

Witness Name: **Dr Robert L Orford**

Statement No. M2B-WG-RO-01

Exhibits: **120**

Dated: 19th December 2023

UK COVID-19 INQUIRY

WITNESS STATEMENT OF DR ROBERT L. ORFORD

I, Robert L. Orford will say as follows: -

Background and Role and Science Advice

1. I give this statement in response to the request made to me on 10 July 2023 pursuant to Rule 9 of the Inquiry Rules 2006 – M2B/WG/RO/01.
2. There is considerable overlap in the questions posed in this rule 9 request with those of M2B-TAG-01 and M2B-TAC-01, as well as M1-ORFORD-01; all of which I authored or co-authored. Where there is overlap or duplication, I have crossed referenced the paragraphs, exhibits or annexes in the relevant statements by way of footnotes to avoid interruption to the flow of the narrative. If there are matters best addressed by others, I have referred the Inquiry to those individuals in the body of this statement.
3. I have an Honours degree and PhD in Molecular Biology, completing a post-doctoral fellowship with the Imperial Cancer Research Fund / Cancer Research UK (three years) and working as an Investigator Scientist with Medical Research Council at the National Institute of Medical Research (five years). For eight years I worked for the Health Protection Agency (HPA) (latterly Public Health England (PHE)) as a Health Protection Scientist, Principal Scientist and Group Leader. I am

a visiting professor of evidence-based health policy at the University of South Wales. My CV is exhibited in my previous statement¹.

4. In the HPA/PHE I worked on developing a system for dealing with cross border chemical health threats through several EU co-funded programmes; in support of Decision EU/1082/2013 on Serious Cross Border Threats to Health. During my time with the HPA I worked on the 2009 swine flu response in the National Emergency Coordination Centre. As part of the EU programmes I worked with many EU countries and international organisations (European Centre for Disease Control (ECDC)/ World Health Organization (WHO)) on emergency preparedness and response. I was a working group member of the EU Scientific Advisory Group for Health and Emerging Environmental Risks (SCHEER). In my work on cross border threats to health I led the development of a rapid risk assessment protocol, hazard statements, network of experts and protocols to provide rapid scientific and clinical advice on chemical emergencies. The methodology was used several times to deal with emerging cross border events and borrowed from similar methodologies for communicable diseases².
5. My module one statement³, and exhibits therein⁴, lays out my roles and responsibilities within Welsh Government prior to the pandemic. Several questions in this Rule 9 request go to issues regarding the pandemic before I became actively engaged in the science response and as such, they are difficult for me to answer. These questions might be better addressed to those with communicable disease and emergency response duties within the Welsh Government during this period.
6. The transition from my pre-pandemic substantive CSAH roles and responsibilities to those covered in this statement, which are principally co-lead of the Technical Advisory Cell (TAC), co-chair of the Technical Advisory Group (TAG) and CSAH are described in the TAC/TAG corporate statement⁵. Exhibits⁶ from my corporate statement provide a description of the Deputy Director level job and person

¹ M2B/TAG/01 [para 6](#), RO/M2B/TAG/01/01-INQ000068496

² M2B/TAG/01 [para 6](#), RO/M2B/TAG/01/01-INQ000068496

³ M1/ORFORD/01 INQ000190665 paras 8-12

⁴ EXHIBIT M1/ORFORD/02-[INQ000187549](#)

⁵ RO/M2B/TAG/01 para 11-14

⁶ EXHIBIT RO/M2B/TAG01/32-[INQ000300213](#)

specification that was agreed by Welsh Government for Fliss Bennee OBE and myself as CSAH for the duration of the period in question.

7. Key responsibilities of my pandemic role, which for the most part was undertaken as a job share, included:

- a) Representing Wales and Welsh Science at the UK Scientific Advisory Group for Emergencies (SAGE), its subgroups and other important four nations expert meetings
- b) Building and Chairing a Welsh group of the leading academics, professionals and advisers for government to ensure that Wales received the most advanced and robustly considered advice on all areas of the epidemic, including risk behaviour and communication, environmental science, testing, surveillance, vulnerability, modelling, epidemiology, genetic sequencing, innovations in health care devices and socio-economic harms.
- c) Developing an extensive intelligence function, including modelling forecasts for NHS Wales, Local Resilience Forums and Strategic Coordination Groups, dashboards of circuit breakers, daily information and collation of local, national and international information on the pandemic and the disease;
- d) Delivering regular technical briefings to external stakeholders (e.g. Welsh Local Government Leaders, Head teachers, Teaching Unions) to inform discussion, advice about SAGE outputs for policy officials and responds to request from policy officials on specific technical areas (e.g. testing, schools and children);
- e) Coordinating a portfolio of Government business for Covid-19 advice, responding to questions from Senedd Members, media enquiries and the public as well as appearing before select committees and the Public Inquiry;
- f) Chairing COVID Intelligence Cell (CIC), member of Health Protection Advisory Group Outbreak Subgroup (HPAG-OSG);
- g) Supporting engagement with UK and international partners and academic representative organisations on research and modelling issues,

leveraging Welsh expertise to strengthen international relations and ensuring Welsh participation in UK and international Covid-19 research;

- h) Leading work to prepare and deliver the First Minister's weekly briefings, coordinating work through the division and wider groups to assure strong, scientifically robust evidence bases for all plans;
- i) Leading work to maintain and develop the standby capability for Technical and Scientific advice in the event of further Covid-19 waves, as exemplified by SAGE; and
- j) Leading work to ensure that external communications and engagement on TAG work, including with parliament and on issues of public scrutiny, are beyond reproach (e.g. by adhering to NOLAN principles of public life and ethical code for scientists).

8. During the pandemic I reported to the Director General for Health and Social Services with TAC overseen by an Oversight Board, the terms of reference for which are exhibited in **M2B/WG/RO/01-INQ000068498**. My role had direct line management responsibility for four senior staff, with overall responsibility for around 30 staff within TAC.

- Head of Corporate and Business Governance (TAC) **NR**
Name Redacted
- Chief Policy Modeller (COVID-19) Dr Brendan Collins
- Head of Advanced Analytics, Intelligence and Modelling (COVID-19)
Craig Solomon MBE
- Head of Behavioural Science and Risk Communication (COVID-19) **NR**
Name Redacted

9. The role had a financial management and oversight of an operational research budget of circa (£7M), with much of the budget allocated to wastewater surveillance (for which I was Senior Responsible Officer), behavioural science and policy modelling.

10. In the role share with Fliss Bennet OBE it was made clear that one of the post holders had to be the Chief Scientific Adviser for Health. As the role share was Deputy Director level, I did not regularly attend Health and Social Services

Executive Directors Team (EDT) meetings, however briefings were provided to the group. From June 2021 onwards, either I or Fliss attended EDT Contingencies Group meetings.

11. During the beginning of March 2020, I was also responsible for leading the development and implementation of the first Welsh Covid testing plan.
12. As described in my module one statement⁷, prior to the pandemic, in my substantive role as CSAH, I did not advise on emergency health planning or pandemic preparedness. My role was not part of the preparedness structures. It would have been advantageous if I had a role in emergency science response prior to the pandemic as it would have been much better to have had in place a well formulated and regularly tested national emergency science coordination function in Wales with agreed protocols, terms of reference, roles and responsibilities, procurement arrangements, staff deployment and rotations prior to the pandemic. Whilst this has not yet been fully realised by the Welsh Government, I hope that the formation of Science Evidence Advice Division (SEA) that I now lead in the Health and Social Service Group of Welsh Government and the repurposing of the Technical Advisory Group (TAG) affords us a much greater capacity and capability to respond swiftly and purposefully to future events that significantly impact health, well-being and society in Wales.
13. My main role throughout the pandemic related to advising on science. I can only answer questions that fall within the remit of my knowledge and/or on which I can reasonably form an opinion based on evidence personally available to me. Questions that relate to my personal view of policies that I did not advise upon will not fall within the aforementioned scope and are best asked of the academics, politicians, and political commentators involved in those decisions. However, I have answered the questions related to the advice that I gave and my reflections upon that advice to the best of my ability in the time available to me. In respect of the provision of science advice it is important to have in mind underpinning principles, methodologies and considerations – see paragraphs 14 to 23 below.

⁷ M1/ORFORD/01 para 16

Science advice

14. On many occasions throughout this Rule 9 request, I have been asked to provide personal opinions or make judgements on the provision of scientific advice to inform policy formation and decision making in Government. In respect of those requests I would ask the reader to consider the following (which is my overarching view). Policy formation and decision making is complex and requires different considerations such as financial, legal, operational, political and ethical. Science was one component of policy formation and decision making during the pandemic, it was an important component. Science provides a structured way of gathering evidence and creating new knowledge to address problems or answer questions with confidence. It is difficult to prove causality with one study and our understanding often develops as new evidence emerges. Science and science communication is important and should seek to find balance describing knowns and uncertainties, allowing room for challenge. In science, confidence is gained when the results of multiple different types of studies from different groups, support the same theory or hypothesis (e.g. face coverings reduce transmission of virus). Most often in science there is not one 'Eureka' moment instead there is a slow and systematic buildup of evidence to support a theory or hypothesis, that in turn becomes a fact or law. Some types of studies like randomized controlled trials lend themselves to some interventions (like vaccines) and less well to others (like face coverings) making it difficult to assign causality or demonstrate impact for some, as exhibited in **M2B/WG/RO/02-INQ000353582**. In stating confidence in scientific evidence, the use of 'low', 'medium or moderate' and 'high' helps add meaning to science advice. For example, 'low confidence' would suggest that there is some evidence to support a position, but it is questionable or liable to change and that more research or analysis is required. Moderate confidence would suggest there is some evidence, possibly from different sources. High confidence would suggest that there are multiple high quality sources of evidence – but it is not yet fact. These statements were often used in SAGE, TAG, TAC or my advice. Similarly, the probabilistic yardstick⁸ was used by SAGE and TAC to be more specific (or less woolly) about the likelihood or confidence of a statement e.g. 'highly likely' means that in ten futures, the event might happen in eight of them. Whilst highly unlikely

⁸ M2B/TAG/01 [para 130](#)

means that in only two out of ten futures the event might occur. Science should be used in policy formation and decision making.

Overview of Relationship with the Welsh Government and Key Individuals/ Groups

15. As stated earlier, my role as Chief Scientific Adviser for Health meant that the responsibility for the science advice provided to the Welsh Government and Welsh Ministers about the pandemic was mine. However, largely the advice offered was a consensus of a group, either TAC, TAG or SAGE. In some points in the statement I use 'we' when making statements, even though the advice is still mine and my responsibility. In referring to SAGE, TAC or TAG advice it means I agreed with that advice when it was given.
16. The CSA(H) advice that I provided and the interaction between TAC/TAG and other pandemic advisory bodies is primarily covered in my corporate statement. However, certain matters are worth emphasizing.
17. In the Welsh Government there was a very clear delineation between elected ministers who make decisions and civil servants who formulate and develop policy. For some advisers like myself or CMO, we have other organisational responsibilities (e.g. as head of profession) or policy responsibilities (e.g. diagnostics). During the pandemic I chiefly wore my 'adviser' hat.
18. In that regard, I believe that my advice to ministers, officials, stakeholders and the public was clear, timely and coherent during the pandemic. I provided emerging information and evidence as swiftly as possible, there was very little delay in sharing emerging scientific information and understanding with key officials and ministers, however others are best placed to inform the Inquiry about this. In my experience science communication, which extends to communication with children and young people, is only unclear if you do not understand the science you are delivering or you haven't thought enough about your audience. I hope that I was able to do both – again others are best placed to advise the Inquiry. I admit that I did not like giving media interviews, however it was a necessity of the job, which I did without hesitation.

19. Throughout the pandemic I worked closely with the Chief Medical Officer (CMO), ensuring he was briefed and aware of emerging evidence and scientific developments. TAC/TAG advice was deliberately published separately from CMO advice as this afforded us the opportunity to provide independent science advice. As it was, CMO advice and TAG/TAC advice did not conflict. We were aware that CMO had primacy as lead health adviser, and often TAC/TAG advice added another level of detail or wider range of advice that sat below higher level CMO advice. An example of this is exhibited in **M2B/WG/RO/03-INQ000048757**. I am very grateful for the collegiality and support of CMO throughout the pandemic. Furthermore, the Deputy Chief Medical Officer (DCMO), Prof Chris Jones, was a member of TAG and in the absence of the CMO I met with Prof Chris Jones to discuss emerging matters. He often contributed to science discussions within TAG or provided comments to papers.
20. In contrast to my work with the CMO, I did not work closely with the Chief Scientific Advisor for Wales (CSA(W)) on the pandemic response, as it was agreed I would lead from a science perspective. I am grateful to the CSA(W) for providing scientists from his group to support TAC in the scientific response in Wales. Dr Robert Hoyle (TAC international intelligence lead) and Name Redacted (TAC virology and testing lead) from the Welsh Government Office for Science both provided an outstanding contribution to the group. I met with CSA(W) monthly to reflect on matters and discuss the wider context of the pandemic. There were no governance arrangements in place between the CSA(W) or the Chief Scientific Advisor for Health (CSAH), and this is still the case. I also see no correspondence between the CSAs in other Departments which I have mentioned previously.
21. I also worked closely with colleagues from Public Health Wales (PHW) throughout the pandemic period. The support that I received from the Chief Executive (Dr Tracey Coper) and throughout the organisation was very positive with significant input, challenge, and feedback from the experts within PHW - for which I am very grateful.
22. I was not a member of a WhatsApp group, Messenger group or other social media platforms that discussed Covid policies or decisions with Ministers, SpAds or senior

officials. Sometimes, others would contact me and my colleagues through WhatsApp. These WhatsApp groups were usually of short duration to deal with a particular issue, for example, a request for a meeting, for information or to prepare briefing. I understand that copies of these kinds of messages have been disclosed to the Inquiry by others. I did correspond with Fliss Bennee by WhatsApp as part of our role share and checking in with each other. This thread has been shared with the Inquiry by Fliss Bennee and, after our role share ended, I deleted the thread. As I have explained in my M2B corporate statement⁹ we used Microsoft Teams to communicate as a dispersed group with different groups serving different purposes (Shield, contained emerging science or situational information; Avengers, contained wellbeing and social information; TVA was a senior management group; Hydra was administrative coordination) other group channels included 'notes from meetings' where emerging information from notable meetings was shared with the group 'TAC brief' for preparing the weekly advice notes and 'Learning and Development' which is self-explanatory.

23. The structures of pandemic governance groups are described elsewhere in the Welsh Government Inquiry responses, and I will not repeat that here. The form and function of TAC and TAG are largely addressed in my corporate statement¹⁰.

24. TAC or TAG communication with the Welsh Government officials and ministers is covered in my corporate statement¹¹. The role of myself and my group was to provide timely and robust scientific and technical advice, and intelligence, to support policy formation and decision making; with decision making remaining the role of Welsh Ministers¹². As new coordination or support groups were established so too were Terms of Reference created, which were revisited and revised periodically¹³.

⁹ M2B-TAG-01 [para 239](#)

¹⁰ M2B/TAG/01 [paras 38-66](#)

¹¹ M2B/TAG/01 [paras 93-97](#)

¹² M2B-TAG-01 [paras 218- 229](#)

¹³ M2B/TAG/01 [paras 4-5, 50-54](#)

25. My module 2B corporate statement lists¹⁴ the meetings that I regularly attended. I also attended: TAG subgroup meetings (not all), HPAG OSG, Covid Intelligence Group (depending on situation), Covid Intelligence Cell (co-chair), NHS Planning Group (with other TAC members), Joint Biosecurity Centre Technical Board, TAC/TAG steering group, and various stakeholder groups, for briefings. Fliss Bennee OBE and I often alternated between meetings with one chairing or attending more operational meetings (such as chairing the Covid Intelligence Cell) and the other chairing or attending more science focused groups (e.g. Virology and Testing Advisory Subgroup (VTAG)). We would discuss the outputs of these meetings and agree key messages to promulgate as co-leads of TAC and we would also discuss the key messages with TAC members in our regular group meetings so that we had a shared understanding of the current situation. Due to significant numbers of meetings that we were asked to join it was important to delegate attendance to other members of the group, also this provided more visibility for those leading analytical work (e.g. in presenting their findings to more senior colleagues)¹⁵.

26. Each TAG subgroup was assigned a TAC lead and secretariat support. The TAC lead attending each subgroup meeting acted as either chair or facilitator. The TAC lead would also attend other relevant four nation meetings, where appropriate e.g. the TAC lead for Education and Children would attend the TAG subgroup for Children and Education, education stakeholder meetings, SAGE subgroup on children and education (as an observer), TAG chairs group and TAG meetings. This networked approach ensured that within TAC we had shared awareness of emerging issues or information across a range of Covid-19 related areas. TAG subgroups fed into the advice of TAG with TAC leads supporting this process.

