

Wednesday, 11 October 2023

1
2 (10.00 am)
3 **LADY HALLETT:** Ms Cecil.
4 **MS CECIL:** Indeed, my Lady. May I please call
5 Professor Kamlesh Khunti.
6 **PROFESSOR KAMLESH KHUNTI (affirmed)**
7 **Questions from COUNSEL TO THE INQUIRY**
8 **MS CECIL:** Thank you, Professor. You may take your seat.
9 Can I ask you to confirm your full name, please?
10 **A.** Kamlesh Khunti.
11 **Q.** Thank you.
12 Thank you, Professor Khunti, for assisting
13 the Inquiry today. If you can keep your voice up, and
14 we also have a stenographer so we may need to take
15 things slightly more slowly. If I ask you to pause or
16 indeed to stop for a moment, it will be my fault because
17 we're going too fast.
18 Professor Khunti, you have produced a witness
19 statement for the Inquiry, that's dated 14 August 2023,
20 at INQ000252609, and it runs to some 16 pages. Is that
21 correct?
22 **A.** That's correct, yes.
23 **Q.** Thank you.
24 It's prefaced with a declaration of truth at the
25 outset and signed on the final page.

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1 were a participant in SAGE?
2 **A.** That's correct, yes.
3 **Q.** And that ran from 24 September 2020 to 10 February 2022?
4 **A.** That's correct.
5 **Q.** But importantly for the purposes of your evidence today,
6 you were also the chair of the SAGE ethnicity subgroup;
7 is that right?
8 **A.** That's correct, yes.
9 **Q.** That was created on 28 August of 2020, with you as its
10 inaugural chair --
11 **A.** That's correct, yes.
12 **Q.** -- and ran through until 23 March 2021 with you as
13 chair?
14 **A.** That's correct.
15 **Q.** Also with regard to the pandemic you took upon yourself
16 chairmanship of the National Long Covid Research Working
17 Group?
18 **A.** That's correct, yes.
19 **Q.** We will go on to explore how and when that was formed in
20 due course. But for the purposes of today's evidence,
21 there are four primary areas I wish to traverse with
22 you, and that is, firstly, the evolving understanding of
23 the link between ethnicity and outcomes in relation to
24 Covid-19; secondly, Long Covid, and your role in
25 relation to that working group; thirdly, and we will

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1 **A.** That's right.
2 **Q.** Thank you.
3 Professor Khunti, if I can just take you briefly to
4 your professional background, as you set out within your
5 statement, you are a professor of primary care in
6 diabetes and vascular medicine, and the co-director for
7 the Leicester Diabetes Centre, that's based at
8 the University of Leicester; is that right?
9 **A.** That's correct, yes.
10 **Q.** You also occupy other hats and other roles. As we can
11 see, you're also the director of the UK National
12 Institute for Health Research, in applied research
13 collaboration, that's in the East Midlands, and also
14 the director of the Centre for Ethnic Health Research
15 and director of the Real World Evidence Unit?
16 **A.** That's correct.
17 **Q.** You are prolific in your output, in that you've
18 published some -- well, well over 1,200 articles; is
19 that right?
20 **A.** That's correct, yes.
21 **Q.** You have specific expertise in diabetes but also in
22 healthcare disparities and ethnicity?
23 **A.** That's correct, yes.
24 **Q.** Thank you.
25 With respect to the Covid-19 pandemic response, you

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1 take it a little bit more shortly, communications and
2 the need for culturally appropriate communications, and
3 your expertise there; and then, finally, just picking up
4 on data and where the limitations lie.
5 If I may turn to the first topic, and that is
6 the risk, essentially, of Covid-19 for ethnic minorities
7 and its relationship with outcomes.
8 Perhaps so that we can contextualise this from the
9 very beginning, what is the meaning of "ethnicity" in
10 the way that you use it?
11 **A.** Ethnicity is quite a heterogeneous term, it's where
12 people, a group of people or individuals identify
13 themselves being from certain cultures, backgrounds,
14 religions, colour or various other habits. It's a very
15 multidimensional term and, as I've said in my statement,
16 there's no theoretical framework, ethnicity means
17 different things to different people and it means
18 different things at different times to different people
19 as well.
20 **Q.** Indeed, what you do flag within your statement is that
21 that has hampered research to date because of that lack,
22 essentially, of theoretical framework for the meaning of
23 ethnicity?
24 **A.** That's correct, yes.
25 **Q.** Thank you.

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1 A. May I, before we start, just say my sincere condolences
2 to the bereaved families.

3 Q. Of course. Thank you, Professor.

4 Professor, you were one of the first to highlight
5 possible increased risk of Covid-19 in ethnic
6 minorities; is that fair to say?

7 A. That's correct, yes.

8 Q. Indeed, one of the ways that it first came to attention
9 was by use of Twitter and the use of a tweet.

10 If I can just call that up, please, that's
11 INQ000223026. This is a tweet that you put out, as we
12 can see:

13 "Dear all - just had a message from a colleague that
14 they are seeing many young south Asians being admitted
15 with severe #COVID19. Can people share their
16 experiences quickly."

17 Looking here we see it's time marked and stamped,
18 it's at 1.56 pm on 1 April 2020.

19 In relation to that, what prompted you to send that
20 tweet?

21 A. Well, because I do work in ethnic minority health, I had
22 some friends who were working in intensive care units in
23 hospitals, I'm a general practitioner myself, and they
24 phoned me and said, "Kamlesh, we're seeing a lot of
25 ethnic minorities at a young age being admitted to

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1 pathways. You also used the word "artefact".

2 A. Yes.

3 Q. Put in very simple layman's terms, is that the situation
4 where, albeit it might look as though something is
5 causative, it's actually not?

6 A. Absolutely, yes.

7 Q. You followed that tweet up with a further tweet on
8 4 April, a few days later, and in this tweet you
9 highlighted some research from the Intensive Care
10 National Audit and Research Centre; is that right?

11 A. That's correct, yes.

12 Basically this showed for the first time that there
13 were about 30% to 35% of people being admitted into
14 the intensive care unit who were from ethnic minority
15 backgrounds. The population statistics suggest it's
16 about 16%, so it's double the number of people who were
17 being admitted to intensive care unit.

18 Q. So some of the first data you were seeing was showing
19 a disproportionate level of hospital admissions --

20 A. Absolutely.

21 Q. -- and into intensive care units?

22 A. That's correct, yes.

23 Q. Thank you.

24 What did you do as a consequence of this?

25 A. So I've -- spoke to a number of colleagues. I spoke to

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1 intensive care units with Covid". Prior to that we
2 hadn't heard about this, because most of the Covid had
3 happened in heterogeneous populations, China, Italy,
4 et cetera, so this is the first time that we'd heard
5 about this signal. So that's why I put this out, to
6 say: is anyone aware of this? And I did have a lot of
7 trolls who came back to say that I shouldn't be
8 panicking people about this, yeah.

9 Q. Twitter is not always the kindest of places.

10 A. No.

11 Q. Can I just pick up on word that you used there, and it's
12 the use of the word "signal". Can you just assist us,
13 what does that mean?

14 A. Signal is something that we may see that we need to be
15 aware of being alert about. That means for the first
16 time we've seen this alert, we don't know whether this
17 is true or not, whether there's an artefact, it's
18 because of the populations that are being admitted to
19 certain areas -- because it happened more in London and
20 the West Midlands initially, there were more people
21 being admitted, and there's obviously a lot more ethnic
22 minorities in London and West Midlands. So we just have
23 to be careful and not say this is a direct causal
24 pathway.

25 Q. So signals are effectively about potential causal

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1 people who are working in the ethnicity area, members of
2 the South Asian Health Foundation, and then I spoke to
3 Professor Sir Nilesh Samani, who is based in Leicester,
4 who I know very well, and we discussed this, and we
5 thought this was something worth alerting the CMO about.

6 Q. Indeed, just to pause you there, later that day you
7 did -- both of you in fact, copied in to the same email,
8 contacted Sir Chris Whitty.

9 A. That's correct, yes.

10 LADY HALLETT: Sorry, I missed the date, Ms Cecil.

11 MS CECIL: 4 April.

12 LADY HALLETT: 4 April, thank you.

13 MS CECIL: Indeed, if we can bring that up, please,
14 INQ000223048.

15 We see a copy of the email. Of course we start at
16 the bottom --

17 A. Yes.

18 Q. -- in terms of the email train, we see firstly an email
19 from Professor Samani, copying you in, explaining that
20 his attention has been brought to the ICNARC audit
21 report, and then that that may require further
22 exploration, and that you and your team, and indeed his
23 team, who have interest and experience in that, would be
24 very happy to help if needed.

25 You then follow that up, and we see that at the top,

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1 and we see your email here. In the second sentence you
 2 explain that:
 3 "In particular recent systemic review data show that
 4 the multimorbidities with the worst outcomes seem to be
 5 cardiovascular disease, diabetes and hypertension and
 6 surprisingly not COPD."
 7 What's COPD?
 8 A. Chronic obstructive pulmonary disease, so it's a chronic
 9 lung condition.
 10 Q. Why was that a surprise?
 11 A. Because when the virus first came round we thought it
 12 was a respiratory virus, like the flu virus, it affects
 13 more people who have respiratory diseases, asthma, COPD.
 14 It did affect people with COPD, but we were surprised
 15 that a lot more people with diabetes and cardiovascular
 16 disease were affected with this.
 17 Q. As we've heard and indeed we'll deal with slightly
 18 later, those diseases are particularly prevalent or
 19 disproportionately so in certain ethnic minority
 20 populations?
 21 A. That's correct, yes.
 22 Q. You go on there to explain about anecdotal reports and
 23 then data, and you explain further there may be many
 24 reasons for that, and you flag socioeconomic, cultural
 25 or pathophysiological?

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1 A. That's right.
 2 Q. At that stage it wasn't clear whether it was an artefact
 3 of geography or a true signal?
 4 A. Absolutely, yes.
 5 Q. Thank you.
 6 Now, following on from that, you wrote the first
 7 editorial on the topic; is that right?
 8 A. That's correct, yes.
 9 Q. It was published in the British Medical Journal?
 10 A. That's correct.
 11 Q. Raising the question: "*Is ethnicity linked to incidence*
 12 *or outcomes of covid-19?*"
 13 You urged, at that stage, the UK to explore
 14 the potential signal urgently and that there was a need
 15 for effectively greater research looking at
 16 the potential causative links --
 17 A. That's correct.
 18 Q. -- pathways.
 19 You particularly flagged concerns being raised
 20 because the first ten doctors in the UK to die from
 21 Covid-19 were from ethnic minorities; is that right?
 22 A. That's correct. That did raise eyebrows when we saw
 23 that in the news on a regular basis, yes.
 24 Q. Then, of course, you also had the data that we've
 25 already referred to?

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1 A. That's correct.
 2 Q. You got a response from Sir Professor Whitty, didn't
 3 you? That response was received on 5 April. He
 4 explains that the "issue is (rightly) rising up the
 5 agenda". With regard to the signal that you mentioned
 6 as being possible, he considered that it was sufficient
 7 to be looked at by groups with expertise, and he also
 8 flags the work that is ongoing from PHE, ICU data and
 9 Biobank, various other pieces of research that are being
 10 undertaken, and he explains that he "will put out
 11 a themed NIHR call". What is that?
 12 A. So this is National Institute for Health and Care
 13 Research, it's the main funding body for applied
 14 research, and basic science research as well. And I was
 15 really surprised because he took action very, very
 16 quickly, the following day, so really admirable that he
 17 did this, that there were some actionable points that he
 18 came up with immediately, and a call did come out for
 19 doing further research in this area.
 20 Q. Indeed. And certainly there is some correspondence
 21 further down that also relates to -- the email that we
 22 have here actually is the last email in the chain, so
 23 slightly later in time, but there were emails from
 24 Professor Sir Chris Whitty in relation to it being
 25 an important point?

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1 A. That's correct, yes.
 2 Q. The Office for National Statistics we've heard a little
 3 bit from already in relation to ethnicity, but they
 4 published in May of 2020 their first article or report
 5 in relation to deaths by ethnic group; is that right?
 6 A. That's correct.
 7 Q. That's a document that you're familiar with?
 8 A. Yes.
 9 Q. Indeed we've heard already from Professor Sir
 10 Ian Diamond that you have been in contact with him and
 11 worked with him at various stages; is that right?
 12 A. That's correct, yes.
 13 Q. In relation to that article and the statistics that were
 14 produced, the provisional analysis showed the risk of
 15 death involving Covid-19 among some ethnic groups was
 16 significantly higher than that within the white
 17 ethnicity population?
 18 A. That's correct.
 19 Q. When taking into account age in that analysis -- so this
 20 is right at the beginning of the pandemic, what was
 21 known as at May of 2020 -- black males were 4.2 times
 22 more likely to die from a Covid-19-related death and
 23 black females 4.3 times more likely than white ethnicity
 24 males and females?
 25 A. That's correct, yes.

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1 Q. At that point it was also noted, and this will become
2 relevant for later in terms of the progression of
3 the pandemic, that people of Bangladeshi and Pakistani
4 Indian and mixed ethnicities also had a statistically
5 significant higher -- raised risk of death, but that
6 those risk factors or the extent of
7 the disproportionality dropped once one had taken into
8 account age but also other sociodemographic
9 characteristics, including self-reported health and
10 disability, and this relied on collation of data
11 including the 2011 census?

12 A. That's correct, yes.

13 Q. That reduced, then, to males and females of black
14 ethnicity being 1.9 times more likely than those of
15 white ethnicity and Bangladeshi and Pakistani ethnic
16 minority men being 1.8 times more likely to have
17 a Covid-19-related death.

18 So at this point in terms of the ONS statistics, is
19 it right to say that it was already flagging up issues
20 in relation to comorbidities that existed within ethnic
21 minority populations and geographic issues, but that
22 the disparity simply could not be explained by those?

23 A. That's right. So basically it was 4 times the risk, and
24 once you take into account the deprivation, the previous
25 health, comorbidities, it reduces risk by 50%. So 50%

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1 A. That's correct, yes, it did, yes.

2 Q. And that consequently resulted in a fuller report being
3 published?

4 A. Yes.

5 Q. You analysed that report; is that right?

6 A. That's right, yes. We didn't peer review it, it -- once
7 it was published we and many others looked at it to see
8 the content and the depth of the report.

9 Q. Indeed. In relation to that, were issues flagged in
10 relation to structural racism and discrimination?

11 A. That's right.

12 Q. As a link?

13 A. That's correct, yes.

14 Q. And socioeconomic circumstance?

15 A. That's correct, yes.

16 Q. Now, given the link between or potential link between
17 structural racism and discrimination and those poor
18 health outcomes, as noted in that PHE report, are you
19 aware of any other work that looked at those issues?

20 A. There's been a number of studies. The issue with
21 structural discrimination and discrimination is how you
22 measure it. It's very, very difficult to measure. So
23 qualitative interviews where people are asked about it
24 will -- you can get a lot of information from.

25 There's a systemic review that's been done about

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1 was accounted for by those factors.

2 Q. That was followed thereafter in June, again dealing with
3 what was known at the outset as the pandemic progressed,
4 by the first of the Public Health England reports?

5 A. That's correct.

6 Q. In relation to that PHE report, certainly there were
7 concerns initially that a truncated report had been
8 published; is that right?

9 A. This is from a BMJ article written by
10 Professor Raj Bhopal, because he had peer reviewed the
11 article, and we wrote in the BMJ stating that he had
12 seen a fuller report and he felt that it was his duty to
13 inform the public that there were bits of the report
14 missing.

15 Q. What bits of the report were missing?

16 A. From what we understand, it was the recommendations that
17 may have been missing.

18 Q. Recommendations. Were there also aspects of stakeholder
19 engagement that were missing?

20 A. The stakeholder was -- I think, from my recollection, is
21 the second report.

22 Q. Second report?

23 A. That's right, yes.

24 Q. That caused a considerable degree of controversy; is
25 that fair to say?

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1 the disproportionate outcomes in people from ethnic
2 minority backgrounds, and that identified I think just
3 a few papers that had talked about discrimination, and
4 again they highlight that it's very difficult to
5 measure.

6 But from the qualitative evidence we have from
7 the British Medical Association, from the nurses
8 associations, there may have been some elements of
9 structural discrimination, for example getting PPE given
10 to -- from the -- healthcare workers particularly from
11 ethnic minorities.

12 Q. And we've heard earlier evidence that ethnic minorities
13 are overrepresented within the healthcare workforce?

14 A. That's right, about 20% of the healthcare workforce, or
15 1.2 to 1.5 million people within the National Health
16 Service, are from ethnic minority backgrounds, yes.

17 Q. Thank you.

18 In relation to that PHE report you wrote of some of
19 the limitations, as you saw it, of those reports. The
20 first aspect is that albeit that they were welcome,
21 because they did shine a light, it was nonetheless
22 a missed opportunity to address significant inequalities
23 in ethnic minority communities. How did you see it as
24 a missed opportunity?

25 A. Well, first of all, the report is very comprehensive and

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1 it was very laudable, the amount of work they did,
 2 you know, speaking to 4,000 individuals, speaking to
 3 a number of stakeholders, so it's a vast amount of work
 4 they'd done. The reason we thought it was a missed
 5 opportunity, because they did have I think six
 6 recommendations, is that they didn't have
 7 the recommendations, although they'd identified them, of
 8 the wider source of determinants.

9 So, first of all, how to protect these populations,
 10 and the wider social determinants of how to ensure that
 11 housing is adequate, it's not overcrowded housing,
 12 the occupations that people were at higher risk, they
 13 weren't protected, the educational elements,
 14 communication, how it was to be done, who was going to
 15 do it. All of that wasn't there in huge detail.

16 Although they'd identified all the drivers, the
 17 recommendations or drivers -- the detailed
 18 recommendations on drivers were missing.

19 **Q.** Were missing. And there were significant gaps in your
 20 view; is that right?

21 **A.** That's correct, yes.

22 **Q.** Now, picking up in June of 2020, which is of course when
 23 the PHE reports -- well, first report -- was released,
 24 you're aware that ethnicity was discussed at one of
 25 the SAGE meetings in June, it was SAGE 40, the 40th

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1 speak to me and we had a Zoom or an MS Teams meeting,
 2 and that's when Sir Patrick Vallance came along with
 3 the GO-Science team and mentioned to me that they'd seen
 4 the signal and they were asking me if I would be willing
 5 to chair this subgroup.

6 **Q.** You cannot assist us with why that subgroup was not
 7 formed earlier; is that right?

8 **A.** I think that people were trying to find evidence for
 9 this, and, as you say, we need validation from various
 10 datasets, so ONS signal was the first lot, then the PHE
 11 data came out. I mean, if you look at the PHE data,
 12 you know -- we may be talking about data later, but
 13 the Public Health England report, they didn't have
 14 anything on occupation, they didn't have data on
 15 occupation, so we don't know whether that would have
 16 reduced(?) the risk. So until then I think they
 17 weren't -- the data weren't as robust. And following
 18 the Public Health England report, I think they decided
 19 they needed a chair for the Ethnicity Subgroup.

20 **Q.** So you took on that role?

21 **A.** That's correct, yes.

22 **Q.** And that subcommittee reported directly to SAGE?

23 **A.** That's correct, yes.

24 **Q.** In terms of the issues to be focused on, they were, as
 25 one would expect, a focus on ethnicity, and some of the

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1 meeting on 4 June?

2 **A.** That's correct, yes.

3 **Q.** And at that point it was accepted within that meeting
 4 that the evidence suggested a significantly higher
 5 likelihood of, firstly, testing positive, secondly,
 6 admission to critical care, and thirdly, the prospects
 7 of death for ethnic minorities?

8 **A.** That's correct, yes.

9 **Q.** In particular, that related to black and South Asian
 10 groups?

11 **A.** That's correct, yes.

12 **Q.** At that point, as you've already identified, the risk
 13 factors or the causative links were assessed as being
 14 due to a complex interconnected range of factors,
 15 including socioeconomic deprivation, involvement in high
 16 risk occupations, geography, household size and
 17 comorbidities. Did that chime with what you were
 18 seeing?

19 **A.** Exactly, and that's exactly what the initial report by
 20 ONS and the Public Health England report also shone
 21 a light to as well.

22 **Q.** As said at the outset, you went on to become the chair
 23 of the SAGE Ethnicity Subgroup. That was set up on
 24 5 August. How did that come about?

25 **A.** So I had an email from GO-Science that they wanted to

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1 broader social determinants --

2 **A.** That's correct.

3 **Q.** -- in relation to ethnicity.

4 In terms of the advice to be provided, was it a case
 5 of it being commissioned from you, or was it advice that
 6 you provided on a freestanding basis?

7 **A.** It was advice on a freestanding basis, completely, yes.

8 **Q.** The meetings were not officially minuted; is that right?

9 **A.** We did have minutes of the meetings, for all
 10 the meetings.

11 **Q.** Sorry, I should be clearer in my question. There was no
 12 formal requirement for those meetings to be minuted,
 13 albeit that high-level minutes were taken?

14 **A.** That's correct, yes.

15 **Q.** Indeed the Inquiry has access to those, so I don't
 16 propose to take us through any of those today.

