HOUSE OF COMMONS

Science and Technology Committee

Oral evidence: UK Science, Research and Technology Capability and Influence in Global Disease Outbreaks, HC 136

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Watch the meeting

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

Questions 2190 - 2271

Witnesses

I: Sir Patrick Vallance, Government Chief Scientific Adviser; and Professor Chris Whitty, Chief Medical Officer for England.

HOUSE OF COMMONS

Examination of Witnesses

Witnesses: Sir Patrick Vallance and Professor Chris Whitty.

Q2190 **Chair:** The Science and Technology Committee is continuing its inquiry into Covid. We have had two types of session during the pandemic. Some have been looking back at the handling of the response to Covid to learn lessons on the way that can be applied; other sessions have been in advance of and to inform debates and votes in the House of Commons on measures put before it.

Today's session is of that second kind—to consider the scientific advice behind the so-called road map that the Government published on 22 February to inform a debate and vote on the renewal of some of those measures before Easter.

We are very pleased to welcome back to the Committee today Sir Patrick Vallance, the Government's chief scientific adviser, and Professor Chris Whitty, the chief medical officer. When both Sir Patrick and Chris appeared before the Committee in December, it was before any vaccine had been approved, let alone given to around a third of the population.

I take this opportunity on behalf of the Committee and MPs in the House of Commons to put on record our gratitude to both of you personally for your leadership in getting us here, whether it is Sir Patrick's leading role in prioritising vaccine development from the beginning of the pandemic, or Professor Whitty's role in driving clinical trials in the NHS, including way back in March driving the RECOVERY trial across the NHS, which was absolutely crucial to the development of the vaccines. We are very grateful for that contribution.

To start to understand the relationship between the road map and the considerations that you have been making in SAGE, Sir Patrick, as chief scientific adviser, to what extent are the measures in it reflective of SAGE advice?

Sir Patrick Vallance: SAGE has given advice around the potential of unlocking to increase cases, how it relates to the vaccine roll-out and how it may be minimised. That is one set of advice that was given.

A second, which we have given repeatedly from very early on, is that outdoors is a lower-risk environment than indoors, and, therefore, in thinking about releasing measures, outdoor things come early if you want to minimise risk.

The third is that, of course, we have been worried, like lots of other people, about the effects of school closures on children's mental health developmental state and educational attainment. Therefore, we are supportive of making sure that the balance between any risks of opening schools and the risks to children was appropriately reflected. Those are the types of advice that were given.

The final bit, which is important, is that, in looking at the modelling and the ability to understand what the impact of releasing measures might be, we are cognisant of the fact that we do not have a very tight handle on the magnitude of impact of different measures. We can make estimates, but we cannot really know, so it is important to do things both slowly enough and with enough time between steps to be able to measure. Taking a decision and waiting long enough to see what effect it has before moving on to a second, third or fourth was an important principle that SAGE recommended, and the timing interval was based on an analysis of when we thought data would become available from each move. That, I think, is crucial to understand what is happening rather than trying to fly blind.

Q2191 **Chair:** Are you satisfied that the SAGE advice is reflected in the road map? Is the road map consistent with the advice that SAGE gave?

Sir Patrick Vallance: The road map is consistent with the sets of advice that I have just described, which are around timing, being able to measure between intervals and, broadly, going more slowly. We do not give recommendations on exactly how that should be done or which things should be done when, but the principle of trying to go at a pace consistent with the vaccine roll-out, so that you have coverage as you begin to release, is broadly in line with what the modelling suggests is a better way to do it than going fast. The sequencing, as I said, of reopening outdoor things before indoor things is consistent with the advice that SAGE has given.

Q2192 **Chair:** Finally from me, are there any material differences between what SAGE advised and what was included in the road map?

Sir Patrick Vallance: As I say, it follows the principles that we laid out and the way we have described that. We do not get into precise details of what happens when you can't. Those are obviously decisions for others to make. The principles that we laid out have been largely followed in the way the road map was constructed.

Q2193 **Chair:** The advice was principles rather than specific measures and the timing of those measures?

Sir Patrick Vallance: Yes. SAGE did not comment on absolutely specific measures; it commented on the principles by which things should happen. It gave advice on speed, on intervals between things and on the types of things that were lower risk compared with higher risk.

Q2194 **Chair:** Would you say those intervals and that speed, as laid out in the road map, are consistent with the speed and pace that SAGE recommended?

Sir Patrick Vallance: Broadly, that is consistent. Certainly, we think the gaps between stages are the right sort of length, and the broad speed of roll-out is one that is consistent with the modelling suggesting the way to minimise the increase in numbers, because it is sort of inevitable that, as

mixing starts again, you will see an increased spread. That is how the disease spreads, so there will be increases, pressure on R and pressure on transmission as you open things up. What was modelled was a series of different paces of doing that, and the road map as laid out was consistent with minimising that increase as you open things up.

Chair: Thank you very much indeed.

Q2195 **Dawn Butler:** Thank you, Sir Patrick and Professor Whitty, for coming to the Committee today.

Sir Patrick, would the road map be strengthened if we focused more on the protection and risk factor rather than policing and complicated messages? Let me explain that a little more.

You said a little while ago that being outside is safer than being inside, so if we focused people's attention more on doing activities outside or making sure they mitigate their risk—maybe if they get tested and then isolate, they can go and visit a loved one, for instance—would that not be more sustainable and more effective than complicated messages saying, "On this date you can go and visit a loved one in a care centre or on this date you can do X, Y and Z"?

Sir Patrick Vallance: I completely agree with the premise that making sure that we all understand what the principles and reasons behind these things are is important. When we understand things, we are more likely to intuitively adhere to them than if we do not understand them, so I agree with that.

It is important to make sure that people understand that outside is less risky than inside, that maintaining hand hygiene is important, as is making sure that we wear our masks in crowded places. I absolutely agree that testing is important. Importantly, it is not just the testing; it is the self-isolation that goes along with it. All of those are incredibly important ways in which we need to think about controlling this. Some of them need to become ways in which we behave as a routine part of life. The more we can make a routine around hygiene matters, ventilation and so on, the better it is.

In terms of exact dates for things, we have argued, as I think the road map reflects, for data not dates, to try to make sure that we understand what the situation is after measures are taken. In terms of precise detail, it is for Government Departments and Ministers to work out exactly what needs to be said and when, in concert with businesses, schools and other groups that will have to make very clear preparation for the things they need to do. The principles bit is crucial, but how that is translated into policy and operational matters is for Ministers and Departments to decide.

Q2196 **Dawn Butler:** There seem to be a lot of dates that do not relate to data.

In the UK, we have changed the regulations regarding the tweaking of

vaccines for fast-track approval. I understand that, in regard to the different variants, there is real concern internationally. They are calling them "scariants" now rather than variants. Does it pose any risk to patient safety

Sir Patrick Vallance: Does what pose a risk to patient safety?

Dawn Butler: The changes that we have made in the regulations. The tweaking of the vaccines that we have asked the scientists to do in regard to combating the different variants is not going to go through the same process as it originally did; it is being fast-tracked. Does that in any way risk the safety of patients?

Sir Patrick Vallance: It is worth thinking about this in relation to flu vaccine. The way vaccine approval works is that every year the flu vaccine gets modified. It gets modified when scientists start to look at how the flu virus itself has changed over the year, what has happened in the southern hemisphere, what has happened in the northern hemisphere and so on, and they make predictions as to what the new vaccine should look like every year. The process is one of adjusting the vaccine but built on the same backbone as the vaccine from the previous year, so the heavy lifting bit of the vaccine is the same year on year, and then bits are changed to make it relevant to the flu that comes that year. That is the process, which is very well established over many years.

In essence, the argument around coronavirus vaccine is that the basic vaccine backbones have now been approved and looked at, some of them anyway; the ones that are in use now have been approved. If you tweak one part of it to make it more likely to tackle a variant—that has not been done yet, but people are looking at it now—and you do not change the rest of it, it falls into a flu-like category of a vaccine that is broadly the same but changed. Then it is up to the regulator, which is obviously why we have an independent regulator, to make decisions as to whether the changes are such that, broadly, it looks like the same vaccine tweaked a bit and therefore has the same safety profile, or whether the changes are more substantial and you need to go through other things. That is a role for the regulator.

Dawn Butler: Professor Whitty, do you have anything to add?

Professor Whitty: Not on that.

Dawn Butler: Thank you.

Q2197 **Graham Stringer:** Sir Patrick, is "data not dates" anything more than a slogan?

Sir Patrick Vallance: For us, it is not; for us, it is very important that you measure what you have done. We do not know what the impact of schools going back, for example, is going to be. There is an estimate from the modelling group that it could have an effect on R of an increase of between 10% and 50%. We do not know within that range exactly what it will be. We know that, as contacts increase, transmission

increases, and we know that as schools go back other things happen as well. Parents meet; some people who perhaps were not going into work may go into work as a result. It changes a number of things, all of which may have pressure on transmission.

That is why, from our perspective, our advice was to make sure that you have enough time to measure what has happened in response to each change and then decide whether you have room to make the next change, either on the date that was announced or delaying it if you have to. Nobody would say that we know exactly how this is going to roll out over the next few months. The important thing is to measure, adapt and take decisions in the light of information as it emerges.

Q2198 **Graham Stringer:** I understand that, although Professor Woolhouse told us a few weeks ago that there had been no surge in infections when schools reopened in this country and in other parts of the world. What I was really getting at is this. What are the numbers, what are the thresholds, so that we would know that it is working or not? Is it the number of people who are being admitted to intensive care? Is it the number of people who are dying? Is it the R number? Is it the infection rate? What are the numbers that will enable us to judge whether the policies that have been taken are successful? If we do not know those numbers, surely it is just a slogan.

Sir Patrick Vallance: Ministers have set out the four tests that they wish to use in order to make—

Q2199 **Graham Stringer:** But they are number-free, aren't they?

Sir Patrick Vallance: Sorry?

Graham Stringer: They do not have numbers in them.

Sir Patrick Vallance: Those are the tests that Ministers wish to use in order to make decisions. What we will do is feed in, as we see them, the numbers of cases, hospitalisations, intensive care admissions and deaths as they occur during that period and the trends that we see within that. That is where we will input to the information that Ministers have when they wish to make decisions.

Q2200 **Graham Stringer:** There is no way that Members of Parliament, who are outside this process, can look at the published numbers and say, "This is really successful," or, "It is not going as well as we wished it would," so that we can judge it. It is just a debate between you and the Government that allows arbitrary decisions to be made, isn't it?

Sir Patrick Vallance: We will make all our data public, as we always do. We will make our interpretation of that available, as we always do. That will be a source of information for people to look at and—

Q2201 **Graham Stringer:** I am sorry to interrupt; I do not like interrupting. I accept that the data on those occasions will be made public, but it is when that data is made public that we can say, "This is going very badly

because there are so many people going into intensive care," or whatever the criterion is. But you are not telling us either what you are advising the Government the criteria should be or what the Government will do. We have general principles, which are difficult to disagree with, but I want to know what the threshold is—what the critical numbers are.

Sir Patrick Vallance: It is for Ministers to decide what they wish to have as targets for these things. They are not matters for science to determine. We can give the information, we can give the trajectory and we can give the impact that we think has happened as a result of the changes that have been made. Obviously, it is a matter for Ministers and Parliament to decide what level of risk and what level of events people are prepared to tolerate.

Q2202 **Graham Stringer:** I am labouring the point, but it is the last time I will ask the question in a different way. You have not recommended precise figures to the Government that will trigger them either to go faster or, more likely, go slower.

Sir Patrick Vallance: We have not recommended precise numbers, no.

Q2203 **Graham Stringer:** In my opinion, it is a slogan.

Professor Whitty, there are a number of uncertainties about the direction it is going in, and they have been discussed. One thing I do not understand is in terms of the vaccination programme, which is going extraordinarily well and is a credit to everybody involved. Most of the over-70s, and soon the over-60s, will have been vaccinated; 90%-odd of the deaths are people in the top age group, over 80, or who have other conditions. Yet the modelling is saying that 30,000 people are going to die. How can you explain that figure when the vaccination programme is so successful and covering those people?

