

Science and Technology Committee

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

Wednesday 13 May 2020

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[Watch the meeting](#)

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

Mr Clive Betts, Yvette Cooper, Robert Halfon and Huw Merriman attended the meeting.

Questions 489 - 624

Witnesses

[I](#): Professor Alan Penn, Chief Scientific Adviser, Ministry of Housing, Communities and Local Government; and Osama Rahman, Chief Scientific Adviser and Director of Analysis, Department for Education.

[II](#): Professor Phil Blythe, Chief Scientific Adviser, Department for Transport; and Professor John Aston, Chief Scientific Adviser, Home Office.



Examination of witnesses

Witnesses: Professor Penn and Osama Rahman.

Q489 **Chair:** The Science and Technology Committee is inquiring into the scientific aspects of the response to the Covid-19 pandemic. Today, we will be examining how scientific advice is given and used within relevant Government Departments and how it influences overall Government policy.

We start with the Ministry of Housing, Communities and Local Government and the Department for Education, and then we will hear from the Department for Transport and Home Office. For the first session, we have invited the Chair of the Housing, Communities and Local Government Committee, Clive Betts, and the Chair of the Education Committee, Robert Halfon, to join us. For the second session, we will be joined by the Chair of the Transport Committee, Huw Merriman, and the Chair of the Home Affairs Committee, Yvette Cooper.

It is now my pleasure to welcome our first two witnesses. Professor Alan Penn is the chief scientific adviser at MHCLG. He is also professor at the renowned Bartlett Faculty of the Built Environment at University College London. Osama Rahman is chief scientific adviser at the Department for Education. Both are members of the Government's Scientific Advisory Group for Emergencies.

Thank you very much indeed for joining us. We have lots of questions, so if you keep answers as short as possible we will be very grateful.

Let me kick off with a couple myself to both witnesses. How many times have you attended SAGE? Do you offer views in those meetings, or do you attend as observers?

Professor Penn: I am a listening, not a participant, attender at SAGE. I have attended probably four meetings in total.

Osama Rahman: SAGE is not a membership organisation. The relevant experts in whatever is being discussed at specific SAGE meetings will be invited. I have been to 10 SAGE meetings, pretty much whenever things to do with children or schools have been discussed. In particular, when it discusses schools I have not been there just as an observer; I have discussed the issue as well. There have been perhaps another 10 occasions when my deputy chief scientific adviser has attended, but only as an observer.

Q490 **Chair:** Professor Penn, what is the rationale for when you do and do not get invited?

Professor Penn: In general, it is up to me. If I wish to attend I can make that request. I keep an eye on meetings that are discussing things that are particularly relevant either to my scientific expertise or the Ministry of Housing, Communities and Local Government.



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Q491 **Chair:** Will you give me a couple of examples of meetings that you have attended?

Professor Penn: I have been involved in meetings that discussed work on environments inside buildings, for example, which led to the recent BEIS advice on going back to work from lockdown. I am, with my scientific background in the area, part of an environment working group of SAGE, so that is where I participate fully as a scientist.

Q492 **Chair:** But you are not allowed to speak. Why is that?

Professor Penn: In the main SAGE meetings?

Chair: Yes.

Professor Penn: That is a very good question. I believe that in the early days there was a problem with the numbers of people potentially present sharing audio conferences, but in general the key people are the scientists involved in the particular discussions. I am not an epidemiologist and a lot of the earlier meetings were about the epidemiology.

Q493 **Chair:** Typically, how many people tend to be at those SAGE meetings?

Professor Penn: I do not know, but maybe 25 scientists and a similar number of observers from parts of Government.

Q494 **Chair:** I turn to your roles as chief scientific advisers within your Departments. Mr Rahman, are decisions in the Department for Education taken reflecting your advice?

Osama Rahman: We get SAGE minutes and the papers for the meetings that I attend, which are very much around children and schools issues. My team will synthesise that to brief policy officials in the Department, our departmental operations centre and the permanent secretary's and Ministers' private offices. The science does go in in a way that other aspects of information need to go in when decision making.

Q495 **Chair:** Can you give me an example of a decision by the Department for Education that has been taken drawing on your advice and the advice of the scientists that you draw upon?

Osama Rahman: Yes, quite a few of the recent decisions have been made not by the Department but by Cabinet. For example, the decision to close schools and a suite of further social distancing measures was a Cabinet decision with advice from SAGE. It was fed through to Cabinet via Patrick Vallance and the chief medical officer. The DFE has been involved in looking at the various options for reopening schools—for example, what years you might open, how many children you might allow in a school and things like that. SAGE's advice on the vulnerability of children to disease and to transmitting different disease has gone into the debate about what years you open.

Q496 **Chair:** Do you draw that advice from a network, or is your advice part of



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the membership of SAGE?

Osama Rahman: It is part of the membership of SAGE, which will come up with consensus views. The evidence base in this area is very fast moving. There is a huge amount of research going on, so it will take a consensus view. Those consensus views are updated, so it will be based on a consensus view at the time or subsequently.

Q497 **Chair:** Professor Penn, can you think of an example of your advice, reflecting that of your scientific colleagues, being influential in a decision that the Ministry of Housing, Communities and Local Government has taken?

Professor Penn: I would agree with Mr Rahman that the decisions by and large have been taken centrally at Cabinet Office level. The way I would interact is generally in informing policy colleagues within the Department about the science and the evidence, as I understand it, coming from SAGE to help to ensure that when it is drawing up policies to go up to Cabinet Office for decision it is taking account of the science.

Q498 **Chair:** Is there a particular example of a policy area in which you have done that?

Professor Penn: There are questions at present on work environments and release from lockdown. I have commented to colleagues on how we might do that, particularly around external space and the use of place and gatherings.

Q499 **Aaron Bell:** I want to talk about education, so I will address my questions to Mr Rahman. You mentioned that the evidence base is evolving. What was the evidence base that underpinned the original decision on 18 March partly to dismiss schools?

Osama Rahman: The scientific advice on that would have been given to Cabinet via the Government's chief scientific adviser and chief medical officer. There are lots of experts on SAGE, including many modellers. The general approach was that, even quite early on, SAGE was saying there might be a role in reducing transmission of infection by closing schools, although other interventions would probably have a bigger effect. Understanding what impact that might have in part depends on the data you have at the time on the prevalence of the virus and other things. Whereas the broad thrust is there may be a role in closing schools, how you decide if and when it is time to close schools will depend on the data to which the modellers get access in making forecasts of what might happen.

Q500 **Aaron Bell:** In terms of the evidence base evolving in the past two months, do we know more about the role of children in disease, the incidence of their getting it, maybe asymptotically, and their role as spreaders or otherwise?

Osama Rahman: The most recent SAGE consensus, which I think was a week and a half ago, is that there is a lot of evidence. SAGE has a high



degree of confidence in the evidence that suggests that the severity of the disease in children is lower than in adults. It has a moderately high degree of confidence that the susceptibility to disease of younger children is lower than for adults.

For older children, there is not enough evidence yet to determine whether their susceptibility to disease is different from adults. There is some evidence that susceptibility to infection, which is different from disease because you can get infected but not get the disease, of younger children might be lower than for adults, but as of a week and a half ago SAGE's degree of confidence in that scientific evidence was low, but that will update over time as more and more research and testing is done internationally.

Q501 **Aaron Bell:** What assessment was made of the risk that children would continue to socialise outside school if we closed schools, particularly secondary children, I imagine?

Osama Rahman: I do not think that was looked at specifically. There are two different things. First, there is the effect of closing schools. You close and open schools and you have things within the school environment. Then there is the effect that opening schools might have outside the school system.

The important thing is that closing and reopening schools, if and when they are open, is part of a suite of other social distancing interventions, adherence to which is quite important. The important thing about reopening schools, perhaps, is that the broader epidemiological impacts are not so much about what happens in schools, although that is important, but whether that leads to a lessening of adherence to other social distancing measures, which tend to have a bigger impact on the spread of the virus than schools in particular.

