1 **Friday, 1 March 2024**
2 **(9.59 am)**
3 **LADY HALLETT:** Good morning on a rather damp St David's Day
4 here in Cardiff.
5 **MR POOLE:** Can I call Dr Chris Williams, please.
6 **DR CHRIS WILLIAMS (sworn)**
7 **Questions from LEAD COUNSEL TO THE INQUIRY for MODULE 2B**
8 **MR POOLE:** Could you please start by giving us your full
9 name.
10 **A.** Christopher Julian Williams.
11 **Q.** Dr Williams, thank you for attending the Inquiry today
12 to give your evidence. Can I just remind you to please
13 keep your voice up so that we can hear you but also so
14 that your evidence can be recorded. If I ask you
15 a question you don't understand, please do ask me to
16 rephrase it. There will be breaks, but if you do need
17 one, let us know.
18 Your witness statement to this module is at
19 INQ000251938. That was signed and dated on 17 August,
20 and is that statement true to the best of your knowledge
21 and belief?
22 **A.** It is.
23 **Q.** Now, Dr Williams, in terms of your professional
24 background, I understand that you have worked as
25 a consultant epidemiologist in Public Health Wales



1 Communicable Disease Surveillance Centre, the CDSC,
2 since 2013, and you have been involved in public health
3 responses to communicable diseases since 2001; is that
4 right?
5 **A.** Yes.
6 **Q.** You are a medical doctor, you completed your medical
7 training and trained as a medical registrar with
8 NHS England, following which you trained in the European
9 fellowship for intervention epidemiology in Germany; is
10 that right?
11 **A.** Roughly, there's -- some of the organisations have
12 changed names, but yeah.
13 **Q.** Between 2008 and 2013 you worked as a consultant in
14 communicable disease control, with responsibilities for
15 outbreak control and surveillance, and you had
16 involvement I think in the 2009 swine flu pandemic, and
17 in addition you've worked for the World Health
18 Organisation as an epidemiology consultant; is that also
19 correct?
20 **A.** That's correct, yes.
21 **Q.** Now, Dr Williams, going back to January 2020, and
22 setting the scene, at the time you were one of only
23 three consultants in the Communicable Disease
24 Surveillance Centre; is that right?
25 **A.** Yes.



1 **Q.** Can you briefly tell us what the CDSC was and perhaps
2 explain its importance and significance in that period
3 January to March 2020.
4 **A.** So we have a responsibility for surveillance of
5 infectious diseases, also advising on outbreak
6 management and research, teaching, those kind of
7 activities.
8 In the early part of the pandemic we moved from
9 hearing about the first case from the WHO at the end of
10 2019 to starting to get briefings, mainly through
11 colleagues in Public Health England, about this new
12 infection, new disease that was affecting people in
13 China, and there were a series of meetings on that,
14 which in general Public Health England led, and we were
15 just -- we were picking up on what was going and I was
16 disseminating it through my organisation.
17 **Q.** We will come to look at that in a bit more detail and
18 break that period down in a moment, but I understand
19 that in March 2020 you became one of three incident
20 directors to Public Health Wales. What did that role
21 involve?
22 **A.** So that was more day-to-day decision-making, attending
23 particular groups with respect to the response within
24 Public Health Wales, and, you know, monitoring the
25 situation. So there was quite a few tasks associated



1 with that, but essentially it was the tactical response
2 on the day. I was one, as you say, of three, and then
3 I think there were four later.
4 **Q.** I'm right in saying that you were also involved with the
5 Technical Advisory Cell and the Technical Advisory Group
6 that we heard a bit about from Dr Hoyle yesterday; is
7 that right?
8 **A.** That's right, yeah.
9 **Q.** What was your primary contribution to the Technical
10 Advisory Group?
11 **A.** So at the beginning I was involved with my role as
12 an epidemiologist and passing on some of the information
13 I was getting through the briefings and other
14 mechanisms. I think the majority of the time I was
15 there to give reports on the surveillance and the
16 unfolding epidemiology of the infection in Wales.
17 **Q.** Would it be a fair summary to say that you were fairly
18 heavily involved, then, with Public Health Wales and the
19 Technical Advisory Group's pandemic response in that
20 early period, January, February, March 2020?
21 **A.** I think that's fair to say, yes. Probably more Public
22 Health Wales because that was my main role, but I was
23 also involved in TAG and worked with the Chief
24 Scientific Adviser for Health.
25 **Q.** So you were working closely with Dr Orford. Were you

1 also working closely with Dr Atherton, the Chief Medical
2 Officer?
3 A. Less so with Dr Atherton, it was more Dr Orford.
4 Q. Of the group of scientists at that time that were
5 working and advising, was it only you that had
6 an academic background in epidemiology and communicable
7 diseases?
8 A. I can't recall all of the qualifications of everyone in
9 TAG, but certainly Welsh Government colleagues were more
10 health and health policy and other aspects of science.
11 There aren't a huge number of infectious disease
12 epidemiologists in general and in the UK.
13 Q. And am I right in saying that you undertook this work in
14 an independent capacity insofar as you were not employed
15 by the Welsh Government; that's right, isn't it?
16 A. Yes.
17 Q. Now, when did you first become aware of the pandemic?
18 A. So I can't recall exactly, but I think I would have seen
19 news reports of the WHO report at the end of 2019.
20 I think it was 7 January when there was a briefing just
21 after the Christmas period from Public Health England
22 about a new pneumonia syndrome coming out in Wuhan in
23 China, and there was sketchy information at that time,
24 but there were continual meetings, repeated meetings,
25 and then we started to learn more.



1 Q. Following that 7 January Public Health England meeting,
2 what role did you assume regarding the outbreak?
3 A. Within CDSC, we tended to get involved when there was
4 a briefing or some kind of communication about something
5 that came through nationally, so I wrote a briefing
6 note, I think it was the next day, based on the initial
7 briefing, I informed other colleagues, and I think there
8 were further briefing notes that came out from England
9 that we then read and adapted and added to.
10 Q. Now, the Inquiry understands that there was a devolved
11 administration update on 15 January that was also hosted
12 by Public Health England. Did you attend that meeting,
13 can you recall?
14 A. I'd have to check my evidence pack. Probably I would
15 have done.
16 Q. What was your perception of the risk posed by Covid-19
17 at that time, so we're talking mid-January 2020?
18 A. I honestly can't recall what my perception is. What
19 I do remember was that, towards the latter half of
20 January, as there were reports of more and more cases
21 coming from China, I was attempting to work out how fast
22 the infection was spreading using some very rough,
23 you know, mathematical techniques, so I must have had --
24 been aware that there was a possibility of much wider
25 spread.



1 Q. At this point in time, so still in sort of mid to late
2 January, what body was responsible for providing expert
3 epidemiology and scientific advice to the Welsh
4 Government in a sort of day-to-day **de facto** sense?
5 A. That would have been Public Health Wales. Public Health
6 England, because of their -- they had a larger
7 respiratory department and international department and
8 other links, they tended to get information, you know,
9 earlier or from different sources to us. Obviously we
10 could access the media and other published sources, but
11 a lot of the time we were taking information that was
12 given to us by them, interpreting it, seeing what the
13 context was for Wales and then disseminating it within
14 our organisation and also to Welsh Government.
15 Q. Now, on 23 January 2020, there was a Public Health Wales
16 briefing entitled "Update on Wuhan novel coronavirus",
17 I don't intend to bring it up on the screen, but I just
18 want to understand, did you play a role in authoring
19 that briefing?
20 A. Yes, I would -- I would have written that, but, again,
21 adapted, probably, from a Public Health England
22 briefing.
23 Q. Understood.
24 Now, that briefing note confirmed the likelihood of
25 human-to-human transmission, and just to read a passage



1 from it, it says:
2 "Due to the enlarging geographic area affected, and
3 evidence of human to human transmission, it is
4 increasingly likely that suspected cases (those with an
5 appropriate clinical picture and travel or contact
6 exposure) will be identified in the UK, including
7 Wales."
8 Did that 23 January briefing change the pandemic
9 response in any way in Wales?
10 A. Once again, I can't remember the exact sequence of
11 events regarding the stepping up of various emergency
12 response activities within Public Health Wales, but we
13 were -- certainly that briefing will have gone to key
14 individuals within Public Health Wales and we made sure
15 that people were aware of the risk.
16 Q. Can you tell us how Public Health Wales was monitoring
17 and advising the Welsh Government on the spread of
18 Covid-19 at this time, so we're still at the back end of
19 January 2020.
20 A. Again, my recollection is not strong from this time, but
21 where we would have had information from the England
22 briefings and the -- by that time -- daily meetings
23 regarding the situation, I would have sent -- I and
24 sometimes colleagues would have sent out an email that
25 also included, I believe, Welsh Government colleagues at

1 the time. If it wasn't directly to Welsh Government
2 colleagues, then someone more senior to me would have
3 disseminated that.
4 **Q.** Was there an understanding amongst your colleagues and
5 those advising the Welsh Government at this time that
6 this had pandemic potential?
7 **A.** I think we were -- we were beginning to realise it had
8 pandemic potential once -- particularly once there were
9 more widespread cases in China. You don't necessarily
10 get to hear about all of the cases and all of the
11 transmission, so you can probably assume that if there
12 are actual official reports from a country such as China
13 that there's probably quite a lot of transmission going
14 on, and there was still international travel.
15 **Q.** Did you or any of your colleagues at this point think it
16 worthwhile to review the Wales pan flu response plans
17 and look whether they would be sufficient for
18 a coronavirus pandemic?
19 **A.** I can't recall whether we looked particularly at the
20 pandemic flu plans. We were -- we would have been aware
21 of them. As I said, I was involved in the 2009
22 pandemic, so I'm sure I'd have looked at them at the
23 time. But the plans tend to -- you have to adapt based
24 on the circumstances that are coming, and I think this
25 needed a different response.



1 **Q.** Just on that point, then, were you given, can you
2 recall, any instructions at any point at this period of
3 time to perhaps begin reviewing population-wide NPIs to
4 deal with a virus spreading such as this, as was
5 instituted in China?
6 **A.** So we had the example of China. I don't recall
7 considering those for -- for the UK. The climate of
8 thinking was not necessarily to start with NPIs, because
9 they'd never really been done at that level. That took
10 a bit longer for that thinking to come through, I think.
11 **Q.** What about scaling up surveillance and contact tracing
12 capacity, was that something that was -- thought was
13 given to at this point in time?
14 **A.** We were certainly scaling up surveillance activity.
15 There were the First Few 100 epidemiology forms that we
16 would sign to complete where we'd got suspected cases.
17 And in terms of contact tracing I think I did -- it
18 might have been February by that time -- I think I did
19 write something on that.
20 Contact tracing per se isn't necessarily the
21 responsibility of CDSC, but we would have been involved
22 in the surveillance, and maybe advising on that kind of
23 response.
24 **Q.** To your recollection, was there any work being done to
25 prepare care homes and hospitals for numerous cases and



1 the risk of nosocomial infection?
2 **A.** I can't recall any -- any particular preparations along
3 those lines, but we did make sure that all of our
4 briefings went to the health service in Wales. And
5 nosocomial spread of infections, respiratory infections
6 is always a risk and ... yeah.
7 **Q.** Now, Dr Sandifer has told the Inquiry in his written
8 evidence that, with the exception of the CMO and his
9 staff, he did not see the same awareness of and urgency
10 about Covid across the rest of the Welsh Government. He
11 has said what he thinks was missing in these first
12 few weeks, namely 8 January, when he first became aware
13 of Covid, to 20 February, which was the first meeting of
14 the Welsh Government HSSG Coronavirus Planning and
15 Response Group, he says what was lacking was national
16 strategic leadership and co-ordination from the Welsh
17 Government.
18 Do you have any comments on those observations of
19 Dr Sandifer?
20 **A.** Between sort of mid-January up to sort of late February,
21 early March, I didn't have an awful lot of direct
22 working with the Welsh Government, so I'm not really
23 able to comment on their level of preparedness.
24 **Q.** Now, the Inquiry's heard in Module 2 that the approach
25 to the pandemic response in accordance with the UK



1 influenza pandemic strategy was one of containment.
2 What did you understand by "containment" and how was
3 that implemented by Public Health Wales?
4 **A.** The idea behind containment is that you would identify
5 every single case that came into the country, you would
6 trace their contacts, gather some information about them
7 and their contacts, and put into place isolation and
8 quarantine of those contacts to ensure that there were
9 no secondary or further cases. That was -- that had
10 been the response also in 2009, as -- "containment
11 phase", as they called it.
12 **Q.** Now, the Inquiry also understands that in January 2020
13 there were several direct flights each week to
14 Wuhan City from London Heathrow and other indirect
15 flight routes. We know also that the common symptoms of
16 Covid-19 were fever and a cold, so the kind of symptoms
17 that might mirror a common cold might not give cause for
18 concern.
19 Knowing all of that, what was your view on the
20 likely success of a containment strategy?
21 **A.** Again, I don't know exactly what my thoughts would have
22 been at the time, but I had my experience of the 2009
23 pandemic of influenza which showed that containment
24 really isn't very feasible in a country with lots of
25 international connections, with infections that are

1 highly contagious, rapidly spread, and, you know, spread
2 through multiple mechanisms.
3 **Q.** Was it your view, then, with that prior experience, that
4 Wales needed to really start preparing for mass
5 community transmission?
6 **A.** I suppose that's the implication, yes, that that was
7 probably on the way, when we were doing -- as I say,
8 I wasn't directly doing the contact tracing, but when we
9 were responding to that surveillance-wise, I think we
10 were aware that it wasn't going to be successful.
11 **Q.** And perhaps with the benefit of hindsight, do you think
12 that containment was the right approach for Wales in
13 February 2020?
14 **A.** I think it was, because even if you think you're
15 eventually not going to succeed, it's worth trying the
16 best you can. It will at least slow -- especially in
17 the first -- first few cases, you can genuinely slow the
18 infection. But as more and more people travel, you get,
19 you know, cases that you're not aware of, that are then
20 transmitting, then that's when it becomes untenable.
21 **Q.** As we move into late February, how did the
22 epidemiological picture in Wales develop?
23 **A.** So I checked my notes before. The first case I think we
24 reported was on 28 February in somebody that had
25 returned from northern Italy, and then -- we should also



1 remember that before that there were a number of
2 suspected cases reported, so people with appropriate
3 symptoms and who had travelled to China or the changing
4 list of countries, who were then identified, isolated,
5 tested and found to be negative. But this was our first
6 positive case, and from then on, you know, the case
7 numbers did increase through March.
8 **Q.** A week or so before that first case, there was a SAGE
9 meeting on 20 February. Were you and your colleagues at
10 Public Health Wales appraised of what was discussed at
11 that SAGE meeting, can you recall?
12 **A.** I don't recall that particular one. I don't think I was
13 able to have any contact through SAGE meetings until
14 either late February or early March via Welsh Government
15 colleagues.
16 **Q.** So after that SAGE meeting of 20 February, Dr Orford
17 emailed Dr Atherton and some other senior figures in
18 HSSG about those SAGE discussions. Now, you aren't
19 copied in to that email. It says:
20 "From cruise ship -- 30-50% asymptomatic-mild;
21 "Likely that UK testing has missed 40% of positives,
22 due to delay in testing versus detectability of virus."
23 Are those figures, and especially that point about
24 testing missing 40% of positives, something that you
25 were made aware of at that time?



1 **A.** I think I would have heard about the results of the
2 cruise ship testing through some of the other
3 professional briefings and, yeah, the fact of there
4 being some asymptomatic cases probably wouldn't have
5 been a huge surprise.
6 **Q.** If 40% of positive cases had been missed, does it not
7 follow that containment measures would effectively be
8 obsolete?
9 **A.** That is the difficulty with containment. You just --
10 I remember writing things at the time saying if we're
11 not catching all the cases then you're only getting
12 whatever effectiveness you get from the cases that you
13 do know about.
14 **Q.** So being aware of this figure of 40% of -- 40% being
15 missed of positives, did you or any of your colleagues
16 advise the Welsh Government of the difficulty that this
17 presented with a containment strategy?
18 **A.** I don't recall any advice I gave on that respect. The
19 containment strategy, in my recollection, was a kind of
20 UK-led strategy, so we were following the UK strategy,
21 which started with containment.
22 **Q.** But if by 20 February you've got Dr Orford emailing
23 Dr Atherton and noting in particular this worrying data
24 about missed 40% of positives, should Wales have still
25 been following the UK Government's containment strategy,



1 if effectively it was a doomed strategy by this point in
2 time?
3 **A.** I would say that if you take the counterfactual, if
4 Wales had decided that we would stop contact tracing,
5 stop trying to identify new cases whilst that activity
6 continued in the other nations of the UK, I don't think
7 that would have been particularly helpful to the
8 response. I think you have to try, even though it's
9 very difficult and essentially impossible after a while.
10 **Q.** Can we, please, have a look at INQ000309714.
11 This was a presentation that was delivered, as we
12 can see on the screen, by Dr Sandifer to the HSSG
13 planning and response group on 28 February. It provided
14 an update as to the progression of Covid-19 in Wales.
15 Did you have any input into that presentation,
16 Dr Williams?
17 **A.** I don't recall, but it's likely that I would have done
18 through some of the update slides that we'd send round.
19 **Q.** If we could please have page 16 of this presentation.
20 The second -- sorry, the third and fourth bullet points
21 read:
22 "• Estimated 10 fold increased demand with further
23 widening of geographical area within Europe.
24 "• Estimated 100 fold increased demand to account
25 for historic cases that will then meet possible case

1 definition."
2 In this case what does "demand" refer to? Is this
3 the demand on Public Health Wales to conduct
4 surveillance and containment on all likely Covid-19
5 cases?
6 A. I can't recall exactly, but I think there was discussion
7 about resources needed for contact tracing around this
8 time and that may have been playing into this. The
9 contact tracing is very resource-intensive and with
10 a sort of exponential increase in cases, it becomes
11 quite difficult.
12 Q. Did you agree that there was likely to be a tenfold and
13 then a hundredfold increase in cases that needed to be
14 contained?
15 A. I can't recall this exactly. This -- the second
16 statement seems to be about changes to the --
17 retrospective changes to the case definition, so yeah,
18 I'm not sure that -- I can't remember the implication of
19 this.
20 Q. At this point would it be fair to say it was almost
21 certain that community transmission would become
22 widespread, in the event it wasn't already?
23 A. Yeah, I think that's fair to say. And, as I say,
24 through my experience from 2009, I didn't think that
25 containment and contact tracing was some -- was



1 a possible early means of containing an infection like
2 this, particularly in a country such as the UK, and when
3 we had continued travel and, you know, continued
4 movement within the country.
5 Q. We can, please, look at the next page, page 17. So on
6 this following slide it reads:
7 "Healthcare providers response.
8 "Future challenges.
9 "• Step change in magnitude of response required."
10 So did you see the need for a step change in the
11 magnitude of response once it was clear that containment
12 would not last?
13 A. Yes. It was going to be a huge demand on the NHS,
14 regardless of the impact on individuals, also just --
15 just the isolation, testing, those kind of demands.
16 Q. Could we, please, have INQ000252365. Thank you.
17 This is an email thread on 29 February, so the day
18 after the presentation we've just been looking at,
19 regarding Public Health England modelling work. We can
20 see that from the subject title.
21 Now, it's an email chain between yourself,
22 Andrew Jones, Deputy CMO, Quentin Sandifer, and
23 Dr Orford.
24 Can we please look at page 2, and the bottom email
25 is from Andrew Jones, who worked for Public Health



1 Wales, to Dr Orford, and it says:
2 "Dear Rob,
3 "We have just come off the PHE IMT.
4 "PHE have reported, through Yvonne Doyle MD, that
5 work on the modelling to inform scenario planning, 'next
6 stage guidance' including on containment strategy, has
7 been accelerated and will commence today."
8 Then if we can just go up to the next email in the
9 chain, so it starts at the bottom of page 1, it's
10 an email from Dr Orford in response:
11 "Thanks Andrew, this is very helpful. Please let me
12 know if there is anything that you need from me in the
13 interim. Happy to call if this is easier?
14 "We will continue stetting up a STAC and work on
15 better sharing of intel. We will write to SAGE early
16 next week informing them as such, including those
17 involved. Once we have the secure shared drive and
18 mailbox in place we will forward details.
19 "Have not received read-out from Thursday's SAGE yet
20 which concerns me!"
21 Then the next email in the chain, the next one
22 above, is from Dr Sandifer, in the middle of that page:
23 "We should avoid calling it a STAC -- it isn't --
24 and what we need is the same level of urgency as it
25 seems is happening in PHE/DHSC."



1 Now, do you agree, Dr Williams, that parts of Public
2 Health Wales, HSSG, were not responding to the Covid
3 pandemic with the same level of urgency as in Public
4 Health England?
5 A. I don't think that was necessarily the case. You say
6 Public Health Wales, HSSG, so HSSG is a subgroup of the
7 Welsh Government is my understanding. But, yeah, we
8 were working certainly in the CDSC with a lot of
9 urgency, and a lot of our work was directed towards --
10 towards this.
11 Q. As we move into March, there was a COBR meeting on
12 2 March in which it was announced that contact tracing
13 for the source of the last two cases of Covid in the UK
14 had been unsuccessful and that there was sustained
15 community transmission in France and Germany. So at
16 that point was it not guaranteed that containment had
17 failed?
18 A. Yes, I imagine so.
19 Q. Now, there's nothing of this in the TAC minutes of
20 2 March. Does that suggest that TAC had either not been
21 made aware by its counterpart scientists on SAGE before
22 that was announced in COBR?
23 A. I don't recall the discussions in TAC. My recollection
24 from the time is that particularly up until the first
25 lockdown we were really, as a UK, including Scotland,

1 Northern Ireland, following a sort of UK Government and
2 PHE-led response, so contain was part of the overall
3 response. We could have had debate about -- internally
4 about whether it was working, whether the contact
5 tracing was working, but there wasn't really a sense
6 that that was something amenable to change. This was
7 the response. And even -- you know, even now, I think
8 that was fair. I think a UK response was the right
9 thing at the time.
10 **Q.** So just going back to one of my earlier questions, when
11 I think I asked you from your experience on the ground
12 who had overall ownership of pandemic response in this
13 early period, and I think you answered Public Health
14 Wales, in light of what you've just said, would it not
15 be fair to say that effectively ownership of pandemic
16 response was being led by Public Health England, with
17 the devolved administrations -- we're obviously focusing
18 on Wales and Public Health Wales -- sort of effectively
19 following suit; is that fair?
20 **A.** For most of the major decisions I think that was fair,
21 but of course we had to plan within the context of
22 a Welsh NHS and our own systems, and I know my
23 colleagues in the laboratory, for example, were working
24 on testing, et cetera. So there were elements that were
25 Wales-specific, but the overarching plan I think was



1 a UK one.
2 **Q.** I now want to turn to a SAGE report. It's INQ000224070.
3 It's entitled, as we can see on the screen:
4 "Low critical care capacity and high severity of
5 Covid-19 mean there is little functional difference
6 between successful 'flattening the curve' and ongoing
7 containment."
8 This was presented to SPI-M and SAGE. It's,
9 I think, first produced 9 March but then updated on
10 16 March.
11 If I can, please, ask for page 6, final paragraph,
12 to be brought up.
13 I'm going to start reading from the end of the
14 second line:
15 "The model results here do no more than reinforce
16 the findings of the WHO China Mission and validate the
17 strategy adopted by Chinese health authorities in or
18 around the 23rd of January 2020; and then subsequently
19 by Hong Kong, Singapore, Japan, and South Korea. We
20 suggest that they are strong evidence with which to
21 abandon mitigation strategies, justified in any way by
22 the possibility of a short epidemic. Governments need
23 to devote the entirety of their attention and resources
24 to creating viable ongoing solutions to the presence of
25 this virus. We suggest that the first step is to adopt



1 stringent fixed-term social distancing so as to give
2 time for detailed planning the rapid development and any
3 accompanying technology."
4 Were you made aware of this SPI-M paper, and if so
5 when were you aware?
6 **A.** I don't recall exactly when I was aware of it, but I can
7 recall it was within a few days or maybe even the same
8 day. My recollection is this represented a kind of
9 shift in thinking in terms of the academic papers being
10 brought to SPI-M from a strategy of mitigation, which
11 was the flattening the curve, to a recognition that
12 mitigation would actually be an untenable and
13 catastrophic situation, and actually would probably
14 result in the same sort of social distancing that
15 a planned extreme social distancing by mandate would
16 have done.
17 So I think this was -- this Riley paper was the
18 first one that really -- in my recollection, that said
19 we had to lock down, essentially, and soon, and that
20 mitigation wasn't really a viable strategy.
21 **Q.** So this was significant in shifting the opinions within
22 TAG; is that right?
23 **A.** I think -- I don't -- I can't say for, within TAG as
24 a whole group, but I think within -- I had some indirect
25 access to what was going on in SAGE and, I think, SPI-M



1 at the time, and this shifted the viewpoints there.
2 **Q.** If we can, please, have INQ000251994 on the screen,
3 please.
4 This is a TAC document titled "Covid -- Technical
5 Advisory Cell: Briefing on Behavioural and Social
6 Interventions". It was circulated on 11 March 2020.
7 Looking at the second paragraph, first, please:
8 "There are a range of behavioural and social
9 interventions that are evidenced as having been
10 effective in responding to past epidemics. These
11 interventions are well understood by the public and have
12 been enacted in other countries."
13 Then in the third paragraph:
14 "Applying behavioural interventions could be helpful
15 in containing an epidemic to some degree or changing the
16 shape of the epidemiological curve ..."
17 Just pausing there, why "could be"?
18 **A.** Yeah, I have reviewed this document, it does come a few
19 days after the Riley paper, although before the 16 March
20 update. I don't think the sentence is entirely clear.
21 I don't recall to what extent I would have had any
22 contribution to that, but it's ...
23 **Q.** But you would agree "could" seems slightly odd in this
24 paragraph?
25 **A.** Yes.

1 Q. If we can skip down to the sixth paragraph, please, at
2 the bottom of this page:
3 "SAGE considered that measures relating to
4 individual isolation will likely need to be enacted
5 within the next 10 to 14 days to be fully effective, and
6 those concerning household quarantining and social
7 distancing of the elderly and vulnerable 2-3 weeks after
8 this. However, the triggers for individual and
9 household isolation could be met earlier depending on
10 the progress of the outbreak in the UK."
11 Then if we can go over the page, please, to
12 paragraph 9:
13 "Modelling suggests that the stringent interventions
14 introduced in Wuhan from 23 January ... may have reduced
15 the reproduction number to below one. However, there
16 are differing views across the scientific community
17 about whether other factors were involved in this."
18 Just, again, pausing there, what was your view about
19 the efficacy of the measures that had been implemented
20 in Wuhan?
21 A. So I think measures in Wuhan and, to an extent, in
22 northern Italy showed that it was possible to enact
23 extreme social distancing to drive the reproduction
24 number below 1 and actually suppress the wave, so
25 I think it was empirically possible.