27. If either myself or a TAC member were presenting to a stakeholder group (e.g. policy modelling or a situational report) we would share slides and key points with the TAC group ahead of that meeting. Similarly key points from important meetings were shared. Much of this information sharing was done using Microsoft Teams

¹⁴ M2B-TAG-01, [paras 7, 8, 15, 58, 69, 74](#), and Annex C [INQ000310242](#), [INQ000320912](#), [INQ000376540](#), [INQ000309858](#), [INQ000386847](#) and [INQ000321058](#)

¹⁵ Para 242 M2B/TAG/01

group chat or in team meetings¹⁶. However, any key findings or important points were published as part of our TAC, or TAG, advice. Throughout this period there was a strong sense of group identity and shared learning in TAC, which was beneficial. It is important to stress that my group was a multidisciplinary team with people leading on different areas, but always seeking a consensus view of TAC or TAG for our advice for which I, as CSAH, was ultimately responsible.

28. It is also important to recognise that there was a great deal of cross-group working and collaboration throughout the pandemic period between civil servants and stakeholders both within Wales and the UK.

29. Fliss Bennee and I also discussed the balance of representation on TAG at several junctures and whilst we are confident that there was representation from different disciplines, public health, academic and clinical professions, ethnic groups and backgrounds, this was not done in a structured or systematic way and was not recorded as such. Fliss and I also ensured that no particular discipline or subgroup had too weighty an influence on considerations, which I believe is reflected in the broad range of science advice provided.

30. A key pillar in establishing TAC and TAG was the secretariat function, which was as important as the science functions, I knew from experience that document management and record keeping was essential both to produce rapid advice, but also for any subsequent Inquiry and demonstrating adherence to the NOLAN principles of public life and the universal ethical code for scientists. Whilst resourcing all posts (administrative and analytical) to the level that was required was not possible, we endeavoured to capture all significant discussions and decisions within the Welsh Government filing system (ishare). Desk instructions were in place within TAC to ensure the correct procedures were followed (e.g. distribution of key papers, new members joining of advisory groups)¹⁷.

31. Another area that I was acutely aware of within TAG meetings was how to avoid 'group think'. This is addressed in my corporate statement¹⁸ but extended here in

¹⁶ Para 239 M2B/TAG/01

¹⁷ Annex C M2B-TAG-01- [INQ000414011](#) and [INQ000414014](#)

¹⁸ Para 42 M2B/TAG/01

terms of my personal views. In TAG, I felt that it was important to have diversity of opinion and ensure members had the opportunity to express their views openly and candidly. By circulating papers outside of the meeting, even though often at short notice, this created a peer review forum where contrasting opinions could be brought into the TAG forum. From the outset I made it clear that members attended as independent experts, rather than representatives of their employing organisation. There was no overt hierarchy of opinion or seniority (e.g. no one profession or professional outranked others) in the group – this took careful chairing to avoid and maintain balance. Fostering trust was important, with both Fliss and I ensuring that there was a positive environment where different opinions could be voiced, discussed and challenged. Consensus of opinion was sought to ensure there was an agreed position on papers. If consensus could not be found (e.g. in first face coverings advice paper which is exhibited at **M2B/WG/RO/04-INQ000320896**) then this was included in the advice. Science debate should be robust and afford the opportunity to challenge thinking and the interpretation of evidence. I consider it a considerable privilege to have had the opportunity to co-chair the group and be privy to the wide range of scientific discourse and debate from the members.

32. I also tried to ensure that there was sufficient 'challenge' to scientific advice by providing an inclusive scientific forum whereby policy colleagues could observe scientific debate related to their policy areas in order to encourage a two-way conversation between 'science' and 'policy'. Two factors that were a challenge that invariably impacted on 'science' or 'policy' interface was time and volume, with science and policy papers being written very quickly and the pipeline for papers continuous; which is different to usual business of government where policies are developed over months rather than hours. We have addressed this in our new structure by introducing a Science-Policy Interface (SPI) role to act as go-between and convenor of commissions, during the pandemic this role was undertaken by our TAC subgroup leads. Other areas for improvement are described further in the Lessons Learnt section below including the need to improve science literacy in Government. This has been commented on by Sir Patrick Vallance (former GCSA) in his review of UKG science capacity and capability which is exhibited in **M2B/WG/RO/05-INQ000350786**.

33. In the Welsh Government Health and Social Services Group (HSSG) a separate policy forum exists that enables debate and discussion on new policies, I am unsighted as to whether other parts of Welsh Government have similar fora, where more rounded policy discussions, that consider the wider set of policy components, are held. The Policy Forum in HSSG is an example of good practice from policy formation and has been helpful in exploring and landing our more recent Science Evidence Advice (SEA) papers. This is exhibited in **M2B/WG/RO/06-INQ000353571**.
34. I was mindful that TAG advice should not be too heavily influenced by one scientific discipline or organisation, which is evidenced in the first 'Preparing for a Challenging Winter 20/21 paper', which is exhibited at **M2B/WG/RO/07-INQ000350159**, and subsequent formation of nine TAG subgroups. I believe the TAG minutes and subsequent published advice show that a broad range of considerations were covered and presented.
35. The TAG and subgroup minutes reflect the discourse of the meetings and actions arising¹⁹. The minutes of TAG meetings or its subgroups are not perfect, partly because of the high demand on secretariat members, also because most, if not all note takers had not received specialist emergency response loggist or rapporteur training prior to the pandemic. If we had had more time and resources the minutes could have been formatted appropriately and published, as was done by SAGE, which is commendable and something that should be done in any future pandemic to aid transparency. I cannot thank my colleagues highly enough, who listened in and minuted abstruse and fast-moving technical meetings as accurately as they did. I have been in this position earlier in my career and I know how difficult it is.
36. Many of the professionals co-opted onto TAG and sub-groups gave their time voluntarily. I do not know what impact the voluntary nature of the work had on our ability to respond. I do not feel that people were reluctant to volunteer their time and energy to support the response, however perhaps this question should be asked of TAG or TAG subgroup members. In future the review of TAG should include

¹⁹ M2B/TAG/01 Annex C [INQ000338625](#), [INQ000221208](#), [INQ000222543](#) and [INQ000310242](#)

consideration of remuneration and expenses in line with the UKG Code of Practice for Scientific Committees.

Collaboration and communication

37. Throughout the Pandemic I am aware that there was significant communication between key decision makers in Wales with regional and local authorities and from my perspective, in terms of what I required, that was largely good. How effective the communication was with others involved in the response between England and Wales, is impossible for me to answer and is best asked of them.
38. I had limited communication with the GCSA Sir Patrick Vallance and CSA(H) Sir Chris Whitty outside of the forum of SAGE. However, As documented in M2B/TAG/01 I met regularly with my devolved counterparts Prof Ian Young (CSAH Northern Ireland) and Prof David Crossman (CSAH Scotland) and I am most grateful for their collegiality and support during the pandemic. My corporate statement²⁰ also documents the four nation science coordination forums that were established during the pandemic, and I exhibit my email advocating that approach in **M2B/WG/RO/08-INQ000349205**.
39. Since the pandemic, the contact between CSAHs has improved with now monthly discussion between CSAH from the Department for Health and Social Care, the Scottish Government, the Northern Ireland Administration, the Welsh Government, UK Health Security Agency (UKHSA), NHS England, the Medicines and Healthcare Products Regulatory Agency (MHRA), and Genomics England.
40. I have made my view clear on the devolved CSAH involvement in the CSA Network and lack of equity between UKG Departmental CSAs and CSAH in the devolved governments²¹. From Module One evidence provided, it is evident that my view, and those of my devolved counterparts, is not one shared by the GCSA.

²⁰ M2B/TAG/01 paras [68-70](#)

²¹ M2B/TAG/01 paras [257-259](#)

41. SAGE tended to only be interested in the actions of the Welsh Government when there were differences in policy approaches (e.g. Welsh Firebreak or differences in local interventions e.g. in Autumn 2020). Unfortunately, it appeared as though the devolved nations were a second order priority.
42. Throughout the pandemic as well as SAGE and TAG, myself and my group sought any evidence available. For example, we routinely monitored Twitter and open-source media for new information and intelligence. Similarly, we monitored pre-print databases for emerging scientific findings and shared relevant papers in our internal briefing documents. As a group we also monitored outputs from Independent SAGE and the Science Media Centre.
43. There was a clear protocol on engaging with media outlets during the pandemic with Comms leading on engagement. I shared our understanding of emerging science or technical themes related to the pandemic with different media outlets throughout the pandemic through both short and long form interviews with TV and radio.
44. We published as much of our advice as we could, particularly so from May 2020 onwards. With regard to improving science communication during pandemics I agree with the conclusions of the Science Media Centre review of the Covid-19 response, which is exhibited at **M2B/WG/RO/09-INQ000353459**.

Commissioning of TAG and TAC advice.

45. Commissioning of TAG papers is covered in my corporate statement²² and below in further detail.
46. TAC provided advice to support decision making by Welsh Ministers on potential changes to the COVID-19 restrictions protective measures in Wales. Prior to the development of an official commissioning process, pieces of advice were based on the outcome of our discussions with Ministers and policy officials about which protective measures were being considered for the next review and the advice that was needed to support decision making.

²² Paras 125-129 M2B-TAG-01

47. Once introduced, the commissioning process aimed to provide clarity around the request being made and the timelines for our response. Our response to this commission was known as our '21-day review advice' and each piece of advice paper included a summary of the latest intelligence and surveillance data on COVID-19 (similar to the TAC summary) plus any evidence to support and inform decision making around the protective measures and restrictions being considered at that particular review cycle²³. The first officially commissioned advice paper related to the 1 April 2021 review cycle was logged on 23 March 2021 and is exhibited at **M2B/WG/RO/10-INQ000350788**. The 21-day review advice was generally commissioned in week one of the three, with our response requested by the Thursday of week two and submitted to the Welsh Government Ministers via a Cabinet paper for discussion on the Monday of week three. The amendments to the protective measures were announced on the Friday of week three and our 21-day review advice paper was published either on or as soon as possible after this day.

48. Once the outline request had been received from policy officials and/or Ministers, we would arrange a meeting of TAC members to consider the request and agree leads for each section and discuss initial thoughts around the evidence available. Due to the tight turnaround (usually a week or less to respond) we would have daily catch ups, mainly via Teams, to discuss progress and identify any blockers.

49. On occasion the commission would be dated midway through the cycle following further discussion between policy teams and Ministers which shortened our response period. Where timings permitted, we would table the advice paper to the Friday TAG meeting for peer review by the group, having shared a draft of the advice the previous day; these advice papers were badged as TAG papers and published as such. Those 21-day review papers where TAG was not consulted on the final draft, were badged as 'Advice from the TAC and Chief Scientific Adviser for Health'. However, it is important to note that even in these instances TAC leads would often reach out to their TAG subgroups for input into the advice if timings permitted. In both circumstances the final 21-day review advice paper was signed

²³ Annex C M2B/TAG/01 [INQ000313450](#), [INQ000221208](#), [INQ000312191](#) and [INQ000312147](#)

off by one of us in our role as co-lead of TAC or co-chair of TAG as appropriate. The advice paper in full was always attached to the relevant Cabinet paper and MA to support Ministerial decision making. We separately sought permission to publish from the Minister for Health and Social Services by email, which is exhibited in **M2B/WG/RO/11-INQ000353326**.

50. Each commission was managed by the relevant TAC lead with reference to their TAG subgroup as appropriate, with peer review by the main TAG as previously described. During the period April 2021 to May 2022, we responded to over 70 direct commissions for scientific and technological advice from colleagues across Welsh Government and Ministers. Many of these requests related to the re-opening of society and business in Wales from full lockdown at the beginning of 2021. Others were more specific to inform particular policy questions: these ranged from advice on weddings, ozone generators and face coverings; to more complex issues around the vaccine roll-out, key behavioural considerations for effective communications, effectiveness and impact of nonpharmaceutical interventions, updates to the Coronavirus Control Plan indicators and thresholds, retrospective analysis of modelled data compared to actuals, and a review of the impact of protective measures used during the course of the pandemic by Welsh Government.

51. As above and in my corporate statement I can demonstrate that the commissioning process was iterated over time to ensure robustness. However, it is important to stress that the volume of commissions, short turnaround time and limited capacity to process commissions presented a near constant challenge throughout the pandemic. The commissions were driven by need e.g. the need to introduce or relax population protective measures in order to reduce harms arising from Covid-19. Some questions were invariably complex and difficult to answer purely from an 'available evidence' base, an example of which is exhibited at **M2B/WG/RO/12-INQ000353252**. We endeavoured to answer questions through a science lens and provided context on what the current situation was, or likely to be, when we answered questions.

52. Whilst my advice was often incorporated in reviews of Covid-19 restrictions via Ministerial Advice, sometimes particularly in the first and second wave, the public

health advice from CMO made reference to the advice of TAC, TAG and SAGE rather than bespoke science advice being commissioned, provided, and published. Sometimes TAC was consulted on draft advice papers or asked for comment rather than providing separate analysis or advice. Given that the CMO was the professional lead for the Covid-19 response this was appropriate. The provision of additional review cycle advice from TAG, from the end of April 2021, ensured that a more detailed and perhaps broader set of evidence and advice was provided to Ministers.

Behavioural Science

53. Prior to the formation of TAG in 2020, the Welsh Government had access to behavioural science advice via the Scientific Pandemic Insights Group on Behaviour (SPI-B). On the 13 February 2020, when the Welsh Government first attended SAGE, the minutes from the meeting summarised the available evidence on public response during a pandemic, with an action to establish SPI-B to provide behavioural science advice. Experts attending SPI-B were drawn from a range of academic disciplines and institutions, chaired initially by Dr James Rubin (Kings College London), with Professor Ann John (Swansea University) and Professor Brooke Rogers (Kings College London) later taking on the chairing duties. The group held weekly meetings until February 2021, moving to a fortnightly schedule until spring 2021.

54. At the beginning of the pandemic there was a great deal of uncertainty as to how the population would react e.g. whether there would have been civil unrest, or disruption due to panic buying, whether the population had agency to maintain protective behaviours or would comply with Government instructions. As highlighted in my corporate statement this is why it was so very important to have the support of behavioural scientists. As it was, Wales benefitted, in terms of pandemic health impacts, from a high degree of support from the public who were willing to forgo their freedoms, earning potential, social and family contact in order to protect more vulnerable members of society. Even between European countries, there were differences in compliance with pandemic rules compared to the UK, both positively and negatively, evidence of which is provided in a paper exhibited at **M2B/WG/RO/13-INQ000353577**.

55. Throughout this period rapid, evidence-informed, advice was provided on a wide range of issues including: adherence to, and the easing of, protective measures; local interventions; reducing transmission within and between households; threats to public disorder and policing challenges; reopening of large events; insights on celebrations and observances; and the impact of financial and other support on self-isolation. TAC advice from 1 October 2020 is exhibited at **M2B/WG/RO/14-INQ000066116** by way of example. Consideration of public health communications formed an integral part of this advice. While meeting infrequently between autumn 2021 and spring 2022, the group continued to provide advice (jointly with other SAGE sub-groups as appropriate) on issues including: the maintenance or reintroduction of behavioural measures in autumn 2021, Non-Pharmaceutical Interventions (NPIs) in the context of the winter 2021/22 Omicron wave and social and behavioural impacts associated with removing the remaining protective measures in spring 2022. An example of this advice is provided at **M2B/WG/RO/15-INQ000350433**.

56. Welsh Government officials attended SPI-B meetings, shortly after the group was established, with meetings attended initially by Dr Heather Payne and from 30 June 2020 by **Name Redacted**. Meetings focused on priority issues determined by the stage of the pandemic, with written advice available shortly afterwards, and incorporated into TAC updates or TAG advice. Given the importance of timely decision making, this advice was circulated immediately on receipt on an Official Sensitive basis to Ministers, Special Advisors, communications colleagues, and relevant policy teams. As advice was succinct and included an agreed executive summary, it was circulated informally, without accompanying briefing. Further information was occasionally provided on request. Regular updates on SPI-B's outputs were also disseminated to a wider group of Welsh Government colleagues, including communications teams, via a behavioural science summary (see below). Importantly, SPI-B advice was routinely built into TAC/TAG briefings and from spring 2021 onwards, the advice provided was also used to inform the 21-day reviews of regulations.

