantial. Have you been able to make any progress in changing that, as you set out your intention to do?

Sir Patrick Vallance: Every Department, bar a couple that are in the process of doing it now, has an externally appointed CSA, and those CSAs have done a good job at getting their own offices right. The danger is that if you have a CSA with no infrastructure, he or she can do very little. They can wander around making a few comments but cannot actually drive things.

We have that side of it in a better place, and the spending review increased the budgets across Departments. The Treasury was very focused on trying to make sure that budgetary R&D was part of how they considered the overall spend. Of course, the science capability review was written jointly between GO-Science and the Treasury for that reason.

Q62 Chair: You have been a great champion of transparency and publication,



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and the Committee has put on the record before its gratitude to you for intervening to cause the SAGE minutes to be published during the pandemic and not, as was previously the case, at the end of the emergency; Aaron Bell has talked about that.

Something that pulls in the opposite direction, which is concerning, is that the Committee, through its Chair and through my predecessors, has regularly tabled questions in Parliament about how often Ministers meet the chief scientific adviser in their Department. It is quite a crude thing, but it gives a useful insight, at least into the frequency of interaction.

Previously, it was typical for Departments to answer those questions. The BEIS Secretary of State disclosed that he had had 23 meetings with his chief scientific adviser in the quarter between 1 December 2020 and 28 February 2021. That was typical of other Departments; for example, there were 12 meetings between the DEFRA CSA and the Secretary of State.

In the most recent round, there has clearly been an edict across Whitehall not to answer this question, and every Department has answered with an identical answer, saying that this information will no longer be disclosed. At a time when you aspire to, and are, galvanising the role of science and indeed the transparency of science, that seems to point in the opposite direction and is rather discouraging.

Would you take away from the Committee a request to try to reintroduce some transparency and enthusiasm for this task?

Sir Patrick Vallance: I was unaware that that had happened, actually, and I will try to find out why, and what measures of interactions would be appropriate to release. I mean, I can't see any reason why those numbers couldn't be released; whether they are the best way of judging it I don't know, but—

Chair: Like a lot of figures, and we have had a discussion about death rates, one can contest them, and they are clearly quite a crude thing, but they are not without meaning, and certainly a Secretary of State who had no meetings with their chief scientific adviser begs some questions that it would be useful to know about.

I will go to some other colleagues—Carol Monaghan and then Chris Clarkson.

Q63 **Carol Monaghan:** Sir Patrick, I would like to ask you a little bit about Horizon Europe and the UK's participation in that. What advice have you given to the Government on participation in European programmes like Horizon, Copernicus and Euratom?

Sir Patrick Vallance: I think the advice from the scientific community has been clear: that Horizon is an important part of the overall funding landscape. There is a desire to be part of Horizon and to have an association with Horizon. That remains the case from the academic community. Lots of pluses to it.

Q64 **Carol Monaghan:** Is the case for association weakening over time?



Sir Patrick Vallance: The difficulty, and I think the EU said this, is that it has become a political issue with the EU about association. I don't think there is any disagreement from scientists across Europe, many of whom have come together to say that they want the UK to be part of Horizon; scientists in Europe want to be part of it. It is, as you will be aware, tied up with other discussions around the relationship with Europe, and it can't budge until those things are budged.

My worry is that if a big science funding mechanism becomes a political football, that is very bad news for science and very damaging for future relationships across Europe in science.

Q65 **Carol Monaghan:** Are relationships and collaborations being affected at the moment?

Sir Patrick Vallance: They will have been already, because we know that there has been a decrease in applications from the UK to European programmes as part of this, so that is a very real risk.

Horizon, or its predecessors, took quite a few years to get going properly; these things are quite difficult to get going, and if it goes down, it's difficult to ramp back up again. I'm very keen, and the UK Government said that they want to associate with Horizon, and we should keep trying to make that happen.

Q66 **Carol Monaghan:** Can I ask you about Euratom, because that is a different issue and has implications for healthcare and treatments? What are your thoughts just now on Euratom and what should the Government be doing on this?