Professor Whitty: The vaccination programme is very successful, and you are absolutely right that that is a huge tribute to everybody who has been involved. The vaccination programme protects people, essentially, in three ways, the first of which is that it protects the individual vaccinated; and you must remember that, of those people who have been vaccinated, the great majority have only been vaccinated once. That provides the majority of the protection but not all of the protection, so they need to have a second vaccination to get the full benefit of the vaccines that have been deployed; they are both two-vaccine vaccines.

The second protection is people who they meet being vaccinated. That is partially achieved in people, for example, living in care homes or nursing homes because of the vaccination programme among their staff, but it is not necessarily among everybody else and other people they might come across; certainly, people who are out and about, going to shops and so on, will come across many people who are not vaccinated.

The third thing is the way in which it helps to reduce the overall rate, because the probability that an individual person who is vulnerable will

meet a virus is, essentially, the overall rate in the general community. But even when people are fully vaccinated, a significant minority—not large, but a significant minority—go on to get significant disease. It is not zero. There are some vaccines that are as close as means no difference to being 100% effective. These are not those vaccines. They are extremely good, but they are not at that level and we do not know who those people are. Then there are some people who have chosen not to be vaccinated or have not been able to be vaccinated who are also at risk.

Finally, there are people who are at risk in the lower age groups. The modelling reflects the fact that because this is such a common virus, it gets to large numbers of people, even if you have a relatively small proportion of people remaining vulnerable, that equates to a very large number of people overall, and that is really what this reflects. As things open up, all the modelling suggests that, at some point, we will get a surge in virus. We hope it does not happen soon, but it might, for example, happen later in the summer if we open up gradually or, if there is a seasonal effect, it might happen over the next autumn and winter. All the modelling suggests that there is going to be a further surge, and that will find the people who either have not been vaccinated or where the vaccine has not worked; some of them will end up in hospital and, sadly, some of them will go on to die. That is just the reality of where we are with the current vaccination.

The current modelling makes a number of assumptions, and I can go into those in detail, if you are interested, but, broadly, it is the reason why we expect to see further deaths, although the ratio of cases to deaths will go right down as a result of vaccination, but not right down to zero, unfortunately.

Q2204 **Graham Stringer:** I accept that. What is 30,000 as a percentage of the group of people who are most likely to die, if infected?

Professor Whitty: I am sorry, I do not understand the question, Mr Stringer.

Graham Stringer: I find it difficult to understand how the figure of 30,000 is arrived at, when a large percentage of the most vulnerable population will have been vaccinated. If the country has vaccinated most of the groups who are likely to die—the over-80s, or people with other conditions, and they are 90%-odd vaccinated—what is 30,000 as a percentage of the non-vaccinated? That must be a serious part of the calculation to work out who is likely to die.

Professor Whitty: The difficulty with working out who is likely to die is that there are several different groups who potentially are going to die, some of whom we cannot identify in any way. You are absolutely right that the great majority of people who die will be either older or have pre-existing health conditions, but not all. For the great majority, you are absolutely right, obviously.

Secondly, we do not know of the people who have been vaccinated who the vaccines have worked in and who they have not, but we know that there will be a minority in whom they will not work. I would not get too stuck on individual numbers. I have repeatedly said all the way through this pandemic that forward projections of exact numbers are really difficult to interpret and I put huge confidence intervals around them.

The general point, though, is that it is not just a few people. There would be significant numbers of people dying. In an average flu year, 7,000 to 9,000 people would die, and in a typical bad flu year over 20,000 people die. These are not ridiculous numbers; they are perfectly reasonable numbers for a significant respiratory virus that infects very vulnerable citizens even when vaccinated, as they may well have been with flu.

Graham Stringer: I was just trying to get to the basis of that number. Thank you.

Q2205 **Chair:** To pursue Graham's point a little bit, Professor Whitty, obviously the modelling is based on assumptions; all models are. The principal models that have gone into this include the Imperial College model and the Warwick model. The assumptions on, for example, the efficacy of the vaccines have happily been superseded—they are better—and so has the take-up, has it not? To Graham's point about the 30,000, that 30,000 presumably comes from those who either have not been vaccinated or for whom the vaccine has not been effective. But we know, happily, that that group is much smaller than modellers had predicted with the best information they had at the time. Does that cause you to revise your view as to what we should prepare for, for the summer?

Professor Whitty: There are probably several points I would make on that, if I may, Chair. First, to repeat my previous point, if you zero in on particular numbers, every single number will be incorrect. They give an indication of general principles. The first and most important principle that the models demonstrate is that, if you open up too fast, a lot more people die—a lot more people die.

The main point on the modelling is to demonstrate the profound difference between opening up too quickly, which leads to very large numbers of deaths, and opening up more slowly in a steady way, in the way that Sir Patrick described early on and is laid out in the road map, but which does not lead to no deaths. It is really important that we do not give any impression that what we expect is that this just goes away and there are no further deaths. That is not realistic, and to pretend that to the British public would be completely wrong; it is not the case. There will be further deaths.

By going steadily, the models demonstrate that you will have many fewer deaths. That depends on the fact that the vaccines that are coming in do a very large amount of the heavy lifting. The vaccine uptake so far is good—very good—but this is an older population and vaccine hesitancy is slightly different among different ages, which you might want to come

back to. Vaccine effectiveness so far looks to be at the higher end of the expected range, but not way out of the ballpark. It is a bit better than the central projection, but if you recall—I know you have looked at this in detail—the Warwick models did an analysis looking at a 99% effective vaccine and still saw significant numbers of deaths, so I think the idea that this completely takes it out of scope is probably not correct.

What you see with the modelling is that, if you do things steadily, you get a much lower and shallower peak, although unfortunately there still will be a surge, with significant numbers but far fewer deaths, and it will be pushed further back in time. There is, in my view—this is not in the models—likely to be some degree of seasonality, which will push the peak further back in time. It does not get rid of it; it moves it in time but does not eliminate it. We hope that by the time we get to the point when the peak is happening, if we go steadily enough, a very high proportion—ideally all—of the adult population will have had at least one vaccine, so we will have some high degree of protection.

However, to go back to your first point, this is not a 100% effective vaccine even for those who take it, which of course at the moment is the great majority.

Q2206 **Chair:** Indeed, but the essential point is that, even though the effectiveness of the vaccines and the take-up has been higher than expected so far, it does not cause you to change the advice as to the pace of unlocking. Is that the point you are making?

Professor Whitty: No, it definitely would not. Under all scenarios, if we unlock very suddenly, or even significantly faster than is recommended, all the modelling would suggest that we would get a substantial surge while a lot of people are not protected. Remember that the people who drive the wave of infection are not generally older citizens; it is generally younger ones. The vaccination policy that we have taken at the moment in the UK, which is to go to the highest-risk people first, will seriously reduce the ratio between numbers of infections and deaths, and that is a fantastic achievement, but it will have a much smaller effect on the actual drive of the wave of transmission, which tends to be in younger adults. They have not yet been vaccinated and, therefore, vaccination will have almost no role to play in reducing transmission in that group for some time, because we have not yet got to the point that they are vaccinated.

If you released very quickly, you would suddenly get a wave of transmission through younger adults, and that would lead in due course to older adults being infected, and some of them, either because they had not had the vaccine or because they were not fully protected by the vaccine, would go on to get serious outcomes.

Q2207 **Chair:** Data clearly has been elevated to have great importance. Angela McLean told this Committee that data not dates was the approach to take. The road map has a lot of dates: 8 March, yesterday, schools reopening; 29 March, outdoor sport; 12 April, outdoor pubs and cafés; 17

May, indoor hospitality; 21 June, weddings without limits. There are a lot of dates. If we are to be driven by data, does it follow that, if the data is better than anticipated, we can bring forward some of those reopenings?

Professor Whitty: Sir Patrick laid out at the beginning the fundamental reason for having the particular five-week gaps between each of the stages. The reason is that it takes at least three weeks, possibly four, to get the data and to analyse it properly, remembering that there is at least a 10-day lag before you start to see cases coming through. The Prime Minister and Ministers have said they want to give people a week's notice before major changes are taken, so that people can make proper preparations either way and do not have to do handbrake turns or sudden starts from absolutely nowhere. If you do that, you are not going to want to reduce the time between the various steps.

If you look at the steps, each one is actually quite a big step. The first step is opening all schools, which is a lot of things, plus some other areas to be opened up. That includes the decision for people to meet outdoors, which is a much lower risk, as Sir Patrick said at the beginning, but not zero risk. Step 1 is already quite a big step.

The list of things that are in step 2 is very long: all the high-contact things indoors such as gyms and retail. It is a very long list of things. Again, it is a very significant step. You would want to see what the combination of schools plus all of those being open is, and that takes you to another five weeks.

Then you get another very significant step. The last step is probably the smallest step, in one sense, but even with that, which is taking all restrictions away, you want to be absolutely confident that we are safe to do it. A lot of people may think it is all over. I encourage them to look at what is happening in continental Europe at the moment, where a lot of countries are going back to rates going up and having to close things down again, having not been in that situation before. It is very easy to forget quite how quickly things can turn bad if you do not keep a very close eye on them.

If I can give one historical point—I know it is not a looking-back thing but it illustrates the point—we looked at yesterday's data, which is the data we have, 65 deaths. It is a low rate because it was from a Sunday, but it is excellent that things are going down, and we feel very pleased that it is going the right way. If we look at the same date a year ago, from 8 March, there had been in total two deaths in the UK, and by 23 March we were in lockdown in a very difficult situation.

People should remember that things can turn bad very fast if you do not keep a very close eye on what is going on. The steps are five weeks for a logical reason, which is around when you can analyse the data. The size of each step is already quite large, and you would want to be very careful before you loaded still more on each of the steps that you were sure what effect it was going to have.

Q2208 **Chair:** It is important to look back and to look at other countries, but it is also important to take account of changes that happen, and the big change is the vaccine. The striking comparison between this country and other European countries that are having to go back into lockdowns is that we have a much more effective vaccine roll-out programme, is it not?

Professor Whitty: To go back to my previous point, if you are thinking about a surge in transmission, remember that the great majority of those who will drive a surge in transmission are not yet vaccinated and will not be vaccinated by Easter. The idea that there is a sort of get-out-of-jail card in terms of a surge of transmission is to misremember where in the age spectrum the drive of transmission is. It is in younger adults, not in those who have so far been vaccinated, by and large.

Of course, the further down the age range we go, and the higher the percentage of the population who are vaccinated, particularly when people have had two vaccines and a further 10 days or so after the second vaccine, of course, it will take more and more of the heavy lifting. That is the whole point that the modelling shows. If you take things steadily and then start your proper opening up—the biggest risk is opening up—when a lot of people in the lower ages have been vaccinated, you are in a much better position. But if you start shunting things forward, you will very quickly get to the very high peaks that were there, and you do not need modelling to understand that the big drive in transmission tends to be in adults under the age of 60. At the moment, we are only just getting to those who are in their 50s, other than those who have pre-existing health conditions.

Q2209 **Chair:** The timing of the measures is clearly of great importance, and this is why all of us are pursuing it. It is on the minds of Members of Parliament because it is on the minds of our constituents whose jobs depend on all this. To explore it a bit further, Professor Andrew Hayward, from University College London, whom you know, said it is absolutely right to be driven by the data, but if we are driven by the data, we need to be prepared, if things are better than expected, to be able to release faster than we expect. That is reasonable, isn't it?

Professor Whitty: I think Andrew would probably want to consider what he meant by faster. I do not think he would at all suggest that we should concertina the five-week gaps, because if you are giving a week's notice to people that is the minimum period you will have data to look at and take a serious judgment on. In terms of how long the period between steps is, that is significant and you would want to be quite careful.

Let me read out what is going to happen on 12 April. We are going to have indoor leisure, including gyms, libraries, community centres, personal care, retail, outdoor hospitality, a lot of things around children, domestic stays overnight, including self-contained, and so on. There is a long list of things that are being opened. You would want to see how all of that opening, which is a lot—I do not think Andrew would argue that

we should do more than that at that stage—interacts with schools, which will be completely open by that stage and back; by the time we get to 12 April we are going into the summer term. We have quite large blocks of potential risk all together.