Q502 **Aaron Bell:** I know that my colleagues have a number of questions about easing the restrictions, but at the time the restrictions were brought in the Education Secretary said that the scientific advice was that schools were safe for a small number of children to continue to attend. How are you in the Department drawing on the lessons learned from making that work safely in opening up for more pupils? How are we learning the lessons of what has been going on for the past two months?

Osama Rahman: There was a specific piece of advice. I mentioned that in all these interventions one of the key things in how effective they are is adherence. It is slightly different for schools, because if you close them you do not have to worry about adherence; they are closed and no one can go in. But another issue you have to take into account is the role that schools can have in safeguarding vulnerable children and the need for critical workers to get to work. SAGE did look at the impact of allowing a low proportion of students still to attend school, so that critical workers' children and vulnerable children could still attend. Its view was that a low percentage of attendance would still provide enough impact as part of a



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suite of other measures—this is the important thing—for the school closure system still to have a benefit.

Q503 **Aaron Bell:** Both at the start and now, what evidence has the Department considered about the need or otherwise for PPE in schools?

Osama Rahman: The Department is working with Public Health England on PPE issues. That is coming via PHE rather than SAGE specifically. I think guidance has gone out. There are already some circumstances where if teachers have to provide support to children—intimate care, such as going to the bathroom or whatever—PPE should be used. PHE is working on the guidance for that rather than SAGE.

Q504 **Aaron Bell:** But you are still saying there is some scientific evidence underpinning those decisions.

Osama Rahman: Yes.

Q505 **Chair:** Why would SAGE not consider that scientific evidence?

Osama Rahman: SAGE has considered the evidence and PHE is then operationalising that in terms of work settings and what the advice is.

Q506 **Chair:** Has SAGE given advice on what level of PPE should be provided in education settings?

Osama Rahman: I do not know. I do not think I was necessarily at the PPE meeting. You will have to ask SAGE that.

Q507 **Chair:** But you are the chief scientific adviser for the Department for Education.

Osama Rahman: I am. I am not sure whether it discussed PPE in schools; it was a general PPE discussion, and I was at that SAGE meeting.

Q508 **Chair:** How many deaths from Covid-positive in the under-18s have there been during the pandemic?

Osama Rahman: I do not have those numbers to hand; I would not have those.

Q509 **Chair:** Do you have a feel for it? Whether children are less or more susceptible to contracting Covid is an important question.

Osama Rahman: It is an important question. I think the death of a child has been reported as part of a cluster of cases emerging from symptoms similar to the Kawasaki disease. I do not have the exact numbers. I can find out from the Department of Health.

Q510 **Chair:** Is it not necessary to inform decisions on policy in schools to know what the experience has been, now several weeks have passed, in the transmission and fatalities among under-18s?



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Osama Rahman: Sure, but that is different from the impact of the school closure. I think it is hard to trace what has happened in schools to a specific death.

Q511 **Robert Halfon:** An article published in *The Lancet* on 6 April questioned whether the public health benefits of school closures were proportionate to the social and economic costs imposed on children and their families. When the schools closed in March, what evidence base did the Department use to weigh the effect of slowing transmission of Covid-19 against the social and economic cost, particularly for disadvantaged children and young people? Will the Department publish the evidence that informed this decision?

Osama Rahman: I have to reiterate that the Department did not make the decision to close schools. I do not think it is for the Department to publish that. That was not a departmental decision but a Cabinet decision. In the case of all children, but particularly vulnerable children, the Department has a view about the important role schools play, which is why specifically we got advice from SAGE about having low proportions of children in school and trying to target mainly vulnerable children and the children of key workers where parents did not have any other options for childcare.

Q512 **Robert Halfon:** A further article in *The Lancet* on 7 April suggested that we could face a social crisis as a result of school closures. It said that children from low-income households live in conditions that make home schooling difficult. In Europe, a substantial number of children live in homes in which they have no suitable place to do homework or have no access to the internet; 10% to 20% of children live in homes that cannot be heated adequately; and 5% do not have access to books at the appropriate reading level. We know that close to 90% of vulnerable children are not being educated. The Sutton Trust suggests that two thirds of children are not accessing online education. What assessment have you made of the socioeconomic effects on children, particularly those who are vulnerable, who are not attending school during the coronavirus outbreak?

Osama Rahman: That is a broader policy question. I cannot really talk about that because I do not think it is a science question per se that SAGE has looked at. The broader social and economic issues are the sorts of issues you would expect policymakers to look at when coming to a policy decision. That is not one I can answer in terms of the science of it.

Q513 **Robert Halfon:** What is the scientific evidence base underpinning the Department's decision to reopen schools for reception, year 1 and year 6 first, and why these years and not others? What modelling has the Department for Education done on likely transmission rates in schools once they reopen? Will you publish this modelling?

Osama Rahman: The Department has not done any modelling on this. One of the sub-groups reporting to SAGE has done various bits of



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modelling on different scenarios for what years you would bring back into school and various other options. My understanding from the Government Office for Science is that all of those will be published in due course. I am not sure of the timing, but I think they are going to be published.

Q514 **Robert Halfon:** Surely, you must have the scientific evidence and you are able to tell me the base underpinning the Department's decision to reopen schools for reception, year 1 and year 6 first.

Osama Rahman: That was not a departmental decision; it was a Cabinet decision following advice from SAGE via the Government chief scientific adviser and the CMO.

Q515 **Chair:** On Robert's question about the impact of closing schools on children, if the Department for Education is not able to give an assessment and advice on that, who is?

Osama Rahman: The Department for Education can, but I am not sure that is a science question. I am sure the Department for Education can look at this, but I am not sure that is a science question per se; it is a broader policy question and policy evaluations.

Q516 **Chair:** In terms of the impact on the welfare, wellbeing and, quite possibly, the health of children, is there anyone in the Department for Education making that assessment and contributing to the discussions in SAGE?

Osama Rahman: The meetings of SAGE I have attended have focused on the science around things like the transmission of the disease and susceptibility to catching it. As I mentioned, it has modelled various options for opening schools and issues at some stage about PPE. There are other SAGE meetings I have not been to.

I think that what you are asking is a broader question about the sort of evidence, evaluation and assessment you would want to have in any policy. It seems to me that is not necessarily a science or SAGE question. I understand why you say that is a departmental question.

Q517 **Chair:** If you are saying that these decisions are made by the Cabinet and are, as it were, visited upon the Department, how do you know it has taken into account the specialist knowledge that you have in the Department?

Osama Rahman: There is a large policy team that the science advice from SAGE feeds into via my science team. I am involved in some of those discussions about what the science means. That advice will go to the Secretary of State and I guess he will express his views to Cabinet. I have never been to Cabinet, obviously; I am not aware of how the decision is made there. I am aware that the Secretary of State is informed of what the science says and what the views on it are, as are policy officials in the Department.

Q518 **Zarah Sultana:** Mr Rahman, earlier this week the Government published



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guidance on actions for schools to enable them to reopen. What assessment have you made as chief scientific adviser on how effectively those adjustments can be implemented?

Osama Rahman: I have not. The Department is working with PHE on the first draft advice and I am sure will be discussing this further with PHE and others in the development of that advice following feedback.

Q519 **Zarah Sultana:** You will not be able to tell me whether there is a risk of transmission if social distancing measures, such as keeping children apart, are not strictly observed, or schools are unable to have smaller classrooms.

Osama Rahman: There is always a risk of transmission. Can we get the risk of transmission to zero? No. Risks do not go to zero. The question is: what can you put in place that will help to reduce risks as much as possible? There will always be some risk, and the question is whether it is a tolerable risk. There is even a risk in going to school anyway; it is not a risk-free environment, so I think the question is: to what extent is that risk acceptable?

Q520 **Zarah Sultana:** You have just mentioned that the advice that the Government issued is being looked at and will be reissued. Will you be playing a role in that, and when will it be reissued?

Osama Rahman: I do not know. I expect that guidance will be developed. Certainly, if we have updated consensus on the science from SAGE, we will ensure that that feeds into the guidance.

