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UK COVID-19 PUBLIC INQUIRY MODULE 2

SECOND WRITTEN STATEMENT OF PROFESSOR SIR JONATHAN NGUYEN-VAN-TAM

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I, PROFESSOR SIR JONATHAN STAFFORD NGUYEN-VAN-TAM, will say as follows:

Section 1: Introduction

- 1.1. I make this statement in response to a Rule 9 request received from the UK COVID-19 Public Inquiry (“the Inquiry”) on 21 April 2023. This is the second witness statement I have provided to the Inquiry, the first, dated 9 June 2023, was submitted for Module 1 of this Inquiry. That addressed a number of specific questions relating to my role as chair and a member of the New and Emerging Respiratory Virus Threats Advisory Group (“NERVTAG”). I understand that this statement has already been published on the Inquiry’s website. I also contributed to the corporate witness statements made on behalf of the Office of the Chief Medical Officer (“OCMO”) by Professor Sir Christopher Whitty, the Chief Medical Officer (“CMO”) for Modules 1 and 2.

- 1.2. This statement is considerably longer than my first as the Rule 9 request to which it responds comprises 475 questions, many of which contained multiple subsidiary questions. On 17 August 2023, I received a further 24 questions or requests for further information. I have tried to answer as many of those questions as I am able to, taking a thematic approach. In some instances, in order to give necessary context to my evidence on a particular point, I have referred to the minutes of meetings at which I was not present and to documents prepared or advice given by others. There are some requests which are better addressed to others. Where this is the case, or where I had no direct involvement in the matter concerned then I have, insofar as possible, indicated this accordingly.

- 1.3. There is one point I wish to make at the outset. The events that I have been asked about took place over the course of more than two years. They were fast moving, challenging and, at times, very stressful not just for me but for many others. Speaking personally, the intensity with which I worked during that period, coupled with the public scrutiny which came with the role I undertook meant that by the time I left my role as Deputy Chief Medical Officer (“DCMO”) in March 2022 I was and felt physically and mentally exhausted. That, I feel, is one reason why I do not always have a clear memory of all the matters with which I was involved. In seeking to provide as much information and explanation as possible to the Inquiry, I have of course refreshed my

recollection where possible by reviewing the relevant contemporaneous documents. However, I have made every effort to avoid describing matters with the benefit of hindsight.

My background

- 1.4. I am an epidemiologist and physician specialising in public health, mainly communicable disease control. I have a medical degree, a Diploma of membership of the Faculty of Public Health of the Royal Colleges of Physicians and a doctorate in medicine (DM) in epidemiology and public health from the University of Nottingham. I am a Fellow (and Hon. Fellow) of the Faculty of Public Health, a Fellow (and Hon. Fellow) of the Royal Society of Public Health, a Fellow of the Royal College of Pathologists, a Fellow of the Royal Society of Biology, an Hon. Fellow of the Royal College of Physicians, and an Hon. Fellow of the Faculty of Pharmaceutical Medicine. In July 2023 I voluntarily relinquished my Licence to Practice, although I remain registered as a doctor with the General Medical Council, UK.

- 1.5. I am currently Senior Strategy Adviser to the University of Nottingham School of Medicine and a part-time, self-employed consulting Clinical Advisor at Moderna Inc, a pharmaceutical and biotechnology company. Over the course of a 36-year career I have held a range of positions in both the private and public sectors. Between 2004 and 2007, I was Head of the Pandemic Influenza Office at the Health Protection Agency Centre for Infections (“Colindale”). Between 2005 and 2009, I was a member of the UK national Scientific Pandemic Influenza Committee (“SPI”). I was a member of the UK Scientific Advisory Group for Emergencies (“SAGE”) during the 2009-10 A/H1N1 influenza (swine flu) pandemic. I have chaired the European Centre for Disease Prevention and Control (“ECDC”) Expert Advisory Group on H5N1 (bird flu) vaccines and acted as a short-term consultant and temporary adviser to the World Health Organisation (“WHO”), ECDC, and the European Commission on multiple occasions since 2005. I am the Senior Editor of the textbook, *Introduction to Pandemic Influenza*, and I have published more than 200 peer-reviewed scientific papers. Most of my academic career has been spent engaged scientifically on aspects of the epidemiology, prevention and control of respiratory virus infections.

- 1.6. Between 2014 and 2017 I was, as mentioned above, the Chair of NERVTAG. This is a Department of Health and Social Care (“DHSC”) committee advising the Government on the threat posed by new and emerging respiratory viruses. In October 2017, I was appointed as DCMO, a post I held until March 2022. As DCMO, my portfolio was vaccines, pharmaceuticals, health protection and biosecurity.

Glossary

- 1.7. To assist the reader, I reproduce here the glossary of key terms set out in the First Witness Statement of Professor Sir Christopher Whitty (the “OCMO Module 2 Corporate Statement”). This provides a useful explanation of the various acronyms, committees and groups to which I refer in this statement.

- CDC: The Centers for Disease Control and Prevention in the United States.
- COBR: The Cabinet Office Briefing Rooms is the term used to describe the Civil Contingencies Committee convened to coordinate the response of Government Departments and other agencies in times of national emergency.
- CSA: Chief Scientific Adviser to a Government Department. CSAs provide independent scientific advice to their main Department, and individually and collectively give scientific advice across Government in their specialist areas.
- DCMO: Deputy Chief Medical Officer.
- DPH: Director of Public Health. Based in local authorities these are the lead public health officials in the authority, providing public health advice to local leaders and the public in their locality.
- GCSA: The Government Chief Scientific Adviser. The GCSA is responsible for providing scientific advice to the Prime Minister and members of the Cabinet, advising the government on aspects of science for policy and ensuring and improving the quality and use of scientific evidence and advice in government. The GCSA is a permanent secretary level post, reporting to the Cabinet Secretary, and is supported by GO-Science.
- GO-Science: An office of BEIS, GO-Science is responsible for: giving scientific advice to the Prime Minister and when required Cabinet committees; ensuring and improving the quality and use of scientific evidence and advice in

government; providing scientific advice in the case of emergencies, through their secretariat role with SAGE; helping the independent Council for Science and Technology provide high level advice to the Prime Minister; supporting strategic long term thinking in government through Futures and Foresight; and developing the Government Science and Engineering profession.

- JCVI: The Joint Committee on Vaccination and Immunisation. This is an independent committee and a statutory body with a statutory and advisory role to advise the Secretary of State for Health and Social Care on the provision of vaccination and immunisation services being facilities for the prevention of illness.
- NERVTAG: The New and Emerging Respiratory Virus Threats Advisory Group. This is a standing committee of DHSC. It advises the Government on the threat posed by new and emerging respiratory viruses.
- NIHR: National Institute for Health Research (the National Institute for Health and Social Care Research since April 2022). The main Government funder of applied research in health and social care.
- PHE: Public Health England. The forerunner to UKHSA on health protection. PHE also had responsibility for health improvement (primarily non-communicable diseases). The functions of PHE were separated in 2021, when UKHSA and the Office for Health Improvement and Disparities (OHID) were established.
- PHEIC: A Public Health Emergency of International Concern. The WHO decide whether to declare a PHEIC based on whether an extraordinary event is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response. Most PHEICs are not pandemics.
- RWCS: Reasonable Worst Case Scenario. Scenarios are widely used in emergency planning. The RWCS is the reasonable worst case assuming countermeasures are either not available, prove ineffective, or are not used. It is assumed that if effective countermeasures are used the outcome will be better than RWCS. Such scenarios are not intended to be predictions.

- SAGE: The Scientific Advisory Group for Emergencies. SAGE is an independent advisory group, convened to provide scientific advice to support decision-making in COBR in the event of a national emergency.
- SPI-B: The Independent Scientific Pandemic Insights Group on Behaviours provides behavioural science advice aimed at anticipating and helping people adhere to interventions that are recommended by medical or epidemiological experts.
- SPI-M and SPI-M-O: The Scientific Pandemic Infections Group on Modelling and Scientific Pandemic Infections Group on Modelling, Operational subgroup are two groups of modellers who advise government. Their membership is drawn from academia and the government service. SPI-M operates in a non-emergency situation while SPI-M-O is stood up in an emergency and can become a sub-group of SAGE.
- UKHSA: UK Health Security Agency. Established in April 2021 and formally operationally from October 2021 UKHSA leads on health protection (infections and emergencies in the main) for the UK.
- UKRI: UK Research and Innovation. The umbrella body of the seven Research Councils, including the Medical Research Council (MRC).
- WHO: World Health Organization.

My role as DCMO

- 1.8. My role at DHSC was to give medical, scientific or public health advice, based on the data available at the specific time of any request, to ministers and officials across Government. This is the nature of the advice I have in mind when, as I do in this statement, I speak of advising others.
- 1.9. The DCMO post is a director level appointment, reporting to the CMO. Usually, there is a principal DCMO for health improvement (mainly focused on non-communicable diseases such as cancer and heart disease) and one for health protection (e.g. infectious diseases and other emergencies). I was the DCMO for health protection. Collectively, the DCMOs and the CMO are supported by one private office (a small

team of civil servants that support senior civil servants or ministers). Like the CMO, the DCMOs are professionally independent with matters relating to health and science and there is an expectation that the DCMOs will communicate with the public via the media.

- 1.10. In giving any advice, I would consider the advice given by SAGE and would have been mindful of any limitations in the data. There were occasions during the pandemic when advice had to be given urgently and in circumstances where the data was limited, or even absent. Then, I would have given an answer based on established scientific principles and drawing on my professional experience and knowledge.
- 1.11. My role during the pandemic was primarily to work on behalf of the CMO on the acquisition of vaccines and therapeutics, at the interface between policy (led by policy officials), procurement (led by the Vaccine and Therapeutics Task Forces (the latter incorporating the Antivirals Task Force)), and clinical trials and studies of the same (led by the NIHR).
- 1.12. I was also seen as a source of expert advice on technical aspects of virus transmission. Everyone in DHSC, but especially in the OCMO with its limited numbers, was very busy and thinly stretched. As a senior leader I tended to work alone on the issues for which I was the lead (supported by a private secretary), checking in with the CMO as and when needed, but typically 3-4 times each week. My direct contact with the GCSA was less frequent and tended to be mainly about vaccines and therapeutics, typically 1-2 times per week. I touched base very regularly with the other DCMOs for England, Dr Aidan Fowler, Dr Thomas Waite and particularly, Professor Dame Jenny Harries.
- 1.13. Given my role, as DCMO for health protection, I was the lead DCMO during the initial phase when the virus emerged. The CMO took a more active role as the threat became clearer. Given the volume of work, all clinical support was focused on COVID-19 within weeks. The division of work within OCMO was never absolute given the speed and volume of requests we received. Generally, however, I focused on drugs, vaccines, and the interactions with NERVTAG and JCVI. Professor Harries, who had previously been a DPH, led on shielding, education and adult social care. Dr Fowler, whose

principal role is NHS England's National Director of Patient Safety led on testing. Dr Waite, when he joined, supported predominantly on epidemiology.

- 1.14. In terms of direct verbal advice to the Prime Minister, I only ever gave direct advice related to the procurement and deployment of vaccines and therapeutics. I discuss the written advice I provided later in this statement.

- 1.15. I am asked by the Inquiry whether I considered resigning from my role of DCMO at any point during the pandemic. The short answer is yes but it needs to be given context. I never doubted my ability to fulfil my role as a DCMO. However, as I have explained above, the pressures were considerable. Requests for advice and clinical input came in to OCMO around the clock, seven days a week for lengthy periods with little to no respite. That work ran in parallel with the need to engage with the public through the media on a regular basis. There were occasions when I received extremely hateful messages from the public by email and on one such occasion, following receipt of emails that responded to a media appearance I had made, I felt the need to escalate the matter to the police. It is against this background that I can say, there were times when I thought about leaving my role. In particular, I recall a conversation with my colleague at the University of Nottingham, Professor Dame Jessica Corner, in which I expressed some of my frustrations to her and I suggested that if the pressures increased then I might have to resign my post. Fortunately, it did not come to that. Nor did it come to a point where I felt it necessary to discuss the possibility with the CMO.

Section 2: Decision Making Structures

- 2.1. During the pandemic, I attended meetings of the following decision-making committees:
 - i. The Civil Contingencies Committee, otherwise known as the Cabinet Office Briefing Room ("COBR"). My attendances at COBR were very rare and usually only when the CMO could not attend.
 - ii. COVID-S & COVID-O - Throughout the pandemic, the Cabinet Office convened ministerial meetings that were divided into those focussed on "Strategy" and those

focussed on “Operations”. These meetings came to be referred to as “COVID-S” and “COVID-O” respectively. COVID-S was chaired by the Prime Minister and was a forum for discussing and setting the strategic direction of the Government’s response to the pandemic. COVID-O was chaired by the Minister for the Cabinet Office and was focused on implementing the Government’s strategy. I deputised for the CMO at these meetings as necessary and attended when there was discussion on a particular aspect of the pandemic response that I led on for OCMO. Generally speaking, I was required to attend COVID-O far more frequently than COVID-S, which tended to be by exception when the CMO was not available.

- iii. Four Nations Meetings – These were meetings convened by the Rt Hon Michael Gove MP, as the Chancellor of the Duchy of Lancaster (“CDL”) to exchange information and coordinate across the Devolved Administrations. First Ministers attended these meetings most of the time. My role was to provide clinical input as needed.
- iv. DHSC meetings – From late January 2020, there was a Permanent Secretary (Sir Christopher Wormald) led series of meetings. These were superseded by meetings chaired by the Secretary of State for Health and Social Care (“Health Secretary”)¹. I attended a number of these meetings throughout the pandemic. Along with written advice, usually provided via emails, they were the predominant route by which OCMO advice fed into decision making in DHSC and Cabinet Office for COVID-O and COVID-S.

2.2. My role, when attending meetings of the committees and groups listed above was to provide scientific and clinical information, advice and analysis that would ultimately help guide and inform decision makers.

2.3. From my perspective, my lines of accountability were always clear. I was accountable as DCMO to the CMO, who was the principal source of clinical advice to the Health Secretary and reported to the Permanent Secretary. There were of course times when I dealt directly with the Health Secretary or one of his junior Ministers without going via the CMO and, while I was not accountable to anyone other than the CMO in a line

¹ Unless otherwise stated, all references to “Health Secretary” are to the Rt Hon Matt Hancock MP.

management sense, I certainly felt I had a duty of responsibility in relation to the advice that I provided to them. In a sense, I saw Ministers and others within DHSC as clients to whom I owed a professional obligation. I felt the same in respect of the CDL, for example, in the Four Nations meetings described above.

- 2.4. I have been asked by the Inquiry to provide my view on the effectiveness of the Cabinet Office decision-making structure that was in place during the pandemic. I believe it was necessary and beneficial to have a central body to coordinate consultation, advice and decision-making across the whole of Government and that it was appropriate for the Cabinet Office to fulfil that role. As far as I could tell that structure worked effectively. It allowed for a range of opinions to be shared and my impression was that participants felt free to speak up and challenge those opinions as necessary. That was particularly the case at COVID-S and COVID-O meetings.

Section 3: Decision Making

- 3.1. I was not involved in the meetings at which key decisions made by No.10 about the response to the pandemic were made, except when it came to vaccines. With the exception of COBR, the committees and groups I have described above at Section 2 were largely fora for discussion and debate as a pre-amble or “workup” to decisions that were to be made at a higher level. To the best of my recollection, they did not, for example, conclude with a major decision being taken, except in relation to vaccines. My understanding is that key decision-making was confined to meetings that were attended by the Prime Minister, the Health Secretary, other senior politicians and officials, the CMO and the GCSA.
- 3.2. Any views I have on the timeliness or effectiveness of key decision-making are therefore only general impressions formed through hearsay and observation of the time that measures took to progress from advice to implementation. I cannot comment on the decision-making process that was undertaken by the Prime Minister and senior politicians in consultation with the CMO and GCSA. However, I can highlight instances in which, from my position of proximity to that process, it seemed to me that there was some delay in final decisions being made. For example, in Autumn 2020, although I

wasn't party to the high-level discussions, I was concerned that tension between DHSC and the Treasury was leading to delay in the implementation of tiered social restrictions. To give an example, at that time, the Joint Biosecurity Centre ("JBC") would advise that a particular locality needed to enter stricter measures. There then seemed to be a long (in epidemiological terms) delay while the details were worked out between DHSC, the Treasury and Local Authorities. My understanding is that negotiations centred around what the appropriate financial support was for a particular locality that was earmarked for tighter restrictions. Those negotiations usually took 2-4 days but could go on for more than a week, a significant period when the case numbers were doubling in a matter of days. I address this issue in more detail below.

- 3.3. The Four Nations and DHSC meetings that I have described above at paragraph 2.1 were more focussed on information exchange and policy alignment than core decision making. In my view they were useful in ensuring that the UK's response to COVID-19 did not become disjointed or misaligned.

- 3.4. I have been asked by the Inquiry about the extent to which I used WhatsApp and other messaging platforms as part of my role in responding to COVID-19. I confirm that I did use WhatsApp to communicate with politicians and Special Advisers (primarily those within DHSC), as well as other Government officials. The exchanges I had via WhatsApp tended to be brief and their purpose was generally to clarify scientific understanding and very much not to record official views or make decisions. If I deemed anything raised via WhatsApp to be of particular importance, I would always ensure that it was followed up by email. I understand the OCMO has already disclosed all emails and documents relevant to Module 2 to the Inquiry.

- 3.5. When I left my role as DCMO in March 2022, I handed in the DHSC-issued mobile phone that I used to communicate via WhatsApp in my professional capacity. I understand that it was retained by the OCMO. In preparing to respond to the Inquiry's requests for disclosure, the OCMO contacted me and asked for the code to unlock the phone. I had not used the code in a very long time (i.e. years) to open the phone because it could be accessed biometrically using my thumb print or facial recognition (I cannot recall which). Unfortunately, it was not possible to access this phone and I

understand the entry of a series of potential, but incorrect, pin numbers by a member of the OCMO team, beyond the permitted maximum number of failed attempts, to have inadvertently deleted the telephone's contents (in accordance with standard settings for Government-issued mobile phones that might contain sensitive data). I also understand that the OCMO and my legal team have made enquiries of technical experts who have informed them that the data on the phone cannot be retrieved. However, I am keen that all possible efforts are made to retrieve the data and if the Inquiry has access to experts who may be able to assist, I am more than happy to provide the phone itself. If the data is truly unretrievable, I do not consider that this will prejudice the Inquiry's investigations in any significant way as all the relevant WhatsApp chats that I was party to will likely be available from other witnesses. I can provide a list of the key chats should it be required.