When you look at that, and think what you would want to put on top of it, what the Government have been told over and again is to take it steady. We do not want to accelerate into trouble and then have to reverse straight back out again—open things up and immediately close them down. That is not what anyone is asking for, so we should be trying to stick to the five-week period, because that is when the data happens, and make sure that we have sensible blocks.

If Ministers want to relook at it, of course they can, but if you think about what is being opened in April, and exactly the same is true in May, which is a very substantial block of things with very high risk when you put them together, you would want to think quite carefully before you load even more on to that, if you are trying to reduce to an absolute minimum the risk that you would then have of reversing out of it.

Q2210 **Chair:** If we got, say, to the end of April, in six weeks' time more or less, and the levels of infection, admissions to hospital, pressure on hospitals, the knowledge of the vaccine and its efficaciousness against new variants—all these things—had gone very well, would we still need to wait until 21 June just because we had set a date rather than being guided by the data?

Professor Whitty: To go back to the dates, the point is that they are set by when you can measure the data. In a sense, my view is that you should take the dates as fixed. With regard to what is in the dates, there is some question that Ministers could look at that, but if you look at the history of this all around the world, it is not full of countries and individual leaders wishing they had done more, faster. It is full of leaders who wished they had actually acted quicker and then been more careful as they take things off. That is the history of this everywhere in the world; it is not specific to the UK at all.

Given the large blocks in those periods, and if you accept the logic that we should be driven by data, in which case the five weeks is basically the minimum we can talk about, you really would need to think quite carefully before, for example, taking some of the really major indoor risks and pushing them into the middle of April, when the great majority of the population who are at risk are still not double vaccinated and you already have a lot of other areas that have potential risk associated with them.

My view is that Ministers are trying to take this steadily. They are trying to do it based on data, they are doing it in big blocks—these are big blocks of risk taken together—and then waiting long enough to see what has happened so they can make a sensible, data-based judgment about the next step.

Q2211 **Aaron Bell:** Thank you both for your time today and for everything you have done throughout the pandemic.

To continue on the line the Chair has been taking, I think data not dates is something this whole Committee can get behind, with our interest in science, but it is 104 days until 21 June. I understand your natural caution, but the lesson from last year is obviously not just that things can turn bad quickly but that the idea of predicting the path of the virus 100 days ahead seems to be something of a fool's errand. We are told that we are doubling the supply of vaccine from next week. I am 41, and I should be getting my first jab sometime in the middle of next month, I expect. You both understand, too, the damage that lockdown is doing, not just economically but to people's mental health, and all the other pressures that there have been on the NHS.

I understand your natural caution, but are we really saying that the 21 June date is set in stone and there is no way that we could possibly go quicker? I think the 12 April date needs to be set in stone as the first review date, but if at that review date we conclude that things are going better than expected, surely there is a case for bringing the other steps forward a little bit.

Professor Whitty: Starting with the obvious point that these decisions are ultimately absolutely for Ministers, so it is not for me to say exactly what they should be, there are two things that I would strongly advise, based on principles. Going back to Patrick's point, our job is primarily to give principles. First, do not try to concertina the five-week breaks; if you want to be based on data, you have to use those five weeks if you wish to give people a week's notice. You simply cannot see the effect size in any time that is shorter than that.

Secondly, on each of the blocks we are looking at, we are all delighted about yesterday's; schools going back is absolutely critical for children's long-term development, mental health and all the other health benefits of schooling. No one contests that at all. That is a big block added to some additional things that allow people to meet outdoors, which is again something that people really want.

The 12 April block is a very big block. If you look at all the things in the 12 April block, it is a big block. You are going to want to wait and see what that does. Then the 17 May one is a very significant block with a lot of stuff that is indoors for the first time. That is the point when we are potentially going to start to see some very significant risks accumulating. If you want to be based on data, that seems a reasonable way to go. It is absolutely not my role to say exactly what should be in which of those blocks, but the principle that the blocks should be a manageable size while significant, which they are, and five weeks apart is one that has very sound logic behind it.

Q2212 **Aaron Bell:** You are suggesting that we need four weeks, and that would be the earliest point at which we could see the impacts of the previous

step, and then there is a week that the Government say they want for announcements. Surely, there must be some indicative data that comes in after week 2 and week 3, through cases. Obviously, we realise there is a lag between cases, hospitalisations and deaths; there has been throughout. Is there nothing useful we can pick up earlier than the four-week point in terms of potentially shortening the gap between steps?

Professor Whitty: If you think about the way in which you can pick up stuff, you are not going to see anything for a generation's time and probably two generations; it will just be completely impossible to see. Then you have to have enough of a direction of travel that you can see the slope in a way that you feel the confidence intervals are narrow enough to take something useful from. Even after four weeks, if you were the Minister, would you feel confident bringing it forward a bit because it seemed initially a popular thing to do, and then being in a situation where you have overloaded the system and you have to reverse and start closing stuff down again? I suspect you would view that as something people are not asking for, when you think it through.

It is really about whether we have enough information. The period of time will allow us to have a rough view as to whether it looks as if it is going way out of the park that we were expecting it to go in, in which case Ministers can be advised, "Look, these data do not look good." It is pretty doubtful that you are going to be in a position where you will be able to say, "These data look so fantastically better. Please take more risks." That seems a very unlikely situation, given how large the blocks of activity already are; but clearly, at the end of the day, it is a decision for Ministers.

Q2213 **Aaron Bell:** Thank you. Sir Patrick, do you want to add anything on those points?

Sir Patrick Vallance: I agree with the way Chris has expressed it. If you think about it, when you make a block of opening up, you do not get an instant change in infection. You start to see spreads as people begin to have increased contacts. It takes time for that infection spread to be detectable. I know you follow the data closely, and you will have seen that we get bumps in the road. You think, "Oh, it's going in the right direction. No, it's not; it is going in the wrong direction." We will see ups and downs during that period.

It takes even longer to start to see what that translates to in hospitalisations. It is quite an important distinction in the presence of vaccines, because vaccines will have a bigger effect there than on transmission, particularly as transmission is largely going to occur in the unvaccinated group, as it always does, in the younger age groups. The estimate is that, after three weeks, you can start to get a real handle on it, and probably somewhere between three and four weeks you can get a decent handle on what is happening. Then Ministers want a week to alert businesses and others to what is going to happen. If you truncate that,

you are, essentially, flying blind. You might feel, "Oh, I can smell it going in a certain direction; it looks like this," but you really won't know. That is the basis for the gap.

As Chris said, there are quite a large number of things in each block, and we simply cannot measure now what effect that will have. The more you put in there, obviously, the higher the risk. It is a decision for others to determine what goes in there, but the principle of saying, let's get the schools open, then let's go for outdoor and then let's go for indoor, seems entirely sensible in terms of the risk profile and the ability to measure the effects.

Q2214 **Dawn Butler:** I have a couple of quick questions. It is quite obvious that a lot of what the Government are doing is dates and not data, rather than the other way around, but I want to take us to the effects of the coronavirus. We know that it affects African Caribbean, Asian, minority ethnic people more than others. What advice have you given the Government to mitigate that, please, Professor Whitty?

Professor Whitty: You raise an extremely important point. What we need to do is divide the risks that have led to significantly higher rates in some cases in many of the ethnic minority population groups of the UK into the risk of getting the infection, and then, once acquired, the risk of dying or having other severe side effects or long-term problems with the infection. Those are separate sets of problems, and they have slightly different mitigations.

The risk of acquiring the infection varied very significantly as we went through the pandemic. In the first epidemic wave, the biggest groups affected—the biggest group in particular—were British black, Caribbean and black African heritage, but significant numbers of people of south Asian heritage and other ethnic groups as well.

If you look at the first part of the second wave, before we got to the B.1.1.7. period, when there was a lot of transmission in the midlands, and a really heavy emphasis and effect, unfortunately, on people of British Pakistani heritage and British Bangladeshi heritage, there was almost no additional risk to people of British African Caribbean and African heritage. That was largely to do with where in the country the wave was. It was in the midlands area. The pattern for different groups was that it was the bit of the country that was hit, and therefore ethnic minority groups who are highly represented in those parts of country were very highly represented, unfortunately, in the people who had serious problems. In the second half of the second wave, which we are on the down slope of at the moment, there was a lot of transmission in London, and we are back to a situation where it was more reflective of the London population.

The reason I am making that point is that we are seeing quite a complex picture in terms of acquisition. A lot of it is to do with occupation. Many of the ethnic minority groups are in high-risk occupations. They might be in

caring occupations; they might be, for example, taxi drivers or security guards, which we know are high-risk groups. Some of it is occupational. Some of it is to do with family structure, in terms of, for example, multigenerational households; we think that was very significant in the effect on people of south Asian heritage in multigenerational households in the midlands area. Some of it is undoubtedly the broad group of things that have been talked about—all the disadvantages of deprivation. There is clearly not an absolute correlation, but where people are living in deprived areas, as with pretty well all infectious diseases, is where Covid has concentrated. There is a really strong socioeconomic gradient and a really strong urban gradient, so there are higher rates in urban areas than in rural areas virtually everywhere.

It is a combination of factors. The final bit of disadvantage, unfortunately, when we come to acquisition—this is a future problem, which we really must get on top of, and I am doing a lot of thinking about it, as is everyone—is that some ethnic minority groups have lower vaccine uptake and greater vaccine hesitancy, for a whole variety of fully understandable reasons, but it is an observable fact. For people particularly of African heritage, that is the case in the UK, although it is getting better at the moment; the direction of travel is better.

The second group of problems are much more biological—the chances of dying once someone has acquired it. That is to do with things like diabetes, comorbidities and a variety of other factors that are much more, in a sense, in the medical sphere. That is more straightforward in one sense because doctors, nurses and other health professionals have to deal with them directly as they come, but there is no doubt that there is a difference in the pattern that we have seen in severity in some ethnic groups.

First, it is very much about concentrating efforts as far as we can in areas of deprivation and in the professions at highest risk. That has been the most important thing. If we do that, we will reduce some but not all of the ethnic disparities and also reduce some but not all of the socioeconomic disparities. But the problem is that many of these disparities are very deep-rooted; they are not things that you can just magic away in a very short period. They are really fundamental problems for the long-term health of those citizens. It is not just a Covid problem; it is an overall problem.

Q2215 **Dawn Butler:** Absolutely. It is very much structural, Professor Whitty; I agree with you on that point. Do the Government understand that structural inequality?

Professor Whitty: The Government do understand it. The problem with many of these long-term structural things is that they are much easier to understand than to sort out in a short time, but they are things that need sorting out fundamentally and they are all the things that lead to deprivation and the ill health that goes with it. If you are in public health, which I am, you have to think about deprivation the whole time, and not

just about Covid. Covid is in a sense an extreme current example, but the same will be true about diabetes, cardiovascular disease and very many other areas. You have to think about that in all aspects of health, as well as the wider disadvantage.

Q2216 **Dawn Butler:** So fighting for more investment in those deprived areas will help with better health outcomes.

Professor Whitty: Improving all the environments where people live in areas of deprivation will help not just health outcomes but life outcomes and that—

Q2217 **Dawn Butler:** Housing, jobs—

Professor Whitty: All those things. This is not a controversial statement. It is a simple statement of fact. These are critical issues across the board. Of course, they have a major health impact, which is why people like me are obviously in very strong engagement, but they have impacts on everything else—life chances, education, all the other areas.

Dawn Butler: Thank you very much.

Q2218 **Rebecca Long Bailey:** Thank you, Sir Patrick and Professor Whitty, for your relentless hard work and for coming along today to speak to us.

The SAGE 80 minutes on 11 February state quite clearly at point 57 that the "consensus view remains that the opening of primary and secondary schools is likely to increase effective R by a factor of 1.1 to 1.5", and at point 60, "There are a number of uncertainties in the modelling including the potential network implications of reopening schools. A phased reopening would allow the effects to be assessed".

With that in mind, Professor Whitty, and in the context that it is undeniable that infection rates began to increase significantly when schools reopened in September, for the avoidance of doubt, were the Government advised by SAGE to pursue a phased reopening in March, and, more broadly, what are the implications of not following that proposal as set out in the SAGE minutes?

