



SCIENCE AND POLITICS

The Perfect Misunderstanding

OCTOBER 2020



WELCOME AND INTRODUCTIONS

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Chief Executive, Radix

My name is Ben Rich and for those who don't know me I'm chief executive of Radix.

We call ourselves the radical centre think tank. By radical we mean we're concerned with system change and fundamental issues of how our institutions are run. By centre, we mean independent, pragmatic and cross-party and this is one of a series of webinars that we've organised.

Most recently we were looking at modernizing property taxes but today's topic – the relationship between science and politics - is subject which is particularly close to my heart and I'm very pleased with the panel we've put together.

For those that weren't here earlier, George Freeman is just struggling with a technical issue but has promised us that he will be here by quarter past six and so we're going to kick off without him and I'll very, very briefly introduce the rest of our panel.

We have Joe Zammit-Lucia who is one of our founders and from the pharmaceutical industry and a qualified doctor.

We have Ewan Kirk who is one of the major investors in science from across the UK.

We have Tracey Brown, who is the director of Sense about Science which promotes sensible conversation about science and particularly in the context of public policy.

And I'm particularly pleased to have Fiona Fox as our chair. Fiona is the director and one of the founders of the Science Media Centre which is an organisation I hugely admire. It promotes quality debate and discussion of science in the media, and promotes science literacy among journalists and media literacy among scientists, I hope is a fair way of putting it, which is crucial to this whole discussion. Fiona, over to you.

WHAT HAS GONE WRONG WITH FOLLOWING THE SCIENCE?

Great, thank you Ben so much.

I'm sure you all saw the front page of the telegraph today: more speculation as to this discrepancy between what scientific advisors appear to be advising and what government appears to be following, and that has been a major theme of the COVID crisis.

I actually thought more about scientific advice than I've ever done about seven years ago when I was invited to Auckland in New Zealand to attend the first ever chief scientific advisors global meeting. Virtually every country in the world including Cuba was there. Castro's son is the chief scientific advisor to the Cuban government and he looks exactly like Castro so it's very strange bumping into him in the corridor.

But actually one of the things that came out of that conference was that the UK system of scientific advice to politicians was the envy of the world. There was nobody with any doubt that we had the best system partly because we had independent-minded scientists embedded in government. Every single sub-department has a chief scientific advisor and then Patrick Vallance sits above them all as *the* chief scientific advisor and brings them all together.

But also this thing called SAGE: The Scientific Advisory Group for Emergencies which very few of the other countries had and which had kicked into action on previous crises like floods, Fukushima, volcanic ash, Zika, Ebola etc. So I am minded when I saw that this meeting was being arranged to just ask what went wrong? Or indeed has anything gone wrong? I'm so fascinated to hear what our speakers say because I think there are still many of the hallmarks of that system that was the envy of the world that I see being demonstrated today, where politicians are absolutely listening to scientific advisors, and SAGE is operating - has operated - for the whole nine-ten months. And yet there seems to be a growing consensus that the system is broken, that it hasn't worked.

So one of the things I really want to ask our speakers is: Are we maybe attributing too many of the failures of COVID to a broken system of scientific advice? Is there still actually something that when we do have this inquiry next year and when we

sit down, hopefully dispassionately and outside of a blame game, and say what worked well and what didn't. It would be so interesting to have the insights of this group of speakers into whether the whole thing is a mess. And obviously, as Patrick Vallance has said rather wistfully several times, no SAGE has lasted this long; most scientific advisory groups on emergencies last for six weeks or two months. They've never published the names of their membership before because they've never been asked to, and they've never been put under pressure to because most of the British public and the British journalists took very little, if any, notice of this system.

Now everybody's noticing it and it is the subject of editorials and columns every day. I was just asked earlier today to look at a Spectator article about this system and give my views and I said "I will feed back to you after listening to our panel tonight." But what mostly strikes me is that this particular journalist had completely overestimated its fault, so possibly I think Tracy might address this based on what we were just discussing a few minutes ago, that he put down every single problem including the lack of data about hospital admissions in Oldham to our failed system of scientific advice.

And I wonder whether we've grown to understand it a lot more than we used to, but in the same sense we really still have no understanding of it and that's leading to all kinds of over-inflated expectations.

The other thing that I really want the panel to address is who is misunderstanding whom? Is this the politicians misunderstanding the scientists or the scientists misunderstanding politics? I think that's really important in terms of lessons learned. At one stage somebody was saying to me that the politicians by talking about "following the science" every single day at the Downing street press conferences, were consciously getting ready to throw the scientific community under the bus - they were just ready to blame everything that's gone wrong on Patrick Vallance and Chris Whitty.

Meanwhile I had scientists on the phone to me saying that the message we need to get out is that we didn't advise any of this, that this wasn't our scientific advice and it was the politicians.

As much as I love the scientific community - and I am definitely a representative here tonight of scientists and not politicians - I do think there are quite a few scientists who want to throw politicians under the bus as well and I wonder what the panel think about that.

You can ignore all of these questions, they are really to set up the discussion but possibly more importantly, to tell you why I find this endlessly fascinating and I actually think many of the people commenting - many of the columnists and people who've just woken up to this - are not people that have been thinking about

it for years. Well, the people on this panel I think have been, and we all know that expertise is a good thing so I'm very, very keen to hear your expertise and your insights.