Sir Patrick Vallance: Those are questions for BEIS to get into. My position on European science is, the closer we can get associated with that, the better, and I have given that advice.

Q67 **Carol Monaghan:** There has been talk about Government plan B. Have you provided any advice to Government on this?

Sir Patrick Vallance: Any alternative to Horizon—if you go back to the review by Adrian Smith and Graeme Reid from a few years ago, where they talked about that—would potentially allow different countries to be engaged.

Am I keen on lots of relationships with different countries in science? Yes. Do I think that such a scheme is easy to get off the ground? No. Just as the European scheme took several years to get off the ground, it would take several years to get it into the right place. However, it would be sensible to have some other position if association with Horizon becomes impossible for some reason.

Q68 **Carol Monaghan:** Some of the other schemes that have been talked about are about attracting talent and collaboration. Have you got a feeling from European partners about whether they are keen on these sorts of schemes, or is everyone just waiting in hope that Horizon becomes a reality again for the UK?



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Sir Patrick Vallance: I think other European countries are keen on those areas that are relevant to all of us, of course. They would prefer that we did it through Horizon.

Q69 **Chair:** Just one follow-up on that, Sir Patrick. Horizon is a seven-year programme that runs from 2021 to 2027, as I understand it. Obviously, as time goes by, the opportunities are literally disappearing—they are past—so there is no point in hanging on forever, clearly, because you can get to the end of it and that whole budget that has been set aside will be wasted. At what point do you think we need to unilaterally move on, given that, as far as I understand it, the ratification problem is not on the UK's side but on the part of the European Commission? At what point do we say, "Actually, to make sure we do have scientific investment, we need to activate plan B"?

Sir Patrick Vallance: I think that is one for the Science Minister, but it is clearly a real issue.

Chair: You are the Government Chief Scientific Adviser.

Sir Patrick Vallance: My advice is, as I have said, to associate to Horizon if we can. If it becomes a political football, that is a very dangerous position for science, and be aware that alternatives take years to really get going. What we should not do, in my view, is to end up in a position where we are not really in or out of Horizon for years, because that is a very difficult position that will lead to a detriment in relationships and science collaborations across Europe.

Q70 **Chair:** George Freeman has given evidence to this Committee, and it is evident from his demeanour that he is as keen as you to associate, but at some point, there is a responsibility to say, "If it is not going to happen any time soon, we need to have international collaborations, and we should set up another scheme." You recognise that requirement on him, I assume.

Sir Patrick Vallance: Yes, and in any case, in a world where science and technology is rapidly changing in many countries, asking the question of which countries we want to have relationships with and what those relationships look like is absolutely essential, and was laid out in the integrated review when that was published last year.

Q71 **Chris Clarkson:** Sir Patrick, I would like to turn to the issue of diversity in STEM. We did a piece of work a couple of weeks ago where we took some evidence on this. Why is greater diversity and inclusion in the work of the Government Office for Science, and the science and engineering profession more widely, important? Specifically, I would like you to think about the impact of low levels of diversity and inclusion on the work that the Government Office for Science does at the moment.

Sir Patrick Vallance: I am going to use a Desmond Tutu quote: "Differences are not meant to separate, to alienate. We are different precisely in order to recognise our need of one another." That is absolutely right for science and technology. Why do we need diversity? Not because



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it is a moral, social and ethical good, which I believe it is, but because it makes it better.

We are trying to tackle very difficult problems. You cannot tackle difficult problems if you have a monolithic group all from the same backgrounds, so it is fundamental. It has been top of my priority list since I came in, and it has been the top of the Government science and engineering profession agenda that we have been running, so it is absolutely critical.

At GO-Science, we currently have rather good levels of diversity. I think 60% of staff at GO-Science are women and 20% are from ethnic minorities—I don't have the exact figure, but we can find that number. We have a good, diverse group in GO-Science, but we obviously have less diversity across STEM than in other areas of society, particularly at the top of STEM. If you look at the universities and other places—at physics, engineering and so on—you see much less diversity. The Royal Academy of Engineering has done a very good job of trying to correct some of that. It is crucial we get that right, and therefore it is an important area for all of us.