Section 4: Advisory Structures

- 4.1. A full description of the advisory groups that OCMO played a role in during the pandemic is set out at paragraphs 5.163 – 5.187 of the OCMO Module 2 Corporate Statement. Personally, I was a member of SAGE and I was a regular observer at meetings of NERVTAG and JCVI.

SAGE

- 4.2. A detailed description of SAGE, its structures and its processes are set out at paragraphs 5.12 - 5.16 and 5.171 - 5.181 of the OCMO Module 2 Corporate Statement. I do not intend to repeat that information here, but rather will respond to a number of requests that have been put to me by the Inquiry for my opinion on the operation of SAGE during the pandemic.
- 4.3. From January 2020 onwards, I attended SAGE when I could. However, I was so busy that I did not have time to stop and consider the effectiveness of its structures and processes or the minutiae of its composition. Those are matters that are more appropriately addressed by the GCSA and GO-Science. On reflection, I do not have any concerns about the way in which SAGE operated. In my view it was well

represented by a broad range of scientific experts and it served its purpose of providing a central scientific view on key matters. SAGE arrived at a central view through rigorous scientific debate and the Chairs doing their job of effectively summarising where the discussion landed. It was not my role to communicate that central view to core decision-makers, that was the job of the Chairs. In my view, the process of providing core decision-makers with a central scientific view was appropriate and, in fact, I cannot envisage a workable alternative. If the CMO and the GCSA were to give non-scientists (such as the Prime Minister) a range of different opinions, I think it is inevitable that they would simply ask them which one they ought to listen to; the result being that the Prime Minister would be making decisions on the basis of one person's view rather than a broad range that have been discussed and tested before being assimilated into an agreed central opinion.

- 4.4. The CMOs and DCMOs from the Devolved Administrations routinely attended SAGE meetings throughout the pandemic. My feeling was always that the committee was operating nationally. Apart from anything else, the science being discussed would not have varied across the UK, even if specific nations may have been at slightly different stages of the pandemic at certain times.
- 4.5. Throughout the pandemic, a number of SAGE sub-groups were convened to inform and supplement the advice that SAGE produced. For example, SPI-B provided advice on the behavioural aspects of the pandemic and the pandemic response; and SPI-M-O provided expert modelling and epidemiological advice. The work of SPI-M-O was particularly important in attempting to frame a range of reasonable options for what might happen next, based on the available epidemiological data. SPI-M-O has often been portrayed publicly as a group able to predict the future and then criticised for getting its predictions wrong. As a scientist observing this process, I felt we understood very well that SPI-M-O could not predict the future but could present a range of well-justified scenarios about what could happen next and the effects of interventions under consideration. From my perspective, SAGE and its subgroups worked well together. SAGE regularly requested input from SPI-B and SPI-M-O. Those groups would convene to discuss the specific matter and then provide a consensus view that would be taken on board by the main SAGE committee.

- 4.6. I have been asked by the Inquiry whether I am aware of any instances of the GCSA instructing any participant in SAGE and/or its sub-groups to edit or remove sections of their reports. I am not aware of any such instances. I have also been asked whether I was aware of frustration amongst SPI-B members about a perceived lack of adoption of their advice. I do not recall being aware of this.
- 4.7. As its name suggests, SAGE focused on scientific advice. SAGE did not consider the economic impacts of the pandemic or the measures that were put in place to respond to it. I believe that would have been beyond the committee's remit. I was cognisant of how significant those impacts were, not least because there are well established links between poverty and poor health outcomes. However, I do not think there is a strong argument for SAGE to have carried out economic evaluations, unless the committee had been radically expanded or reconstituted. There is a risk that the addition of, for example, financial experts as opposed to scientists might have made SAGE disjointed and less effective in delivering a scientifically focused message to Government.
- 4.8. I have been asked by the Inquiry whether I consider that SAGE's advice was too heavily influenced by a particular scientific discipline. SAGE was strongly influenced by bio-mathematical modellers. Modelling, while it is always dependent on the accuracy of source data, can be a very useful tool in a pandemic emergency. I consider that its use here was justified and necessary because it was essential that SAGE was able to present reasonable projected scenarios to Ministers about what could happen in the future. Taking into account the speed with which SAGE was required to advise, I do not think that a particular scientific discipline was inappropriately marginalised. One very significant strength of the SPI-M-O processes that fed into SAGE was that several modelling groups operated independently, and then shared their results. To me it was very significant when different groups using different techniques arrived at broadly similar conclusions. Where you have such a degree of "coherence", then it increases the confidence that scientists can have in the conclusions.
- 4.9. I have also been asked a number of questions by the Inquiry about the rigorousness of the debate that took place at SAGE and the extent to which dissenting opinions were

expressed and recorded. I recall discussions at SAGE being full and robust, as one would expect when experienced scientists come together. I do not believe that “groupthink” was an issue. It is certainly not the case that particular SAGE participants were not invited to attend SAGE meetings due to concerns that they would disagree with the central view.

- 4.10. It is also not the case that SAGE confined its advice to policy options that it considered would be palatable for policy makers. SAGE’s advice was based on rigorous analysis of the best scientific data that was available at the relevant time. It was not sanitised for the benefit of politicians. That is borne out by the fact that at various points throughout the pandemic, SAGE advised that a range of stringent non-pharmaceutical interventions (“NPIs”) were required.

NERVTAG

- 4.11. NERVTAG is a DHSC committee advising the Government on the threat posed by new and emerging respiratory viruses. It was established in 2014, replacing the UK national Scientific Pandemic Influenza Committee (“SPI”) and extending the role of the group to cover not only pandemic influenza but any new, emerging respiratory virus threat to the UK. I was the first Chair of NERVTAG, a role I held until October 2017, when I took up the position of DCMO. After that time, I continued to attend NERVTAG as an observer. When the COVID-19 pandemic began, I attended most NERVTAG meetings as an observer. However, that became increasingly difficult over time as the vaccine work (which was my priority) intensified.

PHE

- 4.12. I have been asked by the Inquiry to express my views on the effectiveness of PHE during the pandemic and any challenges I faced working with PHE. In the early stages of the pandemic, it became clear to me that PHE did not have the capability to support the diagnostic capacity that was very rapidly required by the country. Nor did it have the capability to scale up fast enough to provide the diagnostic capacity that was required. That is not a criticism of PHE or any individual working there; it is merely the reality of the situation and, in my opinion, at least in part, a consequence of political

decisions over a number of years that had resulted in the reduction of public health budgets and capabilities.

- 4.13. Much of the routine diagnostic microbiology and virology work for individual patients in hospital and in primary care is handled by a network of pathology laboratories established within Acute NHS Trusts; sometimes these form multi-site pathology networks. Historically, the laboratories of the Public Health Laboratory Service (“PHLS”) which later became the Health Protection Agency (“HPA”) and finally PHE have been less about providing routine high-capacity throughput to the NHS (although this has varied a bit by region) and more about providing diagnostics for surveillance, reference laboratory work and other specialised work. Prior to 2020, the last time that high scale HPA laboratory testing capacity was required was during the Swine Flu influenza A/H1N pandemic in 2009-10.
- 4.14. I was not involved in the decision to disband PHE in August 2020 and to create the UKHSA and I am not aware of the specifics around those decisions. I did not provide any advice on the matter and I do not have an opinion on the decision or its timing. I gained the impression that the Health Secretary was dissatisfied with PHE’s performance because of its inability to scale up testing quickly. That made me uncomfortable as I had valued colleagues in PHE and I saw the organisation as trying to do its best with the limited laboratory capacity that was in place before the pandemic and the resources at its disposal. Nevertheless, I was also aware that PHE had not been able to upscale its testing capacity so I understood why those political frustrations might have emerged. I did note that the Chief Executive of PHE was not prominent, or sometimes even present, in some of the early meetings with the Health Secretary, when it might have been expected that he would be. I am not able, however, to offer an opinion on whether the absence of the Chief Executive and the attendance in his stead of the PHE senior directors, Professors Yvonne Doyle, Sharon Peacock and Paul Cosford was detrimental or beneficial overall. I do not think the disbanding of PHE had any significant impact on the COVID-19 response. After the decision was taken, as far as I could tell the ground army of PHE staff continued with their work.

Joint Biosecurity Centre (“JBC”)

4.15. I did not have any role in the creation of the JBC in May 2020. Once established, it quickly increased the quality and volume of epidemiological intelligence. The data were easier to access, became more granular and localised, and the quality of their interpretation improved. I felt that the JBC worked well alongside other data sources. I do not have any other observations to make about the JBC.

Section 5: Sources of Advice; Medical and Scientific Expertise; Data and Modelling

5.1. A detailed summary of the OCMO’s approach to advising in relation to COVID-19 is set out at paragraphs 5.9 to 5.31 of the OCMO Module 2 Corporate Statement. I do not intend to repeat that information here.

5.2. The core decision-makers that I routinely provided advice to were the Health Secretary and the DHSC junior Ministers. However, as set out in the Timeline in Section 6 below (paragraphs 6.1-6.102), I also addressed ad hoc requests for advice that were received from across Government as required. I also provided advice to the CMO on various matters that he would then, in turn, take to core decision-makers. As I have already explained, my personal areas of focus were therapeutics and vaccines. Advice on the broader public health response, NPIs and lockdowns was generally provided by the CMO. I worked extremely closely with the CMO and the other DCMOs throughout the pandemic and I consider those close working relationships to have been absolutely vital in maintaining an effective response to the pandemic. To the best of my recollection, I did not issue a piece of advice to a core decision-maker without first satisfying myself that it was in line with the CMO’s view. If I had any doubt in that respect, I would discuss the matter further with the CMO.

5.3. With regard to the commissioning of advice, the OCMO tended to receive requests for advice by email. I don’t recall core decision-makers and their department officials framing requests for advice by reference to specific strategy and policy objectives,

other than perhaps the two core objectives of preventing people from dying and the NHS from collapsing. Rather, we would receive open requests along the lines of, “*we need scientific advice on X...*”. I believe that is the correct approach, rather than starting with preconceived strategies or policy objectives. As an office, we were assiduous in ensuring that the line between scientists and clinicians giving advice and politicians making decisions was always clearly defined. For example, when asked for advice on prioritising elite UK athletes for vaccinations, I made clear it was a political decision with no clinical grounds [JVT2/001 – INQ000073290]. I did not have the impression that core decision-makers wanted the scientists to make decisions about the response to COVID-19 although they quite rightly wanted help assessing the options from a public health perspective.

- 5.4. The UK COVID-19 dashboards (that were publicly available online) and the Cabinet Office dashboards (that were available online to those in Government who had been given specific permission to access them) were extremely helpful in providing me with an up-to-date picture on the epidemiology and therefore ensuring that I could comment appropriately in key meetings. However, I always wanted more information. Where I felt information was lacking, I was careful to build that element of uncertainty into my advice. See, for example, my advice to the Cabinet Office in January 2020 regarding investigations into a potential case in the UK [JVT2/002 – INQ000151322].
- 5.5. I provided advice to core decision-makers by email, by commenting on and amending draft policy documents and guidance and orally in the meetings I have described above.
- 5.6. I never confined my advice to policy options that I considered would be palatable for policy makers. I should reiterate that my role was to provide clinical and scientific advice, but if that involved discussing a range of policy options, I would never confine my advice to a subset of options that might be more attractive to policy makers. I consider that I would have been failing in my public duties if I did. As the discussion evolved, I would offer public health advice to support the decisions being made, working pragmatically towards a solution.

- 5.7. The Inquiry has asked me to comment on the intelligibility of my advice. When giving advice to non-scientists, I always tried to communicate in a way that any sensible layman could understand what I was saying. I believe the advice I gave to core decision-makers was clear throughout the pandemic. I do not consider that it could have been improved.
- 5.8. The CMO and the GCSA are better placed to comment on the Prime Minister's ability to understand the scientific, medical and mathematical concepts that were being conveyed to him. However, from my perspective, I can say that I never left a room with any Minister feeling concerned that they had not understood what I had said. Further, in my encounters with The Rt Hon Matt Hancock, when he was Health Secretary, I found him to be particularly inquisitive and felt that he would keep asking questions until he was satisfied that he had understood what he needed to understand. I felt that we had honest and robust conversations.
- 5.9. I generally did not face pressure from core decision-makers on the deployment of specific treatments for COVID-19. Where such pressure did occur, it came from individual MPs, members of the House of Lords or clinicians working in the community. For example, I received a number of unsolicited emails on the antiparasitic drug, Ivermectin, which was later shown to be ineffective as a treatment for COVID-19 (see for example, **JVT2/003 – INQ000236518**). With that said, there was some pressure from core decision-makers on the use of Vitamin-D as a treatment for COVID-19. For example, see the email thread in which I provided advice on Vitamin-D to DHSC colleagues following a request from the Health Secretary, **JVT2/004 – INQ000071030**.
- 5.10. I was never asked by core decision-makers, or anyone else, not to publicly express aspects of the advice that I had given to them in private. I believe it would have been within the CMO's remit to publish advice if he had so wished and, in fact, much of the OCMO's advice was put into the public domain via the press conferences that were held throughout the pandemic, and through the publication of SAGE minutes, and papers on, for example, particularly sensitive issues such as vaccinating children, the importance of keeping schools open where possible and vaccine dose scheduling.

5.11. In general, I think transparency is important for maintaining public trust and it was right that advice on particularly sensitive issues was made public so that the public could be as informed as possible. However, it is also right that Ministers are afforded a certain amount of privacy when engaged in dialogue with their advisers. In my view, there is a risk that if Ministers are not afforded such privacy then they might stop asking questions of scientific advisers for fear that they would be exposed to public criticism if seen to ask scientifically naïve questions. I therefore consider that routine advice provided to Ministers to help inform their decisions should not be published contemporaneously as a matter of course.

Collaboration with the devolved administrations and regional and local authorities

5.12. To the best of my knowledge, there was effective communication between core decision-makers and the devolved administrations. I have already described the Four Nations Meetings convened by the CDL. These meetings were usually attended by the CMO or a DCMO (most often myself). In addition, the devolved administrations were always represented at COBR.

5.13. Throughout the pandemic, there was close collaboration between the OCMO and its counterparts in Scotland, Wales and Northern Ireland. For example, the OCMO convened regular “Senior Clinicians” meetings, attended by all the UK CMOs and DCMOs, as well as senior clinicians from across NHS England (“NHSE”), PHE, and the Ministry of Defence. The four UK CMOs also had a regular call that the DCMOs often attended. Additionally, I was very careful to make sure that I updated the UK CMOs and DCMOs on any key matters that arose in my specific areas of responsibility, i.e., therapeutics and vaccines. Often this was through one-off rapid meetings because of the tight window between the availability of vaccine trial results and the urgent need to deploy them. I feel that we worked collegiately and that there was a sufficient dialogue throughout the pandemic that fed into the advice that OCMO provided to core decision-makers. I do not consider that the different experiences in Scotland, Wales and Northern Ireland altered the advice that the OCMO gave to core decision-makers, but it did nuance it.

- 5.14. I do not recall any significant divergence between my views and advice and that of the DCMOs for Scotland, Wales and Northern Ireland. Part of the purpose of the fora that I have described above was to ensure that we were, wherever possible, aligned with our counterparts in the devolved administrations. However, there were of course times when one or more of the four nations was at a different stage in the pandemic or in a particular wave. That was particularly the case in relation to Northern Ireland, which is unsurprising given that it has a sea border with the rest of the UK, which would inevitably alter the epidemiology. I also recall certain times when Scotland announced a certain measure before England or continued with it for longer.
- 5.15. To the best of my knowledge and recollection, the CMOs and the DCMOs for the devolved administrations were not involved in the core decision-making of the UK Government, in the same way that I, or the CMO, was not involved in the core decision-making of the Scottish, Welsh or Northern Irish Governments. The UK CMOs and DCMOs came together to discuss the science and ensure an appropriate degree of alignment before taking their advice to their respective decision-makers. In my view, that is how collaboration between the four nations' CMOs and DCMOs ought to function.
- 5.16. In terms of the links to regional and local authorities, the CMO and Professor Harries, rather than me, had regular calls with regional and local public health leaders. In addition, there were regional representatives present at the DHSC Local Action Committee Bronze/Silver/Gold meetings (described at paragraphs 5.201-5.202 of the OCMO Module 2 Corporate Statement).

Collaboration with international organisations/ counterparts

- 5.17. There was a significant amount of collaboration with international organisations and counterparts during the pandemic, particularly in the early stages when information was scarce. Some examples of the interactions I had are set out below in the Timeline sub-section of Section 6 (see, for example, paragraphs 6.10, 6.14, 6.25 and 6.37 below). However, by way of summary, I personally liaised with scientific colleagues and diplomatic officials from: Singapore, Taiwan, China, Hong Kong, Italy, Germany,

France, Romania, Denmark, the USA, Australia, Canada and Chile. I also had contact with colleagues from the WHO and the ECDC.

- 5.18. In terms of the impact that this collaboration had on the advice I provided in the early weeks of the pandemic, when information was scarce, it was absolutely essential. Thereafter, there is a distinction to be drawn between technical information and understanding about the virus and factual or epidemiological information about how it was behaving in practice around the world. In respect of the former, I felt that information gleaned from other countries did not have a significant impact on my understanding or the advice I was able to give because I was confident in my own knowledge and expertise on the technical aspects of respiratory viruses. However, on the latter, collaboration with international counterparts was a valuable source of contextual information, particularly when it came to virus variants. When a variant first emerged in another country, it was important to communicate with the health authorities in that country to understand what was happening and plan for how the spread of the particular variant might impact the UK.
- 5.19. To the best of my knowledge and recollection, neither the OCMO nor core decision-makers had particular regard to scientific advisory structures in other countries. We were more interested in understanding what the scientific opinion in a particular country was, rather than delving into the detail of how that opinion had been arrived at or the specific advisory structures that were in place.
- 5.20. Throughout the pandemic, I believe that core decision-makers were briefed on, and aware of, advice and information provided by the WHO. The WHO, seeking as it does to assist as many member states as possible, focuses its efforts on advising those countries that are resource-poor in terms of technical and scientific expertise. These are areas in which the UK would be seen as resource-rich and, as such, a net contributor to the advice that the WHO would rely on to support less fortunate countries. Given the UK's scientific and clinical capacity, decision-makers in government had access to specialist advice from leading UK-based scientists and clinicians focused on the UK response. While Ministers ought to have been aware of

WHO advice, they didn't need to rely on it to any great extent compared perhaps to decision makers in other countries.