I see George Freeman has arrived, so you're very welcome George and you are going to go second so you've got time to relax while we listen to Tracey Brown from Sense about Science.

A CENTRALISED CAMPAIGN CABAL & FAILURE OF LEADERSHIP

Thank you Fiona and that's exactly where I want to start because there's a lot of commentary now that looks back and suggests that at the beginning when we were guided by the science, it was all a bit of a ruse to set up the scientists and I'm sure there were one or two people for whom that went across their mind.

However, at the beginning it's really important to remember that this is the government that had not long come in and had just come out of the campaign for Brexit, the campaign for the leadership of the Conservative party, and the campaign to win the election. It was a campaigning government and I felt when they were talking about being 'guided by the science' it was actually at that stage a conversation with themselves, saying hey ho this is something else, we've got to approach this in a different way, this isn't something that we can solve in a campaign cabal or that kind of approach.

Unfortunately the journey we've taken is exactly that - towards a kind of centralised, increasingly campaign cabal in cases; that's perhaps a little bit unfair in some areas.

There was a bit of a tendency at the beginning to think that the science was going to produce a whole lot of answers if we just hung back a bit. A bit of a leadership failure there as well, nervousness about taking decisions. That's hardly surprising and I think at that time we all, and all the opposition, and everybody in the scientific community had every sympathy for those in that position of having to make those decisions. I just want to remind people that that's how we all felt, there was a lot of credit, a lot of restraint in terms of criticism. We really felt for people being put in that leadership position and trying to figure out what was going to be their pattern for finding the way forward.

What I think has been hugely underestimated in all of this discussion is the capacity for implementation. So you can have all the advice in the world but if you are reducing your capacity to implement, who's actually going to drive this through?

SAGE are independent advisors by and large and so don't understand how local authorities work, they don't understand the commissioning process.

Tracey Brown
Sense about Science

And you know we didn't have any engineers involved in a lot of the commissioning of significant engineering for example: huge logistics, huge monitoring requirements. That was all rather underestimated and it took government, I think, across all departments quite a while to wake up to just quite what was needed in that way.

And what we began to get is increasing defensiveness around this. At the same time I think we've seen the huge concentration of communications that has happened around Number 10, to the frustration of other departments. I've been involved in a review of the transparency of government's policies going into lockdown and coming out of lockdown. We're going to be publishing that in the next couple of weeks. What we've been looking at is did they publish the evidence behind those policies?

Having done two major reviews of transparency in government in the past, I was really disappointed first of all to see that all of those principles of publishing the reasoning behind policies, links to the data it's based on, links to the evidence, had completely gone out of the window. It was seen as almost, like, 'nice to do, but not in an epidemic setting'. In actual fact instead of a nice add-on, it's turned out that a crucial part of how you manage an epidemic is to publish the chain of reasoning between the scientific advice and the decision that you've come to, and I think that's where the wheels are falling off.

Now the broader population is finding it very difficult to track. Certainly anyone who is in a position of trying to receive the policy and understand what it was based on, whether you were a car sales showroom or a school really found it difficult to understand that relationship between what you're hearing from the evidence on the one hand, and the policy on the other.

I would also add that one of the problems with transparency as things have become more defensive is this: I led the campaign to make SAGE public but actually in the back of my mind then was an idea that was proven right, that one of the biggest problems of SAGE not publishing its material wasn't so much that the wider public wanted to delve into it all, but the government itself didn't know what it was doing. So Priti Patel when promoting quarantine had absolutely no idea - when she kept saying 'the science' - she had no idea what she was talking about, was completely unable to answer the questions.

Kit Malthouse, minister for policing, was on the Today programme and was asked 'Why is it two weeks? Why is it we're doing it now, when all the scientists have said it should have been like that at the beginning?' and he just answered "I'm sure you'll have some scientists on the programme later on who will be able to explain that", which seemed a very strange position to be in when you are the minister being put forward to the Today programme to promote the policy.

And that lack of clarity, when finally the membership of SAGE did get published and people went, 'oh gosh, where are the engineers? Where are the immunologists? We actually need a few more.' And I've just been chairing something for the Department of Health on test and trace, the senior scientists in test and trace - a challenge panel, with scientists and critics of the system. It became really clear just how insulated they've become in the process of trying to implement, trying to move with the changes; they become insulated from the stream of advice.

For example, you might imagine that all the stuff that's going on in Germany, or the Netherlands in public health, that that's something that our government is closely in touch with and monitoring. When, in actual fact, what has to happen is civil servants have to go through the foreign and commonwealth office to find out what other governments are doing and have a conversation about that. And so that's missing information, how other governments are using the evidence has been missing.

Understandably, we're facing an epidemic, but this problem - the lack of understanding of just how much work is needed to implement scientific advice - leads me to say we've almost had too much advice, certainly for what government can handle.