57. In June 2020, to add value to the advice being provided by SPI-B and provide further behavioural science capacity, we decided to develop our own source of

expertise to inform the response to the pandemic in Wales. Professor Ann John, Swansea University, was approached to chair this new sub-group of TAG and work took place to identify potential members, with invites being sent out by the chair in early July 2020. The following external members, in addition to the chair, agreed to join the group: Ashley Gould, Public Health Wales (co-chair from June 2021); Professor John Parkinson, Bangor University; Professor Nick Pidgeon, Cardiff University; Dr Jane Waters, University of Wales, Trinity St David; and Jonathan West, Public Health Wales. Given the speed at which decisions needed to be taken, the sub-group needed to have a direct interface with key users of the advice being produced on a real-time basis, so a small number of key Welsh Government staff were also invited onto the sub-group. In the first instance, colleagues from the Welsh Government communications and vaccine policy teams attended (and did so consistently throughout the period in question), while Name Redacted was TAC lead for the sub-group. A representative from the police force and Welsh Government Police Liaison Unit was also invited, given the potential for public disorder.

58. The sub-group, Risk Communication and Behavioural Insights (RCBI), first met on 22nd July 2020, agreeing initial Terms of Reference at the 5 Aug 2020 meeting²⁴. Meetings took place on a weekly basis until September 2021 when they shifted to a fortnightly frequency, recognising the increasing pressure on members' time given routine work commitments. In total, the sub-group met 53 times up to the end of May 2022²⁵. Membership of the group remained stable throughout the period, with just two members standing down due to other work commitments (Dr Jane Waters in January 2021 and Jonathan West in November 2021). The following external members joined the group to provide additional expertise: Professor Adrian Edwards (Cardiff University) in May 2021; and Professor Tony Manstead (Cardiff University) and Dr Kimberley Dienes (Swansea University) in September 2021. From summer 2021, Ashley Gould shared chairing duties with Professor John. Several external academics were also invited to attend RCBI meetings to present and discuss emerging findings from their research²⁶.

²⁴ Annex C M2B/TAG/01- [INQ000066106](#), [INQ000198437](#) and [INQ000313980](#)

²⁵ Annex C M2B/TAG/01- [INQ000314009](#), [INQ000314010](#), [INQ00014102](#) and [INQ000314030](#)

²⁶ Annex C M2B/TAG/01- [INQ000314009](#), [INQ000314010](#), [INQ00014102](#) and [INQ000314030](#)

59. Meeting agendas focused on priority issues raised by sub-group members and/or policy colleagues, with relevant policy colleagues attending to engage in the discussion. For example, at the 13 October 2021 meeting a vaccine policy colleague attended, seeking advice on misinformation and disinformation around the COVID-19 vaccines, including the targeting of schools with anti-vaccine messaging. In addition, there were standing items to provide updates from the most recent SPI-meeting and available population level behavioural data for Wales. Members were also provided with copies of relevant papers, including those from SPI-B, shared securely via Objective Connect. An agenda and minutes, agreed by participants, are available for each meeting²⁷. In addition to the regular meetings, the sub-group also arranged five well attended webinars in 2021, involving sub-group members and invited speakers, many of whom had contributed to SPI-B. The themes covered by the webinars were as follows: using behavioural science to inform policy and practice; public disorder; risk communication; behavioural science frameworks; and community development and mutual aid. While each webinar had a specific theme, the overall aim was to promote the principles of behavioural science to a broader audience in the Welsh Government and beyond. An example slide pack is provided in **M2B/WG/RO/16-INQ000353572**.

60. A further important function of the sub-group was to provide behavioural science advice to Ministers and officials at strategic points in the pandemic through key contributions to TAG papers. A few examples are summarised below to illustrate this work. First, advice was published on 29 October 2020 on behavioural insights to support a post firebreak Wales which is exhibited in **M2B/WG/RO/17-INQ000066117**. The advice set out how behavioural models and tools could be used to better understand individual and group behaviour and develop communications and policy interventions, coproducing and testing these with different user groups. The advice also emphasises the importance of a collective approach, harnessing a sense of civic duty, setting out a series of principles that could allow people to balance risk while living with COVID-19. Further advice was provided (published on 13th August 2021) on sustaining COVID-safe behaviours,

²⁷ Annex C M2B/TAG/01- [INQ000198436](#), [INQ000313974](#), [INQ000313987](#) and [INQ000313980](#)

informing the transition back to alert level 0 in Wales which is exhibited in **M2B/WG/RO/18-INQ000066120**. This advice, organised around six themes, including moving to a sustainable new normal, addressing inequalities and sustaining change, setting out the COVID-Code, highlighting those behaviours that would need to be carried forward into winter 2021 and beyond. The final example is their advice to inform the revised Coronavirus control plan developed for spring 2022, accompanying the gradual removal of protective measures, advice was provided (published 25 March 2022) on living safely with COVID-19 which is exhibited at **M2B/WG/RO/19- INQ000066371**. Building on previously published advice, the report included a series of recommendations, underpinned by three key aims: support and actions necessary as regulations were removed; addressing inequalities created or exacerbated by the pandemic; and longer-term approaches to optimising behaviours in the event of future challenges.

61. The sub-group also contributed behavioural considerations to various TAG papers, including vaccine certification, moral injury in healthcare workers, contact tracing, the safe conduct of Senedd and Police and Crime Commissioner elections, and the use of face masks. These papers are exhibited at **M2B/WG/RO/20-INQ000353587**, **M2B/WG/RO/21-INQ000312124**, **M2B/WG/RO/22-INQ000349906**, **M2B/WG/RO/23-INQ000066328**, and **M2B/WG/RO/24- INQ000228031**. In addition to support from RCBI, timescales frequently meant behavioural science advice was provided directly from TAC, seeking a view from Public Health Wales, where feasible. This advice took various forms, including material for the documents noted elsewhere, including the 21-day reviews of regulations and comments on draft communications materials. TAC also provided support for a key piece of commissioned research (working with policy colleagues in the Protect team), exploring behaviourally informed approaches to encouraging test seeking behaviour and self-isolation and also working with local authorities (as well as a national online experiment of public health messaging), to reduce risk. This is exhibited at **M2B/WG/RO/25-INQ000353579**. Given personnel changes in the policy team, TAC took over the management of this work, including a subsequent extension to learn lessons for future implementation.

62. A paper, authored by **Name Redacted** on Behavioural Science in Welsh Government was taken to the Executive Group in March 2023. The paper describes the current situation of limited behavioural science capacity and capability within the Welsh Government and sets out recent progress and proposals for developing a programme of work. I exhibit that paper at **M2B/WG/RO/26-INQ000353574**. Work is underway to make a case for recruiting a head of behavioural science in SEA, however current fiscal constraints might make this difficult.

Modelling

63. My corporate statement²⁸ describes the use of epidemic models by TAC and TAG during the pandemic. Questions not addressed in the modelling sections of my corporate statement are covered below. It is likely that others from my group (notably Dr Brendan Collins or Craiger Solomons), who have also been asked to contribute evidence to the Public Inquiry, will provide more granular information on modelling. See also **M2B/WG/RO/27-INQ000066276** for a description of the use of Rt.

64. It was important that a Welsh specific epidemic model was generated and therefore I agree with Professor Mike Gravenor's statement. This development of a Welsh specific model proved to be invaluable to our scientific response in Wales, along with other modelling outputs from other academic groups associated with SPI-M-O. I am very grateful to Prof Gravenor and colleagues in his Group in Swansea University for the incredible effort afforded and their continued support to the response in Wales.

65. A range of questions were asked of the models which were informed by discussions with policy colleagues and through science channels, such as TAG or the policy modelling subgroup. See TAC advice summaries, 21-day review advice and policy modelling papers in Annex C. Modelling was used to inform different decisions such as population protections, testing and countermeasure deployment such as vaccination.

²⁸ Paragraphs 28-36, 134 and exhibits therein Annex C M2B/TAG/01 [RO/M2B/TAG01/17-INQ000300200](#), [RO/M2B/TAG01/18-INQ000300187](#), [RO/M2B/TAG01/19-INQ000300204](#), [RO/M2B/TAG01/20-INQ000300188](#) and [RO/M2B/TAG01/21-INQ000300205](#)

66. The paper exhibited in my previous statement²⁹ provides an example of a policy modelling update from 30 November 2021, the paper highlights uncertainty about the arrival of the Omicron variant and the impact that this might have on subsequent projections. This is exhibited here for reference in **M2B/WG/RO/28-INQ000228034**. It also evidences joint working with SPI-M-O members (Warwick University and Juniper consortium) to generate a RWC for Wales and a comparison with other countries.

67. A TAG policy modelling retrospective paper³⁰ provides a retrospective analysis and exploration of epidemic RWC modelling through the period.

Data

68. Key sources of data are included in my corporate statement³¹ for the ArmaKuni Dashboard. How data and related information was visualized, used and disseminated is dealt with in the sections related to the ArmaKuni Dashboard, TAC summaries, Covid Intelligence Cell and the Covid Situation Report.

69. As described in my corporate statement, initially it was very difficult to capture accurate information from some Welsh Health Boards on Covid related activity (e.g. number of hospitalised patients). Also, we had insufficient capacity and capability to generate a dashboard that could present relevant intelligence to help inform risk assessments. Difficulties were experienced in getting some data from Welsh health organisations which are likely described in fuller detail by others, notably Craiger Solomons MBE, Dr Brendan Collins and Fliss Bennee OBE.

70. It is important to add that once developed, and despite the challenges of developing a secure data visualisation platform during the pandemic, the ArmaKuni dashboard was an excellent source of structured information from different sources that was invaluable in supporting our response to the pandemic. It provided timely intelligence in a way that was understandable, easy to use and deploy for briefings

²⁹ M2B/TAG/01 Exhibit RO/M2B/TAG01/49-[INQ000300263](#)

³⁰ M2B/TAG/01 Exhibit RO/M2B/TAG01/49-[INQ000300263](#)

³¹ M2B/TAG/01 Exhibit RO/M2B/TAG01/58-[INQ000068511](#)

and risk assessments. I am grateful to all those involved in developing this work for Wales.

71. Notwithstanding this, it has been recognised that it is important to have an 'in-house' dashboard and work (overseen by the Strategic Evidence Board in Welsh Government) is ongoing to establish greater inhouse dashboard capacity and capability for emergencies. Adopting a more structured steady state to data dashboards is likely to be advantageous. From the feedback exercise in TAC some members of my team did experience difficulty in accessing some information and data from Public Health Wales. Invariably having data sharing agreements in place and commissioning arrangements in place between the Welsh Government prior to the pandemic would have been helpful. As with SAGE, being sighted on the number and priority of commissions for expert PHW input from different stakeholders would also have been of value.

International

72. The international situation and approaches, including from international organisations, were discussed in TAG meetings, with advice papers also including the international picture. In addition, TAG papers were published specifically considering the international perspective (e.g. winter in the southern hemisphere, or restrictions and unlocking in other countries)³². Further details can be found in my corporate statement³³. Personally, I did not liaise with the World Health Organisation or European Centre for Disease Control. However, to be clear we did not limit ourselves to observations solely arising from the UK.

73. There are several reasons why different countries reacted differently to the arrival of Covid-19. One reason why countries in the far east reacted more swiftly is partly due to their previous experiences of dealing with other viruses, such as SARS. However, this is too simplistic an explanation as there are many other political, societal and cultural factors to consider, which is illustrated in the comparative study exhibited in **M2B/WG/RO/29- INQ000353590**. In an ideal world it would have been

³² Annex C M2B/TAG/01- [INQ000312034](#), [INQ000312052](#), [INQ000312057](#) and [INQ000312070](#)

³³ Para 239 in M2B/TAG/01. Also TAG minutes Annex C TAG/M2B/01 (*as above*)

better to have reacted earlier to the arrival of Covid-19, with prior preparation and readiness being key.

SAGE

74. On the whole questions posed on SAGE advice are covered in detail in my corporate statement³⁴. Remaining additional observations are covered in the following paragraphs.

75. I believe using the pan flu assumptions was a sensible starting point for a virus that was hitherto uncharacterized in a human population. Others have spoken about the significant uncertainties and variation that can be introduced by changing variables in the planning assumptions such as the reproductive ratios or the infection fatality rates. On the latter, swine flu had an infection fatality rate of lower than 0.1%, at the beginning of the epidemic HIV AIDS had an infection fatality rate of 100%. The 1918 Influenza pandemic had a W shaped mortality curve meaning more children, young adults and older people died or became seriously unwell compared to Covid-19 where there was more of an L shaped curve meaning more older people died compared to younger age groups. These are just two examples of how much variability there can be in the outcomes of a viral infection which would have a profound impact on the subsequent policies and decisions. SAGE set about regularly updating and reviewing the pan flu planning assumptions until there was enough information, from the evidence, to satisfy each of the planning criteria.

76. SAGE and its subgroups are largely covered in my corporate statement. However, to reiterate its value to the response to the pandemic it is important to note that all of the SAGE groups were composed of the best academics available and that the members contributed a massive amount to the UK Covid-19 scientific response. It appeared that new members were coopted onto the group as required and a wide range of academics were invited to present their work to the group. I cannot speak highly enough of all of those involved in the leadership and running of SAGE, nor the academic contributors – all of whom were excellent. I am not aware of the

³⁴ Para 59-61 M2B/TAG/01

breakdown of gender, social or ethnic diversity for each group and this is best asked of SAGE.

77. As I have mentioned in my corporate statement, I would like to have seen greater UK representation and governance on SAGE groups, such that it was more explicitly a shared four nation endeavour³⁵. One reason why the group is more oriented towards England, is that unlike for Scotland, Northern Ireland, and Wales there is not an administration specifically for England, other than UK Government. There may have also been other political or civil servant influences on the 'UK' nature of the science response as there were with other parts of UKG pandemic response. Given that England is twenty times bigger than Wales it stands to reason that the academic capacity and capabilities in England far exceed Wales. As such Wales and the other Devolved Nations will always be a net beneficiary of SAGE, despite shortcomings regarding our perceived inequity in commissioning or focus of the group.
78. One mistake I feel SAGE made was, unlike in TAG, economic and health economic advice did not play a significant role. One of the key harms arising from the pandemic was economic damage and therefore economic evidence should have been a key consideration that was explored and shared publicly, as opposed to this being solely a consideration of the UK Treasury.
79. Health economics is an important discipline that can provide valuable insights into the tradeoffs between health and the economic decisions; but should be seen as one strand of analysis and evidence rather than the strand. Much the same as policy modelling or behavioural science, health economics can help us formulate advice with a range of other considerations. For example, when we considered testing and tracing or vaccination, using health economics enabled us to demonstrate the cost effectiveness of these policy areas in the context of the social cost of a covid case at different points in the pandemic, this sat alongside our policy modelling and behavioural science advice³⁶. A similar approach could have been used for UK Government policies such as 'Help Out to Eat Out' whereby the economic benefits of the policy could have been documented alongside SAGE

³⁵ Para 69-71 M2B/TAG/01

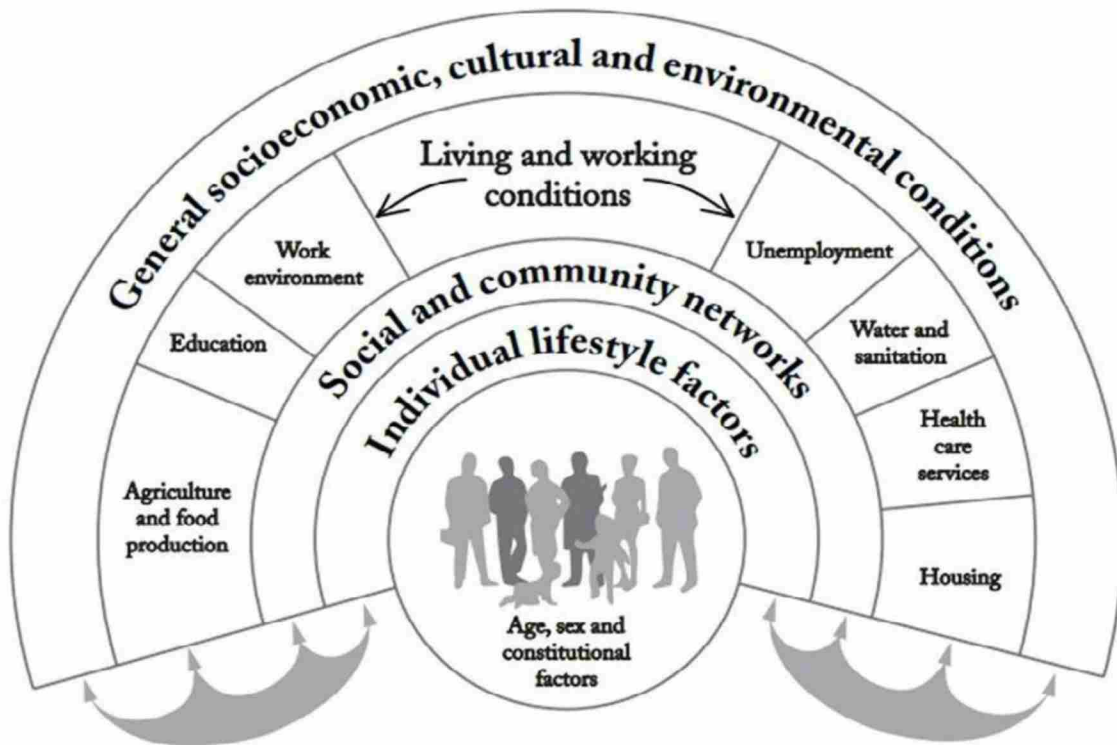
³⁶TAC summary advice Annex C M2B/TAG/01 - [INQ000066302](#), [INQ000066298](#), [INQ000312024](#)

considerations for such a policy to help provide a balance of scientific and technical advice.