1 The debate that I can recall was around the
2 modelling and scenario planning as to what might be
3 possible within the UK, and, as I say, the thinking
4 moved on from flattening the curve to realising that
5 actually it was not only possible to enact a lockdown
6 but actually it was necessary, to avoid terrible loss of
7 life and an impact on wider society.
8 My impression of this document is it was -- it
9 was -- it's maybe a few days behind some of the -- that
10 SAGE thinking, but I couldn't give you a day-by-day
11 account of how those things went on.
12 Q. Just have a look at a couple more paragraphs, if we may,
13 in this document. Paragraph 10 next, please:
14 "Hong Kong and Singapore are undertaking extensive
15 contact tracing as well as a raft of social distancing
16 measures such as school closures and self-isolation, but
17 not to the same level of stringency as seen in Wuhan.
18 There is also anecdotal evidence of extensive
19 self-isolation by the general population. The roughly
20 linear increase in the number of cases in Hong Kong and
21 Singapore suggest that this approach has held the
22 reproduction number around one."
23 Then if we can, please, go over the page, to page 3,
24 and look at the second bullet point:
25 "Home and work based distancing interventions have



1 a greater individual impact. When combined
2 self-isolation, household quarantine and social
3 distancing of vulnerable groups and over 70s is
4 predicted to lead to a 37% reduction in infection
5 related deaths."
6 Then finally, please, paragraph 13 at the bottom of
7 this page:
8 "A combination of these measures is expected to have
9 a greater impact: implementing a subset of measures
10 would be ideal. Whilst this would have a more moderate
11 impact it would be much less likely to result in
12 a second wave. In comparison, combining stringent
13 social distancing measures, school closures and
14 quarantining cases, as a long-term policy, may have
15 a similar impact to that seen in Hong Kong or Singapore
16 but this could result in a large second epidemic wave
17 once the measures were lifted."
18 Just, again, pausing there, it's right, isn't it,
19 that Hong Kong and Singapore had experienced their own
20 coronavirus pandemic in the last 20 years, so they had
21 experience of multiple waves; yes?
22 A. The SARS-CoV-1 -- I suppose it was a pandemic but not in
23 the same sense as, say, the 2009 pandemic, but they had
24 experience of having to step up contact tracing and,
25 you know, those sorts of interventions rapidly.



1 Q. Had they not modelled the impacts of second and third
2 waves as well?
3 A. I don't know what modelling they'd done at the time.
4 Q. Going back to this document we've just been looking at,
5 over the page, page 4, paragraph 14, please:
6 "The timing of interventions would be critical."
7 Then paragraph 16, please:
8 "These interventions assume compliance levels of 50%
9 or more long periods of time. This may be unachievable
10 in the UK population and uptake of these measures is
11 likely to vary across groups, possibly leading to
12 variation in outbreak intensities across different
13 communities."
14 Can you help us, where did that assumption come
15 from, namely that a compliance level of 50% may be
16 unachievable in the UK population?
17 A. I don't know where that would have come from. As I say,
18 the arguments you presented here in this paper are sort
19 of a mixture of the pre-Riley paper about flattening the
20 curve, there's the point about not putting in too many
21 interventions, otherwise you'll get a second wave, but
22 then the one above that you presented shows about the
23 ICU surveillance figures, which was actually part of the
24 mechanism for the repeated lockdowns that Riley was
25 advocating and then Ferguson's paper after that.

1 Q. As a summary, by 11 March 2020, would it be fair to say
2 the following things: the timing of an NPI would be
3 critical, as is stated in this paper; you would agree?
4 A. Yes.
5 Q. Early intervention led to quicker results?
6 I'm afraid if you nod, we can't pick up your answer.
7 A. Yes.
8 Q. Thank you. A combination of stringent NPIs, so home and
9 work-based distancing interventions, self-isolation,
10 household quarantine, social distancing of vulnerable
11 groups, was likely to result in a 37% reduction in
12 deaths?
13 A. Again, that came from the pre-Riley assumptions.
14 I think that was not sufficient actually to suppress the
15 epidemic, so this isn't suppression, that's a flattening
16 the curve statistic in my recollection.
17 Q. I understand. Lockdown in Wuhan was effective?
18 A. Yes.
19 Q. Stringent NPIs in Hong Kong and Singapore also were
20 effective?
21 A. Yes.
22 Q. The ideal outcome would have been to flatten the curve
23 and push the epidemic into the summer months?
24 A. I'm not sure. Are you asking whether I think that now
25 or whether that's an implication of the paper?



1 Q. Whether at the time that would be -- that would have
2 been something that could have been safely assumed or
3 thought.
4 A. I'm sorry, I can't -- I can't really answer that.
5 Q. Bearing this in mind, and what we can see from this
6 paper, why was lockdown not recommended by TAC at this
7 point? So this is 11 March 2020.
8 A. So, again, this is on my recollection, but I have gone
9 back and read some of the papers and done some further
10 thinking, so it is with the benefit of that. My
11 recollection, as I've said before, is that the overall
12 strategy that we were following was a UK strategy, that
13 the chief medical officers had made an agreement that
14 they were going to attempt to do the same thing at the
15 same time, except where there were specific reasons for
16 a different response, because of differences in the NHS
17 structure or whatever. So we were following a UK
18 response.
19 My recollection -- and TAG would have reflected the
20 discussion and the thinking within SAGE. My
21 recollection that the 13 March SAGE meeting, there was
22 a consensus that lockdown was necessary. There may be
23 need for repeated lockdowns, et cetera, but actually
24 that there needed to be extreme social distancing to
25 suppress the epidemic and prevent really severe impacts



1 on the population.
2 And my recollection that after the previous papers
3 about flattening the curve, that certainly by that
4 13 March meeting, that there was a consensus within
5 SAGE, albeit although I wasn't a member, so you maybe
6 better ask people within SAGE, but that's what they were
7 recommending at that time, and I would have thought that
8 TAG and the Chief Scientific Adviser would have echoed
9 those views because that's the way that we were
10 operating.
11 Q. Now, I'll -- we'll come on to that 13 March meeting in
12 a moment. Just, though, hearing what you've said, that
13 effectively it would have been impossible to have locked
14 down without UK Government co-operation; is that fair?
15 A. I mean, I can't say exactly how it would have gone, but
16 I don't think it would have been feasible.
17 Q. Do you not still think TAC should have at least
18 considered locking down and advised the Welsh Government
19 on locking down, leaving aside the practicalities or the
20 relationship with the UK Government and what had been
21 agreed at CMO level?
22 A. I suppose we could have considered doing that as
23 a group, but recalling that the change in the thinking
24 within the SAGE and modelling groups that we were
25 relying on was only happening around this time.



1 Q. Could we please have INQ000271443 displayed. Thank you.
2 This is TAC's briefing on behavioural and social
3 interventions. We understand this to be dated 11 March.
4 If we have a look at point 4, please:
5 "The objectives of these interventions could be to:
6 "• Contain the outbreak so that it does not become
7 an epidemic (note -- this is [likely] to be
8 [unachievable])."
9 Was considering the possibility then of containment
10 completely unrealistically about this date, namely
11 11 March?
12 A. Yes, I think that's -- that's how it would be.
13 Q. Looking then at the next paragraph, paragraph 5, please:
14 "Any intervention would need to be Government policy
15 for a significant duration (2-3 months) in order to see
16 the benefit, as removing and/or relaxing the
17 intervention too early could result in a new outbreak
18 and potentially extend transmission of the virus into
19 Winter 2020."
20 Am I right in thinking that what this is saying is:
21 go too early and the peak of infections might simply be
22 displaced to a worse time of year?
23 A. So the first part of the sentence is correct, that any
24 serious intervention would need to be done for
25 significant duration. It's also true that removing,

1 relaxing it could result in a new outbreak. Reading it
2 now, it looks like a mixture of the two forms of thought
3 at the time, but essentially for a lockdown to work you
4 have to implement it for a sufficient amount of time so
5 that you know you've suppressed the virus and then you
6 can then be sure that the levels are low once you've
7 finished. What then happened after that is something
8 that modelling might predict, but you don't really know
9 at the time.
10 **Q.** I understand. But does --
11 **LADY HALLETT:** Mr Poole, just before you go on, I'm really
12 sorry.
13 You said -- am I right in thinking your question
14 was: am I right in thinking that what this is saying is
15 "go too early and the peak of infections may simply be
16 displaced to a worse time of year"?
17 That's not how I read it. I read it: because any
18 intervention has to be two to three months long, then
19 you don't want to go too late because otherwise you risk
20 going into the winter months.
21 That's how I read it. So I read it the opposite way
22 from you.
23 **MR POOLE:** Well, my Lady, perhaps we can put that to
24 Dr Williams.
25 **LADY HALLETT:** Which is the correct reading?



1 **A.** I have to confess I'm slightly confused by this
2 paragraph, because it seems to be a mixture of
3 flattening the curve and suppression, which was then
4 moved on to.
5 The problem with the -- was thought at the time was
6 that suppression would work, so you put in interventions
7 for two to three months, you would stop the epidemic for
8 that time, but then after a while you would get a second
9 infection and then you would either have to lock down
10 again or you would get a further wave.
11 My also recollection is from the Riley paper and
12 others that they predicted that it would come back every
13 two to three months, actually even more frequently than
14 that, which wasn't actually the case in summer of 2020,
15 so it took a longer time for the second wave to come
16 around than they predicted.
17 **MR POOLE:** Is it right that this is predicated on the fact
18 of there being sort of, effectively, only one lockdown?
19 It doesn't contemplate, does it, two or three successive
20 lockdowns at specific intervals?
21 **A.** So as I've said, the Riley paper from the 9th was
22 starting to contemplate the idea of repeated lockdowns
23 or at least the first lockdowns. I can't remember when
24 the second paper came out but it actually did model
25 repeated lockdowns. But this was around the time that



1 that thinking was changing, so that might be the reason
2 that this document is maybe a mixture of those views and
3 was still reflecting the ideas of kind of flattening the
4 peak, and also being concerned about not suppressing the
5 peak because then you would get another peak but it
6 would come in winter, when we would have the flu and
7 other things at the time. I think the idea of lockdowns
8 was quite far from practice in people's minds and the
9 idea of repeated lockdowns was even -- even further
10 away. So maybe that's why the thinking was along those
11 lines.
12 **Q.** If we can, please, have a look at, I think it's page 6
13 of the document we've got in front of us, we can see
14 there some of the modelling that was done, and I want to
15 look -- it's not -- certainly if you're colour blind you
16 won't be able to follow this but I think you can just
17 about see it, it's -- I'm looking at the grey dashed
18 line.
19 **A.** Yeah.
20 **Q.** Is it right that that represents, looking at the key,
21 school closures, case isolation, household quarantine
22 and social distancing of the entire population?
23 **A.** Yes.
24 **Q.** So it is the scenario most like what we saw enacted over
25 a week later, which we're coming on to in a moment.



1 Yes?
2 **A.** That's right, yes. So the SD is the additional social
3 isolation.
4 **Q.** Yes.
5 **A.** And it shows a flatten -- it's suppressed the first peak
6 completely, but then you get a much larger peak, it
7 predicts, actually into the summer.
8 **Q.** Is that because, as you've just described, a sort of
9 reduction in case rates by mid-May and then suddenly
10 a number of cases sharply increasing, is that because
11 the model assumed that the set of restrictions would be
12 lifted effectively all at once and then case numbers
13 would increase in the population at that point?
14 **A.** I can't remember the exact assumptions but there would
15 have been something relatively simple like that, but
16 yes, we assumed that -- restrictions in place for X
17 amount of time and then either gradually or immediately
18 removed.
19 **Q.** Can you recall, did anyone ask about -- going back to my
20 previous question -- multiple lockdowns or the staggered
21 releasing of restrictions, or were those questions that
22 were not being asked at this time?
23 **A.** I think the staggered release of restrictions -- I can't
24 recall exactly what the modellers did, but they would
25 have probably tried to put simple on/off things within

1 the models, at this stage certainly. They -- I think
2 they were modelled later with staggered restrictions.
3 And the idea of repeated lockdowns was I think the paper
4 after this, when -- again, I can't recall exactly but
5 I'm sure there were papers from Riley and papers from
6 Ferguson, probably Edmunds' group as well, showing what
7 would happen if you lock down for a period and then you
8 used good surveillance to watch until there were
9 a certain number of cases emerging, I think in intensive
10 care, and then you locked down again based on that
11 number. So those were the models they were starting to
12 run a little bit after this paper.
13 **Q.** Now, on 12 March the UK Government announced that from
14 the following day, 13 March, those with coronavirus
15 symptoms, either a new continuous cough, high
16 temperature, should stay at home for at least
17 seven days, and all those over 70 and those with serious
18 medical conditions also advised against going on
19 cruises.
20 Now, obviously that announcement fell short of
21 a mandated lockdown. What warning were you given,
22 Public Health Wales given or yourself or TAC given,
23 ahead of that announcement by the UK Government?
24 **A.** I beg your pardon, is that 13 March?
25 **Q.** This is the announcement on 12 March, with the



1 restrictions coming into effect the following day. What
2 warning, if any, were you given about that announcement?
3 **A.** I don't recall being given any warning.
4 **Q.** Were you surprised that an announcement like that would
5 be made without your input and without any prior
6 warning?
7 **A.** I can't recall if I was surprised or not. I think I was
8 surprised that it wasn't a more -- a more complete
9 lockdown.
10 **Q.** At this point, so we're now 12 March, was the scientific
11 consensus in Wales in favour of restrictions being
12 imposed only and no further, or in favour of
13 an immediate lockdown, to your recollection?
14 **A.** My recollection, as far as it goes, was that we'd
15 thought that -- given all of the preceding papers, that
16 by that 12 March that there would be a UK-wide mandated
17 full lockdown, given the sorts of warnings that were
18 given in the Riley and the Ferguson papers.
19 **Q.** Given that that was your view and, I think I'm right in
20 saying, a sort of scientific consensus view by 12 March,
21 and you were surprised that the 12 March announcement
22 hadn't gone further, did you speak to anyone about this?
23 What did you do?
24 **A.** I can't recall exactly my verbal or written
25 communications at the time. As I say, my -- my



1 understanding at the time was that we were working as
2 a four nations, as a UK-wide response, and it would have
3 been very difficult to lock down in Wales and not lock
4 down in England, and certainly we found subsequently --
5 you know, there's a lot of movement across the border --
6 it only really works properly if there's a UK-wide
7 intervention.
8 **Q.** You've said earlier that you worked quite closely with
9 Dr Orford, the Chief Scientific Adviser for Health in
10 Wales, I mean, at this stage, did you raise your
11 concerns with Dr Orford, can you recall?
12 **A.** I don't recall whether I raised them in a written
13 format. I think it's probable that if we'd had any
14 telephone meetings or similar at the time that I would
15 have expressed surprise that that was the response.
16 **Q.** I think it would be fair summary to say that between
17 this date, 12 March, and 20 March, those on TAC were
18 becoming increasingly concerned about the approach being
19 taken in Wales to the pandemic. If I can just anchor
20 that in perhaps a point in time, on 15 March TAC
21 authored a paper for the SAGE meeting that was to take
22 place the following day -- I don't want that paper
23 pulled up, please -- it's TAC's recommendations for the
24 Welsh Government, and the executive summary reads:
25 "TAC group recommends that unless the requisite



1 resources [resources for the NHS to prevent it becoming
2 overwhelmed] are identified in the next seven days, with
3 a clearly defined plan to implement them in a timely
4 manner a policy of more stringent interventions should
5 be considered for Wales."
6 Why was that your advice or TAC's advice at that
7 time?
8 **A.** I think that was to do with the NHS capacity, that it
9 would need to be greatly augmented if we were going to
10 have a big wave.
11 **Q.** So was there a concern that unless more stringent
12 interventions were immediately put in place, then the
13 NHS in Wales risked being overwhelmed?
14 **A.** Yes, that was a concern at the time.
15 **Q.** Do you think, looking back, that that advice was -- went
16 far enough?
17 **A.** I suppose even after -- even at the time I did wonder
18 whether we, including myself, could have done more to
19 argue for an earlier lockdown, given that the UK-wide
20 lockdown didn't happen when we thought it might have
21 done. The only other thing I would say is that we were
22 ever so slightly behind the epidemiology in England, so
23 actually the case numbers were maybe a week or something
24 behind the numbers in England, and there was --
25 you know, there was rationales for timings of lockdowns,

1 but yes, I was -- I have wondered about whether we --
2 I should have argued harder for something to be done,
3 but I'm not sure it would have made an awful lot of
4 difference.
5 **Q.** Doesn't being, epidemiologically, a week behind, doesn't
6 that, in fact, give Wales sort of effectively a head
7 start, it would allow Wales to get ahead of the curve?
8 **A.** You need to time the lockdown so that you don't --
9 I think -- I recall, you know, John Edmunds' testimony
10 is you don't go into lockdown when there's just only one
11 case, because that's clearly too early, but then when
12 there are too many cases that's too late, so somewhere
13 between one and the other. And the papers were arguing
14 for earlier lockdowns. I don't know exactly how that
15 timing would have worked for Wales, but, as I say, at
16 the time, it -- just wasn't aware that it was an option.
17 **Q.** Now, five days later on 20 March TAC was asked to
18 commission a paper on lockdown measures and then a TAC
19 advisory paper was published on 23 March, which again
20 advised on -- it was entitled "Lockdown and release
21 strategy". So that appears to be the first formal
22 interrogation by TAC into national lockdowns; is that
23 right? Is that your recollection?
24 **A.** I would have thought, given that there was the feedback
25 between SAGE meetings and TAC, that some of the other



1 papers and repeated lockdown papers would have been
2 discussed within TAC but maybe that's the first time it
3 was formally put down on paper.
4 **Q.** Was TAG and TAC consulted on the ultimate decision to
5 lock down on 23 March?
6 **A.** I don't recall the discussions being of that variety,
7 but yeah, I just -- I don't recall, you'd have to ask
8 them about the minutes.
9 **Q.** In your view, should Wales have locked down earlier in
10 March 2020?
11 **A.** So my view is that the UK should have locked down
12 earlier, and ideally, you know, on 12 March or possibly
13 even earlier than that, because of -- partly because of
14 what the modelling was saying in terms of the timing of
15 a lockdown in relation to the impact, and also partly
16 because we had evidence that it would work, from,
17 you know, Wuhan and Italy.
18 **Q.** What would the impact of an earlier lockdown have been
19 on later waves?
20 **A.** It's very difficult to answer that. I think it would
21 have reduced the impact on the first wave in terms of
22 hospitalisations and deaths. However, it might have
23 been that there would have been a rebound effect over
24 the second wave, and we did see that to an extent, that
25 we were actually slightly less impacted relative to



1 population in the first wave but then slightly more in
2 the second wave. This is from some of my subsequent
3 reading of the figures from the time. So there was
4 an extent to which what you don't get in one wave you do
5 get later on, unless it's a very well enacted and early
6 suppression the second time.
7 **Q.** Now, Dr Williams, I just want to change topic, if I may,
8 and ask you some questions about asymptomatic
9 transmission of Covid-19. Again, I want to try to take
10 this chronologically, if I can.
11 What did you know about asymptomatic transmission in
12 early January 2020?
13 **A.** So, again, I'm not sure it would have been something
14 that I thought about greatly, but I can say that
15 professionally I would have assumed that there was
16 likely to have been asymptomatic infection, and this is
17 just from my experience of other respiratory viruses.
18 I know SARS-CoV-1 didn't generally have asymptomatic
19 infections but SARS-CoV-2 does and influenza certainly
20 does. Whether those asymptomatic infections were
21 detectable by testing and whether they were
22 transmissible is a separate question.
23 **Q.** I think on 29 January you and your colleagues at Public
24 Health Wales received an email from Public Health
25 England attaching a paper on asymptomatic transmission.



1 Again, I'm not going to ask for it to be displayed, but
2 that paper, if you recall it, outlined early credible
3 evidence of asymptomatic transmission from an individual
4 in Germany who appeared to have been infected through
5 her asymptomatic parents. Do you recall this paper that
6 I'm talking about?
7 **A.** Yes.
8 **Q.** And the paper concluded that "The currently available
9 data is not adequate to provide evidence for major
10 asymptomatic/subclinical transmission of 2019-nCoV", but
11 that there was evidence of small-scale anecdotal
12 asymptomatic transmission.
13 Was it your view as an epidemiologist that it is
14 better to keep an open mind about transmission
15 possibilities?
16 **A.** I think in general, it is. What you don't know is to
17 what extent they play a role in terms of the
18 transmission of the infection, so something may be
19 possible but not a major factor or it may be possible
20 and a major factor, and it's hard to tell, particularly
21 early in the phases.
22 **Q.** Was it your view that the best approach would be to
23 assume that asymptomatic transmission was taking place?
24 **A.** I can't really answer that. You have to think about
25 also the implications of assuming asymptomatic

1 transmission, which would -- given the case definition
2 at the time was "travel from China or Wuhan with
3 symptoms", you'd then quite quickly shift that to
4 "anyone who's travelled from China", which I don't think
5 would have been very feasible in terms of follow-up, and
6 probably you would have then had to think about,
7 you know, what would the next step be. So maybe that's
8 the light in which it was considered.
9 But yes, it's always worth considering on the
10 precautionary basis what might be transmission routes.
11 Q. Moving forward chronologically, then, so that was
12 a paper that was shared with you on 29 January. On
13 17 February 2020, the Diamond Princess asymptomatic
14 cases were discussed in a SAGE meeting. Do you recall
15 discussing the evidence of asymptomatic cases on the
16 Diamond Princess in TAC?
17 A. I don't recall those discussions in TAC. I'm sure there
18 would have been -- we'd got reports from the
19 Diamond Princess through the PHE meetings, I'm sure
20 there would have been some at least information on that,
21 but I don't recall discussions in TAC.
22 Q. If we can, please, have INQ000119469 on screen.
23 This is minutes of a NERVTAG meeting of
24 21 February 2020.
25 If we could, please, have page 6, at paragraph 3.4.



1 Thank you.
2 "NF noted that there were a few modelling groups
3 estimating a higher infection rate when comparing case
4 populations in Singapore, South Korea and Japan, this
5 suggests that at least a third have been missed.
6 JE commented on this after the meeting taking into
7 account the issue of asymptomatic cases, where the
8 evidence suggests that 40% of virologically confirmed
9 cases are asymptomatic."
10 Do you recall being informed of this?
11 A. I don't recall that particular -- I wasn't on NERVTAG or
12 received the minutes from NERVTAG, but I'm sure the
13 figure of the -- from what was happening in the
14 Diamond Princess was probably reported elsewhere.
15 Q. So by late February, were you and your colleagues aware
16 that asymptomatic transmission was taking place, and the
17 extent of asymptomatic transmission could be as great as
18 40%?
19 A. As I say, I can't recall, but I'm sure it would have
20 been part of the thinking.
21 Q. Did TAG or TAC formally advise the Welsh Government at
22 this point, in late February, about the potentially very
23 high rates of asymptomatic transmission?
24 A. Again, I can't -- TAG -- as I've mentioned earlier in my
25 statement, TAG was one of the things that I was involved



1 in. My role was mainly to give epidemiological updates,
2 and my main role was within Public Health Wales, so
3 I don't recall absolutely all the discussions in TAG at
4 the time unfortunately.
5 Q. Dr Williams, I'm going to change topic again and talk to
6 you next about, first, discharge of patients from
7 hospitals to care homes and also then testing of
8 care home staff.
9 Now, as I'm sure or you may be aware, there is
10 a later module of this Inquiry that is going to be
11 looking at the care sector, but within this module we
12 are looking at high level core Welsh Government
13 decisions that might have impacted on the care sector.
14 Were you involved in providing any advice about
15 discharging patients from hospitals to care homes in
16 February to April 2020?
17 A. February to April ... not ... not that I can recall
18 between February and end of March, no.
19 Q. Is it right that you have subsequently worked with
20 colleagues to address the question of transmission to
21 care homes from these discharges, so namely discharges
22 from hospitals to care homes?
23 A. Yes.
24 Q. That work, am I right in saying, has largely confirmed
25 that transmission to care home residents was driven by



1 their exposure to the community through staff rather
2 than from hospital discharges; is that right?
3 A. That's the broad conclusion. I just want to caveat that
4 by saying that of course it's possible for care home
5 residents from discharges, particularly early in the
6 pandemic, to have then gone on to cause transmission
7 within those homes, I'm not arguing at any point that
8 that wasn't a possibility. We just felt that there was
9 a bigger risk, and an ongoing risk, from the community
10 to staff to the care home, and that was something that
11 was potentially amenable to change, and that's why we
12 did this work.
13 Q. So from the point of view of care home outbreaks, the
14 testing regime of care home staff and residents was
15 important in terms of saving lives, possibly more
16 important than the policies around discharge from
17 hospitals; is that fair?
18 A. I think it was -- I think it's the whole package of what
19 you would do around care homes, how you would support
20 the staff, how you would support the work within -- the
21 infection control and things like that within the
22 care home, rather than simply the testing policy
23 versus -- within staff versus the testing policy on
24 discharges.
25 Q. Can we, please, have INQ000228309 displayed. Thank you.

1 Now, this is an email chain, it covers 31 March
2 through to 1 April. It's between Dr Thomas Connor,
3 yourself, Dr Orford and other members of TAC.
4 Just by way of context, Dr Connor has circulated
5 a paper on nosocomial outbreaks and, given the spread of
6 outbreaks observed in a hospital in late March 2020, the
7 issue was raised as to how effectively you could test
8 healthcare workers to ensure that positive cases of
9 Covid were caught.
10 So just with that context, if we can go, please, to
11 page 2 of this email chain -- I'm grateful -- at the
12 bottom email.
13 It's an email from Dr Connor, yes, on 31 March,
14 22.41. Then over the page, it goes to page 3,
15 paragraph 4, I'm grateful, yes:
16 "Just thinking in terms of timescales the potential
17 for routine testing to have picked this up is very
18 contingent on how that testing regimen is designed. In
19 this case we have a cluster of 50-70 cases who all
20 flagged positive within 7 days of the suspected index
21 case. That to me suggests that one implemented
22 something like weekly testing would be critical in
23 catching something like this early. I would think that
24 if a portion of staff tested every day then detection
25 that there is a problem on a ward might be possible.