Now that's not to say we don't need the scientists looking at all these aspects of the problem, of course we do, but we need to turn our attention not to things being wrong with the flow of advice into government, but how government uses that and also how it uses its own departmental expertise. By centralising policy making in the way that it has, it's skipped through a lot of civil servants and people with extremely good contacts with the expertise in the wider scientific community that they need. That's been missing unfortunately. So it's implementation of advice that we need to be looking to.

China's trade surplus has plummeted to a mere 1.15% of GDP in 2019 from a high point of 8.68% of GDP in 2007.

HEALTH AND ECONOMY SHOULD BE INTEGRATED

Great, thanks so much Tracey, it's a really fascinating way to start. So according to you there is too much scientific advice and this is more about implementation and how it's used.

George, over to you.

Well thank you, and thank you for inviting me and for convening this, it's a really essential conversation.

Fiona Fox
Science Media Centre

George Freeman MP

So for those who don't know me just by way of background: I was elected in 2010 after a 15-year career in biomedical, clean tech and Agri-Tech venture finance. Mainly biomedical science and particularly in the latter years, digital health.

I served as first minister for life sciences under David Cameron, responsible for the NHS drugs budget and the MHRA and NICE. Importantly and for the first time in the UK, I was also in the Department of Business AND Health: having made the case - with which David Cameron completely agreed - that we had to have a much more integrated model of health and economy. As an aging economy, we couldn't run health and economics in two different silos and think of health as something that spent money, and the economy as something that generated it. Not least because we were mired in post-crash debt and actually our life science sector is a major revenue earning industry for the UK with the potential to tackle the structural health deficit which threatens to overwhelm our public finances.

So that was my background when I went to cabinet and explained that we couldn't possibly build a modern life sciences ecosystem or an intelligent health care system without a proper commitment to digital health, pointing out that no Minister was responsible for digital health.

David Cameron then made me the first UK minister for digital health!

After the EU Ref vote and the departure of David Cameron, Theresa May took me to No10 to chair her Policy Board. In 2019 I came back into the Johnson government as number two at transport to drive digitalisation and decarbonisation, before leaving the government in the reshuffle this February.

My last appointment was the first COBRA meeting on COVID. That was the first pan Government COBRA meeting as far as I'm aware, to which every department sent a senior minister with a red folder for it a dry run drill exercise organised by the cabinet office to make sure that every department was thinking about what COVID would mean for it.

I just really want to make three points:

First - and my main point in case my phone link goes down, is that what this crisis has exposed at the very top of our government, and across the G20, is that we have siloed thinking on health and thinking on economy, when in fact they fundamentally need to be integrated. And Covid has shown us very clearly that health is an asset, disease is a cost, health resilience is an asset, and you cannot run an advanced economy or company without recognising that health is a fundamental part of your economy. I mean this both in the sense that if your population is ridden with disease it can't be productive, but also that if you're going to be a healthy economy and an advanced economy, then the life sciences sector, diagnostics devices, digital health, are fundamental.

Now I happen to think that is a huge opportunity for us but this crisis has, I think, caught us and a lot of countries out. That's the first point.

My second point is that advisors advise and ministers must decide and I think in the end we are very lucky and blessed in the UK. I completely agree with the previous speaker, that we have a phenomenal scientific advice infrastructure. We're very lucky, every department has a chief scientist, we have a scientific cabinet that meets and advises the prime minister, but in the end ministers have to take really difficult decisions, and they are difficult, and the reasons ministers take them is because they're elected and they're accountable to the elected house and in the end that's the best protection.

But ministers have to make decisions based on the best advice available to them and they can't blame the people who give the advice. Ministers must take responsibility and frankly if you don't relish that prospect, you shouldn't be doing the job.

To manage this disease you need health advice, epidemiological advice, and economic advice, and I think what happened - understandably - I'm not blaming anyone - is this crisis in the spring caught everyone by surprise, and, totally understandably, for all the epidemiological and scientific advice, we didn't think enough about how you begin to balance the 'E' and the 'H': the economic and the health. And I think in the end ministers ended up doing that instinctively but I think that that has created a sense in the public that ministers are making it up as they go along.

I think that the advisory network, once the immediate threat of public health had passed in April-May, needed a structure at the heart of government that fundamentally recognised we need economic *and* health advice so that ministers could balance the two and make a balanced judgment and I don't think that was ever done.

The Treasury has a lot of expertise and I think Rishi Sunak is a first class chancellor, but my point is I'm pretty sure the Cabinet didn't have a system for receiving high-level advice on the health and economic pay offs and, crucially, to the point Tracey just made, the best advice from around the world on how other countries did it.

One of the things I did during the summer was to help set up an index. We tracked all G20 countries. And that index told you very clearly that some countries were performing far better and why.

My third point is that we're massively over-centralised, and this crisis has exposed that we are an over-centralised state, and in a crisis we deepen that instinct: everything goes to London. And with COVID outbreaks in my own constituency,

that centralisation has been a huge problem because the local authorities, local public health know far better how to track and trace.

So those are my three points: One, we haven't got a proper integrated sense of economy and health together. Two, we haven't got an advisory framework that reflects that, and three, we are over-centralised and the crisis has deepened it.

COMMUNICATING UNCERTAINTY IS DIFFICULT

Right, thanks so much George. This is great, you're all firing through these, over to you Ewan.