Chris Clarkson: Thank you. To quote Socrates, "The unexamined life is not worth living."

Sir Patrick Vallance: Sorry; the figure is 20%. We have 60% women and 20% ethnic minorities in GO-Science at the moment.

Q72 **Chris Clarkson:** Excellent—good progress. As the head of GO-Science, what steps have you taken to improve diversity? Do you think any opportunities have arisen out of the pandemic, particularly with a focus on STEM, to improve diversity?

Sir Patrick Vallance: Yes, they have. There is a very big increase in science, right across the country and across all groups, so that is a really big opportunity. Interestingly, if you go back in history, you see exactly the same after the Spanish flu pandemic, but it didn't last forever. There is a window to really push on this.

One important thing that has come up during the pandemic is the ability for remote working, which makes quite a big difference. It makes a difference for all sorts of reasons, including where people live around the country. Prior to the pandemic, every SAGE meeting had been in person. People would occasionally dial in, but I don't think there had ever been any attempt to change that. For example, if you go back over previous meetings of SAGE, they were largely meetings of people who could get to London easily—mainly people who lived in London. That has completely changed, and we now have very widespread contributions from all around the country. That is true for all sorts of other areas we have been dealing with as well.

We are also looking at basing part of GO-Science outside London, to try and increase that diversity as well. All the other chief scientific advisers are looking at which bits of their activities they might be able to distribute across the country.



Q73 Chris Clarkson: It is fascinating about the pandemic and the window of opportunity. Do we need to be looking at catalysing that reaction that is starting now?

Sir Patrick Vallance: Yes.

Q74 Chris Clarkson: You have given us some of the figures at GO-Science and they sound quite encouraging. Would you be open to publishing that data more widely so that it can be properly scrutinised?

Sir Patrick Vallance: I don't see why those figures shouldn't be out there. I think we are trying to do the same for the Government science and engineering profession as well, but it is a bit more difficult because people self-identify in that, so it is flawed in terms of its absolute numbers.

Chris Clarkson: Thank you.

Q75 Katherine Fletcher: Thanks for everything; that is probably where I want to start. I want to go back to July '20 and data. If I put my glasses on, I can read what you actually said, but you highlighted issues with data within the system. How are you getting on with progress on that? I will follow up on some other bits after that.

Sir Patrick Vallance: Certainly at the beginning of the pandemic, data was a really big issue, even quite simple stuff like getting exact numbers of people in hospital on any one day in different parts of the country. All of that is leaps and bounds better. There is very good data flow now. Lots of things that have been long-term issues around data systems are in a better shape.

From a pandemic point of view, that is really good, but there is a broader question. Is it true in other parts of Government? Ian Diamond, as the chief statistician, is working very hard on this with ONS and trying to make sure we have interoperability between data from different Departments, which is really important. He has a legal ability to try to make that happen.

Q76 Katherine Fletcher: How is he getting on with it? That sounds like a Herculean task.

Sir Patrick Vallance: It is a Herculean task. I think it is making good progress. Is it where it needs to be? Not yet, but a lot has happened. The awareness of the importance of both data and data visualisation has changed dramatically in the past two years, and there is pull for it now; it is not all push to try and make it happen.

Q77 Katherine Fletcher: That is fascinating. In many ways, the pandemic has pressed fast forward on a number of developments, not least that. Earlier on you said that somewhere in Government, science and tech needs to be joined up. Where would you like to see it joined up? Would you put that data question within it? Would you create an independent arbiter for this stuff?



Sir Patrick Vallance: The National Science and Technology Council, a prime ministerially chaired ministerial Committee, is about getting the science and technology joined up across Whitehall. That is obviously for the benefit of the country. One of the big things that we would need to look at is what are the big areas of science and technology that are important for wellbeing, the economy and security. Data always comes up. At the CST, which is the external group that I co-chair with Lord Browne, we have looked at data across government several times, and we had Ian Diamond at the last meeting, or the one before, where we will provide recommendations around that.