17 In relation to foreseeability of impact on ethnicity
 18 minorities, minority groups and potential disparities,
 19 you've explained that initially it was seen as
 20 a respiratory virus and therefore perhaps those issues
 21 weren't considered in the same way they might have been
 22 had it been seen as actually what it was.

23 But was it foreseeable that there would be
 24 a disproportionate impact on ethnic minorities?

25 **A.** Potentially. I think that, looking back on it,

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1 potential we could have thought about it because of
 2 the pre-pandemic disparities, and I think they have been
 3 discussed previously at the Inquiry, among ethnic
 4 minority groups, particularly in terms of deprivation,
 5 health, housing, schooling, et cetera.
 6 **Q.** Moving to the autumn period briefly, you had some level
 7 of involvement with the minister who was placed in
 8 charge of considering the issues of ethnicity, that's
 9 the Right Honourable Kemi Badenoch MP?
 10 **A.** That's correct.
 11 **Q.** What involvement did you have, firstly, with her?
 12 **A.** I think there were two meetings that I seem to have
 13 found. The Cabinet Office contacted me that
 14 the Right Honourable Kemi Badenoch wanted to speak to
 15 me, and this was in October and another one in December.
 16 The October one was a general discussion of what
 17 the SAGE group were doing. I don't have any firm
 18 recollection, but it was -- would have been a high-level
 19 discussion of what SAGE is looking at. I think
 20 the 16 December one was a teaching session that we did
 21 for cross-governmental departments.
 22 **Q.** And I understand you did two teaching sessions?
 23 **A.** That's correct, one was on the drivers of risk and one
 24 was on housing -- no, sorry, vaccinations and housing.
 25 **Q.** Kemi Badenoch's team went on to produce four quarterly

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1 housing, instability, socioeconomic status,
 2 comorbidities and the other --
 3 **A.** Occupations, yeah.
 4 **Q.** Did you and the SAGE Ethnicity Subgroup have regard to
 5 those factors in advising on policy in response?
 6 **A.** We had a paper that was quite a comprehensive paper, it
 7 was on drivers of the increased risk among ethnic
 8 minority groups, yes.
 9 **Q.** Indeed, perhaps we can take you to that now. It's at
 10 INQ000273842.
 11 I'm going to deal with it briefly, if I may, whilst
 12 just perhaps prefacing it before it's brought up on the
 13 screen.
 14 It's a very lengthy report. It sets out in detail
 15 where you and the Ethnicity Subgroup see the drivers as
 16 being.
 17 Perhaps if we could just go to page 110, please.
 18 It's appendix 7. This is the paper.
 19 In relation to that -- I'm very sorry, I thought it
 20 was at page 110.

(Pause)

22 Go to page 114, please. There is a very useful
 23 visual aid.
 24 **A.** 113.
 25 **Q.** 113, please.

23

1 reports to the Prime Minister between June 2020 and
 2 December 2021?
 3 **A.** That's correct.
 4 **Q.** Did you or the Ethnicity Subgroup contribute to any of
 5 those reports?
 6 **A.** We were asked to review them and we had to review them
 7 at pace. We did give some comments on them. I was
 8 asked by one of the officers to see if I would give
 9 a quote to the report, but thinking it through the SAGE
 10 committee, we felt that was inappropriate because SAGE
 11 was an independent research and science body.
 12 **Q.** So was the view to keep that separate, effectively, the
 13 SAGE workings and those individuals, and then
 14 government --
 15 **A.** That's correct.
 16 **Q.** -- produced reports?
 17 **A.** Because they already had advisers who were acknowledging
 18 and supporting the report.
 19 **Q.** And the work that had been done in relation to those
 20 quarterly reports had been done by the Equalities team,
 21 as opposed to the Ethnicity Subgroup that you chaired?
 22 **A.** That's correct, yes.
 23 **Q.** Thank you.

24 So by September of 2020, aspects in relation to
 25 causative links were known in relation to occupation,

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1 **A.** Yes.
 2 **Q.** To 113.
 3 There is a very useful visual aid that sets out
 4 the subgroup's workings. It builds on a paper that's
 5 been adapted by another academic in relation to these
 6 issues; is that right?
 7 **A.** That's correct, yes.
 8 **Q.** I'm afraid it's a little difficult to see on the screen
 9 because of the size of the fonts.
 10 If I can just take you to what is seen as number 1,
 11 effectively what we see is a diagram, at the top it
 12 explains "Shaped by structural racism and other power
 13 structures"; is that the context in which this is
 14 placed?
 15 **A.** That's right, yeah.
 16 **Q.** Then what we see is a green box that deals with
 17 dimensions of ethnicity.
 18 A line to that to the left, we see the differential
 19 exposure and vulnerability and the drivers, and I'm
 20 going to come to that in a moment, and then the output
 21 to the far left. Is that right?
 22 **A.** That's correct, yes.
 23 **Q.** So, taking each one of those briefly in turn, we have
 24 pathway 1, it's the second white box down from the top,
 25 and the first issue in relation to understanding

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1 ethnicity is differential exposure.
 2 What are the issues that arise there in relation to
 3 certain ethnic minority groups?
 4 **A.** So this is what we've just been talking about in terms
 5 of the risk of a higher exposure among ethnic minority
 6 populations, so this is things like occupations, they
 7 are more likely to work in occupations that are in
 8 direct contact patient-facing roles and in low-paid
 9 occupations. Housing, living in high-density housing,
 10 so small houses with a large number of occupants, living
 11 in multigenerational houses, which is where we state
 12 that there's three or more generations living together.
 13 There's also people who are at -- have poor health, so
 14 they may have other health conditions, as we've talked
 15 about, diabetes, cardiovascular disease, et cetera. So
 16 these are all the issues that may put them at higher
 17 exposure.
 18 **Q.** First --
 19 **A.** And healthcare workers is obviously another one.
 20 **Q.** So this is the first aspect, is exposure to the virus,
 21 so there is a potentially disproportionate level of
 22 exposure for ethnic minority individuals because of
 23 those factors. That then may or may not result -- as we
 24 see, if we take it across, and then go down, may or may
 25 not result in Covid infection.

25

1 **Q.** Just dealing with the disease consequence in and of
 2 itself at the moment in terms of the health outcome,
 3 what you identify here are issues such as comorbidity
 4 and then access to healthcare --
 5 **A.** Yes.
 6 **Q.** -- quality of healthcare?
 7 **A.** Yeah. And the access to healthcare may be a driver from
 8 the right side of the dimension, this is about language
 9 and culture and not identifying the disease, not
 10 properly being able to express the disease, not being
 11 aware of the disease and the consequences.
 12 So all of those on the right-hand side also are
 13 drivers across all the pathway, yeah.
 14 **Q.** Indeed. Then what we see there is the potential
 15 enhanced risk then of mortality, of death essentially,
 16 that flows through that particular driver.
 17 Then, as we continue down, the differential social
 18 consequences in relation to follow-on impacts from that
 19 disease?
 20 **A.** That's correct, yes.
 21 **Q.** Thank you.
 22 You do also touch upon, within this, differential
 23 consequences of control measures. I'm not going to go
 24 into that with any detail with you today, we'll talk
 25 a little bit about communications later.

27

1 That then goes into driver 2, which is differential
 2 susceptibility to infection.
 3 In summary, is it the case that minority ethnic
 4 groups may be at greater risk, in your view, of
 5 infection because of differences in immune response,
 6 nutritional status and other --
 7 **A.** Other conditions, and obesity is another big risk factor
 8 for ethnic minority populations as well, yes.
 9 **Q.** We've heard a little bit about obesity already in that
 10 respect.
 11 **A.** Yeah.
 12 **Q.** We then see that once one has the infection, there is
 13 then potentially a differential vulnerability to
 14 the disease; is that right?
 15 **A.** That's right, yes. Some of these overlap --
 16 **Q.** Indeed.
 17 **A.** -- as well, as you can see. So this could be because
 18 they have higher stress levels, they may be living in
 19 areas that have poor air quality, et cetera.
 20 **Q.** Okay. That results then in the differential
 21 consequences of the disease, of an infection of
 22 Covid-19; is that right?
 23 **A.** Yeah, so basically, here, if they become ill they have
 24 more disability, there's job losses, poorer health,
 25 perpetuating this cycle of worse outcomes for them, yes.

26

1 But, in short, those are the identified pathways by
 2 the Ethnicity Subgroup; is that right?
 3 **A.** Yeah. I mean, this is a theoretical framework that we
 4 put the pathways through, yes.
 5 **Q.** Just drilling down very briefly and flagging them up.
 6 You've already dealt with occupation. Household
 7 circumstance, that became very important, is that right,
 8 when it comes to looking at subsequent issues in
 9 relation to the second wave?
 10 **A.** That's right. So there was a separate paper that we
 11 did, as I said, the Ethnicity Subgroup, and here we
 12 wanted to validate the data about multigenerational
 13 households. And I think we must have had -- we had the
 14 best data in the world, and we had five database studies
 15 that all concurred to the same conclusion, that
 16 multigenerational households, people with three or more
 17 occupants, was associated with worse infection, worse
 18 disease and worse mortality.
 19 **Q.** Perhaps if I can just pick up on that, then, in relation
 20 to the first wave and the second wave. In the first
 21 wave all ethnic minority groups were at that elevated
 22 risk, particularly acute within black populations; is
 23 that right?
 24 **A.** That's right, yes.
 25 **Q.** But that changed when it came to the second wave, where

28

1 one saw a decrease in relation to mortality, deaths, for
 2 black ethnic minority populations but a greater
 3 disproportionate effect in relation to Bangladeshi and
 4 Pakistani, South Asian groups; is that right?
 5 A. That's correct. So overall, once -- so basically it
 6 showed that lockdown worked. For nearly -- most of the
 7 ethnic groups, including the white group, you saw
 8 a reduction in infection and mortality. But there was
 9 a higher risk in Bangladeshi and Pakistanis, and we
 10 looked at what the drivers were -- and this is using the
 11 ONS data -- and the drivers were likely to be what we've
 12 already said, the occupations that ethnic minorities are
 13 in, the housing density --
 14 Q. If I can pause you for one moment, when you say
 15 occupations, what types of work?
 16 A. So occupation is people-facing roles, taxi drivers,
 17 restaurants, healthcare workers, et cetera. And people
 18 who were on zero-hours contracts, so they weren't able
 19 to get time out, and so potentially they weren't
 20 reporting their symptoms.
 21 Q. Just picking up on the people with zero-hours contracts,
 22 in terms of financial stability, did you see that as
 23 having any role?
 24 A. That was one of the reasons that we put forward, that
 25 that would have definitely been one of the reasons, and

29

1 the most deprived population out of deprivation,
 2 including ethnic minorities, we near enough eliminate
 3 the risk that we've seen. So a lot of this we feel is
 4 due to the social determinants.
 5 Q. Just picking up on deprivation and the use of the
 6 2011 census, because of course that informs the ONS
 7 statistics --
 8 A. That's right.
 9 Q. -- it's your view, is that right, that as a consequence
 10 of that, socioeconomic circumstance and deprivation is
 11 likely to be under-reported in relation to the role that
 12 it plays, because of changes since 2011?
 13 A. That's correct. So now we have the 2021 surveys that --
 14 they would be better placed. We've also seen in
 15 the surveys that the proportion of ethnic minorities has
 16 increased in England. In terms of whether they're in
 17 more deprived areas I'm not aware of, but it's likely
 18 health(?) changes, yes.
 19 Q. Thank you.
 20 One final aspect, and that relates to biological
 21 factors. When you refer to biological factors, what you
 22 are referring to are comorbidities such as diabetes and
 23 other forms of disease; is that right?
 24 A. That's correct, diabetes, cardiovascular disease,
 25 obesity. There's some possibility of associations with

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1 some of the qualitative interviews have previously shown
 2 that as well.
 3 Q. I think one of the recommendations that you made at that
 4 point was for the provision of proper statutory pay
 5 for --
 6 A. Absolutely, yes.
 7 Q. Sick pay?
 8 A. And similarly we made recommendations on housing, that
 9 if people are in multigenerational housing there should
 10 be provision made of housing given for isolation if one
 11 member of the house was infected.
 12 Q. Thank you.
 13 Then just to pick up on one final aspect in relation
 14 to the drivers, can I just be clear with you in relation
 15 to genetic considerations. Do you consider it likely
 16 that genetics play a role?
 17 A. Well, most of the data shows that there are some, what
 18 we call SNPs, genetic signals, but there is no
 19 conclusive evidence to show that this is driven by
 20 genetics. It does seem to be driven mainly by the
 21 social determinants.
 22 And we've done some additional work subsequently
 23 showing that if we take 25% of the most deprived
 24 populations out of deprivation, we halve the risk of
 25 Covid infections and mortality. If we take 50% of

30

1 psychological aspects as well.
 2 Q. Indeed. And that's why I just wanted to be very clear
 3 about that, that's what you mean by biological --
 4 A. Yes.
 5 Q. -- it's not genetic, it's those comorbidities?
 6 A. That's correct, yes.
 7 Q. Thank you.
 8 Now, if I may pick up, then, on what that meant for
 9 the Covid-19 response, in terms of the government's
 10 response, do you consider that it was successful in
 11 addressing those disparities or could things, other
 12 things, have been done?
 13 A. So the four quarter reports mention a number of areas
 14 that the government addressed the disparities, this is
 15 the Race Disparity Unit four quarterly reports. There
 16 are a number of things that could be done. In terms of
 17 the detail, again, in some of them is lacking. There's
 18 data on pilot areas that were funded to do evaluations
 19 of what worked, what didn't work. Mention about
 20 communications on -- for ethnic minority populations.
 21 And again they mention a number of things that were
 22 done. But to me there were other ways that this could
 23 have been done. We have the best data systems in
 24 the world, and we're the envy of the world with the data
 25 we have. What we needed was real-time data, real-time

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1 data on people being affected in different areas,
2 because we always say local is best, we could have acted
3 on this locally. Leicester local public health did
4 a tremendous effort but they were lacking in data. So
5 if we had data given to us in real time about where
6 the highest risks are, we could have worked with our
7 community champions within those areas, our community
8 leaders in those areas, the pharmacists, the GPs, as we
9 did in Leicester, to reduce that risk.

10 Similarly, the test, trace, isolation programme,
11 again we didn't have any data coming to us to say where
12 is -- are the bottlenecks, which areas are working well,
13 which are not working well. And again, if this data
14 came on a regular basis, in real time, the local public
15 health messaging could have been done.

16 In the reports, you know, there are mentions about
17 the culturally-adapted information that was given out
18 there. Now, giving out a culturally-adapted leaflet
19 doesn't mean that that's going to have a major effect.
20 You need to do a lot more than that. You need to work
21 with that community. And there are discussions about
22 the community champions programmes that were funded, but
23 again we're not sure how these were funded, which areas
24 were funded.

25 And the key one is the evaluations. You know,

33

1 **LADY HALLETT:** -- who had the data that you needed?

2 **A.** I'm not sure if the government had the data. If that
3 was one of the asks, I'm sure Sir Ian Diamond would have
4 provided that data, which he's done for a number of
5 things. As I say, ONS have done an absolute sterling
6 job in getting data to us quickly.

7 **LADY HALLETT:** It's just that you began this passage in
8 relation to saying we have one of the best data systems
9 in the world, so I assumed by that you meant that we
10 were collecting the data but --

11 **A.** It wasn't coming to us, that's right.

12 **LADY HALLETT:** So it wasn't being shared with you?

13 **A.** That's right.

14 **LADY HALLETT:** But you don't know where it was?

15 **A.** No.

16 **LADY HALLETT:** Right.

17 **MS CECIL:** Thank you, I was going to pick up on that myself,
18 so that's --

19 **LADY HALLETT:** Oh, sorry.

20 **MS CECIL:** No, not at all, that's helpful.

21 And you've explained about the need for real-time
22 data and that gap and lacuna there.

23 One of the other aspects that you just touched upon,
24 and perhaps we'll go there next, in fact, because you
25 have explained the need already for culturally-sensitive

35

1 40 million, over £40 million was given out. These are
2 the kinds of things that we should be evaluating
3 robustly, because we have the data. If you put an
4 intervention in Leicester and don't put it in Blackburn,
5 I can tell within a short period of time with the data
6 that we have whether that intervention's worked or not.

7 **Q.** Thank you. So is that one of your primary concerns, is
8 working out what happened, effectively, with those
9 community champions, grants and research projects and
10 that data?

11 **A.** There are soft evaluations that have been done for one
12 of them, but others we're not aware of what the findings
13 are and how we can implement them. For example, we
14 should be implementing them now. Covid is still here,
15 we're seeing an increased risk, but we're not hearing
16 anything about those messages.

17 And when I say regarding the communication and
18 language, Leicester has over 80 languages, London has
19 over 300 languages, what we need to do is the local
20 people will know the best about what their needs are,
21 and it really needs to be localised in terms of
22 the response.

23 **Q.** Thank you.

24 **LADY HALLETT:** Can I just ask -- I'm sorry to interrupt --

25 **MS CECIL:** Of course, not at all.

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1 and appropriate government communications, is to pick up
2 on communications.

3 You were involved with the Centre for Ethnic Health
4 Research; is that right?

5 **A.** That's correct, yes.

6 **Q.** You made various recommendations and infographics in
7 relation to culturally-sensitive and adapted
8 communications.

9 If I could ask that that be called up, please, it's
10 INQ000223040, and if we can go firstly to page 27 and
11 then move to look at 28 and 29.

12 Just while it's coming up, the first page, here we
13 are, this is your recommendation as to how to engage and
14 involve ethnic minority communities; is that right?

15 **A.** That's correct. Yes, this is from the Centre for Ethnic
16 Health Research and the South Asian Health Foundation.

17 **Q.** What we see here is, at the very top: use of
18 culturally-tailored messaging, different languages and
19 formats, some aspects in relation to vaccine hesitancy
20 and, perhaps more generally and of general application,
21 the use of community and faith centres as part of that
22 response?

23 **A.** That's correct, yes.

24 **Q.** Perhaps one of the starkest things here is actually the
25 picture that's in the centre of the page, because

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1 of course that reflects different ethnic minorities,
 2 clearly. Would that be correct?
 3 **A.** That's correct, yes.
 4 **Q.** Presumably that's the purpose of it.
 5 But we also see, in advice to government,
 6 professionals, policymakers and scientists, the use of
 7 interpreters, accurate ethnicity coding, you address
 8 PPE, all of those sorts of issues.
 9 If we go over the page to page 27, what we then see
 10 is an infographic that's been designed for ethnic
 11 minority communities specifically; is that right?
 12 **A.** That's correct.
 13 **Q.** Building on, effectively, the infographic we saw
 14 previously.
 15 **A.** That's correct, yes.
 16 **Q.** So, again, representative pictorial descriptions in
 17 the middle, and then very clear pictures as to what to
 18 do:
 19 "Stay at home and away from others if ill."
 20 In the top left-hand corner.
 21 "Get tested ..."
 22 A picture of somebody with a test.
 23 Vaccine, speak to your GP, take part in research
 24 studies.
 25 So what you have is something that is, at the very

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1 **A.** That's absolutely -- yes, it is.
 2 **Q.** In relation to targeting, there are concerns that
 3 tailored public health messaging aimed at very specific
 4 subgroups of the population can result in greater
 5 stigmatisation, racialisation and those sorts of issues;
 6 is that right?
 7 **A.** If you pick on one minority ethnic group and -- whether
 8 it's culturally tailored or not, they will be singled
 9 out as a high risk, and that will marginalise them, that
 10 will stigmatise them, that will create distrust in that
 11 population. So it's how that's been done. And what we
 12 were saying is: this message is for everyone. The
 13 messaging during the pandemic should have gone to
 14 everyone at the same time. But then, in a nuanced way,
 15 made it appropriate for that population.
 16 **Q.** Indeed.
 17 **A.** So they know that: everyone's getting this, but we're
 18 just getting it so that we can understand it better.
 19 **Q.** Indeed. That's the distinction, essentially, that
 20 the messaging in general terms is the same across all
 21 populations but is then tailored specifically in terms
 22 of those communication aids?
 23 **A.** That's correct. I mean, we had an example of that in
 24 Leicester. We had a bus in an area where we had high
 25 vaccination rates and this bus turned up with

39

1 least, albeit this one's in English, you have the
 2 pictorial representations?
 3 **A.** That's right. I'm not sure if you got the exhibits but
 4 we had these in four, five languages as well.
 5 **Q.** Indeed. I don't have all of those exhibits, I'm afraid,
 6 but certainly I was going to pick up on that, and that's
 7 how they've been produced.
 8 **A.** And the thing about this is this is not just translation
 9 and back translation, a lot of people say we did some
 10 translation and back translation, that's not how
 11 cultural competency works, we have to sit with that
 12 population, that ethnic minority population, go through
 13 the nuances of what this means to them. And it does
 14 take time. And that's what we did with all these
 15 infographics. For example, the word "BMI", you and
 16 I will know what BMI is, ethnic minorities don't know
 17 what BMI is, there is no word for BMI in South Asian
 18 languages.
 19 **Q.** And I understand the same applies to the word "virus"?
 20 **A.** That -- absolutely, yes.
 21 **Q.** It's obviously a key word, certainly in our
 22 understanding of Covid-19.
 23 Just picking up on culturally-appropriate messaging
 24 and communications, that's quite separate to targeting
 25 interventions or communications, isn't it?