Thank you, thank you very much Fiona.

I'd like to actually talk a little bit about the nature of the advice that is given because in my role as the chairman of the Isaac Newton institute, we ran a programme called infectious disease pandemics, where we were trying to understand not only how to model pandemics better, but also how to communicate the results of that to policymakers.

One of the things that is incredibly difficult in communicating particularly pandemics but other fields as well, is the sheer degree of uncertainty. Politics doesn't work very well with uncertainty it's a difficult thing for politicians to say, or to hear, 'we don't really know what the answer is' or 'here is a range of outcomes'.

Pandemics are one area. Rather annoyingly for this particular pandemic, so is economics. Economics is a range-uncertainty-based science and so is health, there's a lot of uncertainties about health. And as those three things collide, the government is just unable to absorb the range of uncertainties.

I noticed when there was an article, I think in the Telegraph, about how every time you ran the famous Imperial College model you got a different answer.

Well yes, you would get a different answer; it's a stochastic monte carlo simulation. Now I would put quite a lot of money on the fact that there isn't anybody in the cabinet who understands the phrase stochastic monte carlo simulation. So communicating uncertainty is difficult.

Now a second point is: the government that we have is uniquely ill-suited to this science and policy dichotomy. As we know members of the government have form on being tired of experts or this country has enough of experts, and that is partly due to the makeup of the cabinet. The makeup of the cabinet is there because they, in my view, believe something which is completely irrational from an economic point of view but they've had enough of experts. They don't want to know the evidence, the evidence on Brexit, and I realise this might be a little controversial,

Fiona Fox
Science Media Centre

Dr Ewan Kirk

but the evidence on Brexit is completely clear. It's an economically stupid thing to do.

But if this government can wave away that evidence, then they can wave away pandemic evidence and then you know you end up with things like Eat Out to Help Out. How did that become a policy?

As George said, it was probably an instinctive thing, this seems like a good idea but we can't have policy made on instinct because instinct or intuition are the things that tells you you're right when you're not and that is just a terrible thing to be part of policy.

And then finally, and this is a personal bug bearer of mine, there just aren't enough scientists in government. Our prime minister and his chief advisor have degrees in classics and ancient history respectively. Now I couldn't understand classical Greek, and I certainly don't have any ability to understand ancient history, but similarly they have no ability to understand complex or even relatively simple scientific statements or scientific data. I've read quite a few of Mr Cummings' blogs on what we should be doing with science and at best it's a dilettante view of what science is, at worst it's just incoherent and illogical. And that causes problems in government because government can't really absorb what the scientists are saying because they're not scientists. And maybe they shouldn't be, but it would help if there were more scientists in government.

'SCIENCE' CANNOT MAKE POLICY DECISIONS

Thank you Ewan - Joe over to you.

I'd like to catch some of the threads that George and others have put on, but I'd like to go back to first principles about what science is and what science is not.

So I have here in front of me a glass, and science can tell me that if I drop this glass on the floor, there's a certain probability that it'll shatter, that is clear, but what it can't tell me is whether I therefore should or should not drop it on the floor. Maybe I'm frustrated, maybe I'm feeling angry, or maybe this glass is valuable, but whether I drop it on the floor or not has nothing to do with science. Similarly, if I were to say get a malignant tumour, I would expect my medical advisors to tell me everything about my options, and the likelihood of getting better, and the cost, and in terms of the quality of life during and after treatment. But what they can't tell me is what choice I should make because that is mine; I have to balance all these different factors.

So I think one of the things that we need to internalise is that science cannot tell us what to do. It can tell us the consequences of various actions but what to do is not

Fiona Fox
Science Media Centre

Joe Zammit-Lucia

a scientific issue. Science, in the jargon, has no normative content. So science can't create policy, it can be an input for policy.

I was pleased to see Professor Ferguson quoted in some paper yesterday when he was asked whether he thought that Christmas could be saved, and he said “that's not my matter, it's a matter for politicians. That is a political decision.”

And that is quite right. It didn't for some reason stop him making many other policy recommendations in the same interview; maybe he didn't want to be the Grinch of Christmas, but in any case I think the thing we need to internalise is that science cannot tell us what to do, science has no normative content.

And this is true particularly in a policy area where, as George mentioned, so many other things have to be balanced.

But there's another side to this coin which also George hinted at. I was making these points a couple of years back at a meeting in one of the meeting rooms in the House of Commons and one senior politician got up and said, “yeah, I understand that but frankly it's much easier for me to say that I'm following the science, than that I've made a political decision.” So this is a folie à deux, if you like, where we have scientists who wade into the policy space where they don't belong, where they have neither the competence, nor the legitimacy to make policy and to your subject Fiona, we have media who give platforms to scientists to make policy pronouncements. And we have politicians on the other hand who believe that it will be much more credible to the public if they say that they're following the science rather than that they are making difficult policy decisions balancing very many factors, decisions that I don't envy them having to make. And it's out of this mix, I think, that the idea, the untrue and unsustainable idea of following the science emerges.