Q78 **Katherine Fletcher:** So you would focus on trying to pull the system together—put clothes lines through the system—rather than trying to carve it out in its own little space to give it extra oomph. You would not have a department for science and technology, for example.

Sir Patrick Vallance: Oh, I see. That is a machinery of government issue, and there are pros and cons. The pros are that you have then got a Department that absolutely looks at science across government. Currently in BEIS, they look after science under BEIS, but not science in every other Department. The cons are—this is my belief—that science and technology needs to be embedded in every Department, and if you pull it out and put it somewhere central, everyone will forget about it and say, “What’s that thing going on over there? It’s not relevant to us.” I would much rather see it embedded in Departments than created as a new, big central function.

Q79 **Katherine Fletcher:** Fair enough; I just wanted to get your views on that on the record. On the national data strategy that the Government are talking about, especially in the health data space, we have an enormous opportunity with our wonderful NHS to do something really exciting—we heard evidence the other day. Do you think that we have the right set-up to allow for health data to be utilised for science, but with protections for the individuals involved?

Sir Patrick Vallance: First of all, on data generally, the DCMS report on data strategy is really good and has got us in the right place in terms of what needs to happen. The last two years have dramatically changed data across the NHS and the way that people think about it. All sorts of ways to share data safely have come up: trusted research environments and different approaches to that, including OpenSAFELY, which was a very interesting initiative to be able to access in a way that didn’t allow data to leave somewhere.

There are some smart ways of doing this now that have been exemplified in the past two years, which I hope the NHS will use going forward. My own view is that the more those data can be safely shared, the better, because the answers will then come back and benefit the NHS. Getting that right, including the ability for the private sector to start using it to develop things, creates a system of data, which, if properly looked after, would be hugely beneficial.



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Q80 Katherine Fletcher: Yes, there is a very interesting opportunity there. I have one final question, if I may, Chair. Almost as an aside in our last evidence session, it was pointed out that the data within the NHS that this pandemic has accelerated the efficient use of, if I can put it like that, has a commercial value.

There was an idea of creating almost a national fund for health data that is used to help reinvest in the NHS. Do you think that the data scope is in play and that that is a practical idea that could be examined and pursued? Or are we still on the journey of getting our data ducks in a row?

Sir Patrick Vallance: I think that is one you will have to put to DHSC. I have a view, as I have said, that the data from patient information is hugely important for operational efficiency in healthcare systems generally, anywhere around the world; and that there are big, legitimate commercial interests that can massively enhance the possibilities, particularly among some of the start-up companies that would come as a result of that. I think there is an opportunity there, but that is one for DHSC.

Q81 Katherine Fletcher: Fair enough. But you would not say that we have any fundamental barriers to doing that within the data architecture of Government as we start to improve how data is communicated across Departments.

Sir Patrick Vallance: I think there are political choices to be made around that.

Katherine Fletcher: Fair enough. Thank you.

Q82 Graham Stringer: You have been very busy over the last couple of years. It has been a long-term concern of this Committee that forensic science, both academically and practically in terms of helping the criminal justice system, is not where it should be. Have you had a look at that, and if so, what are your views?

Sir Patrick Vallance: I am very pleased that we have appointed a CSA for the police. That person started about a year ago and I have asked him and others with an interest in the Home Office and other places to look at forensic science and see where we are.

I recognise that there is a question, not only about the operation of forensic science but about future-looking research for forensic science. How do we make sure we are at the cutting edge? There is no doubt that the UK was absolutely at the cutting edge of forensic science and there are lots of opportunities that could be important for the future. So there is a piece of work on that going on at the moment.

Q83 Graham Stringer: I think 12 years ago we were. Dr Tully, who became a regulator and had previously worked at the forensic science service, has told this Committee on regular occasions that the most serious criminals are getting away with it because forensic science is not up to it and there is a very limited amount of academic forensic science carried out. Also,



within the police forces themselves, their forensic capability is probably not what it should be and they are not accredited. So I am glad that has happened and I would be grateful if you could keep an eye open for it, along with your many other duties.