1 But, say, testing everyone once a week could conceivably
2 have missed basically all of the transmission here. So
3 to me the message is to design routine testing well,
4 taking into account the observed timescales in AB and
5 understanding that such testing has to be rapid to be
6 useful."
7 AB being the hospital that I referred to when giving
8 context to this email chain.
9 Then if we can, please, go at page 2, to the top
10 email.
11 This is your reply of -- on 1 April. I'm looking at
12 the second paragraph, five lines down, starting:
13 "On regular testing I was thinking of a different
14 scenario, whereby healthcare workers could be infected
15 at home rather than the ward. Agree that only daily
16 testing would be secure, but weekly testing would help
17 to give routine reassurance and also set up a rhythm and
18 acceptance of testing and self-consideration of
19 symptoms. Of course you can be unlucky with this too
20 and miss a whole week, but I think it could work and
21 I think have seen that it's been used elsewhere (will
22 check)."
23 Now, you say there "self-consideration of symptoms".
24 Did you consider the role of asymptomatic transmission
25 when considering this advice, Dr Williams?



1 **A.** I believe so, yes. So this was the email -- the
2 outbreak that Tom refers to was one in Aneurin Bevan
3 that actually my team had investigated initially and we
4 found this number of cases and then Tom had added on to
5 that with a genomic analysis to try to work out what the
6 chains of transmission were, and this was then leading
7 into a discussion about how healthcare worker testing
8 might help mitigate the transmission in hospitals both
9 between staff and patients, patients to staff, but also
10 to staff at home. So we started to discuss the timing
11 of that, and how you would optimise it.
12 You also have to remember about the performance of
13 tests and things like that.
14 **Q.** Would it have been more prudent to advocate for testing
15 more frequently than once every seven days, as Dr Connor
16 has done?
17 **A.** I think we were both arguing -- I think we were both
18 discussing whether weekly testing would work and how
19 many it would miss and what pattern you would use,
20 rather than that he was arguing for daily testing and
21 I was arguing for weekly.
22 Again, the -- because -- I think it was in the
23 understanding of the asymptomatic cases, and the fact
24 that healthcare workers do tend to carry on working even
25 if they've got mild symptoms, or sometimes with severe



1 symptoms, and actually I think what I was trying to say
2 here was that giving people the test and then it turned
3 out to be positive maybe before symptoms would at least
4 give them the rationale that they would not then go to
5 work whilst infectious. So there's quite a lot of
6 things going on here.
7 **Q.** Was it your view that there needed to be some routine
8 testing, then, of healthcare workers at least once every
9 seven days?
10 **A.** That's my recollection, is these email chains would
11 allow me(?) time to argue for that.
12 **Q.** On the same day, about two hours later, you email
13 Dr Orford.
14 If we could, please, have INQ000224062 on the
15 screen. Thank you.
16 You emailed Dr Orford -- this was a CDC study about
17 the high proportion of healthcare workers testing
18 positive for Covid-19, and care homes, who were
19 asymptomatic.
20 As we see there, the email at the top of this page:
21 "Will try to discuss this offline with Robin.
22 Whilst it is true that the NPV of the test is low, it is
23 also true that potentially a high proportion of those
24 testing positive (and therefore likely shedding) are
25 asymptomatic (see below in context of care homes). It

1 is also true that HCW will continue to work whilst
2 symptomatic despite guidance."
3 Then email from Dr Orford slightly above that one,
4 please, says:
5 "It would be good to understand if there is more
6 data out there on higher intensity testing of HCWs.
7 Also it is a risk based approach to mitigate nosocomial
8 outbreaks -- whilst it may have a low pick-up it might
9 have a 'marginal gain' and also a psychological barrier
10 for HCWs."
11 What did you understand by Dr Orford's response?
12 What did you understand that to mean?
13 **A.** I think I was -- I think I was arguing for routine
14 testing of healthcare workers so you could pick up both
15 pre-symptomatic, mild symptom and asymptomatic
16 infections, and Rob is just asking if there's more
17 evidence on this. I don't know about the "marginal
18 gain". The negative predictive value point is that,
19 when there's little infection around -- well, there's
20 a lot of infection around, that negative tests might not
21 necessarily mean that that person is negative, so it
22 might provide false reassurance, but I don't know
23 exactly what he means in that second sentence.
24 **Q.** Perhaps to summarise then what was known, what you knew
25 by 1 April, you knew it was essential to routinely test



1 healthcare workers to avoid transmission to patients;
2 yes?
3 **A.** I wouldn't say I knew it was essential but I was
4 suggesting that might be a means of preventing
5 transmission, yes.
6 **Q.** I understand. Symptom-based screening alone would fail
7 to identify Covid-19 cases?
8 **A.** That's what I thought, yes.
9 **Q.** So routine screening of everyone, so symptomatic and
10 asymptomatic, was really the only effective way to avoid
11 transmission of Covid-19 from staff bringing community
12 infections into a care home; is that right?
13 **A.** I think that was part of my thinking. I mean, it's
14 a very complex area, but yes, to pick up those
15 asymptomatic infections you needed a test.
16 **Q.** If asymptomatic transmission accounted for up to 40% of
17 Covid cases, testing symptomatic individuals only could
18 miss up to 40% of outbreaks on any one day; is that --
19 **A.** Yes.
20 **Q.** And if some healthcare workers would continue to work
21 whilst symptomatic, even more infections would obviously
22 be missed; is that right?
23 **A.** If they were symptomatic they wouldn't necessarily be
24 missed, someone would know about them. But, yeah.
25 **MR POOLE:** I'm grateful.



1 My Lady, I'm not going to quite finish this topic,
2 so this might be an appropriate time for a break.
3 **LADY HALLETT:** Certainly. 11.30.
4 **(11.13 am)**
5 **(A short break)**
6 **(11.30 am)**
7 **LADY HALLETT:** Mr Poole.
8 **MR POOLE:** Dr Williams, we were just talking about the
9 position as at 1 April. I just want to move forward
10 a few weeks to 17 April, and there was a Public Health
11 Wales Strategic Coordinating Support Group meeting on
12 that date.
13 You provided an update on the situation in
14 care homes. You said 300 care homes are reporting
15 Covid-19 activity, roughly 25% of care homes in Wales.
16 Then your colleague from Public Health Wales provided
17 some further information and said:
18 "To date 322 of 1,302 registered care homes in Wales
19 have reported Covid-19 activity. A total of 153 cases
20 have been confirmed. Since 9th of April, Public Health
21 Wales have been offering testing of symptomatic and
22 asymptomatic staff. There is a 62% positive iterate of
23 staff tested."
24 Was this a policy that had been rolled out across
25 all care homes in Wales, to your knowledge, with



1 mandatory testing, or was it being offered -- provided
2 only to care homes as and when outbreaks emerged?
3 **A.** My recollection, it was for outbreaks.
4 **Q.** A 62% positivity rate for staff tested must have been
5 very concerning?
6 **A.** That is a high rate, yes.
7 **Q.** Of those tested, more care home staff than not were
8 positive for Covid, 62%?
9 **A.** It's over 50%, yeah.
10 **Q.** Given the number of outbreaks in care homes across Wales
11 at that time, coupled with what we've just discussed
12 about your knowledge of asymptomatic spread, did you
13 think that roll-out of mandatory testing of all staff
14 and residents should take place at that time?
15 **A.** I don't recall what my views were at the time. I think
16 there was a meeting the following day that moved things
17 on a little bit, but no, I don't recall.
18 **Q.** Taking a look at what was happening in England, on
19 14 April the UK Chief Medical Officer's advice was that
20 testing within care home settings was a priority,
21 following concern highlighted by a study of
22 29 care homes by Public Health England, and then on
23 28 April in England the Department of Health announced
24 extending testing to all residents in care homes
25 irrespective of symptoms.

1 There was a ministerial advice on the scaling up of
2 testing in care homes that was provided to
3 Vaughan Gething on 30 April.
4 It's INQ000116607. Which is up on display,
5 thank you.
6 Did you contribute to that ministerial advice?
7 A. I don't recall that I did, no.
8 Q. Perhaps we can just have a look, then, at page 4,
9 paragraph 16, under the "Impact of asymptomatic
10 care home residents" reads, first bullet point:
11 "A pilot study recently undertaken by PHE in six
12 care homes in London that reported an outbreak tested
13 all residents and staff groups. Preliminary results
14 from one care home with over 100 residents investigated
15 at an early stage of the outbreak in the home, 75% of
16 residents were positive for COVID-19 but only 25% were
17 symptomatic. 50% of staff were positive but only 29% of
18 these were symptomatic ..."
19 Then if we can, please, go to page 5, paragraph 21.
20 Paragraph 21, thank you.
21 "Discussions with colleagues in Welsh Government and
22 PHW indicate that testing of asymptomatic (or reportedly
23 so) care workers would help to prevent introductions
24 into care homes, and also provide an estimate of
25 community incidence of COVID."



1 Then, please, paragraph 23, bottom of the page,
2 thank you.
3 Under "The Options":
4 "There are limited options. Do nothing is not
5 [an] option. Expanding into asymptomatic individuals
6 still lacks the evidence base to support this being the
7 best use of testing capacity."
8 So by this point, there was peer reviewed evidence
9 in favour of routine testing in care homes from that CDC
10 study one month prior. Do you agree with the statement
11 that there wasn't an evidence base to support mass
12 testing that we see in this document?
13 A. I don't think that's -- I don't think that's correct in
14 this -- (inaudible) the question. So the CDC paper
15 found that there was asymptomatic infection but it
16 didn't necessarily advocate for routine testing of
17 asymptomatic staff. I think a follow-up paper and then
18 editorial in the New England Journal later in April,
19 I think, before this but after the previous ones,
20 started to advocate for regular testing. However, there
21 wasn't evidence, ie trial evidence, showing that if you
22 took X number of care homes and tested all of the staff
23 and residents and then you took some care homes and
24 didn't, that actually this would improve outcomes. So
25 I wouldn't say that there was strong evidence but on the



1 precautionary basis I think I was advocating for some
2 kind of routine testing of staff, through my sighting of
3 the paper on 1 April and also some documents on
4 the 18th.
5 Q. I understand.
6 Is it a fair interpretation that the reference here
7 to the "best use of testing capacity" that there were
8 capacity issues with testing and so the advice was
9 perhaps to prioritise their use elsewhere, so in
10 hospitals and for symptomatic key workers?
11 A. Having reviewed this document, which I don't recall
12 seeing at the time, but having reviewed this document,
13 it does seem to make mention of capacity. I think
14 there's also a reference to 25,000 tests or something
15 like that, in relation to residents and capacity.
16 Q. Just finally on this topic, annexed to this ministerial
17 advice is a document titled "Summary of discussion on
18 prioritising tests for care homes" -- sorry,
19 INQ000116607, if that could be displayed, please,
20 page 10.
21 This document proposed prioritising blanket testing
22 of symptomatic and asymptomatic staff in certain
23 care homes, those with an outbreak, Covid-free homes,
24 struggling homes. And in this annex it is noted,
25 I think it's page 11, paragraph 2 -- if we can see that,



1 please.
2 "FA [this is Dr Atherton] indicated that it would
3 have been helpful to have this information earlier as it
4 had caused enormous issues in Wales. Proved very
5 difficult situation as the media had picked this up as
6 a very significant divergent of policy.
7 "There was a 4 nations group on testing but Wales
8 did not seem to be fully plugged in."
9 In your view, insofar as you can answer, as you
10 weren't sighted on this paper at the time, was
11 Dr Atherton fair when he said that Wales was not fully
12 plugged in on this issue?
13 A. I wasn't a member of the four nations testing group, so
14 I can't really comment on that.
15 Q. Dr Williams, changing topic and briefly touching on the
16 question of face masks, face coverings, that was
17 obviously one area where there was a difference of
18 opinion between the four nations. I'd just like to ask
19 you a few questions about this.
20 On 11 May the UK Government advised the public to
21 consider wearing face masks in enclosed public spaces.
22 And in terms of what we know happened in England
23 (on 5 June, face coverings were required in hospital
24 settings, on 15 June they were required on public
25 transport, and then 24 June they were mandatory in shops

1 and supermarkets), on the other hand face masks only
2 became mandatory on public transport in Wales on 27 July
3 and in shops and other public spaces on 14 September.
4 Now, there is a TAG advice dated 8 June 2020,
5 I don't need to go to it, but it did not explicitly
6 advise that masks be mandated in public, and on that
7 same date Dr Atherton advised the First Minister on this
8 topic and he said:
9 "I remain of the view that the evidence of benefits
10 does not justify a mandatory or legislative process and
11 I still see dangers in taking such an approach in
12 Wales."
13 Did you agree with that advice?
14 **A.** I can't recall at the time but not necessarily, no.
15 I think I put in my witness statement that I thought
16 that it might be worth a try, masks, even in the absence
17 of good evidence, knowing that it's very hard to get
18 definitive evidence for an intervention such as face
19 coverings.
20 **Q.** As you say, I think you say in your witness statement,
21 on face coverings:
22 "... I can recall arguing verbally (in TAG) in
23 favour of their use, even in the absence of
24 evidence ..."
25 That's right?



1 **A.** That's correct, yes.
2 **Q.** Moving then to another topic, again fairly briefly, just
3 superspreader events.
4 The Six Nations men's rugby match between Wales and
5 Scotland, as we've heard earlier, was due to take place
6 on Saturday 14 March 2020. Welsh ministers declined to
7 intervene to stop that match and the Welsh Rugby Union
8 ultimately took the decision to postpone the match at
9 lunchtime on the day before, but by which time
10 20,000 Scotland fans had already arrived in Cardiff.
11 There were also two Stereophonics concerts on 14 and
12 15 March held in Cardiff.
13 Now, your views, expressed in a briefing to TAC
14 around 10 March, was that the modelling evidence did not
15 show a major impact of mass events on overall
16 transmission.
17 Do you stand by that advice?
18 **A.** I think that's certainly what the modelling was showing
19 at the time. I still think that mass events don't
20 generally have a huge impact on transmission, because
21 there's a lot of transmission going on elsewhere. But
22 of course it doesn't mean to say, as with my previous
23 answer, that transmission can't or doesn't happen at
24 mass events.
25 **Q.** Now, one of the reasons the Wales and Scotland match was



1 not cancelled was, as I understand it, due to a concern
2 about socialising displacement, so people going to more
3 pubs and restaurants if the match was cancelled.
4 Now, in light of what we know about voluntary
5 reductions in contacts and socialising in mid-March, do
6 you think those concerns were well-founded?
7 **A.** I think the concern that transmission could happen
8 better in closed environments like, you know, pubs and
9 restaurants was correct.
10 **Q.** Are you able to assist at all with what might have
11 happened to Covid-19 community caseload progression in
12 Wales in March 2020 had those events not proceeded?
13 **A.** I couldn't -- couldn't say how it would have changed
14 things. I think evidence from some -- some evidence of
15 low effects from mass events and some evidence --
16 I think there was one in Scotland where there was quite
17 a large impact on transmission, but you have to look at
18 the circumstances in the particular events.
19 **LADY HALLETT:** There's also the impact on public behaviour,
20 isn't there?
21 **A.** You could see it as part of a wider --
22 **LADY HALLETT:** You allow a mass event to go ahead, it gives
23 the public the message "Everything's fine".
24 **A.** I agree, and, yes, that should be a consideration.
25 **MR POOLE:** Dr Williams, finally, and again a slightly



1 different topic, about school closures, if I may.
2 You briefly mentioned school closures in your
3 evidence, and in your witness statement at paragraph 118
4 you say:
5 "Regarding schools I thought it was important to set
6 the risks here in context given the relatively low
7 severity and burden in children and the negative effects
8 of school closures."
9 What, in your view, were the risks to children in
10 schools?
11 **A.** I think the risk of infection, severe outcomes in
12 children was low, and that was reasonably well
13 recognised at the time. I have children of my own and
14 I know that the effect of them not going to school might
15 have been damaging to their education and other parts of
16 their social development, and I also knew that there
17 were a lot of concerns about transmission in schools,
18 both driving the epidemic and also within -- across the
19 workforce.
20 **Q.** In the passage I think we've got on the screen, in
21 paragraph 118 of your statement, what do you mean by
22 setting the risk in context?
23 **A.** I think in the context of what the risk was in the rest
24 of the population, that I think I was concerned that
25 maybe schools were seen as a sort of magic bullet to --

1 you close the schools you can really nip some of the
2 transmission in the bud, and that's partly based on the
3 experience of flu, where we know that children play
4 a large role in transmission of influenza, and with
5 other infectious diseases. But I think -- I thought it
6 ought to be balanced with the knowledge that the
7 outcomes were generally pretty good in children.
8 **Q.** And how were the risks assessed for schoolchildren in
9 Wales?
10 **A.** As I say, we set up a report to try to report on the
11 numbers of cases in both schoolchildren and also in
12 staff, to try to say what they were, and also compare
13 them to the incidence and the indicators in the local
14 authority population at the time, just to make that
15 comparison.
16 **Q.** Again, looking at this paragraph of your witness
17 statement, what do you mean by the "negative effects of
18 school closures"?
19 **A.** So, in addition to the effects on the students
20 themselves, I think there was also a recognition that
21 closing schools has a big impact on parents,
22 particularly there was concern about healthcare worker
23 parents and other sort of staff that then wouldn't be
24 able to go to work because the school was closed, so
25 I think that was part of the wider considerations,



1 but ... yeah.
2 **MR POOLE:** Dr Williams, those are all the questions I have
3 for you.
4 I think there are some Rule 10 questions, my Lady.
5 **LADY HALLETT:** I think, Ms Heaven, you're asking some
6 questions.
7 **MS HEAVEN:** Yes.
8 **Questions from MS HEAVEN**
9 **MS HEAVEN:** Good morning, Dr Williams, I represent the
10 Covid-19 Bereaved Families for Justice Cymru.
11 Just two topics, please. I want to come back very
12 briefly to face coverings and then the autumn firebreak.
13 So, my Lady, for your reference, I'm swapping round
14 the two questions on which I've been granted permission.
15 CTI has just covered with you what you say in your
16 statement, but can I just read it back to you and ask
17 some targeted questions. So it's 119 of your statement,
18 don't worry, you say :
19 "On face coverings I can recall arguing verbally (in
20 TAG) in favour of their use, even in the absence of
21 evidence, as I knew that there was evidence from
22 SARS-CoV-1 that surgical face coverings had a protective
23 effect in hospitals and also that they were likely
24 empirically to be effective; and that a measure with low
25 effectiveness deployed very widely can have



1 a significant effect."
2 So two things firstly, can I just check here, you're
3 obviously talking here about advocating for surgical
4 face coverings. Are we talking here about
5 fluid-repellant surgical masks? To give it its
6 technical term.
7 **A.** I think so, yes. I mean, I just meant face coverings in
8 general.
9 **Q.** Okay, that's helpful, because my next question was going
10 to be: it seems that you are also talking about
11 advocating for face coverings in the community, in TAG?
12 **A.** That's my recollection.
13 **Q.** Okay, now, you're saying in your witness here -- your
14 statement -- you're "arguing verbally", and that's
15 obviously your word, in favour of face coverings, and it
16 would seem to be that you're suggesting that, as
17 an infectious disease epidemiologist, you were facing
18 some opposition in TAG to your views. So is this
19 correct, were you facing some opposition? If so, from
20 whom?
21 **A.** I can recall there were arguments about other negative
22 impacts of using face coverings in different groups.
23 I can't recall who in particular might have made them.
24 Also on the case of things like face coverings and --
25 you mentioned surgical face masks, that tends to be the



1 purview of people with infection prevention and control
2 expertise, and microbiologists, and that's not my --
3 generally my area of expertise --
4 **Q.** Well, can I just prompt you, were you facing some
5 push-back from Frank Atherton, CMO, on face coverings?
6 Because we obviously know from the evidence that he was
7 not in favour of them in the community for quite some
8 time.
9 **A.** Frank Atherton wasn't a regulator attender at TAG
10 meetings so I don't think that it would have been him.
11 **Q.** Okay.
12 Second question then, please, is just generally you
13 have given some views but I want to be absolutely clear
14 on your view on the approach taken by the Welsh
15 Government to face coverings. CTI has taken you through
16 the dates. We know that on every measure the Welsh
17 Government diverged and was later than all the other
18 four nations in their approach to recommending and
19 mandating masks.
20 Robert Hoyle, who was from a TAG subgroup, told
21 the Inquiry yesterday the Welsh Government should have
22 mandated masks much earlier. To be absolutely clear, do
23 you agree with his view?
24 **A.** I think that would have been a reasonable approach.
25 **Q.** You've also just been asked by CTI about the approach

1 Frank Atherton took in May and I know you didn't see the
2 document. We know that Frank Atherton was giving advice
3 in May that face coverings were essentially a matter of
4 personal choice, directly contrary to the evidence we
5 heard in Module 2 was being given by Chris Whitty to the
6 UK Government.
7 Do you have a view on the Welsh Government's
8 approach in May 2020 to face coverings?
9 **A.** I don't really have a view, no, not beyond what we've
10 just discussed.
11 **Q.** Okay.
12 Next topic then, firebreak, and again I'm going to
13 read to you. It's paragraph 117 of your statement you
14 say:
15 "I was an advocate for lockdowns when rates were
16 rising, given my experience from March 2020. In autumn
17 2020 surveillance data was used to guide local and
18 regional levels of restriction, and I was involved in
19 explaining these data to groups advising on these. On
20 the firebreak, I recall verbally advocating for a long
21 enough period to be significant, but I was aware that
22 there were constraints in feasibility and also that
23 an intervention not mirrored across the border would
24 have more limited effects."
25 So the first topic is on the timing of the



1 introduction. Were you advocating for the firebreak to
2 be introduced earlier, and if so to whom?
3 And if I can just ask the next one, because you can
4 answer it together, please. Should the firebreak have
5 been implemented sooner?
6 So did you want it at the time to be coming in
7 sooner, and now, thinking back, should it have come in
8 sooner?
9 **A.** I don't recall that in particular. I know there's other
10 evidence from Public Health Wales advice on the
11 firebreak intervention. All I can recall at the time is
12 advocating for some kind of national restriction because
13 the rates were rising, and also for a significant length
14 of time because we knew it wouldn't have much effect if
15 we did it for a short period of time.
16 **Q.** It doesn't say in your witness statement when were you
17 advocating. So when were you advocating for national
18 restrictions?
19 **A.** Again, I don't have records to -- I have to say I don't
20 have records to say exactly what I was saying at the
21 time. I feel that a prolonged firebreak at the time
22 might have actually pushed the larger wave more towards
23 when we had vaccinations, but I don't think that was
24 really a feasible option at the time unfortunately.
25 **Q.** Okay, that was going to be my second question, is:



1 should the firebreak have been longer? And I think
2 you've sort of answered that, haven't you, by saying you
3 thought it probably should but that probably wasn't
4 feasible, to push the firebreak longer into when the
5 more vulnerable groups had been vaccinated?
6 **A.** Yeah, you'd have to ask Welsh Government colleagues the
7 reasons for feasibility. But you can still see the
8 firebreak as a notch in the data, so it had some effect.
9 **Q.** What about a four-week firebreak, was that something
10 that you think perhaps would have been sensible? So not
11 right into the December period but just four weeks.
12 **A.** I really can't say what the difference was -- would have
13 been, I would have probably thought that would just have
14 given a bigger notch.
15 In the event we had quite a prolonged period of
16 lockdown after the December restrictions, that were
17 actually a lot longer than any period that was advocated
18 in the autumn. That's just a reflection with hindsight.
19 **MS HEAVEN:** Yes, okay. Thank you very much.
20 Thank you, my Lady, those are my questions.
21 **LADY HALLETT:** Thank you, Ms Heaven.
22 Ms Foubister. Sorry, have I pronounced that
23 correctly?
24 **Questions from MS FOUBISTER**
25 **MS FOUBISTER:** Good morning, Dr Williams. I represent



1 John's Campaign and Care Rights UK.
2 I'm going to ask a few short questions about your
3 role regarding non-pharmaceutical interventions, I'll
4 refer to them as NPIs.
5 At paragraph 116 of your witness statement you note
6 that your role in relation to NPIs was mainly to provide
7 information to assist with decision-making. Was it
8 within your role to provide information not just about
9 harm caused by Covid but also to provide information
10 about all relevant harms to health, in particular
11 indirect harms resulting from NPIs?
12 **A.** So I do recognise that there are a number of indirect
13 harms from NPIs, but I work in the infectious disease
14 surveillance department, I felt it was my role to give
15 the information about the epidemiology of infectious
16 disease and that others were better placed to give data
17 and advice on other harms.
18 **Q.** I refer next to a document which I hope can be brought
19 up, which is INQ000183846.
20 While I just wait for it to come up, this is
21 a statement from Professor John Watkins, also
22 a consultant epidemiologist, who worked, amongst other
23 roles, for the policy modelling group feeding into TAG
24 and the Social Care Working Group feeding into SAGE.
25 Yes, this is the document. And within that if we

1 could go to page 16.
2 And under the heading "Wider Non-COVID-19 related
3 harms to [NPIs]" there's a paragraph under that heading,
4 and about halfway down the paragraph Professor Watkins
5 says that he:
6 "... highlighted, early on, that people with mental
7 health issues may be harmed by lack of social contact,
8 people with early stage cancer and CVD may not get the
9 diagnosis and treatment they needed, children's
10 education and social development was being impact etc.
11 Despite raising these issues I saw no attempt to
12 quantify, or consider, these when restrictions were
13 being imposed."
14 Were you also aware of concerns of this nature?
15 **A.** I don't recall what the discussions were in TAG, but
16 I think the immediate problem was to avoid a huge health
17 impact from a large wave of Covid-19, and I still don't
18 think that could have been avoided in any other way than
19 a lockdown, despite the negative aspects to it.
20 **Q.** And in 2020, was there an attempt to quantify or collect
21 data or even consider the more indirect harms resulting
22 from NPIs?
23 **A.** I don't recall that from my own work or -- it might be
24 in other people's evidence, but remember
25 I'm a specialist -- it's in infectious disease



1 epidemiology.
2 **Q.** You may not be able to answer this, given what you've
3 just said, but my final question is: to what extent were
4 the adverse impacts of NPIs on people in care or those
5 needing care analysed? To what extent was data or
6 expert input obtained for the benefit of core
7 decision-makers in order to be weighed against the
8 benefits?
9 **A.** I can't answer that, I'm afraid. I'm not part of that
10 evidence.
11 **MS FOUBISTER:** Thank you.
12 **THE WITNESS:** Thanks.
13 **LADY HALLETT:** Thank you very much.
14 Thank you very much, Dr Williams. Thank you for
15 your help.
16 **THE WITNESS:** Thank you.
17 **(The witness withdrew)**
18 **MR POOLE:** If I can -- I'll wait.
19 **LADY HALLETT:** Mr Poole, Ms Whitaker, don't worry, the
20 question wasn't asked, so we're moving on.
21 **MR POOLE:** Exactly, my Lady.
22 Can I call Dr Roland Salmon, please.
23 **DR ROLAND SALMON (sworn)**
24 **Questions from LEAD COUNSEL TO THE INQUIRY for MODULE 2B**
25 **LADY HALLETT:** I hope we haven't kept you waiting too long.