I'd like to say one more thing to some of Ewan's comments, which is the area of science education. I fear that science education has moved to being far too narrow; that we value people who know more and more about less and less. And we need people like that, we need people who are embedded in their subject. But we also need people who know how their subject fits in the real world, we need people who have a broader education, who understand both the science, or at least have an understanding of the science, but who also understand the other elements that are involved in how the world goes around, the economics, the psychology, the policy, the political issues and I fear that our education system doesn't create these people.

Some people are naturally good at it but we don't have an education system that creates people that can take a broad systems view and can have intelligent conversations with the economists, the bankers, the scientists, and many other people, which is what is needed for policy making. I'll stop there.

LACK OF IMPLEMENTATION OF SCIENTIFIC ADVICE

Fiona Fox
Science Media Centre

Thank you so much Joe, and thank you to our panel. That's such a brilliant way to kick off the discussion. Apologies again, if anyone's just joining, I have lost my voice arguing with scientists, politicians and journalists today so forgive me but I feel very well so I'm going to proceed.

So I'm gonna take some questions now, we've got 25 minutes for questions which is good. You're allowed to make short points if you want, you don't have to just ask a question but we have got a very interesting panel. I just wanted to pull out a couple of things which for me were significant which will probably enrage everyone because for you something else might have been significant but I think Tracey's point is key: about not a lack of science, but a lack of implementation of some of the important scientific advice. And in particular a lack of transparency about why those decisions about implementation were made or were not made. So I'm very interested in what people think about that because I think there is a sense that we need more science, and we need the government to listen to more science and have more scientific advisors and Tracey is saying that isn't the problem.

Joe I think makes a very provocative point to someone like me who spends all day every day putting out scientists' views, that science cannot tell us what we should do and when they start to that's an overreach of science. When they start to suggest what policies government should adopt which many of them do, I acknowledge that.

George, I think made three brilliant points, but I'm very interested in this whole 'health separated from the economy' and on this whole pro-lockdown, or anti-lockdown. Somebody said to me, "I'm furious with the government because they're putting the economy first because they're evil capitalists, versus health." And I think you've rightly pointed out George, somewhere along the way, we've decided that the economy is to make money and health is to save lives and you have to be in one camp or the other, and I think that's been a very problematic part of the debate.

And then finally Ewan's point that we have here a government who are not able to cope with scientific uncertainty, but more strongly, Ewan, what you're saying is they've already demonstrated, this particular government, that they are dismissive of experts, they don't trust experts and they don't like experts telling politicians what they should say. And that has infused their response to this, so while they're saying they're following the science, Ewan certainly clearly doesn't believe them.

So these are some of the points that I've pulled out but there are lots of questions coming through. You may absolutely raise your hands. So I can see hands if they go up and I will take you but I'm going to start with a couple of questions that have come in via the moderator. So the first one is from Alana Cullen, who has asked whether the creation of independent sage has either helped or hindered the transparency and clarity of scientific advice.

Tracey, you made the point that your organisation campaigned in quite a leadership way for more transparency - do you think that independent stage was a positive development?

INDEPENDENT SAGE

I don't think it's a problem. I mean I don't agree with Joe, I actually think it would be nice to have a robust enough public life that people could advance their views or opinions as well as their expertise and we enrich discussion because of it. I think it's really fine for somebody who has been an expert in tracing people with HIV to advance a policy idea that they have about how to approach the question of track and trace and I think that's really fine.

I don't think independent sage was particularly problematic, I liked the idea that they would put this stuff out in public. I think it sort of became a bit of a platform more than anything else. It particularly became a platform for organised criticism of the government and its capacity to influence the government was quite restricted by that perception of it.

But I am absolutely all for more voices and for people having their ideas about how to approach a problem like this. You can't have too many ideas, I just think you need to look at whether government is actually in a position to listen to them and make use of them and that requires a level of expertise within government and doesn't just mean necessarily science. I've always been struck by the question that a former MP Evan Harris used to make of select committees which was "you don't have to be a scientist to ask a critical question you just have to ask a critical question."

Okay thanks, anyone else want to - Ewan you've got your hand up. Can I just say that you don't have to answer every question. There are lots of questions, more coming that you may want to answer.

The only thing I'd like to sort of come back to on Joe's point, is that it is true that science doesn't tell you what to do, but it can certainly say to do this would be better under some measure of better. So for example the science tells us don't smoke right? There's a piece of scientific advice, we're all happy with that and what is actually happening is the scientists are saying 'it would be better if you didn't smoke' or 'it would be better if your population didn't smoke' and then the government does things to encourage that.

And so in a sense, that is science really telling us what to do.

I think just to cover the independent SAGE thing, I don't think that was helpful at all. I mean yes, you can have lots and lots of voices but the more voices you have, the more science looks like one of those dark corners of YouTube or Twitter where people are just disagreeing and sharing stuff.

Tracey Brown
Sense about Science

Fiona Fox
Science Media Centre

Dr Ewan Kirk

I don't think independent SAGE really makes any sense because, to be perfectly honest, SAGE itself should be independent and is.

MANY FACTORS TO CONSIDER WHEN MAKING POLICY

Joe, you've had two sets of criticisms there, do you want to come back?

Very good. Yes, yes I do. So I take the point; science can tell you what to do if you have a very clear simple objective. So if my objective is I want to live longer, or have a greater chance of living longer, then science can tell me don't smoke but that may not be my objective.