5.21. I believe that the UK's response to the pandemic was appropriately informed by the experiences of other countries. I have been asked by the Inquiry to comment specifically on the extent to which, in my view, core decision-makers should have adopted an earlier and more rigorous approach to stopping the spread of COVID-19, as was done by some East and Southeast Asian countries and in Australasia. In addressing this question, I assume that it refers to the test and trace containment measures that were put in place in those countries. I do not think that implementing such measures was ever a realistic possibility in the UK. My reason for this view is that the UK had widespread introduction of the virus from Spain, France and Italy during the February 2020 half-term holiday and possibly earlier, specifically from those returning from ski resorts in those countries, at a time when it had minimal testing capacity in place. In other words, the virus was already widely seeded in the UK and our pandemic had already started before we had anything like the mechanisms and infrastructure in place that would have been needed to allow the UK to mirror the containment measures that were adopted in some other countries. The sheer volume of international air passengers crossing the UK Border or transiting through UK air hubs is another highly relevant and related factor that modellers will be well-placed to advise the Inquiry about.

Sources and adequacy of data

5.22. The primary sources of data that informed my advice to core decision-makers were reports from SAGE, the JBC and the public and Cabinet Office-produced dashboards. I was also informed by data from clinical trials and from the COVID-19 Clinical Information Network ("CO-CIN"), which was set up to collate clinical information from the healthcare records of people admitted to hospital in the UK with COVID-19. I received these data by email, by virtue of being on the relevant mailing lists.

5.23. I believe that I eventually had access to all the relevant data that was available. For reasons that remain unclear to me, the OCMO had to press for me to be given access

to the Cabinet Office dashboard, which was initially only accessible to the CMO. If there were other data sources available that I did not have access to, then I remain unaware of them.

- 5.24. During the early stages of the UK's response, I was aware of some delay in data sharing between certain parts of the health system, for example from NHSE to SPI-M-O. My understanding is that this was due to concerns around data protection and obtaining authorisation for data to be released. I strongly encouraged the swift sharing of data as a matter of course, given the emergency that we were facing.
- 5.25. As I have already intimated, the creation of the JBC in May 2020 did improve data collection, analysis and dissemination. From that time on, updates seemed to become more systematised and more regular. Data sources were combined into a common single output document. The JBC provided important information for decision-makers.
- 5.26. In terms of improving data collection, sharing and linkage for future pandemics, I believe the creation of a permissive legal framework on data sharing in times of emergency would go some way to alleviating some of the issues that were encountered at the beginning of the COVID-19 pandemic. Under such a framework, I envisage that during a declared national emergency, the default would be to share non-patient identifiable data for the good of the nation, without first having to undergo a process of seeking permission.

Sources and adequacy of modelling

- 5.27. With regard to the modelling that was done as part of the UK's response to COVID-19, I would make the following overarching points:
- i. many of the questions that have been put to me by the Inquiry on this subject are outside of my knowledge and expertise;
 - ii. the UK is widely regarded as a world-leader in the field of epidemiological modelling; and

- iii. I consider that the modelling that was available to scientists and decision-makers throughout the pandemic was as timely, clear, relevant and reliable as it could possibly have been under difficult circumstances.
- 5.28. To the best of my knowledge and recollection, the purpose and capacity of modelling was properly understood by core decision-makers. Throughout the pandemic the modellers were very clear that they were not issuing definite predictions, but rather providing estimates of the range of possible outcomes at a given point.
- 5.29. As far as I observed, the correct questions were asked of the models.
- 5.30. With regard to collaboration on modelling, different academic groups produced their own models and I wouldn't have wanted them to collaborate. Where you have multiple groups undertaking modelling that produces similar results, you can be more confident in those results.
- 5.31. As far as I am aware, the impacts of proposed NPIs, such as the economic, societal, educational and mental health impacts were not modelled. If anything of that nature was done, it was not done by SPI-M-O, whose sole function is epidemiological modelling, and it was not shared with me.
- 5.32. I do not consider that there was an over-reliance on epidemiological modelling in the advice that was communicated to core decision-makers. It was essential to rely on such modelling.

Section 6: Initial Understanding and Response to Covid-19 (January 2020 – March 2020)

Timeline

- 6.1. A detailed timeline of OCMO activity and key events for the period 1 January 2020 to 31 March 2020 has been set out at paragraphs 5.56 - 5.153 of the OCMO Module 2 Corporate Statement. I do not intend to repeat that exercise here, but rather will provide a chronological summary of my personal involvement in this initial phase of the pandemic and the instances in which I personally advised core decision makers. Some of the following will, by necessity, be duplicative of the timeline contained in the OCMO Module 2 Corporate Statement.
- 6.2. I first became aware of COVID-19 as a cluster of pneumonias in China in late December 2019. I believe this information came to me informally via a colleague or friend who saw early reports that were emerging from Wuhan around that time, such as this ProMED² report from 30 December 2019: **JVT2/005 – INQ000236522**. By the New Year, I was aware that something was developing and that it was necessary to keep an eye on it.
- 6.3. On 2 January 2020, I received an email notification from ProMED that contained, inter alia, the following information:
- World Health Organisation in touch with Beijing after mystery viral pneumonia outbreak... Wuhan health authorities on Tuesday [31 Dec 2019] said 27 people – most of them stallholders at Huanan Seafood Wholesale Market – had been treated in hospital, with 7 said to be in serious condition. Pathology tests were under way to try and identify the virus... Wuhan authorities ordered the closure of the market on Wednesday [1 Jan 2020] ... [JVT2/006 - INQ000151286].*
- 6.4. On 2 January 2020, I received an email from Carolyn Greene at the CDC which forwarded the ProMed report and confirmed, “Our CDC team in Beijing hasn’t received more information thus far than what is included in the [ProMED report]”. I responded to that email asking that the WHO, the CDC team in China or the US Government share any further information when received **[JVT2/007 – INQ000183347]**.

² The Program for Monitoring Emerging Diseases, which is a publicly available system providing global reports of infectious disease outbreaks.

- 6.5. On 2 January 2020, I also forwarded the ProMED email to the CMO and other DHSC colleagues. In doing so, I advised:

I think one we should watch (no more than that) and see what WHO and CDC China have to say in due course. My US CDC contacts don't have any additional info at this stage. Maybe we can ask PHE (Gavin) to actively track this? [JVT2/006 - INQ000151286].

- 6.6. On 3 January 2020, I emailed Sir Peter Horby (an academic colleague and then the current Chair of NERVTAG) to ask him to report back if his research contacts in China provided any intelligence on the outbreak [JVT2/006 - INQ000151286].

- 6.7. On 3 January 2020, in response to an initial report produced by PHE, I sent an email to the CMO and DHSC colleagues advising that:

...common RVIs [Respiratory Viral Infections] seem to have been ruled out. China does respiratory PCR pretty well these days. Chemical pneumonia/pneumonitis should not be forgotten. We have to wait/see. [JVT2/008 – INQ000151287]

- 6.8. The reason we had to wait and see was because we had insufficient information. The list of potential causes was still very wide including, as I mentioned, chemical exposure. It was however a situation that we wanted to continue monitoring.

- 6.9. On 6 January 2020, I emailed a colleague at the WHO to ask for further information on the cluster in Wuhan [JVT2/009 - INQ000151289].

- 6.10. On 6 January 2020, I emailed colleagues at the CDC to ask for any information that they could share:

If you get anything by way of extra details (not on ProMed or IHR) that you can share please would you consider doing so?

Immediate questions we have are:

1. *Does this still look point source?*
2. *Any evidence of HCWs affected?*
3. *Any evidence of geographic creep?*
4. *Any concerns about P2P transmission?*
5. *Have good quality labs such as CDC/Erasmus got any specimens yet to work on? [JVT2/010 – INQ000151291]*

6.11. On 8 January 2020, I provided an update to the Civil Contingencies Secretariat (“CCS”) in the Cabinet Office that set out my understanding of the current position on identifying the virus. I noted that the Chinese were undertaking laboratory work to determine the cause of the outbreak but were not yet sharing samples internationally. I explained that they had already ruled out known viruses such as avian influenza, MERS and SARS but I advised that it would take weeks to identify and characterise a novel virus and the Chinese would want to be certain before disclosure. Commenting on a reported possible case of viral pneumonia in South Korea, I said that we could not be certain that this was the same disease because we did not know the organism yet and therefore nobody could develop an accurate diagnostic test for it. I also noted that when a new organism is identified, it can take several weeks to perfect a test for it and distribute the reagents internationally. Lastly, I suggested that we may well see a small number of cases in places with frequent travel links to Wuhan, such as Hong Kong, but that would not necessarily imply person-to-person transmission, but rather just reflect that someone exposed in Wuhan had returned home during the (unknown) incubation period [JVT2/011 - INQ000151292].

6.12. On 8 January 2020, I shared informal information received from CDC colleagues with DHSC health protection policy colleagues that the outbreak in Wuhan might be a novel coronavirus:

I had picked up a whisper from CDC that it was thinking novel (non SARS, non MERS) coronavirus. Indeed this is what CMO (and me) felt was most likely. We will have to see if confirmed IDC [in due course].

If so, there won't necessarily be a diagnostic test initially.

Whether there will be any cases in returning travellers may depend on chance and whether the exposure in Wuhan (presumably from an animal reservoir)

was point source or is continuing. Good that there remains no known P2P [person to person] transmission [JVT2/012 - INQ000151293].

- 6.13. On 9 January 2020, I wrote to PHE to set out a consolidated view on the information available on the outbreak so far:

My up to the minute take on things:

1. Rumours are rarely incorrect in this space so as predicted we are heading towards a novel coronavirus; notably with zero reported case fatality so far, though 7 of 59 cases with severe disease is a significantly high 12% case-hospitalisation rate in my view such that established person to person transmission would cause serious hospital surge pressures on a par with a severe panflu virus.

2. Our three triggers are not met at this point, implies no change to UK or global PH threat;

3. The caveat is that inasmuch as two other novel coronaviruses have proven to be transmissible P2P predominantly in HC settings I do not rule out P2P transmission and case numbers in China have swelled from 27 when first reported to 59 now.

4. My hunch is that likely the identification of the novel coronavirus has not been simple and that right now there will be no simple reliable diagnostic test available; it is possible that existing pan-coronavirus PCRs will pick it up OK and that MERS/SARS specific PCRs might cross react, but the latter is all a bit speculative.

5. Essentially if we or any other countries get cases we won't be in a position to diagnose by lab test in the next few weeks; more likely it will be resp infection + travel to Wuhan within last 21 days (we don't know incubation period) + no obvious common RVI cause. The caveat will still be that +ve for flu (and lots in China at present) would not in my view assure no co-infection with something novel.

6. Ben Cowling in HK tells me that they absolutely expect cases (even in the absence of P2P transmission) and the possible case in South Korea is a similar case in point.

UK implications:

1. Just because we may have a tentative novel organism identified (disclosed) by the end of the day simply gives us more info but does not materially change any global or UK PH risks

2. Cabinet Office and likely Ministers will be sensitive to imported cases because there is a direct flight to Wuhan once every 2-3 weeks. In reality most returnees will route via Seoul or Beijing methinks.

But right now all we could do, if we do anything, is identify cases of ARI (possibly limited to hospital though we will miss a lot this way) with a recent 21d travel history to Wuhan. Take appropriate specimens for routine RVIs and stores samples and serum for when there is a decent test available. Maybe Maria [Zambon, PHE] has a pan-corona test she can use now?? [JVT2/013 - INQ000151296].

I also forwarded this summary to DHSC colleagues [JVT2/014 – INQ000236466].

6.14. On 9 January 2020, I emailed a colleague in Singapore to ask for further information:

...have you got a case in SG? I am hearing you might??

What does it look like clinically? And [sic] info gratefully received. Do you have any data on age ranges in Wuhan etc [JVT2/015 - INQ000151299].

I received a response on the same day that Singapore had a suspected case that had now been excluded [JVT2/015 - INQ000151299].

6.15. On 9 January 2020, I attended a PHE Strategic Response Group (“PHE SRG”) meeting on the outbreak. The minutes of that meeting record that Professor Nick Phin of PHE provided an update on the latest information and, based on that information, the risk to UK travellers was considered to be “low” and to the UK population was considered to be “very low” [JVT2/016 - INQ000090503].

6.16. On 9 January 2020, the WHO released a statement that confirmed Chinese authorities had made a preliminary determination that the virus was a novel coronavirus [JVT2/017 – INQ000236523].

6.17. On 10 January 2020, I emailed CCS with the following further update:

1. This is a coronavirus

2. Colindale [PHE] has a pan-coronavirus assay it can use now (I do not know how cumbersome, rapid or automated this is – but there may well be very finite capacity limits). The other test-performance limitations are that: a) this should essentially give a yes/no answer for any coronavirus. The test will be positive for ‘normal’ coronaviruses of the type that can be the cause of the common cold. Equally should be positive for SARS and MERS. Should in theory also be positive for the novel coronavirus but we will simply not know the performance of that test against the novel virus (if it is reliable or not in the new application) until we have specimens or sequences against which the test can be validated. Thus right now a positive test might mean something (but might indicate a common cold); a negative test would not be entirely reassuring only somewhat reassuring.

3. The specific assays for MERS and SARS that UK has we can assume do not work for the novel coronavirus or cross-react. The reason is the Chinese were able to conclusively exclude MERS and SARS on the basis of having access to specific MERS and SARS tests.

4. Work on perfecting an assay specific to the novel virus will take weeks not days, but maybe not very many weeks. No-one can begin this assay development work to any great extent anywhere in the world until there is access to specimens and/or genetic sequencing data. There is an ongoing WHO call as we speak but I have not heard yet that any specimens have been shared by China.

5. My opposite number in Singapore (DCMO equiv) confirms that they are in exactly the same place as the UK in terms of current diagnostics [JVT2/018 - INQ000151308].

6.18. On 13 January 2020, I attended the first NERVTAG meeting on the outbreak as an observer. I subsequently provided an update on the meeting to the CCS:

My observations below come with all the requisite 'health warnings' about the dangers of interpreting officials' views of the meetings in advance of the formally approved minutes.

But hope helpful to clarify:

- 1. NERVTAG briefed and watching closely; remain cautious that it is too early to rule out all person to person Tmx but it so far looks very low or absent*
- 2. NERVTAG endorses extant advice to HMG that port of entry screening is not likely to be effective nor a good use of resources.**
- 3. NERVTAG supports PHE risk assessment and approaches to date.*
- 4. During the call, case in Thailand confirmed by sequencing (sequences have now been released at least in part) – this is a Chines [sic] national visiting Thailand (who's symptomatic but not poorly). No contact with implicated market in Wuhan raising unresolved questions. Rather a long interval from date of onset of first case (06DEC19) and latest Thai case (05JAN2020).*

It remains very much a watch (closely) and wait situation.

**To note, NERVTAG aware that the Thai case was picked up by airport thermal screening but this does not change its view that screening will be highly inefficient and is not advised. [JVT2/019 - INQ000151311]*

- 6.19. The formal minutes of that meeting record that PHE provided an update that included the following summary, *“The last WHO statement on 9 January 2020, confirmed that a novel coronavirus has been identified as the cause... Current reports describe no evidence of significant human to human transmission, including no infections of healthcare workers”*. The current PHE risk assessment was set out in the following terms: *“Based on the current available information, the current impact of the disease is considered: Low/Moderate... Risk to the UK population is considered: Very Low... Risk to UK travellers is: Low”* [JVT2/020 – INQ00023107]. NERVTAG endorsed that risk assessment and I agreed with it at the time. The assessment was based on the information that was available at that time. It does not take into account what might evolve in the future.

6.20. On 13 January 2020, I advised DHSC colleagues in relation to NERVTAG's conclusions on port of entry screening and person to person transmission [**JVT2/021 - INQ000151310**].

6.21. On 13 January 2020, I communicated my opinion to colleagues at PHE and DHSC that *"until proven otherwise this should be seen as an airborne HCID [High Consequence Infectious Disease]* [**JVT2/022 - INQ000151309**].

6.22. On 13 January 2020, I also advised DHSC colleagues in relation to an update note for the Health Secretary and on 14 January 2020, I signed off the following condensed version, which I understand was provided to the Health Secretary on the same day (text shown underlined and in bold is as it appears in the original document):

... the cause of the viral pneumonia outbreak in Wuhan City, China has now been confirmed as a novel coronavirus. The virus sequence has now been shared publicly and countries including the UK can begin to develop specific diagnostic tests; this will take weeks rather than days.

The triggers for possible escalation are:

- Infection in Healthcare workers*
- Person to person transmission*
- Wider geographical spread (other than isolated cases in travellers who have acquired the virus in Wuhan)*

None of these triggers have yet been met.

*Following identification of the new coronavirus there are now 41 confirmed cases including 1 death in a person with co-morbidities and 6 more critically unwell. The Thai authorities confirmed a case in a traveller from Wuhan. The source of infection for this person is still under investigation although the patient is symptomatic they are not severely unwell. There is no documented person to person transmission as yet. Although such transmission cannot yet be ruled out **there does not appear to be a significant risk of human to human transmission at this time.***

Our independent expert group NERVTAG (New and Emerging Respiratory Virus Threats Advisory Group) met this morning to receive an update on the situation and actions to date and to provide advice. They:

- endorsed PHE's risk assessment that, based on current available information:
 - current impact of the disease is considered: Low/Moderate
 - risk to UK population is considered: Very Low
 - risk to UK travellers is: Low
 - risk to contacts of confirmed cases of WN-CoV infection is low but contacts should be followed up for 14 days following last exposure and any new febrile or respiratory illness investigated urgently.
- endorsed existing travel advice
- considered if there was a case to introduce Point of Entry Screening in the UK. **NERVTAG did not support port of entry screening for the UK**, which would not significantly reduce the already very low chances of UK cases.

PHE has established a new website on .gov.uk for up to date advice including guidance on clinical management and infection control for healthcare professionals.