Professor Whitty: I am going to unfairly slide this to Sir Patrick, only because he is the main chair of SAGE. If he wants to send it back to me, I will happily answer it.

Chair: Sir Patrick, you have drawn the short straw.

Sir Patrick Vallance: I am very happy to answer. As I said, SAGE has looked at the potential implications of opening schools, and because of all the other things that go along with that, including increased parental mixing, and potentially people taking different work patterns and so on as a result, it is quite difficult to know precisely what the effect is. That is why they have come up with a figure of a between 10% and 50% increase, and we do not know where it is going to be on that spectrum.

They also modelled a sort of staggered opening versus a single opening, and, essentially, you end up in the same place. You are just on a different route to get there. Overall you do not have a different impact, but of course the less you do, the less the effect initially. The question for decision makers is that, if you went sequentially in opening up, you would then have to put a five-week gap between it all. It would be a very long time before you got to a complete opening up. If you go immediately, obviously it will have a bigger effect—I do not think there is any doubt about that—and you will have to measure it after five weeks and see where you are. Where we are now is schools going back all together. There is then a holiday, with the Easter break, and a chance to find out what the effect of that will be.

To go back to the point that, I think, Graham Stringer raised earlier, when we look back at the impact of schools opening, in general, schools seemed to reflect quite closely what was happening in the community. Although we know spread occurs in schools, and we know that children can catch it, we know they are not at increased risk personally in the same way as older people are. We know that it can be brought back into the household from schools because that happens, so it still looks like the way schools impact in this is largely as a reflection on community spread rather than as a driver. It may be different in the current situation because they are some of the few things open now, so they may be a place where we see a driver. All of the things that we do not know we need to measure, but our advice, as laid out in that paper, is that we expect there to be an effect on R and it is absolutely essential to measure it; and that staggering an opening will lead to the same ultimate effect as opening all together.

Professor Whitty: Can I add to that? I do not want anyone to feel that I was sliding that question because I did not want to answer it. Since the question was about SAGE, I thought it was right that Patrick had first go.

There are broadly four important groups to think about when we think about the school-opening decisions. There are children, the wider effect on R and society, which is what Patrick has just talked about, parents and teachers. All of those are critical groups.

In the case of children, everybody who has looked at it is pretty well unambiguous about the advantages of education for children on their physical health, mental health and long-term prospects. To go back to the last question that I was asked, it is one of the most powerful drivers of reducing disparities between different groups. If children are not in school, you are doing them a significant disservice, and I do not think anyone disputes that. That is a really clear thing, whether it is health or long-term prospects.

Set against that, the risk to children from Covid is extremely small. It is not zero, but it is extremely small relative to adults. It is smaller, in fact, than for seasonal flu. Therefore, from a child's point of view, and we

should always start with children, the risk-benefit is clearly in favour of education.

The next issue to think about is the point that Patrick just made on the R. I do not have a huge amount to add, except that we have to open schools at some point, and having this block all about education—given that the next block is also a very large block—makes a lot of sense. We have five weeks. We have the Easter break, potentially. I think people can exaggerate the risk of doing this, given that there is a natural firebreak around the Easter break on the R side.

The third issue is around parents. There is a bit of introduction from schools to parents. A lot of it goes the other way, but, as Patrick said, what drives transmission in schools, as far as we can see, is what happens in the general community. That is the big driver. The way to protect schools is to keep the rates of transmission down, which is why so much of the rest of society is keeping the rates down. Everyone has been absolutely fantastic at doing that.

Finally, of course teachers are concerned. That is perfectly legitimate. Teachers are not in the very high-risk groups. All work that is not from home is a slightly higher risk. That is one reason, among others, that we recommend that people work from home where they can. However, teachers are not in the same group as social care workers, for example, and others who are in very high-contact groups. We hope that, as vaccination is rolled out, the highest-risk teachers will also be protected by vaccination. That is an important thing to acknowledge.

As Patrick said, in terms of the R side, where you started off, it is either a problem now and we wait—you have the holidays and then we measure it—or it is a staggered problem, but it is still the same problem.

Q2219 **Rebecca Long Bailey:** First, to be clear, did SAGE advise a phased reopening? A yes or no answer would be very helpful, because the public are certainly confused. Secondly, to draw on some of the points that you have made, in point 53 of the same paper—the SAGE 80 minutes—a varying selection of mitigation measures were suggested. One of them was social distancing, which is very important but not viable in most school settings. It simply is not viable. How would that change the responses that you have just given?

First, has SAGE advised a phased reopening—yes or no? Secondly, how will the fact that social distancing is nigh on impossible affect the responses that you have just given?

Sir Patrick Vallance: SAGE laid out the evidence as you have seen it and said, "Here are the options you have. You can take an option to go all in one go or you can take a staggered option. You end up in the same place over a different timeframe." We did not say, "This is the one preferred over that one." We simply laid it out as it is laid out there.

On the mitigation measures, there was quite an extensive paper that accompanied those minutes. I cannot remember whether that is the final version; I think the final version came out a week or so later. The paper laid out all the mitigation measures that we thought should be looked at. I think they have been incorporated in the DfE advice. We laid those out. We absolutely recognise, and have recognised for a long time, that social distancing is very difficult to do in schools. Other measures are as well. However, some measures, including things like ventilation, are important, and need to be done properly as part of this.

Professor Whitty: A lot of it comes from a slight misapprehension that SAGE lists the following 15 exact things that the Government must do, and then the Government either do those things or do not do them and deviate from SAGE. That is not actually what SAGE is supposed to do, and that is not what SAGE does. It lays out broad principles. Ministers then have to incorporate them, with everything else, including social, educational and economic impacts. It is not a matter of SAGE saying, "This is what Government should do, in minutiae." It is a matter of SAGE laying out the scientific basis, which is part of decision making for a Minister.

Rebecca Long Bailey: That is very helpful.

Q2220 **Carol Monaghan:** Can you explain more clearly the reasons for the five-week delay? I am looking at the Government's website on the road map out of lockdown. It says, "There will be a minimum of five weeks between each step: four weeks for the scientific data to reflect the changes in restrictions and to be analysed; followed by one week's advance notice of the restrictions that will be eased." We understand the reasons why advance notice is required, but why four weeks for the gathering of data? We see all of the real-time data for case numbers, hospital admissions and deaths, so why do we need four weeks?

Sir Patrick Vallance: The modellers and others looked back and asked when they get reliable information. I will restate some of the thinking behind that to explain why it is the case. When you open something today, you do not instantaneously start to see an increase in infection. It takes days for people to increase their mixing and contacts. You then have days before that becomes something that turns into an infection. You then see a growth of infections, potentially, over a period of a couple of weeks that you may be able to pick up. You will not see that trend instantly. You then have to wait and see what effect it is having—whether it is turning into hospitalisation.

The retrospective analysis says that the earliest time at which there is confidence in the trend that you are seeing is three weeks. That is the earliest, and it is quite a vulnerable early three weeks. You need a week to make sure that you really understand what you are looking at. You can then be much more robust about what you think is happening with the trends. We have all seen the data. It jumps around. It jumps around at weekends. It jumps up and down as people have other things going on

that mean that a number may go up one day and down the next. It is pretty difficult just to eyeball it over a shorter period. People will do that—

Q2221 **Carol Monaghan:** I am sorry to interrupt, but that is why we use the seven-day rolling average, rather than looking at the daily cases.

Sir Patrick Vallance: Yes, but that, too, is not a precise estimate of which way things are going. The assessment is that it will take three weeks, as a minimum, to have reliable data on which to make decisions. More likely, it will take a few days after that to get it into some sort of form. The four weeks are for data analysis and the ability to explain that so Ministers can make decisions. That is the reasoning behind the timeframe.

Professor Whitty: I have one technical point. As the numbers get smaller, the data bounces around more, so uncertainty gets greater.

Q2222 **Carol Monaghan:** Can I ask about the additional week? In Scotland, we have done it differently. We have set out the dates, and the dates will be confirmed a week beforehand. That still builds in a week's preparation time for different sectors, but it means there is an expectation there already, if the data supports that. Is that not possible in England?

Sir Patrick Vallance: I am not sure what you are saying. Are you saying that at four weeks we should make an announcement?

Q2223 **Carol Monaghan:** No. There are three weeks between the different restrictions, and we already know. The road map in Scotland is also published with the dates, but the announcement will be made a week to two weeks before the opening up. It still gives businesses time to prepare and still gives confidence in the road map, but it shortens the additional week that you have said we need for sectors to prepare to reopen. The five-week period seems awfully long.

Sir Patrick Vallance: As I said, our advice is on how long it takes to get the data and to be confident about what the data is saying. That is the advice that we have given. The decision on what period is needed for Government to implement that with business is one for Ministers. It is not a scientific question.

Q2224 **Zarah Sultana:** My questions are aimed at Sir Patrick, but if Professor Whitty wants to come in that will be more than useful. In Wales and Scotland, pupils will be returning to school in a staggered start, with the devolved Administrations saying that they are following the scientific advice. When parents in England look at what is happening in other parts of the UK, they are concerned about whether their kids are being put into riskier, more unsafe environments with the big-bang return. Do you think it is good to have consistency in policy across the UK on, for example, school reopening?

Sir Patrick Vallance: I want to pick up on one thing, to reiterate what Chris said earlier and to make sure it is clear to people who may be listening. I know that you know this. The risk to children is very low. This is a disease that disproportionately affects older people. Children are at very low risk from it.

You asked about consistency. SAGE is a body that brings together people from all of the devolved Administrations. All of the science advisers and medical advisers who feed into the devolved Administrations come to SAGE. A lot of the information comes from there and is then taken out to the devolved Administrations. As we have said, the process of laying out that advice was to look at the impact, or potential impact, of schools opening, with all the uncertainties around that, and then to look at what would happen in single versus staggered opening. In either case, you end up in the same place, but over a different timescale. In any staggered opening, you need to allow enough time to enable you to measure what you are doing as you go along. The advice that came, in terms of what the science says, was almost certainly the same across all the devolved Administrations.

Q2225 **Zarah Sultana:** SAGE advised that schools should go back in a phased return to avoid a third wave, as well as other options. Scientific advice on this issue and on previous occasions, when the Government were advised to go into lockdown during the first and second waves, not to lift restrictions too early, to implement a circuit-breaker lockdown in September and against having people mix over Christmas, was seemingly ignored by the Government. Do you agree that the Government have a track record of ignoring scientific advice or, at least, using it inconsistently?

Sir Patrick Vallance: As Chris said, our job is to lay out as clearly as we can what the science advice is, with all of the uncertainties. Often there are quite large uncertainties around it. I think we have done that. We have made the advice as clear and as public as we can, so that you can see what advice has been given and how it has been presented. Clearly, Ministers are the ones who have to make decisions on it. They need to take into account many other factors when they do so. That is what they do. That is part of the process we live in, in order for decisions ultimately to be made and operationalised. Our advice is there for all to see. Our advice is clear. We have given it repeatedly. When we give the advice, it is not always welcomed by all sorts of people and different parts of the community, but we give it as we see it. Then, of course, it is up to others to try to interpret it, with the other information and other priorities they may have.

Q2226 **Zarah Sultana:** Ministers always tell us that they are following scientific advice, but the Government failed to consult SAGE on "Eat Out to Help Out", and SAGE was not informed about the return of university students until quite late. It then warned of a significant risk with the reopening of campuses. Do you think that the Government understand the role of

scientific advice in a pandemic?

Sir Patrick Vallance: We meet as SAGE once or twice a week, and have done so right from the beginning of the pandemic. We look at all the areas we are asked to look at or choose to look at. We have 15 or so subgroups—I cannot remember the exact number—that work around the clock to bring in advice on everything from environmental monitoring through to behavioural science, modelling and clinical or other aspects. They feed into SAGE. We make all our information and papers public. I think the Government listen to that all the time. Chris and I are in meetings very frequently, giving information and making sure that people understand it.