80. Notwithstanding the above, in my view, SAGE was an incredible UK asset in formulation and delivery of independent, authoritative scientific evidence and advice to inform the UK's response to Covid-19.

81. I do however think that there is room for improvement in how networks of experts, within and outside of government continue to work collectively on key determinants of health that are wider than that of pandemic preparedness but will invariably determine the resilience and impacts of the next pandemic, or major societal challenge, in the UK.

82. For example, the wider determinants of health were laid bare during the pandemic. Covid-19, like 1918 flu – was a disease of inequalities, disproportionately impacting those in lower paid jobs, in poorer housing, older people in care homes, those with co-morbidities or from different ethnic groups; and that these impacts were felt across all harms. The Dahlgren and Whitehead model, in figure one below, shows the key features of society that together determine our experiences of life and health. Systematic variations in these areas leads to social inequalities which has profound impact on health outcomes and our ability to be able to tolerate or be impacted by societal insults like pandemics or other challenges like climate change, or cost of living increases.



83. The provision of evidence and scientific advice for policies across these areas extends across both UK and devolved Governments. With responsibilities for that advice (and research) extending further into public sector research establishments, institutes and units, universities and third sector. No one government, department, or organisation has responsibility for all of the policy areas for the key determinants of health; and by extension no one person or party has overall sightedness over our ability to withstand the next pandemic. Many of the 'actors' that share individual policy responsibility like the United Kingdom Health Security Agency, or the Scottish Government's Children and Families Directorate or the Welsh Treasury will be required to react to the next pandemic. A collective UK 'steady state' approach to science, evidence and resilience that extends well beyond pandemic preparedness and considers the full spectrum of strategic policy evidence is needed. A UK SAGE-like forum is consistent with the recommendations within the recent Nurse Review of the RDI landscape to help form a collective narrative on the evidence and research needs for societal and system resilience. Adopting a cross government approach to science and evidence for resilience should provide collective sightedness across the full spectrum of health determinants and therefore pandemic preparedness. Such a centrally coordinated federated science forum is

likely to culture greater trusted partnerships and support underpinning secretariat and governance mechanisms that could be coopted during PHEIC type emergencies. What is used in peacetime should also be used in war (emergencies) – not duplicated with two processes.

84. Recently my group published a paper, which is exhibited above at **M2B/WG/RO/06-INQ000353571**, looking at the projected burden of disease in Wales and the pressures that this might bring to our NHS in the next ten or more years' time. What is abundantly clear it that we live in an aging society where an increasing number of people will be living with complex long-term conditions and therefore more vulnerable to health threats, like pandemics. Without further cross government and societal action on wellness, disease prevention and social inequalities this will render the UK less resilient to the next pandemic.

85. In my opinion and related to the above, 'science' in the context of SAGE should be interpreted in the very broadest sense – rather than a subset of scientific disciplines – instead taking the Science Council definition that 'science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence.' This definition of science should be incorporated into a set of strategic objectives oriented towards hazard characterization, risk assessment and risk management aligned with reducing harms related to public health emergencies. This broader definition would bring economic and social insight into the scope of SAGE. In doing so it would be important to clarify this wider definition in the SAGE guidance.

86. Whilst not sighted on developments, I am aware that SAGE has undergone a review of its functions since the pandemic.

Initial Understanding and Response to Covid-19

Preamble

87. In addition to the questions asked of TAC and TAG as part of my corporate statement I have been asked over 400 separate questions related to the advice that I provided during the pandemic. Inevitably there is some overlap between this

statement and my corporate statement in responding to those questions. Therefore, rather than repeat the advice already provided I have cross-referred to my Corporate Statement, where applicable. As mentioned previously, the scientific advice during this early period was very much aligned to SAGE given that the advice promulgated from it was a consensus of that group, of which I was a member. As TAC and TAG began to develop and become embedded within the Welsh Government then separate Welsh specific commissions, in addition to that of SAGE, were compiled and published.

88. My corporate statement³⁷ also provides an accurate account of the beginning of the pandemic and lists the key pieces of scientific advice that were shared with policy officials and ministers during this period. Whilst I relay and update discussions from SAGE in my advice, I did not have access to four nation CMO or between Public Health Agencies (e.g. PHE/PHW) discussions so it is likely that some detail (such as early transitions) are missing from my narrative.

89. Although I did have contact with the MHSS (Vaughn Gething) prior to the pandemic on matters related to health sciences (e.g. genomics). Emergency planning and response was not in my purview. Matters related to emergency science sat with the CSA(W) prior to this period, and I was not privy to these discussions. If the role of CSAH in Welsh Government was more aligned to UK CSA guidance and there was greater recognition of the role and contact with other UKG CSAs, prior to the pandemic, it is possible that there would have been different expectations regarding my role in advising Welsh Government and Ministers on the provision of emergency science and health in January 2020. Related to this, I did not have contact with the FM prior to the pandemic.

90. I have, as much as possible, cross referenced SAGE advice and TAC or TAG advice. Firstly, to demonstrate consistency but secondly, to provide direction, or reference, to salient and important advice for the Public Inquiry (as it is not possible for me to distil all of the advice for all of the areas). I have, as far as possible, covered all significant advice. Therefore, in the below I make reference to SAGE advice and TAC or TAG advice in the following categories:

³⁷ Paras 14, annex C and exhibits therein M2B/TAG/01 (no specific INQs to be referenced)

- I. SAGE minutes and SAGE endorsed papers (disclosed);
- II. TAG internal advice (Annex C M2B/TAG/01);
- III. TAC summaries (Annex C M2B/TAG/01);
- IV. TAG publications (Annex C M2B/TAG/01).

January 2020 - Summer 2020

91. To assist understanding and provide a cohesive narrative I have used a chronological approach.

92. My first awareness of the virus, via Government communication, was by way of an email that I received on 21 January 2020 from the pre-SAGE meeting [that had been held that day], which I forwarded to officials in Welsh Government and Go-Science on 22 Jan 2020. I asked to join SAGE on 22 January 2020, as exhibited in **M2B/WG/RO/31- INQ000309705**. I updated the CMO and DG for Health and Social Services on information from COBR on 24 January 2020, which is exhibited in **M2B/WG/RO/32- INQ000252498**. I did not however, send any papers on SARS-CoV2 to the FM in January 2020 (this was not within my roles or responsibilities during this period). Neither had I had any earlier contact from Professor Van-Tam, the WHO (other international organisations), or NERVTAG. In respect of the latter therefore I cannot say whether I would have agreed with NERVATG's statement that the disease was a 'very low' risk to the population. On 30 January 2020 the WHO designated Covid 19 as a Public Health Emergency of International Concern (PHEIC) There are specific procedures in place related to the WHO as described in the International Health Regulation (2005) and UK guidance, exhibited in **M2B/WG/RO/33- INQ000353578**.

93. My early understanding of the virus was informed by SAGE discussions and papers. My understanding, and that of SAGE, was relayed to CMO and other officials in my regular updates which commenced after I joined the SAGE group on 11 February 2020³⁸. I do not have a list of dates or notes of discussion from when I met with the Minister for Health and Social Care or the First Minister. However, I

³⁸ Para 15 M2B/TAG/01

attended a number of discussions with senior officials, special advisers and ministers prior to the introduction of control measures. In these meetings we discussed the pandemic and what was known of the situation at the time, my advice in these meetings would have been to relay key messages from SAGE. I cannot recall any discordance with myself and CMO during this period, we worked closely together, and I am grateful for his collegiate approach and support.

94. Initially there was a high degree of uncertainty of what impact the pandemic would have and how comparable this would be to previous epidemics, like Influenza. I believe SAGE took a very sensible and methodical approach in trying to capture and understand the nature of the SARS-CoV2 virus, the impacts of infection on people and society, as well as mitigation measures, from multiple international sources, including from China, whilst also needing to confirm viral infection and epidemiological characteristics using UK data. SAGE 11 minutes, exhibited in **M2B/WG/RO/34- INQ000309721**. In my previous statement I describe the SAGE priorities during this period, these priorities were also reflected in the first TAG terms of reference, exhibited at **M2B/WG/RO/35- INQ000353583**. As part of this early analysis SAGE considered asymptomatic transmission, and viral shedding before symptoms develop. Although this was uncertain it was considered a possibility in the early stage of discussions and captured in my advice to CMO during this period.³⁹

95. I am unable to confirm whether the understanding of the Infection Fatality Rate (IFR), was properly understood in January 2020 as my involvement with SAGE was not until 11 February 2020 onwards. However, in February there was agreement on the IFR which was incorporated into the planning assumptions which is noted in the TAC updates⁴⁰ and SAGE planning assumptions as exhibited in **M2B/WG/RO/36- INQ000300197**.

96. My early involvement with the pandemic did give rise to very real concerns about the virus and the risks associated with its emergence. This is reflected in my response: leaving my substantive post at that time and establishing TAC. I

³⁹ Annex C M2B-TAG-01CMO email updates 11 Feb 2020 and 20 Feb 2020, [INQ000383626](#)

⁴⁰ Annex C M2B-TAG-01 TAC CMO brief 10 March 2020, [INQ000312231](#)

recognised that TAC would provide a vessel to better understand the ensuing pandemic from a scientific viewpoint and support the Welsh Government and ministers in responding swiftly to the challenges presented by the virus. Prior to the pandemic my substantive Welsh Government role did not include health protection.

97. Also during this early period, as expected, there was a good deal of focus, during the SAGE meetings and beyond, on the Reasonable Worst Case modelling. My corporate statement describes the first Reasonable Worst Case modelling and advice that I provided in detail⁴¹. The RWCS were reviewed periodically, using actuals, discussed by the modelling subgroup, TAG and with policy officials and then published with ministerial approval, from May 2020 onwards. A retrospective analysis describes this for Wales⁴². Epidemic dynamics and modelling are also covered in my corporate statement.⁴³

98. The RWCS was limited by the provision/incorporation of the most accurate and up-to-date clinical or epidemiological data that fed into the model e.g. doubling time, serial interval, percentage of symptomatic/asymptomatic, case fatality ratio, vulnerable populations, reinfection rate; and time frame that the model projected e.g. less confidence in longer projections. Close working relationships with SPI-M-O ensured that the latest data and assumptions were shared with modelling groups.

99. During this time, all of the scientific advice that was coming out of SAGE and reiterated by TAC helped to inform the UK and the Welsh Government's advice to the public. However, the issuing of advice on protective measures (e.g. hand hygiene) was coordinated between the CMO's Office and HSSG Comms. Therefore, further information on the early public health interventions in Wales would be best answered by the CMO and Public Health Wales. Similarly, I did not advise on the availability or dissemination of Personal Protective Equipment in Wales.

100. However, I did disseminate notes to CMO, along with the SAGE minutes on a wide range of considerations, including mass gatherings, infection in children and school

⁴¹ Para 28-37 M2B/TAG/01

⁴² M2B/TAG/01 Exhibit RO/M2B/TAG01/31- [INQ000300269](#)

⁴³ Paras 130, 146, 156, 164, 173, 182, 190, and 198 in M2B/TAG/01

closures, effectiveness of control measures in other countries, sentinel surveillance and likelihood of community transmission. In essence my SAGE notes are a highlight report of the content of discussions which were a forerunner to the minutes of the meetings.

101. Once TAC, and then TAG, had been established at the beginning March, Welsh specific advice began to be intercalated to that of SAGE (e.g. using SAGE agreed RWC projections to estimate NHS demand capacity requirements in Wales) and in turn my advice. As stated in my corporate statement TAG meetings were deliberately phased to occur after a SAGE meeting⁴⁴.

102. I have previously provided⁴⁵ all of the CMO notes and internal CMO TAC briefings that I provided to officials, ministers and Cabinet. The paragraphs below highlight the type of information and advice that was shared with CMO and senior officials which is separate to any formally submitted written briefings or advice.

103. On 11 February 2020 in my CMO update I described some of the key uncertainties related to the epidemiology, I flagged that the pan flu RWC was being used and that the UK could be 2-3 months behind Wuhan⁴⁶.

104. In my CMO update on 14 February 2020 I highlighted the value of the SPI-M-O modelling papers and their conclusions being consistent with SAGE consensus. I flagged the uncertainties related to infection in children and some of the potential impacts related to school closures. At the time it was considered that there was limited evidence for restricting travel within the UK or banning mass gatherings, such as football matches. There was considerable discussion related to the uncertainty of behaviours although most could be considered 'logical' by most people (e.g. not buying certain goods) and that panic was rare⁴⁷.

105. On 18 February 2020, following SAGE 15 I relayed information related to the RWC and that the pan flu scenario was still extant⁴⁸. Also that from limited data, it was

⁴⁴ Para 75 M2B/TAG/01

⁴⁵ Annex C M2B/TAG/01- [INQ000385412](#)

⁴⁶ Annex C M2B/TAG/01 CMO update 11 Feb 2020 - [INQ000383638](#)

⁴⁷ Annex C M2B/TAG/01 CMO update 14 Feb 2020 - [INQ000383638](#), 18 Feb 2020 [INQ000383634](#)

⁴⁸ Annex C M2B/TAG/01 CMO update 18 Feb 2020 - [INQ000383634](#)

suggested that children and pregnancies were possibly less affected by the infection. Environmental persistence was thought to be more persistent than Influenza and that routine disinfection worked well. Also, that the virus was detectable in faeces but not other bodily fluids. I also flagged the importance of clinical trials. These meetings were now by teleconference, with only one connection to Wales, and there were some difficulties experienced in listening in to discussions due to the high volume of callers and background noise, although I received meeting papers and minutes.

106. In February and March 2020 SAGE considered mass gatherings and advised that there was no evidence to suggest prevention of mass gatherings would limit transmission and that other replacement/displacement activities would have similar impacts (e.g. watching sports matches in pubs, as opposed to stadiums). These discussions are documented in TAC briefs⁴⁹ and SAGE Minutes⁵⁰.

107. Throughout February and March 2020 children and measures relating to school closures were discussed often in SAGE and with TAC. On 20 March 2020 TAC advised that school attendance should be kept as low as practically possible (e.g. accommodating children of front-line workers and vulnerable children, but that 40% was too high)⁵¹. From fairly early in the period it was considered that moderate or severe health impacts from SARS-CoV2 infection in healthy children and young people were less likely than perhaps for other diseases (e.g. flu), but that children and the activities around schools (e.g. networks) created large networks of contacts and whilst children were less likely to suffer from symptoms than older adults, it was plausible that children and young people played a role in transmission. The harms related to closure of childcare and educational facilities were also well documented, this included vulnerable children, social inequalities, and impacts on grandparents, teaching staff and front-line staff with children. Behavioural implications were also considered (e.g. actions of parents) as exhibited in **M2B/WG/RO/37-**

⁴⁹ Annex C M2B/TAG/01CMO update 14 Feb 2020 [INQ000383638](#), 25 Feb 2020 [INQ000383612](#)

⁵⁰ SAGE 7 (13 Feb 2020) [INQ000052045](#), SAGE 11 (27 Feb 2020) [INQ000052204](#), SAGE 12 (3 Mar 2020) [INQ000052319](#), SAGE 13 (5 Mar 2020) [INQ000052349](#)

⁵¹ Annex C M2B-TAG-01TAC Brief 20 March [INQ000311875](#), TAC brief 23 March 2020 [INQ000311876](#)

INQ000311898. My corporate statement provides further information related to children and young people⁵².