Q521 **Zarah Sultana:** Some early groups in schools are due to open on 1 June. Does the fact that the guidance has not been reissued and schools will have very little time concern you?

Osama Rahman: The 1 June opening is dependent on a bunch of conditions being met, as I think the Prime Minister announced. Schools have been asked to prepare for that opening.

Q522 **Carol Monaghan:** Mr Rahman, as a former teacher listening to this, I do not think the profession is going to be at all satisfied or put at ease by what it is hearing at the moment.

You talked about the SAGE meetings. You said that a lot of things were not covered, but one thing that was covered was transmission rates and susceptibility. May I ask you particularly about transmission among young children? A few weeks ago the Committee received evidence that it is not clear what the role of children is in transmission. While we know that young children do not seem to be particularly susceptible to Covid-19, we have no idea what their role is in transmission. Can you say a bit about that since, according to what you have just said, that was discussed quite a bit at SAGE?

Osama Rahman: I can. I guess it is a new threat. What I talked about earlier was susceptibility to infection and disease and the severity of



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disease, and I have not discussed the role of children in transmitting the virus.

The view is that there is no evidence to suggest that children transmit the virus any more than adults. Some studies suggest that they might transmit it less than adults, but this evidence is mixed. It is quite early, so there is a low degree of confidence among SAGE currently in the evidence that suggests they might transmit it less.

Q523 Carol Monaghan: Since there is a low degree of confidence, we are putting together hundreds of potential vectors that can then transmit. Is that correct?

Osama Rahman: Possibly, depending on school sizes.

Q524 Chair: May I clarify my understanding? Are you saying that within the Department for Education you have not made an assessment of the impact of the proposed policies to unlock some of the measures?

Osama Rahman: It depends what you mean. I am aware there is modelling that has looked at the epidemiological impact of various options.

Q525 Chair: You know about the practical things in schools. The point about the Department for Education is that it deals with schools, teachers and other education settings, and one would have thought you contributed to the epidemiology across schools.

Osama Rahman: We did. SAGE set up a task and finish working group on children, which I think is in the public domain—I and several of my policy colleagues attended those meetings—partly to help frame it so the modellers could understand what school environments were like and what the different issues were, and as much as possible they could build that into their modelling of various options.

Q526 Chris Clarkson: Professor Penn, local authorities have been given considerably more duties to manage the effects of the epidemic. What data and evidence are you collecting on how effective they have been in doing that?

Professor Penn: MHCLG has a substantial analysis and data division that is gathering evidence on a whole range of aspects of how local government functions. We have a local government finance group that is also looking precisely at issues of income and expenditure. These teams are not under my direction; I feed into them, but they are part of ADD within the directorate.

Q527 Chair: What is ADD?

Professor Penn: The analysis and data division.

Q528 Chris Clarkson: Inasmuch as you feed into it, how aware are you of the data being used to spread best practice or pass on learning experiences from local authorities as they adapt to these new responsibilities?



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Professor Penn: There is a lot of communication going on that I am aware of. At the moment there is a whole process of embedding senior civil servants in different regions across the country to help transmit best practice—it is as much about learning in Whitehall as it is in the other direction—on how these processes are working.

Q529 **Chris Clarkson:** Given the new guidelines that came out on 10 May, people are now able to access public spaces for non-exercise purposes. I am thinking particularly of one of my local parks. In view of the overcrowding, how effective do you think these measures will be in limiting the risk of transmission?

Professor Penn: There are several points on this. The science suggests that being outside in sunlight with good ventilation is highly protective against transmission of the virus. The routes of transmission come in three main forms: from droplets, which is where the 2-metre rule comes in, because to a high degree they fall to the ground within 2 metres; they come from aerosols, which float around much more but carry less virus; and they come from the touching of objects.

Most of the rules around what we should do, such as washing your hands and not touching your face, are components of that transmission rule. What we see in social distancing is building on that scientific evidence. I think the way SAGE has judged the use of outside space is that this is one of the activities of lowest risk that can help in the staged release from lockdown.

Q530 **Chair:** Given the view has been formed that it is relatively safe to take exercise outside and have socially distanced contacts outside, is it reasonable for local authorities to decide individually to close car parks to try to prevent people from following that national advice?

Professor Penn: I do not think that is really a question for science; that is a question of policy. Is it reasonable? Many different people are doing their best to make judgments according to guidance in this area. I would not want to point the finger of blame at any of them; I do not think that would be my role.

Q531 **Mr Betts:** I want to ask about social distancing and the ability to enforce it at local level, and then perhaps I may talk about contact tracing and testing.

On social distancing, transmission outside is a lesser problem than potential transmission of the virus inside—clearly, workplaces are one of those. In my own city of Sheffield, environmental and public health officials have had getting on for 500 complaints about issues they need to investigate. Have you picked up any data across the country about the ability of councils to cope with this situation, and have you given any scientific advice about whether it will be possible for them to do it as more people return to work?



Professor Penn: The short answer is that I have not given any advice about the possibility of doing that. I completely agree with you that there is a load falling on councils as, if you like, the first port of call for many of these questions. This is a very serious matter. The issue about how they are resourced to do this is important; it is under constant review to ensure councils have the resources to deal with the crisis going on at the moment.

Q532 **Mr Betts:** I do not think you really answered the second part of the question about advice on opening more workplaces. If the load is already very difficult for councils to cope with, and more people are going to work and more workplaces are open, do we not run the risk of transmission of this virus because workplaces that are opened will not adopt safety procedures and there will not be anyone there to regulate and enforce them?

Professor Penn: You are absolutely right. There is an increased load as you go back. Shutting things down is relatively straightforward; reopening them in a controlled way is a much more resource-intensive activity. I think this is well understood by policy colleagues who are handling this. However, it is the direction of travel that the Government wish to take.

Our job in trying to help bring science to bear on this is to consider carefully the hierarchy of risks and what measures can be taken, and then to give as clear guidance as possible to employers, trade unions and employees about how they need to consider the risk of going back to work.

I think that as a country we all need to work together and come together around how we make this work. This is part of a very large and complex question.

Q533 **Mr Betts:** The risks are going to increase.

Professor Penn: The risks will increase. It is more difficult to do. One reason we are able to open up is that the total numbers of infected are dropping. Therefore, the risk from that perspective is reducing.

Q534 **Mr Betts:** To give a parallel situation, probably one of the places where most transmissions of this virus have been happening in the past few weeks, as fewer people have been at work, is supermarkets, where people are in close proximity. Many supermarkets are not operating safe distancing, or say they cannot enforce it, and local authorities do not have the capacity to do it. Have you offered any guidance and advice to supermarkets and local authority officers about how we can ensure this does not become the major place where this virus spreads?

Professor Penn: No, I have not offered advice of that sort. However, advice and guidance has been given on the safe operation of supermarkets.



Q535 **Mr Betts:** To whom?

Professor Penn: BEIS has given advice on places of work, and the Health and Safety Executive has, too.

Q536 **Mr Betts:** Those are places of work, but these are places where people go to shop, because it is shoppers as well as workers.

Professor Penn: Of course. Advice has been given to the sector on how to manage these venues, but what I understand is happening at the moment is the gathering of information on what actual disease transmission has taken place. These buildings have been open to the public throughout the lockdown. It is a very useful source of understanding the effects of social distancing practices in building interiors. I have not yet seen the results of that.

Q537 **Chair:** Have you had conversations with local authorities about the capacity of environmental health officers to enforce and inspect these settings?

Professor Penn: No, I have not, but they are one of the primary routes that we have for enforcement.

Q538 **Dawn Butler:** We know that if we want to ease this lockdown one of the main components in allowing it to happen is testing. Can you tell me what evidence there has been in discussions with local authorities carrying out the testing? We know that local authorities have put in place infrastructure very quickly to ensure that they can reach a lot of people in regard to shielding and so on. What evidence has there been in regard to the role of local authorities in testing and building up that capacity?

Professor Penn: Local authorities have a very important role to play in testing and making it possible. So far, most testing has been confined to the health and social care sectors and facilitating the testing of key workers and those who are the most vulnerable.