However, as this Committee will understand very well, there are many other factors that are taken into account when decisions are ultimately made. As Chris has just said, it is not the case that SAGE says, "Here is the answer. Do this." What SAGE will do is say, "This is our best assessment of what the science is telling us at the moment and, therefore, what the options are, what their implications may be and what uncertainties come around that." That is what our job is—to try to make sure that that is clear and understood. It is my belief that in Government they have heard and understood what we have said. It is not that there has been a lack of understanding of what has been presented. We have made sure that that is presented. Therefore, it is part of a more complex decision-making process.

Professor Whitty: Anyone who is a Minister would say that it should be scientifically informed policy. That is a subtle but important difference. The science is part of a decision-making process. It is not the full decision-making process in these very big, societally very important decisions.

Q2227 **Zarah Sultana:** Going forward and thinking of the future, we are going to have to live in a particular way for a long period of time with future pandemics—potentially—viruses and so forth. Do you think it is important to make sure that a scientifically informed policy is the way in which we look at things going forward?

Sir Patrick Vallance: As the Government chief scientific adviser, my answer to that is yes in all domains.

Professor Whitty: I am a chief scientific adviser in my own Department. I also think that the answer is yes, but that is not surprising. We believe very strongly that, in very large areas, science advice may be the dominant factor. In many more areas, it is an important contribution. There are many areas where it is irrelevant. However, where science is relevant, having very good science advice is very helpful.

To spare Patrick's blushes, I note that we have in the UK one of the best science advice systems in the world, with the chief scientific adviser for the Government and departmental chief scientific advisers. People should

realise that that is not typical. It is something that we should use. Many of you have been Ministers and will be Ministers. I hope that you will continue to use science advice because it is critical to many decisions.

Sir Patrick Vallance: I completely agree with the way in which you framed the question—as science-informed policy. I draw your attention to a publication that we put out about two and a half years ago, the science capability review, which was about science need across the whole of Government and how to strengthen it. We are in the process of continuing to do that.

Zarah Sultana: Wonderful. Thank you so much.

Q2228 **Chair:** I emphasise the fact that Sir Patrick and Professor Whitty, and their scientific colleagues, too, make regular appearances before this Committee is comparatively unusual in international terms. We are very grateful for that.

Zarah asked about schools. Perhaps Professor Whitty can clear up a point of confusion that seems to have arisen in the last couple of days, with pupils going back. If a child tests positive at school with a lateral flow test and then subsequently tests negative with a PCR test, does the PCR test trump the lateral flow test? Can they continue their education?

Professor Whitty: The danger of my answering that question is that this has been hammered out by the Department for Education and PHE. If I give my memory of exactly where this is, the danger is that I may add to confusion. Rather than adding to confusion, I will say that I think it is laid out in Department for Education guidance.

Chair: It would be helpful to clarify it. I have been getting emails as a constituency MP, and I know that my colleagues have. Some clarity on that would be very helpful.

Q2229 **Andrew Griffith:** Good morning, Sir Patrick and Professor Whitty. Science and research have been at the heart of all of the most successful parts of how we have dealt with this pandemic, most obviously the vaccine. However, our next generation of current undergraduates is locked up at home in their parents' spare rooms, rather than in our great academic institutions. The Government have promised to review this before the end of the Easter holidays, but could you give me your advice, Professor Whitty? If the case rate stays where you expect it to stay, does your advice support bringing back our undergraduates for the final term of this disrupted year, with social-distancing precautions?

Professor Whitty: As with the SAGE general advice, in a sense, I will give a general answer, but it is for Ministers to decide exactly what happens. The thing about the university and further education sectors, and higher education more widely, is that it is a much more varied structure than schools. Schools are also varied, but not to the same degree. The disadvantages of not being at university or other higher education vary very substantially, depending, for example, on whether or

not it is a practical course. There is prioritisation for people who are on courses that have a strong practical component, because clearly you cannot do that from home over the internet. The sectors also vary in terms of the environments in which people are living, for example. Are they living in halls of residence, are they living at home in multigenerational households, or whatever? There are a number of different ways in which the higher education sector is much more varied.

The way it has been laid out is to have an order of prioritisation for people to go back that takes account primarily of how essential face-to-face teaching is and, secondarily, of where people are in their educational journey through the higher education system. All of us want people to go back to universities at the point at which that is possible, not just for scientific things, but for all education—sciences, arts and practical courses of all sorts. Not only is that a critical part of people's individual intellectual and other development, but it is also—to go back to a repeated point—one of the great drivers of reducing disparity over generations. The reasons why we want people to go back to university are clear. At the same time, there are bits of university and higher education that can be done remotely. While there is a very high risk, the prioritisation in education has to be primary schools, secondary schools and the most practical bits.

Q2230 **Andrew Griffith:** What happens as that risk dissipates? Is there nothing that we are missing in terms of the risk for the 19 to 22-year-old cohort?

Professor Whitty: No. The risk to those individuals from catching an infection, while probably not quite as low as for children, is very low. It is actually about transmission in the wider community and adding to the force of transmission at a time when we are trying to drive rates right down. It is not because we are worried particularly about the risk to the students themselves.

As an aside, we had a big worry about this at the beginning of the autumn term for universities and higher and further education. There was a big surge in cases. Then, due to the fantastic work of the higher education, university and other sectors, and the extraordinary forbearance of students in sticking to rules, the rates came right down. There was an extraordinary reduction in rates over quite a short period of time.

It can be done in a safe way. It is not the kind of student experience people read about or were imagining, to some extent. We hope that in due course people will be able to go back to a full-fat version, but the higher education sector has demonstrated that it can significantly reduce the risks. However, at this point the rates are still very high. We think of things as going down a very long way, but the ONS numbers show that slightly more than one in 250 people still have Covid. The rates are still very high but coming down. We hope they will get down to a point where higher education becomes something that we all feel can probably be welcome.

Sir Patrick Vallance: I think that is right. The universities did a good job and, as Chris said, so did the students. If you look at the data from some of the universities, which are quite good genomic data, they suggest that the universities did not cause much of the spread into towns locally, but that may vary between universities. In the ones that have done it, you cannot see much of a spread.

We know that certain things, such as halls of residence, are riskier for spread than individual houses. There are some things that we know. The universities have been pretty good at managing all of this, and the students have been very good at going along with it. There is a review going on to see when they can be brought back. Like Chris, I am sure that the students are looking forward to returning to what he describes as the full-fat version at some point.

Andrew Griffith: Thank you for your answers. Hopefully, as part of building a science-based superpower, we can get our undergraduates back to get that experience as quickly as possible.

Q2231 **Chair:** On the point about universities, the Universities Minister wrote to students on 2 February and said, "The scientific advice remains that Higher Education teaching settings are very low risk." You have repeated that assessment today. Given that, as Professor Whitty said, universities have taken steps to put in testing facilities and have their own labs, and given that five weeks is such a big chunk of the final term or term and a half for students, isn't the cost of keeping students away from their lectures, sometimes for the final weeks of their university experience, not disproportionate to the risk if the data show that it is safe and proportionate for them to return, in a low-risk setting with institutions that are capable of putting protections in place?

Professor Whitty: I will make two points. First, I broadly agree with the lead-up to your question. We would all recognise that. Secondly, we still have very high rates of transmission. We are having to make really difficult decisions as a society, with the final decisions being made on behalf of society by Ministers. All of the things that have not been possible as a result of Covid are things that we want to be open, for whole heaps of very strong reasons. That is clearly a very strong reason.

As of yesterday, the road map laid out that practical higher education courses can start to reassemble, but all of us hope that we will be able as soon as possible to get to a stage where higher education is possible, just as we hope that a very large number of other areas in society will be able to open up. However, we have to do it in a staged way. Every time you add something in one area, you potentially have to take it off in another to achieve the same overall epidemiological impact. That decision is finally for Ministers.

Sir Patrick Vallance: It is worth understanding where we are at the moment. The numbers last week were higher than they were at any point from the beginning of May through to the end of September last year. I

say that to frame where we are. We are not in some sort of extremely low-risk situation. We are above where we were in any of that period. As Chris said earlier, take-off from this point can lead to quite high numbers pretty quickly.

Q2232 **Mark Logan:** It is good to see both Professor Whitty and Sir Patrick today. Thank you for everything that the science and medical communities are doing. My questions are on border controls. What do you think is the best approach to limiting the importation of cases through border controls?

Sir Patrick Vallance: The advice that we have given from very early on—the WHO said the same thing—is that border controls are most effective when the rates are low in your country and you are trying to stop cases coming in from places with higher rates elsewhere. That is where you have the biggest effect. Obviously, if rates are high in your country, stopping cases coming in from lower-incidence, lower-prevalence countries will not really make a difference.

The second thing is that, in order to stop any importation, you have to have completely rigorous border controls, which would stop everything coming in. That is an extremely onerous requirement, but it is the only way you can stop things coming in completely. Even then, you will not stop them completely, but you will maximally reduce them. That is a very onerous border restriction.

Reducing entry through other measures—self-quarantine and so on—to reduce the chance of cases coming in from places with high rates or high rates of variants will delay rather than stop. Those are the principles underlying our advice. The WHO has made the same points. Clearly, there are then policy decisions that people need to make off the back of that information.

Q2233 **Mark Logan:** Do you think that a large part of the success of Australia and China, for example, in keeping importation and wider infection rates under control over the last year is due to the more onerous and, perhaps, more severe type of quarantining system that has been put in place there?

Sir Patrick Vallance: I will take New Zealand as the example. Clearly, New Zealand has a very rigorous border system. It has no cases, or very few cases, and maintains that through a very rigorous border system. That is the approach that they have taken. At some point, they will have to open up their border, and they will then see an influx of infections. However, that is the route they have taken. It shows that, with no Covid, if you seal yourself off effectively, you can prevent all but a few cases coming through. That is one extreme of the position, but that is what they have done.

Q2234 **Mark Logan:** In the next few months, as we move to open up international travel, and looking to the summer months, what will your

scientific suggestion be if we get our infection rates down incredibly low and have mass vaccination across the UK? Will you suggest that all people returning to the UK or those who have not been vaccinated, for example, coming to the UK should go into hotel quarantining?

Sir Patrick Vallance: Again, we would not make that sort of specific recommendation. It is not what we do. Our advice is very clear, which is to get out the vaccine as broadly as you can. The approach has been driven by a very sensible public health requirement to get the first dose into people as quickly as you can, and to get the second dose a few weeks later to allow more people to get the first dose. That is the right thing. We have to get the vaccination programme rolled out as widely as we can. We need to keep our numbers down. That is the really key thing. The focus on keeping our numbers down is the right thing to do.

It is worth remembering that the variants that people are concerned about are likely to arise everywhere. Although there are some that have come up in certain places, and largely they have been detected in countries that have good sequencing capabilities, there will definitely be other variants that simply have not been detected because they will be in countries that are not sequencing. I would expect to see more variants emerge.

If you look at what has happened, there is a process of convergent evolution that members of this Committee will be familiar with, which is, that, wherever we see these changes, they look the same. The virus is doing the same thing in different ways, acquiring certain mutations that it wants to acquire largely for purposes of transmission, as far as we can tell. That means we will see those being acquired in this country and, again, is a reason to keep rates as low as possible. That is where we should focus our attention.

Q2235 **Mark Logan:** Regarding the implications of that, will we be able to stop new variants entering the UK?

Sir Patrick Vallance: I do not think we will stop new variants emerging. It is what will happen. You can minimise the chance of it happening by keeping rates low, but just as the flu virus changes every year, so I would expect this virus to change over time. That is what viruses do; they mutate. When they find a mutation that gives them some advantage, they hang on to it. At the moment, the advantage is largely on transmission. Most of the mutations that are occurring are those that would give the virus some sort of transmission advantage. Once the world is vaccinated more, variants may come out that try to get round the immune response a bit more. That will lead to a need for new vaccine variation, maybe every year or every couple of years. We don't know.

Mark Logan: Professor Whitty, do you have anything to add?

Professor Whitty: No, that covers it very clearly.

Q2236 **Chair:** We had a conversation with Professor Sir John Bell, who was a

witness to the Committee a few weeks ago, on this point, and the question of border controls came up. He was asked about New Zealand. He replied, "Have you ever flown into Auckland, and have you ever flown into Heathrow? You are in a completely different world. I think it is unreasonable to think that the UK is going to look like New Zealand. It is a very different situation."