108. In February and April 2020 SAGE also advised on environmental science, such as persistence of the virus in the environment, the importance of good ventilation and social distancing⁵³. We worked very closely with the Environmental Modelling Group (EMG) of SAGE, and we are extremely grateful for their work in helping us better understand transmission of SARS-CoV2 and the behaviour of the virus in the environment. Similarly in Wales our Environmental Science Subgroup (TAG-E) chaired by Prof Davey Jones in Bangor was of very high value providing us with excellent advice on a range of matters⁵⁴. For example, from September 2020 onwards we provided setting specific advice such as: ice rinks, outdoors, face coverings in hospitality swimming pools, saunas, steam rooms, gyms, weddings, public toilets, for elections, taxis, communal singing and wind instruments, night clubs and adult entertainment venues⁵⁵ which was informed by the advice of TAG-E.

109. From very early in the pandemic the disease was characterised as a respiratory virus that passed between people. Our understanding of disease transmission improved over time as scientists undertook different studies (e.g. PROTECT study exhibited in **M2B/WG/RO/38- INQ000353581**) or characterised outbreaks, to help understand the main routes of transmission. SAGE, via the EMG group, and TAG⁵⁶ advised that: close prolonged contact was a high risk if an individual was infectious and that this could include symptomatic, asymptomatic (no symptoms), paucisymptomatic (mild) and pre-symptomatic individuals (all people); all routes of transmission should be considered in deploying countermeasures; social distancing of two metres significantly reduced the risk of transmission compared to one metre and aerosol transmission was more likely in closed humid environments. This advice is exhibited **M2B/WG/RO/39- INQ000227182**. Therefore, transmission in homes where people are closer for longer, windows are closed, and people are

⁵² M2B/TAG/01 para [130](#), [132](#), [137](#)).

⁵³ SAGE 8 (18 Feb 2020) [INQ000052098](#), SAGE 29 (28 Apr 2020) [INQ000053212](#), SAGE 30 (30 Apr 2020) [INQ000075781](#)

⁵⁴ M2B/TAG/01 Annex C - [INQ000312668](#), [INQ000312695](#), [INQ000312702](#) and [INQ000312693](#)

⁵⁵ Paras [152](#), [163](#), [168](#), [180](#) and [INQ000312059](#)

⁵⁶ M2B/TAG/01 Annex C TAC advice 5 June 2020 [INQ000311863](#)

talking represented a higher risk than other environments e.g. those outdoors. Environments that were high risk of transmission included care homes and hospitals; people many of whom were clinically vulnerable from different networks and mixing for prolonged periods in closed, humid or poorly ventilated areas, created the conditions where the virus and disease could propagate and thrive. The EMG paper on the use of ventilation in controlling Covid-19, exhibited at **M2B/WG/RO/40-INQ000349902**, was discussed in SAGE 60 on 1 October 2020 and reflected in my advice⁵⁷.

110.SAGE discussed national clinical trials of vaccines at several junctures, for example SAGE 8 on 18 February and SAGE 30 on 30 April 2020. Consideration was also given to the risks associated with raising a vaccine purely against the spike protein of the virus due to likely changes over time⁵⁸. During the first year of the pandemic there was a high degree of uncertainty as to whether a vaccine would be possible to generate and if so when the vaccine might become available in sufficient numbers of doses to support the pandemic response in Wales. Whilst we advised on vaccines delivery and population immunity in TAC and TAG, I was not a member of the Joint Committee for Vaccination and Immunisation (JCVI). This advice is exhibited at **M2B/WG/RO/41-INQ000350448** and **M2B/WG/RO/42-INQ000066330**.

111.On 20 February 2020 I describe some features of data from the Diamond Cruise ship outbreak, with information on symptomatic or mild cases and that there was high likelihood that the virus was already in circulation. Also, that contact tracing should continue until trigger events show that there are infections not linked to travel⁵⁸.

112.At several points in my notes, including 25 February 2020⁵⁹, I highlighted the need for consistency with plans in NHS systems and the importance of good information flow for planning and response. I also made clear the need for collectivism from any population level actions and I summarized the key points from SAGE discussions,

⁵⁷ M2B/TAG/01 Annex C TAC CMO brief 02 Oct 2020 - [INQ000312048](#) and [INQ000120560](#)

⁵⁸ M2B/TAG/01 Annex C CMO update email 20 Feb 2020 - [INQ000383626](#), [INQ000052098](#) and [INQ000075781](#)

⁵⁹ M2B/TAG/01 Annex C CMO update email 25 Feb 2020 - [INQ000383621](#)

such as the use of NPIs and some key principles and uncertainties regarding their use. I flagged that based on current modelling NHS bed capacity would be outstripped for about eight weeks over the peak of the epidemic and I highlighted the need for appropriate information sharing between the four nations at a government and operational planning level.

113. On 27 February 2020, my notes again describe difficulties in joining the discussion but highlight the work needed to be done in Wales on using the RWC to project potential impacts on NHS Wales. I further describe the setting up of TAC⁶⁰.

114. The Coronavirus Action Plan was published on 3 March 2020. Prior to its publication I had commented, by email on 1 March 2020, that the document was Anglocentric and needed to better reflect the devolved nature of Health and the responsible organisations in Wales. This is exhibited in **M2B/WG/RO/43-INQ000298975**.

115. From 3 March 2020 my CMO updates, post SAGE discussion become that of TAC with more detailed notes and embedded papers from SAGE and PHW. Here I share the first modelled projections on NHS demand and capacity from colleagues in Public Health Wales. This note also describes the likely move away from containment due to the detection of cases not linked to travel⁶¹.

116. I have addressed questions related to 'Herd Immunity' in my corporate statement⁶² that relate to discussions and advice in early March 2020

117. The CMO TAC brief date 10 March 2020⁶³ describes some features of the situation in Lombardy, Italy which was discussed in SAGE 14 (10 March 2020). My corporate statement⁶⁴ also describes my advice on lockdowns that was provided on 19 March 2020.

⁶⁰ M2B/TAG/01 Annex C TAC CMO Update 03 Mar 2020 - [INQ000385209](#)

⁶¹ Annex C M2B-TAG-01 TAC CMO Update 03 Mar 2020 - [INQ000385209](#)

⁶² M2B/TAG/01 paras [27-32](#)

⁶³ Annex C M2B-TAG-01 TAC brief 10 March 2020 - [INQ000336670](#)

⁶⁴ Para 87 of M2B/TAG/01 and Exhibit RO/M2B/TAG01/61-[INQ000066358](#)

118. I provided advice to the FM ahead of the 17 March 2020 decision on limiting non-essential contact, this is covered in my corporate statement⁶⁵.

119. My corporate statement⁶⁶ also describes the period from the beginning of March to lockdown on 23 March 2020 and provides key science advice documents that were provided during that period.

120. During March and April 2020 nosocomial (hospital-based) transmission was discussed regularly in SAGE (meetings 19, 23, 24, 25, 26, 27 and 29), and reflected in my advice, which highlighted the urgency of finding practical measures to reduce transmission through practical infection prevention control measures, that nosocomial cases were an increasing proportion of cases, that separate hospital sites might be sensible for treating Covid-19 patients, that rapid feedback from hospitals which have higher levels of hospital acquired infection (HAI) was necessary. In HSSG DCMO and CNO led work on Infection Prevention Control with Dr Eleri Davies from PHW a member of the SAGE nosocomial subgroup.

121. My corporate statement and exhibits therein⁶⁷ describes early TAC advice from June 2020 related to face coverings and again in August 2020. My advice on face coverings and the potential impacts on transmission and epidemic growth in Wales changed as more evidence information became available.

122. As shown in the above paras and in my corporate statement and the corresponding SAGE minutes and papers, there was a high degree of uncertainty during the early stages of the pandemic. Also, reflected in the above, that the subject matters related to the ensuing pandemic were wide ranging. Despite all of this I ensured that the important messages from these early meetings and considerations for policy colleagues were relayed and colleagues were fully informed of the emerging scientific advice.

⁶⁵ M2B/TAG/01 paras [82-88](#)

⁶⁶ Paragraphs 81-90 in M2B/TAG/01 and Annex C M2B-TAG-01 - [INQ000299964](#), [INQ000300216](#), [INQ000300219](#), [INQ000300260](#) and [INQ000300178](#)

⁶⁷ M2B/TAG/01 statement para [140](#)

First Lockdown

123. Lockdown was always going to be a difficult decision to balance, as it had a huge impact on people's civil liberties and other associated harms. However, I believe that given the information available at the time it was the correct decision to lockdown, and it remains the correct decision. If better information had been available regarding the prevalence of infection in the community it is possible that a swifter lockdown would have been initiated, which is likely to have reduced the health impacts in Wales; this is supported by modelling that was undertaken after the first lockdown as exhibited in **M2B/WG/RO/44-INQ000353575**. As it was, Wales was estimated to be behind other parts of the UK, notably London, in the first wave. Consequently, UK decisions that were driven by epidemiological and NHS observations in London benefitted Wales and other parts of the UK where the epidemic was less advanced⁶⁸.

124. On 20 March 2020, the advice of TAC said that the risk of exceeding NHS capacity was higher than previously considered. This was due to a higher reproduction number and lower doubling time than previously thought, which would have increased the RWC projections and shortened the available window to respond⁶⁹.

125. Having advised on the need to lockdown, TAC then advised on an approach to releasing from the first lockdown on the 23 March 2020, also highlighting SAGE discussion on 31 March 2020 in the subsequent brief⁷⁰. In **M2B/WG/RO/45-INQ000311902** the release from lockdown in other countries is described. TAC also advised on early warning indicators and circuit breakers that might help Welsh Government safely unlock restrictions which is exhibited in **M2B/WG/RO/46-INQ000227967**. Throughout the lockdown period we advised on the state of the

⁶⁸ Annex C M2B-TAG-01 TAC CMO brief 2 Mar 2020 [INQ000385209](#), TAC CMO Brief 22 Mar 2020 [INQ000311876](#)

⁶⁹ Annex C M2B-TAG-01 TAC Covid-19 Brief 20 Mar 2020 [INQ000311876](#), SAGE 18, 23 Mar 2020 [INQ000061526](#)

⁷⁰ Annex C M2B-TAG-01 TAC CMO Brief 23 Mar 2020 [INQ000311876](#), TAC CMO Brief 31 Mar 2020 [INQ000384072](#)

epidemic in Wales (e.g. NHS usage, doubling times) and adherence to measures (e.g. survey and mobility data).

126. There was also advice on easing of restrictions. We provided a steady flow of information regarding the state of the epidemic in Wales, as well as a set of metrics that would help describe the impacts of relaxations to ensure significant return to epidemic growth could be monitored and acted upon by Welsh Government. My colleagues in TAC and I commented upon key documents such as the traffic light route map. We advised not to make large changes in protective measures and to monitor the impacts of unlocking before additional relaxations were made. This is exhibited in **M2B/WG/RO/47-INQ000349438**. At the time of relaxations, my colleagues and I could observe a significant decrease in the epidemic over consecutive weeks, also NHS activity, and a reduction in adherence to measures by the population, suggesting the epidemic was waning and some relaxations could be made. Via the Chief Economist we also advised on the economic impacts of the pandemic in Wales⁷¹. See also my corporate statement on restriction reviews and relaxations⁷².

127. In reviewing restrictions and relaxations, my colleagues and I advised on whether different policies might or might not impact on Rt under the current epidemic conditions. This advice is exhibited in **M2B/ORFORD/48- INQ000350317**. Advice on specific measures was coupled with academic papers or SAGE advice to ensure the most recent evidence was incorporated into our advice. Higher level advice was also provided for example 'easements that are associated with lower risk activities (e.g. outdoor activities) should be prioritised over higher transmission risk activities (e.g. indoor activities)'. Activities where a higher transmission risk can be mitigated using the hierarchy of risk control (either through regulations or guidance), enforcement and risk communication, should be prioritised over activities where mitigations may be less modifiable (extended households)⁷³.

128. Obviously lifting restrictions inevitably led to the question as to whether children should return to school and these decisions were being considered around 29 June

⁷¹ Annex C M2B-TAG-01, - TAC Brief 26 Jun 2020 [INQ000311867](#)

⁷² Paras [132](#), [133](#), [147](#), [150](#), [151](#), [159](#), [162](#), [168](#), [194](#), of M2B/TAG/01

⁷³ Annex C M2B-TAG-01, TAC brief 31 March 21 - [INQ000312021](#)

2020⁷⁴. My advice was clear on the uncertainty related to the return to schools and the potential impact that might have on Rt (e.g. whether or not it would lead to an increase in epidemic growth) and that smaller incremental steps were advisable.

Border Controls

129. Border controls were discussed frequently from January to late April and is documented in the SAGE minutes that I attended⁷⁵. At the time the SAGE consensus was that, unless draconian and fully adhered to, travel restrictions would not have been effective in limiting transmission because cases were already established in the UK, which I agreed with. On 9 April 2020 TAC advice⁷⁶ showed a high level of support in Wales for border closure registered through IPSIS MORI polling. Further advice in this period was provided by SAGE and TAC on border controls⁷⁷ and trigger points for testing of travelers. Questions related to policies and procedures for surveillance and tracking of returning travelers are best addressed by those responsible for these areas.

130. In June 2020 SAGE advised on the policies of quarantine from a scientific perspective e.g. use of double testing, pre-travel testing or testing of travelers from countries of higher prevalence of infection⁷⁸.

131. Following the first wave and the reduction in cases (and availability of tests) in the UK the advice around testing at borders changed with SAGE recommending testing of returning travelers, although more for epidemiological purposes⁷⁹.

132. Around this time advice around limiting importation related to travel to Wales also changed as testing was more widely available and the relative number of infections were lower in Wales compared to other areas, including those in England⁸⁰. The

⁷⁴ Para 136 M2B/TAG/01

⁷⁵ SAGE 7 (13 Feb 2020), 11 (27 Feb 2020), 17 (18 March 2020), 18 (23 March) [INQ000052045](#), [INQ000052204](#), [INQ000075778](#) and [INQ000061526](#)

⁷⁶ Annex C M2B-TAG-01 TAC 9 April 2020 [INQ000336398](#)

⁷⁷ Annex C M2B-TAG-01 TAC 28 April 2020, SAGE 29 (28 April) [INQ000336466](#) and [INQ000053212](#)

⁷⁸ Annex C M2B-TAG-01 TAC (CMO TAC brief, 18 Jun 2020). SAGE 42 (18 June 2020) [INQ000311887](#) and [INQ000061550](#)

⁷⁹ Annex C M2B-TAG-01 CMO TAC advice 04 Sept 2020 [INQ000066409](#), SAGE 55 (3 Sept 2020) and [INQ000232196](#)

⁸⁰ Paras 147, 148, 153 in M2B/TAG/01

advice contained in MA-FM-1722-20 is exhibited in **M2B/WG/RO/49-INQ000176849** with supporting evidence in **M2B/WG/RO/50-INQ000227177** and TAC advice in **M2B/WG/RO/51- INQ000350787**.

133. It is difficult for me to provide an overarching opinion as to whether border control policies were proportionate and necessary. For me to provide a sensible evidence-informed answer would require an analysis of the impacts of the policies at different times of the pandemic and for consideration to be made of the benefits (reduction in importation of cases) and disbenefits of these policies (economic impacts, disruption to travel).

Testing

134. Testing was limited in the early period of the pandemic. There are several reasons why it took some time for an accurate diagnostic laboratory test to be validated and then for the provision of this test to be expanded sufficiently to meet the needs of the pandemic, as well as the prioritised provision of testing, as exhibited above in paragraph 132. Some of these questions might be better addressed to those responsible for the operationalisation of testing and health protection measures in PHW and UKHSA.

135. Testing was however a regular topic of discussion in SAGE meetings during February and March (SAGE 8, 9, 16, 17, 18, 19, and 21) and in TAG meetings⁸¹. Any updates in this regard were provided to CMO and senior officials. Discussion in these meetings included: the need for swabbing to test asymptomatic individuals during isolation, the need for community and sentinel surveillance for trigger points (e.g. when there is sustained transmission), agreeing PHE proposed trigger points to discontinue contact tracing, the need for serological testing to understand asymptomatic infection, the urgent need for scale testing, importance of testing key workers e.g. NHS staff, and the need for clear rationale for testing patients and key workers. Testing was discussed often by SAGE, rather than list every SAGE

⁸¹ Annex C M2B-TAG-01 - [INQ000052098](#), [INQ000087502](#), [INQ000075664](#), [INQ000075664](#), [INQ000075778](#), [INQ000061526](#), [INQ000119726](#), [INQ000119727](#), [INQ000309915](#), [INQ000309976](#) and [INQ000313255](#)

meeting that covered testing and the key pieces of advice that were conveyed here it would be easier to refer to previously disclosed papers, statements and minutes produced by SAGE colleagues in Go-Science.