1 **THE WITNESS:** No.
2 **MR POOLE:** Dr Salmon, could you please start by giving us
3 your full name.
4 **A.** Yes, I'm Roland Lawrence Salmon.
5 **Q.** Dr Salmon, thank you very much for attending today and
6 giving your evidence. If I can just ask you to keep
7 your voice up so that we can hear you, also so your
8 evidence can be recorded. And if I ask you anything
9 that isn't clear, please do ask me to rephrase it.
10 Now, you have kindly given a witness statement to
11 this Inquiry, INQ000224354. We can see that on the
12 screen. We don't need to go to it, but at page 16
13 you've signed and dated this statement on 14 July last
14 year, are the contents of that statement true to the
15 best of your knowledge and belief?
16 **A.** Yes, they are.
17 **Q.** Dr Salmon, in terms of your professional background and
18 career, between 1990 and your retirement in 2013, is it
19 right that you worked as a regional epidemiologist for
20 the Communicable Disease Surveillance Centre Wales, and
21 from 1998 you were its director?
22 **A.** Yes, that's correct.
23 **Q.** You spent eight years, up to 2019, as a member of the
24 Department of Health's Advisory Committee on Dangerous
25 Pathogens, including two years as acting chair and



1 eight years as chair of its transmissible spongiform
2 encephalopathy working group; is that right?
3 **A.** Yes, that's correct, I was succeeded by one
4 Chris Whitty.
5 **Q.** The Inquiry knows him well.
6 From 2003 to 2013 you were a member of the
7 Scientific Advisory Committee (Conseil Scientifique) of
8 the French National Institute for Public Health
9 Surveillance and subsequently, until 2016, a member of
10 its management board; is that right?
11 **A.** That's correct.
12 **Q.** I think you have been a senior crematorium medical
13 referee for Cardiff Council Crematorium since 1999; is
14 that also right?
15 **A.** That's also correct.
16 **Q.** In terms of your role in the Welsh Government's response
17 to the pandemic is it right you never sat on TAG or TAC
18 or any of their subgroups?
19 **A.** I had no formal role at all.
20 **Q.** And is it right you had no formal communication at any
21 level with the Welsh Government or its advisory groups
22 throughout the pandemic?
23 **A.** Yes, that's also correct.
24 **Q.** Now, I plan to ask you some questions in a moment about
25 the overall notion of population immunity and shielding,

1 but first, if I may, I want to address some comments you
2 have made concerning the pre-eminence of modelling and
3 modellers in the pandemic and the figures that those
4 modellers used.
5 Now, in your witness statement you have commented
6 that in TAC it was, your words, "mathematical modellers
7 that dominated the agenda".
8 Now, you have obviously confirmed you were not
9 a member of TAG or TAC. The Inquiry has heard evidence
10 from a member of TAG and TAC a moment ago,
11 Dr Chris Williams, who was a consultant epidemiologist.
12 The Inquiry has also received written evidence from
13 other members of TAG, so Jonathan Price, he is the chief
14 economist, Dr Catherine Moore is a microbiologist,
15 Dr Brendan Collins is the head of health economics, and
16 later on this afternoon we will hear from
17 Professor Ann John, who is an expert in public health
18 and psychiatry. So on the face of it the membership of
19 TAG appears broad. I just want to understand the basis
20 for your comment in your statement that it was
21 mathematical modellers that dominated the agenda.
22 **A.** Yes, certainly. I mean, you'll be the first to point
23 out, Mr Poole, that that is, of course, hearsay, and
24 I would be the first to concede that point, and to
25 recognise that there were -- as I think I put in my



1 statement, there are a number of other individuals with
2 other skills particularly relevant to communicable
3 disease.
4 However, the outputs and the emphasis that was put
5 on particularly the R number and on social distancing
6 suggested to me that the particular discipline of
7 mathematical modelling was rather more dominant. And
8 I also drew on my own experience of being on these sorts
9 of committees, and we had of course had interaction with
10 mathematical modellers on the Advisory Committee on
11 Dangerous Pathogens, on the committee in France.
12 And one of the things which you will find with any
13 group of scientists in the room is that there will be
14 a number of opinions, or at least two or three opinions.
15 They have to be synthesised in some way. And then
16 of course along come the mathematical modellers with
17 some very neat numerical constructions, and there's
18 always a little bit of a tendency to heave a sigh of
19 relief and to follow the way that that guides.
20 And in many ways that can be very helpful, but you
21 do have to detach yourself a little bit from that and
22 ask: well, how do these models, in my own qualitative
23 assessment, relate to the infectious disease problem as
24 I see it? And I didn't get a sense of that happening.
25 Particularly from the public commentaries from TAC and



1 particularly on one of two of their online published
2 outputs.
3 **Q.** So is the problem you describe perhaps less a TAG and
4 TAC issue, is it more a political one? Might it be said
5 that -- so one of the roles of, say, a Welsh minister,
6 a non-expert in the field, is to receive the technical,
7 the scientific advice, the modelling advice and weigh
8 that up against other kinds of impacts and harms; would
9 that be fair?
10 **A.** I think that's fair, and I think it's very fair to say
11 that: does the problem exist with the construction of
12 the advice, its communication or its reception? And
13 I think, frankly, problems can occur at any one of those
14 stages.
15 **Q.** We are going to hear later on this afternoon from
16 Professor Michael Gravenor. He was one of the modellers
17 with TAG and TAC. He explains in his witness statement
18 that the problem wasn't with too little modelling per se
19 but with the fact that there was insufficient data and
20 capacity to build sophisticated models accounting for,
21 say, economic impact, social harms, indirect health
22 harms and so on, to be able to fully model the impact of
23 NPIs. Have you got any comment on that statement?
24 **A.** I mean, only to say that that is true and that is
25 a common complaint that you hear.



1 **Q.** Changing topic, then, and moving to population immunity
2 or, as some refer to it, herd immunity. You have said
3 in your statement at paragraph 16, just to sort of
4 orientate you, you say:
5 "Herd immunity is not a strategy but rather a time
6 honoured epidemiological term that is used to
7 characterise the resistance of a community to
8 an infectious disease."
9 Now, that statement is uncontentious, but perhaps
10 you can explain to those following the evidence what you
11 mean by that.
12 **A.** Yes. I think I mean to -- I mean, I think that the
13 quote that I've put in there describes it very clearly
14 and I'm not entirely sure how I can improve upon that,
15 but I think it describes the circumstance where
16 sufficient people have been exposed to a disease
17 previously that new introductions of an infection can't
18 hold and spread -- can't get a hold and spread to any
19 appreciable degree.
20 **Q.** Now, as a perhaps important caveat, it's right, isn't
21 it, that the notion of population immunity was built
22 into modelling work that was done by SPI-M and SAGE? So
23 it's not as though they ignored it altogether, they
24 accounted for the fact that as community transmission
25 figures grow, at some point people will develop

1 immunity, so the virus peaks and case rates fall?
2 A. Yes, I mean, that is one of the ordinary underlying
3 assumptions of what's called SIR modelling, which
4 I think was the predominant form of modelling used both
5 by SAGE and with TAG. Though, as you point out,
6 I wasn't there, so I can't say that with any certainty.
7 Q. Likewise, by late February 2020, so when containment had
8 ended in the UK, the scientific and policy approach was
9 not that Covid could be suppressed indefinitely,
10 which -- the knock-on effect of that is that almost
11 every conceivable long-term strategy for tackling the
12 pandemic would involve some form of herd immunity,
13 really would you agree the issue for the politicians and
14 the decision-makers was: what is the best way to get
15 there?
16 A. Yes, I mean, I would go further than that, I think that
17 was always the issue right from the outset. I mean, you
18 provided me with Professor Whitty's statement to read as
19 part of the evidence bundle and he does a briefing note
20 for the special adviser at Number 10 Downing Street on
21 the -- I think it's 28 February 2020, and when I look at
22 that his summary of the situation and the possibilities
23 I have to say is almost exactly the same kind of
24 parameters of any summary that, had I had to write one,
25 I would have come up with.



1 Q. Moving on then. Am I right in summarising your position
2 in the following way: that the epidemiological notion of
3 acquiring population immunity can be part of a policy of
4 managing Covid-19 in a population as an alternative to
5 the imposition of stringent population wide NPIs? So
6 that policy would be one of, I think you used the
7 phrase, "focussed protection" of the most vulnerable to
8 Covid-19?
9 A. Yes, I mean, I suppose the problem I have is that
10 I consider the policy to represent what you would do
11 either as a politician or a public health agency, and
12 you don't "do" herd immunity; herd immunity or
13 population immunity is where you might get to, dependent
14 on what the actual actions you take are.
15 Now, the actions that were taken were rather
16 stringent lockdown measures. My own view was that
17 measures more focused on the individual would deliver
18 a similar position eventually. But I think you're right
19 to say that in both of them the state of population
20 immunity features is an important end point.
21 Q. You say in your statement that acquiring population
22 immunity is more of a beneficial byproduct of the
23 strategy of focused protection?
24 A. Yes.
25 Q. Is it perhaps not more accurate to say that population



1 immunity and focused protection are really two sides of
2 the same coin? So, for those who are vulnerable, for
3 them to return to a semblance of a normal life, the
4 population around them needs to acquire a degree of
5 immunity, thus enabling vulnerable individuals -- we're
6 obviously talking in a pre-vaccine world here -- to
7 receive healthcare, receive visitors, go into their
8 communities and so on; is that right?
9 A. I mean, I'm -- I suppose I'd say you're welcome to make
10 that distinction. It's not one I would feel
11 particularly necessary to make. I think -- or the way
12 I've described it as a byproduct probably has sufficient
13 clarity for everybody's understanding.
14 Q. Now, I just want to go through some of the concerns that
15 have been expressed about this general approach, just
16 to --
17 A. Yeah.
18 Q. -- get your comments on them, please, Dr Salmon.
19 First, Professor Woolhouse, professor of infectious
20 disease epidemiology at the University of Edinburgh,
21 also a member of SPI-M, he has said in his statement to
22 the Inquiry in Module 2 that it was not known in the
23 early stages of the pandemic whether the immunological
24 resistance acquired from catching and recovering from
25 Covid would be 100% effective in preventing reinfection.



1 So just pausing there, this means that allowing the
2 disease to move through the population in, say, March
3 and April 2020 without any guarantee that previous
4 infections would ensure immunity would be a highly risky
5 strategy. Do you agree with that?
6 A. Well, actually I don't. I mean -- and interestingly
7 I think there are some contradictions in
8 Professor Woolhouse's own witness statements in this.
9 I mean, he makes the point that if you had taken
10 more modest interventions somewhat earlier than they
11 were -- I mean, he uses it -- calls it cocooning, I call
12 it focused protection -- then it would have been
13 possible to detach the epidemics that were taking place
14 among vulnerable populations in places like hospital and
15 care homes from the wider transmission in the community.
16 I think that's correct, and I think that transmission in
17 the community might reasonably have been expected to
18 bring with it a measure of protection.
19 Now, you wouldn't have known how much until the
20 epidemic had progressed, but I think you would have felt
21 reasonably confident that you would have -- while that
22 was happening, be protecting the most vulnerable
23 elements of society.
24 Q. So do you take exception with me describing it as
25 a highly risky strategy? Would you accept that it was

1 a risky strategy then?
2 **A.** I mean, I think it would have been a relatively
3 straightforward and safe strategy and I think many of
4 Professor Woolhouse's own comments tend in that
5 direction.
6 **Q.** Another concern, and do correct me if I'm wrong, with
7 the approach of a protect vulnerable individuals while
8 allowing population immunity for everyone else, is that
9 does it not assume that population immunity could be
10 reached within a matter of months or within a short
11 period of time?
12 **A.** Well, no, it doesn't. I mean, it will take as long as
13 it will take. I mean, I think the question you have to
14 ask yourself are: what are your alternatives given the
15 disruption that other approaches will take?
16 Yes, ideally you would hope it would arrive
17 relatively quickly. I mean, there is an interesting
18 historical example that I think Professor Heymann
19 introduced at the very beginning of the proceedings of
20 the Inquiry, and that's the coronavirus OC43, which was
21 almost certainly a pandemic virus at the end of the
22 19th century, yet, certainly by the time we're able to
23 identify it and study it, we think of it as a common
24 cold virus and it seems quite likely it transitioned to
25 that stage in a relatively short space of time. So



1 there were reasonable biological grounds for a degree of
2 optimism about what would happen here.
3 **Q.** Related to the point I just made about the population
4 immunity might take a significant period of time is
5 a point that Sir Chris Whitty makes in his evidence in
6 Module 2. His witness statement is at INQ000248853, and
7 we're looking at paragraph 6.23.
8 Sir Chris says:
9 "The biggest scientific weakness is that it starts
10 from the thesis that inevitably herd immunity will be
11 acquired if you leave things long enough. That is not
12 the case for a very large proportion of the most
13 important diseases in the world. For most of the major
14 disease I have worked on, you never acquire full herd
15 immunity. Basing a policy on the assumption that
16 eventually immunity in the less at risk population will
17 protect the others is not a safe starting point."
18 What do you say in response to --
19 **A.** Well, this is very like --
20 **Q.** -- so --
21 **A.** This is very like a comment he made in the BM -- British
22 Medical Journal, and I frankly thought it was bizarre,
23 because your jumping-off point -- and the examples he
24 used in the British Medical Journal were the Ebola virus
25 and the human immunodeficiency virus, HIV. Now, of



1 course your jumping-off point for any consideration of
2 your strategy is the biology of the virus that you're
3 dealing with, and those viruses are so fundamentally
4 different in their properties that, yes, of course you
5 wouldn't adopt a herd immunity strategy for them, but my
6 point is that the underlying virology of the coronavirus
7 is such that that becomes a reasonable option and, in my
8 view, one that -- about which you could have made
9 relatively optimistic predictions from a fairly early
10 date.
11 **Q.** There are a few other concerns that have been expressed
12 with a focused protection policy. If I just outline
13 a few of them so we can know your response --
14 **A.** Please.
15 **Q.** -- Dr Salmon.
16 **A.** I'd be keen to respond, to be --
17 **Q.** First, people who are not in the vulnerable group will
18 contract Covid-19 and die, so this would happen at
19 greater numbers due to a greater rate of transmission
20 before -- obviously we're talking before vaccine
21 development. I mean, do you agree with that?
22 **A.** I'm not convinced about that either. I mean, what
23 you're talking about is how do these different
24 strategies work out in practice. Now, the strategies
25 that we did adopt, with the rather extensive lockdowns,



1 also -- because, I would argue, of the loss of focus,
2 also resulted in rather large casualty rates among the
3 vulnerable in care homes and hospitals.
4 Now, it's quite true that you have to craft your
5 focused protection rather carefully and it's also true
6 that you might modify that as it goes along. But
7 I don't see that intrinsically that would necessarily
8 lead to more infection in a wider population, and indeed
9 it might lead to less infection of vulnerable people due
10 to, a point that I also make in my witness statement,
11 that the number of severe cases is not merely, as
12 John Edmunds erroneously said, a function of the number
13 of cases, it's also a function of the time over which
14 the virus circulates. The longer it circulates, the
15 more opportunity it has to go into those risky
16 situations, like care homes, like prisons, like meat
17 factories, like hospitals, where it will infect
18 vulnerable people with, you know, the sorts of
19 consequences that we've seen.
20 So, as I say, I don't accept actually the point that
21 Professor Whitty is making here.
22 **Q.** Now, it may be that you will give the same answer to
23 this next concern that you've just given, because
24 another concern about focused protection is that
25 hospitals would exceed capacity and not be able to

1 provide other required forms of urgent care, let alone
2 treating those that require assistance with Covid-19.
3 Do you agree or disagree?
4 A. I mean, as I say, I think my previous answer
5 substantially addresses that point.
6 Q. What about, finally, the effect of focused protection on
7 Long Covid? That's entirely unknown and could be severe
8 and significant?
9 A. Yes, I mean, Long Covid is one of the unknowns in all of
10 this. I mean, it's less unknown now than it was,
11 and I ... I can't claim I've looked at this in a lot of
12 detail but there were papers in The Lancet from an
13 Oxford-based group, based on millions of health records
14 in the United States, and the takeaway message from that
15 is not that Long Covid is trivial or that we can
16 discount it, not at all, but that it's very similar in
17 both its frequency and in the range of symptoms to long
18 forms of other viral and infectious diseases, which we
19 know exist and which we co-exist with.
20 I have some knowledge of this because in the
21 late '90s, with Dr Sharon Parry of Cardiff University,
22 we did a long paper for the Health and Safety Executive
23 on the chronic sequelae, the chronic consequences of
24 infectious diseases.
25 So whilst I, as I say, fully acknowledge the



1 uncertainties around Long Covid and I fully acknowledge
2 its seriousness, it seems to me it's of a piece with
3 consequences from other infectious diseases about which
4 we don't take similar protective measures.
5 Now we need to understand all of these a lot better
6 and if Covid gives a stimulus to research into this sort
7 of thing, I feel that can only be a good thing, but what
8 I don't think it calls for is particular extra
9 preventive measures over and above those that are used
10 for acute Covid, because the final point is that the
11 very -- the worst, the most serious sequelae of
12 Long Covid appear to be proportional to the seriousness
13 of the initial illness. So inasmuch as we control that
14 initial illness and control its serious forms, whether
15 by vaccination, whether by letting the vaccine(sic)
16 circulate among people when they were younger and safer,
17 rather than letting them get to being old and
18 vulnerable, we will also be preventing the worst aspects
19 of Long Covid.
20 Q. Dr Salmon --
21 **LADY HALLETT:** Are you moving on?
22 **MR POOLE:** I am, my Lady.
23 **LADY HALLETT:** Can I just ask, I don't know how easy it is
24 to do in a few sentences, but could you give me some
25 practical information on how focused protection would



1 work? In other words, supposing my mother was still
2 alive and living alone -- I mean, how do you find the
3 vulnerable -- what place -- what measures do you put in
4 place? How does it work?
5 A. Yes. Sure. This was the kind of thing that I was
6 trying to address when I wrote to a number of
7 politicians here in Wales. And I might commend the
8 correspondence I have with Rhun ap Iorwerth to you.
9 I mean, essentially for the vulnerable population it
10 doesn't look terribly different from the lockdown that
11 they had already. What is rather easier for them,
12 however, is that services around them should be working
13 rather better.
14 I feel that on top of that shielding of those
15 high-risk individuals, like your mother, for example,
16 would be particular attention to the locations which we
17 rapidly identified were a risk for spreading the
18 disease -- we've talked about these a lot -- hospitals,
19 care homes, prisons, meat factories. That is where
20 I would have used test and trace, particularly when the
21 numbers of tests available were rather limited.
22 And there is a very simple reason for that. I mean,
23 I've done my share -- not as much as the environmental
24 health officers -- of chasing people around the
25 community and trying to actually manage a system of



1 contact tracing in a wider community. It's extremely
2 difficult and resource-intensive. Whereas if you have
3 a population for which you have a convenient register
4 and you know who they are and you wish to stop the
5 spread among them, whether that's staff of a care home,
6 staff in a hospital, that is much easier to organise in
7 an efficient and effective way, and actually eliminates
8 the largest part of the problem.
9 The final thing I would have done, and again
10 I mention this in my letter, is promoted the use of
11 protective equipment in at-risk occupations. And again,
12 in the first two or three months of the epidemic we were
13 pretty clear what those occupations were. I mean, it is
14 an abiding scandal that the PPE stocks had been depleted
15 between 2009 and 2020.
16 So I hope that gives you a feeling for how I see
17 this would work out in practice. And this was the
18 suggestion, as I say, I made to several Welsh
19 politicians, I mean, largely on the ground that they
20 were contemplating the firebreak, which struck me as
21 a thoroughly bad idea, but Mr Poole may well wish to
22 come on to that.
23 **MR POOLE:** Dr Salmon, let's just explore this then a bit
24 further with you, because I think the letter you're
25 referring to is the letter of 18 October 2020.

1 A. Yes.
2 Q. So we've got that displayed, INQ000130868.
3 Who did you send this letter to? I think you've
4 said --
5 A. Oh, gosh.
6 Q. -- Welsh ministers?
7 A. Yeah, it's -- do you want me to run through --
8 Q. I don't need an entire distribution list, but just give
9 me a sense of who was in the --
10 A. I essentially sent it to politicians -- I've had a long
11 career in Wales, and Wales is not a big place, so I
12 essentially sent it to politicians I had met under some
13 other heading in the past.
14 That was two Plaid Cymru politicians, Dai Lloyd and
15 Rhun ap Iorwerth, the Conservative leader,
16 Andrew RT Davies, and three Welsh ministers,
17 Mark Drakeford, Vaughan Gething and Julie Morgan.
18 Q. Thank you. If we have a look, please, at the second
19 paragraph, you list the matters that the letter
20 concerns.
21 Number 4:
22 "Workable approaches centred on the person
23 ('targeted shielding', 'focussed protection')."
24 Which is what you've just been --
25 A. Yeah, I --



1 Q. -- my Lady.
2 If we go to that section then of the letter, I think
3 it's page 2, you describe here how the framework would
4 work in practice, and you suggest at (i) at-risk people,
5 at-risk locations and -- thank you -- and then, over the
6 page, to -- the next page -- at-risk occupations, which
7 you've just alluded to.
8 In terms of at-risk persons, you say:
9 "Effectively shield vulnerable people by
10 a combination of advice to (to wear masks, avoid
11 situations where they couldn't control their personal
12 space) and the necessary social support to make this
13 do-able."
14 Then in terms of at-risk locations, the next bullet
15 point, you say:
16 "Ramp up infection control and bring in regular
17 screening and exclusion of infected/symptomatic persons
18 from locations where spread occurs readily. This would
19 include:
20 "• Hospitals
21 "• Care Homes
22 "• Meat Factories
23 "• Prisons
24 "• Universities"
25 And I just want to focus, in the time we've got, on



1 those two in particular, because it is known that the
2 vast majority of deaths from Covid-19 in Wales occurred
3 in hospitals and care homes.
4 Some of those deaths in hospitals were of course
5 contracted in the community but we also know that rates
6 of nosocomial infection were high throughout the
7 pandemic.
8 Professor Woolhouse has said about this, he says it
9 wasn't made clear how well the vulnerable segment could
10 be protected from infection in practice.
11 Now, the Inquiry understands from February to
12 March 2020 Public Health Wales and NHS Wales were
13 devoting considerable effort to infection control
14 measures, testing staff and patients, attempting cohort
15 infectious and non-infectious patients and care home
16 residents, and so on, and yet still Wales had
17 a significant number of deaths amongst those who were
18 being shielded, and that was a pattern that was seen
19 across the whole of the UK.
20 Now, against that backdrop, Professor Woolhouse's
21 comments might seem like an understatement. I mean,
22 what effective practical protections could have been
23 provided to those who needed to shield from March 2020,
24 that were available in March 2020, that were not
25 provided to vulnerable people in hospitals and



1 care homes in Wales?
2 A. I mean, okay. I think shielding of vulnerable people at
3 home just to dispose of that first was precisely the
4 sorts of things that people were doing on their own
5 initiative before the lockdowns were brought into place,
6 a point, again, that I think Professor Woolhouse rightly
7 makes.
8 In terms of protection in the location, like
9 hospitals and care homes, I'm not going to sit here and
10 pretend there are any very easy solutions to this.
11 I just I think would make the point that it didn't
12 become any easier to do this because the whole of the
13 population was locked down. In fact, quite the reverse.
14 A degree of lack of focus, in my view, made spread in
15 those particular locations occur more readily. I mean,
16 the sort of things that you have to do, having adequate
17 personal protective equipment and having adequate
18 capacity to test and trace, probably should have been
19 anticipated on the basis of the pandemic flu plans and
20 yet apparently hadn't been, and -- yes, I think that
21 I'll conclude there perhaps.
22 Q. Would you agree that targeted shielding for social care
23 workers in March would have been extremely difficult,
24 would it not? You have a finite number of care workers,
25 you have care homes that were not set up to enable

1 isolation rooms and cohorting, and on top of that you
2 have a business model predicated on social care workers
3 moving between sites.
4 **A.** I mean, all the above is true but, I mean, I think the
5 question the Inquiry might wish to ask itself is: did
6 the introduction of lockdowns actually make that any
7 easier to manage? And I would argue no, it didn't.
8 And that reminds me of the other point that, with
9 advancing age, I'd forgotten, the other problem that we
10 have is the lack of capacity in our acute hospital
11 sector. Our hospitals run often at 85% to 90% occupancy
12 all the time. With that you really don't have the space
13 and resilience for efficient and effective infection
14 control.
15 One way around that might have been to have used the
16 Nightingale hospitals for step-down care rather than
17 imagine that they would have been used for acute care.
18 But as far as I can see that never happened either.
19 **Q.** There is one other matter I just want to ask you before
20 we move on. Targeted shielding assumes that people who
21 are vulnerable can be protected by virtue of their
22 vulnerability, defined, presumably, as a health
23 vulnerability. However, obviously the Inquiry
24 understands that those with pre-existing health
25 vulnerabilities who are on the shielding list compared



1 with vulnerabilities of whole communities are not
2 necessarily one and the same thing. So, for example, we
3 heard earlier this week from Professor Ogbonna and the
4 findings of his socioeconomic subgroup that reported in
5 June 2020, and they concluded that the risk of
6 Covid-related death in males and females of black
7 ethnicity was 1.9 times higher than those with white
8 ethnicity, and that the risk of Covid-related death from
9 men of Bangladeshi and Pakistani ethnicity was 1.8 times
10 higher than white males.
11 Now, I assume you are not proposing that Wales
12 should or could lock down and shield communities that
13 are already minoritised within society?
14 **A.** No, not at all. And I think a bit of context is quite
15 helpful here, if you'll allow me.
16 Easily the biggest driver of vulnerability is age.
17 I mean, a point that Professor Woolhouse makes, and
18 I endorse, and comes from the original OpenSAFELY study
19 available on 7 May -- as a pre-print -- in 2020 is that
20 the risk to an 80-year old is 10,000 times the risk to
21 a 20-year old, the risk of death.
22 Now, if you slightly -- what's the word? -- cheating
23 slightly put that into a "what is your year-on-year
24 rising risk?" it's about -- your risk goes up about
25 1.16 per year. So that means, of course, that someone



1 from a black and minority ethnic group has the same risk
2 as a white person about five years older than them, when
3 you sit and do the sums.
4 So what that also tells us is that younger members
5 of those communities, although they may be at more risk
6 than their white equivalents -- and this is quite wrong
7 and shouldn't be the case, I entirely concede that --
8 though they be at more risk are not at substantial
9 enough a risk that they need to change their behaviour
10 patterns at all, it's just that the levels at which
11 vulnerability kick in are at a younger age group in
12 those communities, as I say by about some five years,
13 based on some fairly crude maths.
14 **Q.** Dr Salmon, I want to change topic now, and you've
15 anticipated that I might have wanted to ask you some
16 questions about the firebreak, which I'm going to do
17 now.
18 **A.** Sure.
19 **Q.** You described in your letter to the Welsh Government
20 that we looked at a moment ago.
21 And perhaps we can have it back up, it's
22 INQ000130868. If we can have a look at page 2, please,
23 the first bullet point on that page.
24 You say:
25 "• 'Good adherence to measures' is required."