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1 a billboard about vaccinations and it was totally
 2 inappropriate to have a billboard there when we already
 3 had high vaccination rates there.
 4 **LADY HALLETT:** So what was the impact of that?
 5 **A.** Well, the local communities felt stigmatised. They
 6 were: why are we -- you know, we've worked very hard --
 7 the GPs said: we've worked very hard to get the patients
 8 vaccinated, but the people who are -- why are the
 9 billboards still coming? Because the vaccination rates
 10 are already high in that area, because the local
 11 community worked really, really hard, and they thought
 12 that enough possibly wasn't being done by that
 13 community.
 14 **LADY HALLETT:** They didn't see the message and say, "Ah, but
 15 we're ahead of the game here"?
 16 **A.** Well, different people will take it differently, as you
 17 can imagine.
 18 **MS CECIL:** Were similar billboards in other areas of
 19 Leicester?
 20 **A.** As far as I'm aware, yes.
 21 **Q.** Thank you.
 22 Thank you, those are all the questions I have on
 23 communications. If I can touch very briefly now on
 24 additional involvement within the Covid-19 response.
 25 You were also involved in Independent SAGE; is that

40

1 right?

2 A. That is correct, yes.

3 Q. Your role there was as a primary care researcher. As

4 you've already explained, you are a GP by professional

5 background, and indeed you remain, as I understand it,

6 a practising GP and clinician?

7 A. That's correct, yes.

8 Q. And that was the reason why you were invited to join in?

9 A. That's my impression, yes.

10 Q. In terms of your input into Independent SAGE, was that

11 based on your role as a clinician?

12 A. As a clinician I think the ethnic minority work that I'd

13 done was also important to them as well.

14 Q. What were the distinctions in the type of work that you

15 were doing for Independent SAGE as opposed to your role

16 in the SAGE subcommittee for ethnicity?

17 A. I think Independent SAGE was discussing various aspects

18 on a regular basis and then the main aim was to get it

19 out to the public, while within SAGE the issues were

20 about looking at the problem, looking at the science,

21 getting the group together to look at the science, and

22 then give robust evidence to the government in terms of

23 the interventions that need to be put in place.

24 Q. Did you see any disadvantages in the role of

25 Independent SAGE?

41

1 A. Okay, will do.

2 Q. No, not at all.

3 With regard to that working group, just to place it

4 in context, there are representatives from the nine

5 major Long Covid epidemiological studies in the UK, and

6 indeed we're going to be hearing from two of those

7 individuals -- and I understand they're colleagues that

8 are well known to you --

9 A. Yes.

10 Q. -- Professor Brightling and Dr Evans, on Friday, and so

11 as a consequence of that I'm not going to take you

12 through the clinical aspects of Long Covid or those

13 sorts of issues --

14 A. Sure.

15 Q. -- because we'll be hearing from them.

16 But what I do wish to just touch upon you with is

17 why that group was formed, and can you just explain very

18 briefly how that came about?

19 A. So I think this was following an email exchange we had,

20 and there is an email in the evidence from Chris Whitty

21 to myself, Professor Sir Ian Diamond and

22 Nish Chaturvedi, about a lot of work that's going on, to

23 see if we can co-ordinate this work together. So

24 I emailed the epidemiological groups that were funded

25 from NIHR, the UKRI, and ONS obviously was doing the

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1 A. I didn't see any disadvantages at all. In fact, when

2 I was asked by Sir Patrick Vallance to join the SAGE,

3 I did mention to him that I was part of Independent SAGE

4 and he was -- there wasn't any reason for me to stop

5 Independent SAGE at that stage, yeah.

6 Q. Thank you. And indeed you carried on in

7 Independent SAGE until May 2021; is that right?

8 A. That's correct, yes.

9 Q. The reason that you left was because of a lack of time,

10 essentially?

11 A. Absolutely, yes.

12 Q. And we've already heard a lot about the types of work

13 that you were already engaged in, in the pandemic

14 response.

15 The final area in that regard is in relation to

16 Long Covid, and you have explained that were the chair

17 of the National Long Covid Research Working Group, often

18 referred to in documents as just the "Research Working

19 Group" for short?

20 A. Yes.

21 Q. That group first met on 11 March 2021 and continues to

22 meet in fact; is that right?

23 A. That's correct, yes.

24 Q. I've just been asked, Professor Khunti, can you just

25 keep your voice up, please.

42

1 work, and they all agreed to be part of this group.

2 Q. Indeed. And if I can just -- for those that are

3 following the email is at INQ000072959. That's the

4 email from Professor Sir Chris Whitty to you and

5 Professor Sir Ian Diamond.

6 Following on from that, you set up that group; is

7 that right?

8 A. That's correct, yes.

9 Q. As you've just explained. Did you have the -- were you

10 under the impression that you reported to the CMO, to

11 Professor Sir Chris Whitty?

12 A. He'd asked us to set this group up, so whether it's

13 reporting or -- he certainly was interested in what was

14 going on, and he wanted to know what was going on on

15 a regular basis. So I think we initially said it was

16 reporting but it was really what we were doing is

17 sharing what we were doing with Professor Sir

18 Chris Whitty on a regular basis. Initially it was

19 two-weekly, now it's four-weekly.

20 Q. Indeed, and one of the things that he asked you to

21 consider was to co-ordinate on a definition, as we can

22 see from this email, "case definitions". Why was that?

23 And the reason I ask that question is because there were

24 already definitions from the World Health Organisation,

25 as you know, and indeed NICE.

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1 A. Yeah, so the definitions have been very different, and
2 if you look at the data for Long Covid they vary, some
3 say four weeks, some say eight weeks, some say 12 weeks,
4 so I think in terms of definitions we did take the
5 NICE definition, and it was just to ensure that everyone
6 was working in a similar manner as far as
7 the definitions go. We weren't going to redefine
8 the definition unless there was any evidence to do that,
9 but our role was not to redefine the definition.

10 Q. Thank you.

11 Now, just in terms of the working group and the
12 output, the product of it, if I can just call up
13 INQ000073726.

14 It's an email from you to Chris Whitty, and what you
15 have explained there is that you have been having
16 the fortnightly Long Covid meetings, they have been
17 enormously useful and productive, you explain that one
18 of the initiatives that has resulted is a collection of
19 Long Covid research papers similar to the Covid-19
20 research collection held by UCL, which we may hear some
21 of later in the evidence.

22 But the point of your email was really to ask if he
23 was agreeable to him(sic) using his name in relation to
24 that research collection; is that right?

25 A. That's correct, yes.

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1 in terms of publication and the use of the CMO's name.

2 And what we see here is that there's a description,
3 Nature:

4 "The group is planning to publish the attached
5 commentary in Nature ..."

6 That's a journal, isn't it?

7 A. That's right, yes.

8 Q. And you have asked whether Professor Sir Chris Whitty
9 "would be happy to have the below line included", and
10 what we see there is that it essentially says:

11 "Researchers on these studies have formed the
12 National Long COVID working group, reporting to the
13 Chief Medical Officer for England, to share key findings
14 and promote ..."

15 Understanding and so on?

16 A. That's correct.

17 Q. Now, in relation to that, that was being flagged, and
18 you can see underneath it says:

19 "From my understanding of the Group, 'reporting to'
20 is possibly a bit strong and slightly overstates your
21 involvement ..."

22 And they make a proposed modification?

23 A. So reporting would mean that he would have a say in what
24 we do, which he absolutely doesn't, and we inform him,
25 as I said, with the minutes on a two-weekly or

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1 Q. And he replies shortly thereafter, and we see at the top
2 there that he says:

3 "I think it would be sensible not to put the 'CMO'
4 bit in as it might at some point get people asking about
5 clearances (from one side) [presumably that's the
6 government side], independence from Gvt (on the other
7 [side]) and thinking that I 'endorse' papers."

8 How did that chime with what you had understood his
9 role to have been at that point?

10 A. We weren't sure whether we were there to just inform him
11 or report to him, but the reporting is very, very
12 separate. The funded studies have to report to
13 the funders, independent of anyone, so they'd be
14 conducting the studies independently of the CMO --

15 Q. Yes.

16 A. -- and reporting to the funders. So, in hindsight, he's
17 absolutely right: we're not reporting to him, we're
18 informing him.

19 Q. Indeed. And indeed there's a subsequent email from one
20 of Chris Whitty's -- the individuals in his office, on
21 2 November, and that's at INQ000074244.

22 What we have there is -- it's from, as I say,
23 an official within DHSC, but working -- private
24 secretary to Professor Sir Chris Whitty, and what that
25 does is it flags this in relation to a subsequent aspect

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1 a four-weekly -- and he always acknowledges that, it's
2 been helpful for him as the CMO.

3 Q. Did you form any impression that he was seeking to keep
4 the working group effectively at arm's length?

5 A. Well, because it's not funded by the CMO, it's funded by
6 NIHR, UKRI, so he wouldn't have a say in any of
7 the workings of the group, or the individual studies.

8 Q. That perhaps brings me on to the next point, which is:
9 why was the working group not set up as a subgroup of
10 SAGE? Can you assist us with that?

11 A. Yes, sure. So if you look at all the evidence that's
12 been provided so far, there was a paper to SAGE, I think
13 led by Nish Chaturvedi, in July of 2021, of a number of
14 groups that had looked at Long Covid, and the report
15 stated that they were conducting epidemiological
16 studies. The SAGE's response would be: if there is
17 something concrete there that we can help to improve
18 outcomes, that we can do something about, then they
19 would take that forward as a recommendation to the
20 government.

21 Until now, most of the studies are still evaluating,
22 even Chris Brightling in his report said we're in the
23 infancy of Long Covid, so the research is still being
24 done. What we don't know is the exact causes, exact
25 disease trajectories, and there are not currently any

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1 treatments for it at all. So at the moment we're still
 2 in the research phase of Long Covid.
 3 **Q.** That perhaps explains why it operates differently --
 4 **A.** Absolutely.
 5 **Q.** -- in your view?
 6 **A.** That's right.
 7 **Q.** I have been asked to ask: do you think that that
 8 reflects a lack of importance given to Long Covid,
 9 because it's not a formal subgroup of SAGE?
 10 **A.** Absolutely not. If there wasn't importance put to it
 11 they wouldn't have discussed it at SAGE, but it has been
 12 discussed. And I think everything else that was going
 13 on within SAGE was to reduce Long Covid, because they'd
 14 obviously established Long Covid was an issue. The only
 15 way currently that the evidence that we had, and even
 16 now we have, is to reduce the risk of getting Covid in
 17 the first place. And that was through everything that
 18 we've discussed at SAGE about reduced risk,
 19 population-level risk of people getting Covid, and
 20 that's through NPIs (non-pharmaceutical interventions)
 21 and vaccinations, and those were large areas of work
 22 that SAGE was doing. So if we reduce the population
 23 level of people getting Covid, then the risk of
 24 Long Covid would be lower as well.

25 **Q.** You've covered it to some extent in your answer, but
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1 the BMJ in relation to management of that condition?
 2 **A.** That's correct, yes.
 3 **Q.** Thank you. We will be hearing a little bit more about
 4 your short report that the working group produced in due
 5 course, so I don't propose to take you through those
 6 today. We've heard a little bit already, and indeed
 7 from Professor Sir Ian Diamond, that the ONS worked with
 8 you in relation to statistics. Can you recall when that
 9 was?
 10 **A.** Statistics in relation to Long Covid?
 11 **Q.** Long Covid, my apologies.
 12 **A.** So I think that was in the SAGE minutes of
 13 November 2020.
 14 **Q.** Indeed, it was -- I believe it's SAGE 69, if it
 15 assists -- on 19 November.
 16 **A.** That's correct.
 17 **Q.** It's really just to get a broad understanding.
 18 **A.** So I was representing the Ethnicity Subgroup within
 19 the main SAGE meetings, but because I'd done some work
 20 in the area of Long Covid I was asked to work with ONS,
 21 and that's when they were starting the CIS, the Covid
 22 Infection Survey, and they were going to add
 23 the Long Covid questions to that, and it was just to
 24 work with the team regarding the questions that were
 25 going to be asked and how the study was going to be set

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1 just to be clear, in your view, does the fact that it's
 2 a working group impact at all upon the advice that was
 3 then taken on board by SAGE in terms of its importance
 4 and ...
 5 **A.** Well, when we were still in our infancy, April 2021, it
 6 was quite early on still and the studies were just being
 7 set up there, some of the studies are still not
 8 finished, so we don't have results from many of
 9 the studies, so it would have been too early to report
 10 to SAGE with the results.

11 **Q.** Thank you.

12 If I can just pause for a moment, you've answered
 13 a number of the areas and so I'm just going to truncate
 14 those.

15 Just dealing very briefly -- because, as I say, we
 16 will be hearing on Friday from Professor Brightling and
 17 his colleagues in relation to that, and Dr Evans -- in
 18 terms of your understanding, am I right that
 19 the incidence of Long Covid, albeit not termed as such
 20 at that point, was aware and apparent throughout late
 21 spring and early summer of 2020?

22 **A.** That's when the reports started mainly coming out,
 23 mainly from the patient groups and then from the
 24 researchers themselves, yes.

25 **Q.** And indeed in August 2020 guidance was published in
 50

1 up.

2 **Q.** Thank you.

3 With regard to your involvement in SAGE, and advice
 4 provided, were there discussions about advice to be
 5 provided to government decision-makers and policymakers
 6 in relation to Long Covid, to your recollection?

7 **A.** Not that I'm aware of, no.

8 **Q.** Thank you.

9 In fact, it appears that the first detailed
 10 discussion on Long Covid doesn't take place until
 11 February 2021. Can you help us with why it may be that
 12 it took so long?

13 **A.** I think most of this, as I've said, is because there
 14 wasn't any evidence there that one could change anything
 15 in terms of Long Covid. Long Covid was this new
 16 disease, we still don't know much about Long Covid, as
 17 you'll hear from Chris Brightling, so at this phase it
 18 was mainly trying to get informed from the studies that
 19 had been done, which are still -- many of them are still
 20 not complete.

21 **Q.** Thank you.

22 You have had the opportunity of reading the report,
 23 haven't you, and just in general high-level terms, do
 24 you agree with the report of Professors Brightling and
 25 Dr Evans?

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1 A. Yes, completely agree, yes.
 2 Q. You completely agree, thank you.
 3 A. There's areas about funding I think he mentions, which
 4 we've discussed at Long Covid meetings as well, and we
 5 do agree further funding is required, but there are NIHR
 6 calls(?) that people can go to, to continue doing this
 7 work, if they wanted to extend their work.
 8 Q. I have just three very short points, if I may, and then
 9 I'll be handing over, my Lady.
 10 The first relates to the collection of data in
 11 relation to Long Covid. Effectively at the outset of
 12 the pandemic, as we've heard, data was not being
 13 collected. In terms of that, are there any
 14 recommendations that you would make with regard to
 15 population-level data collation?
 16 A. I think longer-term we've learnt a lot from this
 17 pandemic, there are a number of areas that we can look
 18 at, but in terms of Long Covid, I think we need to start
 19 planning for this very early. And the studies like CIS
 20 and REACT, these are what we call, now, hibernating
 21 studies, we're not doing them, but they could easily be
 22 set up -- if another pandemic came, they could very
 23 quickly be set up.
 24 Q. Essentially used as sleeping studies to be activated; is
 25 that right?

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1 I think because the diagnosis is so difficult of
 2 Long Covid -- unless you're a researcher, we're doing
 3 that on a regular basis -- in clinical practice
 4 Long Covid is a difficult diagnosis for a busy general
 5 practitioner. There are training elements already
 6 inputting for that though.
 7 Q. We've heard a little bit about that, and obviously we
 8 can surmise, and you've covered the implications for
 9 that within your statement in relation to assessing
 10 that.
 11 Finally, just in relation to ethnicity and sex, it
 12 appears that data concerning ethnicity at the moment is
 13 less consistent in relation to having a causal link or
 14 that enhanced risk of Long Covid, is that right?
 15 A. Yes, there are -- so there are some studies that have
 16 shown that ethnic minorities may have Long Covid when we
 17 look at the large datasets. When we look at prospective
 18 studies where people are asked about Long Covid, we seem
 19 to see less Long Covid, but again I think there maybe
 20 some nuances here. We've seen ethnic minorities get
 21 worse disease, we'd expect them to get more Long Covid,
 22 but this may be the language that's used, and I don't
 23 think there's work that's been done in terms of
 24 the language of Long Covid with ethnic minorities, and
 25 that's an area of work that certainly needs to be done.

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1 A. That's right.
 2 Q. Thank you.
 3 Then in terms of coding issues, a further tweet from
 4 you, because you appear to use social media in this way,
 5 INQ000280199, you tweeted that:
 6 "Longcovid is poorly coded in primary care records
 7 but there are other ways."
 8 Again, in relation to collation of data.
 9 What other ways do you see?
 10 A. So the coding structures came very quickly, I think
 11 there were 18 codes that were set up for Long Covid
 12 within the GP systems. The tweet was in relation to
 13 a paper that was published a month before from
 14 OpenSAFELY, that's in the British Journal of
 15 General Practice, that showed that only 0.04% of
 16 practices at population level had a code for Long Covid.
 17 By that time we'd had a number of people with
 18 Long Covid, but only 0.04% were shown on the GP computer
 19 systems, and it was variable, 25% of practices did not
 20 have a code at all. So it showed that there is an issue
 21 with coding of Long Covid.
 22 The other areas are that if patients are going to
 23 Long Covid clinics, for example, if they came back to
 24 the practice, that's one way of putting Long Covid codes
 25 in. Otherwise we have to do them prospectively.

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1 Q. So we still have a gap there?
 2 A. Absolutely.
 3 Q. Can you just assist with women, because women appear to
 4 be disproportionately impacted in terms of the initial
 5 outputs for some of these research studies. Do you know
 6 why that is?
 7 A. I don't, sorry.
 8 MS CECIL: Not at all. We'll be hearing, as I say, from
 9 Professor Brightling and Dr Evans in any event in due
 10 course.
 11 My Lady, those are my questions. There have been
 12 applications that have been granted by two core
 13 participants, the first is FEHMO and the second is
 14 the Long Covid groups.
 15 LADY HALLETT: I think I'm just going to check. Professor,
 16 do you mind if we take a break? I'm sorry, Mr Thomas.
 17 It's just I have been watching our stenographer.
 18 Are you okay if we take a break now and come back
 19 afterwards?
 20 THE WITNESS: Sure.
 21 LADY HALLETT: Good, thank you very much. In which case
 22 I shall be back at 11.30.
 23 (11.13 am)
 24 (A short break)
 25 (11.30 am)

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1 **LADY HALLETT:** Mr Thomas.
 2 **Questions from PROFESSOR THOMAS KC**
 3 **PROFESSOR THOMAS:** Hello, Professor, I represent
 4 the Federation of Ethnic Minority Healthcare
 5 Organisations, FEHMO.
 6 I've only got a few questions for you. One of my
 7 questions has already been asked, but let me come on to
 8 the three questions that I do have.
 9 My Lady, I'm starting from question 2.
 10 **LADY HALLETT:** Thank you.
 11 **PROFESSOR THOMAS:** The Chair asked you earlier a question,
 12 she said:
 13 "... who had the data that you needed?"
 14 Your response was you weren't sure and you said:
 15 "I'm not sure if the government had the data. If
 16 ... one of the asks, I'm sure Sir Ian Diamond would have
 17 provided that data ..."
 18 "[The data] wasn't coming to us ..."
 19 My question is this: so bearing that in mind, what
 20 was the source of the data in the period leading up to
 21 March/April 2020 that connected certain underlying
 22 clinical conditions with increased vulnerability to
 23 Covid-19?
 24 **A.** Okay, so in terms of the data, there were a number of
 25 data points that were available to researchers, and

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1 a cautionary way, that "We're seeing more people from
 2 ethnic minority backgrounds being admitted to hospital",
 3 and we'd not heard of this.
 4 And then after that I think the first lot of data we
 5 were relying on was the ICNARC data, which is
 6 the intensive care unit data that's collected nationally
 7 from a number of centres. And we were tweeting this on
 8 a regular basis saying there is still this risk, and
 9 then more patients were admitted, and saying
 10 disproportionately ethnic minorities are more
 11 represented in intensive care unit database.
 12 So we were the first ones to make these, all these
 13 signals available to people. And then I think that's
 14 when ONS started looking at the data.
 15 **Q.** Yes. Can I just follow on from that, if I may. So you
 16 were signalling this, did you consider the level of any
 17 such risk to be actionable, you wanted it acted upon?
 18 **A.** Before we act on anything we need a definite
 19 confirmation that there is a causal risk there, and we
 20 hadn't identified -- we knew that there were more
 21 patients admitted to the hospital -- and I am talking
 22 here of May/June time, and that's when ONS did their
 23 first lot of analysis showing and confirming this risk.
 24 **Q.** Right.
 25 Let me move on to my last area. Are you aware of

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1 obviously they were available to the Office of National
 2 Statistics. In terms of the government, I'm not sure
 3 what data were available to them.
 4 **Q.** Okay.
 5 **A.** Unless they commissioned the other groups to do
 6 the work.
 7 **Q.** Yes. But you're clear in your analysis -- well, let me
 8 ask you in a non-leading way: did the analysis of that
 9 data that you did have, that suggested a heightened
 10 vulnerability to Covid-19 based on race and ethnicity?
 11 **A.** Absolutely, yes. And as I mentioned before, it's
 12 the ONS data and the Public Health England data also
 13 suggested that, and then subsequently a number of other
 14 independent researchers have also identified that risk
 15 as well.
 16 **Q.** Okay, thank you.
 17 Let me move on to my next question. If there was
 18 a growing expert view in between March/April 2020 that
 19 there was indeed a heightened risk to Covid based on
 20 race and ethnicity, can you say who the main voices who
 21 were making this call, who were -- you know, "This is
 22 a potential problem", who were the main voices?
 23 **A.** So, as I said, the first signal that we mentioned
 24 earlier was that I was the first one to point that risk
 25 out. And, as I said, this -- you know, it was in

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1 any targeted interventions that were formulated to
 2 address the probability of heightened risk of Covid
 3 based on race and ethnicity?
 4 I'll repeat the question if you want me to.
 5 **A.** Please, yeah.
 6 **Q.** Are you aware of any targeted intervention that was
 7 formulated to address the probability of heightened risk
 8 to Covid-19 based on race and ethnicity?
 9 **A.** So if you look at the four quarterly reports from
 10 the Race Disparity Unit, you do see that there were
 11 targeted interventions throughout those four reports,
 12 and they were at various levels, including
 13 the communications that we've talked about,
 14 the vaccinations and more data-driven work that could be
 15 done.
 16 In terms of my answers I gave earlier, the targeted
 17 interventions were -- we felt it wasn't co-ordinated as
 18 such. They weren't -- the funded individuals, there was
 19 about 60 authorities that were given this funding, they
 20 were left to themselves to decide what to do with that
 21 rather than having a co-ordinated effort -- or even
 22 having co-ordinated pilots, to say, "Let's intervene
 23 here in this area, intervene in this way in this area",
 24 to draw out and reduce the risk and to identify what are
 25 the best interventions that will lead to better outcomes

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1 for people from ethnic minority backgrounds.
 2 **Q.** Yes. I've finished, but just on that, do you think
 3 things were being done timely?
 4 **A.** The first quarterly report was in October, and that's
 5 when they started discussing this. I think the first
 6 lot of funding for community champions was given in
 7 January 2021. Yes. £23.75 million was given for
 8 community champions over, I think, 60 authorities. And
 9 we think that this could have been done earlier, yes.