Given the interconnectedness, and given the flights in and out of the UK in normal circumstances, should we be looking at measures internally to control any incursion rather than seeking to seal ourselves off from the rest of the world?

Sir Patrick Vallance: As I have said, our focus needs to be on reducing the levels we have here. That is the key point, to keep things under control. As levels come down, test, trace and isolate becomes increasingly important; and cluster identification, making sure that we understand where there are outbreaks and how to deal with them. Of course, the vaccines will make a huge difference to all of it. I do not think that zero Covid is possible. There is nothing to suggest that this virus will go away, at least any time soon. It is going to be there circulating. It may be a winter virus that comes back over winters, with increasing infection rates during that period. I do not think zero Covid is possible. It will be very difficult for any country to maintain complete absence of it long term because, at some point, countries have to open up borders.

Q2237 **Chair:** Your deputy, Dame Angela McLean, said that it is a fallacy to think that we know where new variants will arise. The implication is that they arise in all countries or can arise in all countries. Is it sensible, is it effective, to have a red list of countries for which there are very extreme restrictions, when there could well be variants in lots of other countries that we simply do not know about?

Sir Patrick Vallance: As I said, variants will arise everywhere, including in this country. They are an inevitable part of this.

If you take the second principle, which is that border controls are most effective when you have low incidence here and higher incidence or prevalence somewhere else, you can apply that equally to variants as well. If you knew that somewhere had 80% of a certain variant circulating, it is a much higher probability that you would import it from that country than from a country that had 1% or 0.5% of that variant. There is some logic in thinking about where there is the highest prevalence of either the virus overall or a particular variant, but we should not dream that we can stop these things coming in, or indeed evolving within domestic virus transmission.

Q2238 **Chair:** There are countries where there simply is not enough sequencing to know whether there are variants that might worry us if we knew about them. Is that not the case?

Sir Patrick Vallance: That is the case.

Q2239 **Graham Stringer:** Professor Woolhouse told this Committee that the risk of transmission outdoors is very low indeed, yet the policy of restricting people going outdoors is having quite severe implications for civil liberties. I can understand why Merseyside police prefer going to Formby beach rather than chasing drug gangs in Liverpool. When there has been no real evidence of an increase in infection when beaches in Formby, Brighton and all around the country have been crowded, would it not be sensible to advise to get rid of this policy? If I can roll my two questions into one, what is the scientific basis of the rule of six?

Sir Patrick Vallance: Outdoors is absolutely lower risk than indoors, but it is not zero risk, as Chris said. It depends on what you do outdoors. Clearly, people in very close physical contact outdoors, people passing things around, where you can transmit from hand to implement to hand to face is not zero risk. It is not zero risk, but it is definitely lower risk than indoors. That has been something that we have been concerned about right from the very beginning.

Right at the beginning, our concern was indoors spread. Particularly in closed environments with lots of people and poor ventilation, the ability to spread easily in pubs and other things was a concern right at the beginning, much more so than outdoor gatherings. It remains the case that outdoor looks like lower risk. That is why opening up outdoors is coming before opening up indoors and is the order we would agree with. When levels are very high, clearly you have a risk of transmission, and as levels come down the risk of transmission outdoors goes down even further. That is where we are. I agree that it is much lower. I do not think it is zero, but it is a lower risk.

Q2240 **Graham Stringer:** Saying it is not zero is something we can all agree on. There is nothing in life that is zero risk. The empirical evidence when there have been crowded beaches is that there is no spike; there is no evidence that it has led in those areas to increased infection. Yet there are consequences to people's civil liberties and to their health of not allowing them to go into parks and on to beaches. If I can repeat the second part of the question, what is the scientific basis of the rule of six?

Sir Patrick Vallance: We have said previously that the rule of six does not have some scientific absolutism to it. It is a policy decision based on minimising the number of people interacting. That is the case. The more people you have interacting, the higher the chance of there being some spread.

I reiterate that our view has always been—it is clear in the SAGE papers—that outdoors is much lower risk than indoors, but it is not completely risk free. It is the case that it is difficult to see how things like large beach gatherings and so on can cause a spike. The same was the case in a protest march in New York; they did not really see any spikes after that. It is lower risk, but the other thing that can happen with outdoor events, and so on, is that, when indoor things are also open, you

start to get people congregating indoors around that. That can increase risk, but outdoors itself is lower risk. Chris, do you want to add to that?

Professor Whitty: No, I completely agree.

Q2241 **Carol Monaghan:** Following on from that, Sir Patrick, there is a report in today's *Times* that the Children's Minister has said that face masks will not be enforced in secondary schools; they will not be made mandatory for students in classrooms. Are you comfortable with that?

Sir Patrick Vallance: This is quite an important point. It is as you come out of lockdown that these things become more useful. Coming out of the first lockdown, we said that masks become more useful because you start to get further interactions. The advice is that in secondary schoolchildren it is advisable for those children to wear masks. You can see across Europe that many countries have taken the same position; some have gone down to primary schools, which is not workable. At the moment, there will be a data review, and we will see where we are and see where the numbers are. As numbers come right down, these things can get looked at again, but that is the advice at the moment. In terms of the translation of that advice into recommendations, it is for Ministers to decide how to do that.

Q2242 **Carol Monaghan:** Professor Whitty, you have previously used flu as an analogy for Ministers setting acceptable risk. One thing we have tried to tease out in this Committee on a number of occasions is what level of death is acceptable. Can you give us any indication of what level of risk is acceptable?

Chair: You have commented on that before.

Professor Whitty: I have commented on it before. My view remains the same, and it remains the same as pretty well everyone. The idea that we will get zero deaths from this is unlikely to the point of not really being worth considering as a policy option. There will be deaths from this. There is no doubt about it, unfortunately. The question about how much society is prepared to take to reduce that risk is a societal question. Therefore, it is a decision for Ministers and Parliament, and in the devolved authorities and nations for their Ministers and Parliaments.

The reason for saying that is just to take the example of flu in a different way, which is not comparing the death rate. This year, we have had almost no deaths from flu. Flu has virtually disappeared because flu has a lower rate of transmission than Covid. If you get Covid right down, flu goes away. Would we want to go forward in a situation where we say, "Right, now we know how to deal with flu, every winter will be like this winter, and then we will get no flu deaths"? That is a societal question. That is a choice, essentially. It is a choice for society as a whole, reflected through Ministers and Parliament. This is not a situation where a doctor like me or a scientist like Patrick and me—Patrick is also a doctor—should be saying, "This is what it should be."

What we should say is that these are the possibilities, here are the upsides and here are the downsides, remembering that there are significant downsides from a health perspective, leaving aside anything else, to things like lockdowns and all the things that are going on. Even if you just take a health perspective, there are risks and benefits on both sides of the equation. When you lead on to wider societal issues—societal choices such as seeing family and the economy—there are other factors to bring into account as well. These are very difficult things to balance, and it seems to me very much a societal question.

Q2243 **Carol Monaghan:** Given that it is up to Ministers and wider society to decide what the acceptable risk is, have you been given any indication of what sort of level it is?

Professor Whitty: At this stage, the clear indication is that everybody thinks that the risk from Covid is far too high. That is the reason why people in all four nations are taking the decisions they are taking at the moment.

Regarding the question about how far down the slope we can go, and then towards the end where it is discretionary, what are the things that people wish to do as society to push it even further down, we have not reached that point in the decision-making process for any of the four nations at the moment. The one thing I would very much caution against is people thinking that we can go to a zero-Covid approach. I completely agree with Patrick's point on this. It is not a realistic goal if by zero you actually mean zero. Some people are reinterpreting zero to mean very low. Very low—yes, we absolutely all want to go to very low, but very low and zero are, to me as a scientist, two rather different things.

Sir Patrick Vallance: We rather assume that zero actually means zero, not low. It seems a reasonable assessment.

Professor Whitty: We absolutely all want to go for low.

Q2244 **Carol Monaghan:** We have had evidence to this Committee from people who suggest that we should be taking a much stronger approach. Professor Devi Sridhar argued that our public health approach should be more akin to measles, and the UK should be aiming to suppress and eliminate Covid through vaccines, mass testing and supportive isolation. Dr Stephen Griffin raised concerns and said that the more we learned to live with this virus, the more we would give it opportunities to mutate and that is not in our best interest. He said that to maintain significant prevalence would be unwise at best. Do you have any comments on those two pieces of evidence we heard?

Professor Whitty: I have huge respect for both people. Let us take the measles example. Measles is a disease where, if you catch it once, you never catch it again. It is a single infection. It gives you complete protection for life. The vaccine basically does the same thing. That is not at all similar to Covid.

The second thing is that measles is a disease where the great majority of the risk is in children, and, therefore, the ethics strongly support vaccinating children at a very early age. Measles is a much more dangerous disease in childhood than is widely understood. In some countries, it can have up to 5% mortality. It is much lower in the UK, but it still has significant risks of encephalitis, brain damage and many other problems. Therefore, vaccinating children is absolutely the right thing to do, and you can get the whole population vaccinated with a vaccination programme that will protect them for life. That is completely different from Covid where, first, the vaccine is not a complete protection, and natural infection is not a complete protection.

Secondly, because children are relatively spared, we are much more cautious about vaccinating children as the ethics of vaccinating children to protect adults is quite complicated. We will have to have that discussion at some point as a society. It is not the same as measles where you vaccinate children to protect children, and then they are protected for life; and then you can end up in a situation where you have almost complete population immunity. Even with measles, with the incredibly effective vaccine, and when you can get to very high levels, including in children, people have talked about eliminating measles for a very long time. Countries come in and out of elimination, but it has not been achieved yet for any significant period of time. That is the real risk. If by elimination, you mean zero cases transmitted in a clear and reasonably large geographical area, which is how I would define it, we are nowhere near eradication of measles, for example. While I understand the points being made, the comparison is quite difficult to sustain.

I completely agree with the general principle that we should try to get the rates absolutely as low as possible. There are some signs and implications that somehow people who argue that you cannot have zero cases want Covid to continue. I would love Covid magically to disappear. I am an infectious diseases epidemiologist. This is something I have thought about quite a lot over many infections. Getting rid of infectious diseases that have a significant asymptomatic spread, highly transmissible across all ages, with respiratory transmission all around the world, is quite a tall order. If we get to the point where it is at such low levels that we can finally say, "We are very close to elimination; let's give it a go," that is fine, but we are an incredibly long way from that now.

At this point, we should be concentrating all our efforts on getting it down as low as we possibly can and see where we go. All of us want to get to the point where there are as few cases as possible. If we can get to zero, that is fine, but there are very few scientists who have looked at this who think that getting to zero is a realistic option. All of us think that getting to very low rates is a realistic option, and that is what we should be aiming for.

Q2245 **Carol Monaghan:** The lowest level of our current Covid alert system can

only be reached when there are no cases in the UK. Do we need to revise it if a zero-Covid approach is not possible?

Professor Whitty: When we get down to the point where we are at the next lowest level, where there are very low levels and we are not getting significant importation—we will potentially get to that point with vaccination in the UK and globally; it is very important that we see this as everyone's problem globally as well as just a UK problem because we cannot just solve the problem here and then have done with it—that debate is a very right one to have, but we are quite a long way from there now in all four nations and across Europe. We should be humble in the face of a very dangerous and highly prevalent virus at this point.

Q2246 **Carol Monaghan:** I suppose that is something that we, as a Committee, and the Government will need to come back to at another date.

Sir Patrick, the Government have talked about the reopening of international travel from 17 May. Are you comfortable with that? Was that a recommendation of yours?

Sir Patrick Vallance: Again, we do not make recommendations on specific actions like that. We have given advice on the relative importance of different approaches to border controls. We have published that evidence. We have given a very clear recommendation that keeping levels low in this country is what we should be aiming for as a priority, but we do not give advice on specific actions.

Q2247 **Carol Monaghan:** Are you happy with that particular piece of Government advice?