136. During the early period of February and March 2020, there were no other senior officials that were available to lead the development of a Covid-19 testing plan for Wales. From 22 March, alongside my science advice duties, I acted as Senior Responsible Officer for testing. I led the establishment of a multi-partner testing forum that swiftly drew together a technical plan for Covid-19 testing (by 27 Mar 2020), I secured funding (£22.5M, [MA/VG/1136/20]) and began to implement the programme. MA/VG/1136/20 is exhibited in **M2B/WG/RO/52-INQ000136770**. We published a first public testing plan on 6 April 2020 [MA/VG/1226/20], which I exhibit at **M2B/WG/RO/53-INQ000136774**. In April 2020 there was a review of the programme and a new SRO, Jo-anne Daniels OBE, was appointed. This review was not shared with me.

137. On 05 May 2020, SAGE 33, advised on rapid testing, including via Point of Care Devices, of patients and staff as well as the importance of implementing guidance from the Environmental and Modelling Group (EMG)⁸². Importantly SAGE⁸³ and PHW, working with SAIL, advised that some groups particularly care home workers were more likely linked to transmission, than the discharge of patients into care homes from hospitals. This analysis is exhibited in **M2B/WG/RO/54-INQ000353592**. This evidence is different to the current public narrative that outbreaks in care homes was directly attributable to discharged residents. The evidence points towards other vectors for infection, rather than toward patients discharged from hospitals to care homes.

138. Whether serial testing of care home workers, residents and visitors and all other control measures would have significantly reduced the health impacts of SARS-CoV2 in these settings, prior to mass vaccination, requires close consideration. During the Omicron wave when there was considerable testing in these settings there were still a great many outbreaks, fortunately in a population that had a high

⁸² See also M2B/TAG/01 SAGE 33 (5 May 2020) [INQ000061541](#)

⁸³ SAGE 55, 3 Sept 2020 [INQ000232196](#), SAGE 59, 24 Sept 2020 [INQ000061567](#)

degree of acquired or naturally induced immune protection. In considering the most effective infection prevention control measures in any setting, including hospitals, the hierarchy of risk control should be carefully considered. Exhibits **M2B/WG/RO/55-INQ000350087**, **M2B/WG/RO/56-INQ000353580**, and **M2B/WG/RO/57- INQ000353586** provide further detail.

139. Testing and TAG specific advice from VTAG after June 2020 is covered in my corporate statement⁸⁴. TAG produced papers on testing including 'the core principles for the utilization of RT-PCR tests for the detection of SARS-CoV2 which is exhibited at **M2B/WG/RO/58- INQ000349696**, and 'the principles related to the introduction of new testing technologies, exhibited at **M2B/WG/RO/59- INQ000349963**. These papers were produced to support the development of TTP policies. Also TAC advised on some of the principles of TTP on 5 May⁸⁵.

140. As with many areas of the pandemic response testing policies evolved over time, however it is important to highlight that when tests are limited, as they were at the beginning of the pandemic, it was essential to have a clear rationale or purpose for testing (i.e. optimising clinical care, deploying countermeasures, understanding the epidemiology or viral evolution or assessing the impacts of countermeasures). As more tests and technologies became available the policies also changed (e.g. testing to travel or environmental testing e.g. wastewater.), which is exhibited in **M2B/WG/RO/60-INQ000177534**. Furthermore, in the early phases of the work, there were issues with the procurement of reagents and equipment in Wales. In part this was because of decisions in Whitehall regarding testing, but also because of global demand. Relevant email exchanges are exhibited in **M2B/WG/RO/61- INQ000310023**.

141. I am indebted to the drive, determination and support of my colleagues both from within Welsh Government, notably **Name Redacted**, and programme partners, such as PHW (Dr Tracey Cooper, Dr Robin Howe, Prof Tom Connor), the Life Science Hub (Cari-Anne Quin) and Health Technology Wales (Dr Susan Myles) during this

⁸⁴ M2B/TAC/01 paras [135-7](#), [146](#), [149](#), [160](#), [171](#), [178](#), [185-6](#), [196](#), [211](#), [223-7](#)

⁸⁵ Annex C M2B-TAG-01 TAC brief 5 May 2020 [INQ000411802](#)

period. I also recognise the incredible effort that was afforded by my colleagues, such as Claire Rowlands from April onwards on the Test Trace Protect programme.

Autumn 2020 onwards

142. The firebreak period is covered in my corporate statement⁸⁶. The first SAGE discussion of a 'circuit break' which we termed 'firebreak' in Wales (so as not to confuse with our use of term 'circuit breaker' to describe epidemic conditions that would require policy intervention) was on 20 September 2020 with further advice provided on 25 September 2020⁸⁷.

143. My view at the time was that epidemic indicators were deteriorating in Wales, even with local interventions in place. Based on the international picture, which was one of increasing epidemic growth, more needed to be done in Wales to reduce the growth of the epidemic. The TAG advice on introducing a firebreak was followed and announced on 19 October 2020. The advice paper that was published on the same day set out the epidemiological position of why a firebreak was required. In the same paper the balance of harms (e.g. economic) was also considered. This paper is exhibited at **M2B/WG/RO/62-INQ000239571**.

144. Prior to the Firebreak in Late August and in early September 2020 we were commissioned to provide advice on NPIs that would impact transmission. A copy of the commission is exhibited at **M2B/WG/RO/63- INQ000349843**. A paper on NPI toolbox was developed by TAC and agreed by TAG, as exhibited at **M2B/WG/RO/64 INQ000350547** and **M2B/WG/RO/65-INQ000220672**. The paper was shared with SAGE as exhibited in **M2B/WG/RO/66- INQ000349853**. The TAG paper was used to support a paper on the effectiveness of NPIs which was developed by John Edmunds and Fliss Bennee OBE. The outputs of these discussions led to the advice related to a Firebreak which is exhibited at **M2B/WG/RO/67-INQ000350789**. During this period, in a Permanent Secretaries meeting, it was indicated that England would not pursue a firebreak. A note of this meeting is exhibited at **M2B/WG/RO/68-INQ000349867**.

⁸⁶ M2B/TAG/01 para [151](#), [159](#), [161](#), [248](#), [250](#)

⁸⁷ Annex C M2B-TAG-01 - TAC CMO Brief (20 Sept 2020) [INQ000222823](#), SAGE 58 (21 Sept 2020) [INQ000061566](#), SAGE 59 (24 Sept 2020) [INQ000061567](#)

145. Over the following weeks we advised senior officials that intervening early was preferential, which I exhibit at **M2B/ORFORD/69- INQ000349942**. An options paper was written by Tom Smithson with Firebreak options (13 October). A summary Firebreak paper was produced to support a Cabinet discussion on 18 October where the Firebreak was agreed, which is exhibited above at **M2B/ORFORD/67- INQ000350789**. I attended an off-the-record media briefing on the Firebreak with Fliss Bennee on 19 October 2020.

146. Requests for further information on the financial considerations of the cabinet meeting related to the Firebreak and period after this are best addressed to the FM.

147. NPI interventions, such as firebreaks or lockdowns, are a blunt tool, they should be guided by the best epidemiological intelligence available, and the five harms framework should be central to policy thinking. Such interventions should be pre-planned as part of the policy arsenal for dealing with pandemics, rather than done reactively. Earlier intervention where uncontrolled growth is observed (or highly likely) has a greater impact than intervening later, stakeholders and the public should know well in advance that such measures may come and the conditions that will be introduced as a result (e.g. to help supply chain planning). Similarly, the exit conditions and reasons for them (e.g. to maintain R_t at or below 1 for a defined period) or other policy objectives (e.g. minimizing economic, educational impacts) should be discussed, agreed and published prior to the intervention with a clear assessment of the best evidence available. These plans should be reviewed, exercised and red-teamed regularly.

148. Responding early is not without its challenges particularly if sentinel surveillance is poor or underpowered, or there is a lack of trust or uncertainty in international data. Intervening early also requires agreement from ministers and well-formed policies in the planning stages (e.g. this is what we will do, and these are our strategic objectives in doing so, this is the cost, this is how will deliver said objectives, this is how we will evaluate the policy). Building trust with the public and key stakeholders (e.g. local authorities, Unions) through open dialogue is important such that co-produced achievable plans can be put in place to mitigate disruption and indirect impacts. Public and government trust in science and public health

leaders and organisations should be built and invested in prior to the event. Lastly and importantly responding to pandemics should not be politicised, a grown-up UK relationship is required in trusted partnership with common goals and approaches agreed. If all of these things had been in place prior to the first and second wave we would undoubtedly have intervened earlier and reduced the worst impacts of the pandemic. The pandemic was unavoidable, but its impacts however bad' could have been far worse for Wales and the UK.

149. Lessons learnt for the firebreak period have been published including the TAC paper exhibited in **M2B/ORFORD/71-INQ000227898** and **M2B/ORFORD/72-INQ000353585** which suggested national interventions were more effective than local interventions, but that any intervention waned over time. The firebreak itself pushed the epidemic back 38 days thus achieving its aim. I exhibit a modelling retrospective paper at **M2B/ORFORD/73- INQ000300189**. Following the Firebreak in Wales I drafted a paper that considered the addition of mass lateral flow device testing to a future shorter firebreak (as had been implemented in other countries e.g. Slovenia). However, this paper did not gain policy traction and may have been considered too costly, considered too difficult to operationalise or out of step with political thinking. I exhibit this paper at **M2B/ORFORD/74-INQ000349990**. Mass testing in Merthyr Tydfil in Winter 2020 was undertaken as part of a UK pilot and was shown to be an effective intervention, as exhibited in **M2B/ORFORD/75-INQ INQ000300182**.

150. On 30 October I advised that 'A new, simpler, national approach, with sustainable changes in behaviour in many areas of life is needed in order for R_t to remain as near to 1 as possible' which reflected the need to move away from local restrictions and ensure simpler messaging about understandable restrictions to stop the epidemic from growing'. This was not reflected in the subsequent Ministerial advice [MA/FM/3689/20] which said 'keeping it at a manageable level (at or below R_t 1.2)'. This MA is exhibited at **M2B/ORFORD/76- INQ000198589**.

151. Unfortunately, the Firebreak was seen as a way of setting a sustainable path for Wales through to Christmas with fewer restrictions (and balancing harms) but predicated on behavioural changes rather than an opportunity to continue to decrease the epidemic and hold it at a sustainable level and avoiding exponential

growth. A relevant media report is exhibited at **M2B/ORFORD/77- INQ000353576**. Unfortunately, the force of the epidemic and the numbers of relaxations did not enable this to happen.

152. My view was that too many changes were made at the same time and that the impact of fewer relaxations (e.g. return to education) were not observed before more were made (e.g opening hospitality and leisure facilities). This was reflected in the CMO's statement that was annexed to the Ministerial Advice exhibited above [MA-FM-3689-20] *'This context supports the proposal for a gradual rather than total easing of our firebreak arrangements. It is imperative that we avoid extended chains of inter-household mixing in either private or public settings. Allowing only two households to come together as a single extended household is an appropriate measure'*. As well as opening up too much of society at once I think that opening hospitality at this time was a mistake as it led to a general feeling of 'if it is okay to go to the pub, then it is okay for me to mix with others' and play the system, for example four sets of four friends would visit a pub at the same time. Due to the difficulties and harms associated with control measures (such as loss of income and education), the seriousness of the potential health impacts at this time were not considered in a balanced way, with the conversation more about what people want, without the reasoned debate about how this could impact on the health of the population. In a reasoned discussion about restrictions it would be sensible to say we can do X but there is a 50% chance it might lead to Y, if we do half of X then there is a 25% chance it might lead to Y. This framing of decisions might have helped people decide the level of risk that they were willing to take when deciding between one harm (economic loss, loss of freedoms) and another (hospitalisations, deaths).

153. On 9 November 2020 we published a TAG paper on behavioural science paper post firebreak – with the paper encouraging a simpler co-produced national approach, encouraging collective responses that reduce inequalities. This paper is exhibited at **M2B/ORFORD/17-INQ000066117**. The paper was used in considerations about the post-Firebreak period and advocated a simpler national approach with clear messaging that encouraged collectivism and positive behaviours. Changing the narrative from 'what can I do' to 'what should I do' proved difficult.

154. The relaxations agreed in the period (and public behaviours) led to exponential growth of the epidemic in Wales. A TAC internal summary showed mobility had returned to pre-Firebreak levels and mixing in people's homes for social reasons had increased⁸⁸.

155. Given the lagged nature of some of the indicators (e.g. Rt) that were reported it took several weeks to see the loss of the benefits gained from the Firebreak and a return to exponential growth (which was first seen in an increase in reported cases) on 20 and 27 November. TAC summaries are exhibited in **M2B/ORFORD/79-INQ000066436** and **M2B/ORFORD/80- INQ000312067**.

156. In the same period TAC was commissioned to consider the approach to schools, with Ministers committed to closing schools as a last resort. Whilst we made it clear that opening schools would impact on the epidemic, we also advised on measures that might reduce transmission in schools and educational establishments. The TAG evidence review is exhibited in **M2B/ORFORD/81- INQ000299692**.

157. In my Cabinet advice on 25 November, exhibited at **M2B/ORFORD/82-INQ000350002**, for the restrictions review on the 2 December 2020 I said that 'it is better to intervene early than late; short and sharp interventions work; compliance wanes over time; and firebreaks and harder restrictions (e.g. tier 3+) can reduce levels of transmission in the community. Rules must be simple, understandable, and achievable – with an agreed beginning and end.' In the policy modelling advice which was published on 18 December we advised that 'The most efficient way to reduce harm from covid-19 and pressure on the NHS is to remove the Christmas relaxation policy and move to alert level 4 restrictions as soon as practically possible (high confidence)'. This advice is exhibited in **M2B/ORFORD/83- INQ000321023**.

158. Following the firebreak I continued to advise on the nature of the epidemic in Wales including the deteriorating nature of the situation and need for further interventions before Christmas, and I exhibit this advice in **M2B/ORFORD/84-INQ INQ000227903**. This included publishing a statement on 7 December 2020 on NPIs

⁸⁸ Annex C M2B-TAG-01 - 13/11 [INQ000396239](#) and 20/11 TAC Brief [INQ000066436](#)

in the pre-Christmas period which highlighted the need for Tier 3 restrictions. This statement is exhibited in **M2B/ORFORD/85- INQ000350042**.

159. Based on my observations, it is important to stress that Firebreak and other measures were very difficult decisions for ministers to make due to the costs and indirect harms that would be accrued (as in the first lockdown) and the imposition on the lives and livelihoods of the people of Wales. I believe ministers did take our advice seriously. The firebreak had the intended effect on the epidemic in Wales, but the conditions of the pandemic deteriorated in the run up to Christmas.

160. My corporate statement⁸⁹ describes the period following the firebreak and the advice that was provided with regards to the Alpha variant and measures that might be required to control the growth of the epidemic in Wales.

161. Following an extraordinary meeting of NERVTAG and SPI-M that I attended on 21 December 2020 and SAGE 74 I updated officials on 22 December 2020 via the TAC Internal Brief. TAG published a brief on the more transmissible Alpha variant on 23 December 2020⁹⁰.

162. With the later emergence of Delta and Omicron again my advice to Welsh Government, ministers and stakeholders included specific information for Wales about the new variants. The small changes in the genetic code of each variant led to significant activity due to the potential and realised behaviour of the disease as each became more dominant in Wales. Prior to the variants becoming dominant uncertainties related to immune evasion, increased transmissibility and pathogenicity were key considerations with our advice evolving rapidly as new evidence became available. In each case we worked closely with SAGE, UKHSA and Public Health Wales. An example of this was when Omicron first emerged there was concern that the variant could have been both more transmissible and have a similar case to hospitalization ratio to Delta variant which could place a material risk to the NHS in Wales, see TAG advice dated 15 December 2021 which I exhibit at **M2B/ORFORD/86-INQ000228012**. Within two days the likely CHR was considered to be lower than that of Delta which significantly impacted on NHS demand

⁸⁹ Paras 156-162

⁹⁰ Para 158 M2B/TAG/01

projections, and the advice to deploy Level 4 protective measures was rescinded, in exhibit **M2B/ORFORD/87- INQ000350492**.