10 **PROFESSOR THOMAS:** It could have been done earlier.
 11 My Lady, that's all I ask, thank you.

12 **LADY HALLETT:** Thank you, Mr Thomas.
 13 Mr Metzger.

Questions from MR METZER KC

14 **MR METZER:** Thank you, my Lady.
 15 Two topics, please, Professor Khunti.
 16 First of all, I'm going to cite, I'm not going to go
 17 to the INQ number, but it's INQ000280061, which is part
 18 of Sir Patrick Vallance's dairies.
 19 At page 205, Professor Khunti, he recorded an entry,
 20 on 6 October 2020, listing the reasons why
 21 the Great Barrington proposal, namely herd immunity and
 22 let it rip, as you will be aware, is wrong. Number 4 on
 23 that list is Long Covid.

24 First of all, do you agree with Patrick Vallance's
 25

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1 Would SAGE be responsible for informing government
 2 decision-makers about the nature of risk of Long Covid,
 3 as with other factors on Patrick Vallance's list, such
 4 as how long immunity lasts?

5 **A.** I think that was already in many of the SAGE papers.
 6 The SPI-M modelling had looked at how long the immunity
 7 lasts, after an infection or vaccinations, and these
 8 were all taken into account when the modelling was done.

9 **Q.** Thank you.
 10 You said at paragraph 3.5 of page 13 of your report,
 11 you said:
 12 "By August 2020, understanding was sufficient for
 13 guidance on management of 'post-acute Covid' (as the
 14 longer-term effects of Covid-19 were then termed) to be
 15 published in the British Medical Journal."
 16 Is it right that SAGE did not provide advice on
 17 Long Covid to government decision-makers by October 2020
 18 when Sir Patrick Vallance made this note in his diary?

19 **A.** As I mentioned earlier on, there weren't any
 20 interventions for people with Long Covid. Indeed,
 21 you'll hear on Friday we don't have any interventions at
 22 the moment. Really, we're at its infancy in terms of
 23 knowing much about Long Covid. So at that stage we did
 24 not have any interventions to put into place to help
 25 people with Long Covid except to reduce the risk of

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1 view that Long Covid was one of the reasons why letting
 2 the virus spread unchecked was wrong?

3 **A.** Absolutely. I agree with that. As I mentioned earlier,
 4 at the moment the way to reduce the risk of Long Covid
 5 is through reducing the risk of people getting Covid.
 6 And this is through, as we said, all the NPIs. And now
 7 we have the vaccines that can drive the risk. Vaccines
 8 drive the risk -- reduces the risk, and there's good
 9 evidence now that if people are vaccinated they're less
 10 likely to get Long Covid. If they have Long Covid and
 11 they're vaccinated, there's also data to suggest that
 12 they get less Long Covid.

13 **Q.** Thank you.
 14 Since you've said yes, can you answer this
 15 subsidiary question: should Long Covid be one of
 16 the factors to take into account in assessing the need
 17 for non-pharmaceutical interventions to limit
 18 transmission?

19 **A.** Yes, absolutely. As I've said, that's one of the ways,
 20 and one of the major ways, of reducing the risk of
 21 getting Covid in the first place, and we know -- also
 22 know that if you have had Covid and you have Long Covid
 23 and you have Covid again, your risks are worse. So
 24 definitely, yes.

25 **Q.** Thank you.

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1 Long Covid with the interventions I've mentioned, the
 2 NPIs and the vaccination programmes.

3 **Q.** All right, well, that ties in well to my second topic
 4 that I want to go on to, on recommendations.

5 The Long Covid group, the two questions I want to
 6 ask you about that in relation to something you said,
 7 I think, both in evidence at paragraph 3.8 of your
 8 witness statement. You of course sat on SAGE. Can we
 9 look at the minutes of SAGE 94, on 22 July 2021, which
 10 is INQ000092856. I don't know if that's going to be put
 11 up.

12 **LADY HALLETT:** It's up on mine.

13 **MR METZER:** Not on mine, sorry.

14 Could we go to page 4 at paragraph 27. I want to
 15 ask you about the fourth line, which starts:

16 "For those children who do suffer long illness" --

17 **LADY HALLETT:** You need to be near the microphone, sorry.

18 **MR METZER:** I'm sorry, yes. It's on my screen, thank you.

19 "For those children who do suffer long illness
 20 duration, there may be a need for guidance to parents,
 21 carers and schools on how to support them."

22 Would you agree that this appears to be
 23 a recommendation from SAGE?

24 **(Pause)**

25 **A.** That's what it seems like, yes.

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1 Q. Thank you. Do you know if that guidance was prepared?
 2 A. I'm not aware of that, sorry.
 3 Q. So you're not able to say, if it wasn't, why it wasn't?
 4 A. As I said, I was on the SAGE for -- as chair of the
 5 Ethnicity Subgroup. I did give comments on Long Covid
 6 particularly for the CIS survey. Children's Long Covid
 7 is not my area of expertise.
 8 Q. So be it. And the last INQ I'd like to take you to,
 9 INQ000249018, which is a WHO policy brief, number 39.
 10 That's titled "*In the wake of the pandemic: preparing*
 11 *for long COVID*".
 12 Can we look, first of all, at the first page and
 13 just confirm that you're a co-author?
 14 A. That's right, yes.
 15 Q. Thank you. Page 4, can we go to, please, which is
 16 a correction from 22 March 2021, can we take that to
 17 indicate that the report was published by then,
 18 March 2021?
 19 (Pause)
 20 A. This is the first time I've seen this, so if this is
 21 there, yes, I do agree.
 22 Q. So you do agree that we can indicate the report must
 23 have been published by then, March 2021?
 24 A. Yes.
 25 Q. Thank you.

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1 reference to --
 2 LADY HALLETT: Microphone, Mr Metzger. Sorry, it's because
 3 it's not appearing on your screen.
 4 MR METZER: I'm very sorry, I'm bending down. I'll bring it
 5 down with me:
 6 "Although Long COVID is not yet fully understood
 7 health policy-makers should be preparing to address it."
 8 A. Yes, so this is to the policymakers, in terms of
 9 the government policymakers, and we know that they did
 10 set up the Long Covid clinics because of that.
 11 Q. Yes. So the last question I ask, therefore, is: SAGE
 12 could have made similar recommendations on the basis of
 13 information available at that time, which is early 2021;
 14 do you agree?
 15 A. They could have done but, as I said, this wasn't
 16 a question that was put towards SAGE to look at this
 17 evidence, because there wasn't any evidence. Even the
 18 Long Covid clinics were set up to help people with Covid
 19 but there wasn't any evidence, as such, for that.
 20 Q. No, just recommendations?
 21 A. Yes.
 22 MR METZER: Thank you.
 23 LADY HALLETT: Thank you, Mr Metzger.
 24 MS CECIL: Thank you, my Lady. That concludes the evidence,
 25 unless your Ladyship has any questions.

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1 The last thing I want to ask you, page 23, please,
 2 we can see there a number of recommendations for
 3 policymakers. Do you have that, Professor Khunti?
 4 A. Yes.
 5 Q. Yes. Do you agree that these recommendations could have
 6 been put before SAGE?
 7 A. I'm just reading those.
 8 Q. Yes, of course.
 9 (Pause)
 10 A. Yeah, so these are recommendations stating that we
 11 should be implementing patient registers, we should be
 12 giving guidelines on multidisciplinary services, but we
 13 didn't have any evidence for this at all. These were
 14 all consensus recommendations that we gave, as part of
 15 this document. SAGE was looking at the acute
 16 complications, and giving advice of trying to reduce
 17 the risks associated with this, acute effects of
 18 the pandemic.
 19 Q. Yes.
 20 A. In terms of this, there are other areas looking at this,
 21 there are already clinics that have been set up to deal
 22 with this. These were all actioned by the government in
 23 terms of having clinics for people with Long Covid.
 24 They, I think, pre-date some of the discussions on SAGE.
 25 Q. Yes. But we can see the implications for policy makes

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1 LADY HALLETT: No, I have no questions.
 2 Thank you very much, Professor, for all the work you
 3 have done generally and for all your help with this
 4 Inquiry. We are very grateful.
 5 THE WITNESS: Thank you very much.
 6 (The witness withdrew)
 7 MS CECIL: My Lady, if I may just hand over to Mr Keith.
 8 MR KEITH: My Lady, the next witness is Professor Tom Hale.
 9 PROFESSOR THOMAS HALE (affirmed)
 10 Questions from LEAD COUNSEL TO THE INQUIRY
 11 MR KEITH: Good morning.
 12 A. Good morning.
 13 Q. Could you commence, please, by giving the Inquiry your
 14 full name.
 15 A. My name is Professor Thomas Hale.
 16 Q. Professor, thank you very much for attending today and
 17 for the provision of your expert report prepared for
 18 this module, which relates to the Oxford Covid-19
 19 government response tracker for which you are
 20 responsible in part, although you lead the team that has
 21 provided and provides that tracker.
 22 You've prepared this report for us, it's
 23 INQ000257925, and I believe on the last page -- perhaps
 24 not the last page, which is page 105, but earlier in
 25 that report -- you've appended the usual declaration

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concerning -- in fact it's on the second page -- you set out the usual understanding of your duty to provide independent evidence and you confirm that you've made clear those matters which are within your knowledge and those which are not, and those which are true and those which are not.

Now, you are a professor or you are the professor of global public policy at the Blavatnik School of Government. Is that in the University of Oxford?

A. That is correct.

Q. In essence, are you a specialist in the area or the issue of how political institutions evolve, adapt, to face the challenges, whatever they may be, that they face, globally and in the context of those particular countries in which the governments operate?

A. That's correct. I focus especially on transborder threats such as pandemics where we need to look at different government responses, compare them and understand how they interact.

Q. Professor, whilst you give evidence, please try to keep your answers as slow as you can humanly make them, it makes it much easier for our stenographer.

Do you hold a PhD in politics from Princeton, a master's degree in global politics from the LSE, an AB in public policy from Princeton School of Public and

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the pre-eminent tracker of this information, or were there a large number of other bodies also scouring the position around the world to see how governments were responding?

A. It was the largest of these efforts. There were several of them, which we've listed in the appendix, close collaborators and colleagues, each often providing a different set of issues that were the focus. But our project became a focal point for many users of the data because it had a huge breadth, covering 185 different countries around the world, also, in many countries, depth, looking at their subnational jurisdictions, particularly important in places like India or the United States where subnational differences were very significant, also including the subnational jurisdictions of the United Kingdom. And it became very timely, so the data was collected through a team of trained volunteers, who eventually numbered 1,500 in total, a massive team, all using their contextual knowledge from different parts of the world combined with our system, which we trained them in, to create comparable information.

So for those reasons, even though there are many trackers of different areas of policy, this one became an important tool for many governments, for many

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International Affairs?

A. I do.

Q. Have you written for many years on these areas?

A. I do.

Q. Thank you very much.

The report, does it fulfil this main aim, which was to research and review the many thousands of articles and pieces of learning which concern themselves with the impact of the various governmental measures which were applied by governments across the world --

A. Correct.

Q. -- in response to the pandemic, and based very largely on the information collated by your tracker team?

A. That's correct. Our project was providing an evidence base for many, many hundreds, indeed thousands, thousands of studies that took place looking at what governments were doing in response to the pandemic and what the effects of their policies may or may not be on different outcomes of interest, such as the health of their populations or their economies.

Q. Your tracker, the project which I think you launched in March 2020, obviously looked around the world at all the various responses that the governments across the world put into place.

Was it one of a number of trackers? Are you

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researchers and for the public at large.

Q. Did many governments during the course of the pandemic in fact, as a result, incorporate information from the Oxford C-19, Covid-19 government response tracker into their own responses, their own analysis and their planning processes?

A. That's correct. So our data were made available instantly, in real time, on the internet and so were used by many, many governments, researchers, media organisations to create a record of who was doing what and how does it compare to, for example, government's own plans or actions. And that was indeed the idea: to facilitate learning.

Q. In the United Kingdom, did the two academic leads of the tracker project, yourself and Dr Petherick, assist the United Kingdom Government by way of taking part in or joining the International Comparators Joint Unit, expert advisory group, which provided timely and vital information to the UK Government on what the impacts appeared to be of the various different types of measures applied by governments across the world?

A. That's correct. Dr Petherick and I had the privilege of serving on this committee beginning from the spring of 2020, when it was created, and then through its various forms until around the middle of 2021, when it

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1 ceased its work.

2 **Q.** Just focusing for a moment on how the information

3 tracked in the project was assembled, you've mentioned

4 the very large number of volunteers across the world.

5 Did those volunteers have -- or were they recruited

6 locally so that they would have the facility,

7 the ability to be able to deploy local knowledge in each

8 country or jurisdiction or subregion when collating the

9 various aspects of the impact of whatever measures might

10 have been deployed?

11 **A.** That's exactly the strategy that was used. So it's

12 quite important for any kind of comparative exercise to

13 navigate between two fundamental desiderata. One is

14 a comparable system where you can say A is like A, B is

15 like B, which necessarily requires a little bit of

16 abstraction, but also, on the other side, the ability to

17 have real contextual information, to understand exactly

18 what a given policy might mean in a particular context;

19 to use the local language to understand that context, to

20 understand the meaning of a policy, and to combine those

21 two.

22 So using a team of volunteers -- and I would like to

23 really offer, again, our huge thanks for the way these

24 volunteers gave their time during the pandemic to create

25 this global public good -- using that combination of

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1 quality assurance, so that your analysis and your

2 thinking is open to review?

3 **A.** Exactly.

4 **Q.** Now, the Inquiry has heard a great deal of evidence

5 about non-pharmaceutical interventions, and plainly

6 you're aware of what they are.

7 In terms of the sorts of measures that you tracked,

8 in very broad terms, were those measures non -- what we

9 would call non-pharmaceutical interventions, but also

10 including the impact of vaccine-related measures, so

11 they were broadly the same but they included the whole

12 field of vaccination?

13 **A.** That's correct. So the project began in the spring

14 of 2020, when the most prominent responses governments

15 were taking to the pandemic were in the form of NPIs,

16 often restrictions on movement or travel or requirements

17 to stay at home. However, as the pandemic evolved, so

18 too did responses to it, and so our project had

19 the imperative of adapting and adding new categories of

20 response as our toolkit against this disease expanded,

21 and that most significantly took the form of measuring

22 the different policies that governments put in place to

23 encourage vaccination, sometimes to require vaccination,

24 and also how some of the restrictions that have been

25 used in the pre-vaccine period, such as travel

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1 expertise, in the local context, with a comparable

2 methodology, is what allowed the data to emerge.

3 **Q.** Do we presume that the data, the information about how

4 the various governmental measures were coming into

5 existence and being deployed and what their impacts

6 were, was assembled by viewing official government

7 websites across the world, official news reports, and

8 any publicly available information about what those

9 measures consisted of?

10 **A.** That's correct. So the volunteers were tasked with

11 looking at, say, an official government website where

12 information on different measures and restrictions might

13 be posted, or, for example, where that didn't exist --

14 and there are certainly many governments around the

15 world where communication around Covid-19 measures were

16 less consistent and clear than in other parts -- where

17 the suitable information was sourced from government

18 websites, you know, maybe a less official kind of

19 document but in a posting on a government website, or

20 similar information.

21 And importantly, the project has recorded these

22 original sources as permanent digital records and so

23 the entire historical archive for each of our data

24 points is there for consideration.

25 **Q.** And is that an important feature for the purposes of

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1 restrictions, might vary, for example allowing more

2 freedoms for vaccinated individuals than others. So

3 those complexities were important.

4 **Q.** Do we have on page 47 of your report the full list of

5 the Oxford Covid-19 government response tracker

6 indicators, that is to say the measures or the policies

7 that were tracked, and we can just see that they can be

8 conveniently grouped into containment and closure,

9 economic responses, health systems, and, over the page,

10 vaccine policies and miscellaneous?

11 **A.** Correct. And richer descriptions are available on the

12 link provided on page 47.

13 **Q.** It's important, isn't it, to identify the limitations on

14 the work that your project was able to carry out? You

15 tracked the measures and you tracked the impact of

16 the measures. But what the project couldn't do was ever

17 identify, for obvious reasons, the counterfactual

18 position: what would have been the impact if these

19 measures had not been applied in the various

20 jurisdictions; is that correct?

21 **A.** Correct.