As we move towards release from lockdown, the notion of tracking, tracing and testing to isolate any new outbreaks becomes absolutely important. There is work going on through the biosecurity group that has been established, which brings together the capacity across Government to deal with this.

Q539 **Dawn Butler:** Is it fair to say that the only way to increase capacity and for it to be effective is to ensure that local authorities are in charge of testing locally?

Professor Penn: You ask a question about capacity, which has many different elements. There is the laboratory testing capacity, which has been built up enormously over the past period, and many people talk about a target of 100,000 a day. But there is the issue of how you use that testing capacity to best effect to manage transmission in the community, if you like. I am talking about the second part of this. The



laboratory capacity is there and is building. The next part is how you best apply it.

Q540 **Zarah Sultana:** Eighty five per cent of respondents to a survey by the National Education Union disagreed with the Government's plans, and 92% said that they would not feel safe with the proposed wider opening of schools. Mr Rahman, do you believe it is safe to plan the reopening of schools without meeting the five tests proposed by the NEU: much fewer cases of coronavirus among the population; a national plan for social distancing in schools; testing; a whole-school strategy; and protecting vulnerable teachers?

Osama Rahman: I do not really have belief; I base it on the scientific evidence and make sure that is fed into decision making.

Chair: We will have to wrap up this session. We are very grateful to both of you for your evidence. The work of Departments, given their expertise and knowledge of the particular sectors, whether it is local government or schools and other educational settings, is very important. The Committee has long championed the role of the chief scientific advisers. We are very grateful for your evidence today.

Examination of witnesses

Witnesses: Professor Blythe and Professor Aston.

Q541 **Chair:** For this second panel, I am delighted to welcome to the Committee Huw Merriman and Yvette Cooper, the Chairs of the Transport and Home Affairs Committees, and our witnesses. Professor Phil Blythe is the chief scientific adviser at the Department for Transport and professor of transport systems at Newcastle University. Professor John Aston is the chief scientific adviser at the Home Office. Both witnesses are members of SAGE.

Professor Aston, how many times have you attended SAGE, and is it in a full-spectrum advisory capacity, or an observing capacity?

Professor Aston: I believe that I have been to almost every SAGE. There have been about 35 SAGEs, and I think I have probably been to 25 plus—between 25 and 30 of them. I have been a full participant in each of those meetings, I suspect partly in my role as chief scientific adviser at the Home Office, but partly in my role as a professor of statistics at Cambridge and so as a statistician.

Professor Blythe: I have been to 18 SAGEs as an active participant, but I have not attended a SAGE meeting in the last month, as they have mainly been on the medical and modelling side.

Q542 **Chair:** I see. So in the last month they have mainly been medical but not transport matters discussed at SAGE. Do you get to see the agendas?

Professor Blythe: Yes, I do. Transport matters have largely been discussed in a more operational group, the sub-group called



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environmental modelling. I am now a member of that and have been putting in my questions and contributing to that, looking at some of the pragmatic and practical ways of how to ramp up transport provision as we come out of the lockdown.

Q543 Chair: Can you give me an example of how scientific advice that you have convened has informed a decision that has been useful within the Department?

Professor Blythe: We have been advising each of the policy teams, through the Covid steering committee, on turning the science advice from SAGE into practical measures to help to look at how we can run better capacity of transport. We have also been connecting the policy teams to scientific evidence outside SAGE to help to deliver priorities there.

We work across the whole range of what the Department does; we are very influential on things like the NO₂ emissions from vehicles, getting electromobility much more on the agenda, and setting the agendas on things such as clean air zones, to try to reduce NO₂ emissions in many cities around the UK—as a separate example.

Q544 Chair: I have the same question for Professor Aston, particularly thinking of this pandemic. Can you give us an example of an area in which scientific advice that you have convened has been important for decisions made within the Home Office?

Professor Aston: The scientific advice has been given right across all decisions that the Home Office has made within the pandemic. There is a very regular dialogue with Ministers and senior officials on any issue happening with regard to the pandemic, where scientific input was needed. Examples, of course, include measures around borders and law enforcement, and the effects that various different measures will have on law enforcement, from across the entire science side—so not just hard science but social science as well.

Q545 Chris Clarkson: I have a question that I think pretty much everyone on the panel has been asked—certainly, I am asked it in Heywood and Middleton. How many people are arriving in the UK each day, and how are the Government keeping track of that?

Professor Aston: Are you asking just about people arriving in the UK each day?

Chris Clarkson: Yes.

Professor Aston: I do not have the latest figures for this week, but it is between 97% and 99% down on the numbers that were arriving. I can tell you that, up to 26 April, from aviation, there were 95,000 arrivals, and 53,000 were UK citizens.

Q546 Chris Clarkson: How many of those people do you estimate had Covid-19?



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Professor Aston: That is a really good question. We believe that less than 0.5% of those arriving potentially had it—or, sorry, less than 0.5% of those arriving contributed to the total number of cases of Covid-19 in the UK.

Q547 **Chris Clarkson:** Do you have an understanding or estimate of the proportion of arrivals to the UK before lockdown who had Covid-19?

Professor Aston: On 23 March we looked at this, and, again, we looked at the total number of Covid-19 cases and estimated that less than 0.5% of those cases in the UK were from those arriving in the UK from overseas.

Q548 **Chris Clarkson:** Is a standard model used to make that estimate?

Professor Aston: It is actually a really complicated modelling thing to do. It was done by SAGE, using a number of SAGE participants to get that information. It requires you to understand the prevalence in overseas countries as well as in the UK, and you need to put that modelling together to get the estimate of the ratio between incoming cases to domestic cases.

Q549 **Chris Clarkson:** Presumably, that was factored into the decision not to lock down certain people coming in from other countries, such as France, for example.

Professor Aston: Of course, there is a timeline. People who came into the country after 23 March were subject to exactly the same domestic restrictions as those who were in the UK. Before that, SAGE looked at various different countries and provided advice on people from particular countries who should be subject to enhanced monitoring and screening as they came across the border, or self-isolation as they came in. All that was done through advice coming from SAGE on the likely hotspot areas in the world.

Q550 **Chair:** You said that the proportion of people arriving with Covid-19 was less than 0.5%. How do you know that?

Professor Aston: We have made estimates. It is quite an involved calculation. Effectively, we looked at the likely numbers of cases within the UK and overseas, while understanding that there is, of course, under-reporting. That is not under-reporting being done deliberately; it is, of course, because the number of tests do not reflect the number of people who have the virus. We have used estimates of how to take reported cases to total cases, and we have used that to estimate the ratio between imported cases and the total number of cases.

Q551 **Chair:** There are no tests at airports, on arrival, are there?

Professor Aston: No, exactly. These are estimates from prevalence estimates from the UK and overseas.

Q552 **Chair:** So you are looking at the incidence of the virus in countries from



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which people are coming and, obviously, from which Brits are returning.

Professor Aston: Yes, so it is not just the nationals of those countries—it is also UK nationals who have been in those countries. It is people who are coming across the border.

Q553 **Chair:** So it is an assumption about the level of prevalence, rather than a measure.

Professor Aston: It is an estimate. In the same way as we have estimates for the number of cases in the UK, we have estimates for the number of cases overseas as well.

Q554 **Yvette Cooper:** Thank you, Professor Aston, for our correspondence so far. May I clarify the figure you have just used? You said 0.5%. Is that 0.5% of people arriving in the country are suspected to have Covid-19?

Professor Aston: It is 0.5% of the total cases in the UK that have been imported in that way.

Q555 **Yvette Cooper:** I do not think that was the question you were asked. The question that I would like an answer to is: what proportion of the people arriving in the country do you estimate have Covid-19?

Professor Aston: That is quite a difficult question to answer. As you know from our correspondence, worldwide prevalence rates are less than one in 1,000, so you expect it to be less than one in 1,000, although we can get slightly better estimates by looking at different countries. That was done during the SAGE advice: we looked at specific hotspot countries and the prevalence rates in those countries, and we used that to estimate the number of people, and the ratio of imported cases to domestic cases.