We will keep you updated on significant developments. [JVT2/023 - INQ000047493]

6.23. As can be seen, the update note includes reference to “triggers for possible escalation”. These were set by CMO following discussion with myself. On 14 January 2020, I provided further advice to DHSC colleagues on these triggers:

“ ...

1. For trigger one you mean cases in HCW, not necessarily deaths. HCWs getting it basically indicates P2P transmission and in a sense 1 are a special subset of trigger 2. HCWs are always the canary in the coalmine.
2. Trigger 2: obvious, means we then have a situation where even if we turn off the tap (the animal reservoir) this thing can run and run self-sufficiently

3. *Trigger 3: means that closing the market was not enough and either we have P2P transmission or we have not turned off the tap and the animal reservoir is still out there; or indeed both.*” [JVT2/024 - INQ000151314]

6.24. On 15 January 2020, following reports of possible person to person transmission, I advised DHSC colleagues on the subject:

“ ...

For now we do have P2P by the sound of it; but it does feel, from the statement made, like H5N1 in 2004 where we did see P2P that was largely limited to really close contacts in family and household settings, and where the length of the chains of transmission were short (e.g. person to person to person – STOP) suggesting inefficient transmissibility between humans. This was not unexpected in the grand scheme of things.

NERVTAG was right to be cautious and slightly circumspect about transmission.

We can expect CCS to want an opinion today and as I'm out at a WHO flu meeting this view is offered now.

Does this cross a CMO trigger point? Best to ask Chris. I suppose technically it does but it does not feel like it is efficient or established community transmission. The question is rather more what else do we do that we are not already doing now if the report is confirmed IDC [in due course]? (perhaps very little other than worrying a little bit more).” [JVT2/025 – INQ000151316]

6.25. On 16 January 2020, the Japanese Ministry of Health, Labour and Welfare notified international colleagues that a case had been identified in Japan. On the same day, I forwarded the notification to the CMO and other DHSC colleagues and advised as follows:

“ ...

I still am not overtly worried that WW3 is starting but I think it's also fair to say that concern has increased a bit and P2P transmission seems likely and not entirely rare, although chain length is very short.

Also the HK press release suggests quite a confused picture. There might be some losses in translation, but it also appears that there are several possible instances of household transmission with chain length of 2 (as far as I can decipher).

I think it's the dispersal of the infections footprint in Wuhan, beyond the market, that is the key possible new feature." [JVT2/026 - INQ000151321]

- 6.26. On 16 January 2020, Professor Neil Ferguson (an expert academic infectious disease modeller) wrote to me and CMO estimating that based on two exported cases in Japan and Thailand, the 40-50 cases reported to date were unlikely to be accurate and that his central estimate was 1,149 cases by 6 January 2020 **[JVT2/027-028 – INQ000183353 / INQ000183386]**.
- 6.27. On 16 January 2020, I attended a further PHE SRG meeting on the outbreak. The draft minutes of that meeting show that Professor Nick Phin of PHE gave an update on the current situation, including a suspected case in the UK. There was also an update on port health and recommendations were made. These were endorsed by the SRG and I asked that they be shared with the OCMO for review. It was agreed that the risk assessment set at the last meeting (see paragraph 6.15 above) remained unchanged **[JVT2/029 – INQ000090504]**.
- 6.28. On 17 January 2020, I attended a WHO-coordinated modelling telecon and subsequently highlighted key points from the meeting for DHSC and PHE colleagues **[JVT2/030 - INQ000151328]**.
- 6.29. On 17 January 2020, I attended a further PHE SRG meeting on the outbreak and provided an update on the WHO-coordinated modelling teleconference from earlier that day. The minutes record that my update was as follows:
- *Chinese authorities have provided a list of all cases.*
 - *WHO requires written permission from Chinese authorities to share this with any modelling group.*

- *Models created to date have focussed on export of the disease, as expected the risk is highest for other Chinese cities, Hong Kong, Bangkok and Tokyo, with London falling in the middle of the list of cities at risk.*
- *6-7 viruses have been sequenced from cases.*
- *It is unclear whether China has been systematically testing for the novel virus, or whether this is limited by a case definition, therefore the known 41 Chinese cases may reflect incomplete testing.*
- *Exit screening at Wuhan has been fully executed since 16 January, some partial screening was conducted earlier.*
- *There was no explicit discussion of what exact screening is being done.*
- *Modellers agree that more than 41 cases should be expected, the estimated figure may be around 1500-2000 cases.*
- *It was estimated that there is a three-fold travel increase expected in China with new year celebrations, which will potentially affect the estimated figure.*
[JVT2/031 - INQ000090505].

6.30. On 17 January 2020, I advised DHSC colleagues in respect of a further update for the Health Secretary:

...

- *45 patients with Wuhan novel coronavirus (WN-CoV) have been reported in Wuhan (four new cases reported today). At least five of those have severe illness and two deaths have reported in individuals with underlying health conditions (the status of the four new cases is as yet unknown).*
- *Two cases have been confirmed in travellers from Wuhan to Thailand, and one case in Japan (other members of the same Japanese family are said to have respiratory symptoms but have not been declared as cases to date; all family members visited the same zoo in Wuhan).*
- *There is an indication of short transmission chains within some families in Wuhan, likely representing inefficient human to human transmission. The WHO's position remains unchanged, that there is no evidence of significant human to human transmission and no reported healthcare worker infections.*
- *Chinese authorities have confirmed that a British national who was unwell in Wuhan, and had been in the UK 21-29 December, does not have WN-CoV. It*

is unclear whether he has been tested for WN-CoV and found to be negative, or did not meet the criteria for testing. He is believed to be well and is not being treated in hospital. FCO is seeking to make contact with him to check his welfare.

- *Samples were taken from his symptomatic wife, who is currently in isolation at Liverpool High Consequence Infectious Disease Unit; in the last hour all test have come back negative for coronaviruses, isolation will be lifted and she will be discharged this evening.*
- *The situation has been categorised as Enhanced Incident by PHE, supported by the DHSC risk assessment. The operational management of the incident will continue to be led by PHE, with DHSC leading a review of the port of entry risk assessment. Cabinet Office Civil Contingencies Secretariat has also been fully engaged with this risk assessment and are supporting the cross- Government coordination. [JVT2/032 - INQ000151329]*

6.31. On 17 January 2020, I advised on the port health recommendations that had been made at the PHE SRG meeting the previous day (see paragraph 6.27 above. My text is shown in red below, policy colleagues' text is shown in black):

“Thank you very much for sharing IMT and SRG recommendations on port health. The CMO and DCMO have now considered these and their feedback follows in red:

Rec 1 - For direct flights between Wuhan and Heathrow, implement an announcement during the flight asking passengers to report symptoms to cabin crew combined with the requirement for a General Aviation Declaration (radioed by the pilot to the airport prior to landing) that there is nobody unwell on the aircraft. If an individual is declared unwell, the flight will be dealt with according to existing operational plans.

This is NOT supported. NERVTAG has not recommended entry screening and this recommendation would, in effect, be self-reported entry screening for symptoms that might identify some NCoV19 cases but also lots of other things. Also, some passengers might hide symptoms for fear of consequences. If the aircrew detect a clearly unwell passenger its BAU for them to issue a GAD.

Rec 2 - For terminals receiving direct flights (i.e. at London Heathrow), ensure isolation capability is available for the immediate management of suspected cases

This is appropriate for interception and safe management of people who self-report having seen arrival notices (see below i.e. if used) and/or who are picked out by aircrew or customs as looking very ill in some way which would be BAU.

Rec 3 - For all ports in England, prioritising those known to receive higher volumes of travellers from Wuhan via indirect routes:

- a. Accelerate the roll out of the RING card (an aide memoire which highlights key symptoms of infectious diseases) to frontline Border Force staff in conjunction with supporting training. This is to support early recognition of compatible illness in passengers entering the UK.*

This is a potential option but NOT YET as it will be hard to recognise anything that distinguishes NCoV19 from ARI in general and support BF staff.

- b. Add WN-CoV-specific information to the existing operational support information used by all airport ground staff. This is to support early recognition of compatible illness in passengers.*

Agreed but NOT YET

- c. Public information posters displayed in English and Chinese. It is suggested that includes information about NHS 111 should they be unwell after leaving the airport, but discussion with NHSE is underway to agree this. Posters can either be targeted to those airports known to receive direct flights and higher volumes of indirect travellers, or across all airports. This is to ensure that arriving passengers know about the symptoms to be aware of should they develop, and actions to take.*

Potentially OK but NOT YET

CMO is content for preparation work for options 2 and 3 to be done 'quietly' so they could be implemented quickly if deemed necessary in the future.

In summary, CMO/DCMO advise that it would be TOO SOON to do any additional measures on the basis of one case in Japan and one in Thailand (places with high Wuhan traffic and China generally). If by Monday we have two cases who have been in the UK (one fleetingly) and maybe a couple more 'pop-up' cases elsewhere in the world e.g. HK or Australia for example, then it might be the time to consider acting.

CMO is also conscious that there have been no new case declarations in China itself since 06JAN20 which could mean the outbreak is over and we are picking up tail ends or there will be a second round of reporting."

[JVT2/033 - INQ000151331]

I discuss port health recommendations in more detail in Section 8 of this statement.

6.32. On 19 January 2020, Sir Jeremy Farrar (then the Director of the Wellcome Trust) provided the CMO with information from an unpublished scientific paper, which the CMO then forwarded to me. My immediate view was that the data demonstrated clear evidence of person-to-person transmission at family/household level but did not confirm sustained community transmission. I also considered that the data showed a possibility of asymptomatic transmission **[JVT2/034 – INQ000183355]**.

6.33. On 20 January 2020, I contributed to an update note for the Health Secretary. That note explained that the risk to the UK population had been assessed by the CMO as very low. However, it also stated:

...that the CMO triggers, below, may be met in the next day or two, which may lead to a change in the risk assessment:

- *Infections of healthcare workers*
- *Significant person to person transmission meaning onward transmission to a 3rd case in a chain.*

- *Wider geographical spread (other than isolated cases in travellers who have acquired the virus in Wuhan) [JVT2/035 - INQ000047513]*

- 6.34. As a general point about UK risk assessments, I always understood these to reflect the **current or present** risk to the UK and not the medium or long-term future risk. In that sense I felt they did not inform the future. In my mind I was certain from mid-January, that we would experience a severe pandemic in the UK. That is to say, even if the risk was currently said to be low, I absolutely understood in my mind's eye that the risk would escalate, potentially rapidly and it was a matter of when, not if, things would progress. I believe I was very clear in articulating that to my colleagues and to Ministers. I do not know what the GCSA's view on this was at the time, I do not recall having the discussion with him. I do recall having discussions with the CMO around this time and, to the best of my recollection, his response was to agree that the situation may well escalate but for now we needed to wait and monitor developments closely.
- 6.35. On 20 January 2020, I attended a further PHE SRG meeting on the outbreak. The minutes of that meeting record that an update on the current situation was provided. It was also noted that, "*...the risk assessment will benefit from revisiting as one or more of the triggers for escalation have been met: 1) infection of a healthcare worker; 2) confirmation of person-to-person spread; or 3) geographic spread... Conversations are ongoing with CMO, NERVTAG and IMT to coordinate the new risk assessment.*" **[JVT2/036 – INQ000090506]**
- 6.36. On 20 January 2020, I attended the first DHSC Permanent Secretary led meeting on the outbreak. The minutes of that meeting record that an update was provided, and it was agreed that the situation was developing rapidly. There was discussion around port of entry measures and it was agreed that entry screening would be neither effective nor efficient **[JVT2/037 – INQ000106057]**.
- 6.37. On 20 January 2020, I attended a teleconference with the CDC and international colleagues from Australia and Canada. The discussion centred around port of entry measures **[JVT2/038-039 - INQ000151339 / INQ000151340]**.

6.38. On 21 January 2020, I attended the second NERVTAG meeting on the outbreak as an observer. NERVTAG noted that the reported number of confirmed global cases had increased to 283 and that human-to-human transmission had been reported overnight, including fifteen healthcare workers. NERVTAG also noted that although there was clear evidence of human-to-human transmission, the extent of transmissibility between people was not clear and it was also not possible to make any reliable inferences about the case fatality rate [JVT2/040 – INQ000023119].

6.39. On 22 January 2020, I attended the first precautionary SAGE meeting on the outbreak. SAGE reached the following assessment:

7. There is evidence of person-to-person transmission. It is unknown whether transmission is sustainable.

8. The incubation period is unclear – but appears to be within 5 to 10 days; 14 days after contact is a sensible outer limit to use.

9. It is highly probably that the reproductive number is currently above 1.

10. It is currently estimated that the mortality rate for WN-CoV is lower than for SARS, but it is too early to reliably quantify that rate.

11. There is insufficient information currently on the genetic strain to comment on WN-CoV's origin.

12. There is no evidence yet on whether individuals are infectious prior to showing symptoms.

13. There is no evidence that individuals are more infectious when symptoms are more severe, but that is likely.

14. There appears to be very little genetic diversity in WN-CoV based on sequences available so far.

15. It is reasonable to argue – based on lessons from MERS and SARS, and consistent with exported cases of WN-CoV – that individuals returning from Wuhan are no longer at risk if they show no symptoms after 14 days. [JVT2/041 – INQ000119711]

- 6.40. On 24 January 2020, I advised DHSC colleagues by commenting on a paper on *'UK Escalation Triggers and Response Options'* that was to be discussed at COBR that afternoon [JVT2/042-043 - INQ000047540 / INQ000047541].
- 6.41. On 24 January 2020, a note that I had prepared for Ministers was circulated. That note provided a brief summary on vaccines and treatments [JVT2/044-045 - INQ000047553 / INQ000047554].
- 6.42. On 28 January 2020, I advised DHSC, and PHE and Ministry of Defence colleagues on repatriation flights for British Nationals returning from Wuhan. In respect of non-symptomatic travellers, I advised on the composition of the on-board medical crew, which was to include a combat medical technician and two nurses (one ICU trained), noting that the probable worst case was that during the course of the flight a patient might develop a cough or fever. I advised that if that were to occur, the symptomatic traveller should be masked and isolated and hand sanitizer should be available to passengers and crew. I recommended that paracetamol syrup might be made available for children who become symptomatic on the flight and if anything urgent were required, I suggested that Professor Calum Semple, an expert paediatrician and respiratory doctor, could be available to advise. With regard to transporting symptomatic individuals, I again advised on the appropriate composition of the on-board medical crew (qualified medical and nursing staff with respiratory or IDU experience). I advised that all cabin crew and medics wear personal protective equipment and that all patients wear facemasks before boarding and throughout the flight. I also advised that passengers be distanced by a minimum of two metres in all directions and that cylinder delivered oxygen be available. I confirmed that all of these points had been discussed with the CMO [JVT2/046 - INQ000151366].
- 6.43. On 28 January 2020, I attended the second SAGE meeting on the outbreak. As set out below, the minute of that meeting records SAGE's current understanding of COVID-19 (paragraphs 9-23 of the minute), current thinking on the Reasonable Worst-Case Scenario ("RWCS") (paragraphs 24-27 of the minute) and the triggers for change in Government approach (paragraphs 28-30).

Current understanding of WN-CoV

9. *Origin: Current evidence suggests a single point zoonotic outbreak, which is now being sustained by human-to-human transmission. No evidence of ongoing zoonotic transmission.*
10. *Case fatality rate: currently estimated to be lower than SARS, but many uncertainties remain.*
11. *Reproductive number: estimated as between 2 and 3, in accordance with estimates from the Chinese authorities, but these figures are uncertain.*
12. *Doubling rate: estimated at 3 to 4 days.*
13. *Clinical presentations: varied, from mild coughing to fever and pneumonia. Uncertainty regarding clinical symptoms for individuals with mild illness.*
14. *Incubation period: likely to be average of 5 days, but considerable variation in specific cases.*
15. *Duration of infectivity: unknown, but 14 days seems a reasonable estimate.*
16. *There is limited evidence of asymptomatic transmission, but early indications imply some is occurring. PHE developing a paper on this.*
17. *Transmission route: respiratory.*
18. *SAGE urges caution in comparing WN-CoV with SARS and MERS: the transmission dynamics are different.*
19. *Control measures: ideally infection control in healthcare settings and rapid detection of cases.*
20. *It was agreed that Pandemic Influenza infection control guidance should be used as a base case and adapted.*
21. *Currently no evidence of control measures having an impact on transmission rate, but this is to be expected: not enough time has passed since implementation of measures.*
22. *SAGE supported the principle of self-isolation (but requires behavioural science input on public communication).*
23. *SAGE endorsed NERVTAG's position that those coming into contact with returning travellers to the UK, e.g. Border Force agents, do not need additional infection control measures to those currently advised.*

Reasonable Worst-Case Scenario (RWCS)

24. There are a number of scenarios that this outbreak could follow, depending on virulence and transmissibility.

25. The current RWCS is similar to an influenza pandemic where no vaccine or specific treatment is available.

26. The RWCS for the UK should be based on a reproductive number of 2.5 (middle of current estimates) and should assume that some of those who have returned from China are infectious.

27. SAGE also agree that the UK RWCS should be based on pandemic influenza planning

Triggers for change in HMG approach

28. For UK: SAGE agreed that the current triggers which would require a change in HMG's approach (sustained human-to-human transmission outside China and/or a severe UK case) are appropriate.

29. For changing travel advice for China: NERVTAG advised a change in the geographical aspect of case definition, from Wuhan to a number of Chinese provinces. SAGE agreed that this should inform travel advice – which Chinese provinces is to be determined.

30. SAGE agreed to keep these triggers under review, e.g. if there were multiple, geographically-spread mild cases in the UK. [JVT2/047 – INQ000057492]

6.44. On 29 January 2020, the CMO and I joined the Health Secretary on a call with the Director-General of the WHO. The question of the WHO declaring the outbreak a PHEIC was discussed on that call [JVT2/048 – INQ000107070].

6.45. On 30 January 2020, the WHO declared a PHEIC. From my perspective, we had already been treating the outbreak as a PHEIC and the declaration did not impact our response or advice. My personal view is that the WHO could have declared a PHEIC up to two weeks earlier.

6.46. On 30 January 2020, the UK CMOs advised the public of an increase in the UK risk level from low to moderate [**JVT2/049 - INQ000068529**]. As I have intimated above (paragraph 6.34), my view was that the progression in risk assessment from low to moderate to severe was inevitable as the pandemic progressed. I felt that there was a degree of arbitrariness in the exact timing for the transition from one risk level to the next, but that the move from low to moderate at this time was entirely appropriate.