22 **Q.** Is that because, in very general terms, firstly, this is

23 an observational study, you observed what was happening,

24 it's not a controlled study of what the impact might be,

25 in theory, of an intervention. And, secondly, many of

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1 these measures and interventions were being applied
 2 simultaneously, and therefore it's impossible to say
 3 what the precise impact may have been or was from any
 4 individual particular intervention; is that correct?
 5 **A.** Indeed. And so with these differential impacts you
 6 might find across different NPIs, it's exceedingly
 7 difficult to say: in this particular instance, say, 5%
 8 was done by this one, 10% by another. Instead, the
 9 knowledge we're able to glean from the literature is to
 10 identify the tendencies that, on average, different
 11 kinds of interventions, either individually or in
 12 combination, may have.
 13 **Q.** Of course, if you look at page 47, you can see that
 14 the measures are self-defined in very broad terms:
 15 school closures or workplace closing, income support,
 16 testing policy, and so on and so forth.
 17 **A.** Mm.
 18 **Q.** So it's a very high level assessment, is it not?
 19 **A.** Correct.
 20 **Q.** But it's very useful because it identifies, doesn't it,
 21 how different governments across the world responded in
 22 general terms and what the broad consequences were of
 23 those particular governmental decisions?
 24 If we look at page 8, by way of a demonstration of
 25 a very user-friendly diagram, this, for example,

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1 limits both health impacts and the need for restrictive
 2 policies."
 3 By "restrictive policies", do you mean more
 4 stringent policies?
 5 **A.** Correct.
 6 **Q.** Stringent measures.
 7 Fourthly:
 8 "Economic support bolsters compliance."
 9 By that, do you mean the provision of economic
 10 support by government, for example by way of support for
 11 those who are self-isolating, tends to improve
 12 the ability or the degree to which a population will
 13 comply with a particular measure?
 14 **A.** Yes.
 15 **Q.** Fifthly:
 16 "Prolonged restrictions can have costs."
 17 What sort of costs, in very broad terms, did you
 18 have in mind by that phrase?
 19 **A.** There are many potential costs. The ones we focused on,
 20 because they were a source of great interest in the
 21 literature, were around mental health impacts, around
 22 domestic violence, around learning outcomes for
 23 children, and of course for the economy. Of course
 24 there are many others as well to consider.
 25 **Q.** So now dealing with each of those broad findings in

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1 provides a chart by colour of school closures during
 2 the Covid-19 pandemic as at 24 October 2020, and it
 3 shows those countries in which no measures in relation
 4 to school closures were imposed, those in which they
 5 were recommended, those in which closures were required
 6 but only at some levels, and then those countries in
 7 which all levels of schools, so all ages, schools were
 8 closed?
 9 **A.** Correct.
 10 **Q.** And you can see the broad thrust of it. All right.
 11 Turning to the summary of your research of, as I've
 12 said, the scientific literature reporting on
 13 the information collated by your project and by your
 14 tracker, page 11 of your report, are there a number of
 15 general findings that you draw from your review of these
 16 thousands of studies reporting on the data which you've
 17 collated? So, in essence, what everybody did.
 18 Firstly:
 19 "Speed matters."
 20 And we're going to come and look at these in turn.
 21 Secondly:
 22 "Strength matters."
 23 Those two observations I think are self-evident,
 24 that their meaning is clear. Third:
 25 "Effective use of test, trace, and isolate measures

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1 turn, firstly, speed matters. It may be thought to be
 2 self-evident, but what is the broad consequence of
 3 a timely, that is to say a rapid, adoption of
 4 a non-pharmaceutical intervention? That is to say, the
 5 imposition of a social restriction or a distancing
 6 method or a mask-wearing measure or a full stay at home
 7 mandatory order.
 8 **A.** So the long experience of managing infectious disease of
 9 all kinds shows very clearly that because such diseases
 10 tend to spread in a non-linear and, in the case of
 11 Covid-19, rapid fashion, early interventions, when
 12 the prevalence is low, are critical to restrain further
 13 spread. Once spread has reached a certain scale, and
 14 therefore because more spread means, in exponential
 15 logic, more and more spread, at a certain speed, it's
 16 much harder for any policy to have the same effect it
 17 would have had at a lower level of spread.
 18 Therefore, speed matters. And, for example, one of
 19 the studies we looked at show that a single day of
 20 delaying a mass gathering ban, so something like
 21 concerts or sporting events, a single day of delay had
 22 an impact of perhaps a 7% increase in the cumulative
 23 death toll during that wave. So one day, 7% increase,
 24 quite a significant importance for speed.
 25 **Q.** Does your report refer to a number of studies that show,

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1 by reference to measures taken during the first
 2 five days and also some other studies which show the
 3 effects of the implementation of NPIs in general terms
 4 during the first 10 to 14 days, can have a very
 5 significant impact or did have a very significant impact
 6 on the transmission of the virus?

7 **A.** Correct. Most of the studies show there was a two-week
 8 lag between when a policy might come into effect and
 9 when you might notice the impact of that on the number
 10 of cases, which is tied to the time it takes the
 11 Covid-19 disease to incubate and spread.

12 **Q.** I've described it, perhaps a little cheekily, as
 13 self-evident. It is obvious, though, isn't it, that if
 14 you apply a measure, a restriction, because it takes the
 15 effect of some sort of restriction, it is bound to have
 16 a beneficial impact in terms of limiting
 17 the transmission of the virus?

18 But on account of the way in which a viral outbreak
 19 or a virus disease will spread, what is the particular
 20 significance, what is the particular need for acting
 21 fast?

22 **A.** It's precisely to stop before it starts. Once it's
 23 become so widespread that you are inevitably going to
 24 have some degree of non-compliance leading to further
 25 spread, it's too late for those measures to have

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1 seemed to have this effect.

2 **Q.** What about mask wearing?

3 **A.** Mask wearing is indeed one of the factors that has been
 4 shown. I think I would -- I note the Royal Society's
 5 report on this fact, showing quite a clear balance of
 6 evidence that the right kind of mask wearing in
 7 particular has reduced transmission.

8 **Q.** When you say the "right" type of mask, do you mean
 9 medical masks, respirators, as opposed to cloth masks?

10 **A.** That does seem to be where the evidence shows, yes.

11 **Q.** Now, you've used the word "stringent". In the context
 12 of border measures, for example, is there a link between
 13 the efficacy, the effect of a particular measure or
 14 border measure and the ruthless degree or the stringency
 15 by which such a measure has to be applied?

16 **A.** For border measures, it's important to think slightly
 17 more broadly about the role they might play alongside
 18 others. So oftentimes restrictions on international
 19 travel were geared not at clamping down on local spread
 20 but, for example, at preventing new entrance into
 21 a population for example of a new variant. So I might
 22 suggest that there -- it should be assessed in
 23 a different way. But yes, on average, we see a tendency
 24 for stronger restrictions on travel to be associated
 25 with reductions in the spread of the disease.

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1 the kind of clampdown effect they would have had if it
 2 were just a few people. So it's a simple kind of fact,
 3 mathematical logic of exponential growth, that once you
 4 have passed the point of a certain threshold of spread,
 5 it's not going to be feasible to bring that down without
 6 a very prolonged and intense level of restriction.

7 **Q.** Did the tracker and did the reviews, the literature
 8 reviews of the tracker and the data that it collated,
 9 reach any conclusions in relation to individual NPIs
 10 beyond that of the one concerning the banning of
 11 mass gathering, to which you've already referred,
 12 including matters such as school closures? Was there
 13 a significant link between the closing of schools and
 14 a reduction in the transmission of the virus thereafter?

15 **A.** Yes. So as was mentioned, the exact impact of any
 16 single measure in a given instance is always going to be
 17 difficult to say, because they tend to come in packages.
 18 But on balance, the literature shows, as you would
 19 expect, policies that are more effective at preventing
 20 people from meeting each other are going to be the ones
 21 that have the greatest impact on cases,
 22 hospitalisations, and eventually deaths. So stay at
 23 home measures were obviously one of the most strong --
 24 we observed, one of the strongest overall tendencies to
 25 do. But school closures, workplace closures, also

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1 **Q.** And is that fairly obvious, because with border
 2 measures, with restrictions on travel, there is a range
 3 of measures which could be applied, from screening for
 4 symptoms of the virus, whether you've got a temperature,
 5 whether or not you're showing signs of fever, all
 6 the way across to a full-blown closure of your border?

7 **A.** Correct.

8 **Q.** And if you apply a border measure which is less
 9 stringent, for example a temperature check or
 10 a screening, it is much more likely to allow the virus
 11 to continue to enter any particular country because
 12 the nature of that sort of measure is extremely hard to
 13 police and to enforce and to --

14 **A.** Correct. And it's really the most stringent measures,
 15 for example closures or required long periods of
 16 quarantine, say in hotels, that show this particularly
 17 high effect on transmission.

18 **Q.** I've already asked you about the generic difficulties of
 19 trying to apply a counterfactual position and of trying
 20 to drill down into the impact of specific measures. Is
 21 it for those reasons that you can't express a view,
 22 for example, as to what the specific impact might have
 23 been in the United Kingdom of banning mass gatherings
 24 earlier? For example, you're aware of the Six Nations
 25 matches which were held in February and March,

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1 a football match between Atlético Madrid and Liverpool
 2 and so on, and a racing festival at Cheltenham. Does
 3 the data and the literature provide you with any answer
 4 as to what might have been the impact had those large
 5 mass gatherings not taken place?

6 **A.** A study could be done, a modelling study, which would
 7 have tried to use mathematics and statistics to create
 8 a counterfactual for comparison, but no, we can't look
 9 back in an observational way and say: had this been done
 10 earlier, definitely this would be the impact. Rather we
 11 can say is: let's look at all of the countries in
 12 the world, see which ones imposed this kinds of mass
 13 gathering bans, what the impact was on their disease
 14 situations and then try to interpolate that to the UK.
 15 That's the level of evidence that we can provide.

16 **Q.** Turning to the second topic, strength matters. Plainly
 17 some measures are more stringent, more ruthless than
 18 others. Stay at home orders, by virtue of their
 19 mandatory nature, are amongst the most strong policy
 20 interventions, are they not?

21 **A.** Correct.

22 **Q.** Does the data and the review show, not surprisingly,
 23 unsurprisingly, that stay at home orders had
 24 the greatest impact in terms of the policy impact? They
 25 had the greatest consequence?

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1 the available scientific literature is based on earlier
 2 phases of the pandemic, that's when most of these
 3 studies were done, because even though it's now
 4 especially self-evident perhaps to us now that these
 5 kinds of measures did reduce transmission and therefore
 6 cases and therefore hospitalisations, and therefore
 7 deaths, that evidence base did not exist in the same
 8 kind of robust way for this particular disease when it
 9 had recently emerged. So there's a huge flurry of
 10 studies in that first period.

11 As the pandemic progressed, new research questions
 12 around, say, vaccination, drew attention and so there
 13 was a wider range of topics that needed to be
 14 considered. But overall, the studies that were
 15 conducted on NPIs across the period of the pandemic do
 16 show consistent results.

17 As the pandemic progressed, however, one of the most
 18 important things to control for -- well, two of the most
 19 important things to control for were how vaccinated
 20 a population was, how vulnerable it was, how exposed it
 21 had been, and in the same vein how different variants of
 22 Covid-19 were more or less transmissible.

23 So we expect in a more vaccinated population or one
 24 that had been exposed to higher levels of infection
 25 before we'll see less of an effect, because there is not

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1 **A.** To the extent we can distinguish individual policies, as
 2 we've discussed, yes, they do seem to have a very large
 3 impact.

4 **Q.** Similarly, did the closing of schools and the limiting
 5 of mass gatherings also have, as these things go, more
 6 effective impact than other less stringent measures?

7 **A.** So some of the -- it would depend on the level of
 8 closure. So some mass gatherings for example were not
 9 completely banned but were allowed to occur with, say,
 10 a 2-metre rule or other kinds of mitigating factors, so
 11 we would say a more stringent measure is one at the top
 12 of our scale, not so much about the intervention -- kind
 13 of intervention but rather the degree of stringency to
 14 which it was applied.

15 **Q.** Perhaps again self-evidently, the benefit of a more
 16 stringent measure was, it would seem, not just
 17 a reduction in transmission but also a better outcome in
 18 terms of health and death rates?

19 **A.** Correct.

20 **Q.** Did that general proposition apply throughout
 21 the pandemic? So in the latter stages of the pandemic,
 22 across the world, do stringent measures have the same
 23 general impact as they did in the earlier stages of
 24 the pandemic, and if not why not?

25 **A.** So we must recognise that the bulk of the evidence in

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1 as much vulnerability. And also with a more
 2 transmissible version of the virus, it would be
 3 important -- we'll see a less significant effect,
 4 because more would be needed to achieve less.

5 **Q.** So, hoping I don't do a terrible injustice to your
 6 learning trying to summarise it, later during the
 7 pandemic, when populations by and large had become more
 8 vaccinated, such governmental measures as were put into
 9 place at that time would be bound to have less impact
 10 and less effect because the populations had by then
 11 already become vaccinated and therefore there was,
 12 firstly, less need for stringent measures, and secondly,
 13 by comparison to the beneficial impact of vaccination,
 14 whatever stringent measure you might otherwise put into
 15 place would have less impact.

16 And secondly, as variants came through with
 17 different transmissibility features, for example
 18 a particular variant might have an impact on young
 19 persons and children, the closing of schools at that
 20 point would have proportionately, therefore, a greater
 21 impact?

22 **A.** If that were the case, that would indeed line up in that
 23 way. So the overall relationship remains the same --
 24 more stringency, more speed, fewer cases, fewer
 25 hospitalisations, fewer deaths -- but the size of that

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1 effect will go down as the population gains more
 2 protection through immunity, and the size of that impact
 3 will go down as the transmissibility of the disease
 4 increases.
 5 **Q.** Test, trace and isolate measures were applied by
 6 a number of governments. It's common ground, and not
 7 open now, I think, to serious debate, that
 8 the United Kingdom was not a country that was able to
 9 deploy significant test, trace and isolate measures in
 10 the early days of the pandemic.
 11 Does your data show that test, trace and isolate
 12 measures were, generally speaking, highly effective?
 13 **A.** Our review of the literature does show this to be the
 14 case. Indeed, the evidence base, we must say, though,
 15 is harder here, because it's very difficult to find
 16 comparable information across countries on, for example,
 17 the percentage of contacts traced each time, with
 18 the time it takes to trace those contacts. Even here in
 19 the UK we don't have, necessarily, consistent
 20 information about those two key variables over the whole
 21 course of the pandemic.
 22 So here there is a slight difference in the quality
 23 of the evidence the world has available but the studies
 24 that have been done nonetheless very clearly show that
 25 effective test, trace, isolate and support measures were

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1 **A.** Correct. So there are two categories of studies that
 2 are particularly relevant here: first, a number that
 3 show that existing levels of economic deprivation or
 4 short-term economic shocks reduced compliance; and
 5 secondly, and relatedly, when there's economic support
 6 that's provided, either through governmental programmes
 7 such as the furlough scheme here in the UK or, as was
 8 the case in many countries, through social
 9 organisations, for example in India an extensive social
 10 provision of food to vulnerable households, this was
 11 very helpful in ensuring greater compliance with NPIs.
 12 **Q.** The costs of prolonged restrictions is your next theme.
 13 Again self-evidently perhaps, the evidence which you
 14 looked at strongly suggests that strict and prolonged
 15 non-pharmaceutical interventions will have negative
 16 impact on mental health, educational prospects,
 17 particularly deleterious effects on older adults, and
 18 also the increased prevalence in domestic violence?
 19 **A.** Correct.
 20 **Q.** Were there a number of studies which showed that in
 21 relation to that latter issue, that of domestic
 22 violence, there were substantial increases in domestic
 23 violence as a result of the prolonged use of some NPIs,
 24 and that was in countries in Europe and in America,
 25 across the world?

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1 very helpful.
 2 **Q.** Contrary to what I suggested to you earlier, which is
 3 that it's generally not possible to demonstrate
 4 the counterfactual position, have there, in this
 5 particular field, the field of test, trace and isolate,
 6 nevertheless been some studies which did attempt to
 7 predict or to show what the position would have been in
 8 the United Kingdom had there been more comprehensive
 9 levels of testing and contact tracing?
 10 **A.** That's correct.
 11 So I would direct you to page 15. We have
 12 summarised a study by Panovska-Griffiths et al 2020
 13 which was, as I said before, a modelling study, so using
 14 hypothetical parameters to estimate the effect of
 15 a counterfactual, and in that case they did show that
 16 TTI strategies could have been successful in particular
 17 in the second wave of Covid-19 in the UK if they had
 18 been more effective at capturing a wider range of
 19 contacts and more quickly.
 20 **Q.** Turning to economic support and the bolstering of
 21 compliance, were there a number of studies which showed
 22 in general terms that when stronger, so more extensive,
 23 more generous, economic support policies were adopted,
 24 compliance with whatever social measure, for example
 25 self-isolation, that was in place was better?

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1 **A.** Indeed. And it's striking to see such consistency in
 2 the findings across very different contexts. Indeed, in
 3 countries where the previous levels of domestic violence
 4 were also quite different, all showed a similar
 5 increase.
 6 **Q.** Again, we've heard evidence on this from a number of
 7 sources, the application of more stringent
 8 non-pharmaceutical interventions also had
 9 disproportionate impact on various sectors of
 10 the populations in each of the countries, on ethnic
 11 minorities, members of ethnic minorities, ethnic groups,
 12 women, the elderly, those living alone, and those
 13 suffering from comorbidities as well as those who were
 14 otherwise economically disadvantaged?
 15 **A.** That's correct, and it truly is one of the cruellest
 16 injustices of this pandemic that often similar people,
 17 similar groups of people who were both vulnerable to
 18 Covid were also vulnerable to the effects of actions
 19 against Covid.
 20 **Q.** Some countries have, of course, been praised for
 21 the stringency and the rapidity of their
 22 non-pharmaceutical interventions, South Korea being one
 23 of them, but even in such countries did those
 24 non-pharmaceutical interventions strike
 25 disproportionately hard upon some sectors of

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1 the population?

2 **A.** They certainly did, and the elderly population in

3 South Korea, one study showed, was particularly

4 negatively affected by the policies the government put

5 into place. And I'd add that these differential

6 extracts were often exploited by the virus to affect

7 larger populations. So, for example, in Singapore,

8 a country which is particularly effective in managing

9 the disease overall, one large, relatively uncontrolled,

10 outbreak occurred first in a population of migrant

11 workers, who are one of the more marginalised groups in

12 society, and so there the differential impacts were not

13 just an injustice but also a detriment to the country's

14 overall response.

15 **Q.** Turning to page 19 of your report, you then turn to

16 focus upon the United Kingdom Government's own

17 responses, but in a comparative perspective. By which

18 do you mean that you've looked at the NPIs which were

19 applied in the United Kingdom and you've compared them

20 in terms of the speed and stringency with which they

21 were imposed by the government here against other

22 countries and in relation to the particular nature of

23 those NPIs?

24 **A.** Correct.

25 **Q.** Now, at page 21, do you produce a figure, you call it

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1 the virus has already spread in a country.

2 So did you, on page 23, compare the position of what

3 delays there had been before the NPIs were applied after

4 the 100th confirmed case in each of the countries?

5 **A.** Correct.

6 **Q.** And in general terms, what did that chart show about

7 the extent of the elapse of time or, perhaps more

8 pejoratively, delay?

9 **A.** It shows very clearly, figure 3B, that in relation to

10 the spread of the virus, restrictive measures across

11 the United Kingdom came into place much more slowly than

12 they were put into place in other groups of comparator

13 countries, different regions, similar -- countries with

14 similar political systems, those with similar

15 populations or age profiles, et cetera.

16 And this is particularly true, it's really not --

17 the only real place where the United Kingdom's

18 restrictions were broadly comparable were for the two

19 categories, panels E and H, on protection for the

20 elderly and stay at home requirements, but on every

21 other NPI we looked at, there's a considerable delay in

22 the UK measures compared to other groups of countries.

23 **Q.** Are there two points that must be made, two additional

24 points that must be made, in relation to the chart at

25 3B: firstly, it might be thought that England had

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1 figure 3A, which shows, in respect of England, Scotland,

2 Wales and Northern Ireland, and by the division of

3 particular NPIs, school closures, workplace closures,

4 cancellation of public events and so on and so forth,

5 how many days elapsed between the first confirmed case

6 of Covid in each of those countries and the time, the

7 point at which that particular NPI was imposed?

8 **A.** Correct.

9 **Q.** And in general terms, do you conclude or does

10 the literature show that for the majority of these NPIs,

11 England, Scotland, Wales and Northern Ireland delayed --

12 or there was a greater elapse of time before

13 the imposition of these NPIs than really the majority of

14 all other countries?

15 **A.** That's correct. I would also draw your attention to the

16 following figure, 3B, which looks at --

17 **Q.** We were going to get there.

18 **A.** Wonderful.

19 **Q.** Well, let me ask you this, Professor: the danger in

20 relying too much upon a chart that shows the delay

21 between the first confirmed case of the virus and

22 the imposition of NPIs, is that the first confirmed case

23 has a degree of variability as to when it might be, and

24 that may depend on a lot of different reasons, and it

25 may also not be a fair reflection of the extent to which

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1 delayed to a greater extent than Scotland, Wales and

2 Northern Ireland because, for example, in relation to

3 school closures, workplace closures and cancellation of

4 public events, the bar chart is longer? But is that

5 because, at the point at which the United Kingdom

6 applied those measures, which it did simultaneously in

7 many places on many occasions, for England, Scotland,

8 Wales and Northern Ireland, by that point in time the

9 virus had been prevalent in England for longer?

10 **A.** That's correct. So if we were looking at this in normal

11 calendar time, the different parts of the United Kingdom

12 would look much more similar. If we were looking at

13 this in calendar time, the United Kingdom as a whole

14 would look sort of in the middle of the pack relative to

15 most other countries. But of course the virus doesn't

16 think about calendar time, it thinks about its own

17 spread. So this chart is showing us, if you will,

18 a virus time perspective, and for decision-making that's

19 of course the key metric.

20 **Q.** The second most important point, perhaps, is that

21 the stay at home requirement was imposed in

22 the United Kingdom, the mandatory lockdown, of course

23 simultaneously or very close in time to the cancellation

24 of public events, workplace closures, school closures

25 and the closing of public transport, because that was

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1 the effect of the lockdown, and that is why there is
 2 very little by way of a delay in relation to the stay at
 3 home requirement in the middle of that page.
 4 **A.** It's because, yes, the stay at home measure came into
 5 place, you know, on March 23rd, quite close to the 100th
 6 case, which was -- I think it was a few weeks before
 7 that. But other kinds of policies can be(?) put into
 8 place in softer forms before that. So it wasn't a 100%
 9 "You must not go to school", but there were different
 10 kinds of suggestions that were being made,
 11 recommendations, et cetera, so some of that's captured
 12 here as well.

13 **LADY HALLETT:** I'm afraid I'm still struggling with the
 14 virus time and real-time concept. Could you just run it
 15 past me again, Professor, please?

16 **A.** Of course, my Lady. So the bottom axis here, the X axis
 17 along the bottom, which is a very small number,
 18 I apologise, you will see it shows zero on the
 19 left-hand, then goes 5, 10, 15, 20. So those are
 20 the number of days since the 100th case.