Q556 **Yvette Cooper:** To calculate that ratio of imported cases to existing domestic cases, presumably you had to come up with a number or proportion of incoming cases with Covid-19. What is that figure?

Professor Aston: I personally do not feel that that figure is a particularly robust estimate. The ratio itself is a much better estimate—first, because it gives you an idea about the actual risk that is posed by people coming across the border. Secondly, it is much more stable than the estimate of particular incoming cases.

The reason for that is you have to take the estimate of the prevalence in a particular country, be that in the UK or in other countries, and understand the infection fatality rate, because from the best statistics in countries across the world it is possible to estimate the number of true cases in the country. You also want to look at the number of reported cases in the country and use that.

The infection fatality rate is subject to uncertainty, and the number of symptomatic cases is subject to uncertainty. However, the ratio between domestic and overseas cases means that they cancel out on both sides, so that uncertainty drops out. The 0.5% figure is far more robust than



particular figures about the number of cases coming across the border or the number of cases in the UK.

Q557 **Yvette Cooper:** I understand that you will have degrees of confidence in every figure that you use. Nevertheless, a figure must have been used, or have been implicit, in the calculation to come up with the 0.5%. Previously, in one of your letters to me, you said that the median prevalence worldwide was 0.1%. Obviously, that does not reflect the hotspots in the areas from which the UK was receiving a lot of people, when people arrived from Italy, Spain, New York and so on. Is it reasonable to assume that, during this period, the proportion of people arriving in the country with Covid-19 will be somewhere between 0.1% and 0.5% of arriving travellers?

Professor Aston: It will depend very much on where they come from, because you have different prevalence rates in different places. It would be hard to generalise. However, we are confident that at no point so far from 23 March has the number of cases exceeded 0.5% of domestic cases, of those coming into the UK.

Q558 **Yvette Cooper:** But I am still asking for the proportion of people arriving. I understand the point that you have made, but I want to know about the proportion of people arriving. In that period in the middle of March, we had 40,000 people still arriving a week from Milan, 40,000 people still arriving a week from Madrid. At a certain point, the peak prevalence in Italy was estimated at around 1% for northern Italy, at its peak. That would suggest that you had hundreds of people arriving during that period from Milan and Madrid alone. Is that a fair assessment—to talk about hundreds rather than tens of people arriving with Covid-19 during that period?

Professor Aston: It would depend exactly on what prevalence estimates and case fatality rates you were using, to get a confidence in that. It would be very hard for me to say that it is within that confidence level without being very precise about what estimates you were using to get those prevalence rates.

Q559 **Yvette Cooper:** I ask this because the Government made a decision on 13 March to lift all guidance for self-isolation at the border—before the SAGE paper from 23 March, which none of us has seen because it still has not been published. When Ministers took that decision, did they have any estimate of the number of people arriving each week who might have Covid-19?

Professor Aston: At that point in time, when that decision was made, an estimate was made of what the effect would be of putting further restrictions on the border—that it would delay the epidemic by a small amount of time and therefore was deemed unsuitable.

Q560 **Yvette Cooper:** How long?



Professor Aston: It depends on the proportion that you would expect of numbers of people.

Q561 **Yvette Cooper:** I understand that it will depend on lots of things, but what was your central scenario, when that decision was taken to lift any guidance? Previously, people from Italy and Wuhan were asked to self-isolate at the border for 14 days. Inexplicably, at a time when other countries were increasing their restrictions or requirements to self-isolate, the UK lifted them all. It was before the peak in Spain, still around the peak in Italy, and it was several weeks before the peak in the UK. So at that time—I am sure that it would depend on a lot of things—what was the central estimate given to Ministers of the number of people likely to be arriving in the UK with Covid-19?

Professor Aston: The central estimate at that time depended on information about the numbers of people that we estimated had come across the border. Without telling you the complete layout of that, it is impossible to answer that question in a fair manner.

Q562 **Yvette Cooper:** There has to have been a conclusion—

Professor Aston: I can come back to you about what the assumptions were, if that would be most helpful.

Q563 **Yvette Cooper:** But advice was given to Ministers that had that figure in it, was it?

Professor Aston: Advice was given to Ministers about the delay time that would happen depending on various scenarios about people crossing the border.

Q564 **Yvette Cooper:** Did it include a figure for the number of people coming into the country at that time with Covid-19?

Professor Aston: At that time, it included the figures of how much you would have to delay the number of people crossing the border to delay the virus. There were various different pieces of evidence.

Q565 **Graham Stringer:** Following up on Yvette's question, there appears to have been an anomalous decision to isolate 273 individuals who came in on flights from Japan and China, while people from hotspots in Europe, which Yvette mentioned, such as Milan and Madrid and elsewhere, were not isolated. What was the basis for that? What was the scientific evidence that that decision was based on? Can I just ask a follow-up, too?

Chair: Let him answer the first one, before you follow up.

Graham Stringer: It is part of the same question.

Chair: It is an amplification, is it? Okay.

Graham Stringer: I just wanted to know whether it was a Home Office decision or a Transport decision.



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Professor Aston: It was likely a Government decision across the board. It is unfair to characterise it as nothing being done about other people coming across the border. At that point in time, there was lots of information about what should happen about people coming from various different locations in the world. There was enhanced monitoring at airports for people who were coming in. So it is not fair to characterise it as nothing being done about those other people.

Q566 **Graham Stringer:** The sound quality is not good. Did you say that it was not fair to characterise it as anomalous?

Professor Aston: It was not fair to characterise it as nothing being done for other people. It was part of a consistent approach across the border. At that point, with people coming from Wuhan, there was a very high prevalence in Wuhan at that point.

Q567 **Graham Stringer:** But it also applied to plane flights from Japan but not from Milan and Madrid at that point.

Professor Aston: I cannot remember exactly the date, but there was advice for those who were symptomatic to self-isolate and, later, for those who were coming from northern Italy to self-isolate.

Professor Blythe: I think that came in on 4 March.

Q568 **Graham Stringer:** Sorry, what came in?

Professor Blythe: The restrictions on landing from northern Italy came in on 4 March, and the whole of Italy on 5 March.

Q569 **Graham Stringer:** Was it a Department for Transport decision or a Home Office decision?

Professor Blythe: It was a decision of Government; it was not a departmental decision.

Q570 **Graham Stringer:** Does that mean it was a Cabinet decision? Did you give advice to the Cabinet on that issue?

Professor Blythe: I did not on that particular issue, no.

Professor Aston: Because it was a SAGE piece of advice, that would come from the Government's point of view.

Q571 **Graham Stringer:** So, neither of the departmental scientific advisers gave advice on that decision.

Professor Aston: Not directly to Cabinet, no. We talked to the Home Secretary at all times about the effect of people crossing the borders.

Q572 **Graham Stringer:** What was the evidence used to isolate people coming from China and Japan?



Professor Aston: It was a general SAGE conversation. You would have to clarify with the Government's chief scientific adviser and the CMO as to what advice they gave to Cabinet.

Q573 **Graham Stringer:** The Transport Secretary has indicated that he would be relaxed about, or would like to see, the introduction of testing at airports, whereas the World Health Organisation and Public Health England have said that temperature checks, for instance, are very limited in their effectiveness. Is the Department for Transport's scientific adviser talking to airports about their desire to bring in testing, and temperature testing?

Professor Blythe: We have an expert group with the aviation industry on restarting recovery of aviation, which includes the airlines, airports and other stakeholders. Those discussions are ongoing at the moment. We are aware of the trials that Heathrow is looking to implement with temperature testing. As you rightly said, only a small proportion of those with the virus exhibit a high temperature, so it is not going to be a silver bullet that will solve the problem of knowing who has the virus coming into the country.

Q574 **Graham Stringer:** Are you part of that expert group?

Professor Blythe: Yes, I am.

Q575 **Andrew Griffith:** I shall continue with the theme. What is the scientific evidence behind proposing a 14-day self-policed quarantine for international arrivals?