6.47. On 3 February 2020, I received a request from No.10 via the Cabinet Office for ‘an assessment of how we think China is doing controlling the spread from the health angle’. My response was as follows:

1. *The strong restrictions on movement applied by the Chinese Government in Wuhan City and Hubei Province are likely to have had some effect in slowing transmission to other parts of China but are unlikely to have stopped it altogether.*
2. *There are insufficient data on which to be clear that there is sustained transmission in China outside of Hubei Province; nevertheless modellers consider this to be highly likely, although the epidemic will be less advanced in other parts of China [**JVT2/050 - INQ000047658**]*

6.48. On 3 February 2020, I attended the third SAGE meeting on COVID-19. The minuted summary includes the following:

1. *On the expected impact of travel restrictions, SAGE estimates – with limited data – that if the UK reduces imported infections by 50%, this would maybe delay the onset of any epidemic in the UK by about 5 days; 75% would maybe buy 10 additional days; 90% maybe buys 15 additional days; 95%+ maybe buys a month.*
2. *Only a month of additional preparation time for the NHS would be meaningful. It would also be meaningful if the outbreak were pushed out of usual winter respiratory season.*
3. *To prevent imported infections along these lines would require draconian and coordinated measures, because direct flights from China are not the only route for infected individuals to enter the UK.*

4. *Additional measures would be required and 50% reduction is probably about the best that could be achieved with a ban on direct travel from China alone.*
5. *Stopping travel would also have other impacts, including on supply chains.*
6. *SAGE will address the question of what package of measures might lead to a 1 month delay (including measures to stop spread within the UK)*
7. *SAGE will also seek to refine its estimates through further modelling; SAGE is next meeting on Tuesday 4 February 2020.*

Situation update

8. *The epidemic is still in its early stages. It is a reasonable hypothesis that the epidemic is still growing exponentially – doubling every 4-5 days.*
9. *Case ascertainment in China appears to be low: potentially 1 in 15 being identified, possibly 1 in 20. The scale of the epidemic in China could be in the region of 200,000 to 300,000 cases.*
10. *Incubation period (time between exposure to infection and symptom onset): consensus of modellers puts this at 5 days, but range is 2 to 14 days.*
11. *Generation time (the time between the infection of a primary case and one of its secondary cases) estimated at 6-7 days.*
12. *There is some evidence of younger people in China showing symptoms.*
13. *Sustained community transmission outside China should be expected.*
14. *Data challenges remain: data from Hubei province, where testing is more thorough, is most reliable.*
15. *To better understand the epidemic, it is important to have access to case numbers reported by onset date, data on numbers of people being tested, age distribution of cases and co-morbidity information – updated daily.*

[JVT2/051 – INQ000051883]

- 6.49. International engagement continued throughout this period to engage insights and knowledge, including on cases. On 3 February 2020, I know the CMO met the Director General of the WHO as well as joining a G7 call.

6.50. On 3 February 2020, an advice note that I had prepared for the Health Secretary on the costs and timeline for vaccine development was shared with DHSC colleagues [JVT2/052-053 – INQ000047659 / INQ000047660].

6.51. On 4 February 2020, I attended the fourth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *SAGE agreed that greater sharing of data on the outbreak is essential. HMG should make the case for data sharing at every opportunity.*
2. *The outbreak is likely to peak in Wuhan/Hubei in the next 3 to 5 weeks. This is currently a wide range, and SAGE would seek to refine this estimate as more data emerges. There will be a lag before it peaks in China, then further lags before it peaks elsewhere in the world if it spreads widely.*
3. *A delay now in the arrival and spread of WN-CoV in the UK would be beneficial for improving NHS readiness and ability to manage a UK outbreak and importantly may push any outbreak beyond the winter respiratory season. The NHS is currently facing winter pressures, and outside of the winter respiratory there will be fewer people presenting at hospital with similar symptoms to WN-CoV.*
4. *SAGE remains content with the validity of the statement (issued 3 February) on the impact of international travel restrictions on delaying spread of WN-CoV.*
5. *SAGE agreed that, based on current evidence, domestic measures such as shutting down public transport or restricting public gatherings would probably be ineffective in creating any meaningful delay in spread of WN-CoV.*
6. *SAGE agreed that HMG should continue to plan using current influenza pandemic assumptions, which can be modified as data becomes more certain.*
7. *Modelling group SPI-M to produce projections of when the epidemic will peak, as well as other issues, including the impact of closing schools in different outbreak scenarios.*

...

Situation Update

11. *SAGE was updated on latest case numbers and fatalities: there was agreement that figures for China likely a significant underestimate.*
[JVT2/054 – INQ000061512]

6.52. As the SAGE minutes show, legitimate concern was expressed as to under-ascertainment of case numbers emanating from China. That made it even more important to continue to get information on case numbers from a wide variety of sources. So, as I hope the narrative in this timeline shows, there was ongoing international engagement throughout this period.

6.53. On 4 February 2020, the NIHR and UKRI launched the first rapid research call, which offered funding for COVID-19 research. The CMO and I had been closely involved in instigating and launching this call. I attended the call and gave a briefing to researchers. I understand that the OCMO and my legal team have tried to locate any written records of this meeting but that nothing has been found.

6.54. On 6 February 2020, I attended the fifth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *The geographical element of the case definition (i.e. the criteria for deciding whether an individual has a disease) for WN-CoV before this meeting was anyone who has travelled from Hubei in the previous 14 days, or anyone who has travelled from mainland China and has developed possible symptoms.*
2. *In light of new evidence of human-to-human transmission beyond China, SAGE advises that the UK geographical case definition should be widened, taking into account available information on air travel volumes from Hubei to other countries, numbers of reported cases in other countries, and understanding of other travel routes.*
3. *SAGE now advises that individuals in the UK who have travelled from Thailand, Japan, Republic of Korea, Hong Kong, Taiwan, Singapore, Malaysia or Macau and are showing possible symptoms of WN-CoV should also be included in the case definition.*

4. *SAGE advises that this decision will need to be reviewed in the coming days as further information becomes available.*

Situation update

5. *SAGE was advised of a third UK case which has tested positive for WN-CoV.*
6. *The individual has not been to China, but has recently visited Singapore.*
[JVT2/055 – INQ000061513]

6.55. On 7 February 2020, I attended a call with the CMO and our counterparts in Singapore to discuss the response to the virus. A contemporaneous note of that call is exhibited at **[JVT2/056 – INQ000047705]**.

6.56. On 11 February 2020, the sixth SAGE meeting on COVID-19 took place but I did not attend. The minuted summary includes the following:

1. *SAGE agreed that HMG should continue to plan using influenza pandemic assumptions.*
2. *SAGE advised it is essential that the maximum amount of information is derived from confirmed cases in the UK.*
3. *Assuming the reproduction number and doubling time are similar in the UK to the early stages of the outbreak in Wuhan, an epidemic in the UK could be expected to peak around 2 to 3 months following the establishment of widespread transmission, but there is low confidence around this. It is predicted to have a lower peak but broader duration than a pan flu outbreak.*

Situation update

4. *SAGE was updated on rough case numbers and fatalities for China and other countries.*
5. *The UK has 8 confirmed cases, all of whom acquired the virus overseas.*
6. *Swabbing is taking place of individuals quarantined at Arrow Park and Milton Keynes.*
7. *It is not possible for the UK to accelerate diagnostic capability to include Covid-19 alongside regular flu testing in time for the onset of winter flu season 2020-21.*

8. *Validated serology for clinical use in the UK is around 4 to 6 weeks away. Singapore and Hong Kong are close to validated serological capability. [JVT2/057 – INQ000087552]*

6.57. On 13 February 2020, the seventh SAGE meeting on COVID-19 took place but I did not attend. The minuted summary includes the following:

1. *SAGE concluded that neither travel restrictions within the UK nor preventing of mass gatherings would be effective in limiting transmission.*
2. *SAGE advised that the most effective way to limit spread in prisons at this stage would be by reducing transfer of individuals between prisons.*
3. *Public messaging should stress the importance of personal responsibility and responsibility to others.*
4. *Public messaging should stress both the efficacy and sufficiency of any behaviours it recommends to reduce the likelihood of the public adopting further unnecessary or contradictory behaviours.*

Situation update

5. *SAGE and wider HMG should continue to work on the assumption that China will be unable to contain the epidemic. [JVT2/058 – INQ000052045]*

6.58. On 14 February 2020, I attended a call with the Minister of Health of Singapore who provided information on cases in Singapore. A contemporaneous note of the call is exhibited at **[JVT2/059-060 – INQ000236468 / INQ000236469]**.

6.59. On 16 February 2020, I provided advice to DHSC colleagues on the repatriation of British Nationals from Japan, following the receipt of a report from the Foreign Office on the Diamond Princess cruise ship. Japan had not acceded to the UK Government's request that a land-based quarantine facility be made available to UK nationals currently on the vessel. I advised that the preferred onshore option was clearly not viable and agreed with the report that the remaining options were to evacuate British nationals on a UK or another nation's charter flight. I highlighted the risk of illness or viral transmission on board any flight and advised that any British national re-entering the UK having been on board the Diamond Princess should be isolated for 14 days. I

further advised that a more controlled option would be a bespoke evacuation flight with supervised entry of passengers into a 14-day quarantine [JVT2/061 – INQ000151477].

6.60. On 18 February 2020, the eighth SAGE meeting on COVID-19 took place but I did not attend. The minuted summary includes the following points:

1. *There is some evidence that case incidence is decreasing in China. However, this does not rule out a resurgence once restrictions on internal movement are lifted.*
2. *SAGE agreed it is essential that the UK plans for how it will handle clinical trials and treatment should there be an outbreak of Covid-19 in the UK.*

Situation update

3. *Data from China indicates that the incidence of Covid-19 is decreasing. However, this does not rule out a resurgence of the disease later in the epidemic as internal travel restrictions are lifted and schools return.*
4. *Indications from international partners suggests that children with Covid-19 are displaying milder symptoms, but this does not preclude them from being carriers of the disease.*
5. *Discussions are taking place across Government on how researchers can access clinical samples. An access committee, coordinated by UKRI, is being set up to balance the needs of the scientific community and consider what will have a demonstrable impact on controlling the epidemic.*
6. *Priorities will shift during a potential outbreak from containment and isolation on to delay and, finally, to case management.*
7. *Currently PHE can cope with five new cases a week (requiring isolation of 800 contacts). Modelling suggests this capacity could be increased to 50 new cases a week (8,000 contact isolations) but this assumption needs to be stress tested with PHE operational colleagues.*
8. *SAGE agreed that alongside contact tracing, early warning surveillance systems – community and sentinel based – need to feed into trigger points for decisions on when the current monitoring and contact tracing approach is no longer working.*
9. *When there is sustained transmission in the UK, contact tracing will no longer be useful. [JVT2/062 – INQ000061516]*

6.61. On 20 February 2020, the ninth SAGE meeting on COVID-19 took place but I did not attend. The minuted summary includes the following:

1. *Before consideration of measures to reduce spread is undertaken, it is essential to understand the ability of surveillance methods to pick up evidence of an epidemic (and how those methods might be improved), understand when evidence will become available, and – from that surveillance – the likely trajectory of an epidemic.*
2. *It is also essential to understand the objectives behind seeking to manage the epidemiological curve, informed by key challenges the NHS is seeking to mitigate.*

Situation update

3. *There is evidence of local transmission unlinked to individuals who have travelled from China in Japan, Republic of Korea and Iran.*
4. *There is evidence from China and Hong Kong that social distancing measures have had some impact in limiting the outbreak. [JVT2/063 – INQ000052106]*

6.62. On 21 February 2020, I provided comments through OCMO to DHSC on the Wuhan Novel Coronavirus Cross Health System Communications Strategy which they were preparing [JVT2/064-065 - INQ000047812 / INQ000047813].

6.63. On 21 February 2020, I provided a clinical view by email to CCS, DHSC, the Cabinet Office, the Home Office, BEIS and PHE in relation to the Diamond Princess cruise ship and the process for those British Nationals who had been on board to return to the UK [JVT2/066 - INQ000151502].

6.64. On 21 February 2020 I forwarded hospital inpatient data received from Singapore to colleagues at DHSC, NHSE, SAGE and SPI-M, expressing the view that it was likely to be highly reliable and suggested how it might inform the UK's reasonable worst case scenario planning [JVT2/067 - INQ000151506].

- 6.65. On 22 February 2020, I advised the Foreign and Commonwealth Office (“FCO”) on travel to South Korea. The FCO was seeking advice on recommending against all but essential travel to two regions within South Korea. I provided information on the situation in South Korea, explaining that there were fewer than 500 cases but the numbers were climbing rapidly, that the doubling time was about 4 days and that there was evidence of person-to-person transmission. I noted that the current advice in respect of China was against all travel to Wuhan and against all but essential travel to the rest of the mainland. I suggested that travel advice to other countries, including Italy, Iran and the rest of the Middle East should be kept consistent and that SAGE and the CMO were due to consider the matter in the next couple of days. I advised that anything more than recommending against all but essential travel to the two regions under consideration would be jumping ahead of the science. It was agreed that a note would be put to ministers covering the latest situation in South Korea and the implications of changing the travel advice **[JVT2/068 - INQ000047831]**.
- 6.66. On 25 February 2020, I attended the tenth SAGE meeting on COVID-19. The minuted summary includes the following:
1. *SAGE advises that surveillance measures, which commenced this week, will provide actionable data to inform HMG efforts to contain and mitigate spread of Covid-19.*
 2. *The risk of public disorder in the UK – defined to include opportunistic crime, community tension and rioting – is assessed to be very low in response to an epidemic. Pro-social behaviour and altruism are more likely public responses; public communications should seek to guide and promote such behaviours. **[JVT2/069 – INQ000087503]***
- 6.67. On 26 February 2020, I provided comments to DHSC on a draft Action Plan document – *Coronavirus: Preparedness and Response* **[JVT2/070-071 - INQ000047878 / INQ000047879]**. This was a public facing DHSC document that was published on 3 March 2020. It set out in detail what was then known about the virus, the plans that were already in place to respond to such an outbreak, the actions that had been taken to respond to it thus far, the planned next steps and the role that the public could play

in supporting the response. My contribution was to ensure clinical accuracy. For example, I advised on our current understanding of the virus, likely symptoms, disease severity, previous pandemics and initial response measures.

6.68. On 26 February 2020, I deputised for the CMO at the fifth COBR meeting on the outbreak. The minutes of that meeting record that I provided the following update:

“...official data from China showed that case numbers continued to increase. Internationally case numbers in South Korea, Iran and Italy highlighted clear person to person transmission and the following areas of concern:

- *The connectivity of Iran, particularly with other countries in the Middle East.*
- *Sustained human to human transmission in Italy – which receives a high number of travellers to and from the UK.*
- *Two further serious cases and [sic] Germany.*
- *It was still difficult to predict when or if case numbers would increase in the UK.”*

The minutes also record that I gave the following advice for individuals arriving in the UK from impacted international regions:

“ ...

- *Iran, specific areas of Northern Italy and South Korea (as designated by their respective Governments), and the Hubei province – anyone travelling from these areas was advised to self-isolate regardless of whether they have symptoms on arrival in the UK.*
- *For further countries or areas, including Northern Italy, Cambodia, Myanmar, Laos, Vietnam and Thailand – anyone travelling from these areas was advised to self-isolate if symptoms present.” [JVT2/072 - INQ000056216]*

6.69. On 27 February 2020, I attended the eleventh SAGE meeting on COVID-19. The minuted summary includes the following:

1. *SAGE reviewed Covid-19 planning assumptions and advised that, in the reasonable worst case scenario, 80% of the population may become infected, with an overall 1% fatality rate in those infected. Only a proportion*

of those infected will experience symptoms. This fatality rate represents a reduction in the number of excess deaths relative to previous planning assumptions (in which a case fatality rate of 2-3% was based purely on identified cases rather than all infected individuals).

Situation update

- 2. dCMO has established a system, CO-CIN, to catalogue data from cases of Covid-19.*
- 3. CMO's office is looking out for any secondary bacterial infections in reported Covid-19 cases, but to date there is little evidence for secondary infections.*
- 4. NERVTAG is reviewing a range of therapies and related trial designs that NHS settings can realistically implement [JVT2/073 – INQ000061519]*

6.70. On 27 February 2020, I advised the Rt Hon Oliver Dowden MP, then the Secretary of State for the Department for Digital, Culture, Media and Sport (“DCMS”) in relation to cancelling mass gatherings (specifically, the Six Nations rugby match between Italy and England in Rome). I was supported in that meeting by DCMO Dr Aidan Fowler, Professor John Edmunds (London School of Hygiene and Tropical Medicine), Professor Neil Ferguson (Imperial College London), Dr Jonathan Read (Lancaster University) and NR (PHE). The advice given at the meeting is set out in the exhibited contemporaneous note [JVT2/074 - INQ000047898]. As is clear from the note, a range of views were expressed. I explained to the Secretary of State that while it may be necessary to cancel mass gatherings in the future, the current epidemiological evidence did not support such a measure at that time. That advice was based on three main factors:

- i. Community transmission was likely to be present in the UK within the next two weeks if it was not already and therefore any additional case importation from the continent was unlikely to have a significant impact.
- ii. The group of people travelling to watch the rugby represented a small proportion of the larger cohort of people travelling to and from Rome/Italy at that time for other reasons. Cancelling the rugby was therefore unlikely to have a significant impact on the number of cases imported to the UK.

- iii. The evidence base for concluding that outdoor mass gatherings increase transmission was, and remains, extremely poor. At a mass gathering of say 40,000 people, if you attend you may well come into prolonged close contact with only a few people. Those that went with you, maybe a few in a pre-match bar, those in seats nearby (often open air) and those in closed spaces such as the toilets if there is a queue.

6.71. On 27 February 2020, I provided advice to DHSC colleagues on the same matter following a request from the Permanent Secretary DHSC [JVT2/075 - INQ000151512]. I explained that I had asked SPI-M to conduct a rapid review on the issue, but in the absence of that review, *“all we have for now is the CMO/DCMO combined view that fans travelling to Italy and back in large numbers won’t help; but probably won’t have any major impact either (beyond what is already in train, seen and unseen in terms of importations from Italy). And that by 14th March UK could well be in a very different place than now. Thus no overriding PH reason to cancel and any decision largely political”*.