21 So, for England, that will be -- the clock will
 22 start -- I'm sorry, I don't have the exact date in my
 23 mind, but it started before, because England had 100
 24 cases long before Scotland did, long before Wales did,
 25 and before Northern Ireland did. So for each of these

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1 **Q.** So if we look at school closures in the top left,
 2 the red line, which I think we can see more clearly than
 3 other lines, is the United Kingdom, is it not?

4 **A.** That's correct.

5 **Q.** And so we can see that in relation to school closures,
 6 in the early days there was a fairly high level of
 7 stringency, the United Kingdom was more severe, more
 8 strict in terms of the school closures, meaning any
 9 possibility of what was being done in relation to
 10 schools, but then the red line comes right down to
 11 a very low level of stringency and then goes back up.

12 Similarly workplace closures, on the right-hand
 13 side. We can see that in the early days workplace
 14 closure was prevalent, of course, in the United Kingdom
 15 because of the lockdown, was more strict than almost all
 16 other countries or regions, it comes back down but not
 17 as far as the lower level of stringency for other
 18 countries, and then goes rocketing right back up again,
 19 of course, around the time of the second wave?

20 **A.** Yeah.

21 **Q.** We can see, if you scroll back out, a similar pattern of
 22 cancelling public events, restrictions on gatherings,
 23 closing public transport, stay at home, but particularly
 24 restrictions on internal movement, a very high level of
 25 stringency, effectively, during the first wave, and

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1 jurisdictions, and as well as all the comparators, we're
 2 measuring when they put in place a measure based on how
 3 far it was from the 100th case, not when the -- what
 4 the date on the calendar was.

5 **LADY HALLETT:** Thank you.

6 **MR KEITH:** Or putting it another way, at the point at which
 7 the particular measure was imposed for
 8 the United Kingdom, the virus had already spread further
 9 in England?

10 **A.** Correct.

11 **Q.** And more time had passed since the first or the 100th
 12 case?

13 **A.** Correct.

14 **Q.** Can we then turn to a different topic, which is on
 15 page 24, the comparison between the timing and intensity
 16 of UK responses to other countries.

17 On page 25, to go forward one page, you produce
 18 table 4, which is entitled, we can see from the
 19 left-hand side of the page, "Policy Strength". Over
 20 time, that is to say the whole period of the pandemic,
 21 have you looked at, in these charts, the stringency,
 22 the general level of severity of the measures applied by
 23 each country and compared them over time with a very
 24 large number of other countries across the world?

25 **A.** Correct.

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1 then, relatively speaking, a very considerable drop in
 2 the level of severity, the summer of 2020, and then
 3 moving right back up again at the time of the second
 4 wave?

5 **A.** Correct.

6 **Q.** What that shows, does it not, is that there was a degree
 7 of rollercoaster element in the United Kingdom's
 8 response? By comparison, I emphasise, to other
 9 countries, we went right up the scale and reacted, some
 10 would say overreacted, at the first wave, then
 11 underreacted between waves, and then rocketed right back
 12 up again at the time of the second wave?

13 **A.** There's certainly, in the United Kingdom's response, as
 14 in many other countries, I should add, an element of
 15 ramping up, ramping down, ramping up, ramping down, and
 16 so the metaphor of a rollercoaster does come to mind.

17 The important difference between this line of -- red
 18 line showing the United Kingdom as a whole and the other
 19 countries. (inaudible) of course, these are averages,
 20 the other ones, so there will be, within every one of
 21 those lines, a number of countries, some a bit higher,
 22 some a bit lower, this is showing the central tendency
 23 of these different groups.

24 So as the legend has fallen off the screen, zoom in
 25 here, but you will see, for example, that the yellow

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line is Parliamentary democracies, across the world, and indeed the UK is higher right through to the middle of 2021; after spring 2021 becomes much lower on average, across all these different measures.

Q. You have already taken us to the earlier charts, which showed us much more carefully the delay at the beginning. These charts show overall the level of stringency over time.

Are you able to reach a view as to whether, in general terms, the United Kingdom applied non-pharmaceutical measures only when it became apparent that they were unavoidable, because they were delayed and at the time at which they were then imposed we know in the United Kingdom the NHS was believed to be likely to collapse, and then when they're lifted there is then a long period of delay before consideration appears to be given to their reintroduction, and then when they are reintroduced, again, because of the passage of time and the lateness, there is a requirement for those restrictions to be ever more stringently reimposed?

A. Correct. So we see this rollercoaster tendency where restrictions are put into place only after it becomes apparent there will be a very severe threat to the health system. That's after a large amount of community spread has begun. Because it's so prevalent

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measures to maintain a very low level of spread, and, when a new outbreak would emerge, to quickly react to make sure those individuals were not involved in further spreading the virus. That prevented them from getting to the point of a wider population spread, in many instances, that would have required more restrictive stringent measures to control.

So the effective use of these testing measures was a nice way of maintaining a low level of spread and therefore not beginning the rise of the rollercoaster back up the ramp.

Q. Did you also find a link between those countries which had that testing capacity and which were able to avoid relatively stringent NPIs and those countries which suffered the most in terms of excess number of deaths, economic performance, and general health impact?

A. Correct. So the countries that were riding the rollercoaster were referring from a trifecta of large health impacts, high, long periods of stringency, and negative economic consequences, and those that were able to maintain a low level of spread, perhaps through effective TTI measures, were able to have a better outcome on all three of those measures.

Q. Overall, does the literature and the data from your tracker project show that there were some areas of

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at that moment, the restrictions need to be more stringent and to be in place for a longer period of time than might have been the case otherwise, but precisely because sustaining high stringency for a long period comes with costs, there's huge pressure to roll them back sooner rather than later and that leaves, inevitably, some residual virus circulating in the population, which lays the seeds for the next wave to emerge. So this kind of tendency to act too late in the first instance and to take measures away too soon in the second instance does tend to lead to the peaks and troughs that these graphs show.

Q. Do later charts and figures, which I won't take you to, show that an analysis, putting together some of the threads that you have identified, of those countries which had significant or substantial testing, contact tracing and isolation systems against those countries which were not obliged to impose NPIs at such high levels of stringency because they had effectively delayed, show that the presence of significant testing, contact tracing and isolation measures allowed countries not to have to react by way of the imposition of such severe stringent measures?

A. Indeed. So countries as diverse as Japan, South Korea, Vietnam, others, were able to use testing and tracing

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conspicuous success for the United Kingdom: the speed and scope of its genetic sequencing, because that allowed it to be very well placed to assess the emergence of variants and the spread ultimately of the virus; a very considerable and impressive degree of ability to test and survey and keep tabs on the spread of the virus, particularly in the middle and later stages of the pandemic, through surveys such as the ONS COVID-19 Infection Survey; and the speed and extent of the vaccine deployment?

A. Correct.

Q. But the absence of a test, trace and isolation process ultimately led to the data and the findings which you've reached in relation to the delay and then the repeated reintroduction of extremely stringent and damaging measures?

A. We do see consistently that countries that performed well, were able to avoid the rise and fall of cases, deaths and restrictive measures, were those that used the testing, tracing, isolation and support measures effectively, alongside other measures.

MR KEITH: Thank you very much.

LADY HALLETT: Thank you very much indeed, Professor Hale. An extraordinary project.

THE WITNESS: Thank you.

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1 **LADY HALLETT:** I had no idea projects like that were going
2 on, and I think one of my previous witnesses asked for
3 global comparisons, so extremely helpful, thank you.

4 **THE WITNESS:** You're very welcome.

5 **(The witness withdrew)**

6 **LADY HALLETT:** Shall we break now for lunch?

7 **MR KEITH:** Certainly.

8 **LADY HALLETT:** Because I think this afternoon's witness is
9 here, but you'd probably like to have a --

10 **MR KEITH:** By all means.

11 **LADY HALLETT:** 1.45, please.

12 **(12.47 pm)**

13 **(The short adjournment)**

14 **(1.45 pm)**

15 **LADY HALLETT:** Mr Keith.

16 **MR KEITH:** My Lady, the next witness is Sir Mark Walport.

17 **SIR MARK WALPORT (affirmed)**

18 **Questions from LEAD COUNSEL TO THE INQUIRY**

19 **MR KEITH:** Could you give the Inquiry your full name,
20 please.

21 **A.** Yes, I'm Sir Mark Jeremy Walport.

22 **Q.** Sir Mark, you gave evidence in Module 1, so let me
23 welcome you back.

24 **A.** Thank you.

25 **Q.** And thank you for the provision of a further statement,
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1 I'd got that one right.

2 The UKRI is an amalgamation, is it not, of what were
3 formerly known as research councils; it provides funding
4 to researchers, businesses, universities, charities,
5 NGOs and the like in relation to the broad field of
6 science and medicine?

7 **A.** Broader than that, actually. So it was created by Act
8 of Parliament, came into existence in 2018, and brought
9 together the seven research councils, which cover
10 everything from the arts and humanities to
11 the biological, physical, medical sciences.

12 It also brings together the UK's innovation agency,
13 Innovate UK, and also, in the case -- and for all those
14 activities is UK-wide. It also incorporates
15 Research England, which provides infrastructure support
16 for English universities.

17 **Q.** Could you please, whilst you give evidence -- it's my
18 fault for not reminding you -- try to go as slow as you
19 possibly can.

20 **A.** Sorry.

21 **Q.** The reason I ask you about the UKRI is that during this
22 pandemic, although you were no longer the Government's
23 Chief Scientific Adviser, did you nevertheless attend no
24 less than 54 meetings of SAGE in your role as the CEO of
25 the UKRI? Why was that?
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1 and this time the Royal Society report, to which I'll
2 turn in a moment, in relation to which were the chair of
3 the expert working group.

4 **A.** That's correct.

5 **Q.** You are well known to this Inquiry. By practice you
6 specialise in clinical medicine and research as
7 a general physician and rheumatologist. You latterly
8 became head of the division of medicine at
9 Imperial College. You were director of the
10 Wellcome Trust from 2003 to 2013, and, most pertinently
11 perhaps, from April 2013 to September 2017 you were the
12 Government Chief Scientific Adviser?

13 **A.** Correct.

14 **Q.** Your successor was Sir Chris Whitty, on an interim
15 basis.

16 **A.** Correct.

17 **Q.** He was followed by Sir Patrick Vallance, as is
18 well known. The current incumbent is
19 Dame Angela McLean, and she took up her post in this
20 year, 2023.

21 You were also the founding chief executive officer
22 of the United Kingdom Research Institute, if I have the
23 acronym --

24 **A.** Research and Innovation.

25 **Q.** Thank you very much. I began to pause, I wasn't sure
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1 **A.** I did, and it was because an important responsibility
2 for UKRI was funding the research and, indeed,
3 the innovation appropriate to a national emergency. And
4 in the context of that, and actually one of the reasons
5 for the creation of UK Research and Innovation, is that
6 that research included everything from biological
7 sciences around the virus itself right through to
8 the social sciences, funded by the Economic and Social
9 Research Council.

10 **Q.** So, by virtue of your attendance on SAGE, you were able
11 to be there as the CEO of UKRI in order to prompt
12 the early and rapid funding --

13 **A.** Yes.

14 **Q.** -- of the various pieces of work or research or
15 cumulation of data that SAGE required to be done?

16 **A.** Absolutely. It was part of, if you like, a two-way
17 transmission mechanism between the mechanism that
18 provided scientific advice through Sir Patrick Vallance
19 and Sir Chris Whitty, so that we could be sure that
20 the research was relevant wherever possible.

21 **Q.** As part of your many roles, are you also an elected
22 fellow of the Royal Society, I think a position that you
23 have held since 2011, as well as being its
24 vice president and, wonderfully, its foreign secretary?

25 **A.** Indeed.
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1 Q. The Royal Society is, I think, the oldest scientific
2 academy in existence, or at least in continuous
3 existence, having been founded in 1660, but it
4 essentially recognises, promotes and supports excellence
5 in science, and is it by virtue of that function that
6 you came to chair the working group that produced
7 the report that you have exhibited for us?

8 A. I was actually asked to chair it before I became
9 the foreign secretary, by virtue of my sort of broad
10 expertise in the area. The foreign secretary bit came
11 later, and reflects the fact that science is global and
12 so the Royal Society from its inception was very
13 international in its outlook to research.

14 Q. The report that the Royal Society has produced, and it
15 forms the heart of your evidence in this module, was
16 produced and published, was it not, in order to set out
17 in general terms what has been learnt about
18 the effectiveness of the application of what we now well
19 understand to be non-pharmaceutical interventions; is
20 that correct?

21 A. That's correct.

22 Q. Did the working group which comprised, I think, six
23 groups of researchers, assemble and examine evidence
24 from around the world in order to be able to determine
25 the effectiveness of that application?

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1 that every virus is different, in terms of its forms and
2 degrees of transmissibility, and that the first line of
3 defence, if you like, in relation to dealing with
4 a viral pandemic, particularly a respiratory one, was
5 the application, the consideration of NPIs because there
6 were, of course, in those early days, no antiviral
7 treatment and no vaccine?

8 A. That is absolutely correct. There were no specific
9 medical interventions at that stage.

10 But it's important to recognise that not only do
11 different viruses vary, but the coronavirus itself
12 varied over time, and the main driver for the evolution
13 of a virus or, indeed, a bacteria is to reproduce more
14 effectively. And so, in general, infectious diseases
15 tend to become more transmissible, and so the barrier
16 function of, for example, a mask becomes harder and
17 harder as the transmissibility goes up.

18 Q. In truth, all governments faced a terrible quandary, did
19 they not --

20 A. Yep.

21 Q. -- in the early days of the pandemic, because it was
22 simply not possible to know with any degree of
23 exactitude the nature of the likely spread of the virus,
24 and under that heading one might include a lack of
25 understanding of Covid, of the coronavirus' reproduction

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1 A. Yes, that's correct.

2 Q. NPIs are usefully summarised at page 20 of your report.
3 They're very familiar, of course, to this Inquiry.
4 They're defined in the report as:
5 "Any measure that is implemented during
6 an infectious disease outbreak to attempt to reduce
7 transmission that is not a vaccine or drug. NPIs can be
8 behavioural, social, physical or regulatory in
9 nature ..."

10 And they can of course be encouraged to be adopted
11 or applied through a variety of approaches from advice
12 and guidance to the force of law. And they comprise
13 masks and face coverings, social distancing and
14 lockdowns, and over the page, test, trace and isolate,
15 travel restrictions and controls, environmental
16 controls, and communications, which, although not
17 a measure, form an essential part of the debate about
18 the efficacy of non-pharmaceutical interventions?

19 A. That's correct. And of course they all have in common
20 that they're intended to reduce the transmission of
21 an infectious disease, in this case a virus, by acting
22 to reduce the exposure of people to the hazard which is,
23 in this case, SARS-CoV-2 virus.

24 Q. At the heart of any examination of NPIs, and of their
25 efficacy, must there be an acknowledgement of the fact

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1 number, whether it was asymptomatic or pre-symptomatic,
2 what its incubation period was, what its latent period
3 was, what its generational period was, how quickly it
4 would double in size and so on, all that was unknown?

5 A. Absolutely.

6 Q. So to a very large extent the application of
7 non-pharmaceutical interventions took place against
8 a significant background of ignorance?

9 A. Yes, that is absolutely right. And whilst
10 the principles of how non-pharmaceutical interventions
11 work, as I've already said, because every infectious
12 disease is slightly different, then policymakers were
13 faced with an extremely difficult challenge, which is
14 new infection, as you say, much not known about it, its
15 clinical features poorly understood, and so -- but
16 nevertheless there were signs that this was a dangerous
17 virus, and so important to take precautionary measures,
18 and apply non-pharmaceutical interventions.

19 Q. Once it became apparent that this was a virus capable of
20 causing death in large numbers as well as severe injury,
21 all governments faced a terrible balance or dichotomy,
22 which was the absence of the imposition of
23 non-pharmaceutical interventions would likely lead to
24 unconscionable numbers of deaths, but the imposition of
25 non-pharmaceutical interventions against that background

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1 of ignorance, through no fault of government, would
 2 likely lead to terrible cost and damage?
 3 **A.** That is absolutely correct, and so a very strong
 4 incentive for policymakers to slow the spread of
 5 infection. And of course the other thing at
 6 the beginning of this pandemic was that it was not known
 7 whether it would be possible to make a vaccine or what
 8 medical countermeasures might become available. But
 9 there's not only the direct consequences of the virus in
 10 terms of causing illness, but also the indirect
 11 consequences in terms of health systems becoming
 12 overwhelmed, the danger of the breakdown of other
 13 aspects of national infrastructure. And so every
 14 incentive to take quite a strong precautionary principle
 15 and do the very best possible to slow or, if possible,
 16 to stop the spread of infection. And some countries did
 17 take a zero Covid approach from very early on. In other
 18 words they tried to eliminate the spread.
 19 **Q.** I'm pleased to say that we shan't be engaging today,
 20 Sir Mark --
 21 **A.** No.
 22 **Q.** -- in the conceptual debate of suppression versus
 23 mitigation --
 24 **A.** Correct.
 25 **Q.** -- but that debate is reflective, isn't it, of one of

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1 the pandemic, there was no opportunity for them to be
 2 able to put into place at the same time any sort of
 3 system for empirical conclusions to be drawn about how
 4 effective the steps were that they were putting into
 5 place?
 6 **A.** I think it would have been extremely difficult,
 7 certainly in the absence of prior preparation of
 8 protocols. And it's also worth say that if you want to
 9 explore the specific effectiveness of one of these
 10 non-pharmaceutical interventions, then the perfect
 11 experiment is to have a population half of whom do use,
 12 half of whom don't, or use a different one. But it
 13 was -- policymakers recognised that you need to use
 14 non-pharmaceutical interventions in combination, and so
 15 there was a priority to introduce measures in
 16 combination.
 17 **Q.** And, bluntly, the governments had to get on with the job
 18 in hand --
 19 **A.** Absolutely.
 20 **Q.** -- and do whatever they could to combat the virus --
 21 **A.** Correct.
 22 **Q.** -- with maximum speed?
 23 **A.** Correct.
 24 **Q.** The study which the Royal Society has therefore carried
 25 out is an observational study, is it not?

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1 the many extremely difficult decisions that all
 2 governments have to make?
 3 **A.** Correct.
 4 **Q.** At the time of the commencement of the pandemic, was
 5 there much by way -- or any objective analytical
 6 information or research available to governments as to
 7 the likely effects or impacts of this broad range of
 8 non-pharmaceutical interventions?
 9 **A.** Well, once it became clear, which it did fairly rapidly,
 10 that it was transmitted by a respiratory route, then
 11 there was a lot of evidence that if you could keep
 12 infected people away from uninfected people, that would
 13 reduce the transmission. So every reason to think that
 14 non-pharmaceutical interventions would be effective, but
 15 how effective was unknown.
 16 **Q.** Was there a large or any body of randomised controlled
 17 trial work or analysis from empirical data as to how in
 18 practice any of these NPIs would work?
 19 **A.** No. Minimal information, because so much depends on
 20 the transmissibility of the virus, and the details of
 21 the route of the transmission. So there was very, very
 22 little prior evidence.
 23 **Q.** Do we therefore take it from that that because
 24 governments were forced at great speed to apply
 25 non-pharmaceutical interventions at the commencement of

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1 **A.** It's a systematic review of the evidence. In other
 2 words, it's to look at all types of evidence. And in
 3 some cases there were trials which were deductive, in
 4 other words you could compare a group using masks and
 5 a group not using masks, but by and large, because
 6 non-pharmaceutical interventions were introduced in
 7 combination, it was extremely difficult to dissect
 8 the relative effects of one non-pharmaceutical
 9 intervention against another.
 10 So, to give you a concrete example, when strong
 11 social distancing measures are applied, then is
 12 the effect due to wearing a mask or to the social
 13 distancing? And so the groups reviewed an enormous
 14 amount of evidence and came down to a relatively small
 15 number of studies, in the hundreds, where it was
 16 possible to achieve some deductive information about
 17 the effectiveness or otherwise of the non-pharmaceutical
 18 interventions. But for those systematic reviewers who
 19 are used to working with placebo-controlled clinical
 20 trials, they would view the evidence as being far
 21 weaker, but on the other hand observational research is
 22 important, and indeed, going back through the history of
 23 the Royal Society, it's the way we have learnt about all
 24 sorts of things. You can't always do an experiment, you
 25 have to rely on observational data.

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1 So we did the work in two parts, really, which was
 2 to try to work out as much as we could about each of
 3 the individual non-pharmaceutical interventions, but we
 4 also did a number of country case studies, because that
 5 gives you a different observational approach to what
 6 happens when things are done in combination. You can
 7 learn quite a lot from those.

8 **Q.** Were those three case studies in fact studies drawn from
 9 Hong Kong, New Zealand and South Korea?

10 **A.** That's correct.

11 **Q.** Finally by way of introduction, the value of
 12 the Royal Society's report to this Inquiry is, if I may
 13 say so, self-evident, but for what general purposes did
 14 the Royal Society engage this valuable piece of work?

15 **A.** Erm --

16 **Q.** Is it, if I may ask, in order to promote the general
 17 learning and understanding of this topic, or did you
 18 have an eye towards its use and its importance for
 19 the purposes of future crises which might befall us?

20 **A.** I think the answer is both, actually. So research
 21 advances through individual discoveries, but importantly
 22 it advances through the aggregation of knowledge derived
 23 from a variety of studies.