People have multiple, varied objectives in their lives and in the area of policy it's even more complicated: there is no very simple, clear objective where the scientists can then tell us 'if that is your only objective or your prime objective then this is what you should be doing.' If life were that clear then it would all be much simpler but it's not like that, there's a lot of balancing of various factors to be done.

The other issue I want to raise a little bit, is a question really. About SAGE and publication of sage advice and transparency. Why are we only talking about this in the scientific context? What is the SAGEs equivalent for the economy? What is the SAGE equivalent for all the other factors that are affected by the pandemic? Why should it be that we have this SAGE, but we don't have transparency or the same kind of setup for all the other parts of the jigsaw that are involved here? So that's just a question, why is it that this is kind of pulled out?

And I'd like to pick up on the point that Tracey made. I agree with her fully that the more voices we have, and the more opinions that are expressed, the better because it makes for better debate. But if you are using your platform and your kudos, if you like, or credibility because of your expertise in one narrow area then to pontificate on something that is outside that, then that is an abuse of power. And that I feel very uncomfortable with.

Okay. So if I do individual questions and ask the panel to come back we're not going to get through many so I've changed my tactic, I'm going to read out two or three and then ask any of you to answer whichever ones you want to because I think we'll get through more.

So we have a question here from Ian Weatherhead who was picking up on George's point about why has there been such a paucity of sharing guidance between countries. So that's one.

Richard Tedder is on the line, he's a clinical virologist and asks why we think this community that spent a lifetime working on infectious diseases were entirely left out of SAGE and says that actually the advice is not that scientific. So that's about a clinical virologist not being represented on SAGE.

Fiona Fox
Science Media Centre

Joe Zammit-Lucia

Fiona Fox
Science Media Centre

And then we have Kevin Langford who is asking about the issue of international comparisons; do we have examples of other countries handling scientific advice better?

And then my final one, which is linked to that actually in terms of how to do it better: Simon Mundy points out that in Scotland John Leech, the national clinical director, goes on the radio in the mornings with the scientific position and then Nichola Sturgeon responds at lunchtime. Is there a better way of managing communication?

That's something that we get lobbied about a lot, why don't we encourage Chris Whitty and Patrick Vallance to do press briefings separately to Boris Johnson and the ministers so that they look like they're giving independent advice. If you don't mind we'll go back to you, sorry Tracey, but keep doing it in that order. Can I ask you to answer any of those that you want to.

WE NEED TO HEAR FROM OTHER SCIENTIFIC DISCIPLINES

I totally agree about the virology and I think also that many virologists are working in environments where they also understand how you implement the knowledge that you've got and that's what I'm getting at, it's not about "what do you do", it's the "how do you do it" that's been missing from a lot of their understanding. And I think the other thing to bear in mind is so if you look at this situation from a virologist perspective, what you've got is unfolding knowledge and there's lots missing. So this isn't so much a problem of the science, the science is there as someone's pointed out in the discussion on the chat. The science is there, there's a lot of experience about both how and also understanding viruses and what different pathways they might take. What was missing was the evidence unfolding as to do we have a sustained immunity after having the virus? Who's transmitting it on what days out of the period of time that we've got the live virus in our bodies and how it's been transmitted?

Those kinds of things needed information. We were missing that information. But what we were also really missing, I think, is pulling in those people who really understand how to use that information when it comes, and virology is a major part of that, but so was engineering; I think engineering was really missing too.

I think two things, Tracey makes a brilliant point about engineering, and we talk about science. I think one of the problems is that in government through this crisis science has come to mean epidemiology, and that's only one of the sciences that we need to be drawing on. We also need to be drawing on engineering we need to be drawing on system dynamics. There's a much broader range of scientific disciplines that could inform or alter political decisions and I think the lack of engineering for example, the lack of drawing on the best science in information

Tracey Brown
Sense about Science

George Freeman MP

technology, we could have had a much better app. So I think we've had rather a narrow definition of science. That's my first point.

Second point about the international comparison somebody asked, the honest answer is I don't know why we haven't had more international comparisons. I know that when ministers are asked, the answer tends to be, 'well different countries collect data in different ways and so you can't compare.'

Now there is a degree of truth about that, it's very easy for the BBC to put up a chart showing Sweden versus Germany versus the UK and actually they're very different data sets, but that's one of the lessons from this is that we need a collective international system for shared and common data sets.

I view this like an earthquake warning, we don't have different data sets for warning about earthquakes, we know what the Richter Scale is and we know everywhere in the world if there's a tremor. And I think one of the legacies of this crisis, because it's not the first pandemic it's about the twelfth in fifteen years, we need to develop a common international system for plant, animal and human health detection and shared data. And actually on the economy, we have this, we have the OBR, the Office for Budget Responsibility, we have the IFS, we have a lot of independent experts putting out information- helpful, important information on the economy.

We have almost nothing really on health that's equivalent and I think that gap has now got to be closed. And that actually is rather exciting. I'd like government to start accounting for health, accounting for disease and accounting annually for how prepared we are, and putting a cost on disease so we can start to properly measure the value of health. And I think what we then see is not 'shall we top up the NHS with a couple of billion when we've got it spare?' We'd see a much more systematic approach to tackling disease, and preventing disease and promoting health.