Professor Aston: For the 14 days, it is quite clear. If you contract coronavirus overseas and then come into the UK, it could take you seven days to foresee symptoms, and another seven days to display those symptoms, so 14 days in which to be able to see whether you have symptoms is a reasonable amount of time. While the final details are still to be worked out, I think this will be enforceable, in the same way as we expect people to do other things by making sure that they obey the law.

Q576 **Andrew Griffith:** In your transmission modelling, what percentage assumption did you make about the number of people failing to comply effectively with the 14-day self-policed quarantine?

Professor Aston: In all the epidemic models, there is a variable surrounding compliance, and there would have been a SAGE model to look at all these things. SAGE models all have built-in non-compliance within their model.

Q577 **Andrew Griffith:** What is that number?

Professor Aston: It is a SAGE model, so I cannot tell you that exact number.

Q578 **Andrew Griffith:** You do not know it, or you cannot tell us.



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Professor Aston: You would have to ask Patrick Vallance and SAGE for that number.

Q579 **Chair:** So you know it, but you are not allowed to disclose it, or you are not familiar with it.

Professor Aston: I would not know the exact number. There are multiple models being used for modelling, so I would not be able to tell you about any one particular model—*[Inaudible]*—multiple groups across the country.

Q580 **Andrew Griffith:** Professor Blythe, has your Department evaluated the model applied by Austria of offering arriving passengers PCR tests in a secure area before they clear border control?

Professor Blythe: Not that I am aware of.

Q581 **Andrew Griffith:** Have you looked at any other international application of practice?

Professor Blythe: We are looking at practice from around the world. Indeed, I was on the telephone to the chief scientific adviser to the Ministry of Transport in New Zealand this morning, because it has implemented quarantine as well. Initially, it was implemented as a voluntary quarantine if you were not showing symptoms; it has now been changed to compulsory quarantine in hotels, because it was found that a number of backpackers and holidaymakers were breaking the quarantine. So we are trying to learn from different practices from around the world.

Q582 **Andrew Griffith:** Did you get a sense from them of the level of non-compliance with that voluntary quarantine? What sort of number did you glean from them?

Professor Blythe: They could not give a number. They gave some examples of where backpackers have been picked up travelling around when they should have been in quarantine—but as for strict numbers or a percentage, no, I do not have that.

Q583 **Andrew Griffith:** I have a final question for Professor Blythe. Is there something medically different about the type of passengers who take aeroplanes from those who take trains or ferries?

Professor Blythe: Not that I am aware of.

Andrew Griffith: Thank you.

Q584 **Chair:** Just to follow up on Andrew's question about looking at different models, in particular the model of Vienna, where it is possible to be tested there and then to demonstrate that you do not have the virus, why has that not been evaluated, given that the aviation industry and a lot of businesses are very concerned about the impact of having a mandatory 14-day quarantine? Surely, it would be better to allow people to be tested.



Professor Aston: I am happy to come in on the SAGE discussions on that. PCR testing is not a panacea; it does not tell you if everyone has the virus, because people test positive only at a certain point. If they do not necessarily test positive, it does not mean that they do not have the virus.

Q585 **Chair:** But the Austrian authorities have concluded that it is a reasonable way in which to proceed. Has that been evaluated? Professor Blythe indicated that it had not been evaluated and considered. Do you know different?

Professor Aston: All I know is that we have discussed the use of testing at the border. The difficulty is that PCR testing does not give you a definitive answer.

Q586 **Chair:** We are making a great play, and rightly in my view, about the rapid expansion of testing across the country, including of asymptomatic people in particular settings. If it is useful and appropriate there, why would we not deploy it in the transport system?

Professor Aston: It is useful there, but you have to remember that the border is a single point in time. The ability to test in the country allows you multiple opportunities to do that.

Q587 **Chair:** But someone who takes a test and tests negative could then be allowed to fly without being quarantined. Why is it the case that, if someone tests negative who works in a hospital, perhaps in an intensive care unit, they are allowed on that basis to go to work? Why should they be allowed to go to work, but we require—

Professor Aston: Because we can repeatedly test them.

Q588 **Chair:** Would it not be possible repeatedly to test travellers?

Professor Aston: Not if you are not going to hold someone at the border.

Chair: I turn to Huw Merriman, Chair of the Transport Committee.

Q589 **Huw Merriman:** Professor Blythe, what has changed from a scientific perspective that has caused the quarantine to be brought in, versus when we first locked down, when one would have assumed that we would be keener to keep a close eye on those coming into the country?

Professor Blythe: I think that Professor Aston answered the question about the decisions taken when we first locked down. What has changed now is that community infection is lower in the UK and, therefore, the potential proportion of people bringing the virus in from abroad is relatively higher, and may have a higher impact, which is why that decision is being made now.

Q590 **Huw Merriman:** I apologise, because I could not hear Professor Aston properly, so I did not catch that piece of evidence—but I shall pick that back up.



May I probe a bit more into that, Professor Blythe? From a non-scientific basis, it strikes me as being somewhat bizarre. If there is a concern that the more people who have the virus, the worse the peak becomes and the harder it is for the NHS to manage, surely that would be of pressing concern, rather than at the time where we are now, when we are looking to ease the lockdown and there is a feeling that we have not had such a high peak—that it has been a flatter line for the NHS.

Professor Blythe: SAGE gave its advice at the time based on the modelling and the practicalities around that, and that is what the Government made their decisions on. That is the best way I can answer that at this point.

Q591 **Huw Merriman:** Would it be possible to publish the scientific evidence that backs up the need for quarantine?

Professor Blythe: I have not been involved in those discussions in SAGE recently; I would have to defer to John for an answer to that.

Professor Aston: Certainly, SAGE intends to publish the papers that it has been considering, and I hope very much that you will get access to that, as SAGE publishes those papers.

Q592 **Chair:** This Science and Technology Committee has been pressing for the publication of papers that have informed decisions, or advice given by SAGE that has informed decisions being made by Ministers. We were pleased that, on 5 May, a tranche of papers was published, along with a longer list of papers that would be published. The first of the papers was entitled, "The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak", and was discussed by SAGE on 13 February. Another paper, on scientific advice on restricting flights from specific countries, was discussed by SAGE on 23 March. Why has neither paper been published yet?

Professor Aston: I believe that the second of those papers, from 23 March, is scheduled to be published very soon, one hopes in the next couple of weeks.

Q593 **Chair:** Sorry, I missed the timetable. When is it going to be published?

Professor Aston: I think in the next couple of weeks, or that is my belief. It was committed to a couple of weeks ago that it would be published in the next three weeks or so, so I think it is in the order of one or two weeks. The first paper is an academic paper that has subsequently been published in peer-reviewed literature. It is available in *Science*, and I am more than happy to send you the reference, if that would be useful.

Q594 **Chair:** But why, when the website has been established to give transparency in a formal scientific way—

Professor Aston: That paper was almost certainly a preprint; I think that the published version will be the version of record, which is the one from our scientists.



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Q595 **Chair:** Why would it take another two weeks for the other paper to be published, which is very relevant to what we are discussing?

Professor Aston: That is a question that you would have to ask SAGE and Patrick Vallance.

Q596 **Chair:** You are a member of SAGE. Do you discuss when advice that you have taken from academic papers should be published?

Professor Aston: I do not remember discussing specific papers and when they should specifically be published. We have had discussions in SAGE about the fact that, ultimately, we would like to see these published.

Q597 **Chair:** So does SAGE discuss that? Who decides when it is published? Is it SAGE collectively, or an individual?

Professor Aston: No, I believe that it is the Government Office for Science along with other Government organisations. You would have to ask Professor Vallance that.

Q598 **Huw Merriman:** We are told that these answers and the next steps are led by the science. On that basis, have either of you been involved in the scientific rationale whereby travellers from France will not be quarantined, whereas travellers from Germany, say, will be?

Professor Blythe: I have not been involved in those discussions.

Professor Aston: The work is still ongoing, but I have been involved in discussions as to what particular exemptions should be given to France.

Q599 **Huw Merriman:** Perhaps you could just tell us what makes somebody from France different from somebody from other parts of, say, mainland Europe.