24 During the pandemic the Royal Society did convene
 25 two committees to provide evidence reviews, and so it

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1 level in Scotland. So we were more interested in
 2 the evidence and its quality than its geographical
 3 origins.

4 **Q.** Thank you very much.

5 Could we now then turn, please, to the general
 6 findings --

7 **A.** Yep.

8 **Q.** -- the conclusions reached by the research done by
 9 the Royal Society in relation to each of the NPIs, and
 10 we'll pick up the thread, if we may, at page 28 of
 11 the Royal Society report under the heading of "Masks and
 12 face coverings".

13 In general terms, prior to the Royal Society's
 14 report, there was very little material by way of
 15 previous systematic reviews into the effectiveness of
 16 the wearing of masks, and by masks I mean cloth and
 17 medical and respiratory and the whole range of masks; is
 18 that correct?

19 **A.** That's correct, yes.

20 **Q.** The research looked at available evidence in relation to
 21 the efficacy of all masks, as I've suggested,
 22 respirators, surgical masks and face coverings such as
 23 cloth masks; is that correct?

24 **A.** Yes.

25 **Q.** There were a number of -- 35 observational studies, in

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1 was a logical extension of that work that, at a time
 2 when it was really important to understand the best
 3 evidence that we have on the effectiveness of
 4 non-pharmaceutical interventions, it was a timely report
 5 to produce.

6 **Q.** It's implicit in what you've said already, Sir Mark,
 7 that the review comprised a minute examination of
 8 studies and reports and research materials from across
 9 the world.

10 **A.** Yes.

11 **Q.** One of the core participants has asked the Inquiry to
 12 ask of you the extent to which the research covered
 13 material produced in or relating to Wales, and I suppose
 14 one could draw from that question a wider question,
 15 which is: can you say anything about the degree or the
 16 proportion of that research material which related to
 17 the United Kingdom as opposed to the rest of the world?

18 **A.** I don't think I can answer that question specifically.
 19 We deliberately looked worldwide, and the, you know,
 20 criteria for inclusion was that it was published in
 21 English, and so I can't answer the question specifically
 22 with respect to Wales. But I can say, as an example of
 23 a study which is actually slightly outside the remit of
 24 this, we learnt an enormous amount about the efficacy of
 25 the vaccines from studies that were done at a population

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1 fact, which were looked at. And in relation to
 2 the effectiveness of masks in reducing SARS-CoV-2
 3 transmission, if we go over the page, did the majority
 4 of the studies themselves conclude that masks and mask
 5 mandates, by which I presume you mean mandatory
 6 orders --

7 **A.** Yes.

8 **Q.** -- to wear a mask, reduced infection compared to those
 9 studies that found there had been no effect?

10 **A.** Yes. So there were 35 studies in community settings.
 11 Three of them were in fact randomised controlled trials,
 12 and there were 32 observational studies, and then were
 13 a further 40 studies in healthcare settings, one of
 14 which was a randomised control trial, and
 15 39 observations.

16 The majority of those studies, the large majority,
 17 showed that the masks were effective. And importantly
 18 there was a gradient. In other words, respirator masks
 19 were more effective than surgical masks, and mask
 20 wearing in the context of a mandate, in other words
 21 an instruction with more or less legal force behind it
 22 to wear masks, was also more effective.

23 So, if you like, the plausibility of the results was
 24 emphasised by that gradient of effect. In other words,
 25 you might expect that a very -- you know, the sort of

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1 masks that you'd wear in a -- if you're exposed to
 2 a dangerous toxin is much more likely to be effective
 3 than a loosely fitting mask.
 4 I should qualify it by saying that there was
 5 information about mask wearing in other infections, and
 6 in fact there were evidence syntheses, and we've learned
 7 about flu as well. So it's not that there was no
 8 evidence, but there was no evidence in relation to masks
 9 in coronavirus.
 10 **Q.** The issue of mask wearing is a particularly vexed one in
 11 the context of the general population. To what extent
 12 did the research indicate a level of efficacy for
 13 cloth masks of the type that the government might order
 14 or mandate a population to wear, so non-medical?
 15 **A.** I don't think there were any of the systematic reviews
 16 that could distinguish between, say, cloth masks and
 17 surgical masks, so I don't think we have information to
 18 answer that.
 19 **LADY HALLETT:** Was there also, do I remember, conflicting
 20 advice about mask wearing and its effectiveness and
 21 whether it engendered complacency?
 22 **A.** There are lots of interpretations of the evidence, and,
 23 you know, this is one of the challenges with
 24 observational data. It could be that those who avidly
 25 wore masks of any sort were more likely to socially

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1 **Q.** -- care home measures, mass gathering and physical
 2 distancing.
 3 In general terms, and I suggested similarly to
 4 Professor Hale before you, perhaps not surprisingly,
 5 the research showed that these social distancing
 6 measures were associated with considerable, that is to
 7 say significant, reductions in community level
 8 transmission of SARS-CoV-2?
 9 **A.** That's correct.
 10 **Q.** Was there a link found between the degree of stringency
 11 in the application of these various measures and
 12 the degree of reduction in transmission?
 13 **A.** Yes, broadly there was. So stay at home orders --
 14 the more stringent the measure, the more effective. The
 15 restrictions on mass gatherings were important. But
 16 each of them were effective, and of course quite often
 17 these were applied in combinations as well, and I think
 18 it's important, we will come back to it I think, but
 19 NPIs work in combinations, that's the critical thing,
 20 but none of them -- I mean, physical separation on its
 21 own, if one had been able to physically separate people
 22 for a prolonged period of time, would have a very
 23 profound effect, but would also be possibly unhealthy in
 24 other ways.
 25 **Q.** But a stay at home order --

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1 distance themselves. So there are other
 2 interpretations. But nevertheless, and particularly,
 3 I think, in the healthcare setting, where people are
 4 more likely to wear the masks correctly as well --
 5 because anyone who saw mask wearing, a lot of masks were
 6 worn underneath the nose where they would do no effect
 7 or weren't fitting properly. So it's another case where
 8 the fact that actually they were shown to be effective
 9 in healthcare settings suggests that there were --
 10 you know, there was, if you like, a causal relationship
 11 between the mask wearing and the protection.
 12 **MR KEITH:** The next broad group of NPIs that the research
 13 addresses is the social distancing and lockdowns on
 14 page 31. Under that heading, does the report include
 15 recommendations for people to stay separated from other
 16 individuals, as well as legal mandates to stay at home?
 17 **A.** There were 34 studies on physical distancing, as opposed
 18 to 151 studies that looked at stay at home orders. So
 19 the group that did the social distancing and lockdown
 20 work divided into, I think, nine different groups of
 21 social distancing measures, which included restrictions
 22 on mass gatherings, I won't read them all out, but
 23 they're listed in the report.
 24 **Q.** Workplace closures, school closures --
 25 **A.** Correct.

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1 **A.** Yes.
 2 **Q.** -- will of course encompass necessarily within
 3 the effect of such an order a form of social
 4 distancing --
 5 **A.** Yeah.
 6 **Q.** -- as well as, depending on the width of the social
 7 order -- an impact on schools, workplace and --
 8 **A.** Absolutely correct. But of course stay at home orders,
 9 you know, have to be modified in order to keep a nation
 10 working, so key workers would still have to go to work.
 11 But correct.
 12 **Q.** One of the more important points in this chapter
 13 concerns the recognition of the effectiveness of social
 14 distancing and the importance of social distancing in
 15 care homes --
 16 **A.** Yes.
 17 **Q.** -- because some of the research showed, quite plainly,
 18 that the strict cohorting of staff alongside residents,
 19 and restrictions on visitors, was associated with
 20 significantly reduced transmission, again
 21 unsurprisingly?
 22 **A.** Yes. I think that's exactly right. I think that none
 23 of this is surprising when you think about the first
 24 principles of stopping an infected person infecting
 25 an uninfected person. But that is absolutely right: in

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1 care homes, if you could restrict the movement of care
2 workers, for example, between different care homes or
3 between different populations, that reduces the chance
4 of anyone infected, in this case an infected
5 care worker, infecting large numbers of people. So
6 that's important.

7 Equally, if you have got people in a care home who
8 are infected, then keeping the staff that look after
9 them separate from uninfected people is important.

10 Q. Test, trace and isolate.

11 A. Yep.

12 Q. Quite plainly, again, there were a number of papers and
13 research articles to which the report had regard, and
14 some of that material in fact comprised detailed data
15 from the United Kingdom, did it not?

16 A. Yes, particularly the app that was used on the
17 Isle of Wight.

18 Q. Was that when the government introduced by way of
19 experiment a non -- I think it was a non-Apple,
20 non-Google app, and they applied it across
21 the Isle of Wight to see what the response would be and
22 whether or not it was effective in ensuring compliance
23 with --

24 A. That is correct.

25 Q. -- social distancing.

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1 because of course the application of all of these
2 non-pharmaceutical interventions depends on all sorts of
3 social and cultural issues as well.

4 Q. Of course.

5 A. Korea was very well prepared because it had had
6 the outbreak of MERS in 2015, and I think it's fair to
7 say that not only the government was more prepared but
8 the community was aware of what happens when you have
9 a dangerous virus in your country, and so they were able
10 to adopt -- so testing on its own with sort of voluntary
11 isolation doesn't work nearly as well as if you've got
12 very systematic testing, coupled with the tracing and
13 the isolation. Those are the key other elements.

14 Q. Therefore is the key feature to a system,
15 a comprehensive scaled-up system of test, trace, contact
16 and isolate --

17 A. Yeah.

18 Q. -- that it is necessary but not sufficient, because it
19 may only work either at the beginning of a pandemic or
20 during the course of a pandemic below certain levels of
21 incidence, that is to say the spread of the virus or the
22 level of incidence of the virus has to be below a point
23 at which the system of test and trace can work in
24 practice?

25 A. Yes.

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1 A. The evidence overall is strong that if test, trace and
2 isolate is applied early, and effectively, then it's
3 actually quite a powerful measure, and we may come back
4 to it when it comes to the discussion of Korea.

5 But almost all of these interventions -- the other
6 thing we haven't specifically talked about is sort of
7 the force of transmission. In other words, when there
8 are a very large number of cases in a community, so the
9 exposure goes up. And in the case of test, trace and
10 isolate, when you've got very many cases then it's very
11 difficult to apply it at a national level. So with all
12 of this, early application is important.

13 Q. That's a point, if I may suggest, of enormous importance
14 in the case of the United Kingdom, because the position
15 was, wasn't it -- and it's well established -- that
16 there was no significant or comprehensive test, trace,
17 isolate system in the United Kingdom in the early days?

18 A. Yes.

19 Q. What the evidence from South Korea, along with
20 New Zealand, Australia and a number of other countries
21 shows, that if there is in place such a system, it
22 becomes possible for the government to be able to
23 control the spread of the virus before it runs away?

24 A. Yes. I think that is correct. It is, of course,
25 difficult to extrapolate between different countries,

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1 Q. If the level of incidence is too high, no system of test
2 and trace, however sophisticated, could get on top of
3 the problem?

4 A. When the level is very high, then, you know, essentially
5 you end up testing, tracing and isolating the whole
6 country, which is where you need -- you get to lockdown
7 measures. So it is exactly as you describe, it's when
8 you have geographically limited and low levels that you
9 can remain able to test at sufficient scale and bring it
10 under control without locking down everyone.

11 Q. We may never know what the effect would have been had
12 the United Kingdom had a comprehensive scaled-up test
13 and trace, isolate system at the beginning, but is there
14 anything that can be said about the levels of incidence,
15 the incidence -- the level of spread of the virus, in
16 the early days in the United Kingdom?

17 A. Well, the one thing we do know is that in February of
18 2020 there were about 1,500 independent importation of
19 cases which was across the whole nation from people
20 who'd been away during the half term school holidays in
21 Italy, Spain and Switzerland, who had been on skiing
22 holidays, and because they were a young and fairly fit
23 population, they managed -- the sort of severe morbidity
24 wasn't really seen in that population. So the UK was
25 hit in a very widespread way very early. We didn't have

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1 tests nearly as early at scale as Korea did. So a lot
 2 of this comes back to the evidence I gave actually in
 3 Module 1, which is: the real challenge for nations is to
 4 be prepared.

5 **Q.** Of course. And were genomic studies in fact
 6 subsequently carried out, in particular a main study in
 7 the summer of 2020, which was able to trace back
 8 the genetic origin of a large number of infections --

9 **A.** Yes.

10 **Q.** -- in the United Kingdom to viral infections in France,
 11 Spain, and Italy?

12 **A.** Yes. That is correct. And as a result of that we knew
 13 that these were independent introductions.

14 **Q.** There was what is known as a widespread -- well,
 15 a spreading, a wide spreading of individual separate
 16 infections across the United Kingdom?

17 **A.** Yes. I think it's -- may go slightly beyond this
 18 report, but there were important sort of chance events
 19 in different countries that altered their experience of
 20 the disease, and obviously those countries that are
 21 extremely well connected global transport hubs were at
 22 more -- had more exposure early on.

23 **Q.** You make the point on page 35, in addition, that even
 24 where Covid-19 cases are higher, so even where there is
 25 a higher incidence, test, trace and isolation may still

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1 necessity for people to come in? And of course
 2 quarantine is then a very powerful tool for that.

3 **Q.** Starting at one end --

4 **A.** Yeah.

5 **Q.** -- does the research show that screening measures were
 6 particularly effective in controlling the spread of the
 7 virus?

8 **A.** Screening measures were very weakly helpful, because of
 9 the incidence of asymptomatic infection.

10 **Q.** Could you just elaborate, please, on that?

11 **A.** Yes. So if you have someone that you're screening on
 12 the basis of the fact that they have a temperature or
 13 they're coughing at the border, that will only pick up
 14 people who have symptomatic infection. On the other
 15 hand, it may be that there are people who are either
 16 infected but have no symptoms, or in fact are in the
 17 earliest days of an infection, and even a PCR test might
 18 not become positive for two or three days after they've
 19 crossed the border. So simply health screening on its
 20 own, even with a one-off PCR test at the border, will
 21 leak, people will leak through who have the infection.

22 **Q.** And standing back, of course every government which is
 23 considering any sort of border measure has to grapple
 24 with the conundrum of what the impact would be of the
 25 imposition of border measures in terms of trade, travel,

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1 have an important role to play, because of course it can
 2 still suppress -- perhaps only around the outer
 3 margins -- but it can still suppress the virus, even if
 4 it's not able to completely control its spread?

5 **A.** Well, that comes back to the need for the combination of
 6 measures, and so ... but, I mean, you need a very high
 7 intensity of testing if you're going to be able to
 8 effect it when there's -- the question is really whether
 9 the outbreak is geographically localised or whether it's
 10 spread.

11 **Q.** Well, that leads us on very neatly to the next broad
 12 area of NPIs, travel restrictions and controls across
 13 international borders. Does that cover, in fact, quite
 14 a wide range of measures from screening --

15 **A.** Yes.

16 **Q.** -- checking people's temperatures when they come across
 17 a border or looking for signs of fever, all the way
 18 across the spectrum of measure to shutting a border or
 19 only allowing people in with full isolation and
 20 quarantine?

21 **A.** It does, and it includes a quarantine as part of it as
 22 well. So shutting a border completely is extremely
 23 difficult for almost any country in the world, because
 24 we all -- most countries depend on the importation of
 25 goods and services, and so how do you deal with the

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1 and that presents an even greater problem for those
 2 countries like the United Kingdom which are more
 3 interconnected and engage in greater levels of trade
 4 than some others?

5 **A.** Yes, that is correct, and there's also the question of
 6 the prevalence of the virus in the country that people
 7 are coming to, compared with the country they're coming
 8 from. So if you're coming from a country which has the
 9 same variant at the same level, border controls won't
 10 have much efficacy. On the other hand, if they're
 11 coming from a country with a much higher rate of the
 12 virus, then they are potentially very important and also
 13 when you've got new variants emerging you may be able to
 14 slow them down.

15 **Q.** And if a country already has Covid established in it,
 16 stopping individual members of the public travelling
 17 into that country will be like -- well, allowing them in
 18 might be, I think it's been described as throwing a lit
 19 match onto an already raging fire.

20 **A.** Yes, but with the exception that if there are new
 21 variants emerging, then that may still be relevant. But
 22 I think the real point about the travel measures is
 23 that, again, you have to implement a comprehensive
 24 package for them to be effective. And I think
 25 New Zealand is quite an interesting example we'll come

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1 to, where they have the advantage that they're
 2 geographically isolated -- I mean, basically you get
 3 there by plane or occasionally by boat, ship -- but they
 4 found, even with the most stringent application of
 5 border controls, there would still be influx into the
 6 country. So, for example, at the border it may be that
 7 a border official or someone supervising a quarantine
 8 facility could become infected and carry the infection
 9 into the country. So border controls are only effective
 10 in the context of other stringent measures as well.

11 **Q.** So that we may be clear, in those small number of
 12 countries where rigorous border closures enabled those
 13 countries to keep a tight grip on the virus and, by and
 14 large, thereafter to avoid long, stringent --

15 **A.** Yes.

16 **Q.** -- national lockdowns, for example, those border
 17 closures were coupled with other NPIs, but in particular
 18 TTI, test and trace?

19 **A.** Absolutely, it was test, trace and isolate coupled with
 20 border controls, and of course it was found that long
 21 periods of quarantine were more effective than short,
 22 that compulsory quarantine was more effective than
 23 voluntary quarantine, and later on in the pandemic it
 24 was found that you could probably reduce quarantine
 25 times if you did daily testing. But effective

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1 have been some beneficial outcome, but it's impossible
 2 to quantify it?

3 **A.** I think that's right, and of course one of the purposes
 4 of the report was to provide recommendations for how we
 5 might fill evidence gaps in the future, and there is
 6 a clear opportunity to gather evidence when it comes to
 7 environmental controls.

8 **Q.** Then the impact of communication.

9 Was that -- you've already described how that's not
 10 strictly a measure or an NPI, but it's an extremely
 11 important facet of non-pharmaceutical interventions
 12 because unless the community adopts and complies with
 13 them, then their efficacy would be significantly
 14 underwhelmed.

15 **A.** That's correct.

16 **Q.** Was this a topic in which you looked specifically at the
 17 United Kingdom position?

18 **A.** We did, because the cultural context of communication is
 19 so specific, so we restricted ourself in this case to
 20 the United Kingdom.

21 Of course communication interfaces with all sorts of
 22 other cultural aspects of society, so for example social
 23 cohesion, altruism, all sorts of features of society.

24 So we did restrict ourselves, and the evidence is
 25 that people did largely comply, so the communication was

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1 quarantine, if you're trying to keep your border as
 2 a barrier, is -- was an essential feature as well.

3 **Q.** The next broad area is that of environmental controls,
 4 on page 39. In the general scheme of things, if the
 5 rubric or the aim is to control the spread of a virus,
 6 how important are environmental measures such as air
 7 cleaning devices, ventilation, surface disinfection,
 8 screens and so on?

9 **A.** I'd say that, disappointingly, this was the area where
 10 there is the weakest experimental evidence, and there
 11 are a small number of observational studies that show --
 12 appear to show the effectiveness of environmental
 13 measures, and that's everything from reducing the number
 14 of people in an environment to increasing ventilation.

15 Again, everything that is known about the
 16 transmission of infection says that one way of reducing
 17 the exposure to exhaled virus is to increase the
 18 ventilation, so having open windows, increasing
 19 air flow, but there is remarkably little rigorous
 20 evidence that could be adduced, and I think it's one of
 21 those cases where absence of evidence should not be
 22 taken to be evidence of absence. In other words,
 23 because we can't demonstrate it doesn't mean that there
 24 wasn't an effect.

25 **Q.** So we must leave it on the basis that there may well

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1 working overall, although there were certain features
 2 about the communication such as the trusted
 3 communicator, persuasion rather than coercion, a number
 4 of features like that that were more likely to engender
 5 trust, because trust in the communications is extremely
 6 important, and the corollary of trust is
 7 trustworthiness, and so communicators who were seen to
 8 be trustworthy were, by and large, well trusted.

9 **Q.** Two points arising therefrom, please, Sir Mark.

10 Firstly, was trust found to be the most common factor in
 11 terms of impacting upon the effectiveness of
 12 communication?

13 **A.** I think it's a major factor, but clarity, consistency,
 14 a balance between, whilst being authoritative in, as it
 15 were, the reliability of the information, not being too
 16 controlling. So ... but, I mean, all of that in a way
 17 integrates into --

18 **Q.** Trust?

19 **A.** -- trust.

20 **Q.** I in fact was reading out the words of the report
 21 itself, Sir Mark:

22 "Trust was the most common factor impacting
 23 communication effectively."

24 **A.** Yes. Absolutely.

25 **Q.** Thank you.

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1 Secondly, could you just elaborate, please, on the
2 importance of knowledgeable and trusted local groups and
3 leaders as communicators? So in the particular context
4 of members of ethnic minorities, how important is the
5 existence of knowledgeable and trusted local leaders in
6 the communication of NPIs and the promotion of trust?