1 In the second bullet point:
2 "• The incubation period of Covid-19 (2-14 days)
3 combined with high asymptomatic carriage rates (c30% in
4 youg adults) ensures that the virus will be reintroduced
5 into the community as soon as the circuit breaker is
6 finished."
7 Then finally the third bullet point:
8 "• 'If regulations and behaviour then return to
9 pre-circuit break levels, there would be a return to
10 exponential growth' meaning any respite is a very small
11 number of weeks, too short to remedy problems with track
12 and trace systems and too soon for a vaccine to be
13 available."
14 I assume you stand by the concerns that you
15 expressed at that time in that letter?
16 **A.** Yes, I do, and, I mean, within the inverted commas are
17 quotes from SAGE minutes that I'd taken from the time,
18 so in a sense these are quotes from the proponents of
19 this scheme that seem to me to suggest that it won't
20 work rather than anything that I may have introduced
21 into the debate.
22 **Q.** You say in your witness statement:
23 "... from a simple eyeballing of the observed COVID
24 incidence, it would be difficult to conclude other than
25 any effect was marginal at best."

1 So do you think that the matters that you've
2 identified already, so especially -- we've still got it
3 on the screen -- especially the second and third bullet
4 points of the letter, prove to be borne out?
5 **A.** Yes.
6 **Q.** Would those issues have appeared had the firebreak been
7 implemented for longer, in your view?
8 **A.** No, I don't think there would have been, because I think
9 there would have been sufficient circulation in the
10 community or sufficient opportunity for reintroduction
11 that yes, possibly we might have had a slightly longer
12 pause, but exactly the same situation would have
13 re-established itself very quickly.
14 I understand the enthusiasm for some clinicians for
15 the firebreak. I mean, I am a doctor, I have worked,
16 admittedly many years ago, in busy clinical settings
17 when almost any respite is so welcome, but I do think
18 this one was particularly expensively bought, and really
19 is hard to justify on broader social grounds.
20 **Q.** Changing topic again slightly, talking about NPIs. At
21 paragraph 24 of your statement, you say that you
22 consider many decisions regarding NPIs that were made by
23 the Welsh Government were, your words, "inappropriate
24 and lacking justification". You identify as two
25 examples the Welsh Government's decision to close



1 selected supermarket aisles and pubs being prohibited
2 from selling alcohol. Can you just briefly explain why
3 you considered those two examples to be inappropriate
4 and unjustified?
5 **A.** Yes, because I can think of no basis on why you might
6 think they would work. If we consider supermarket
7 aisles, I mean, case control studies in France, the
8 ComCor study at the Institut Pasteur showed that large
9 supermarkets and large department stores were not
10 a setting where increased risk took place. So whether
11 you leave the aisles open or you leave them shut really
12 doesn't matter. And actually if people are going into
13 the supermarket why do you want to shut one aisle and
14 not the other one? It seemed quite -- I mean, I think
15 one of your witnesses yesterday was talking about a lack
16 of lived experience, but that seemed to suggest a lack
17 of lived experience of even going to the supermarket.
18 And also the pub with no beer. I mean, the problem
19 with any setting -- and yes, restaurant and pub settings
20 are an issue -- are when people congregate in them, and
21 that those people who are vulnerable are best avoiding
22 them and advised to do so. But sort of opening it up
23 and not have beer seems to me perhaps an overly enduring
24 legacy of the chapel heritage, I don't know.
25 **Q.** Dr Salmon, finally, you wrote a blog post titled "The



1 ... View from Wales".
2 We have it at INQ000130866.
3 Perhaps we can just look at that together, if we
4 can --
5 **A.** Yes, of course.
6 **Q.** -- please have a look at page 2, the third paragraph,
7 please, that starts "Finally", I'm grateful:
8 "Finally, the Wellbeing of Future Generations Act,
9 some of Wales most forward thinking legislation
10 singularly failed to translate into any sort of
11 systematic evaluation of the downsides of global
12 'lockdown' approaches; downsides most likely to impact
13 on just those future generations whose interests the Act
14 seeks to protect."
15 Please can you just briefly expand on your views
16 there on lockdowns in the context of the Wellbeing of
17 Future Generations Act.
18 **A.** Yes, I mean, what I had in mind here was the loss of
19 educational and employment opportunities to younger
20 cohorts, I mean children, students, young adults in
21 work, who bore a disproportionate share of the economic
22 and social burden. And it's easy to think that, "Well,
23 that's economics and on the other hand we're saving
24 lives", but what I think we lose sight of unless we take
25 a whole-life view of public health is that those losses



1 of opportunities and that economic loss will translate
2 into -- and there are plenty of examples of this -- ill
3 health and loss of life expectancy. It may not be as
4 immediate, but it will certainly be there.
5 Now, how we level those up, we're starting to stray
6 into where people's values are, and I think where the
7 politicians are reasonably expected to come in, but
8 I did feel that this particular dimension wasn't even
9 considered.
10 And when I say "I", I mean we, and if you'll forgive
11 me I might draw attention to who my fellow authors are.
12 I mean, Meirion Evans received the OBE for his work on
13 SARS in Hong Kong in 2003 with the World Health
14 Organisation; Stephen Palmer had worked in Atlanta and
15 set up the Communicable Disease Surveillance Centre in
16 Wales; and John Watkins has spent his -- who I think has
17 submitted written evidence to this Inquiry -- has spent
18 his life working on influenza and respiratory disease
19 epidemiology. So these are not lightweight opinions,
20 whatever view you may take of mine.
21 **Q.** Would you have supported a full lockdown if it permitted
22 schools to remain open?
23 **A.** No, I don't think I would because I don't, frank -- it
24 has always been my view that the purpose of epidemiology
25 is to target attention on those people who are

1 vulnerable, who are at risk, in the terminology, and
2 those behaviours that constitute a risk. That is why
3 you do it. And you do it in such a way as to keep the
4 restrictions that you impose as targeted as possible and
5 to allow as much of the ordinary life that people want
6 to lead -- whether you approve of it, whether you
7 disapprove of it -- to go on as much as possible. That
8 is the whole scientific not to say ethical basis of the
9 discipline. So just to sort of think "Well, this is
10 hard work, let's just shut everything down and that will
11 spare us any further thought on the matter" seems to me
12 quite the wrong way to approach it. And I don't always
13 agree with Professor Woolhouse, who I know distantly,
14 but the title of his book *"The Year the World Went Mad"*
15 is one I'm entirely in tune with.
16 **MR POOLE:** Dr Salmon, I have no further questions for you.
17 **THE WITNESS:** Thank you.
18 **LADY HALLETT:** I don't think there are any Rule 10
19 questions.
20 **MR POOLE:** No, my Lady.
21 **LADY HALLETT:** Thank you very much indeed for your help,
22 Dr Salmon, I'm very grateful.
23 **THE WITNESS:** My pleasure.
24 **(The witness withdrew)**
25 **LADY HALLETT:** Right, well, so that everyone can make their



1 plans, we have to finish by 4.15 at the latest. So
2 shall we break now for lunch?
3 **MR POOLE:** I think if we can, my Lady, yes.
4 **LADY HALLETT:** And then return at 1.30?
5 **MR POOLE:** That's fine.
6 **(12.34 pm)**
7 **(The short adjournment)**
8 **(1.29 pm)**
9 **LADY HALLETT:** Yes, Ms Spector.
10 **MS SPECTOR:** My Lady, please can I call Professor Ann John.
11 **PROFESSOR ANN JOHN (affirmed)**
12 **Questions from COUNSEL TO THE INQUIRY**
13 **MS SPECTOR:** Could you please start by giving us your full
14 name.
15 **A.** Ann John.
16 **Q.** Thank you for attending today and assisting the Inquiry.
17 As we go through your evidence, please remember to keep
18 your voice up and speak into the microphone so the
19 stenographers can pick up everything that you say.
20 Please do ask me to repeat if anything isn't clear.
21 Your witness statement that you provided for this
22 module of the Inquiry is at INQ000286066, and it was
23 signed on 2 October 2023. Are the contents of that
24 statement true to the best of your knowledge and belief?
25 **A.** Yes.



1 **Q.** Professor John, in terms of your professional
2 background, is it correct that you are a clinical
3 academic with a background in primary care and public
4 health?
5 **A.** Yes.
6 **Q.** As a brief overview of your career, such as is relevant
7 to the Inquiry, you are clinical professor of public
8 health and psychiatry at Swansea University and an
9 honorary consultant in public health medicine, a role
10 you have held since 2017?
11 **A.** Yes, at a professorial level.
12 **Q.** You are a strategic lead for mental health research and
13 national-led suicide prevention at Public Health Wales,
14 and you co-chair the cross-government group for suicide
15 prevention?
16 **A.** Yes.
17 **Q.** Prior to 2017, you were the deputy head of Swansea
18 University Medical School?
19 **A.** Yes.
20 **Q.** Before which point you held various senior posts in
21 public and mental health at Swansea University?
22 **A.** Yes.
23 **Q.** With regard to your involvement in specific groups
24 tasked with Covid-19 pandemic response, you were
25 a member of the Technical Advisory Group, or TAG, from



1 27 June 2020?
2 **A.** Yeah.
3 **Q.** Within TAG, you were chair of the Risk Communication and
4 Behavioural Insights (RCBI) subgroup?
5 **A.** Yes.
6 **Q.** You were a member also of the children and education TAG
7 subgroup?
8 **A.** Yeah.
9 **Q.** And in addition to all of those roles you sat on what's
10 called SPI-B, the independent Scientific Pandemic
11 Insights Group on Behaviours advising SAGE and the
12 UK Government in the summer of 2020?
13 **A.** Yes.
14 **Q.** Which you became co-chair of in June 2021?
15 **A.** Yes.
16 **Q.** Professor, what was the Risk Communication and
17 Behavioural Insights (RCBI) subgroup and what was its
18 work?
19 **A.** So the RCBI subgroup was a group that was set up as
20 a subgroup of TAG, so it was to -- it was basically to
21 provide scientific insights and support to policymakers
22 around behavioural science.
23 **Q.** Is it right that you were approached to set up the group
24 by Fliss Bennee, the co-chair of TAG, in early June of
25 2020?

1 A. Yes.
2 Q. And you held your first meeting on 22 July of 2020?
3 A. Absolutely.
4 Q. In terms of SPI-B, that group provided expert social and
5 behavioural scientific advice as a subgroup of SAGE.
6 A. Yes.
7 Q. How did you come to be involved with SPI-B?
8 A. So initially I was invited by James Rubin to sit on the
9 group. Then when SPI-B developed a co-ordination group,
10 so that was sort of a smaller group of scientists, and
11 then a wider group that we would draw on, I was on the
12 co-ordinating group. And then when James Rubin and
13 Lucy Yardley stepped down as co-chairs, I was invited by
14 Brooke Rogers, Professor Brooke Rogers, to be co-chair
15 of SPI-B.
16 Q. To ask you about the timings, you have told us that you
17 were approached to chair RCBI in Wales on 2 June 2020
18 and the first meeting of that group, as we've heard, was
19 held on 22 July 2020. On the other hand, the Inquiry
20 understands that SPI-B, as a general group, was stood up
21 on 13 February of 2020. Although I appreciate that you
22 might not have been a member in that initial formation
23 of SPI-B.
24 After becoming the chair of RCBI were you able to
25 gain any understanding all about why the RCBI had not



1 been set up earlier in the course of the pandemic?
2 A. It's very difficult for me to comment, because that was
3 also very close to the time that I'd become involved
4 with TAG as well, so I'm not sure what the thinking was
5 before that, but I guess what I would say is that as
6 soon as I was invited and we'd pulled all the members
7 from diverse disciplines together for RCBI, we had
8 a very active role in feeding into TAG.
9 Q. You might not be able to answer, but do you know whether
10 anything was being done prior to June 2020 to obtain
11 specialised Welsh-specific advice about behavioural
12 science?
13 A. So I can't really answer that, I know there were people
14 on the sort of civil servant side with some expertise in
15 behavioural science.
16 Q. Do you think that it might have helped had RCBI been set
17 up earlier than it was?
18 A. I think one of the things that the pandemic has really
19 highlighted, you know, and it was absolutely pivotal
20 prior to the advent of vaccination, is how important
21 behavioural science is. So understanding -- so this
22 idea that you can tell people what to do and they'll do
23 it is naive and antiquated, and I think, you know, the
24 importance of behavioural science has been absolutely
25 highlighted during the pandemic. You know,



1 understanding people's, you know, motivations, their
2 capabilities, their understanding, and awareness about
3 risk, you know, the limitations in their lives to enable
4 them to follow rules, and the impacts of inequalities,
5 was absolutely highlighted. And so, I guess, from my
6 perspective, and for going forward, you absolutely want
7 behavioural science input during any pandemic from the
8 beginning, but also that that capacity is being built up
9 currently.
10 Q. You touched on it already, but can I ask you to provide
11 an overview of what the term "behavioural science" means
12 and what its methodology is.
13 A. So it's that understanding -- I guess in some ways
14 I would repeat what I've just said, it's understanding
15 human behaviour, you know, that people will have
16 motivations about why they might follow rules or
17 behaviour in a certain way, that there are limitations.
18 You know, staying in a one-bedroom flat during
19 a stay-at-home order is very different to staying in
20 a house with a garden. You know, people might have
21 front facing frontline jobs with zero-hours contracts,
22 so then when you're asking people to isolate where
23 there's no financial assistance, then that's really --
24 that's much more challenging for them than for someone
25 who has the financial wherewithal.



1 So having that understanding of motivations,
2 capabilities and opportunities is really important when
3 you're thinking about, you know, what are the -- how do
4 we encourage people to behave in certain ways. And
5 I guess it also highlights that things like, you know,
6 using "protecting others" rather than blame and fear and
7 shame is always a much more ineffective way.
8 Q. We might return to some of those themes in due course in
9 your evidence, but as a summary is it correct to say
10 that some of the things that RCBI advised on during the
11 course of the pandemic were: examining behaviours
12 towards restrictions in place such as physical
13 distancing, you've touched on that; examining
14 differential uptake of vaccines; understanding drivers
15 of behaviours in young people regarding NPIs
16 (non-pharmaceutical interventions); and focusing on
17 protective strategies for under-served groups?
18 A. Absolutely.
19 Q. What empirical or observed evidence did RCBI rely on to
20 formulate its advice?
21 A. So for the most part, in a pandemic where lots of the
22 things that -- the science that we were relying on was
23 being generated and evolving as time went on, the sorts
24 of things that we were relying on were mainly surveys.
25 Some of those surveys were what we call panel surveys,

1 so they try to be as representative as they can be, but
2 it's all self-report. And the issues around self-report
3 is that -- you know, it's not that people lie, it's that
4 sometimes -- you know, when I was a GP, if I was asking
5 someone "How much do you drink?", those answers can be
6 very different to what someone's actual consumption is,
7 for all sorts of reasons. So self-report was
8 absolutely -- so those sorts of surveys were absolutely
9 important in a situation where we didn't have the
10 evidence, but I guess we know that they're quite biased.
11 And going forward, it would be really good to have what
12 we call empirical evidence, so also being able to see
13 what people actually do rather than what they say
14 they'll do.
15 **Q.** You describe in your witness statement that both the
16 RCBI and SPI-B preferred what you call a facilitative
17 and/or enabling approach rather than a directive
18 approach. Are you able to explain the differences
19 between those two approaches?
20 **A.** A directive approach is -- would be much more: you make
21 a rule and you enforce a punishment if people don't
22 follow those rules. An enabling approach is really,
23 you know, I would say, fundamental to behavioural
24 science. It's understanding all those different factors
25 that sort of encroach upon why someone might behave in



1 the way that they do.
2 So the vast majority of people adhered to the
3 restrictions that were in place. And where they didn't,
4 it was for the reasons that I outlined before, you know,
5 it was things like, you know, not having access to
6 financial support to self-isolate, it was, you know,
7 being in -- not having the support to go and get a food
8 shop or walk their dog. So I guess it really is about
9 understanding those sorts of issues.
10 **Q.** Moving to RCBI and how the commissioning process worked
11 for that group, how did that process work? Did
12 commissions come from TAG or did they come elsewhere in
13 the Welsh Government?
14 **A.** So for the most part, we either received commissions
15 during discussions in TAG, so I do remember -- you know,
16 in a particular incident I remember about moral injury
17 in healthcare workers, that was a discussion that
18 happened in TAG. Other times we would hear from the
19 secretariat what had -- what questions were being asked.
20 **Q.** Were you able to set your own priorities as a group or
21 did these always come through TAG or through the
22 secretariat?
23 **A.** I think I would say that we were in some ways able to
24 set our own priorities because we were such active
25 members of TAG, so we were able to bring issues up.



1 **Q.** Did you at times provide advice on issues that, where
2 advice hadn't been requested but you felt that that
3 advice was necessary?
4 **A.** I think that where we were -- you know, so a good
5 example is young people, that where -- them -- you know,
6 something might be touched upon in TAG, we would be able
7 to say "We'll go away and do some work on this".
8 **LADY HALLETT:** Sorry, Professor, you used the expression
9 "moral injury", I don't think everybody knows what moral
10 injury means, could you just give a short explanation.
11 **A.** So I think the thing about moral injury -- so we talk
12 a lot about burn-out, and people really link burn-out to
13 workload, but actually it's much more complicated than
14 that. You know, burn-out is much more common in what we
15 call a moral injury, so where people are working in
16 a situation where they can't do what they have been
17 trained to do, where they're doing things that they feel
18 are against the ethos of their profession.
19 So we did a piece of work predominantly on
20 healthcare workers who were working, you know, at high
21 capacity but also in a situation where people were
22 sometimes, you know, dying without loved ones, that
23 might be in conflict with how they would want to
24 practice. So we were highlighting that it was not
25 just -- and most of the evidence on this issue comes



1 from combat zones. So we were looking at the evidence
2 that existed to apply it to the sort of morale in the
3 healthcare and social care sector.
4 **LADY HALLETT:** Thank you.
5 **MS SPECTOR:** Was the RCBI a multidisciplinary group? What
6 kinds of expertise did the group have access to?
7 **A.** So for the most part, so there were public health people
8 there, there was myself and Ashley Gould, who was going
9 to be my -- who was my co-chair after about a year.
10 There was -- there were various psychologists, so there
11 was Professor Nick Pidgeon, who has a lot of expertise
12 in risk communication, predominantly in relation to
13 climate change, and does a lot of UK Government advice.
14 There was Professor John Parkinson, there was
15 Tony Manstead. We also had -- we had evidence synthesis
16 experts, Adrian Edwards, we had people from social
17 sciences.
18 So I think behavioural science really is
19 multidisciplinary, and we also invited officials from --
20 we had a member of the Welsh Government sort of
21 communications team, which I think meant that they were
22 hearing a lot of behavioural science in terms of how
23 communications were done. And someone from the police
24 as well.
25 **Q.** Do you think that there was sufficient representation on

1 TAG and on RCBI of people from ethnic minorities and
2 from socially deprived backgrounds or minoritised
3 groups?
4 A. In a word, no. I think that reflects society as
5 a whole. So if you look at the composition of
6 professors around the country in every university,
7 representation from, you know, people from ethnic
8 minorities or more socially deprived backgrounds, even
9 representation in university of people from deprived
10 backgrounds is not great. So I do think -- we had the
11 best people round the table, and the way that looked and
12 was -- the composition of it reflects society as
13 a whole. So I think there's something to do about
14 widening access and participation in science and
15 education.
16 But knowing that to be the case -- you know, having
17 a diverse range of voices round the table is really
18 important. Knowing that to be the case, it really
19 highlighted how important it was to have co-production,
20 be going to groups of people from, you know, ethnic
21 minorities, from more deprived communities, to really
22 understand how they felt about interventions being
23 discussed. So that sort of focus group work, which was
24 going on to to some extent, but also that co-production
25 and co-development of interventions is really important.
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1 Q. I now want to ask you about co-ordination and divergence
2 of policies between the UK and Wales.
3 Please can we have displayed on the screen
4 INQ000384805, and can we see the email that was sent on
5 12 May 2020 from Professor John Watkins, who is
6 a professor of epidemiology at Cardiff University and
7 was a member of the policy modelling subgroup of TAG.
8 Email sent at 12.17, second paragraph down:
9 "... I find it quite alarming that the four home
10 nations are not marching in step in addressing the
11 challenge of exiting 'lockdown'.
12 "From a scientific point of view, the epidemiology
13 of this disease does not warrant this differential
14 approach and therefore I am a concerned that opinion is
15 diverging. Wales, with its extended land border with
16 England, crossed daily by citizens for work, with
17 differing rules backed by law, puts people in
18 a particularly difficult position. If all policy in
19 this matter is based on Science and I am not aware of
20 any difference in the scientific advice given to Welsh
21 Government compared to England, then why have ministers
22 chosen a different course?"
23 Professor Watkins' concern was that rules were
24 putting people in a difficult position.
25 Now, I am not going to ask you about the rights and
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1 wrongs of those policies, I want to ask you about the
2 impacts of those kinds of divergences between the
3 four nations and especially between Wales and England on
4 population behaviour.
5 Are you able to assist with what the impact that
6 divergences like the speed of exiting lockdowns is
7 likely to have had on people's understanding of and
8 compliance with restrictions in Wales?
9 A. So one of the basic principles of behavioural science
10 and communication is having clear messages that -- where
11 you explain why you've come to that policy decision.
12 I think for people, this divergence across nations --
13 now, there's always going to be some because the
14 composition in different regions is different. You
15 know, as we've heard, Wales has an older, more deprived
16 composition in terms of population. So there are some
17 reasons to be different.
18 However, it would have been very confusing to people
19 that -- you know, there was one point where you had to
20 wear a mask on the train till you got to Newport and
21 then you could take it off. Now, there is no doubt in
22 my mind that that -- you know, that idea, that if we're
23 following the science why are we coming to different
24 conclusions, was difficult for people, and that would
25 have had an impact on trust, and we know how much trust
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1 in government and in the decisions being made impacts
2 behaviours in these situations.
3 So while I think we do need to acknowledge that
4 sometimes rules will be different, the responsibility is
5 to communicate why, and I think that sometimes was
6 missing.
7 Q. I think you've answered my next question, but I'll put
8 it anyway. Is it possible that divergences of policy
9 like the ones you've described weakened a belief amongst
10 the population in the science and could those
11 divergences have caused a fall in confidence in
12 government policies that were being led by the science?
13 A. So, yes, I think for -- you know, unless you gave a very
14 clear explanation for that divergence, it would have
15 affected some segments of the population. So, you know,
16 if you trust in your government, if you feel that
17 a policy is being done, is being enacted to keep you
18 safe, it may not impact adherence, but in general, for
19 other parts of the population, it would. So I think
20 clear, consistent messaging is really important.
21 And I guess going forward it would -- and I do think
22 this is -- my understanding is this is happening, is
23 I think it's -- working together, you know, recognising
24 that part of that leadership role across the
25 four nations is coming to some kind of consensus, in the
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1 way we did as scientists in terms of policy, is really
2 important going forward.
3 Q. Professor, I now want to ask a you few questions about
4 the formulation of assumptions about population
5 compliance around NPIs, especially in the first wave of
6 the pandemic. I caveat these questions in that it is
7 fully appreciated that RCBI was not set up at that point
8 in time.
9 Please can we have on screen INQ000049647.
10 This is a document from Imperial College titled
11 "Impact of non-pharmaceutical interventions ... to
12 reduce COVID-19 mortality and healthcare demand" dated
13 16 March 2020.
14 If we turn to page 6, please, there's a table titled
15 "Summary of NPI interventions considered". Under "Case
16 isolation in the home", top row, if you look at the
17 final sentence, it says:
18 "Assume 70% of household comply with the policy."
19 Then second one down, "Voluntary home quarantine",
20 final sentence:
21 "Assume 50% of household comply with the policy."
22 Then, moving two rows down, "Social distancing of
23 entire population", first sentence:
24 "All households reduce contact outside household,
25 school or workplace by 75%."