INTERNATIONAL COMPARISON AND COOPERATION

Okay thank you, do Ewan or Joe want to come back on anything or should I go back out?

No, I'll just say one thing about the international, not necessarily international comparisons, but international cooperation. I mentioned the programme that we stood up at the Isaac Newton Institute; we had sixty participants from twenty five different countries, everyone sharing their epidemiological models, everyone sharing their data. It was incredibly useful and we got a lot of insight into the way other people were thinking about modelling it and I think the scientific community is very good at doing that.

Fiona Fox
Science Media Centre

Dr Ewan Kirk

In regards to finally George's point. In the past as I remember it the CDC in the U.S. was the central clearing house for that data and maybe it could be again with a different president.

Let me make a point if I may about international comparisons but not about data or science, but about communication which is the other point that was raised.

So here in the Netherlands early on in the COVID crisis the prime minister went on television and said to people "look what do you expect from me? I have to make hundred percent of the decisions on fifty percent of the of information because we don't have any, and information that's changing every day and different advice that I get that is conflicting. So my position is we're gonna do our best, we're going to take the advice that comes along, but it's going to involve a lot of judgment, we're going to do our best to make the best judgments, we'll get some things right and we'll get some things wrong."

It seems to me that that is a much more honest position than the chest thumping world-beating everything that was attempted, not very successfully, by the UK government. To be fair the Netherlands doesn't have quite the same adversarial, aggressive political culture that exists in the UK so whether it would have worked for the UK government is a different question. But I think the reality is that this is all surrounded by a lot of uncertainty and certainly I don't feel in a position to second guess what people are doing because I have neither the information nor the expertise across the huge range of areas required.

SCIENTISTS SHOULD NOT BE AFRAID TO SAY 'I DON'T KNOW'

Great thank you. There's a question here from Johnny Rich.

I'm finding the discussion about COVID extremely interesting and thank you to all the panellists but I also want to pick up on Ewan's comments about not enough politicians are scientists or not enough scientists are politicians and should politicians therefore take a more active role in direct decisions about science and engineering research? Through for example ARPA, and will this improve scientific research, will it improve engagement with science or will it just lead to less good "world beating", in inverted commas, research?

Gosh, that sounds like one for you to organise a whole other discussion on Ben but yes, please do.

I'm going to take another question before I ask you to come back on that. Daniella Santos is in the audience. So Daniella is basically just making that point that was made by a couple of you earlier on that communicating that we don't know something shouldn't be a taboo, it should be something we're proud of certainly. At the science media centre we've run eighty different press briefings since COVID

Joe Zammit-Lucia

Fiona Fox
Science Media Centre

Johnny Rich

Fiona Fox
Science Media Centre

and one of the first thing we say to all the scientists is you will get twenty, thirty, forty questions but please feel proud of saying 'we don't know', that's so much better than attempting an answer when we don't yet have the data.

So we're actually, believe it or not, we're getting to being out of time so I'm going to ask our speakers to respond to these questions and sum up and then ask Ben to make some final comments.

SHOULD POLITICIANS HAVE SAY IN SCIENTIFIC RESEARCH FUNDING?

It would be a truly terrible thing if we had politicians or the political advisers directing decisions about research and engineering funding. They are exactly the wrong people to be able to do this because we will end up getting lots of funding for whatever the latest trendy cool thing is like Bitcoin or data science. Data science is great but do we want to put all of our eggs into that particular basket?

The politicians are exactly the right people to decide *how much* we are going to spend on R&D, but they're not the right people to decide how to spend it.

George, I'm tempted to come to you then. Ewan is categorically saying that you have not got any of the credentials to decide how our research funding is spent. Do you take issue?

Well up to a point. So having been a science minister and having had a career in financing science, I'm not a scientist at all. Rather embarrassingly David Cameron used to refer to me as his scientist but I said "no Prime Minister, I read history and philosophy of science at Cambridge, I'm not a scientist."

But I do think it is really important that in the end the priorities about how much we want to spend on science as a country and what the strategic goals we want to try and achieve with science are political decisions. My slight pushback on the danger of letting scientists control it all is that in my experience, there is a danger that the civil servants tend to just keep giving money to the same scientists and you get very, very established chains of spending and it's quite difficult for new labs and new teams to break in. And I think we need some more science, if I might put it that way, in the allocation of money.

Some of our best laboratories in the country have earned the right to get block funding and they shouldn't have to argue for political money, but in areas of emerging science I think it's really important that there's a bit more science applied to how we allocate the money. If you just let the civil servants and scientists do it, my experience is you'll keep giving it to the same old people.

POLITICIANS SHOULD BE TAUGHT HOW TO ASK BETTER QUESTIONS

Dr Ewan Kirk

Fiona Fox
Science Media Centre

George Freeman MP

Fiona Fox
Science Media Centre

Tracey Brown
Sense about Science

Tracey?

Right, I just want to finish by asking what we could say to scientific advisors that they could do better and do differently?