Professor Aston: My understanding is that all those things are subject to finalisation, so it would be difficult for me to give any specifics on that until the policy is finalised. I do not want to prejudge that.

Q600 **Huw Merriman:** Perhaps you could write to the Chair on that basis.

Professor Aston: Yes, of course.

Q601 **Huw Merriman:** My last question relates to a letter sent from Heathrow Airport Ltd to the Secretary of State for Health on 23 April, copying in the Secretary of State for Transport and asking Public Health England to prove exactly why testing at the airport was not effective. Has that letter been seen by you, Professor Blythe, and has there been a response, as far as you are aware?

Professor Blythe: I have seen the letter; I am not aware of a response being returned, as of yet. It was left with Public Health England to respond, I think.

Q602 **Huw Merriman:** Many people find it somewhat strange that we have not



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had quarantine in place and that, therefore, people have been able to come in, as they are, without any testing. We are told that temperature testing is not effective, whereas it seems at least to be a mitigant, and now we are going all the way through to quarantine as we ease the lockdown. From a scientific perspective, how would you describe the logic of all of that?

Professor Blythe: There have been difficulties with getting the volume of testing up to speed, as we have seen in the media, in discussions. The decisions not to quarantine those coming in from hotspots in the early days of the virus was on advice coming from the modellers, which was then taken up to Cobra and to No. 10.

The reason they are looking at quarantining now is that it will make a difference, because there are still hotspots around the world and, with the level of infection in the UK being lower, it will have more of an impact. It is also more doable, because not as many passengers are arriving as there were in January or February, which helps to make it a more practical proposition.

Q603 **Carol Monaghan:** Professor Blythe, when the Prime Minister made his statement on Sunday, he encouraged certain workers in England to return to work. We have seen pictures of public transport, particularly the tube and rail services in London, being packed full of people. First, what impact do you think that movement will have on the R value? Has any thought been given to movement within the UK, on how easing of restrictions in certain parts of the UK will affect the devolved nations, which are still under far stricter restrictions?

Professor Blythe: In the early days of SAGE, there was an estimate that the peak would be reached in different parts of the UK at different times, so we collected transport data at a regional level and used that to look at social distancing evidence and how many people were travelling. We looked at data from different regions, in case it was needed to make decisions at a regional level. Indeed, at the moment, that has not been done.

We monitor the transport system very closely; we put a lot of effort into collecting data—on load factors on all trains, buses, tubes and so on. The first sitrep that I saw this morning suggested that the number of people using the tube was up 9% from last Wednesday. Just to put that into perspective, that is still 93% down on the same Wednesday last year.

Q604 **Carol Monaghan:** I have been on the tube in London regularly, and 93% down is still busy.

Professor Blythe: It is still busy, yes. Being in Newcastle and on the metro is a blessing, because it is not quite at the same level.

The challenge is in trying to find practical ways in which to keep the risk down while enabling a little bit more capacity on public transport. We are working very closely with the Health and Safety Executive. About 10 days



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ago we did walk-throughs with transport stakeholders, drivers and passengers on bus, metro, tube and rail, to look where all the touch points are—the likely points where transmission could occur.

We are working with the Health and Safety Executive on how we can try to reduce those risks. There is a hierarchy of risks that you have to take and consider, to try to manage that, and there is a lot of work going on. The same thing is going on around the world. We all have the same challenge in trying to deal with social distancing and the risk of transmission while trying to increase the amount of capacity in public transport. At the moment, we are talking about only 15% on buses and, probably, up to about 20% on trains, if we are keeping it to 2 metres social distancing.

Q605 **Carol Monaghan:** Has the risk been weighed with economic impact? Is that what is determining the risk that we are willing to take here?

Professor Blythe: We can only provide the science; the decisions on the economic impact come from elsewhere.

Chair: We go to Aaron Bell, and questions on enforcement, which are obviously particularly relevant to the Home Office.

Q606 **Aaron Bell:** Professor Aston, what data and understanding do you have on the effect of lockdown on public disorder? Has the actuality been as you expected, or has it been different?

Professor Aston: We did quite a lot of work. A behavioural science sub-committee of SAGE, SPI-B, has done quite a lot of work throughout the epidemic to work out what the effects would be on public order and protest.

A number of factors came into trying to understand the messaging. The police have done a very good job in trying to take a proportionate approach, which has led to very high levels of compliance and people being encouraged to comply rather than it having to be enforced. There have been a number of enforcement actions by the police, but they are at a very low level, particularly when you compare them to overseas. I do not have the overseas numbers, but, in the UK, I think we have had had about 10,000 enforcements in the lockdown period, which is actually a very small number, when you think about the entire population and what we are asking them to do.

Q607 **Aaron Bell:** There has been an increase in fines for breaking the rules. Was that an evidence-based decision based on the experience that you have had so far?

Professor Aston: I am not sure that SPI-B discussed the level of fines—that would be a policy decision—but it has looked at the effect of different strategies on enforcement and how, in actual fact, trying to get social compliance is much more effective than enforcement activities.



Q608 **Aaron Bell:** Aside from the lockdown rules themselves, what estimates were made of other potential civil disorder effects of a lockdown?

Professor Aston: Again, we looked at the effect on protest, et cetera, which of course is quite curtailed under the lockdown rules, and tried to understand what the effect might be. SPI-B looked at some evidence, and of course we tried to feed that in. This is quite a difficult area; it is really hard to get evidence, particularly around lockdowns, which are not exactly common, but a lot of social science input has been put into what the potential effects might be.

Q609 **Aaron Bell:** You said that police forces had taken a relatively light-touch approach, and that has been generally welcomed. However, different police forces have clearly taken different measures in how strict they have been. Has any evidence been gathered? Are we collating evidence on the impact from individual police forces and what lessons we can learn from that, to spread best practice? Do we have an idea of what best practice is yet?

Professor Aston: Ultimately, I suspect that would have to be a question for the police, on what evidence they are gathering. However, I know that we are regularly talking to the police. I regularly talk to the NPPC to understand what they think they need, and what evidence they will have to gather. We have a really good dialogue and try to make sure that we are getting scientific evidence to them, with them asking us the questions that they think are helpful to ask, in trying to improve the outcomes they are trying to achieve.

Q610 **Katherine Fletcher:** Hello, professors. Thank you so much for everything, and for coming today and for trying to put into English what I am sure in your heads is a series of statistical models with log curves, distributions and all sorts.

One thing that struck us from previous sessions of evidence is the importance being placed on the NHSX app and its ability to inform social distancing and inform some of the measures that we have discussed here today. To what extent is technology playing a role in allowing us to maintain social distancing both from a positive inform effect but also from an enforcement effect—for example, with number plate recognition or even drones? This is perhaps a question for Professor Aston at the start, but, obviously, the question on modelling for transport is one for Professor Blythe.

Professor Aston: It is a good answer. We need to be careful about the fact that the NHSX app is a help and not an enforcement app—it is not a Home Office app. We need to be clear that it is being used in that way. It is much more about making sure that we get the population to buy into the use of the NHSX app, because that is the ultimate way in which we are going to be successful in using it. We are going to need really good compliance to make it a really strong part of response, and that has to be driven by people's view that this is going to make a tangible difference to the epidemic and the safety of themselves and the country. That has to



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be the driving heart of what we have been talking about, with the NHSX app.

Q611 **Katherine Fletcher:** I know that a series of people have had some security concerns about that. From the Home Office perspective, are you happy to confirm that you do not have any direct involvement in that technology, and it is primarily seen as a health app?

Professor Aston: Not at all. It is being run by NHSX.

Q612 **Katherine Fletcher:** Great. In terms of technology and the role that it has to play to help to maintain social distancing, as we start to release these lockdown measures, from a compliance or transport perspective, are there any new technologies being brought to bear?

Professor Blythe: We have been working with technology partners on video processing. We are using cameras on the streets and in transport locations to look at things like distancing between people. It measures the distances and draws a red line between them if they are less than 2 metres apart, a yellow line if it is 2 to 3 metres, and a green line if it is above 3 metres, just to do assessments on how well people are maintaining social distancing.