Covid -19 Harms

163. During the early phase of the pandemic we advised in CMO updates and briefing notes on the direct harms associated with Covid-19 which included both the impacts on the population of Wales (e.g. number of people infected, symptomatic, seriously unwell and deaths) alongside NHS impacts (e.g. number of beds or ICU units required, including peak demand)⁹¹. On numerous occasions TAC advised on the harms and impacts associated with the pandemic and the protective measures (NPIs), which also included health inequalities⁹². In TAC advice in exhibit **M2B/ORFORD/88-INQ000239542** on 19 October and **M2B/ORFORD/89-INQ000227486** from 25 November 2020 we provided officials with a high-level summary of evidence on costs and benefits and potential mitigations for measures to address Covid-19 in Wales. We also advised on socio-economic and indirect harms⁹³. The Welsh Government Chief Economist (Jonathan Price), Lead Health Economist (Brendan Collins) and Chief Statistician (Stephanie Howarth) and members of their groups were represented on TAG; a socio-economic harms group was also established⁹⁴. Modelling unintended consequences was described in the early TAC updates to CMO⁹⁵. Whilst we considered and advised officials and ministers on the indirect health harms and other harms related to the pandemic and policy choices in Wales throughout this early period, it wasn't until July 2021 that we first published our approach to considering these impacts and the five harms attributable to the pandemic. This paper is exhibited at **M2B/ORFORD/90-INQ000350570**.

164. Vulnerable groups were considered throughout the period with a great many discussions in SAGE and TAG about the consequences of the pandemic on at risk

⁹¹ Paras 82-90 M2B/TAG/01

⁹² Paras 112, 132, 142, 155, 172, 181, 188, 198, 204 of M2B/TAG/01

⁹³ Annex C M2B-TAG-01 - TAC CMO Brief 20 Mar 2020 [INQ000312929](#), TAC Covid-19 Brief 23 Mar 2020 [INQ000311876](#), TAC CMO Brief 14 Apr 2020 [INQ000220420](#), TAC CMO Brief 20 Jun 2020, [INQ000311887](#)

⁹⁴ Table 1 M2B/TAG/01 - p14 CMO TAC Brief 27 Mar 2020 [INQ000312879](#)

⁹⁵ Annex C M2B-TAG-01 - [INQ000311876](#), [INQ000384072](#) and [INQ000384072](#)

populations, for example I exhibit **M2B/ORFORD/91- INQ000311863** which is a summary of advice dated 5 June 2020. Like all other pandemic and other PHEICs there were disproportionate impacts on some parts of society compared with others (e.g. direct health impacts on older adults, non-health impacts on children and young people, higher risks for front line works, higher risks for some ethnic groups). For example the Clinical Characterisation Protocol (CCP) for Severe Emerging Infection was developed by the International Severe Acute Respiratory and emerging Infections Consortium (ISARIC) and served as an important study to understand higher risk populations (e.g. minority ethnic groups), this work was regularly bought to SAGE and in turn my advice. I exhibit this paper at **M2B/ORFORD/92- INQ000353584**. Advice related to shielding policies for clinically vulnerable groups was discussed regularly in TAC and SAGE⁹⁶ as were the consequences of lockdown measures on vulnerable groups, which is exhibited above in the CMO Brief of 23 March.

165. Some examples of CMO briefings that advised on the impacts on minority groups disclosed in Annex C to my previous statement are referenced in the footnote⁹⁷ as well as the corresponding SAGE meetings that reported differences in health outcomes in different ethnic groups from early on in the pandemic. Advice on impacts on minority groups was also provided to Welsh Government by the FM's Black, Asian and Minority Ethnic COVID-19 Advisory Group.

166. Throughout the pandemic we assessed the impacts of the measures that were put in place to protect the people of Wales and the NHS from the worst of the pandemic. For example, an NPI tool was created to support decision makers estimate the impacts of their policies. As well as the SAGE related activities that were undertaken to monitor the progress of the epidemic and evaluate the likely or actual impact of measures (e.g. modelling, review of local restrictions) TAG undertook studies to describe the impact of the epidemic and relevant measures (e.g. Covid-19 deaths, social cost of a case, Covid-19 health inequalities) More

⁹⁶ Annex C M2B/TAG/01 - TAC CMO Brief (28 Apr 2020) [INQ000336466](#), TAC CMO Brief (24 July 2020) [INQ000311892](#), TAC CMO Brief (31 Jul 2020) [INQ000385411](#), SAGE 29 (28 Apr 2020) [INQ000053212](#)

⁹⁷ Annex C M2B/TAG/01 - TAC CMO Brief (28 Apr 2020) [INQ000336466](#), TAC CMO Brief (24 July 2020) [INQ000311892](#), TAC CMO Brief (31 Jul 2020) [INQ000385411](#), SAGE 29 (28 Apr 2020) [INQ000053212](#)

recently my group undertook work to estimate the impacts of protections in Wales⁹⁸. In doing so they described the positive benefits of reducing transmission through NPIs which decreased cases, hospitalisations and deaths in Wales and the negative impacts such as on other patient pathways, increasing staff absence through isolation, impacts on mental health, loss of education, economic impacts, increasing inequalities.

Health inequalities

167. Covid disparities (differences) and health inequalities (unfair or avoidable difference in health) is a very important and far-reaching subject that merits close consideration, not just for Covid-19 but for society. I exhibit a relevant paper at **M2B/ORFORD/93- INQ000353589**. I have referred to this matter several times in this statement and in my corporate statement. In Wales, we specifically identified a fifth harm for Covid which was the 'exacerbation of old, or introduction of new inequalities' due to the pandemic or arising from protective measures. TAC advice is exhibited in **M2B/ORFORD/94- INQ000300206**. We undertook analysis and published papers on health inequalities and disparities to support policy colleagues in their work in reducing health inequity. Examples are provided in **M2B/ORFORD/95- INQ000239587** and in the paragraph above, exhibit reference **M2B/ORFORD/88- INQ000239542**.

168. Covid-19 disparities, whether related to ethnicity, age, sex, employment, housing, comorbidities, behaviours and combinations therein, were obvious throughout the pandemic and were most pronounced in deaths. For example, an 85-year old person was far more likely to experience a poorer outcome than a 40-year old individual, this is a Covid-19 disparity or difference and was difficult to avoid, at least before vaccines, due to differences in the bodies response to the viral infection. A 65-year old male from a lower socioeconomic background had a higher risk of a poorer health outcome than a person of the same age and sex from a higher socioeconomic background, this is a health inequality and could be avoided or reduced through interventions (e.g. via target risk communication, or easier access to a vaccination clinic).

⁹⁸ Exhibit RO/M2B/TAG01/80 - [INQ000300217](#)

169. Often there were intersecting inequalities that would act to exacerbate health inequity for some (for example, an older male from a south Asian community, with diabetes, in a lower paid front line job could be at higher risk of a poorer outcome than others of the same age, sex, community, without diabetes or front-line job). There are a myriad of other factors at play (e.g. psychosocial, discrimination, housing, education, access to healthcare, geography) that can lead to health inequity. Effort should therefore be expended on identifying and supporting those at higher risk (e.g. in vaccination strategies) to reduce health inequalities.

170. In October 2020 we published a paper to understand current and future health inequalities around COVID-19 and suggested some potential mitigations for these inequalities. The parallel work by the FM advisory group on worse COVID-19 outcomes in BAME (Black, Asian and Minority Ethnic) communities was published on 22 June 2020 and identified the full range of structural inequalities seen in deprived communities, with the additional influence of the effects of racism.

171. Welsh Government has committed to addressing inequalities in the Wellbeing of Future Generations Act and other strategies (e.g. A Healthier Wales) which once realised will reduce social inequalities and improve societal resilience against events like pandemics. This is exhibited in **M2B/ORFORD/96- INQ000353588**.

172. Health inequity is apparent and measurable in other diseases like cancer and cardiovascular disease, as well as health life expectancy and life expectancy. The pattern of health inequity for 1918 flu deaths was similar to Covid-19. Unless societal inequalities are targeted by governments then underlying structural and societal factors related to health inequity will influence the accumulation of deaths, hospitalisations and cases in the next pandemic, the resulting policy response (particularly non-medical) will lead to other inequities (e.g. economic, educational).

173. Whilst we described and reported on Covid disparities and health inequalities, as well as providing policy recommendations, my group did not set policy (e.g. measures to protect front line healthcare workers). Questions related to the measures and policies that were deployed to tackle health inequalities are best addressed to policy leads in Health and Social care or other Groups in Welsh

Government for the policy response related to other inequalities (e.g. economic, employment, educational).

Long Covid

174. On 3 September 2020 a meeting (chaired by Ruth Crowder) and attended by members of TAC began to consider the impacts of Long Covid in Wales. Several colleagues flagged work of the Tony Blair Institute on 5 October, exhibited at **M2B/ORFORD/97- INQ000350796** which further stimulated discussion about the need to further understand and estimate the impact of Long Covid in Wales, as well as summarising ongoing research on the matter.

175. A discussion paper was written for TAG to consider in December 2020 with a revised version published in February 2021, which is exhibited at **M2B/ORFORD/98- INQ000350221**. Colleagues in my group worked closely with the policy leads (notably Ruth Crowder) on ensuring access to the relevant understanding of the long-term conditions associated with SARS-CoV2 infection. My group worked closely with the Healthcare Research Wales Covid-19 Evidence Centre to follow-up with a report on active research on Long Covid, which was published in November 2021, and exhibited at **M2B/ORFORD/99- INQ000350797**. An update paper from my group on Long Covid in Wales was published in October 2022, and exhibited in **M2B/ORFORD/100-INQ000350785**, and **M2B/ORFORD/101- INQ000353591**.

Covid-19 Deaths

176. Alongside colleagues from the Welsh Government Knowledge and Analytical Services (KAS) we undertook analysis on Covid-19 deaths in Wales after wave one publishing our first paper in July 2020, which I exhibit at **M2B/ORFORD/102- INQ000252532**. The paper considered the deaths in Wales associated with COVID-19. The paper stated that there were fewer deaths in Wales compared to the UK as a whole and most parts of England and that highest death rates were in older people, people from BAME backgrounds and deprived communities. We made several recommendations regarding timely surveillance and TTP and advised that there should be a continued focus on identifying and protecting the most vulnerable people in society. We undertook a further analysis of deaths (and hospital

admission in March 2022 showing deaths and social inequalities, providing estimates of years lost life during the pandemic period and how vaccines had reduced absolute health inequities. This is exhibited at **M2B/ORFORD/94-INQ000300206**.

Lessons learnt

177. I have previously expressed that we were unprepared for the arrival of a pandemic from a scientific advice perspective in Wales. If we had TAC or a similar structure in place, with the tools developed during the pandemic (e.g. dashboard, policy modelling, behavioural science) prior to the pandemic it is entirely possible that we would have reacted differently from January onwards. I believe that more Welsh Government coordination meetings in January and February 2020 would have been helpful. However, planning preparedness and response activities were not within my remit and so information in this regard is best provided by others.

178. My module one statement⁹⁹ describes lessons learned and recommendations related to pandemic preparedness activities. In my Corporate statement¹⁰⁰ for M2B I also describe the lessons learnt exercises and papers that I led during the period in question, which I have expanded upon below. In my view the TAC/TAG model worked as well as could be expected given the condition, and on the whole, received positive feedback from TAG members and policy colleagues (as below). Invariably if the system had been established, exercised, iterated and red teamed prior to the pandemic this would have been advantageous with improvements made and opportunities to address any perceived weaknesses (as below). Ensuring greater alignment with the Code of Practice for Scientific Committees in future is important, but also the code of practice may need to be updated to reflect the extraordinary experience of the pandemic and how, in these circumstances, scientific advice is provided to government.

179. Notwithstanding the 'lessons learned' analysis, which is obviously hugely informative and beneficial, I can demonstrate that we learnt from experience and

⁹⁹ M1/ORFORD/01 paras 29-50

¹⁰⁰ TAC/TAG Module 2B statement [paras 229- 237]

iterated our approaches as we moved through the pandemic - adapting our form and function to meet the challenges ahead and we continue to do so. The review exercises undertaken during the pandemic were designed to understand and address perceived weaknesses and also to plan ahead. The papers covered both the setting up and operation of TAC and TAG and work programmes and are detailed below.

180. An internal TAC paper was authored in July 2020. The internal review exercise considered the resilience and operation of TAC, which I exhibit at **M2B/ORFORD/104-INQ000349840**. Whilst positives were identified there were notable weaknesses related to sustainability of the response and impact on staff, lack of planning, the temporary nature of the staffing arrangements and need for specialists. Some of the actions identified were incorporated into the winter paper below (e.g. setting up of subgroups), other actions were taken forward separately e.g. establishment of desk instructions.

181. Following the first wave of the pandemic in July 2020, I co-authored a paper entitled Preparing for a Challenging Winter 20-21, exhibited at **M2B/ORFORD/07-INQ000350159**. In it, recommendations were made (and actioned) relating to the form and function of TAC and TAG that recognised the current and future challenges including: the setting up of new groups (Virology and Testing Subgroup, Environmental Science Subgroup, Risk Communication and Behavioural Insight Group, Socioeconomic Harms Subgroup, International Intelligence Subgroup, Children and Education Subgroup), strengthening TAC, ensuring REF recognition for members, providing formal advice to 21 day review cycles, agreeing RWCs, development of indicators and circuit breakers, wider use of behavioural science, creation of the Covid Evidence Centre.

182. In March 2021, I co-authored a TAG discussion paper called 'Returning to a 'new' Normal', which I exhibit at **M2B/ORFORD/106-INQ000282033**. The paper was shared with ministers and policy colleagues. The purpose of this paper was to consider future policy needs from a scientific perspective for transition to a more complex, less technical – business as usual for COVID-19. The paper was intended to support broader policy led recovery discussions and planning. In total, 11 recommendations were made which together advised a 'one health' evidence-

based approach that embraced the challenges the changing pandemic would pose (new variants, more waves, changing population behaviours and vaccination, deepening of inequalities and formation of new ones). Our recommendations touched upon a broad range of topics including: the use of the five COVID harms to support policy development, decision making and evaluation; to strengthen Welsh Government's ability to co-ordinate and collaborate on the provision of science advice for COVID-19; nesting future pandemic planning into long-term goals and policies; improving case finding through TTP and scaling sequencing capacity; continued policy modelling and surveillance, including internationally; development of strategies to promote adherence to infection control behaviours; support national research and knowledge mobilisation for recovery; and take steps to understand and mitigate socioeconomic, educational and other harms. Many of the recommendations from this paper have been taken forward; for example, we published a paper on the five COVID harms and the revised CPP reflected the need to balance these harms as one of its two strategic aims.

183.A further internal review work for TAC was carried out in July 2021, which is exhibited at **M2B/ORFORD/107-INQ000350790**. Some of the lessons identified and actions were taken forward in the creation of Science Evidence Advice (SEA) Division in HSS. Other identified actions, such as those related to TAC subgroups were carried forward into the Preparing for a Challenging Winter 21/22 paper, exhibited above at **M2B/ORFORD/105-INQ000350159**. Some issues identified in both internal TAC reports, particularly those related to staffing models that afford a sensible work life balance for civil servants responding to emergencies have so far not been addressed.

184.In July 2021 an Executive Committee workshop on the use of evidence in Welsh Government, exhibited at **M2B/ORFORD/108- INQ000338131**, made the following recommendations:

- a. Building capacity – including dedicated budget bids for evidence, developing in-house analytical capacity;
- b. Improving links with academia – including fast track secondment schemes, better use of PhD interns and fellowships;

- c. Supporting the post-pandemic continuation of innovative approaches to science and evidence developed during the pandemic like the TAC and,
- d. Becoming a more evidence driven organisation – including considering establishing an evidence advisory board, develop robust plans for emergency technical and scientific advice.

And three statements of ambition:

- I. Ministerial advice, decisions and policy direction should be based on high quality evidence from a range of sources.
- II. Citizens should have the data and information they need to hold government to account.
- III. The Welsh Government needs to maximise research impact and research income into Wales to ensure that the academic research base has the capacity to provide high quality evidence for future policy needs.