This is a totally different question, although it is reflected. We are all in favour of this country being a scientific superpower. Can you define that?

Sir Patrick Vallance: I know what I think needs to happen in terms of science. We are really outstanding at discovery science, early university science and research institute science. We are much better than we were at start-ups and SMEs coming from that. We have a significant gap in scale-up. How do we scale up those companies? We also have a gap in terms of major R&D-intensive growth companies in the UK. If you put that together, in order to be really effective, all parts of that system, including the role of things such as Government procurement, need to be aligned to make sure that the science is properly supported at the beginning and that there are systems to make sure that all the other bits work. When that works well, you end up with strategic advantage from science.

Q84 **Graham Stringer:** Thank you. I will just add a personal thanks for the time and effort and the clarity of your input into this Committee and generally of your advice. You are looking much more relaxed than you did at the height of the pandemic.

The good thing about having clear advice is that it is easy to agree or disagree with it. One of the areas I would like to explore is that the last time you were before the Committee, you said that, in terms of mitigating the increasing carbon dioxide in the atmosphere and its effects, it was good to be first and early on. I am unconvinced about that.

I think in many ways it is one of the areas of science where it is better to be a follower, particularly given that some countries are keen on doing it, because you can benefit from their technology. We are a tiny part of the production of worldwide CO₂. Can you take us through, in detail, your reasoning for wanting us to be first in that area?

Sir Patrick Vallance: I am sorry, I do not exactly know what I was referring to there. Is that first in terms of the net zero ambition?

Graham Stringer: Yes.

Sir Patrick Vallance: I think setting a clear target such as net zero gives clarity for innovators to actually do something. You can see that already. We have lots of people wanting to come into the innovation space. They know that there is an ambition to try to get net zero here. That is where there is an advantage.

Now, I am not naive enough to think that all of the discoveries come from the UK—it is a global issue, and we need to be well connected globally—but I do think there is a genuine economic and societal benefit from getting the great research that is going on in the UK translated into solutions for net zero, and there will be export opportunities as well.



That doesn't mean that we should not also be followers in some aspects, because there will be bits that we are not good at and we don't know about, but there is a business opportunity. There is a danger that net zero is seen as a cost. Of course, there is a cost associated with it, but there is a massive upside benefit, which will be a return. Therefore, this is an investment, not a cost.

Q85 Graham Stringer: I understand that. This country has not been great at translating original ideas into technological and economic benefit in the past. I understand the point about targets and giving clarity to industry. It also implies picking winners, doesn't it? You give an incentive to hydrogen; it turns out not to be the best technology and you have wasted a lot of money. You need batteries; you put a huge amount of money into that. I could go through the list. That is the problem with targets, isn't it? The Government are effectively picking winners, which they are terrible at.

Sir Patrick Vallance: At some point, of course, you do need to pick something, because you need to implement it. The way I think about this and the way that we have described it in the Net Zero Innovation Board is: start at 2050—most countries have now bought in 2050 as the target; some are a bit later—and work back and ask what the latest date is by which you need to make a decision in order to implement.

That is not going to be 20 years—it is going to be 10-something for most of those. Then, you use your R&D to do exactly what you are alluding to—to optimise the chance of being able to make a good decision. Don't use your R&D to just say, "I already know the answer." If you don't know the answer, what are the unknowns that would allow you to make the hydrogen versus some other decision? But be very clear about by when you need to have made that decision.

If we can optimise our R&D spend in that space, that will allow us to make the right decisions at the time you need to come off the fence and say, "We are going to implement this because we have got an implementation plan that needs to roll out."

Q86 Katherine Fletcher: You mentioned earlier in your evidence the opportunities for regional investment. With absolutely no weight of evidence at all, I would just observe how many people there are from the north-west of England or the top of the M6—particularly around Manchester—on the Science and Technology Committee. Perhaps you could reflect upon that as you move forward.

Chair: Everyone is welcome on the Committee, from all over the United Kingdom.

Sir Patrick Vallance: We are putting an office in Manchester.