7 A. I think one can extrapolate from advice, say, on
8 vaccines to NPIs, because I think there is a sort of
9 common denominator; and certainly when it comes to
10 improving uptake of vaccines, then there's pretty good
11 evidence that people trust people who they feel are like
12 them, in similar cultures, more. So it is important to
13 have that communication distributed and reflecting the
14 diverse nature of a community.

15 Q. Three subissues, if I may.

16 Firstly, how important in the development of trust
17 and promulgation of effective communication is the need
18 of consistent messaging and the absence of conflicting
19 or changing messages?

20 A. I think that there is little doubt that consistent
21 messaging is extremely important, and that then takes us
22 to how uncertainty is communicated as well. And
23 uncertainty is sometimes communicated as: X has one
24 opinion and Y has a completely opposite one, and that
25 then sends very confusing messages.

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1 uncertainty and the communication of science in general.

2 It's the whole nature of science to be sceptical,
3 actually, to want further evidence. And I think the
4 evidence is actually that the public, and there isn't
5 one public, but public audiences did accept and
6 understand the fact that there are things which were not
7 known.

8 Q. The say the whole nature of science is to be sceptical;
9 was it you who described scientists as licensed
10 dissidents in --

11 A. No, it wasn't me, but --

12 Q. It could have been?

13 A. It could have been, but it wasn't, no.

14 Q. Therefore, in conclusion on this part of the report, do
15 you call, in fact on page 44, for governments in future
16 to convey information clearly with consistent messages,
17 there we are at the top right-hand corner --

18 A. Yes.

19 Q. -- to convey information by trusted sources such as
20 health authorities, but in fact there's a reference back
21 to knowledgeable and trusted local group leaders?

22 A. Yep.

23 Q. And, thirdly, there must be a proper balance struck
24 between authoritarianism and optional --

25 A. Yes, those were the summary of the evidence review

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1 Q. Because you were looking technically at research
2 emanating from the United Kingdom, was one of the
3 findings of the report that government guidance in the
4 United Kingdom -- which had, as we know, changed
5 multiple times, and of course changed across devolved
6 administrations as opposed to the United Kingdom -- led
7 to the potential for non-compliance, simply because
8 people became either confused or desensitised?

9 A. Yes. I'm not sure that the evidence is that rigorous on
10 that, but I think it's a reasonable interpretation of
11 what happened.

12 Q. Thirdly, to what extent is an absence of scientific
13 certainty damaging to the efficiency or efficacy of
14 communication? So, putting it bluntly, to what extent
15 does a population need to know the scientific basis for
16 what it's being told in order to make it comply?

17 A. Well, but that's an interesting question, but it goes
18 back to the start of the pandemic and even at the end
19 there were huge numbers of things we didn't know, and
20 actually an important part of the communication is to
21 communicate what is not known as well as what is known.

22 So, whilst everyone would like perfect answers as
23 soon as possible, we started with hardly any specific
24 answers, we had generic answers, and so that I think is
25 a sort of more general issue of communication of

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1 there. That's correct.

2 Q. You then turn, or rather the report then turns to
3 a cross-national comparison of NPI effectiveness. You
4 are aware, of course, of the report from
5 Professor Tom Hale?

6 A. Yes.

7 Q. You may indeed have seen his evidence earlier today. In
8 broad terms, are the conclusions from the Royal Society
9 report very similar, although they come at it from
10 a different angle, to the conclusions reached by
11 Professor Hale to the effect that the more stringent
12 an NPI, the more effective it is likely to be, and also
13 that the availability of comprehensive scaled-up test
14 and trace and isolation measures are likely to be of the
15 very greatest importance in being able to keep control
16 or to regain control of a virus?

17 A. Yes. I read Professor Hale's report, I was sort of
18 locked away in a room out there whilst he was giving his
19 evidence, so I didn't hear it, but I enjoyed his paper
20 and actually I was pleased that it was very
21 complementary to the paper produced by the
22 Royal Society, so he came from the observational angle
23 of looking at policy implementation in different
24 countries across the world and correlating it with Covid
25 cases --

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1 Q. When you say complementary, I should just make plain,
 2 you mean it went --
 3 A. It complemented --
 4 Q. -- very well alongside it --
 5 A. Yes, correct.
 6 Q. -- complemented it, rather than being very nice about
 7 it?
 8 A. Yes, correct.
 9 LADY HALLETT: Complement with an E.
 10 A. Yes, with an E.
 11 MR KEITH: Yes, indeed.
 12 A. Exactly. I did my research on a system of proteins
 13 called complement, with an E, and people used to
 14 misspell it all the time, so ...
 15 But, yes, and of course the angle from the
 16 Royal Society report was to do a systematic review of
 17 the evidence directly, but when it came to our national
 18 case studies, they fit more with the approach that was
 19 taken by Professor Hale.
 20 Q. Could we then turn briefly to those three case
 21 studies --
 22 A. Yep.
 23 Q. -- that's to say Hong Kong, New Zealand and South Korea.
 24 I don't want you to give an account of how the
 25 Hong Kong authorities proceeded throughout the whole --

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1 not as they should have been, there were very large
 2 numbers of elderly members of the Hong Kong population
 3 who were not vaccinated and so when in particular
 4 Omicron broke through --
 5 A. Yes.
 6 Q. -- they were vulnerable and they died in very large
 7 numbers?
 8 A. That is correct.
 9 Q. So Hong Kong is a very good example of the beneficial
 10 impact of go early, go hard in terms of the early
 11 imposition of stringent NPIs?
 12 A. That is correct.
 13 Q. With vaccination?
 14 A. That is correct, and of course that was the remarkable
 15 thing about this pandemic, which is that within a year
 16 of the pandemic starting there were vaccines that
 17 stopped people dying. So, yes, but that's a correct
 18 analysis.
 19 Q. New Zealand recorded its first case of Covid-19 on
 20 28 February, not entirely different to the
 21 United Kingdom, but two weeks later on 14 March it was
 22 announced that anyone entering the country must
 23 self-isolate for 14 days, border controls became
 24 increasingly tightened until the point, at 9 April, when
 25 only New Zealand citizens and residents were permitted

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1 A. No.
 2 Q. -- course of the pandemic in relation to their
 3 imposition of NPIs, but focusing on the broad thrust,
 4 the -- and painting it in a very general term, in a very
 5 general way, the Hong Kong authorities applied, very
 6 early on, stringent NPIs because of boundary closures in
 7 early February, a full quarantine policy, either at home
 8 or in a hotel, from March for travellers arriving from
 9 Europe and North America, and then from July quarantine
 10 for all arriving persons. Is that a fair summary?
 11 A. Yeah.
 12 Q. And therefore they were able -- or rather the virus
 13 never escaped their control?
 14 A. It escaped -- they were able to keep it under control,
 15 so, yes, it didn't escape in the sense that it was
 16 there --
 17 Q. Indeed.
 18 A. -- but at very low level.
 19 Q. And where it popped up, the system for test and trace
 20 and in particular isolation was able to deal with
 21 outbreaks of the virus over time?
 22 A. Yes, that's correct.
 23 Q. But where Hong Kong suffered terribly was that when
 24 these stringent NPIs were lifted, it became apparent
 25 that the levels of vaccination in the population were

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1 to enter the country at all, and even they had to
 2 undergo a 14-day quarantine.
 3 A. Yes, a compulsory quarantine which was observed, as it
 4 were, yeah.
 5 Q. Therefore although there was a one-month strict lockdown
 6 and a whole series of local lockdowns, so attempts to
 7 suppress local outbreaks, and a fairly low level of
 8 domestic NPIs imposed, New Zealand remained mostly
 9 transmission free until late 2021?
 10 A. Yes, that's correct. I think New Zealand provides
 11 a very clear illustration of what is needed to make
 12 border controls work, because we do have very good data,
 13 and what they found was that in spite of having rigorous
 14 quarantine there were still cases that were brought into
 15 the community by probably people working in and around
 16 the borders, and by using testing, tracing and isolation
 17 they were able to keep those under control, but from
 18 time to time there were then episodes that suggested
 19 there was domestic transmission occurring, so you
 20 wouldn't have been able to do contact tracing right back
 21 to the border, and under those circumstances they
 22 imposed quite strong localised lockdowns.
 23 So I think it's an extremely good example of how, if
 24 you're going to make border closures work, you have to
 25 do a whole lot of other things as well.

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1 Q. And you must make clear, mustn't you, that -- again to
2 repeat perhaps the obvious -- we will never know whether
3 the United Kingdom, had it had a developed system for
4 test, trace and isolate and had it had quarantine
5 facilities, and had it had the geographical, the
6 population density and the socioeconomic conditions
7 which apply in New Zealand, would have been able to keep
8 the virus under similar control?

9 A. That is absolutely correct. So we have a much larger
10 population, a much higher population density and
11 interconnectedness, and although we are an island, we
12 are an island with only a short sea barrier to other
13 parts, lots of shipping, and so it is very, very
14 difficult to extrapolate from one country to another.

15 Q. But what is clear is that the New Zealand imposition of
16 border controls was, by the general scheme of things,
17 applied very early?

18 A. Yes.

19 Q. And secondly, whether or not it was to do with the early
20 application of those border NPIs, they didn't appear to
21 have suffered in the same way that the United Kingdom
22 did from multiple, indeed nationwide, seeding of
23 infection in those weeks in February?

24 A. Well, that's true, but in fact, I mean, the full
25 rigorous quarantining in New Zealand didn't happen until

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1 localised, a high-consequence infectious disease, had
2 a much higher rate of fatality?

3 A. Yep.

4 Q. And it had also therefore put into place and developed
5 much more active measures for the control of disease?

6 A. Yes.

7 Q. The SARS-CoV-2, Coronavirus 2, infection was first
8 identified in South Korea on 20 January 2020. On
9 23 February, public health authorities raised the
10 infectious disease alert to the highest level, and then
11 combined NPIs were applied over time.

12 Did South Korea have a very sophisticated and
13 developed system for community based screening, for test
14 and trace, and in terms of contact and isolation, very
15 sophisticated systems for electronic --

16 A. Yes.

17 Q. -- contact tracing?

18 So people could be traced through credit card or
19 debit card use, through CCTV, through their location --

20 A. Yes.

21 Q. -- because of mobile phone use --

22 A. Yep.

23 Q. -- and so on and so forth?

24 What was the outcome of the application in general
25 terms of that level of stringent NPI?

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1 9 April, they had a more voluntary policy until then,
2 and of course in the UK by 14 March we'd already had
3 a very substantial introduction of cases, and they did
4 have actually in New Zealand quite a long national
5 lockdown as well. So -- but, I mean, the general
6 principle is correct that having controlled the first
7 major outbreak, then after that they were able to
8 maintain it by rigorous border controls coupled with
9 other measures.

10 Q. And by 14 March, anybody entering the country had to
11 self-isolate for 14 days?

12 A. Yes, that's correct.

13 Q. So had there been multiple seedings around that time in
14 New Zealand -- and we will never know whether there were
15 or not -- there is at least the prospect that that
16 mandatory self-isolation would have had a beneficial
17 impact?

18 A. Yes. What I can't tell you is how effective that
19 self-isolation was.

20 Q. Indeed.

21 Then finally South Korea. South Korea's population
22 is 51.4 million, so I think 15 to 20 million perhaps shy
23 of the United Kingdom's, so not entirely unequal in
24 size. It, it is very well known, experienced
25 an outbreak of MERS which had of course, although more

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1 A. Well, they managed to avoid the need to have a lockdown,
2 so ... but they were -- it illustrates the necessity of
3 being prepared. So they had learnt a lot, as I said
4 earlier, from the MERS outbreak, they'd strengthened
5 their epidemic intelligence service, and so they were
6 prepared to develop an extensive test, trace and isolate
7 very early. And in fact the sort of kinetics of the
8 South Korean infection was very similar to the UK,
9 I mean, the first UK case was in January as well.

10 So with a much, much more rigorous enforcement of
11 the tracing and the isolation, they avoided a national
12 lockdown. They had some very large superspreader events
13 around certain religious organisations on a couple of
14 occasions.

15 Q. But notwithstanding those superspreader events, their
16 system for NPIs or their system of measures enabled them
17 to circumnavigate --

18 A. That's correct.

19 Q. -- the pandemic in a very different way to us.

20 They were able, were they not, to gain approval for
21 a diagnostic test at a relatively early stage --

22 A. Yes.

23 Q. -- on 4 February? And does other evidence show that by
24 late March they were testing individual members of the
25 population at a prodigious level --

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1 A. Yes.
 2 Q. -- way ahead --
 3 A. They scaled up --
 4 Q. -- of the United Kingdom?
 5 A. -- way ahead of, I would need to check but I suspect
 6 almost every other country in the world. They were
 7 very, very fast.
 8 Q. The report draws the threads together in a number of
 9 messages, if I may call them that, from page 63 onwards,
 10 Sir Mark.
 11 I needn't, I think, trouble with the summaries that
 12 are set out there in relation to the need for going
 13 early, go hard, and for the link between stringency and
 14 reduction in transmission, because you've covered that.
 15 But, on page 64, you make these points: firstly, on
 16 the basis of strict early application of NPIs, it is
 17 obvious that it was that combination of NPIs that was
 18 crucial in terms of efficacy?
 19 A. Yes.
 20 Q. Secondly, that the value of a proper test, trace and
 21 isolate system is enormous, it is perhaps the core NPI
 22 if the aim or the goal is to stop a runaway infection or
 23 to try to regain control.
 24 Third, as you've already indicated, it is not
 25 possible however to reach counterfactual conclusions,

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1 the virus is to stop, of course, the likelihood of
 2 variants but also to stop the prevalence of syndromes
 3 such as Long Covid which come, of course, by way of
 4 injury from the widespread --
 5 A. Well, that is correct, and also to avoid the need for
 6 prolonged periods of restriction of people's liberty
 7 with all of the consequences that that brings. So being
 8 quick and being stringent is very important.
 9 My qualification of the second comment you made,
 10 which is about how we acquire the evidence in the
 11 future: that isn't just for scientists, that is for
 12 policymakers as well. In other words, what we need in
 13 any pandemic, and indeed for public health as a whole,
 14 is high quality data, and so ideally protocols need to
 15 be developed for how one might deal with the
 16 observational data in a future pandemic, because
 17 researchers can't do it in the context of an environment
 18 that doesn't allow them to.
 19 And so I think working with policymakers to agree
 20 potential protocols, to agree the sort of information
 21 that's needed is really important, and ideally this
 22 should be international, because you can learn things by
 23 comparing country A with country B, with the caveats of
 24 all the sort of cultural issues we've been discussing.
 25 So ... but I think the scientific community, if

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1 "What might have happened here if", and so on.
 2 Fourth, the key lesson to researchers is to be
 3 prepared, because it is only by understanding as fully
 4 as we may the impact of non-pharmaceutical interventions
 5 will we appreciate the vital importance of test and
 6 trace, and of ensuring that a combination of NPIs next
 7 time is used at the earliest possible moment?
 8 A. Yes. So I'd qualify what you've just said, I think, in
 9 two ways.
 10 Firstly, the effectiveness of non-pharmaceutical
 11 interventions does depend on the transmissibility of the
 12 virus, and so no country in the world was essentially
 13 able to control it once the Omicron variant came out.
 14 That was the point at which China, with its very
 15 rigorous restrictions for mobility, just couldn't
 16 achieve it any more. So there is always that.
 17 But that is another argument for acting early,
 18 because now that we know that there is the potential for
 19 developing a vaccine during the lifetime, then your best
 20 chance of doing that is as fast as possible before the
 21 virus has had a chance to evolve to be more
 22 transmissible, because that's what they will do.
 23 Q. Just pause there.
 24 A. Yes.
 25 Q. One other ancillary benefit of stopping the spread of

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1 there had been protocols of the sort that ISARIC,
 2 for example, had had in terms of the clinical
 3 description that I talked about in my evidence in
 4 Module 1, the International Severe Acute Respiratory
 5 Infection Consortium, they had protocols that they
 6 developed ten years ago, and so were able to activate
 7 their studies very, very quickly, within days of the
 8 pandemic starting.
 9 Q. To drill down just for a moment in two aspects of that
 10 very helpful answer.
 11 Firstly, do you set out in the report the need for
 12 therefore systems of accumulation of data and research
 13 to be put into place, so you say there needs to be
 14 during the interpandemic period --
 15 A. Yes.
 16 Q. -- the interregnum before the next pandemic, the
 17 pre-positioning of national and international research
 18 consortia and networks, data infrastructures,
 19 methodological protocols and mechanisms for the
 20 collection of data? And do you mean by that we need to
 21 know in much greater detail what the likely consequences
 22 are of viral infection in terms of transmissibility and
 23 the epidemiological impact, but also much more about the
 24 NPIs which may be deployed in future to be able to
 25 combat it?

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1 A. Yes, and the analogy is with drugs and vaccines where,
2 because there were protocols that could be applied
3 during the pandemic, we learnt very rigorously and
4 deductively about the effectiveness of, for example,
5 dexamethasone in saving lives in people in intensive
6 care units, in learning which monoclonal antibody
7 therapies were -- anti-inflammatory therapies were
8 effective and which weren't.

9 In the same way, if we had very good continuous
10 evidence collection during the pandemic, we might learn
11 more in real time about the effectiveness of different
12 measures at different times.

13 As I've described, however, in relation to
14 environmental measures, there are some things one can
15 learn from experimental studies between pandemics. So
16 it's perfectly possible to understand the distribution
17 of particles of viral size in closed spaces, what
18 ventilation might do. Some of that work is already
19 done.

20 But at the start we didn't really know the balance
21 of -- the importance of washing hands and cleaning
22 surfaces. We do know that actually enteric
23 infections -- so infections of the gut -- decreased, and
24 we also know about the effectiveness, to some extent, of
25 the non-pharmaceutical interventions from the fact that

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1 policymakers what the answer should be, but policymakers
2 will always make the best decisions, one hopes, if they
3 have all the evidence, and so you need evidence on all
4 sides of the equation.

5 MR KEITH: Thank you.

6 My Lady, that does conclude the evidence of
7 Sir Mark.

8 LADY HALLETT: Sorry, I wasn't trying to hurry you.

9 MR KEITH: No, no, I had referred to the possibility that it
10 was the last and final area about three times.

11 LADY HALLETT: I'm not sure you're being fair on yourself
12 there, Mr Keith.

13 Questions from THE CHAIR

14 LADY HALLETT: Can I just ask one question, and this
15 positively is the last.

16 Given the importance you place on the study -- your
17 report places on having a scalable system of test, trace
18 and isolate --

19 A. Yes.

20 LADY HALLETT: -- have you got any estimation of what our
21 position is like today here in the UK?

22 A. I think it is not as strong as we would like it to be.
23 But that is a judgement, and I should probably resist
24 it.

25 LADY HALLETT: And I didn't give you notice of the question,

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1 influenza and respiratory syncytial virus infections
2 dropped during the pandemic.

3 But ultimately each infection is --

4 Q. Is different?

5 A. -- itself, yeah.

6 Q. Lastly, in the context --

7 LADY HALLETT: Is this last?

8 MR KEITH: Yes, this is the last --

9 LADY HALLETT: It's just that I've been asked to take
10 a break.

11 MR KEITH: This is the last question.

12 In the context of your earlier answer about the
13 terrible conundrum faced by governments in relation to
14 whether or not to impose non-pharmaceutical
15 interventions, do you call for a much closer examination
16 of -- call for the need for a new structure or
17 a framework or a policy by which the relative benefits
18 and costs of alternative steps which could be taken by
19 a government are examined? So a cost-benefit analysis,
20 what Lord O'Donnell, you might know, has described as
21 a wellbeing cost-benefit analysis?

22 A. Well, I think one of the things we say in the report is
23 that there were costs in other domains of life,
24 economic, people's wellbeing, education, and those need
25 to be analysed as well. And I wouldn't dare to tell

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1 but I thought I'd just --

2 A. I think there is much more to do, and we talked in my
3 last appearance about the work of Dr Kirchhelle, who is
4 one of your advisers, on the history of public health,
5 and I think that the disinvestment in public health, not
6 just in the UK but in the richer countries of the world,
7 needs to be tackled. But that is a personal opinion
8 rather than the sort of -- yes. It goes beyond this
9 report, that's for sure.

10 LADY HALLETT: Thank you very much, Sir Mark, I'm very
11 grateful. I hope we're not imposing on you too much.
12 I have a feeling we may impose on you again, if we may,
13 but I don't know, I haven't checked with the other
14 modules. But I'm extremely grateful to you again for
15 all your help.

16 THE WITNESS: Thank you, my Lady.

17 MR KEITH: I very much regret to say that it was Sir Mark's
18 first question this afternoon --

19 LADY HALLETT: Oh, would we impose on him again?

20 MR KEITH: -- would you be wishing to see him again?

21 My Lady, that concludes --

22 LADY HALLETT: The problem is we do have a module
23 specifically on health, you see, Sir Mark, so it's just
24 possible.

25 THE WITNESS: Okay.

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1 (The witness withdrew)

2 MR KEITH: That concludes today's evidence.

3 LADY HALLETT: Thank you all very much indeed. 10 o'clock

4 tomorrow, please.

5 (3.02 pm)

6 (The hearing adjourned until 10 am

7 on Thursday, 12 October 2023)

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