Sir Patrick Vallance: Inevitably, at some point travel will reopen. It reiterates the point that the fighting of this virus is a global thing and not a national thing; therefore, vaccines need to get out to other countries as well. As more countries become vaccinated, and as we get the ability to understand how much transmission reduction is reduced by vaccination, it makes freer movement across countries much more possible again. That is clearly what needs to happen at some point. Whether or not it is with certification or whatever, we will see. At some point, travel has to reopen, and it has to be done in a way that is safe, that variants can be detected and so on, which speaks to a global screening programme.

Q2248 **Carol Monaghan:** I think you may be avoiding the subject slightly. We know that other countries are way behind us in terms of vaccination. It is about the date of 17 May, which is in about two months' time, and whether that is a sensible date or not.

Sir Patrick Vallance: I will answer again. I have been very clear that we will have to measure as we go along, and we don't know. The dates are really only times, and we need to look at data.

Carol Monaghan: Thank you, Sir Patrick and Professor Whitty.

Q2249 **Dawn Butler:** Professor Whitty, I understand that a zero-Covid strategy

is not about zero Covid. It is about the approach taken and how the Government act to try to eliminate as much as possible the risk of Covid. For instance, having unclear messaging is not a zero-Covid strategy. A zero-Covid strategy would mean that you had the clearest messaging possible so that people followed all the instructions and directions, and they were compelled to do that. If we educate people in regard to being outside as opposed to being inside, mitigating the risk that we spoke about earlier, that is a zero-Covid strategy. The strategy is different from saying we want zero Covid. Is that not correct?

Professor Whitty: I have to admit that, as a scientist, for me, zero means zero. If you are saying, "I want a zero-Covid strategy," what you are saying is, "I want zero Covid cases." Now, you can say that. What I am saying is that I do not think it is a realistic option. If people say, "By zero, I do not mean zero. I mean another number," fine, but then put a different number on it.

I completely agree with your thesis though, which is clear messaging, trying to be simple, trying to make the points as explicit as possible and, to go back to our previous discussion, trying to make sure that every community is reached by messaging in an appropriate way. Those are absolutely central. In a sense, I am not disagreeing with you. I am just making a very specific point about the term "zero", which has a meaning in science, and I think we should stick to that meaning.

Q2250 **Dawn Butler:** That is a fair point. I did not create the meaning. The other question I have is on test and trace. Should the resources spent on test and trace be spent on other interventions? Would that have a better outcome?

Professor Whitty: I always avoid answering resource questions on a matter of principle, because that is really a question for Ministers. I will say a bit generally about the benefit of test and trace, fully accepting that there are multiple other things we have to do. It has to be seen as part of a wide suite of different things.

Within test and trace, there are at least three different elements that have different purposes and different advantages. One of them, which is the one that I interact very closely with on a daily basis, is the information-gathering bit—the Joint Biosecurity Centre. The UK now has an incredibly sophisticated system across all four nations for gathering data—some of it is ONS data and some of it is test and trace data—so that we know where we are going. This goes back to the initial premise of this whole discussion. That is the data that will help us decide if it is safe to move forward to the next stages. All the data that is collected in very considerable detail by a variety of different routes that we can then triangulate is critical to making safe and sensible policy decisions.

There is a very important part of the testing and tracing system around testing people who are symptomatic and might have the virus so that they isolate if they actually have Covid. That is really critical. There is

really clear evidence that that is a very important part of it. It also means that people who do not have Covid can go about their daily business once they have been cleared from that point of view.

The final bit is case finding and contact isolation. That is also an important part and will become an increasingly large part as we get down to much lower numbers. I have said right from the beginning, because it is a basic principle of public health and epidemiology management, that case finding and contact isolation has a much smaller part to play when you have incredibly high numbers, simply for practical reasons as much as anything else.

As we get down the numbers curve, an increasingly high proportion of the heavy lifting can be taken by that. Our hope is that simple interventions like washing hands, face masks where appropriate, test and trace, and, above all, vaccines will together provide a lot of the heavy lifting for keeping the virus rate down for much of the remainder of the year, once we have got it down from this initial lockdown. We can see the different components in different ways.

Q2251 **Dawn Butler:** I agree. For people to self-isolate, that comes with its own complications in regard to whether they can afford to, and so on.

My last question to both of you is this. There is obviously a gap in regard to the science and then what the politicians say. What has been your biggest frustration?

Professor Whitty: If I am perfectly honest—this is not aimed at politicians either in Government or not in Government; it is a general statement—it is when what we think we have said, or I certainly think I have said, clearly is then misrepresented to the general public. The reason is that that causes confusion. It goes back to your previous point. It is absolutely critical that we give clear messaging. Sometimes, I give unclear messaging. It is my fault that I am just not communicating clearly. Obviously, you also have situations where people misrepresent what you are saying for whatever reason, and that confuses the general public. That is not helping in a general pandemic.

My frustration is when science advice given publicly is, in a sense, miscommunicated. I absolutely take my own share of the blame for that, because sometimes I simply have not communicated well enough myself. I am not trying to point fingers at other people.

Q2252 **Dawn Butler:** I understand that. Is there an example you could give us?

Professor Whitty: I am not going to give examples, because that would be unfair. I am just making the general point.

Q2253 **Dawn Butler:** That is fair enough. Sir Patrick?

Sir Patrick Vallance: Chris has said exactly what I would say. I am also not going to give an example, because that is exactly the example that would then become used as has been described, so I shan't do it.

There is another frustration in the whole thing, which is not to do with politicians. At every stage, we have to deal with imperfect information. There is uncertainty. We are trying to express what we know and what we do not know, and what the uncertainties are around that. That will continue to be the case. That uncertainty is what we all need to bear in mind. It does not mean that the science is not valuable. It is incredibly valuable because it has bounds around that uncertainty, but it is not a precise answer. It is the best information at the moment.

Dawn Butler: Thank you both very much.

Q2254 **Chair:** To follow up Dawn's questions on test and trace, in the autumn SAGE thought that the test and trace system was not making a significant contribution to reducing the R rate. Is it now?

Sir Patrick Vallance: Test and trace is working very well at the moment. Testing, as Chris said, is incredibly important for the information we have to monitor this. There is a very good testing system in place now that reaches a high proportion of people who are positive, and that will be increasingly important as we come to very low levels. It is worth being clear what was said when SAGE made a comment about test, trace and isolate. It was that at very high prevalence levels contact tracing and isolation becomes progressively less important because the disease is everywhere, and you cannot do it.

What becomes important then is isolation and taking people out of being able to circulate. As prevalence comes down, test, trace and isolate—it is worth remembering that the isolate bit remains very important—becomes increasingly important to try to stop the cases that are there from being able to spread it. I anticipate that the impact of test, trace and isolate will become even more important over the next few months as we go into, hopefully, lower levels and the ability to get back to a form of normality.

Q2255 **Chair:** You mentioned the testing system. What about the tracing system? What is your assessment of that at the moment?

Sir Patrick Vallance: The examples that we have seen recently of the tracing system being able to identify cases of new variants and track them down even when forms have been lost is impressive. We have a much stronger system than we had, certainly at the beginning. It has taken a long time to get it there because it is a complicated thing to do, but it is working pretty well. Tracing will be important, particularly so-called backward contact tracing when you ask where might a person have got it from, and whether you can trace where they got it so that you can identify clusters. That is what will be important, I suspect, as we go forward.

Q2256 **Chair:** The road map for unlocking, as we have discussed extensively this morning, depends on a number of assessments—the effectiveness of the vaccine, its roll-out and the spread of transmission. How important has test and trace been in your advice to Government as to the pace of

unlocking?

Sir Patrick Vallance: The modelling has assumed that there are baseline measures that will be effective as things are unlocked. One of those is test, trace and isolate. Others include things like hand hygiene, mask wearing and so on up to a certain point. Those baseline measures are assumed to take some of the lifting going forward as we unlock.

Q2257 **Chair:** The test, trace and isolate organisation has made an estimate of its impact on R, which I think from memory extends to up to 0.8. Have you assessed their assessment?

Sir Patrick Vallance: We have done various assessments over the course of the last eight months or so of the impact of testing, tracing and isolation. I do not have all the figures off the top of my head, but we have published several things on that. We have not looked specifically at the work that they have done. The impact of test, trace and isolate varies depending on the state of the epidemic. At very high prevalence, it is very difficult for it to make a big impact.

Q2258 **Chair:** In the assessment that they presented to this Committee and to the Public Accounts Committee, which was part of their business case for quite considerable sums of public money, SAGE and its subgroups have not validated the £25 billion that they are spending, or am I wrong?

Sir Patrick Vallance: We have not been asked as SAGE—it would be a slightly strange thing for us to be asked to do—to validate it for that purpose. I suspect they have been involved, but I do not know which of the modelling groups may have been involved in helping on that. They are quite closely linked to JBC and other parts of test, trace and isolate, so I would not be at all surprised if some of the modelling groups have been involved.

Q2259 **Katherine Fletcher:** Gentlemen, thanks hugely. It is always a pleasure to be schooled and learn from your munificence.

My dad is a fan of yours. He, for many years, has participated in the UK Biobank longitudinal study based in a wonderful facility in Cheadle, south Manchester. He recently got a lateral flow antibody test through the post, and I assisted in drawing his blood at the weekend. I am happy to confirm that his first dose of AstraZeneca vaccination has produced not only a strong IgM response but also a strong IgG response.

Many moons ago, last year, antibody testing—which is, for the uninitiated, "Have you had it and are you immune?" versus antigen testing: "Do you have it now?"—was hailed as one of the ways that we recover and return to normal life from the pandemic. Given that we are now testing lateral flow antibody tests, Sir Patrick, could you talk about what role they have to play moving forward?

Sir Patrick Vallance: First, I should declare that I was on the board of Biobank for a number of years, so I know that organisation well. I am strongly supportive of the important work they are doing.

You are quite right that antibody levels are now increasing across the population, particularly in over-60-year-olds who have been vaccinated. I was looking at some data this morning. We are getting to quite decent levels of antibody there, which speaks to the question of what you do about using it for some form of certification and so on.

The Royal Society has produced a very good document on that with 12 things that need to be considered when one thinks about certification, ranging from what you are trying to use it for, because vaccination or antibody positive tests tell you that you may be protected personally, but it does not tell you that you cannot spread it to somebody else. That is different from an antigen test, which might tell you that you do not have it today, and you might not spread it today, but you might catch it tomorrow.

There are different tests. We need to think about how durable the results are. We need to think about how they can be protective for the individual, and how verifiable they are. I thought the 12 tests that the Royal Society laid out were a good way of thinking about that as Governments think about how they want to consider any form of certification, including issues of equity and inequalities arising as part of that. We have rightly had a lot on that today, because this is a disease that feeds off inequality and feeds inequality, and we need to watch out for that as we go to any new measures. It is likely that we will have some form of international agreement around how to use these things for travel.

Q2260 **Katherine Fletcher:** It is almost "Test to travel coming through a postbox to you soon." Thank you; it is an exciting development and he was genuinely excited.

Slightly more broadly, I have an aunt and uncle, also in south Manchester, who have been giving blood to the Oxford studies on a regular basis, and there is a huge groundswell of interest in the value and understanding of what we can do as the British public to participate in scientific research. While we are still locked down, and we are still looking at the light that is coming at the end of the tunnel, what would you say to the British public about participating in the life sciences, whatever you are and wherever you are?

Sir Patrick Vallance: First of all, I would say a big thank you because it has been fantastic. The response of people to the scientific studies has been really spectacular. If you take something like the RECOVERY study, over 11% or 12% of people—possibly even higher—who were in hospital were part of that study. That is fantastic and exactly what we should be aiming for. When we do not know the answer, as we did not for those drug studies and for many forms of research by definition, making sure that we can encourage people to get into trials is the way to get answers. We have seen that really dramatically across this. The UK has been brilliant in the studies that have been done that have come up with answers—what works, and, as importantly, what does not work—so we do not end up giving things to people that do not work.

I am absolutely excited about the fact that the British public have been so great at taking part in these studies and that they are so interested in doing so. I hope that one of our lasting legacies from this is that we will be a country that continues to have widespread public participation in science, and that as a result we have a system for getting answers to those questions that we do not know.

Professor Whitty: I echo to some extent what Patrick said. I completely agree. A massive thanks to all those who have been involved, not just in trials but in the observational studies, which have been very important to our understanding.