1 Could we now, please, turn to a different document,
2 INQ000349161.
3 This is a TAC briefing for the Welsh Government
4 titled "Briefing from SAGE outputs on Behavioural and
5 Social Interventions".
6 And then on page 3, at paragraph 16:
7 "These interventions assume compliance level of 50%
8 or more over long periods of time. This may be
9 unachievable in the UK population and uptake of these
10 measures is likely to vary across groups, possibly
11 leading to variation in outbreak intensities across
12 different communities."
13 If I just ask you some questions about that.
14 In terms of actual compliance figures, it's
15 of course difficult to obtain concrete -- a concrete
16 single metric of whole population compliance across the
17 pandemic. That said, in late March and April 2020, are
18 you able to comment on what population compliance was
19 like, whether it was in excess or under the estimates
20 that we've just seen in those documents?
21 A. So I guess firstly I really don't like the word
22 "compliant", because -- I think "adherence" is a much
23 better word. I think we -- I think the vast majority
24 of -- I think these are probably underestimates at the
25 time. Now, I think when you're -- for the sort of



1 modelling that was being undertaken then, they're
2 actually being more conservative, so they're basing
3 their assumptions on lower levels of adherence than
4 I think actually we found. I think the issue around
5 that is that it sort of -- I think we didn't make the
6 most of, and absolutely underplayed, the public's,
7 you know, wanting to both protect themselves but also
8 those around them. That -- I think in Wales we did
9 understand that sort of collective responsibility, and
10 that talking about all those things was much better than
11 thinking about -- thinking about it from a sort of
12 people will break the rules perspective.
13 So I think there's two issues here, I think these
14 are very conservative assumptions, and normally when we
15 do -- when we make assumptions, when we're doing
16 modelling, you tend to be on the conservative side
17 because there are many more risks with being on --
18 looking at them the other way.
19 But I think we do -- we fail to recognise sometimes
20 how much the public and communities pull together.
21 Q. On 14 April 2020, one of your colleagues from SPI-B,
22 Professor Lucy Yardley, said in an email to
23 Professor Mark Woolhouse, a professor -- as we've heard
24 earlier today -- of infectious disease epidemiology:
25 "I find epidemiologists tend to underestimate the



1 extent to which what people do is malleable and can be
2 influenced by how things are introduced and supported."
3 Do you agree with Professor Yardley on that point?
4 A. Absolutely. I think, you know, it goes back to that
5 issue around financial support for isolation. You know,
6 for some people it was very challenging to isolate,
7 you know, from a financial -- from the point of view of,
8 you know, feeding your family. If you're on
9 a zero-hours contract, if you're working in a workplace
10 where you'll put loads of burden on others, if you're in
11 a front facing, frontline occupation, you need support
12 to stay home. So absolutely, I agree with her.
13 Q. Moving to a new topic, I will ask some brief questions
14 about the notion of behavioural fatigue, which touches
15 on, of course, some evidence that you've already given
16 for us.
17 In your witness statement that you provided you
18 reference the emerging debate on behavioural or pandemic
19 fatigue in March of 2020 which was later addressed in
20 RCBI. Are you able to briefly summarise what that
21 debate was and what it referred to in the population?
22 A. So the idea of pandemic fatigue I think really fits in
23 with sort of popular culture. You know, it sounds like,
24 you know, Barack Obama and Mark Zuckerberg talking about
25 decision fatigue. So it sort of feels like common

1 sense, doesn't it? People will get tired of it.
2 In actual fact there no evidence for that. I think
3 as time went on from when that term was first mentioned,
4 you know, more and more of us came out and said, well,
5 actually, there's no evidence for that.
6 I think if you -- if you put forward clear
7 consistent messaging, if you supported people in how to
8 adopt certain behaviours like isolation, there was no
9 idea that pandemic fatigue existed.
10 **LADY HALLETT:** I think Professor Sir Chris Whitty, who used
11 the expression, regretted it in his evidence before me.
12 **A.** And I think absolutely it's because it's sort of --
13 you -- you're trying to communicate with the public and
14 it sounds like common -- you know, it sounds -- it's in
15 popular discussion, isn't it? So yeah, absolutely.
16 **MS SPECTOR:** What were some of the dangers of public
17 discourse normalising a notion of behavioural fatigue?
18 **A.** I guess -- I guess where -- you know, if it -- if
19 people -- it's almost like a confirmation bias. So if
20 you think that pandemic fatigue is something, then
21 I think the risk for the public is that it might
22 normalise, sort of, not adhering so carefully.
23 I think the risk in terms of policy and for
24 scientific advice is that that would impact how you
25 think we can continue with restrictions or what



1 restrictions should happen after you come out of, say,
2 a firebreak or a stay-at-home order. So I think that's
3 where the danger in the term lay.
4 **Q.** In your view and from your experience working in TAG and
5 on RCBI, were policymakers or ministers within the Welsh
6 Government, were they making decisions based on notions
7 of behavioural fatigue that you didn't think, as you've
8 said, there was evidence for?
9 **A.** No. I think as soon as -- this was something that,
10 within the sort of behavioural science groups I was in,
11 we were very clear about it, and we communicated that
12 every time it came up.
13 **Q.** Moving to the summer of 2020, in his statement to this
14 Inquiry, Dr Rob Orford has said that following the first
15 wave too much of society was opened up all at once and
16 in terms of hospitality it led it a feeling that "if
17 it's okay to go to the pub then it's okay to mix with
18 others" and that there was a lack of reasoned debate on
19 the impact or harm of these measures.
20 Do you agree with Dr Orford's comments about that?
21 **A.** So the way I think about this, so I'm assuming this is
22 linking to Eat Out to Help Out, you know, you've heard
23 before how we didn't have input into that or its
24 messaging. I can't comment on the balances across
25 different areas that policymakers were making. But



1 I guess what I would say is that if you're saying to
2 people, you know, "We need to eat out to help out the
3 economy", now, when you're thinking about people's
4 motivations, the economy might not be the most important
5 thing to them, it might be the mental health of their
6 grandmother, it might be their own sense of loneliness.
7 So if you can do things for one reason, then you can
8 do it for others, so it absolutely would have affected
9 people's behaviours.
10 **Q.** Moving forwards in time, just briefly, TAG published the
11 paper "Behavioural insights to support a post fire break
12 Wales" on 29 October 2020. Did you or the RCBI feed
13 into that paper?
14 **A.** Yes.
15 **Q.** What was the purpose of the paper? What was it designed
16 to achieve or to support?
17 **A.** So the firebreak in October was a sort of a short
18 two-week stay-at-home order, and, you know, when people
19 are coming in and out of different restrictions, it
20 really is about thinking about: how do we do that and
21 maintain behaviours? And so it was really thinking
22 about issues like the financial support, having --
23 giving people ...
24 So one of the things that we, you know, struggle
25 with, everyone, is, like, risk, risk perception and risk



1 communication. And your perception of risk feeds into
2 your behaviours, but it's really hard to communicate.
3 You know, like the radiation from flying in an aeroplane
4 is the same as having ten almonds in your pocket. You
5 know, that's the sort of way that you try to communicate
6 risk. And I guess it was highlighting as well how
7 people could, as restrictions eased, go forward into
8 their own behaviours but understanding how they could
9 maybe do that safely or how they might make another
10 choice in your life.
11 So one of the things that really impacts on
12 behaviour is education and awareness, and also
13 I think -- I think we could have been better -- so
14 I think for policymakers you like to -- you like to give
15 certainty, because giving people certainty, you sort of
16 feel that that feels like a good leader and that feels
17 like we're keeping people safe. Whereas in actual fact,
18 you know, being able to communicate uncertainty in
19 a situation that was evolving, you know, rapidly,
20 I think might have prevented those ideas about,
21 you know, there were U turns or why have we got
22 different policies in different places.
23 **Q.** Going back to the summer of 2020, we know that RCBI
24 wasn't set up when restrictions began to ease in Wales
25 in 2020 after that first wave, but do you think it would

1 have helped if the kind of work that you did later on in
2 October on risk awareness and communications in that TAG
3 paper could have been done following the first wave?
4 Would that have assisted in the manner in which Wales
5 unlocked from lockdown?
6 **A.** I think, in keeping with what I said earlier,
7 I absolutely believe, and I think it's fully
8 acknowledged now, having behavioural science and all
9 those disciplines' input into these sorts of changing
10 restrictions was important, and would have been
11 important.
12 **Q.** Moving to my final topic: under-served groups and ethnic
13 minorities and data on them and their representation.
14 You explain in your witness statement that the
15 pandemic highlighted one of the underpinnings of public
16 health that is often overlooked, and you go on to
17 describe how usually groups who are under-served and
18 vulnerable are largely hidden and unlikely to impact the
19 health of others. But, you say, this changed during the
20 pandemic.
21 Are you able to just expand on what you meant by
22 that.
23 **A.** So when you -- so we all think that things -- things
24 like the data collected by hospitals or the data
25 collected in schools or even the census gives us true



1 facts. If you work with data, you develop a healthy
2 disrespect for it.
3 One of the things that really came out in the
4 pandemic, and I think has been transformative, is that
5 there were things that we could not count. So -- and
6 one of those things was about ethnicity. You know,
7 ethnicity is so poorly recorded in routinely collected
8 data. And that's sort of for understandable reasons,
9 you know, people often would say "Prefer not to say".
10 And that comes back to trust. But because those things
11 aren't recorded, we can't count, and because we can't
12 count, we can't see what the disproportionate impact in
13 certain sectors of society are.
14 So if people aren't accessing services, we can't
15 count them. If we don't -- if we're not recording
16 ethnicity, it's very difficult -- and there are lots of
17 characteristics, at least with the impact of the
18 pandemic on ethnic minority groups -- you know, there
19 was that sense, when you were on social media very early
20 on in the pandemic, you know, lots of the photos of
21 people who were dying were from ethnic minorities, but
22 there are, equally, lots of characteristics where people
23 might be vulnerable that aren't so visible.
24 And I think one of the important lessons going
25 forward, and I do -- I do think it's been recognised, is



1 ensuring that we have timely, accurate data systems. We
2 can't just, you know, try to develop data systems in the
3 middle of a pandemic. We really need to invest, and
4 I think in many ways we have, in those systems being
5 operational.
6 **Q.** My final question is just about that. Are you able to
7 provide slightly more information about what has been
8 done already and what is still being done to increase
9 the acquisition of the kind of data that you describe?
10 **A.** So there are UK-wide initiatives, both with NHS data,
11 with recording of ethnicity status in hospitals, in
12 healthcare. There's the idea of recording ethnicity on
13 death certificates, but recording on death certificates
14 of things like occupancy and ethnicity can be quite
15 poor.
16 So I guess what I'm saying is there's a lot of work
17 to be done with under-served populations, so I know
18 that -- you know, back in the day I always used to tick
19 "Prefer not to say" because you have an inherent
20 knowledge that it's going to be a disadvantage to you.
21 It's not an advantage to be from an ethnic minority. So
22 I think there are things that we need -- we need to
23 address education and awareness of people in terms of
24 their suspicions about why we're recording this data.
25 And we also need to think about, you know, how we



1 address those trust issues across our most, sort of,
2 unheard vulnerable populations. Because all those
3 things come down to trust.
4 **MS SPECTOR:** My Lady, I have no further questions, and
5 I don't believe there are any Rule 10 applications.
6 **LADY HALLETT:** No, there aren't.
7 Thank you very much indeed, Professor. I do hope
8 being a clinical professor doesn't mean you stopped
9 teaching, because I found it extremely interesting.
10 Thank you very much indeed.
11 **THE WITNESS:** Thank you.
12 **(The witness withdrew)**
13 **MR POOLE:** If I can call Professor Michael Gravenor, please.
14 **PROFESSOR MICHAEL GRAVENOR (affirmed)**
15 **Questions from LEAD COUNSEL TO THE INQUIRY for MODULE 2B**
16 **LADY HALLETT:** I hope we haven't kept you waiting,
17 Professor.
18 **MR POOLE:** Please take a seat, Professor. If you could
19 start with giving us your full name, please.
20 **A.** My name is Michael Brynley Gravenor.
21 **Q.** Professor, whilst giving your evidence, if you can
22 please keep your voice up so we can hear you but also so
23 your evidence can be recorded. If I ask you a question
24 you don't understand, please do ask me to rephrase it;
25 and thank you again for coming and assisting the Inquiry

1 this afternoon.
2 The witness statement you've provided for this
3 module is at INQ000347979. We don't need to go to it
4 but at page 35 you signed and dated that on 28 October
5 of last year. Are the contents of that statement true
6 to the best of your knowledge and belief?
7 **A.** Yes.
8 **Q.** Professor, by way of overview of your career, then, to
9 date, you're a professor of epidemiology and
10 biostatistics at Swansea University; correct?
11 **A.** That's right.
12 **Q.** Your academic career has been focused on infectious
13 disease epidemiology and public health data analysis
14 through mathematical modelling and statistics; is that
15 also right?
16 **A.** That's right.
17 **Q.** Although you have not previously worked with
18 coronaviruses I think I'm right in saying you have
19 professional experience in the practical application of
20 mathematical models of infectious disease for
21 policymakers; is that right?
22 **A.** That's correct.
23 **Q.** In terms of your role during the pandemic, is it right
24 that in May 2020 you joined TAG and the modelling
25 subgroup which was co-chaired by Brendan Collins and



1 Craiger Solomons?
2 **A.** That's right.
3 **Q.** From April to May 2020 you and some colleagues from
4 Swansea University, which we will call the Swansea
5 modelling team, had been commissioned to provide
6 a Welsh-specific epidemiological models to assist the
7 Welsh Government respond to Covid-19; is that right?
8 **A.** That's right, yes. I maybe wouldn't say commissioned,
9 but ...
10 **LADY HALLETT:** You volunteered.
11 **A.** Yes.
12 **MR POOLE:** Was the work that you did voluntary, unpaid work?
13 **A.** Yes. Up until much later in the day.
14 **Q.** To the best of your knowledge, Professor, were there any
15 epidemiological models being developed and run in Wales
16 for the Welsh population in February and March 2020?
17 **A.** I would say that some of the -- or a good few of the
18 SPI-M models would include Wales as an element.
19 I wasn't aware of any specific focus on Wales from any
20 other models.
21 **Q.** So is it right in this period, February/March, Wales was
22 heavily dependent on the modelling work that was being
23 done by SPI-M, which was also being used to inform SAGE
24 discussions?
25 **A.** Yes, that's correct.



1 **Q.** Professor, when did you first become aware of Covid-19?
2 **A.** I think it would have been on the news in early January,
3 I expect.
4 **Q.** What were your views about what was happening in Wuhan
5 and the potential pandemic that was unfolding in the
6 January 2020?
7 **A.** I think -- I knew as colleagues several of the
8 epidemiologists that were involved in the analysis of
9 the outbreak in Wuhan and I read their reports as they
10 were coming out in January, so I followed it quite
11 closely because of my background and because of my links
12 with some of the people working on it at that time. So
13 I think I was fairly up to date with the evolving
14 situation and the potential concerns, because I could
15 see it being conveyed by colleagues.
16 **Q.** But obviously at this point you had no formal role in
17 advising the Welsh Government, you were entirely
18 independent?
19 **A.** That's right.
20 **Q.** Did you raise the alarm with your professional
21 colleagues? I think you say in your witness statement
22 that very large numbers of infections in 2020 would be
23 likely.
24 **A.** Well, within the medical school in Swansea, yes, in
25 informal conversations, yes, it looked fairly obvious.



1 **Q.** What kind of interventions did you think would be
2 required?
3 **A.** At that point, I -- I really don't know at that point.
4 I think that's going back quite a long time and a bit of
5 hindsight involved there. I just expected a large
6 epidemic.
7 **Q.** Could we, please, have INQ000374405 on screen.
8 This is an email that you sent on 24 February 2020,
9 and it's right you sent this to an individual who worked
10 at Public Health Wales?
11 **A.** That's right.
12 **Q.** I'm just going to pick it up from about four lines down:
13 "The other is corona related. I cornered Brendan
14 the other day ..."
15 Is that Brendan Mason, who worked for Public Health
16 Wales?
17 **A.** That's right, Brendan and I were lecturing together on
18 that day in the medical school to medical students.
19 **Q.** So you say:
20 "I cornered Brendan the other day, he was measles
21 outbreak lead, and I was asking him for data and
22 information on MMR vaccination. He was looking pretty
23 pale with 24/7 preparation for corona, and I briefly
24 asked him if he needed any modelling support, might be
25 a bit late in the day but Wales does represent

1 a devolved and small public health response so
2 potentially they can do things differently, university
3 campus closures, that sort of thing, if they wanted.
4 They may make some support on scenarios and if they do
5 I wondered if you were interested."
6 By doing things differently, what do you mean?
7 Differently to England, differently to the rest of the
8 UK?
9 A. I honestly can't remember what I meant at that point.
10 I really was at that point just reaching out to some
11 colleagues to see if they would be interested in
12 essentially some modelling analyses, because it might be
13 provided. And it was through my contacts with Brendan
14 that I was introduced to Public Health Wales and
15 Dr Chris Williams and colleagues.
16 So at that stage I was following the modelling
17 analysis quite closely, and I thought that some help may
18 have been -- in terms of interpreting perhaps the
19 modelling output that was coming out. I was aware that
20 these kind of reports might have been news to a lot of
21 people. So I was just really fishing around at that
22 stage for maybe something that we could do to help
23 interpret what was happening in Wales. I was aware that
24 the health response was devolved but I don't think I was
25 referring to any specific kind of activity at that



1 point.
2 Q. No, you were obviously offering modelling support, and
3 in that email we just looked at you said it might be
4 a bit late in the day, so was it your view that, sort
5 of, modelling should have really been put in place
6 already by the -- towards the end of February 2020?
7 A. Yeah, I guess that's what I thought, yes. I -- or that
8 they would be relying on the, you know, well established
9 groups in SPI-M and the large groups involved there,
10 Imperial and the London School of Hygiene and Tropical
11 Medicine. So I knew that a lot of modelling support was
12 going to come from that area and that's what might have
13 been relied upon.
14 Q. Did you get a reply from that offer, did Public Health
15 Wales take you up on your offer at this stage of
16 providing modelling support?
17 A. On that day, no, but that is the -- as I said, that was,
18 I think, when -- as I recall, that's when, sort of,
19 leave was cancelled, so to speak, for Public Health
20 Wales and things got very, very busy indeed.
21 So I didn't hear back immediately, but that is the
22 route at which I was introduced to Public Health Wales
23 and, ultimately, Welsh Government.
24 Q. And individuals like Dr Chris Williams who we heard from
25 earlier?



1 A. Yes, so Dr Mason introduced me to Chris Williams and
2 that's really where the link started.
3 Q. On 14 March you sent an email, perhaps we can have it
4 up, INQ000374409. You sent an email, and I think it
5 was -- you sent it to someone who I understand is
6 a mathematical biologist, you say:
7 "All gone a bit bonkers here, control via natural
8 herd immunity? I think they will backtrack on that. No
9 evidence on duration of immunity, no evidence on
10 long-term respiratory complications of survivors by age.
11 "Don't understand why. Massive investment in the
12 surveillance and testing of the obvious route into the
13 country via half term ski trips. Shut down and have
14 a substantial in % terms, it has to be (given it is at
15 low end) effect on R0. Chase up cases like hell with
16 all the resources going there, slow everything down in
17 the summer, wait for better treatments for next winter."
18 Do you stand by what you said then in this email of
19 14 March, that by locking down earlier, investing in
20 surveillance and testing of those entering the country
21 and chasing, in your words, cases up like hell would
22 have been the best strategy for Wales in mid-March 2020?
23 A. It's difficult looking back at these now, but parts of
24 it, parts of it.
25 I think by the 14th -- I think -- we'd gone past the



1 routes into the country, I think we'd gone well past
2 that. So I think this is more of a comment that -- as
3 you know, herd immunity was discussed many, many times
4 and the approach there means slightly different things
5 to different people, but I think it well reflects my
6 concerns that -- I mean, there is a little bit of
7 modelling there, which -- the first thing that would
8 come to my mind is that the idea that we reach a certain
9 threshold and that's it, that's -- as an epidemiologist,
10 that never seemed like a very sensible conclusion,
11 because viruses are extremely adept at changing and so
12 there was always going to be concerns over immunity, and
13 I think this is -- this is before the term "Long Covid"
14 was mentioned but systemic nasty respiratory viruses
15 cause damage and we don't know the problems there.
16 But in terms -- and also, in terms of large scale
17 emergency response, then shutting activities down and
18 reducing contacts a lot has always been part of
19 discussions of pandemic response in terms of things like
20 influenza and -- in worst-case type scenarios, then
21 shutting down and waiting for vaccine improvements in
22 terms of influenza is a discussed option. So it seemed
23 that we were very much, very much at that point in
24 mid-March.
25 Q. At this point in mid-March, I mean, it's right, isn't

1 it, to say that there was no massive investment in
2 surveillance and testing of those coming into the
3 country, whether it be ski trips or otherwise. There
4 was no shutdown, we know, for a further week. There was
5 no contact tracing, let alone the rigorous contact
6 tracing that you're advocating for in this email.
7 I mean, would it be fair to say that this was
8 a missed opportunity for Wales to have better controlled
9 the first wave?
10 A. No, I think at this point there was not really -- I --
11 I don't think this was applicable at that point in time,
12 it just simply wasn't. So this is not something that
13 could have been done at that point in time, but it's
14 something that we had to move towards. And so I would
15 slightly separate out the surveillance and the routes
16 into the country: surveillance I meant within Wales, not
17 in terms of international travel, which I think was long
18 gone by then.
19 But no, I don't think it's something that could have
20 been done at that moment. It's something that would --
21 that it seemed very apparent that we would have to
22 invest in going forward.
23 **LADY HALLETT:** You're not saying it should have been done
24 before?
25 A. I think there would -- I think it's apparent that there



1 wouldn't have been much time before to put that full
2 surveillance and testing in place. I think, given the
3 numbers of tests that were available at that time,
4 that's not something that could have just been done at
5 that point.
6 So I'm not saying that it was an option that was
7 missed, it's just a comment that that's where we'd got
8 to head towards.
9 **MR POOLE:** This is mid-March 2020.
10 A. Yeah.
11 Q. And we've heard from various witnesses alarm bells
12 ringing with them in early to mid-January, so it's
13 a two-month period.
14 A. And I think testing, bringing a testing system into
15 place to deal with that is a huge challenge and, as it
16 proved, took considerably more time. So I would not
17 like to represent it as an option that was right there
18 available at that time. That's not correct.
19 Q. We've heard from Dr Roland Salmon earlier today about
20 his views on the efficacy of lockdowns, and in your
21 statement to the Inquiry you have said that it was clear
22 that once the situation of late February, early March
23 was reached, a first national lockdown was necessary.
24 Why do you describe it as being clear by late
25 February, early March, that lockdown was necessary?



1 A. Well, there was very little -- I think by late February,
2 early March we -- the reported seeding throughout the
3 country was suggesting that the kind of things that had
4 evolved around surveillance and testing and -- were not
5 sufficient to be able to control it UK-wide, and it was
6 going to spread very, very rapidly.
7 So all we then have to -- is to greatly reduce
8 contacts, greatly reduce mixing between individuals, and
9 at that point we had a pretty good estimate of the
10 transmissibility, dealing with a very, very
11 transmissible virus, and it seemed that there wasn't
12 really anything else in the short term, other than
13 a substantial reduction in contacts.
14 Q. Do you think that the national lockdown should have been
15 implemented earlier than 23 March?
16 A. In retrospect, I think it would have been helpful it
17 was, yes.
18 Q. I'm right, aren't I, that your modelling subgroup
19 analysing an earlier lockdown in a July 2020 paper?
20 If we could, please, have INQ000302585 displayed.
21 Excellent. Page 7, thank you.
22 I want to look at figure 9. This shows the effect
23 of different timings of lockdown parameters on the
24 potential course of the pandemic in Wales. Under the
25 scenario of no mitigation measures at all, the pandemic



1 would be expected to have reached a very high peak in
2 mid-May. Yes?
3 A. Yes.
4 Q. If only pre-lockdown reduction levels of contact were
5 maintained, so in other words no full lockdown, a peak
6 of over 250 deaths per day may have been expected near
7 the beginning of June; yes?
8 A. Yes.
9 Q. And if lockdown had been delayed by only five days the
10 scenarios here suggest an additional 28% of deaths would
11 have occurred. Am I reading that right?
12 A. Yes.
13 Q. And if lockdown had been introduced only five days
14 earlier than 23 March, an expected 24% of deaths may
15 have been prevented; is that also right?
16 A. Yes, that is the output from that model fit, yes. So
17 moving all those reductions in contacts earlier would --
18 can only really have the effect of slowing down the
19 epidemic earlier, with a knock-on effect on the first
20 peak. So I understand that there are debates about how
21 we slowed down contacts prior to the mandated lockdown,
22 and so this modelling exercise is an exercise in moving
23 kind of all of those events earlier in time. But
24 I think it's -- it's an inevitable part of infectious
25 disease dynamics that if you reduce contacts earlier,

1 you reduce the peak. There are potential consequences
2 of that later on, but in terms of the peak, yes.
3 I think that that is -- I think that that's -- there's
4 a strong, strong case for that.
5 Q. I was going to ask you, Professor, would an earlier
6 first peak have led to a greater number of deaths in the
7 second wave?
8 A. It is possible you have -- it depends what you do in the
9 second wave. There are -- by suppressing it so hard,
10 you have fewer people infected, and that means later on,
11 when mixing increases, there are more people that can
12 become infected in the second wave. You would
13 technically have a slightly higher R value when the
14 second wave would be initiated, which was inevitable.
15 So those things are important considerations, as
16 I say, very, very important consideration, yes, but
17 I guess it depends. I think the question of whether
18 you'd have more in the second wave begs the question of
19 what do you do differently in that second wave.
20 Q. Quite.
21 In your statement you describe other reasons,
22 indirect reasons, why an earlier lockdown would have
23 been preferable, and one of those reasons relates to
24 care homes, and in your evidence you say care homes
25 would have fared better from an earlier lockdown.