185. I co-authored a second TAG paper on winter preparedness, which was shared with officials and ministers in October 2021, and I exhibit at **M2B/ORFORD/109-
INQ000350502**. The purpose of this paper was to consider what evidence or information might be required to support the Welsh Government response for winter 21/22. Similarly, to our previous winter paper, it identified gaps and uncertainty in our understanding and made recommendations, based on the available evidence, but also posed a key question for policy colleagues on what outcome the Welsh Government was now seeking to achieve, given the balance of harms had changed by this point with more focus on hospitalisations than on deaths. 26 recommendations were made in the paper, the first one being that the Welsh public sector should consider and prepare for two different scenarios – seasonal normality of COVID-19 and continued public health emergency response. This first recommendation was reflected in the updated Coronavirus Control Plan published in October 2021 which set out the Welsh Government's planned response for COVID-19 stable and COVID-19 Urgent scenarios. This document is exhibited at

M2B/ORFORD/110-INQ000337845. Other recommendations focused on prioritising the reduction of nosocomial infection, continued collection of data on health and social care associated COVID-19 infection, maintaining testing as an effective intervention that produces a changed clinical outcome, consideration of the possible rates of ingress of variants with different characteristics, and maintaining capability for mass vaccination beyond summer; all of which were picked up through activity set out in the Welsh Government's Public Health Respiratory Winter Plan for 21/22, which is exhibited at **M2B/ORFORD/111-INQ000350791.**

186. From the above it is evident that the form and function of TAC and TAG were considered throughout the pandemic and changes were made to address challenges, and also anticipate and support the Welsh Government needs. Furthermore, that TAC and TAGs operation, functions and structures have been analysed and critiqued as we have come out of the pandemic and moved back to 'normality'.

187. Whilst the structure and function of TAC and TAG was reviewed throughout the pandemic, I felt it was important that towards the end a comprehensive 'wash-up' session was carried out to ensure that lessons learnt from the setting-up and running of TAG and its subgroups were captured, from the viewpoint of its members. On 6 May 2022 this wash-up session was conducted, Exhibit RO/M2BTAG01/051 provides a more detailed description of what worked well and what could be improved with regard to the group. The key points are highlighted below¹⁰¹:

- a. The TAG subgroup chairs expressed the positive experience their groups had, and that the diverse make up of all the subgroup memberships worked really well. The demands initially were extremely high with short turnaround deadlines but all managed to deliver within the required timescales.
- b. Some members reported incidents of challenging encounters, where they faced difficult discussions within their groups. They felt it was appropriate

¹⁰¹ Exhibit RO/M2BTAG01/48 - [INQ000300265](#)

to help answer a policy question through the provision of evidence and science but not to advise if a particular policy should be implemented. On reflection, groups should have maintained a stronger dedicated focus on science.

- c. The subgroups felt there was a good breadth of expertise and membership attending their meetings. The connections made with external partners were very supportive, they shared intelligence, data and information in a timely way to help deliver workstreams during the pandemic. It was suggested that the subgroups needed to be set clear objectives in order to better identify their membership needs.
- d. Engagement and communication were felt to be a positive experience, with MS Teams and Objective Connect and their available functions being useful tools in terms of connecting with external stakeholders. The barrier many of the subgroups faced was when multiple individuals were required to review and provide input to a single document. This is something which needs further discussions with the Welsh Government IT and Security colleagues.
- e. Some groups faced difficulty to get their foot in the door to UK led meetings. To help engagement and communication for Wales, Welsh Government officials should work closely with UKG counterparts to ensure experts and policy officials have access to advice with representation on relevant groups.
- f. Recognition from WG of individual and group efforts could be improved and may help to sustain involvement and acknowledgement of how the evidence from TAG has been used to inform the response to Covid-19.
- g. Process development and management is an area of focus for improvement, even though it has evolved over time, as there is a need to ensure a clear and effective way to deliver key workstreams.

- h. Setting Terms of Reference which are clear to understand, set out the scope for each subgroup and that are regularly reviewed to ensure they remain fit for purpose was suggested.
- i. The TAG Wash up event was very insightful with good open and honest feedback provided by all.

188. The recommendations put forward for consideration on the future of TAG included:

- a. Continue the TAG and subgroup meetings but less frequency to allow its members to continue to discuss and share information on recovery (ongoing).
- b. Keep a 'sleeping core' of some subgroups that can be readily reactivated if a COVID 'urgent' scenario arises (ongoing).
- c. Create and review terms of reference (including membership) for both the TAG and all subgroups regularly, with timely update of the WG website; this will support in recruiting the right expertise and set clear direction for each group (ongoing).
- d. Welsh Government officials should work closely with UKG counterparts and other UK level organisations to allow access to advice and visibility of other groups (ongoing).
- e. Improve sharing of evidence outside of Wales and ensure appropriate attendance at all UK level subgroups and meetings (ongoing).
- f. Consider the utility of an evidence synthesis and rapid primary review function, like the Wales Covid-19 Evidence Centre, beyond Covid to support decision making both in non-emergency and future emergency contexts. This is exhibited in **M2B/ORFORD/112- INQ000353521**.

- g. Consider the digital access granted to trusted external partners and identify the best solution for use in future emergency scenarios, to expediate drafting of advice by multiple parties in real-time.
- h. Review and improve the co-ordination of communication and information flows from subgroups to the main TAG and vice versa.
- i. Provide research excellence framework (REF) letters to TAG and subgroup members, exhibited in **M2B/ORFORD/113-INQ000350783**.
- j. Clearer processes for commissions for new advice and finalising papers for publication to aid efficiency and manage demand, as exhibited at **M2B/ORFORD/114-INQ0003507920**.
- k. Consider how science can be applied more broadly to future emergency planning and decision making.

189. In addition to our 'wash-up' session, a Welsh Government review (by Bethan Bateman) of TAC and TAG from the Welsh Government Officials perspective was conducted, which is exhibited in **M2B/ORFORD/115- INQ000350575**. It identified areas that required further work and consideration, much of which was incorporated in the establishment of the Strategic Evidence Board [below]. These areas included:

- e. The need for improved scientific literacy in policy to improve the challenge of scientific advice.
- f. The need to have sufficient internal analytical capacity and for the analyst to policy interface to be improved.
- g. The need to have one version of advice that combined the view of CMO, TAC and PHW.
- h. Difficulties with the sheer volume of meetings and papers and it being difficult for policy officials to keep up with the narrative.

- i. The need for clarity of what was on offer, as noted in para 49b, with policy colleagues needing help on policy options and scientists oriented towards the evidence rather than recommendations.
- j. Difficulties with creating a balanced harms policy approach when the non-health harms were difficult to measure reliably (at least in the short term).
- k. Recognition that policy needs to be well rounded and there are potential problems with direct access to science specific conversations with ministers, like policy modelling, without the wider policy wrap.

190. In recognising organisational risks related to the use of evidence and science, that were apparent in the pandemic, a paper was taken to the Executive Committee in April 2022 which is exhibited at **M2B/ORFORD/116-INQ000338133**. The paper asked 'how can we use evidence better, to inform effective policies and also help the organisation address future challenges' and made three recommendations:

- I. Agree a formal Strategic Evidence Board (SEB) should be established with a senior chair from Exco membership to provide leadership on the use, delivery and organisation of evidence in Welsh Govt. The SEB should be tasked to take forward the actions outlined in the paper.
- II. Agree to a federated model of thematic evidence hubs, with the TAC model providing a sound basis for a common operating model in terms of engagement with wider research networks, but with clear flexibility to redeploy resources as needed and to collectively build capacity in scarce or emerging skills.
 - i. Sub-Recommendation 2a: Note that, as part of recent HSSG discussions and in support of the Transition Programme, key functions of TAC will be retained within HSSG to capitalise on the learning of the pandemic and to provide ongoing continuity in

scientific and analytical evidence around Covid and other communicable diseases.

- III. As part of the transition plan, commission a piece of work to scope and cost the requirements for data and evidence to support Civil Contingencies operations, to provide a more robust platform for future emergencies alongside wider work being taken forward by the NS&CC team.

- IV. Agree that as an organisation the Welsh Government needs to embed a better culture of evidence use within our processes and policy development, including awareness raising and capability building amongst policy professionals.
 - i. Sub-Recommendation 4a: Note the work of the SEB would include working with Cabinet Office and the Policy Profession to develop mechanisms which maximise opportunities for challenge and evidence input to be introduced at an early stage of policy formulation.

 - ii. Sub-Recommendation 4b: To agree that the CSA Wales will work with science, research and innovation policy leads across the Welsh Government to develop proposals for a coherent and strategic approach to the Welsh Government's science evidence and research policy.

191.A cross-government programme of work, under the auspices of the Strategic Evidence Board is now in place to take forward the identified actions.

192.In February 2022 a paper describing the transition of TAC to a new 'business as usual' model was shared with ExCo. I exhibit this paper at **M2B/ORFORD/117-INQ000353573**.

193.Following an organisational development process in HSS Group, SEA Division was established with a paper approved by the Executive Group on its form and

function. The paper describes the differences and similarities with TAC. A further paper on the SEA work programme was approved in May 2023. These papers are exhibited at **M2B/ORFORD/118-INQ000187543** and **M2B/ORFORD/119-INQ000350784**.

194. Like finance and legal considerations, evidence (from groups like TAC or SEA) should be a required component of policy development (and evaluation) and advice to ministers. If the science advice systems had been established, exercised, iterated and red teamed prior to the pandemic this would invariably have been advantageous. This is also dealt with in my TAC statement para 219¹⁰². There is still much to learn about the scientific response to the pandemic in the UK and there is now a considerable evidence base supporting future work on emergency science, an example of which is exhibited at **M2B/ORFORD/60- INQ000177534**.

195. In summary, largely I believe that the TAC and TAG structure was effective - but not perfect. There were areas that could and should be improved, but it is important to also recognise that the TAC-TAG was a 'pop-up model' borne from the necessity to deal with a high-volume, fast-moving set of complex problems with a high level of uncertainty which yielded both push and pull policy activities (e.g. policy action was required due to external factors (push) and internal demand (pull)). Areas identified for strengthening have by and large been incorporated into plans and operations, but there is more to do. Some areas like improving scientific literacy, in-house analytical capability etc. will take time and are not problems that are exclusive to the Welsh Government. The pandemic has shown us that evidence is important in, policy formation, decision making and evaluation. Also, that it is important to work at the interface between policy and science to ensure that they are as close as possible. Defining and reviewing terms of references regularly both for science advisory committees and for policy groups should ensure that the roles and responsibilities are understood and mission creep is avoided.

¹⁰² Para 230 of M2B-TAC-01

Questions not addressed elsewhere.

196. Questions about the structures within the Welsh Government that are involved in emergency response are best answered by those within the Welsh Government with responsibility for setting up, maintaining and evaluating these structures (e.g. DG Covid-19 Restart and Recovery, DG Health and Social Service).
197. Questions about decision making in the Welsh Government are not in my purview. Decisions were made by elected Ministers, the Welsh Cabinet and the First Minister.
198. I was not made aware of all meetings, the participants and their agendas and therefore it is not possible for me to answer which meetings between key decision makers I should have been invited to attend.
199. Throughout the pandemic period I regularly met with the Health Minister and the First Minister (at least weekly) to update them on the current situation and share emerging or important information. I also regularly met with the Education Minister, particularly during periods around school closure and disruptions. Minutes or notes of these meetings may be available from Ministerial Private Offices and I exhibit at **M2B/ORFORD/121- INQ000350026** an example summary note.
200. During this period all Ministers, including the First Minister, all senior civil servants, special advisors and individuals with whom I had contact, in responding to the pandemic worked tirelessly. I cannot speak highly enough about all of my colleagues who I had the good fortune to work without throughout this period, everyone worked above and beyond what might be reasonably expected of them in very difficult circumstances.
201. I thought about resigning many times over during the pandemic. It was the most unforgiving and difficult period of my working life. I lost two years of seeing my young children grow up due to the relentless schedule. Like the scientists contributing to the effort, I was not reimbursed for the early mornings, late nights, weekends and holidays that I worked which extended well beyond what might

reasonably be expected. Watching my colleagues suffer from mental exhaustion, the scale and the inescapable nature of the work was difficult beyond compare. However, many people in Wales lost so much more and experienced so much worse – for that reason and to try to prevent or reduce further harm I stayed. My firm belief being that science could help inform difficult decisions, especially when there were no harm free options and that evidence would tell us if these decisions were right. To a degree ‘it is what it is’ I was in post when the pandemic arrived, it was my job to see it through as best possible.

202. Other Welsh Government senior officials (Jo Trott) led on the Joint Biosecurity Centre and are likely to provide a more detailed narrative on the creation of the Joint Biosecurity Centre, for example the development of the Agency Agreement between organisations. Aside from being a member of the Technical Board and encouraging the involvement of my staff (Craiger Solomons) with modellers, I had little to do with the establishment of the Joint Biosecurity Centre, although there were discussions in SAGE about the alert levels and also in TAC advice¹⁰³ I exhibit Terms of Reference for the Joint Biosecurity Centre in exhibit **M2B/ORFORD/122-INQ000299826**. Personally, I found the idea of establishing a new public health agency during an emergency very questionable, however we did our best to support officials in so doing. Some of the products of the Joint Biosecurity Centre were helpful in informing our understanding of the pandemic supporting our own risk assessments and informing our advice for Welsh Government. I exhibit the following Joint Biosecurity Centre documents in **M2B/ORFORD/123-INQ000350793**, **M2B/ORFORD/124-INQ000350578**, and **M2B/ORFORD/125-INQ000350794**.

203. Professor John Watkins was a member of the Policy Modelling Subgroup rather than a member of TAG. From our published and unpublished information previously provided to the Public Inquiry it is evident that a much broader set of scientific considerations were made in the formulation of my advice than that which Professor Watkins indicates.

¹⁰³ Annex C M2B/TAG/01- CMO TAC Brief (28 May 2020) [INQ000311884](#)

204. I did not advise on the 'Eat Out to Help Out Scheme' neither did I think it was particularly sensible from an epidemiological perspective. I was not privy to the advice that was offered to ministers on the policy, neither was I asked or commissioned for advice on the matter.

205. TAG published advice on Covid-19 enforcement activities was clear in that 'wherever possible enforcement should be seen as a last resort (i.e. engage, explain, encourage' and only 'enforce' if necessary)'. Also, there was no evidence that an enforcement approach resulted in positive public health outcomes, as evidenced by behavioral insights in exhibit **M2B/ORFORD/17- INQ000066117**. An internal discussion paper from my group related to public disorder was written and shared in autumn 2020, which is exhibited at **M2B/ORFORD/127- INQ000350795**.

206. Questions about Covid-19 official statistics, including health data, are best addressed to Welsh Government KAS, Public Health Wales and the Office for National Statistics.

207. Public Health Communications is covered in my corporate statement¹⁰⁴. My view is that Welsh Government and my colleagues from health who provided the lion's share of public briefings, notably CMO Sir Prof Frank Atherton and DCMOs Prof Chris Jones CBE and Dr Gill Richardson OBE, did an exceptional job in conveying the key points related in public briefings throughout the pandemic.

Concluding comments

208. During the pandemic the very smallest of changes in the genetic code of one viral particle inside a human being across the other side of the world would have profound impacts on our society in Wales – this is still true today, SARS-CoV2 is still with us as are other significant communicable diseases (such as avian influenza) that will one day cause another pandemic. When the next pandemic comes the social inequalities and burden of disease will once again be the soft underbelly of our great nation and science will once again be lent heavily upon for support. It is important that science remains a priority, the pandemic has shown us

¹⁰⁴ M2B/TAG/01 paras [206-218](#)

the importance of using science and evidence to inform policies and decisions about the challenges that we face as a society.

209. As lead science official for Welsh Government during the pandemic I had three principal concerns which I discussed regularly with Fliss Bennee OBE and others. Firstly, that we used science and evidence to the best of our ability to inform policies and decisions to reduce harm arising from Covid-19 in Wales. Secondly, the wellbeing of my staff and members of TAG and its subgroups; who worked incredibly hard over a very long period and thirdly, recognition that everything that we did would be viewed in slower time and fine detail through the eyes of a Public Inquiry. I hope that my evidence demonstrates that I did my best under difficult circumstances in executing my roles and responsibilities.

210. In hindsight, I believe that the Welsh Government developed, iterated and adopted a sensible approach to risk assessment, risk management and decision making that was clear and coherent. I also believe the Welsh Government provided a clear narrative for their actions and published the scientific evidence supporting their decisions as swiftly as possible. At least from my perspective there was a great deal of cross organisational working towards a common purpose of reducing harms from Covid-19. It is my view and that of the Strategic Evidence Board¹⁰⁵ that further work should be undertaken to ensure science and evidence is embedded, like finance and legal, in all Ministerial Advice, including in emergencies.

211. I hope that the lessons learnt from the Inquiry are enshrined in our collective understanding and where necessary laws and regulations are agreed to afford the highest level of protection for our future generations from such events and that due diligence and effort is afforded in addressing social and health inequalities and public health.

212. I offer my sincere condolences to those who lost loved ones, suffered illness or experienced hardship during the pandemic in Wales.

¹⁰⁵ Para 74 above

Statement of Truth

I believe that the facts stated in this witness statement are true. I understand that proceedings may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief of its truth.

Signed:

Personal Data

Dr Robert L. Orford

Dated: _____

19th December 2023