6.72. On 28 February 2020, the UK reported its first confirmed cases of community transmission. I don’t recall this event impacting my advice to decision-makers in any significant way. I thought that it was inevitable and that this was just the beginning. I do not know whether this view was shared by the CMO and the GCSA.

6.73. On 2 March 2020, I met with Nigel Huddleston MP, then the Minister for Sport and officials from DCMS, to again discuss the matter of large sporting events. A summary of those discussions is set out in the exhibited note [JVT2/076 - INQ000047924]. At that meeting, I explained the basic epidemiology of the virus (as it was then understood) and reiterated my previous advice that from a transmission risk perspective, the sporting event itself was likely to be secondary to other interactions that might happen on the way to the event, at a hotel, or in a bar for example. I explained that all options should remain on the table and that we would continue to reassess based on the evidence, but that at that time there was no clear rationale for cancelling events.

6.74. On 3 March 2020, I attended the twelfth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *SAGE discussed the impact of potential behaviour and social interventions on the spread of a Covid-19 epidemic in the UK, including the resulting public response. Going forward, agreement on the optimal timing of these interventions will be required.*
2. *NHS England confirmed it has sufficient information in relation to the reasonable worst case (RWC) scenario for operational planning.*

Situation update

3. *PHE have implemented a surveillance and monitoring plan as per previous SAGE discussions. [JVT2/077 – INQ000119719]*

6.75. On 5 March 2020, I attended the thirteenth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *There are currently no scientific grounds to move away from containment efforts in the UK.*
2. *There is epidemiological and modelling data to support implementation – within 1-2 weeks – of individual home isolation (symptomatic individuals to stay at home for 14 days) and whole family isolation (fellow household members of symptomatic individuals to stay at home for 14 days after last family member becomes unwell) to delay Covid-19 spread, modify the epidemic peak and reduce mortality rates.*
3. *In addition, there is scientific data to support implementation – roughly 2 weeks later – of social isolation (cocooning) for those over 65 or with underlying medical conditions to delay spread, modify the epidemic peak and reduce mortality rates.*
4. *SAGE agreed an updated set of reasonable worst case scenario planning assumptions for Covid-19.*

Situation update

5. *UK surveillance of intensive care units has identified Covid-19 cases. Not all of these have had overseas travel or contacts, suggesting sustained community transmission is underway in the UK. [JVT2/078 – INQ000061521]*

- 6.76. On 6 March 2020, I forwarded data received from the CDC to DHSC colleagues with the instruction that it was important for the Health Secretary to see it. The data related to mortality rate in COVID-19 cases in Washington State and suggested that the risk of death and serious illness was greater in the elderly [**JVT2/079 - INQ000151536**].
- 6.77. On 7 March 2020, together with Professor Harries and the CMO, I contributed to advice for the Cabinet Office on proposed social distancing measures. The advice centred around a two-tier approach that would recommend more stringent measures for a first group of very high-risk people and less stringent measures for a second group consisting of both individuals over the age of 70 and younger individuals with chronic health conditions [**JVT2/080 - INQ000047986**].
- 6.78. On 7 March 2020, I advised DHSC colleagues in relation to a briefing paper for the Health Secretary on a proposed 'isolate to protect' policy. This comprised three lead interventions that had been modelled by SAGE: (1) home isolation for symptomatic patients; (2) whole household isolation for symptomatic patients; and (3) social distancing for the elderly and vulnerable [**JVT2/081-082 - INQ000151545 / INQ000151546**].
- 6.79. On 8 March 2020, I advised the Health Secretary's Senior Private Secretary on the logic behind not performing health checks on passengers returning to the UK from Italy:
- "Travel checks will not work.*
- The flight time is 2-3 hours.*
- The incubation period is typically 120 hours.*
- Almost all cases will be missed."* [**JVT2/083 - INQ000151553**]
- 6.80. On 8 March 2020, I provided advice to DHSC colleagues on cruise ship travel that was intended for the Health Secretary in advance of a COBR meeting the following day. My advice set out the risk factors of a cruise ship environment and explained that,

despite these, we would likely not support blanket FCO advice that said, “don’t go on cruise ship holidays”. Rather, I explained, “we would prefer softer, more risk-stratified advice... for passengers over the age of 70 and those... with high-risk conditions to consider very carefully whether it is advisable to take cruise ship holidays until the Covid-19 crisis is over”. The CMO agreed that, “The key thing is the more vulnerable patients” [JVT2/084 - INQ000047995].

6.81. On 10 March 2020, I attended the fourteenth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *SAGE agreed that social distancing measures for the elderly should apply to those aged 70+. Modelling using 65+ and 70+ deliver comparable results, but there is a large drop off in efficacy if the measures are confined to 80+.*
2. *SAGE advised that these social distancing interventions should consider 2 distinct groups: a) those aged 70+ who are generally well and b) vulnerable groups of all ages (including those aged 70+).*
3. *Limited evidence suggests that children can be at risk of Covid-19 and will mostly experience mild illness, though they probably transmit the virus.*
4. *SAGE will revisit its advice on the risks posed by different kinds of social gatherings/meetings and the impacts of restricting them on the epidemic curve at its next meeting (12 March). This will include consideration of the effects of physical distancing among individuals and duration of exposure on infectivity and transmissibility of Covid-19.*

Situation update

5. *Based on surveillance, including cases in intensive care units (for whom there is no travel history accounting for infection, the UK likely has thousands of cases - as many as 5,000 to 10,000 – which are geographically spread nationally.*
6. *Transmission is underway in community and nosocomial (i.e. hospital) settings.*
7. *Available data for the UK are accruing fast. Firmer estimates of infection rates will be available next week.*

8. *PHE has a serology test up and running for population-level analysis. Analysing greater volumes of samples is now the priority.*
9. *A test for frontline diagnostics may come from the private sector.*
10. *It was agreed that PHE and SPI-M should discuss how to make surveillance data more useful for modelling purposes (e.g. providing case location data).*
11. *It was reported that all pneumonia cases in hospital are now due to be tested.*
12. *The UK is considered to be 4-5 weeks behind Italy but on a similar curve (6-8 weeks behind if interventions are applied). [JVT2/085 – INQ000061522]*

6.82. On 10 March 2020, following from an email exchange with Professor Ferguson, I advised a DHSC colleague on the isolation period for someone who has tested positive for COVID-19 and their household [JVT2/086 - INQ000151564].

6.83. On 10 March 2020, I advised DHSC and Cabinet Office colleagues on pre-symptomatic transmission as follows:

“The evidence that people shed virus and are infectious to others whilst in the pre-symptomatic stages is highly limited and inconclusive. It is not possible to say there are no cases ever of pre-symptomatic transmission, but in relation to transmission from people with established symptoms the force of infection from asymptomatic people is likely to be extremely low. I do not advise that we complicate our case isolation policy and, if we were to do so, the science on pre-symptomatic transmission would need re-visiting by SAGE and/or NERVTAG before we did so.” [JVT2/087 - INQ000151568]

6.84. On 12 March 2020, I advised DHSC colleagues on the draft PHE *Staying at Home Guidance for individuals with confirmed coronavirus infection (COVID-19)* [JVT2/088-089 - INQ000048055 / INQ000048056].

6.85. On 13 March 2020, I attended the fifteenth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *Owing to a 5-7 day lag in data provision for modelling, SAGE now believes there are more cases in the UK than SAGE previously expected at this point, and we may therefore be further ahead on the epidemic curve, but the UK remains on broadly the same epidemic trajectory and time to peak.*
2. *The science suggests that household isolation and social distancing of the elderly and vulnerable should be implemented soon, provided they can be done well and equitably. Individuals who may want to distance themselves should be advised how to do so.*
3. *SAGE is considering further social distancing interventions – that may best be applied intermittently, nationally or regionally, and potentially more than once – to reduce demand below NHS capacity to respond. The modelling sub-group is discussing potential interventions on Monday 16th, for review by SAGE on Tuesday 17th.*
4. *The behavioural science suggests openly explaining to the public where the greatest risks lie and what individuals can do to reduce their own risk and risk to others, even if taking individual measures may be more feasible for some than others. Greater transparency could enable personal agency, send useful signals about risk and build trust.*
5. *Measuring the impact of all interventions depends on sufficient, relevant data delivered on time: it is a priority to ensure accurate and complete data are available with minimal delay.*

Situation update

6. *SAGE is keen to make the modelling and other inputs underpinning its advice available to the public and fellow scientists.*
7. *There are probably more cases in the UK than SAGE previously expected at this point, and we may be further ahead on the epidemic curve, but the UK remains on broadly the same epidemic trajectory. The change in numbers is due to the 5-7 day lag phase in data availability for modelling.*
8. *Office for national Statistics (ONS) is gathering data on a) availability and prices of key (“anxiety”) goods b) labour market trends c) consumer spending across key sectors d) and business behaviour (e.g. home working).*
9. *ONS is also developing a new opinion survey, for which questions are being finalised over the weekend.*

10. SAGE will review a dashboard containing the findings from these datasets at each meeting. [JVT2/090 – INQ000203985]

6.86. On 14 March 2020, I advised DHSC colleagues on potential NPIs following a request that came out of a meeting with the Prime Minister that morning (that I did not attend) and in advance of a further meeting with the Prime Minister to be held the following day. My advice was as follows:

“...

1. *There are absolutely no magic activities not to do*
2. *It is primarily mathematical, about the number of close human contacts and driving that number down*
3. *The next factor is close proximity (human density) and duration of contact (e.g. busy cinema for a 2hr movie)*
4. *The next factor is about air exchanges and ventilation (snug rooms in a crowded pub) and that makes indoor events higher risk*
5. *The key interaction we want to stop is interactions between different households and the number of interactions (so speed-dating for 2hrs is very much worse than a 2hr dinner in a restaurant with a single spouse or lover)*
6. *The final one is keeping essential life going (which is why the Italians did not close supermarkets and pharmacies); it's arguable that funerals will have to go on but the wakes are a really bad idea; wedding receptions where the old are exposed to the young and middle aged also bad, but there may be policy limits...*

...

The biggies are: pubs, restaurants, cinemas, theatres, nightclubs, book clubs, wine clubs, bible groups, prayer groups, cubs, scouts, beavers, youth clubs, bingo. I could go on... [JVT2/091 - INQ000151592]

6.87. On 14 March 2020, I provided my view on a paper regarding mass gatherings that had been prepared by DCMS for officials at DCMS, DLUHC, BEIS, Cabinet Office, the Home Office and the Treasury. I explained that the paper “*fails to clarify the modelling I have seen (so has SPI-M) that within the blanket term mass gatherings, the*

propensity for onward transmission is higher at small mass gatherings such as large family parties, weddings, versus much larger ones like outdoor stadia. This means the potentially easy pick for a minister – [of restricting] only large or very large gatherings is the weakest choice. I believe the Minister must make the decision armed with nothing less than the full facts. Even if that means a hard decision, as in ROI, becomes the rational one” [JVT2/092 - INQ000151600].

6.88. On 16 March 2020, I attended the sixteenth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *On the basis of accumulating data, including on NHS critical care capacity, the advice from SAGE has changed regarding the speed of implementation of additional interventions.*
2. *SAGE advises that there is clear evidence to support additional social distancing measures be introduced as soon as possible.*
3. *These additional measures will need to be accompanied by a significant increase in testing and the availability of near real-time data flows to understand their impacts.*
4. *SAGE will further review at its next meeting whether, in the light of new data, school closures may also be required to prevent NHS capacity being exceeded.*
5. *SAGE did not review the work on intermittent application of measures nationally or geographically in detail but will do so.*

Situation update

6. *London has the greatest proportion of the UK outbreak. It is possible that London has both community and nosocomial transmission (i.e. in hospitals).*
7. *It is possible that there are 5,000-10,000 new cases per day in the UK (great uncertainty around this estimate).*
8. *UK cases may be doubling in number every 5-6 days.*
9. *The risk of one person within a household passing the infection to others within the household is estimated to increase during household isolation, from 50% to 70%. [JVT2/093 – INQ000075664]*

6.89. On 18 March 2020, I attended the seventeenth SAGE meeting on COVID-19. The minuted summary includes the following:

1. *Based on limited available evidence, SAGE considers that the UK is 2 to 4 weeks behind Italy in terms of the epidemic curve. The consensus is that growth of the UK epidemic is tracking at the same rate as in other countries.*
2. *SAGE advises that available evidence now supports implementing school closures on a national level as soon as practicable to prevent NHS intensive care capacity being exceeded.*
3. *SAGE advises that the measures already announced should have a significant effect, provided compliance rates are good and in line with the assumptions. Additional measures will be needed if compliance rates are low.*
4. *Reliable data on the health impacts of existing interventions will only be available in 2-3 weeks. This would not be in time to inform judgements on additional interventions to limit NHS pressures, which are likely to be significant within 2-3 weeks. It may be possible to collect intermediate data, and this should be a priority.*
5. *Social distancing based on a) places of leisure (restaurants, bars, entertainment and public spaces) and b) indoor workplaces depend on compliance with the guidance issued earlier in the week. We do not yet have reliable compliance data and therefore collecting reliable compliance data should be a priority.*
6. *If the interventions are required, it would be better to act early.*
7. *Transport measures such as restricting public transport, taxis and private hire facilities would have minimal impact on reducing transmission in London.*
8. *Future SAGE meetings will consider broader aspects of Covid-19 including clinical science, genetics, virology, and treatments and vaccines.*

Situation update

9. *There are 1,950 cases in the UK (17/03 at 14:00), with 87 intensive care cases, of which 62 are in London. Testing capacity has reached 6,084 daily, with a goal to reach 25,000 tests as soon as possible.*
10. *The UK is following broadly the same exponential growth rate of cases as Italy, and there is consistency with patterns in other countries.*

11. *There is uncertainty on our exact position, but the consensus view is that we are 2-4 weeks behind the epidemic curve in Italy.*
12. *Assuming a doubling time of around 5-7 days continues to be reasonable, but this is before any of the measures brought in have had an effect; these measures are likely to slow the doubling time even if there is still an exponential curve.*
13. *Modelling suggests that, without mitigation, London could reach Covid-19-related intensive care capacity by early April. [JVT2/094 – INQ000061525]*

6.90. On 20 March 2020, I advised DHSC colleagues on shielding measures in response to queries from the Minister for Social Care. The Minister had questioned the current advice that the clinically extremely vulnerable should shield at home, but the remainder of the household should stringently follow social distancing advice. She questioned whether the whole household should be advised to shield instead. My advice was that the only totally risk-free approach was for the entire household to shield at home, but that that obviously presented a number of practical problems, which I set out [JVT2/095 - INQ000151619].

6.91. On 21 March 2020, I provided further advice to DHSC colleagues on shielding measures by reviewing and commenting on a Q&A document that would inform the public about the Government's shielding advice [JVT2/096-097 - INQ000151623 / INQ000151624].

6.92. On 21 March 2020, I attended a COVID-S meeting and provided an update on case numbers and ITU capacity [JVT2/098 - INQ000056263]. The minuted summary of my update includes the following:

“The critical question was how many cases were in the Intensive Treatment Unit (ITU); this number was 335, of which 193 cases were in London. This was up from 143 the day before. Under normal circumstances there were 700 ITU beds in London, which could be expanded. London was not yet at that pressure point. Prohibitions on social activity had been discussed at length by the Committee the previous day. There was some risk of ITU's being overtopped if the Government did not do more, but there were also risks associated with

further action. The ITU data being presented alone was not a reason for the Government to decide that day to change decisions made the previous day”.

6.93. On 23 March 2020, I attended the eighteenth SAGE meeting on COVID-19. The minuted summary includes the following:

- 1. UK case accumulation to date suggests a higher reproduction number than previously anticipated. High rates of compliance for social distancing will be needed to bring the reproduction number below one and to bring cases within NHS capacity.*
- 2. Public polling over the weekend on behaviour indicated significant changes but room for improvement in compliance rates.*
- 3. Estimated Covid-19 fatalities are anticipated to overlap with those who are likely to be within the final year of their lives. It is important to get an accurate excess deaths estimate, including potential deaths due to the measures taken.*
- 4. Given the clear links between poverty and long-term ill health, health impacts associated with the economic consequences of interventions also need to be investigated.*
- 5. Antibody screening for healthcare workers should aim to identify those with immunity who can care for the most vulnerable patients.*

Situation update

- 6. The NHS is surging bed capacity over the next fortnight, with a focus on London.*
- 7. The data suggest that London is 1-2 weeks ahead of the rest of the UK on the epidemic curve. Case numbers in London could exceed NHS capacity within the next 10 days on the current trajectory.*
- 8. The accumulation of cases over the previous two weeks suggests the reproduction number is slightly higher than previously reported. The science suggests this is now around 2.6-2.8. The doubling time for ICU patients is estimated to be 3-4 days.*
- 9. Increased community testing and surveillance will be invaluable to measure the effects of the interventions taken.*

10. *Genome sequencing is providing insight into the seeding of cases across the UK. Results suggests that there have been introductions from different parts of the world as well as community transmission and some nosocomial clusters (i.e. in hospital settings).*

11. *PHE are seeking to understand environmental dispersal of the virus in hospitals. They are working with SPI-M and NERVTAG, and will bring a paper back to SAGE. [JVT2/099 – INQ000129072]*

6.94. On 23 March 2020, I provided written advice to GO-Science colleagues on measures that could be taken to improve social distancing and reduce transmission, following a request from the Prime Minister via the Cabinet Office. I commented on a draft table prepared by the Cabinet Office that set out a number of potential measures that could be implemented. As will be seen from the exhibited document, my advice is set out against each option in red text [JVT2/100-JVT2/102 – INQ000236470 / INQ000236471 / INQ000236472].

6.95. On 23 March 2020, following a request from the Health Secretary, I provided advice to his Private Secretary on whether COVID-19 could be spread through food production. I forwarded advice from the CDC on the subject that stated, “*Currently there is no evidence of food or food packaging being associated with transmission of COVID-19*”. I added the following, “*Clearly the original human focus was from a food market in Wuhan but that was a very uncontrolled situation. It is however plausible that CV-19 could be passed on if an infected person shared a common crockery and or cutlery dipped into a common cooking pot as part of a meal. In reality the epidemiological challenge would be determining if it was the crockery, the food, the cutlery or just the close range contact between the individuals*” [JVT2/103 - INQ000151628].