1 Just briefly, why do you say that?
2 A. It's -- that's a tricky question, because we didn't --
3 we do not model care homes explicitly in our work.
4 When -- many of these models work better on a large
5 scale, a large population scale. When it comes down to
6 individual hospitals or individual care homes then there
7 are local level effects that must be taken into account
8 in terms of disease control that are going to be
9 implemented and can never be captured by a broad scale
10 modelling exercise.
11 I think that that comment would refer to the fact
12 that the late lockdown meant we had a very high
13 prevalence of infection throughout April and early May
14 in the UK, and any effort to keep an infectious disease
15 out of a risky environment, such as a hospital or
16 a care home, is more difficult if the prevalence in the
17 community is higher.
18 So we've since looked at the relationship between
19 the prevalence in the community and risks in care homes,
20 and there is a significant association between the two,
21 in that clearly infection control is likely to be easier
22 if the prevalence in the community is not so high.
23 So by keeping that prevalence -- maybe it's
24 something we'll come back to later -- but by keeping
25 that prevalence at a lower level, there are consequences



1 of having a high -- dealing with a high prevalence.
2 And I think the infection at the hospitals and the
3 infection in the care homes, which don't follow this
4 epidemic curve exactly, they show different problems
5 with infection spread in these environments, and I would
6 say that one aspect of that link would be the high
7 community prevalence.
8 Q. Professor, I just want to change topics, if I may, and
9 talk to you about the Imperial influenza model.
10 The evidence heard in Module 2 confirmed that the
11 earliest models created in the UK to deal with the
12 Covid-19 pandemic were created by SPI-M using the
13 Imperial model; that's right, isn't it?
14 A. Yes, amongst other models, yes.
15 Q. And you've described in your statement how the Imperial
16 model had been developed for influenza.
17 It's right, isn't it, that there are advantages and
18 disadvantages of relying on a model that has been
19 developed for a different disease? So on the one hand
20 you have the advantage that the model is available for
21 use rapidly; on the other hand, the Imperial model being
22 based on influenza has different epidemiological
23 features that were less relevant to Covid. Is that
24 a fair summary?
25 A. Possibly. I would put a lot more emphasis on the



1 former. So I didn't --
2 Q. On the advantages?
3 A. Yes.
4 Q. The positives?
5 A. I didn't consider it a weakness really at all, because
6 it was certainly very, very convenient that these issues
7 had been thought about at a large scale and geographical
8 scale and a lot of the impacts of disease spread had
9 been built into them, and then changing those models to
10 reflect, for example, the different incubation period or
11 the different infectious period of a different virus is
12 something that can be implemented by an expert team like
13 Imperial very quickly.
14 Q. Let me just put to you some of the comments that
15 Professor Mark Woolhouse made about the disadvantages of
16 the Imperial model and see what you agree with and what
17 you disagree with.
18 Professor Woolhouse said influenza models explicitly
19 represented schools rather than care homes and influenza
20 models tend to focus on social distancing as the
21 preferred method of intervention rather than alternative
22 interventions. And he identified two reasons for that:
23 first, contact tracing is not a useful intervention for
24 influenza due to its short generation time and high
25 numbers of asymptomatic cases, therefore is not

1 incorporated into the models, but obviously is a key
2 intervention for SARS-like infections like Covid; and
3 then second, he makes the point that influenza has
4 a lower R number than Covid, meaning that social
5 distancing measures required to keep an epidemic
6 manageable can be much less drastic than a full
7 lockdown.
8 The first question is: as a point of principle, do
9 you agree with those observations?
10 **A.** Yes, I think all those are valid observations, yes.
11 **Q.** As a consequence, then, of using the Imperial model, do
12 you think that that adopted a trend or a bias in favour
13 of lockdowns rather than focusing on the contribution
14 of, say, case detection, contact tracing,
15 self-isolation, shielding, and so forth?
16 **A.** I'm not sure how one follows from the other. I mean,
17 the models can't include all the important factors,
18 they're always a simplification of reality. So I think
19 the major drawback would be not having explicit
20 care homes and that route.
21 So that is a -- that is a problem. So I agree with
22 those issues. I think that they don't necessarily flow
23 from choosing that model as the starting point, because,
24 of course, all these models were greatly developed over
25 time, but choosing this model as a starting point



1 I don't think that that was problematic in that sense.
2 It's -- it was identified very quickly over time
3 what needs to be changed and added. Contact tracing,
4 for example, was analysed by several modelling groups
5 very, very early and models and papers were published on
6 that in, I think, late January, early February. So some
7 of those issues were being addressed quite early on,
8 some but not all.
9 **Q.** Now, although you were not involved with the Welsh
10 pandemic response at this period of time, are you able
11 to comment on any concerns that the models were
12 London-centric or followed a pattern too closely pegged
13 to London?
14 **A.** At this point I would not -- I wasn't privy to any data
15 or models themselves, so it's quite difficult to comment
16 on that, I would say. Yeah, I just -- I just -- at that
17 point I was not actively using the models or building
18 them.
19 So I think -- do you mean London-centric in terms of
20 data and analysing the outbreak in London? Because they
21 weren't in any way confined to London.
22 **Q.** Let me just put to you some comments from one of your
23 colleagues on TAC and the co-chair of the modelling
24 subgroup, Craiger Solomons, who has commented that the
25 approach of trying to use the material model crudely



1 adjusted for Wales' population size provided results, in
2 his words, of poor quality. And that -- his reasons,
3 I'll give you the three reasons and then ask for your --
4 whether you agree with them.
5 He said that because models were seeded to Wales
6 rather than England they could not account for
7 differences in Welsh demographics, differences in Welsh
8 geography, rurality, socioeconomic factors, population
9 movement, and also different timings and durations
10 of NPIs.
11 **A.** Okay, so there's several points there and I do agree
12 with some of them, I guess.
13 So I don't think it's a problem with the models.
14 It's more the kind of questions you're asking from the
15 models, and I think they would be a little bit less
16 Welsh-focused by these groups, which is perhaps not
17 surprising. So I think it's not the models themselves,
18 no. It would be perhaps your last point, in terms of if
19 slightly different timings are involved, the seeding of
20 the models is a reasonable -- reasonable point. Wales
21 getting infections slightly after large parts of England
22 means that at any point in time you might be at
23 a slightly different stage of the epidemic. So having
24 the ability to use those same models but in the Welsh
25 context gives you a little bit more insight, I suspect.



1 **Q.** Now, you say in your statement that it was clear by the
2 end of March that a Wales-specific model would be
3 required, and we'll explore after the break in a moment
4 the development of the Swansea model in the spring and
5 the summer of 2020.
6 Did the lack of a Wales-specific model increase
7 planning uncertainty in Wales?
8 **A.** I think what I meant by required was we'd been asked to
9 do it, so I don't think --
10 **Q.** So in your view not needed?
11 **A.** I don't think I would have known at that point. So when
12 I said "required" I meant we would -- we were -- we were
13 required to do it because we'd been asked.
14 **MR POOLE:** I understand.
15 My Lady, if that's an appropriate point to take
16 a break.
17 **LADY HALLETT:** Yes, certainly. I shall return at 3 o'clock.
18 **(2.42 pm)**
19 **(A short break)**
20 **(2.59 pm)**
21 **MR POOLE:** Professor, I'm going to ask you some questions
22 briefly about the Swansea model next, we know that the
23 Swansea model was not operational or used by
24 policymakers during the first wave of Covid and you very
25 helpfully in your witness statement set out the timeline

1 of its development, which I'm not proposing to take you
2 through now, save to note that modelling work using the
3 Swansea model commenced around May to June 2020; is that
4 right?
5 **A.** That's right.
6 **Q.** And then modelling results were available around
7 August 2020?
8 **A.** That's right, yes.
9 **Q.** Now, could you just please provide a brief high level
10 overview of how the Swansea model worked for us?
11 **A.** It's probably worth saying that there's not one model.
12 In the intervening time before we developed the Swansea
13 model we provided lots of small modelling analyses and
14 questions and developed lots of different models over
15 the period, probably ten or 15 different models. But
16 the main model we used, which was labelled the "Swansea
17 model", not by me, it -- we -- these models, as you've
18 mentioned, have been in development -- are best if
19 they've been in development for a long time, so we took
20 the decision not to build it from scratch. I felt at
21 first it would be too difficult to do that.
22 But by that time a lot of the SPI-M modelling groups
23 had made modelling frameworks available to the public,
24 and we explored a range of those, and used a framework
25 that was provided by the London School of Hygiene and



1 Tropical Medicine, and then that's the model that we
2 adapted for Wales.
3 On a broad level, it describes the transmission of
4 an infectious disease within the 22 local authorities of
5 Wales, so it's what we call a local authority level
6 model. So the demographics are relevant to those local
7 authorities. And then the results are collated on
8 a Wales level. And that was the level where it was
9 probably most appropriately used.
10 But at the heart of it it's a local authority
11 SEIR-type infectious disease model.
12 **Q.** And in terms of the uses of the model, is it right that
13 the Swansea model played a role in modelling a range of
14 key policy decisions, so if I just run through a few of
15 them: firebreak, social distancing, self-isolation
16 requirements, the reasonable worst-case scenario in
17 autumn and winter 2020, the potential effect of the
18 firebreak lockdown in October/November 2020, and also
19 the return of children to school in 2020 and also in
20 2021; is that right?
21 **A.** Yes, I would say so. I think isolation-type models were
22 probably based around contact tracing models, which were
23 done separately.
24 **Q.** I think you say in your evidence that the Rt estimate
25 alone is not sufficiently robust to inform decisions.



1 What other factors would you be expecting policymakers
2 to consider?
3 **A.** I think I'm referring there to the R value is crucial in
4 terms of the direction that the epidemic is taking and
5 how fast, but it has to be put in the context of a time.
6 I think I would be referring there to the prevalence.
7 So if, for example, there was an R of -- an Rt of around
8 about 1.4, you might expect the doubling time over about
9 ten days, which is useful, but the situation there has
10 to be related to the prevalence.
11 So, for example, if there were 100 cases a day
12 a Wales, which at times would have been a relatively
13 small number, this would indicate that in a week or so
14 you might expect 200 cases per day, but if you were in
15 a situation where the prevalence is already 1,000 cases
16 a day, then in a week or so there'll be 2,000 cases
17 a day, and in absolute terms the growth rate's the same
18 but in absolute terms it makes a very big difference to
19 the impact of that. So the impact is not directly from
20 Rt, it is combined with the overall prevalence.
21 **Q.** I understand.
22 I'm going to ask you about some of the modelling
23 then that the Swansea model was used for. The first
24 major event I want to touch on in the summer of 2020 is
25 Eat Out to Help Out.



1 Now, we know Eat Out to Help Out, that was
2 introduced between 3 August and 31 August 2020, so the
3 Swansea model was up and running, could have advised
4 policymakers on how Eat Out to Help Out would impact
5 transmission and impact on hospitality and deaths. Were
6 you consulted on the Eat Out to Help Out scheme or asked
7 to model any of its effects?
8 **A.** No.
9 **Q.** Can you help us, what was the community caseload of
10 Covid-19 in Wales immediately prior to 3 August 2020?
11 **A.** I couldn't tell you exactly. It was very low.
12 **Q.** Very?
13 **A.** It was very low.
14 **Q.** Low.
15 How would the removal of many NPIs affect the
16 position in June/July 2020, as restrictions eased?
17 **A.** Well, it would increase the Rt value and we would return
18 to an exponential growth of the epidemic.
19 **Q.** In your opinion, did the Eat Out to Help Out scheme
20 accelerate the arrival of the second wave in Wales?
21 **A.** I haven't seen any analysis of that and we haven't
22 conducted any analysis of that ourselves, so I can't
23 really comment on that.
24 **LADY HALLETT:** I think we --
25 **A.** Anything that -- sorry.

1 **LADY HALLETT:** I'm sorry to interrupt. You carry on.
2 **A.** I would just say that anything that increases the --
3 anything that increases close contacts in a risky
4 situation is going to increase. Mixing -- anything that
5 increases mixing is going to increase Rt and accelerate
6 the arrival of the autumn wave. The extent to which it
7 happened, I really don't know.
8 **LADY HALLETT:** I think that's consistent with evidence I've
9 heard in a previous module. And I should also say that
10 Rishi Sunak, who introduced the policy, indicated that
11 Eat Out to Help Out was meant to be conducted in
12 a Covid-secure environment. So I don't know how one can
13 factor that into modelling calculations, but you hadn't
14 done them anyway, so ...
15 Thank you.
16 **MR POOLE:** Moving on to the autumn 2020 and the firebreak,
17 you describe in your statement that it was clear by
18 11 September 2020 that the R number in Wales was
19 above 1. At this time a TAC report I think referenced
20 a SAGE R number for Wales of between 0.7 and 1, and
21 stated that the current R number was higher than this
22 suggests. Why do you think it was higher than
23 suggested?
24 **A.** Well, one thing to say is that the published R numbers
25 were always lagged by -- in the order of two to



1 three weeks, depending on where you really look at it.
2 This is because the signal that we observe for any
3 changes to transmission, say an increase in
4 transmission, are cases and hospitalisations and
5 possibly deaths, and these do not occur at the time of
6 infection, they occur after a delay. And that delay
7 could be in the order of two weeks.
8 On top of that, you -- there is a delay from the
9 last data point that you had before you estimated Rt,
10 which could add a few more days to that as well, and
11 then there's potentially a delay in communicating that
12 advice. So it all adds up to the most -- the most
13 up-to-date R value really reflects the situation
14 a couple of weeks prior.
15 So if you want to make a comment on today's R value,
16 then you really have to look at the trends that you've
17 seen in the past and any other knowledge you have about
18 mixing.
19 So if we were in a situation where we see the trends
20 in R increasing, and on top of that perhaps some other
21 areas of the country sitting on SPI-M would be reporting
22 R values above 1, so you can see trends there. But on
23 top of that, if in terms of behaviour the only thing
24 that's really happening in terms of there's not controls
25 on -- not so many controls on social mixing and schools



1 have gone back and other activity is going on, then it
2 would be a very reasonable conclusion that the R value
3 was above 1 at that point.
4 **Q.** So when SAGE on 11 September were reporting the R number
5 for Wales as between 0.7 and 1, and you say likely to be
6 higher, what do you think the R number was more likely
7 to be at that point?
8 **A.** I possibly could have brought that information with me,
9 but I think we were head -- I think it was in the order
10 of 1.2, 1.3.
11 **Q.** I think I'm right in saying, aren't I, by this point in
12 time you had modelled a new reasonable worst-case
13 scenario which showed a potential for a large second
14 wave?
15 **A.** Yes.
16 **Q.** Now, in the modelling work that you were doing in late
17 August, September, am I right in thinking that while you
18 modelled some NPIs being introduced to reduce contact
19 and bring the R number down, the assumption was that
20 there would not be a repeat of the March 2020 national
21 lockdown? Is that right?
22 **A.** In the reasonable worst case?
23 **Q.** Yes.
24 **A.** Yes.
25 **Q.** Where did that assumption come from, that there wouldn't



1 be a repeat of a national lockdown?
2 **A.** I think that would come under the remit of the
3 reasonable worst case that we were asked to model. So
4 it would be, the situation in August or September, this
5 amount of behaviour, where is this taking us? So
6 it's -- I mean, there are various different uses of the
7 models, and modelling explicit policy such as
8 introducing restrictions in movement, et cetera, would
9 be part of a scenario modelling. In terms of the
10 reasonable worst case I think the remit would generally
11 be: if things stay as they are where are we heading?
12 And it can possibly take into account some changes over
13 time.
14 **Q.** Modelling was conducted for the 11 September 2020 TAC
15 advice that went to the Welsh Government -- I don't need
16 to display that advice here -- it was noted in that
17 advice the pattern of increasing cases is similar to the
18 situation in February, action should be taken to prevent
19 significant harm arising from Covid-19 or another
20 national -- sorry, or another full lockdown.
21 Then again, that was 11 September.
22 On 18 September a TAC advice, if we could have that,
23 please, displayed, INQ000222823, as we see there it's
24 18 September 2020, if we could look at page 2, the first
25 bullet point, please:

1 "The epidemic is evolving rapidly across Wales and
2 the UK, meaning that estimates become out of date very
3 quickly. There is consensus that the situation
4 continues to be serious. This is highlighted by the sad
5 news that we have begun again this week to have deaths
6 from Covid-19 recorded in Wales."
7 Then if we can please have a look at the fourth
8 bullet point on that page:
9 "A package of ... (NPIs) on local and national scale
10 may be needed to bring R back below 1. Some NPIs may
11 need to be in place for a significant length of time,
12 though an earlier and more comprehensive response is
13 likely to reduced the length of time for which they are
14 required."
15 What did you envisage by an "earlier and more
16 comprehensive response", Professor?
17 **A.** So, again, the earlier that you act, you're acting at
18 a lower prevalence, and the degree which you suppress it
19 then takes you down to an even low prevalence. So in
20 terms of buying time, from that sense, acting earlier
21 suppresses it to a lower level and delays the next
22 action. Waiting longer means you have to either act
23 more severely to bring it down to very low levels or you
24 are acting to bring it down to a somewhat lower
25 prevalence from which it will return as well.



1 I think the important thing of this point in time is
2 we estimated how many people had been infected in Wales
3 during the first wave, and it's not a very large number,
4 it's maybe 6, 7% of the population at most, and it just
5 left a huge potential for growth which is reflected in
6 the reasonable worst cases for the UK as well. The
7 situation is not quite the same because the R value is
8 generally much lower than it was in March, and that's
9 because of the understanding of isolation and test and
10 trace and just general realisation that you shouldn't be
11 spreading a virus.
12 However, the R value is -- it doesn't need to be
13 very far above 1 to be problematic, and I think --
14 you know, this is sometimes difficult to communicate,
15 but the -- an R value of 1.2 doesn't sound much
16 different to an R value of 1.1, but very approximately,
17 in terms of contacts, you have to reduce your contacts
18 by 20% from 1.2 and 10% from 1.1 approximately. So it's
19 twice as much effort, so twice as much of a reduction in
20 contacts required just for small changes in R. So the
21 potential was very, very much still there.
22 **Q.** When you're talking about an "earlier and more
23 comprehensive response", is "comprehensive response"
24 alluding to potential for the need for a lockdown or
25 a firebreak lockdown?



1 **A.** I am -- I don't know. I expect so. I didn't write
2 this, of course.
3 **Q.** If we could, sticking with the same document, please,
4 page 5 and then the third bullet point on that page,
5 please. Thank you.
6 "In mid-April mobility of Facebook users in Wales
7 was 50% lower than the baseline, this is 1% lower than
8 the baseline and is up slightly from last week. 22% of
9 Facebook users in Wales are staying put, similar to the
10 previous week. In early April around 45% were staying
11 put -- this was around 18% in early March."
12 Does this mean that, in addition to the worsening
13 indicators that we've just looked at, people in Wales
14 were travelling more in September than they were in
15 March, which was obviously likely to culminate in
16 greater community transmission?
17 **A.** Yes, possibly. I find it difficult to comment on this,
18 I never analysed this data at all.
19 **Q.** I understand.
20 If we could, please, have a look at some further
21 modelling for a 2 October 2020 TAG advice -- thank you,
22 INQ000066408 -- we can see that on the screen there.
23 It's page 2, please, first bullet point.
24 It says:
25 "Some data streams indicate potential slowing in the



1 growth rate of the epidemic, but it remains likely that
2 infection incidence is growing overall in Wales."
3 Then, please, the second bullet point:
4 "The latest estimate of R; from ... (SAGE) for Wales
5 is between 1.3 and 1.6."
6 Then, please, the fifth bullet point on that page:
7 "Unless measures bring R back below 1, it is
8 possible that infection incidence and hospital
9 admissions may exceed scenario planning levels."
10 So from your point of view, Professor, was it clear
11 from early to mid-September 2020 that significant
12 intervention would be required to reduce transmission,
13 and then by early October, this being dated 2 October,
14 there was concern that hospitals exceeding scenario
15 planning levels, so in other words the NHS in Wales
16 would risk being overwhelmed?
17 **A.** Yes, I would agree with that, yes.
18 **Q.** Do you think the tone of the TAC advice documents that
19 we've just seen was sufficient to convey the seriousness
20 of that message to the Welsh Government?
21 **A.** I think I'd have to see the full context for that.
22 **Q.** Well, were there occasions when you thought perhaps
23 stronger warnings, stronger messaging might be
24 warranted?
25 **A.** I don't think so. I don't -- I don't think so. I think

1 the -- I think there was some uncertainty there,
2 perhaps, in terms of the estimates and perhaps because
3 we'd come from the period where the R value was
4 estimated as being under 1, even though that was out of
5 date, so I think there was a growing realisation here
6 across TAC that we were heading towards interventions.
7 **LADY HALLETT:** Could you look at the first bullet point,
8 Professor. I mean, if I were a politician reading this,
9 "Some data streams indicate potential slowing in the
10 growth rate ...", I'd think, "Oh, good, we're going the
11 right way", and I may not even focus too much on what
12 remains of that sentence.
13 Don't you think that should have been much more of
14 an alert rather than, "Oh, we may be getting better"?
15 It doesn't sound very strong to me.
16 **A.** Yes, I think the second bullet point should have gone
17 first on that, because I think by that point we were
18 fairly clear that R was greater than 1.
19 It's hard to remember exactly when this was written.
20 When it was written and when it was dated might be two
21 different things. But ... yeah --
22 **LADY HALLETT:** Do you know who drew up the briefs and the
23 reports?
24 **A.** Sorry?
25 **LADY HALLETT:** Do you know who drew them up?



1 **A.** No. No. I knew that they could be circulated. Yeah,
2 circulated for comments, yes.
3 **MR POOLE:** Professor, you describe in your statement that
4 you were first asked to model a specific firebreak
5 scenario of two to three weeks on 11 October. Were you
6 surprised that that work was commissioned a whole month
7 after you started raising concerns about transmission
8 rates in Wales?
9 **A.** Not really. Once again, I'd say we weren't commissioned
10 to do it. There was no commissioning involved at this
11 stage at all.
12 **Q.** You were asked to.
13 **A.** And the second thing to say is it's true that we were
14 asked to do the specific two and three-week model. At
15 that point we'd previously modelled a range of
16 scenarios, so it wasn't the first time we'd looked at
17 that. So I think we'd been looking at firebreak
18 situations elsewhere, circuit-breakers were being
19 actively discussed in SPI-M and in many places, so that
20 was not the first time we were asked to do it and we had
21 been preparing that before.
22 **Q.** I mean, did the fact that you were carrying out this
23 modelling work entirely pro bono, I think, until
24 August 2021, did that have an impact on the work that
25 you were able to do?



1 **A.** Yes, yes. It -- we would have been able to do a lot
2 more. So everything we were doing -- the team at this
3 point, myself and Professor Lucini and Dr Dawson and
4 Dr Bennett, we all had full-time commitments to our
5 roles in the university, so if we could have been
6 relieved of that we would have been able to run more
7 scenarios, I think we were quite keen on running
8 additional models alongside -- it's important to have
9 an ensemble if you can, and we could've looked at more
10 scenarios. We could've done more things. We could've
11 possibly brought in more people as well, which would
12 have been very, very useful. So I think a mechanism
13 that could have enabled that would have been quite
14 useful, I think.
15 I think it's an important point to make that in
16 an emergency situation there are certain expertise that
17 does not necessarily sit in a standing capacity within
18 government or within health services, and it exists in
19 places like universities, and accessing that expertise
20 is -- I think it's very important, not just from our
21 point of view, but important -- there's expertise in all
22 sorts of the response, the behavioural side, the
23 genetics, and accessing that -- a mechanism to access
24 that expertise I think is an important lesson we've
25 learnt and -- yeah. So this was largely evening work,



1 yeah.
2 **Q.** That 11 October modelling of a two to three-week
3 firebreak, were you surprised that you were asked to
4 model a two to three-week firebreak as opposed to, say,
5 a four-week or even longer firebreak?
6 **A.** Yes, I've certainly considered this since. I wouldn't
7 say I was surprised. We -- we just did it. This is
8 late in -- not -- this is 15 October. We have
9 a question, we do it. And so I think just delivering
10 that to a -- to a level of quality that we'd be happy
11 with is what took our focus. I don't think we -- we had
12 already run situations that were longer, and we know
13 that a longer firebreak would have more of an impact.
14 So at that point in time, I can -- I can say that we
15 just took it and we did it.
16 **Q.** I think I'm right in saying you did in fact model,
17 though, a four-week firebreak, did you not?
18 **A.** Yes, we've looked at -- we looked at all ranges, we
19 could --
20 **Q.** What --
21 **A.** -- our model and simulations over many different
22 combinations and repeated ... all sorts of situations.
23 **Q.** What did the modelling show about the impact of
24 a four-week lockdown?
25 **A.** I think -- I think we -- well, it would have driven the

1 prevalence lower and it would have given more time
2 before prevalence returned to the pre-firebreak levels.
3 That's something we reported on in detail for the two
4 and three-week scenarios. For the other scenarios we
5 have -- had those numbers, but at this point this was
6 the remit of our -- of our investigation, we focused on
7 those two and provided that.
8 **Q.** Having sort of perhaps stepped outside the brief and
9 modelled a four-week lockdown, and having made the
10 findings that you did, did you advise TAG or TAC of
11 those findings at the time?
12 **A.** At the time, no. I think they were shared -- I think
13 they were discussed in the modelling subgroup perhaps
14 prior to that, but I think by the time we got to
15 15 October we -- there was a fairly well set plan for
16 dates going over the school half term, so when we looked
17 prior to that, we just set up a set of scenarios in
18 which you can vary the length of the firebreak, and they
19 may or may not have had school closures and they may
20 have had different effects. So there would have been
21 very many scenarios that we would have, and then we
22 would focus then on the two to three-week -- and then we
23 were given a date. So they wouldn't have been directly
24 comparable anyway because we were running over the
25 half term, and then after the half term of the firebreak



1 there was a mixed school -- some -- some return to
2 school.
3 So it was a very specific situation that we were
4 modelling in response to that email, which does not
5 directly correspond to the previous kind of
6 circuit-breaker experiments that were done before.
7 **Q.** From what you've just said, it sounds as though by the
8 time you were asked to model the firebreak it was pretty
9 advanced thinking on the part of the Welsh Government
10 that there was going to be a firebreak. I mean, did
11 modelling -- in your view, did modelling work need to be
12 carried out in order for that decision to be made to
13 impose a firebreak?
14 **A.** I think possibly not, I think it's going to perhaps
15 guide thinking in terms of the impact and maybe being
16 most useful in terms of the return time. So it's
17 an important decision. So you've got to understand the
18 particular circumstances in which it's going to work and
19 the uncertainty around that.
20 So within the remit of the two and three-week
21 firebreak we considered a combination of what the true
22 value R was when we headed into it. Now, that was
23 unknown, so we considered a range. Then we have to
24 consider a range of the impact, and so we considered
25 a range of those, because it may not reduce contact as



1 much as it happened in March. So we can use that as
2 a yardstick but it may not be as effective. Then
3 finally we have to consider what is the likely R at the
4 end of the firebreak. And there are certain things to
5 consider there, it's deeper into the winter, there might
6 be a carry-over effect of the firebreak, whether it's
7 beneficial. Which is what largely transpired. So there
8 are many different potential outcomes.
9 And I think the modelling is useful to sort of have
10 those explicitly down -- we don't necessarily know which
11 one of these is going to be followed so it's not
12 necessary to show that, but with that -- with that
13 analysis you can say that under the range of the
14 assumptions -- under the range of scenarios that we
15 consider to be reasonable then this is going -- this is
16 a possible likely effect. And if that is a suppression
17 for some extra time beyond the actual break, then it
18 has -- then it will have a big impact on prevalence, as
19 it did.
20 **Q.** Professor, did you have any concerns that the Welsh
21 Government on occasion were perhaps overly eager to
22 obtain modelling outputs at perhaps the expense of
23 timely decision-making?
24 **A.** It's not my experience at all, no.
25 **Q.** The First Minister's provided a statement to this module



1 of the Inquiry in which he said that the firebreak
2 produced the gains which had been expected but that the
3 gains were, in his words, much more short-lived than the
4 modelling available to the Welsh Government had
5 anticipated. Now, we know that by early December in
6 Wales indicators for clinical admissions and the Rt rate
7 were nearing pre-firebreak levels, so is the
8 First Minister right in that assessment?
9 **A.** I believe not. I think, as I've kind of described
10 previously, the firebreak scenarios covered a very large
11 range, but in reality the time bought was at the upper
12 end of our optimistic scenarios. So while there were
13 some scenarios in which it could possibly be lower, they
14 were the very, very, very most optimistic.
15 The -- what we -- what we hoped was a baseline
16 scenario was the current R and then it would have
17 a large impact, because the -- I believe the comms and
18 the preparation was done very well and people were aware
19 and they were -- it looked as if they would be on board.
20 So we set an impact that would be quite effective, not
21 quite as effective as March, but a very effective one.
22 And following that we assumed that the R would be
23 exactly the same again. Using that model, we projected
24 a return time to the pre-firebreak conditions of
25 38 days, and the data will show that the return time was