We are also beginning to think about issues that may come around the use of cash in future. Clearly, handing over notes and coins could transmit the virus, so we are looking at what options there are to make transport more cashless as a protective measure, de-risking it.

Q613 **Katherine Fletcher:** Are you confident that any of those measures will have individuals' privacy at their heart? It is welcome to hear that it is a realtime data input into all of the models that we talk so much about.

Professor Blythe: The camera technology just looks at the human as a blob and certainly does not make any attempt to do facial recognition or impact on privacy. With any sort of payment that could reduce use of cash, obviously, privacy, security and trustworthiness will all be key. It is early stages, but we have lots of brainstorming in the Department to see how we can capture new technology and new ways of doing transport as we come out of the lockdown. That is just one of those that we are thinking about internally at the moment.

Q614 **Katherine Fletcher:** Wonderful. I think that a lot of concern about the models is that it is almost a black box to those who have not necessarily built a model before. Is there anything else on which you can give the Committee or the general public confidence about the inputs to these models—the raw data that is spitting figures out? The camera example is quite a tangible one, of checking whether people are complying.

Professor Blythe: We are beginning to look at doing specific analysis and modelling for use cases. This is the stuff that I mentioned that we are doing with the Health and Safety Executive—taking people on walk-throughs in different transport modes, really to look at the practicalities



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and the hierarchy of risks, at what risks can be mitigated and what risks we are still carrying as we look at changing how we do transport and improve capacity.

There are so many unknowns around this on transmission, but I assure you that people are looking at some of the practical solutions and working on it day and night at this point in time.

Q615 **Katherine Fletcher:** I am sure.

Professor Aston, are any data inputs coming from the Home Office? Number plate recognition and drone cameras have been used, somewhat controversially.

Professor Aston: I believe that number plate recognition has been used a little bit to understand traffic on roads, and so on. I would have to check for sure, but I believe that is the case.

More widely—if you do not mind me taking off my Home Office hat and putting on my statistician hat—I feel that getting the right amount of data for this is going to be absolutely crucial. To look more widely, some of the work that the ONS is doing in trying to understand prevalence, specific crime incidence and infection rates is going to be absolutely crucial to make sure that the models are calibrated to what is happening in the real-world data.

There are some excellent things that we have seen recently that will really help us to move forward, because they help us to have the data we need.

Q616 **Zarah Sultana:** I want to learn about the link between transport usage and transmission. Professor Blythe, do you have an estimate for how lower use of public transport since 23 March has contributed to the reduction of the reproduction number, R?

Professor Blythe: Not directly. All I can say is that since the lockdown we have monitored the use of public transport in the UK. As you see at the five o'clock briefing every day, you look at car use, TfL bus and train, and train and bus outside London, and it shows how much social distancing is happening and how much less travel there is. It is up to the statisticians like John and the modellers to show the correlation between that and the R.

Q617 **Zarah Sultana:** This week we have seen greater numbers of people using public transport to get to work after the Prime Minister's announcement on Sunday. What scientific assessment have you made of how public transport use will increase after this relaxation of measures? How much will it be allowed to increase before significant transmission starts again?

Professor Blythe: As you heard on Sunday, the recommendation was that, if you can avoid using public transport, do so. We recognised that it would increase. We are working with transport operators to try to work



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on ways in which to keep it safe; we have provided some general guidelines and we are now working on specific walk-throughs to try to mitigate this. Obviously, if there are more people in one place, there is clearly a higher risk of transmission.

Q618 Zarah Sultana: I have one final question. You will have heard about the sad case of Belly Mujinga, a London Victoria railway ticket officer who died two weeks after being spat on by someone claiming to have Covid-19. As we start to see public transport usage increase, what does the scientific evidence suggest about the safety of vulnerable frontline workers?

Professor Blythe: Is that an enforcement issue, John?

Professor Aston: I think we can all agree that that kind of behaviour is just absolutely intolerable, and people who participate in that kind of activity should feel the full force of the law. It is also common among police officers, and we are really hoping that serious sentences are imposed on people who do that kind of thing.

Q619 Chair: Are any steps being taken to step up enforcement and precautionary action against that? Is it possible to do that? Is there anything that can be done differently in response to this terrible case?

Professor Aston: From a scientific point of view, I would not be able to answer that.

Q620 Dawn Butler: To pick up on Zarah's question, do you have modelling for the number of people versus the number of buses, say, that is needed for it to be safe for people to travel around? If you have that modelling, is it available for us to view?

Secondly, Professor Blythe, you mentioned that you expect to see peaks in certain areas at different times—so different areas will have a different peak when it comes to infection rates. Is that modelling available for us to see the specific areas where you expect there to be a higher peak and at what time, and the reasons for that?

Professor Blythe: Answering your second question first, I did not actually say that—I said that in the early stages of SAGE they looked at the possibility that peaks would happen at different times throughout the country, and we were making sure that we were collecting the transport data to understand the performance of social distancing and the like, to inform any decisions that may take place. I am not aware of where modelling is on that at this point in time.

On the first question about capacity in public transport, our analysts looked at transport modes and made assessments using the 2 metre rule of what capacity current public transport could be at and maintain social distancing. For buses, it was around about 15% to 20%. There is not full operation of bus services at the moment—they were reduced during the



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lockdown—so it can be increased so much, but it is not going to get back any time soon to the levels of capacity that we saw pre-Covid.

Q621 **Dawn Butler:** On the peaks around different parts of the country that you speak about, is that information available?

Professor Blythe: As I say, there was speculation that peaks would occur at different times, and we were asked to collect transport data from the regions to support any decisions that were being made. As I mentioned, I have not been to a number of SAGE meetings since the beginning of March, so I am not aware whether that data is in one of the papers that is going to be released. In fact, I am not even aware that that data is available.

Q622 **Chair:** Professor Aston, do you have a perspective on this?

Professor Aston: On local peaks, while obviously it was true that different places were acting in different ways, we should also remember that, because the instigation of lockdown was nationwide, that will affect the relative effect of local changes. That will have an effect on whether we see distinct local peaks or much more levelling out, because of the fact that the lockdown happened nationally rather than locally.

Q623 **Chair:** We need to bring things to a conclusion, but perhaps we could have a final question from me.

The fact that we followed other countries in the pandemic gives us the opportunity to learn from what they do, for good or ill. To what extent is there rigorous scrutiny of the actions and policies of other countries to advise our own—in particular, in the context of the question that our colleague Andrew Griffith asked about the Austrian experience in testing? In your separate experiences, is there a systematic approach of considering and learning lessons from other countries?

Professor Blythe: There has been a lot of discussion about that. We are trying to do some learning ourselves with our international partners around transport. UK Research and Innovation has some pots of money for Covid-type research, and it is funding research looking into international comparisons, I believe.

Q624 **Chair:** Professor Aston, does SAGE have a big focus on what is being done and what are the effects in other countries?

Professor Aston: Certainly, what is happening in other countries is discussed a lot at SAGE. Also, I know that—*[Inaudible]*—have a lot of conversations with their international counterparts, which gives them information about what is happening in other countries.

On the Home Office side, we have a strong partnership, where we try to learn a lot from what is happening, and from all the research. We try to make sure that we ask research questions that we can all learn from rather than any one individual, so we have done lots of work on that.



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Chair: Thank you. We are very grateful for the time that you have given to the Committee today. The role of chief scientific advisers is very important; you are independent academics in your own right, who are performing a public service in your current service in Whitehall. We are very grateful for that; we know that you do not speak for the Department in the same way, perhaps, as a permanent secretary or a Minister does, but we are very grateful for the advice that you give.

We want to encourage you to give more of that advice and for it to be listened to. I am slightly concerned that, when decisions are being made on transport, the perspective of Professor Blythe has not been called upon since March by SAGE.

We are very grateful for the work that you are doing and the advice that you give and the help that you have given to the Committee in understanding these important questions as to how the knowledge within Departments contributes to the national response.