6.96. On 23 March 2020, I advised colleagues at DLUHC and BEIS on social distancing at outdoor food markets. My advice was as follows:

“The basic problem with any kind of trading is human density/overcrowding, and face to face contacts (the riskiest ‘procedure’ of all). Open markets and food markets can be made a bit safer by limiting the number of people allowed

to enter. But this requires cordoning and enforcement and if closely packed queues form at the entrances you have almost defeated the object.

Markets have three very definite disadvantages over supermarkets:

- 1. In relative terms lots of face to face exchanges (many more than at supermarkets)*
- 2. More difficulties in enforcing/regulating human density*
- 3. Short hours (in my town they are all packing up by 2:30pm) meaning a concentration of people in a shorter period of time*
- 4. Combination with food and drink stalls, open air seating etc. essentially reforming restaurants*

I have to be perfectly frank here, the more watered down social distancing enforcement becomes (for perfectly understandable commercial and economic reasons) the more people will die because we haven't bent the epidemic curve downwards and the NHS is then overwhelmed and cannot treat our loved ones. This is really real." [JVT2/104 - INQ000151632]

6.97. On 23 March 2020, I advised DHSC colleagues on social contact between children, following a request from No.10. My advice was as follows:

"My position is that we need to eliminate contact between households as much as is humanly possible. Therefore children may play outdoors and indoors with other children from the same household. But children should not play with children from other households. (I think the reality is that parents with just one child will make an arrangement with parents who also have just one child that the two children will play together in a mutually exclusive way)." [JVT2/105 - INQ000151634]

6.98. On 26 March 2020, I attended the nineteenth SAGE meeting on COVID-19. The minuted summary includes the following:

- 1. Data and modelling for NHS demand must be aligned completely with SPI-M modelling – and there must be a single version of the numbers in use across HMG.*

2. *Nosocomial transmission, risk markers for severe disease and severity scoring for COVID-19 cases need urgent attention.*
3. *It is vital not to make hasty decisions regarding treatments based on insufficient data.*
4. *SAGE will begin shifting attention to future phases of the epidemic to anticipate challenges and opportunities to minimise impacts and harms, release current measures safely and advise on long-term issues.*

...

Situation update

12. *The data suggest a 3.3 day doubling time in hospitals.*
13. *New data collected from this week on human contact patterns will be used to estimate R for community spread. SPI-M is reviewing R later today.*
14. *Spare bed capacity is at roughly 20%, including in London. Surge capacity planning for London is underway.*
15. *Significantly fewer children are attending school than anticipated.*
16. *ONS data points to very high proportions of people in the UK changing their behaviour. Social interaction is greatly reduced, as is footfall on public transport, at parks and beaches. Mobile phone data for the over-65s suggest they are staying in one location. WiFi data suggests strong reductions in fast food outlet and supermarket use.*
17. *ONS is planning future surveys, including a dedicated survey for those experiencing social shielding.*
18. *CO-CIN data points to more men being admitted to hospitals than women, and more men than women dying. Cases cannot be triaged simply according to standard severity scores when they present at hospitals. Understanding is building of the most serious co-morbidities affecting mortality. New approaches to scoring severity and risk for COVID-19 are required.*
19. *ONS, DHSC and the HO Chief Scientific Adviser will produce a report on excess deaths by 8 March.*
20. *HSE found no material difference between the N95 and FFP2 respirator masks. Both provide protection as long as the wearer is face-fit tested. Choice of masks needs to risk-assessment [sic] driven. Further advice for NHS and PHE on overall PPE will be completed within 24 hours.*

21. SAGE participants will receive advice about personal and digital security
[JVT2/106 – INQ000119726]

6.99. On 27 March 2020, I attended a COVID-S meeting, chaired by the Prime Minister. My contribution, recorded in the resulting minute, was to update on potential treatment options for COVID-19 **[JVT2/107 - INQ000088602]**.

6.100. On 29 March 2020, I attended the twentieth SAGE meeting on COVID-19. The minuted summary includes the following:

- 1. SAGE endorsed the reasonable worst case and optimistic scenarios, incorporating changes discussed in the meeting.*
- 2. Further work is required to understand how best to release measures and the scale of any resultant epidemic peaks.*
- 3. Further work is required on age distribution of ICU cases.*

Situation update

- 4. The average length of stay in ICU was taken as 9.5 days on NHS advice.*
- 5. Vast majority of admissions to ICU and high dependency units are aged between mid-40s and 70. There are fewer admissions among the over 70s.*
- 6. ICU care may not reflect the full burden of disease, as now many patients are being cared for in other settings.*
- 7. NHS reported that critical care bed occupancy is not yet reaching saturation levels, London included.*
- 8. There is evidence that severity varies by sex (men are affected more severely), but there is no evidence that transmission varies by sex.*
- 9. NHS models use numbers approved by SAGE, but they are run more frequently and need to provide regional and other detail – leading to quantitative, but not qualitative differences in projected scenarios.*

[JVT2/108 – INQ000061528]

6.101. On 31 March 2020, I attended the twenty-first SAGE meeting on COVID-19. The minuted summary includes the following:

1. *NHS will set up a group to urgently understand and tackle nosocomial transmission. This group should include a range of science disciplines and engineering.*
2. *SAGE agreed scientific priorities for future work.*

Situation update

3. *SAGE noted that the trends in ICU admissions and deaths appeared consistent with a straight line increase rather than an exponential increase.*
4. *NHS reported that critical care bed occupancy has not yet reached saturation levels, with around 1,000 beds in London, but that surge capacity was being used, with large teaching hospitals under most pressure.*
5. *It was noted that data on deaths in the community are now available, as well as hospital deaths. These will be reported weekly. This would include deaths where a doctor identified Covid-19 as a cause, although testing would not necessarily have been carried out. This added 40 extra deaths to the week ending 20th March. Getting an agreed single source of information of deaths, with dates and test status is important.*
6. *R is estimated to be around 0.6, with an upper bound of 0.9.*
7. *NHS reported that the doubling time in HDU/ICU is 5 days (± 0.12) nationally and 6.2 days (± 0.14) in London.*
8. *The true community infection rate is not yet available.*
9. *More detailed clinical coding will provide better understanding of the disease. [JVT2/109 – INQ000119727]*

6.102. Having set out the relevant timeline, I now turn to those aspects of the initial understanding of and response to COVID-19.

SAGE's initial response to the outbreak

6.103. I have been asked to provide my opinion on various aspects of SAGE's initial response to the outbreak. I do so in the following paragraphs.

6.104. The first precautionary SAGE meeting was on 22 January 2020. Reflecting on the timeline as a whole, I don't consider that this represents any kind of delay. The CMO

and the GCSA made the decision to convene SAGE on 20 January 2020, i.e. one week after NERVTAG had first met to consider the outbreak. In my view, that is a reasonable timeline given the state of knowledge about the outbreak at the time.

- 6.105. As set out in the timeline above, SAGE initially advised that the Government's response to the outbreak should make use of influenza pandemic assumptions with appropriate adaptations (see, for example, the summaries from the second SAGE meeting on 28 January 2020 and the fourth SAGE meeting on 4 February 2020). That was a perfectly reasonable approach to adopt. There was no other respiratory virus that had hitherto caused a known human pandemic that could reasonably direct our response. The choices were therefore: begin from pandemic influenza, which was known to have caused four pandemics in the last 105 years; begin from SARS-CoV-1 or MERS, neither of which had caused a pandemic and one of which had entirely fizzled out; or begin from a blank sheet of paper, with almost no data with which to populate it, i.e. guess from first principles.
- 6.106. The specific timings for the implementation of NPIs and for the first lockdown were political decisions informed by SAGE advice. The CMO would be best placed to provide insight on the factors that influenced the timing for the first lockdown, having attended the relevant meetings with the Prime Minister and other core decision-makers. I have been asked by the Inquiry about the concept of "behavioural fatigue". I do not recall advising on this or seeing any advice from SPI-B or the UK Behavioural Insights Team on it. However, discussion about the effectiveness of social restrictions which have never been used before would likely involve the possibility that the public might only be willing to tolerate such restrictions for so long and so if you implemented them too early, you would run the risk of tolerance and compliance waning at exactly the time you needed them to be strong.
- 6.107. The minutes of the SAGE meetings set out above illustrate how the thinking around NPIs developed over this initial period. SAGE responded to information as it became available and refined its advice according to where the UK was projected to be on the epidemiological curve. For example, on 5 March 2020 [JVT2/078 – INQ000061521] and then again on 10 March 2020 [JVT2/085 – INQ000061522], SAGE advised a

staggered approach to self-isolation based on the current understanding of where the UK was in relation to the projected epidemic peak. On 13 March 2020, SAGE noted that, due to a lag in data provision, the UK may be further ahead on the epidemic curve than previously thought and therefore *“household isolation and social distancing of the elderly and vulnerable should be implemented soon, provided they can be done well and equitably”* [JVT2/090 – INQ000203985]. On 16 March 2020, SAGE changed its advice on the basis of further data, including on NHS critical care capacity, and recommended that the implementation of NPIs be sped up.

6.108. I have been asked by the Inquiry to comment on the extent to which, particularly in the initial months of the pandemic, core-decision makers relied too heavily on SAGE and other scientific advice, and the criticism made by the then Chancellor of the Exchequer, the Rt Hon. Rishi Sunak MP, that scientists were “inappropriately empowered”. I am not able to comment on the factors that were taken into account by core-decision makers, or indeed the relative weight given to those factors. That would be a matter for the relevant core-decision makers. However, the Government assured the public that decisions were being led by the science and I have no reason to suspect that the science was not being heard clearly. In my view, that is an entirely appropriate approach when faced with the emergence of an unknown deadly virus. To the extent that the former Chancellor’s comments constitute a suggestion that scientists were, in effect, dictating policy, I do not agree with them. As I have explained above, SAGE did not set policy, it provided information and advice to Government. SAGE delivered a consensus view reached by a group of informed scientists from a range of appropriate disciplines. It was, rightly, for Government drawing on all the advice available to it, to make a decision. If the former Chancellor’s comments represent a concern that factors beyond the purely scientific, such as the economic or the social, were not given sufficient prominence by decision makers in the early stages of the pandemic, then that is a legitimate question, but again, one that I am unable to offer a view on, having not been party to the actual decision-making process, when I would have expected scientific/medical, economic, and social arguments to have all been in play.

My initial understanding of the outbreak

- 6.109. The date on which I recall first being seriously concerned about the threat that this virus potentially posed to the UK was 16 January 2020. I remember the date because it is also a close relative's birthday. By that date, it was clear that this was a novel coronavirus, it was fairly clear that human to human transmission was occurring, and my view was that this would be a significant pandemic.
- 6.110. A key defining factor in the early stages of the pandemic was a lack of verifiable data. I pressed international colleagues to share data wherever possible. However, in the first few weeks of the outbreak, we worked on the assumption that the data we had were incomplete. I note that the minutes of SAGE's fourth meeting, on 4 February 2020, record that "*Lack of data sharing is seriously hampering understanding of WN-CoV*" [JVT2/054 – INQ000061512]. I understood that the virus was transmitted via the respiratory route including droplets and fine particles, but there was initially insufficient data to understand how transmissible the virus was or whether asymptomatic transmission was occurring. The extent to which contact transmission was occurring was also (and still remains) uncertain. It is true that there was an initial view in Government that Covid-19 was broadly similar to influenza and that view was not wrong. As with influenza, it was a respiratory virus, producing a pandemic, with broadly similar modes of transmission and measures to prevent the spread included isolating and minimising contact with symptomatic individuals. While I appreciated that there were differences between this virus and influenza (which became more apparent as data became available), it was reasonable to take the RWCS for pandemic influenza as a starting point.
- 6.111. Once we began to see enlarging foci of infection in several countries it became clear that this was a virus with very high transmissibility and, in that respect, it was clearly distinct from SARS-CoV-1 and MERS-CoV. For example, on 20 March 2020, SPI-M-O's *Consensus view on Covid-19* noted that "*the observed rapid increase in ICU admissions is consistent with a higher reproduction number than 2.4 previously estimated and modelled; we cannot rule out it being higher than 3*" [JVT2/110 – INQ000071111]. There were limitations to how much we could learn from either SARS-CoV-1 or MERS-CoV, neither of which ever developed into a human pandemic, suggesting that both those two organisms were much easier to control than SARS-CoV-2. At the first precautionary SAGE, on 22 January 2020 (see paragraph 6.39), it

was suggested that the mortality rate for SARS-CoV-2 was lower than that for SARS-CoV-1 and that, based on lessons from SARS-CoV-1 and MERS-CoV, the incubation period for SARS-CoV-2 was likely to be no longer than fourteen days. Both of those early assessments turned out to be correct. At its next meeting, on 28 January 2020 (see paragraph 6.43), SAGE cautioned against comparisons with SARS-CoV-1 and MERS-CoV because the transmission dynamics appeared to be different. As I have already intimated, that assessment also turned out to be correct.

6.112. In respect of the infection fatality rate for COVID-19, I do not believe this was fully understood in the UK until data started to come out of CO-CIN, which revealed the hospital infection fatality rate. Data from CO-CIN started to emerge towards the end of March 2020.

6.113. There is no clear answer to the question of when exactly it was known that the virus was capable of being transmitted by asymptomatic individuals. That conclusion became gradually more likely as more data became available. For example:

- i. At NERVTAG's second meeting on the outbreak, on 21 January 2020, it was noted that *"there are currently no data on infectiousness in relation to symptom onset and whether asymptomatic or subclinical patients are infectious"* [JVT2/040 – INQ000023119].
- ii. At SAGE's second meeting on the outbreak, on 28 January 2020, it was noted that *"There is limited evidence of asymptomatic transmission, but early indications imply some is occurring"* [JVT2/047 – INQ000057492].
- iii. On 29 January 2020, Professor Sharon Peacock of PHE sent a PHE-prepared paper to me and the CMO that set out the current evidence for asymptomatic transmission of SARS-CoV-2 (then referred to as "2019nCoV") [JVT2/111-112 – INQ000151372 / INQ000151373]. That paper concluded that, *"The currently available data is not adequate to provide evidence for major asymptomatic/subclinical transmission of 2019nCoV. Detailed epidemiological information from more cases and contacts is needed to determine whether transmission can occur from asymptomatic individuals or during the incubation period on a significant scale"*.

- iv. At SAGE's fourth meeting on the outbreak, on 4 February 2020, it was noted that *"Asymptomatic transmission cannot be ruled out and transmission from mildly symptomatic individuals is likely"* [JVT2/054 – INQ000061512].
- v. At NERVTAG's tenth meeting on the outbreak, on 20 March 2020, it was noted that *"there is plenty of information on asymptomatic people testing positive for SARS-CoV-2 but very little information regarding transmission"* [JVT2/113 – INQ000119619].
- vi. At the beginning of April 2020, the PHE-prepared paper referred to above was updated and the conclusion at that time was, *"Overall, available evidence to date suggests the possibility that some asymptomatic/presymptomatic transmission is occurring. However, whether this is occurring on a significant scale and how it contributes to the overall transmission dynamics of the pandemic, remains uncertain"* [JVT2/114 – INQ000236478].
- vii. At NERVTAG's sixteenth meeting on the outbreak, on 1 May 2020, there were extensive discussions on the subject of asymptomatic transmission. The minutes of that meeting record the following consensus position: *"PCR-positive asymptomatic individuals may be infectious; but the level of infectiousness compared to symptomatic individuals is uncertain"* [JVT2/115 – INQ000220211].

6.114. As I have explained in Section 4 above, in this initial period the UK did not have the diagnostic capacity that would have been necessary to properly understand what was happening in the wider population in epidemiological terms. The reasons for that are myriad, but in short, this was a new virus that required the development of new tests at speed. That was a technically complex task that PHE was capable of doing in terms of science specialism, but perhaps was not set up to do at the speed or scale required. The lack of diagnostic capacity did have an impact on our ability to fully advise core decision-makers on the spread of COVID-19. Put simply, we did not have an accurate enough picture of the case incidence or prevalence in the UK.

6.115. On 10 February 2020, PHE started to roll out its COVID-19 diagnostic test to laboratories across the UK. This development did not have a particular impact on my advice to core decision-makers about the response to COVID-19. All it meant was that I could advise that we could now do more testing, but we still needed to do far more

testing than PHE could deliver. At that time, it was still necessary to be considering where we deployed our limited testing capacity so that it had the greatest benefit, in the knowledge that there was not enough for all reasonable use cases.

6.116. In early to mid-March 2020, the information coming from SAGE about the doubling time was of real concern. It meant that what looked benign one week became non-benign the next week. At that time, I did have concerns that the NHS could be overwhelmed and I recall discussions within OCMO about the possible consequences of that happening, including the possibility of having to introduce some form of triage system around age that would mean non-admission to the NHS for patients above a certain age. Fortunately, the NHS was not overwhelmed and such measures, which in normal circumstances would have been unthinkable, did not require further consideration.

The Government's initial response to the outbreak

6.117. I have been asked by the Inquiry for my view on various aspects of the Government's initial response to the outbreak and, in particular, the involvement of the Prime Minister in these early stages.

6.118. As to my understanding of the UK Government's initial strategy in relation to COVID-19 during the period January to March 2020, my impression was that it was appreciated within Government that the spread of the virus had to be slowed to prevent the NHS from being overwhelmed. Furthermore, although it may not have been fully appreciated at the very beginning, I also think there was, in time, a general understanding that there would need to be some measures in place to slow the spread until an effective vaccine could be developed. It was certainly the case that I started having conversations with the GCSA about vaccines from very early on (i.e. late January – early February 2020).

6.119. The phrase "flattening the curve" refers to a strategy of trying to spread an epidemic over a longer period so that the peak number of cases is lower than it would otherwise be in a shorter but taller peak. In that scenario, the epidemiological curve that plots

“Number of Cases” on the Y-axis against “Time” on the X-axis is broader and flatter. When there is a tight, sharp epidemiological curve the Number of Cases is too great for the health system to cope, and some people have to be turned away from hospital. Flattening the curve avoids that scenario and you instead have an overworked hospital for a very long time. It is true to say that the strategy of flattening the curve was about preventing the NHS from being overwhelmed and that policy objective was directly linked to the aim of reducing the number of deaths from COVID-19; if the NHS had been overwhelmed it would not have been able to provide proper treatment to all of the COVID-19 patients that required it and more would have died due to inadequate care. My understanding is that the strategy of flattening the curve always remained a core part of the Government’s response to the pandemic.