I have three additional points, one of which is to thank your family, who are clearly a part of the scientific effort.

Katherine Fletcher: The apple didn't fall very far from the getting-enthusiastic-about-studies tree, fortunately.

Professor Whitty: In one of my other roles I run something called the National Institute for Health Research, which is the structure for a lot of clinical research. We are getting very close to the point where almost 1 million people in the UK have taken part in clinical studies, either observational or trials. That includes trials of drugs where the UK is taking a leading role, trials of vaccines—the AZ is the exemplar, but we have trialled other drugs as well—and the big observational studies such as the SIREN study in healthcare workers, and the COSiN study, which has looked at a lot of people who have severe disease, and, in fact, going back to some of the earlier discussion, has helped to tease out some of the risk issues for people of different ethnic groups.

People have shown an extraordinary volunteer spirit: the patients in hospitals; the volunteers for trials; and doctors, nurses and other healthcare workers, who, on top of their day jobs, have enrolled people into studies, made sure it is safe for them to do them and done all of the work. That is the way we have managed to accelerate the knowledge of this disease. The UK has probably done more than almost any other country per head of population because of that volunteer spirit from the population and the healthcare staff.

My final point is that, if you look around the UK, all four nations, it is not just the teaching hospitals. We are talking about district general hospitals, general practices, healthcare workers in community settings, and people working in nursing and residential homes. All of society has been taking part, and it is a real gift to the future. That is the way we will get on top of the virus, and, indeed, it is an offering in a sense from the UK to the whole of the world. That is basically a very long-winded way of saying thank you.

Chair: We have a few brief supplementaries.

Q2261 **Graham Stringer:** I hope they are brief supplementaries. We are coming

up to 12 weeks since the first vaccinations; in fact, we have probably passed it for a number of people. When the commitment to give those people a second vaccination comes around, will it lead to a significant drop in first vaccinations, and do you have numbers for that?

Professor Whitty: The first thing is that, because we did the delayed second dose, we have been able to vaccinate a much larger percentage of the population. As Patrick said, that proved to be a sensible decision. It was a decision based on data, but it was indirect data. In retrospect, the data are backing up that it was a reasonable, safe and sensible decision, because it has led to a much larger proportion. Now we are revaccinating people, and that has started, but it will really start to take off. If you think back, 12 weeks ago was back in December, and that was the point when the vaccination programme was really beginning to take off. This will follow. We will start to see the numbers of people getting their second vaccines move up quite rapidly. The most recent data on that showed that over 1 million people have had a second vaccine, but we expect the numbers to go up significantly.

The problem we have always had, which is the reason we delayed the second dose, is limitation of supply. At this point in time, our expectation is that we will be able to manage the second vaccination, and it is really critical that people do it. I want to stress to people that, if you have family members who are thinking about doing it, encourage them to do it, because that is how you get full and long-lived protection. The bigger bit was from the first one, but you still get significant additional protection from the second vaccine, and probably more long-lived protection. It is critical that people have it.

There should be enough additional vaccine supply to roll out the first vaccine to the large part of the population who still have not had one vaccine. There are many caveats to that because vaccine supply is always subject to all the problems of any kind of drug supply. At this point in time, our expectation is that, over the next few weeks, we can continue to do the second vaccination but additionally do first vaccinations. It will not go at quite the same rate as if you were only doing one vaccination, but we expect to be able to do both.

Q2262 **Graham Stringer:** We have not really touched on surge testing. I looked on the website this morning, which said that the objective of surge testing is to better understand the virus and to monitor and suppress the spread of the coronavirus. Looking on the website, there were 28 surge testing projects. There may be more by now. Have those objectives been met and are there any other objectives? Has it been an effective programme?

Professor Whitty: With all the various forms of testing, the first thing to say is that you are not taking someone from a high risk to zero risk. What you are aiming to do in these surge testing models is to reduce risk by identifying people who have infections but do not know they have infections and then make sure they can isolate, knowing that they have

the virus. The assessments of them in places like Liverpool have, in a sense, been mixed in both positive and negative ways. It is well worth looking at that. Colleagues in Liverpool, at the University of Liverpool and others, have been very good at setting it and designing it in a very good way.

Positively, significant numbers of people have been identified who otherwise would not have been identified. The downside is that, as always, there is what is called the inverse care law, which is when there is less ability to do this with strong support in areas of higher deprivation where the risks are potentially greater, as we were discussing earlier in the session. It is not a panacea at all, but it is a useful addition to other measures, provided it is properly targeted and that when we are doing it in a new way it is properly assessed.

There are different sorts of surge testing. There is the surge testing, for example, that is done around variants of concern. That is for a slightly different reason, which is to pick up or identify the size of the problem and to make sure that we can reduce the risk that things like the South African variant are widely spread.

There are a variety of reasons for doing it and a variety of mechanisms. None of them is perfect, but our expectation is that certainly some of them, probably most of them, have a significant useful, additional effect on top of other activities. But they are not a panacea.

Q2263 **Graham Stringer:** You were both extraordinarily helpful at the start of this pandemic in opening up both the membership and the minutes of SAGE so that we could all understand what was going on and who was involved in the process. Unfortunately, NHS England has not been as open with the information that might enable us to understand what is going on. Local NHS trusts are really controlled and cannot put out information without the say-so from the centre, which often does not come. Trying to get the number of cancelled elective operations and the number of cancelled emergency operations is very difficult. We also now have the Joint Biosecurity Centre, which is not as open as SAGE.

It is a request to both of you, but I would like Professor Vallance to answer. Openness in this epidemic is vital. I think you agree on that. Can you put pressure on all the bodies—NHS England and the Joint Biosecurity Centre—to put out as much information as they have?

Sir Patrick Vallance: I am in favour of making sure that as much information as possible is made public. I have made that point repeatedly and will continue to do so.

Q2264 **Graham Stringer:** Will you put pressure on them to do that? That is your view. You both have very influential positions to put pressure on those organisations.

Sir Patrick Vallance: I certainly ask, for the areas that are relevant to what we are doing, that we make data as available as we can. Clearly, I

cannot be responsible for that across the whole of the other parts of Government. We asked for it. I will continue to ask for it and will continue to make the point that openness is the right way to deal with this. It allows other people to look at the data, analyse it and draw interpretations. It is a very important part of the scientific process.

Chair: To reinforce what Graham said, Sir Patrick, you have been absolutely influential in changing the procedures of SAGE to make the papers open from the outset. That was a personal initiative at the request of the Committee, and we are very grateful for that. It has been very important to the scrutiny and learning from the pandemic.

Q2265 **Aaron Bell:** Thank you again, gentlemen. As a computer programmer, I always found that treating zero as a number equal to zero was pretty useful as well, to avoid any unexpected behaviours, so I think we are as one on that. The road map said that all limits on social contact will be removed eventually. Which restrictions, if any, will be needed after 21 June?

Sir Patrick Vallance: I do not know. We need to look at what we measure every five weeks and see where we are. It rather depends on where we are in the epidemic. I will answer slightly more helpfully though by saying that, next winter, I would not be surprised if we had to keep some sorts of things in place as numbers go up again. We certainly should keep the hand hygiene going. We should certainly keep test and trace in position so that we can monitor what is going on. It is possible that there will be situations where masks need to be worn in certain crowded situations if numbers go up next winter, but it is very dependent on data and how it goes.

Q2266 **Aaron Bell:** No social distancing—just masks?

Sir Patrick Vallance: It is possible. There are two things. First, there will be some innate social distancing because of behavioural change. People will behave slightly differently, which will create some of that. We do not know how much more may be needed over the course of next winter. Next winter will not look like this winter, but there will still be cases. There will be an increase in numbers, I suspect, and we should expect there to be some sort of pressure next winter, but nothing like we have seen over the course of this winter.

Q2267 **Aaron Bell:** If we come to masks, would you envisage that that would be something that is largely voluntary and encouraged rather than compulsory next winter? It seems to me that we will be in a very different place. Much like it is with flu, it is up to people whether they go out and risk catching it. Are we not potentially in an analogous situation next winter with Covid?

Sir Patrick Vallance: If we are in that position, if vaccines are as effective as they look as though they are, and we have great coverage, and this is controllable, clearly you do not need as many things to be there, and you can release many of them. If that is not the situation, and

things happen, new variants or whatever it might be, that change it, we will have to see where we are and respond accordingly. It is too early to say how it will look.

Q2268 **Aaron Bell:** On that point, the Prime Minister has indicated that the point of the road map is to do things irreversibly. Under what circumstances could you envisage measures being reintroduced? Is it simply the variant situation, or are there any other reasons why we might need to reintroduce measures in the United Kingdom?

Sir Patrick Vallance: The aim of measuring as you go along is to make sure that you take the right steps when you have the information. We do not yet know how this will play out longer term. Chris may want to comment, but our view is that it will become progressively less of a problem as we go forward. That does not mean it will be zero problem next winter. There will be cases. Reintroduction of measures is entirely dependent on the course of the pandemic and things like whether there is a new variant that completely escapes immunity, which is unlikely. It is more likely that the vaccines will have an effect. They already have an effect on most of the variants. The higher the immune response, the better. It covers some of the other variants as well. Variant vaccines are being produced that will have an effect. It is all pointing in the right direction, but nobody can say with certainty that this is finished. We are certainly not out of woods yet, even in this wave.

Professor Whitty: I start with a very healthy regard for the pragmatism of the people of the United Kingdom—all four nations. People know that winter is when seasonal viruses tend to be worse, and our expectation is that there will be surges in winter. People know this is a new virus about which we do not know full amounts. No one is expecting us to be able to predict exactly what we need when, where and how. We will take it as it comes. None of us wants unnecessary measures at all. Equally, none of us wants to not have measures on a point of principle when it is obvious we need them. The sensible thing is that we take it as it comes.

Aaron Bell: Thank you both very much. That has been very helpful.

Q2269 **Chair:** Does it not follow from that, Professor Whitty, that the right demeanour is to be ready, to be poised, to take measures if they are necessary? Is the whole doctrine of irreversibility, in one way, actually not the right stance to be taking? Should we not be preparing ourselves to be poised to spring to take action in the winter if necessary?

Professor Whitty: I absolutely do not want to speak for the Prime Minister, but what he means by irreversibility, and what most people understand it to mean, is that in the foreseeable future we do not go down a path where we have a very high chance of having to reverse almost immediately out of it again. I do not think anyone is trying to say that we have absolute certainty about exactly where we will be over the entirety of the next five years. I do not think anyone in the country is expecting that. I certainly am not and I doubt any of the Committee are.

Irreversibility is to do with what we can see in the next period. There are some uncertainties ahead, and we will just have to deal with them as they come.

Q2270 **Chair:** We have talked a lot about dates, and we have put forward some of the questions that will arise in the debate around this in the Chamber of the House of Commons as to the timetable. You set out why the five-week intervals are appropriate. Coming at it from the other side, how would you assess the risk of not being able to make the best-before dates, as it were?

Sir Patrick Vallance: By definition, I do not know, which is why we want to measure. Currently, things are looking good. They are headed in the right direction. The numbers are coming down quite well. I am very pleased to see death rates coming down steeply. It is all headed in the right direction. If that continues, it is a very good path to be able to do what is in the road map. Clearly, there might be some unexpected upswing, and Chris has already alluded to the fact that an increase in numbers is being seen in some countries in Europe. If you were to take a historical view over the past year, we have tended to follow that when it happens. Hopefully, it will not happen this time because of vaccines, but we need to be vigilant.

Q2271 **Chair:** Is it your central expectation that the dates published in the road map will be the dates that the various unlockings will happen?

Sir Patrick Vallance: My expectation is that the dates in the road map are the dates at which we will have data that we will feed into Ministers to make decisions.

Chair: Thank you very much indeed. You have been very generous with your time, your expertise and your experience. As I said at the beginning, this is a session in which we have tried to put some of the questions that we know are on the minds of other Members of Parliament. There are 11 of us on this Committee. There are 650 Members of Parliament. They will be debated in the Chamber of the House of Commons when these measures come for approval and in the debate around that approval. You have done us a great service by answering a lot of the questions that are on people's minds, and for that, and for your great efforts throughout this pandemic, we are very grateful.