1 in the area of 39, 40 days.
2 Now, I think that's coincidentally close, okay,
3 that's not something you expect from these kind of model
4 exercises, they do not have that kind of precision, but
5 it coincidentally shows that that baseline scenario was
6 almost exactly the time bought. And I would say quite
7 a substantial amount of time, if -- so 39 days added on
8 to the time of the firebreak, which is only two weeks
9 long, is quite substantial and it shows the trajectory
10 that the epidemic took within the firebreak.
11 And that's been -- there's many independent
12 corroborations of that. You can see in the ONS data
13 that the prevalence in Wales is half that of England
14 around about that time, and you can -- and there are,
15 I believe, published estimates from independent
16 modelling groups, the London School published a paper on
17 the circuit-breakers in England which analysed the
18 effectiveness of the Wales firebreak and showed,
19 I think, that it had a 45% reduction in Rt, which is
20 quite considerable.
21 So I think the time bought is pretty much very, very
22 close to what we suggested in the models.
23 **Q.** So when the First Minister said the gains were much more
24 short-lived than the modelling available to the Welsh
25 Government had anticipated, I understand your evidence



1 to be the modelling was accurate. Would it therefore
2 follow that the duration of effects had not been
3 communicated to the Welsh Government?
4 **A.** I don't think that's true, I think we -- I think we said
5 for a two-week we would expect a three to five-week
6 reset, and for a three-week we'd expect a five to
7 seven-week reset.
8 **Q.** So the net effect of that is you say that statement from
9 the First Minister, that's just wrong?
10 **A.** Yes, I think it doesn't reflect the post-firebreak
11 period.
12 What we found post-firebreak is that there was
13 a little bit of a period where growth was -- one might
14 imagine that the R number declines very, very rapidly,
15 and as soon as everyone goes back to normal it goes
16 right back to normal. The evidence is that there was
17 a period after the firebreak where it was actually
18 growing a little bit more slowly than prior to the
19 firebreak, and then it picked up speed. Which might
20 represent the conditions of transmission and going
21 deeper into the winter, as we approached December, but
22 also the arrival of the Alpha variant, which is circling
23 that time, which is considerably more transmissible.
24 **Q.** Professor, just before we leave this topic of the
25 firebreak, just two short questions, and we've still got



1 quite a bit to cover, so if you could try and keep your
2 answer as brief as you can to these questions.
3 First is: was the timing of the firebreak in your
4 view reasonable or should it have come earlier? My
5 second question: should it have been longer?
6 **A.** I think the timing was -- earlier would have helped, as
7 we have talked several times about the prevalence issue.
8 I do believe that the timing including the preparation
9 and the comms was about right. But having it at the
10 lowest end means that it was always going to be the
11 minimum impact in the shortest amount of time. So
12 looking back on it now, we -- I do think it should have
13 been longer.
14 A longer firebreak could have -- given how effective
15 it was, given how effective it was in reducing Rt
16 a longer firebreak would have set -- if that, if those
17 benefits had continued, it would have set the prevalence
18 down to a very low level, and then we would have headed
19 toward December.
20 I think a four-week firebreak would have put the
21 reset time deep into December. At this point in time
22 we've got a lot of knowledge from -- about the
23 transmission conditions deep in the winter, including
24 knowledge of Alpha, the Alpha variant.
25 So I think a longer firebreak would have put us in



1 a much, a much better position in December and
2 potentially could have avoided some of the worst of that
3 second wave.
4 **Q.** And the four-week firebreak, just to be clear, had been
5 modelled but the results of that modelling exercise had
6 not been passed on to TAG or TAC?
7 **A.** Not as part of the -- not as part of that commission,
8 because the instructions came to provide evidence on the
9 two and three-week.
10 **Q.** I understand.
11 **A.** The work has been -- the effects have been shared
12 informally in the modelling subgroup and in terms of
13 just general discussions about a longer firebreak has
14 a bigger effect.
15 **Q.** Professor, I want to move on to the winter period 2020.
16 On 2 December TAG published a statement regarding NPIs
17 in the pre-Christmas period.
18 Could we, please, have INQ000350039. Thank you.
19 If we could have a look, please, at page 3. If
20 I can go to the second paragraph, in fact, on the third
21 line of that second paragraph, the -- where it starts:
22 "The firebreak had the intended impact of a short
23 sharp early intervention to push back the epidemic by
24 three to four weeks. The benefits of this period of
25 negative growth have nearly been lost, with case numbers

1 and hospital admissions nearly reaching levels seen at
2 the beginning of the firebreak."
3 Then, please, if we can go to the same page, page 3,
4 but the fourth paragraph, that starts:
5 "Deaths are currently as high as May, with the
6 excess death rate in Wales higher than in England and
7 Scotland over recent weeks, and tracking above our
8 reasonable worst case."
9 That was obviously a concerning picture
10 epidemiologically; yes?
11 **A.** Yes, yes, I think that's possibly around the worst point
12 of the epidemic, I would say, in my experience.
13 **Q.** And in the same document, the policy modelling done by
14 your team at Swansea University compared some different
15 NPI interventions over December 2020 against some
16 varying rates of background Rt.
17 If we can, please, have page 12. Thank you.
18 So the policy options being compared were: first, no
19 intervention; then entering Tier 2 restriction; and
20 then, the third one, entering Tier 3 restrictions.
21 Pausing there, why were those the three options that
22 were modelled? Was that the commission that you had
23 that received?
24 **A.** For that particular paper, yes. So they would be
25 directly asked to use those conditions. I think prior



1 to that we'd already started looking at the next point
2 at which changes would need to be made, and we'd already
3 considered various levels including Tier 4.
4 **Q.** Now, the advice of TAG that was summarised back in
5 2 December 2020 -- I don't need this to be displayed --
6 but that summary was that policy modelling suggests
7 that -- I'm grateful -- introducing the equivalent of
8 Tier 3 restrictions, for example closure of hospitality
9 and entertainment, reduction in mixing prior to the
10 relaxation of restrictions before Christmas will reduce
11 the number of hospital and ICU beds required for
12 Covid-19 patients and subsequent deaths.
13 Is it right that the strongest, if I can put it that
14 way, NPI option then being explored in early December
15 were Tier 3 restrictions, or you've just alluded to you
16 were in fact looking at Tier 4 or effectively lockdown
17 restrictions as well?
18 **A.** We were looking at them, but that was the question that
19 was being asked here.
20 **Q.** So you were effectively reporting only -- and this is no
21 criticism, because of the extent of your commission --
22 but you were reporting only on the strongest NPI option,
23 being Tier 3 restrictions?
24 **A.** Yes.
25 **Q.** Now, we looked previously at a TAG meeting on



1 13 October. It was noted in those minutes of that TAG
2 meeting that, and I just read this to you:
3 "Yesterday there was a COBR meeting and announcement
4 around the [three] tiers in England -- a SAGE chairs
5 group took place yesterday and no one felt that the
6 highest tier was strong enough to bring R below 1."
7 So my question is this: if Tier 3 restrictions had
8 been seen as insufficient before the firebreak lockdown,
9 and Wales was quickly approaching pre-firebreak levels,
10 why was it assumed that Tier 3 restrictions would be
11 sufficient this time around?
12 **A.** Sorry, what was the date of the SAGE?
13 **Q.** 13 October.
14 **A.** So there was a lot of -- there was a lot of debate about
15 the R values to use for different tiers and it did
16 change a little bit over time, and I think there was
17 a little bit of a difference between areas and between
18 DAs. So we'd previously used a value where it just
19 pushes it under 1, and I think that was appropriate,
20 I think that was appropriate at the time. Again, we
21 would explore sensitivity to that. But by the time
22 we've got into December, I think it was just becoming
23 clear that that was not the case.
24 So I think by this, by around about this point --
25 which is why I think I mentioned that this point in the



1 epidemic, it became clear that this was definitely not
2 the point in Wales. So shortly after this, we start to
3 realise that Tier 3 is nowhere near enough. But we're
4 now dealing with a much more transmissible situation
5 than we had previously, and bringing that kind of Alpha
6 advantage in transmissibility, which we didn't have at
7 this point in time, into it would show that it would not
8 be close to enough with Tier 3.
9 **Q.** So it's your view that Tier 3 restrictions would not be
10 sufficient to bring the R value down?
11 **A.** Oh, it would bring the R value down.
12 **Q.** Sorry, to bring the R value down below 1?
13 **A.** No.
14 **Q.** Yet we see here in this TAG --
15 **A.** Sorry, I don't mean -- it was around about this time, it
16 was -- I couldn't -- I wouldn't say that it was before
17 this was written, no. No, sorry, I don't want to give
18 that impression at all. It was right about this time.
19 **Q.** But I would be right in saying that nowhere in this
20 advice does it allude to any concerns that in fact
21 Tier 3 restrictions would not have the effect of
22 bringing the R value below 1?
23 **A.** No, I don't think it mentions that. It certainly has
24 an impact on R which is going to reduce the number of
25 cases, it's going to reduce the number of

1 hospitalisations but ... yeah, I think that there are --
2 there were points at which that would be a reasonable
3 assumption to make, but those turned out not to be true
4 quite soon after this.
5 Q. Before we move off this document, I just want to ask you
6 some final questions about the advice given about
7 pre-Christmas NPIs, and in particular schools.
8 I'm grateful, page 13 of this document.
9 We can see there in the table that your team had
10 modelled the difference in hospitalisations and deaths
11 between schools staying open and closing between 14 to
12 18 December. Schools staying open for that period you
13 estimated would result in between 120 and 150 deaths;
14 that's right, isn't it?
15 A. Yes.
16 Q. I'm asking you this because in a TAG meeting two months
17 earlier the picture looked different.
18 If I can just have those notes, please,
19 INQ000313192 -- I'm grateful -- page 4, paragraph 1,
20 right at the top:
21 "When asking people to self-isolate because they're
22 Covid positive, there are issues around what other
23 members of the household do and this is a moral and
24 public health discussion and may lie outside the remit
25 of TAG. Worth highlighting the evidence of children



1 transmitting to adults is so limited that it may be
2 worth letting children out anyway."
3 And then, reading on, please:
4 "Concern is around children in schools and what
5 happens there. Agree immune suppressed children are
6 a different situation, but the current evidence does not
7 suggest transmission in the school context. Still quite
8 a lot we don't know about asymptomatics infection; the
9 modelling originally done was based on flu where
10 children are super spreaders and this has not been
11 replicated with Covid."
12 But my question is simply this: why were you then,
13 in December, modelling deaths against school closures if
14 you weren't satisfied that children were meaningful
15 spreaders of the virus?
16 A. I'm sorry, I didn't. This is not my opinion.
17 Q. So is the answer that when we look at the 2 December TAG
18 paper, this was something you had been asked or TAG had
19 been asked --
20 A. Can you clarify the date of this?
21 Q. This is 9 October 2020.
22 A. Okay. So I think the exact role of transmission in
23 schools was pretty much unknown, I think, by this point.
24 So this is all assumption. I think we'd gone through
25 a situation where schools closed pretty quickly in



1 March, prevalence was driven down to very, very low
2 levels and then there was the school holidays and then
3 a couple of weeks back in school. None of that is
4 sufficient to give you a good estimate of the importance
5 of transmission in schools.
6 Q. Now, we know schools were closed early on 14 December;
7 hospitality, however, remained open. Do you think you
8 should have been asked to model the effects of keeping
9 schools open and closing hospitality venues?
10 A. Sorry, for which dates?
11 Q. So 14 December is when schools were closed early in
12 Wales, but hospitality remained open. So my question
13 was simply: do you think you should have been asked to
14 model the effect of in fact keeping schools open but
15 closing hospitality?
16 A. Yes, I think we could have done that, it's a blunt tool,
17 whether you can distinguish things very easily, in
18 terms -- in terms of schools we relied heavily on what
19 we would call the contact matrix between different age
20 groups and this is obtained from surveys and empirical
21 epidemiology, surveys such as CoMix, and they basically
22 tell you how often a person of one age is in contact
23 with a person of another age on a typical day.
24 So within those surveys, the contacts that take
25 place within schools are to some degree recorded, so



1 those are the contacts that we would remove from our
2 model when schools are closed. So it was -- it was not
3 based on the observation -- so our model was not based
4 on the observational epidemiology of how often
5 transmission occurs within schools, it was based on the
6 typical contacts that are made within schools and
7 between school-aged people and people outside of the
8 schools.
9 So in some ways it's a very easy thing to implement
10 in the model, and you can remove those, which simulates
11 school closures. It doesn't capture all of the nuances
12 of that, but at the end of the day those contacts exist,
13 and reducing any contacts in the model across or within
14 groups and across groups -- because not all the contacts
15 can be maintained within children -- if you reduce any
16 of those contacts, you are going to reduce infections
17 and cases and hospitalisations, deaths. The extent to
18 which they are changed is very, very difficult to do --
19 but ultimately all we're doing there is reducing the
20 contacts of that age group -- and a little bit harder to
21 do under other circumstances.
22 Q. Can we just return to the chronology. We were working
23 our way through December and the advice that was being
24 given by TAC. On 11 December there was a further TAC
25 advice that was published. I don't need it to be

1 displayed, I'll just read you a few relevant passages
2 from it:
3 "Cases of Covid-19 per 100,000 of the population in
4 Wales, have increased by 54% since our last report.
5 "As of 9th December, test positivity for
6 COVID-19 ... is above the red circuit breaker indicator
7 threshold, at 19.4%.
8 "As of 11th December, the number of people with
9 confirmed COVID-19 in hospital, has increased by 9%
10 since last week, remaining higher than the April peak
11 and above the red circuit breaker indicator threshold."
12 So as with the October firebreak, I think you were
13 commissioned to provide some further modelling, but was
14 it not obvious from 11 December that Tier 4
15 restrictions, namely a lockdown, would be needed to get
16 a grip on transmission rates?
17 A. Yes.
18 Q. Do you think that a third lockdown should have been
19 implemented earlier?
20 A. Yes, in retrospect, yes.
21 Q. Now, in December 2020 Professor John Edmunds stated,
22 "this is the worst moment of the whole epidemic", and in
23 January 2021 that, in his words, "really major
24 additional measures" were needed.
25 We now know that Wales fared particularly badly in



1 the second wave and in December 2020. Do you think the
2 same comment applies then to Wales? Was Wales caught in
3 a very bad position?
4 A. Yes, I would say so. I think it's -- it doesn't give
5 much solace, but I think there is a -- it was somewhat
6 unfortunate to come out of a firebreak into the highest
7 transmission period, December, with the emergence of the
8 Alpha variant which went on to make up a very, very
9 substantial part of the second wave. So whilst there
10 was measures going on in early December, they clearly
11 weren't enough, and they came at a time of the return
12 period from the firebreak.
13 So I think it is one of the worst situations in that
14 point, in the sense that we dealt with -- we had to deal
15 with a very difficult situation, which was very high
16 transmission rates, from the point of high prevalence.
17 So it comes back to the point again, is if you had
18 a longer firebreak, for example, you deal with those
19 situations from a lower prevalence, and so by that point
20 you would be able to perhaps respond or consider the
21 response a little bit -- a little bit better, and
22 certainly the -- you know, the consequences of that
23 period would have been -- would have been reduced.
24 So whilst Alpha can't be predicted, it kind of
25 illustrates that importance of the overall prevalence,



1 and so dealing with that already high was a -- it was
2 rather a sort of perfect storm and I think -- I think
3 that could have only been avoided by a longer firebreak
4 before -- beforehand.
5 Q. Professor, just two short topics before I finish.
6 Indirect effects of NPIs. Could more have been done
7 by your team on indirect harms over 2020 and 2021, had
8 the resources been made available to you?
9 A. Are you referring perhaps to economic type effects or --
10 Q. Indirect effects, NPIs, so social, economic, quality of
11 life.
12 A. This is not our area of expertise in terms of social
13 effects. No. And I -- we set up the model very, very
14 early to build in potential costs so that indirect
15 effects and cost benefits could potentially be weighed
16 up against each other. That was done in September.
17 So, however, I don't think that the numbers to bring
18 into the model were ever -- ever provided, were ever
19 made available. So I think the framework was there, but
20 if we'd have been given more time, no, because there was
21 nothing to -- there was nothing to bring in. So we
22 were, I think, frustrated by that and made a certain
23 amount of progress on the costs sides for the health.
24 That fed into every model run. But in terms of how the
25 knock-on societal or economic effects, I felt that there



1 was no information being provided to us at all that
2 would allow us to bring that into the model.
3 Q. Finally -- and I think you may have answered this
4 question already in your evidence this afternoon --
5 what, if any, modelling was done to reflect the elderly
6 population in Wales? What specific considerations were
7 given by TAG and TAC on preventing the spread of Covid
8 amongst the elderly, particularly those in care homes?
9 A. Well, TAG would have a care home group which worked with
10 the SAGE care home groups for very -- mostly, that's not
11 something I was involved with. In terms of modelling,
12 it is -- it is something that was not part of -- most,
13 I think, almost all the models didn't model care homes
14 explicitly. So they were not -- they were not tools
15 that were well developed for that question. You can
16 look at the questions of reducing contact in elderly and
17 how much that would improve matters, but that's --
18 that's not much help if you really don't know what's
19 going on on the ground.
20 So I think that that is a -- not so much of
21 a modelling question, more of a disease management on
22 the ground type of question. And if we understood that
23 much better, then perhaps it could feed back to the
24 models, but it's not something we were involved with at
25 all.

1 **MR POOLE:** Professor, thank you. Those are all my
2 questions, but there are some questions from behind me.
3 **LADY HALLETT:** Ms Heaven.
4 **Questions from MS HEAVEN**
5 **MS HEAVEN:** My Lady.
6 Good afternoon, Professor Gravenor, just a few short
7 questions. I represent the Covid-19 Bereaved Families
8 for Justice Cymru.
9 I want to start by asking you -- so, sorry, it's
10 back to the firebreak, please. So this is a comment
11 that was made to the Inquiry in the witness statement of
12 Andrew Nelson -- I don't know if you know who he is or
13 was at the time -- chief executive information officer
14 at Cym Taf Morgannwg University Health Board. Just so
15 that we can be clear, part of his role in the pandemic
16 was to model the impact of Covid on hospital flows,
17 resources and healthcare systems.
18 I think you nodded when I asked you if you knew who
19 he was; is that correct?
20 **A.** Yes, Andrew was a very valuable member of the modelling
21 subgroup, TAG.
22 **Q.** So he says this at paragraph 250, my Lady:
23 "In regard to the firebreak, it is apparent from
24 emails and files [which he attaches, I'm not going to
25 show them to you because we don't have time] that I and



1 others raised concerns that the two-week period was
2 going to prove insufficient to allow Wales to avoid
3 a pre-Christmas lockdown and that it would not reduce
4 the prevalence of Covid to a level in line with the
5 Swansea University model for Q3/4 2020/21 which had
6 formed the basis of Welsh Government's planning guidance
7 to the NHS at that time."
8 So we obviously know -- and we can see the email
9 that you received from Rob Orford on that Sunday evening
10 on 11 October requesting you to look at the two to
11 three-week period.
12 So my question is this: were you then made aware of
13 these concerns that were being raised, we know it was on
14 16 October, by Andrew Nelson?
15 **A.** I don't recall that, no, I don't recall that being
16 a major discussion. We were very -- I think it could
17 well be something that would have been commented on,
18 that when the announcement came that it was going to be
19 about two weeks, I think several people would have
20 perhaps made the comments that they would like it to be
21 longer. I don't remember it being a major point of
22 discussion within our modelling group.
23 **Q.** Well, I can't take you to any emails to show that you
24 were aware, so I'll move on from that point.
25 He also says this:



1 "With the benefit of hindsight, the modelling group
2 maybe should have done more analysis of extending the
3 autumn firebreak until the majority of the most
4 vulnerable JCVI groups had been vaccinated."
5 And he says 80% of the groups had received their
6 first vaccination by 16 February, and he says "as this
7 may have reduced fatality".
8 So before I ask you for your comment on this
9 statement, just so that we can understand your evidence
10 just a moment ago on this issue, you said that if there
11 had been a longer firebreak this would mean very low
12 prevalence into December, you said four weeks would push
13 deep into December, and you say in your statement -- and
14 indeed you've said it today -- that this would have
15 meant that Wales would have faced the period of high
16 winter transmission plus the emergence of the Alpha
17 variant from a starting point of much lower community
18 prevalence than it had to face in December 2020.
19 So that's your evidence.
20 Now, just before I ask you to comment on the
21 vulnerable groups and the vaccine roll-out, presumably
22 the Welsh Government knew at the time, in October 2020
23 and before the firebreak, what you've just said today
24 because, as you confirmed, you had modelled a four-week
25 firebreak and presumably you'd fed the results back into



1 the Welsh Government; is that correct?
2 **A.** Sorry, I described that in a little bit of detail.
3 I wasn't asked specifically to model for that. We set
4 up the model to contain firebreaks of any duration.
5 **Q.** Yes. But you say in your witness statement that you
6 modelled two to four weeks.
7 **A.** Yes.
8 **Q.** That's what you say in your statement. So presumably
9 you fed the results of a four-week firebreak back into
10 the Welsh Government?
11 **A.** It would have been discussed at some point, at some
12 point perhaps at the policy modelling group, but --
13 **Q.** So if you --
14 **A.** -- I can't point you to the exact --
15 **Q.** No.
16 **A.** -- exact time. As I say, those scenarios are not
17 directly comparable to the commissioned two/three-week
18 ones because they had specific dates and specific
19 scenarios round school.
20 So the point being we considered a range of
21 firebreaks and then, by then, it was narrowed down to
22 two to three weeks.
23 **Q.** Okay. But if three weeks buys a three to five-week
24 delay, does it follow that four weeks buys a four to
25 six-week delay?

1 **A.** So I would say three weeks buys a five to seven-week
2 delay.
3 **Q.** Okay, so what does four weeks buy?
4 **A.** Seven to nine.
5 **Q.** Okay. And the Welsh Government knew that, did they?
6 **A.** I wouldn't say that they knew that, that was not in the
7 report. So the report for the five to seven weeks and
8 the three to five weeks was in the report that went in
9 for the two to three-week firebreaks. That did not
10 include the four-week firebreaks.
11 **Q.** Why not?
12 **A.** Because that was the report requested at that specific
13 time for the two to three-week firebreaks. It didn't
14 reflect previous work, it reflected the questions that
15 we were asked at that point in time, and we have to be
16 very focused on those --
17 **Q.** Okay.
18 **A.** -- and all the scenarios -- there are, as I mentioned,
19 there are lots of scenarios around those, not -- that
20 don't just involve the time of the firebreak.
21 **Q.** Okay.
22 **A.** So once we were asked to do two and three weeks, we
23 focus on that.
24 **Q.** We don't want to take an unfair point against the Welsh
25 Government; they didn't know about your results for the



1 four-week modelling?
2 **A.** No, but I think we would -- we would all know that we
3 have the evidence from a two-week firebreak in terms of
4 how much of an effect it has, and the three-week
5 firebreak --
6 **Q.** Yes.
7 **A.** -- the extrapolation to a four-week firebreak is --
8 **Q.** Common sense?
9 **A.** It's common sense.
10 **Q.** Okay.
11 So let me move on to the question, then, on the
12 vulnerable groups and the roll-outs. You said you
13 modelled many scenarios. We can't see any evidence in
14 the disclosure or in your witness statement to suggest
15 that in autumn 2020 your modelling team was asked to or
16 indeed modelled various scenarios relating to
17 an extended lockdown -- so this is the Andrew Nelson
18 point -- beyond four weeks, factoring in things like the
19 proposed timing of the vaccine roll-out to vulnerable
20 groups; and of course we know the vaccine arrived in
21 Wales in December 2020 and I think the roll-out started
22 in the January.
23 So is the Inquiry to understand that you were not
24 asked and hence did not conduct modelling on this issue,
25 so extended lockdown, linked to timing of vaccine



1 roll-out?
2 **A.** Extended firebreak?
3 **Q.** Yes, firebreak, thank you.
4 **A.** No.
5 **Q.** No. So you were not asked and you didn't model it?
6 **A.** I guess other than the four-week, no.
7 **Q.** No. Okay.
8 Very finally, if I may, my Lady, 22 December 2021,
9 First Minister for Wales, Mark Drakeford, announced
10 restrictions that would come into force on Boxing Day,
11 and this was obviously in response to Omicron. It
12 includes, as I'm sure you remember, the rule of six,
13 meeting in pubs and restaurants, cinemas, face coverings
14 in restaurants but they could be taken off when you were
15 sitting down, outdoor events limited to 50 with 30
16 indoors but no restrictions for smaller meetings in
17 private homes.
18 So it's just a very short question: were you asked
19 to model these range of proposals that were announced on
20 22 December and, if not, do you accept you should have
21 been asked?
22 **A.** 22 December ...?
23 **Q.** 2021.
24 **A.** Erm --
25 **Q.** So it's the rule of six again.



1 **A.** So in 2021, at exactly that time, we modelled a lot of
2 scenarios for Omicron. At that point I think we were
3 largely modelling the range of scenarios that reflected
4 the uncertainty regarding the severity of Omicron. So
5 we'd had a very limited number of -- a very limited
6 amount of data on the hospitalisations and deaths which
7 indicated the levels of severity. So we had to run sets
8 of scenarios that were all consistent with that and then
9 see what was happening next.
10 So I think -- as I remember, we didn't -- we
11 certainly didn't, in answer to your question, model
12 those very, very specific interventions because we never
13 do.
14 **Q.** Okay.
15 **A.** It is more the broader reductions in transmission that
16 are accompanied by those interventions, and we certainly
17 modelled lots of scenarios of Tier 1, Tier 2, Tier 3 --
18 **Q.** Okay.
19 **A.** -- type interventions in the period from December and
20 going into January with Omicron, as we gradually learnt
21 more about its severity. But quite a lot of scenarios
22 then, yes.
23 **MS HEAVEN:** Well, thank you very much, those are my
24 questions.
25 Thank you, my Lady.

1 **LADY HALLETT:** Thank you, Ms Heaven.
2 I think that completes the evidence for this week.
3 **MR POOLE:** My Lady, it does.
4 **LADY HALLETT:** Thank you very much, Professor, and if by the
5 sounds of it you had to fulfil your other full-time
6 commitments as well as doing this work, please accept my
7 gratitude, I'm sure the gratitude of people of Wales, to
8 you and to your colleagues.
9 **THE WITNESS:** Croeso.
10 **(The witness withdrew)**
11 **LADY HALLETT:** Thank you. 10 o'clock Monday, please.
12 **(4.05 pm)**
13 **(The hearing adjourned until 10 am**
14 **on Monday, 4 March 2024)**
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