So we've focussed very much on where government's going wrong and all that sort of thing but there are probably lessons, and one of them I would say is help politicians instead of having this kind of tussle about 'you want the answers, we can't provide them', why don't you actually teach politicians how to ask good questions?

And I think that's one of the things that's been really clear in this epidemic, knowing what questions to ask and of whom has been missing a bit from government. I think that government does need to use its civil servants bit better to do that too, but I do think scientific advisors have a role to play in explaining how to ask questions, how to commission the answers you're looking for, and how to drive the information towards you for the kind of policy choices that you think you're making. I don't think there's much know-how in the scientific community about how to do that and I think it's a big task ahead.

One final point from you Joe and then we'll go to Ben.

HOW CAN SCIENTISTS COMMUNICATE SCIENCE BETTER?

Yeah I would just like to react to some of the comments. We've heard it before, there should be more scientists in government and when I speak to business people they say there should be more business people in government, when I speak to bankers they say there should be more bankers in government, when I speak to economists they say there should be more economists in government, when I speak to lawyers there should be more lawyers in government. Everybody thinks that their specialty is special. But the reality is that politics is about being a generalist, it's about being able to take a broad systems view and in my view our education system simply doesn't prepare us for that.

I think Tracey and Joe have made some kind of summing up comments, so I just want to invite Ewan and George to make more general comments and also all of you if we've got a couple of minutes. So is there anything - do you want to leave us happy for the evening? It's very dark outside, it's raining, times are grim; is there anything positive you want to leave us with? I think Tracey was very clear about what the politicians can do to make this better but do you believe that we can get this right in this terrible winter? Can we get this better than it is?

Well I'd just like to say something that maybe we're missing is that scientists are particularly bad at understanding or communicating their science.

Fiona Fox
Science Media Centre

Joe Zammit-Lucia

Fiona Fox
Science Media Centre

Dr Ewan Kirk

I saw that David Spiegelhalter was on the call but I think he's just left. David is fabulous at explaining science and fabulous at explaining the uncertainty and how to communicate difficult concepts, and I think one of the things that scientists could do would be to be educated better at communicating what it is they do. Because it's either this dichotomy between kind of dumbing down the signs so that you don't blind people with all of the science and making it informative enough to give people the gist of it. And that's really quite a hard thing to do and I think scientists could learn science communication better and I think that would help policy.

Thank you.

George, any summing up comments?

WE NEED A CABINET OF MANY TALENTS AND EXPERIENCE

Yeah, two.

One is, I think the point about everybody who wants to see more people like them in government is well made and I think the truth is we do need scientists in parliament but we've got to knock it out in the lords not it out of the commons. But you don't want a whole cabinet of scientists any more than you want a whole cabinet of lawyers or a whole cabinet of bankers.

And I think it is important that in the end elected politicians make the decisions, hopefully of the highest calibre people, who are able to make really difficult judgments based on life experience and democratic accountability to both parliament and the people we serve. In the end I believe strongly is democracy; we've got to make it work.

And second, the last point is we live in an age of incredible science and technology and I think it is really important, I think institutions like the Cambridge centre for science and policy, there are others I know, do brilliant work in helping civil servants as well as politicians to be a bit more aware of emerging science and technology and what it might mean. And we need more of that. But I don't think that necessarily means that we have to have a cabinet of scientists. We need ministers who are able to draw on the widest possible range of advice and expertise.

Right okay, unless any of the speakers have got any final comments, I'm gonna hand back to Ben. And just to thank our panel, whom I think have been excellent. That was fascinating, it feels like an hour well spent to me. My voice held up just about so thank you for putting up with me and thank you for those who asked questions from the audience.

So I'm heading back to you Ben.

Fiona Fox
Science Media Centre

George Freeman MP

Fiona Fox
Science Media Centre

AND FOR THE FUTURE

Ben Rich

First can I say huge thank you to all of the panel for what I thought was a fascinating discussion. As I feared, and was probably inevitable, we only just began to scrape the surface.

Can I say a particular thank you to you Fiona for struggling through against your voice but keeping us very much on track and very focused, and that was very helpful.

It does strike me that we have just started this discussion and inevitably we ended up spending a lot of time discussing the management of communication around COVID and that I think is right.

But it may be that there is a second discussion picking up on Johnny and Ewan's point, particularly that looks forward and says 'so what is the role of politicians in making the most of scientific policy moving forward?'

So that's something we might like to return to, and can I open up that to anyone on this call who would like to be part of that discussion. We have a daily opinion piece on our website: four hundred to seven hundred words long and we welcome submissions to that and if somebody would like to pick up this debate and didn't get the opportunity to perhaps make all the points they wanted to make, then please do get in touch with me via the website and let me know if you would like to put a comment up there - we will be returning to this.

One sort of housekeeping point for some of you this will be your first Radix event and you're very, very welcome. We don't charge for any of our events. If you do want to support Radix, we are supported purely by the individual donations and you can make one via our website. If you want to support sessions and discussions of this kind please look up the donate button in the top right hand corner.

Thank you again to all our speakers, particularly Fiona, thank you for your time and I wish you good night. Other than to say, of course if you want to view this again it's all on our Facebook page.

Thank you, good night everyone.

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