Q87 Chair: The Committee, as viewers will know, is taking evidence right across the country and we will be going to Northern Ireland next.

I have a couple of questions, Sir Patrick. The Committee produced a report on ARIA. The chief executive-designate has decided not to take up



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the post. Is there a rethink going on in Government as to where and how ARIA might be established?

Sir Patrick Vallance: I think the chief executive withdrew for personal reasons. There is a process going on at the moment to appoint the chair. There is a rekindled process to look back at the CEO appointment to see what needs to happen. The approach is the same. It is a matter of getting people in post to get that off the ground.

Q88 **Chair:** I assume you are on the interview panel for the chair.

Sir Patrick Vallance: Yes.

Q89 **Chair:** Do you have a view as to the type of person you are looking for, either for the chair or the chief executive? Are they to come with a purpose for the organisation or do you regard that as something that will be given to them by the Government?

Sir Patrick Vallance: I think it will not be given to them by the Government. In other words, there will be suggestions as to the areas that are really important. I will give you an example that goes right the way back to the beginnings of ARPA in the US.

One of the previous senior people in ARPA was telling a story about how the Treasury had said one year, "We're completely fed up with buying bigger and bigger computers for every Department. Can't you get these bloody things to speak to each other?" And that was literally the mission that ARPA then took. It thought, "That's an interesting one. Yes, we think we can do that," and that was the ARPANET, which then led to the internet.

So that is the sort of thing that I would expect Government to be able to articulate. They need to articulate what the problem is in such a way that the CEO can then say, "Hmm, that's interesting. I think we probably can do something there. It's very difficult, and it's got lots of complexity to it, but I think the science is at a stage where we might be able to do something."

That, I think, is a big challenge for Government: how do you articulate things in the right way? And it is a big challenge for the CEO in thinking, "Which are the problems? Which are the ones that I can go after that would make sense?" So the CEO needs to be that type of character. The chair, obviously, needs to be able to help the CEO and make sure the organisation runs properly, but they also need to be very good at keeping everyone else off the back of ARIA.

Q90 **Chair:** Thank you. The commitment to ARIA was made in 2019. We are now in 2022 and a budget is there and available to be spent, to be invested. Do you have a feeling as to when you expect the chair to be appointed?

Sir Patrick Vallance: The process is ongoing at the moment. I don't have exactly the timetable for that. I am sure that it is public, actually, because

it will be in the adverts for the post, but I don't know it off the top of my head. I am sorry.

Q91 Chair: I have a final question, on Russia and Ukraine. The Science Minister has made a statement in the last few days about suspending scientific collaboration with Russian institutions, for reasons that everyone understands. As the Government Chief Scientific Adviser, do you have a feel for what the breadth of those collaborations is and do you have a view as to whether there is a model that we can adopt? Obviously, the international space station is an area of particular collaboration, but do you have a perspective on this?

Sir Patrick Vallance: Well, there are a number of things. First of all, I think it is very important that scientists and technologists in Ukraine are looked after, and I was pleased to see the approach being led by the British Academy to try to make sure that systems are in place to support them. I think there are also scientists in Russia who have spoken out about this and they also need to have some system to look after them. And then BEIS is looking at the landscape of collaborations as you have described.

The one thing that I do just want to say, which is important, is this. If you look at CERN, it was established after the second world war as a way to bring nations together, and in the belief that science and knowledge transcend political boundaries and are a way to harmonise the world and create things for everyone. It is really important, in an unstable and difficult political situation, that those sorts of ideals do not get destroyed and we end up with a problem. CERN is iconic in that respect.

Chair: And an example to be followed.

Carol Monaghan: And this July is the 10th anniversary of the discovery of the Higgs boson.

Chair: Thank you very much indeed. Sir Patrick, may I thank you and echo what Graham Stringer said? The Committee is very grateful for the courtesy and the time that you have given to all our inquiries, which are all relevant to your work, and for the clarity and candour of your answers. It has been good to have you back. I dare say the public watching, who may have missed you at press conferences, have enjoyed the two hours of you today. That concludes this meeting of the Committee.