6.120. I did not witness the Prime Minister express an initial view in early 2020 that Covid-19 was not a serious threat and was akin to swine flu. I have a recollection of being told on the margins of an early meeting that I attended, that the Cabinet Office were having some difficulty getting the Prime Minister to engage with the issue of the outbreak, but I cannot recall who told me that. It was not raised in the meeting itself.

6.121. I obviously did not agree with any assessment that concluded that we were not faced with a serious threat. As I have already explained, by mid-January 2020, I was of the personal view that this would be a pandemic with serious consequences for the UK. It follows that I consider a first COBR meeting could have been held at any time after that date and it would not have been an over-reaction. However, with NERVTAG first convened on 13 January 2020 and SAGE first convened on 22 January 2020, I think it was broadly reasonable for COBR to have its first meeting on the outbreak on 24 January 2020. COBR could not have met before there was advice available from NERVTAG and SAGE; had it done so it would have simply asked for consolidated opinions that we would not have had. As I have already explained, these early stages were defined by a lack of information. The Government could therefore have had lots of meetings in January 2020, and most would have circled around the fact that, at that time, we just did not know enough yet.

- 6.122. I was surprised that the Prime Minister was not involved in any of the first five COBR meetings held in relation to the outbreak. Not least given that, at each meeting, the situation was escalating. With that said, I am unaware of what the competing demands on the Prime Minister's time were in late January and early February 2020. I therefore cannot make a judgment on whether he ought to have attended a specific meeting. In my opinion the Prime Minister's involvement in a matter is symbolic and means that it is more likely to be taken seriously. I can say that the outbreak was certainly being taken seriously within DHSC in these early stages, but I do not know whether it was getting the same traction across Government departments at that time.
- 6.123. On 3 February 2020, the Health Secretary made the following statement to the House of Commons, *"In the case that the epidemic here gets much more serious, we have 50 highly specialist beds, and a further 500 beds are available in order to isolate people, but of course, we are working on further plans should there need to be more"*. I believe the Health Secretary was referring to the fifty specialist isolation units and the 500 infectious diseases beds that were available at that time as part of the High Consequence Infectious Disease ("HCID") network. This statement does not encapsulate plans for the response to what would become COVID-19. Rather, it is a summary of the HCID capacity at that time and, given what we then knew, it was a reasonable position to be in.
- 6.124. On 3 March 2020, the Prime Minister told a press conference that he *"was at a hospital the other night where I think there were actually a few coronavirus patients and I shook hands with everybody [...] and I continue to shake hands [...] washing your hands is the crucial thing"*. I did not personally advise the Prime Minister on this point either before or after that press conference. On the same day, SPI-B had released a paper to the public in response to a request from SAGE on *"the use of behavioural and social interventions on a Covid-19 epidemic in the UK"* [JVT2/116 – INQ000129014]. That paper included the following advice:

"There was agreement that Government should advise against greetings such as shaking hands and hugging, given existing evidence about the importance of hand hygiene. A public message against shaking hands has additional value as a signal about the importance of

hand hygiene. Promoting a replacement greeting or encouraging others to politely decline a proffered hand-shake may have benefit.”

I do therefore consider the Prime Minister’s comments on that day to have been spontaneous, ill-informed, and rather unhelpful. However, I cannot comment on the extent to which they might have undermined public health messaging because I don’t know how aware of SPI-B’s advice the public were at that time.

6.125. On 5 March 2020, during an interview on ‘This Morning’, the Prime Minister stated, in relation to COVID-19 that, *“one of the theories, is that perhaps you could take it on the chin, take it all in one go and allow the disease, as it were, to move through the population, without taking as many draconian measures”*. I did not advise the Prime Minister to say that. I also did not advise, and would not have advised, that “taking it on the chin” was a viable response to COVID-19.

6.126. On 5 March 2020, a statutory instrument was made into law that added COVID-19 to the list of notifiable diseases and SARS-CoV-2 to the list of notifiable causative agents (pursuant to the Health Protection (Notification) Regulations 2010). This meant that registered medical practitioners were now under a statutory duty to report suspected cases of COVID-19. I am not an expert on notifiable diseases and I do not have a firm view on whether this step ought to have been taken earlier. However, I do not consider that there would have been any significant benefit if it had been. That is because the only people in whom there was a diagnosis of COVID-19 were those who had a positive PCR test, and we knew about all those people. Additional notifications of suspected cases would not have helped beyond possibly giving us a sense of increased acute respiratory illnesses. The problem with clinical diagnosis of acute respiratory illnesses in the absence of diagnostic tests is that in a normal winter period, at least a dozen respiratory viruses are within the differential diagnosis and in 2020 before any lockdown measures, these viruses would all have been possible causes alongside COVID-19.

6.127. On 9 March 2020, Italy implemented a national lockdown, followed by France on 17 March 2020. I have been asked by the Inquiry whether any consideration was given to following the practice of other countries at this time. That is not a question to which I

can give a full answer, because I was not present for all of the relevant meetings. However, on 10 March 2020, SAGE considered that the UK was “4-5 weeks behind Italy but on a similar curve (6-8 weeks behind if interventions are applied)” [JVT2/085 – INQ000061522]. As set out above, that estimate was revised at SAGE’s next meeting, on 13 March 2020, because of a data lag, which meant that the UK may have been further ahead on the epidemic curve than previously thought [JVT2/090 – INQ000203985]. On 18 March 2020, SAGE’s consensus view was that the UK was 2-4 weeks behind the epidemic curve in Italy [JVT2/094 – INQ000061525].

6.128. On 21 March 2020, I attended a COVID-S meeting at which the Prime Minister expressed the view that “unless the country could turn around the current situation it was heading for an Italy-style situation” [JVT2/098 – INQ000056263]. I provided an update to the committee and explained that there was a risk of ITUs becoming overwhelmed if further action was not taken. On 22 March 2020, the CMO attended a further COVID-S meeting. The minutes of that meeting record that, “On the comparison to Italy, he noted the UK will be at that stage at one point, but that Italy had managed to slow their curve and therefore it was possible for the UK to do so also”. The minutes also record the Prime Minister’s summary in the following terms, “it was clear that we needed to take dramatic action to flatten the infection curve and that the key argument was around the timeliness for interventions and associated messaging” [JVT2/117 – INQ000056266].

6.129. On 23 March 2020, SAGE considered that London was 1-2 weeks ahead of the rest of the UK on the epidemic curve and that case numbers in London could exceed NHS capacity within the next 10 days on the current trajectory [JVT2/099 – INQ000129072]. On the same day, the UK Government decided to implement further social restrictions that amounted to a national ‘lockdown’. In summary then, it was clear from mid-March that the UK would need to adopt measures that mirrored those taken by Italy and France, it was just a question of timing.

6.130. On 12 March 2020, the Government announced that it was moving from the ‘contain’ phase to the ‘delay’ phase of its strategy. I did not specifically advise on this decision, but I supported it. As I have explained above, I felt clear from mid-January that this

was going to be a significant pandemic. My view was therefore that a strategy of delaying the peak would have been entirely rational from that time onwards.

6.131. On 16 March 2020, a modelling paper by the Imperial College Covid-19 Response Team led by Professor Neil Ferguson set out two potential strategies for responding to COVID-19 as follows:

*“ (a) **Suppression.** Here the aim is to reduce the reproduction number (the average number of secondary cases each case generates), R , to below 1 and hence to reduce case numbers to low levels or (as for SARS or Ebola) eliminate human-to-human transmission. The main challenge of this approach is that NPIs need to be maintained – at least intermittently – for as long as the virus is circulating in the human population, or until a vaccine becomes available. In the case of COVID-19, it will be at least 12-18 months before a vaccine is available. Furthermore, there is no guarantee that initial vaccines will have high efficacy.*

*(b) **Mitigation.** Here the aim is to use NPIs (and vaccines or drugs, if available) not to interrupt transmission completely, but to reduce the health impact of an epidemic, akin to the strategy adopted by some US cities in 1918, and by the world more generally in 1957, 1968 and 2009 influenza pandemics. In the 2009 pandemic, for instance, early supplies of vaccine were targeted at individuals with pre-existing medical conditions which put them at risk of more severe disease. In this scenario, population immunity builds up through the epidemic, leading to an eventual rapid decline in case numbers and transmission dropping to low levels.” [JVT2/118 – INQ000087315]*

6.132. The paper then discussed the potential consequences of pursuing different versions of these two responses. It was predicted that an unmitigated epidemic in the UK could result in: (a) critical care bed capacity being exceeded by the second week in April; (b) 81% of the population being infected over the course of the epidemic; and (c) a total of 510,000 deaths. The paper also found that an “optimal mitigation” scenario could still result in critical care capacity being exceeded by at least eight-fold and, even if all patients were able to be treated, in the region of 250,000 deaths. The paper, therefore, concluded that “*epidemic suppression is the only viable strategy at the current time*”.

6.133. I am not aware of the extent to which this paper influenced the Government's response to COVID-19 and I do not recall what my view on it was at the time. However, the fact that it was produced by Professor Ferguson and his team means that I would have considered the projections to be highly credible. I hold Professor Ferguson in the highest scientific regard. The paper would have been considered by SAGE and its projections would likely have fed into the advice that SAGE was providing to the Government in mid-March 2020 (as to which, see the Timeline section above). The measures that the Government decided to introduce from 23 March 2020 (collectively referred to as 'lockdown') were deemed necessary in order to prevent critical care capacity from being exceeded; a goal that was ultimately achieved. However, I note that despite the shift towards a "suppression" strategy, the UK has still experienced more than 229,000 deaths to date. The estimate of c.250,000 deaths in an "optimal mitigation" scenario therefore now looks to have been, if anything, an underestimate.

6.134. On 18 March 2020, the Prime Minister announced attendance restrictions at schools in England. I did not personally provide advice to core decision-makers on this measure. Restricting attendance at schools was a measure that the Government, quite understandably, wanted to avoid if possible and certainly delay for as long as possible. That is because, as was noted in the UK CMOs and DCMOs consensus statement (August 2020) on schools and childcare reopening, "*multiple sources of evidence show that a lack of schooling increases inequalities, reduces life chances of children and can exacerbate physical and mental health issues*" [JVT2/119 – INQ000070464]. My understanding is that the decision to implement attendance restrictions at schools was taken at this point because it had become clear that unless we reduced the rate of transmission, the health system would soon be unable to cope. At that time, there were a finite number of levers left to be pulled to try and avoid that eventuality and the modelling showed that restricting attendance at schools would be the most effective. I note that the minutes of a COBR meeting on 18 March 2020 (which I was not invited to attend), record the following summary of the situation, provided by the GCSA:

"The GCSA said that even if social distancing measures were increased London remained at risk of exceeding its ICU capacity. Modelling suggested that school closures would play an important role in helping to ensure that ICU demand was not exceeded. The Scientific Group for Emergencies (SAGE)

estimated that school closures could potentially reduce COVID-19 cases by 10-15 percent – and below the threshold for breaching ICU capacity... In order of the most to least effective, the following additional measures could be considered: closure of schools and colleges, closure of leisure facilities, closure of indoor workplaces and closure of non-essential retail.” [JVT2/120 – INQ000056211]

6.135. On 19 March 2020, the Prime Minister told a Downing Street press conference that the UK could “*turn the tide of coronavirus*” in twelve weeks. To the extent that the Prime Minister meant that we could get to a position in which the outbreak was under control and posing less of an overwhelming threat to the NHS in twelve weeks, I consider that his statement was a reasonable one. However, I think his phrasing was not ideal and may well have been interpreted by some as suggesting that life would return to normal in twelve weeks. It would have been preferable if he had said that the pandemic is unlikely to be over in anything less than two years, which is the advice I would have given if asked at that time. I say that because during the 2009 swine flu pandemic, which began in May of that year and was very mild in comparison, I worked advising HM Government (I sat on SAGE and I ran the FLU-CIN surveillance study) and it was early summer 2010 before my life began to return to some kind of normality.

6.136. Lastly, I have been asked by the Inquiry whether I was aware of any of the following views being expressed or statements being made in this initial period:

- i. The Prime Minister expressing sentiments to the effect that he should be “injected” with COVID-19 on television to demonstrate to the public that it did not pose a threat.
- ii. The then Cabinet Secretary, Lord Sedwill, advising the Prime Minister, on or around 12 March 2020, to explain to the public that the UK Government’s plan to respond to COVID-19 was akin to “*chickenpox parties*” as it was necessary for people to get the disease so that herd immunity could be achieved by September 2020.
- iii. The then Deputy Cabinet Secretary, Helen McNamara, expressing the view on the evening of 13 March 2020 that “*the country is heading for a disaster*”.

I did not witness any of these expressions/statements and was not aware of them being made. On point i. above, and in the interests of scientific accuracy, I would like to place on record that much later on in the pandemic, when far more was known about the virus, the UK did in fact conduct the world's first COVID-19 challenge study. This was highly regulated and controlled, fully ethically approved by an independent committee and involved inoculating a small number of very healthy young adult volunteers with the SARS-CoV-2 virus to study in detail patterns of virus shedding and the potential for spread. The experiment was completed safely. It is obviously different from someone being injected with a virus on daytime television.

The CMO's and GCSA's initial responses to the outbreak

- 6.137. I have been asked by the Inquiry for my view on various matters relating to the CMO's and the GCSA's initial responses to the outbreak, including the extent to which there were any tensions between the GCSA and the CMO, and between myself and the CMO during this initial period.
- 6.138. I was never aware of any tensions between the GCSA and the CMO. They seemed to work together very closely and effectively, in an atmosphere of mutual respect. I think GCSA knew CMO was stronger on public health matters and that CMO knew GCSA was stronger on the development of medicines and vaccines.
- 6.139. From my perspective, it would be wholly inaccurate to say that there were tensions between the CMO and I about the appropriate response to the outbreak in January 2020. At that time, there was a spectrum of reasonable responses to what was emerging. At one end of that spectrum was a more immediate action orientated mindset, which would have advocated taking more decisions "on instinct" and so taking the risk of being wrong; and at the other end was a more cautious and information gathering mindset, which leant towards waiting for actual evidence before moving. I think it would be fair to say that I was closer to the former end of the spectrum and the CMO was closer to the latter end. These approaches reflect our different personalities more than anything else and we understood and mutually respected those differences.

We were, and remain, good friends and were always able to discuss what were complex issues in a collegiate manner.

6.140. I always kept in mind that my role as DCMO was to support the CMO. As was his practice, he would have invited views and discussion but, where a final decision on a matter was needed, then it was for Professor Whitty, as the CMO, to take. OCMO would not have functioned as effectively as it did had we not all appreciated that there was a chain of command.

6.141. I should also acknowledge that the CMO's knowledge and understanding of the mechanics of Government were, and still are, far greater than mine and I have no doubt that there were myriad factors he needed to balance and sensitivities he needed to consider when making decisions around how to navigate issues within Government. I am also not aware of what steps he might have been taking or conversations he might have been having in the background during this initial period. For the avoidance of any doubt, I regard the CMO's response to the outbreak in January 2020 (and indeed beyond) as entirely within the range of reasonable responses given the information available at the time. He was a very fine and supportive leader under difficult circumstances.

6.142. I have been asked for my view on whether the CMO's experience in government in 2009 dealing with the H1N1 swine flu epidemic may have influenced his initial views as to how best to respond to the emergence of COVID-19 and, specifically, whether that experience may have given him concerns that taking measures to COVID-19 at pace could later be perceived as an over-reaction. That is properly a question for him. I don't have any memory about the CMO's role in 2009 (when he was Chief Scientific Adviser to the Department for International Development) nor do I recall meeting him in any of the Government meetings, including SAGE, which I attended in 2009-10. I cannot say therefore how that experience influenced his views.

6.143. However, having worked with the CMO during a very intense time in this country's history, I can say that he has never struck me as someone who would be influenced

by a concern about possible professional perceptions of over-reaction. In my experience, the CMO is always analytical and measured, data-driven and is far more likely to be guided by a concern that actions might later be perceived as not sufficiently well thought through. Giving careful consideration to a matter is, I would say, a particularly strong part of his overall “brand”.

6.144. I have also been asked by the Inquiry for my views on certain comments made by the GCSA on the BBC Radio 4 Today Programme on 13 March 2020. The relevant quote is as follows, *“[the aim is] to try and reduce the peak, broaden the peak, not to suppress it completely. Also, because most people get a mild illness, to build up some degree of herd immunity as well so that more people are immune to this disease and we reduce the transmission, at the same time we protect those who are most vulnerable from it. Those are the key things we need to do”*.

6.145. I do not take these comments to mean that the GCSA was advocating a deliberate strategy of letting people get infected in an unconstrained way so as to achieve so called “herd immunity”. For the record I do not believe this concept holds good for respiratory viruses in the same way as it does, for example, for measles. We cannot achieve herd immunity for influenza because the virus changes constantly and vaccines which do not block all infections, require annual reformulation to incorporate strain changes. So far with COVID-19 we have seen many variants emerge, amounting to strain changes, and the vaccines have been altered at least twice to improve protection against newer strains. In my view, the point that the GCSA was trying to convey was that as more people inevitably become infected (even as we are trying to reduce transmission), there would begin to be more people in the population who would have some degree of partial immunity to the virus, who could not then take part in prolonging a chain of transmission, who would on balance be less likely to be re-infected, and who would be less likely to be as infectious to others for as long if they were re-infected. Perhaps, on this occasion, the GCSA did not elaborate sufficiently to be clear enough; it may be that the interviewer did not give him the time to do that.

My assessment of the initial response to the outbreak

6.146. I have been asked by the Inquiry to give my opinion on the UK's initial response to COVID-19. I address this here.

6.147. For my part, I consider that my own response to the news coming out of China in January 2020 was appropriate. The most important thing at that time was to build up a picture of what was happening. As set out in the Timeline sub-section of Section 6 above, I monitored sources of information closely, pressed international colleagues for further information and shared it with colleagues in a timely manner. As I have already made clear, by mid-January it was clear in my mind that this was going to be a significant pandemic. However, I wasn't aware of the true extent of spreading through the UK until our diagnostic capacities increased. By February half-term, I believe I understood that the virus had actually been present in the UK for several weeks before that, but I can't really say how many since we had no tests.

6.148. Once it became clear that the virus was not going to be contained, which for me was very early on, it is my view that the strategy of "flattening the curve" was the correct approach. We had to prevent a situation in which the NHS was unable to offer treatment to everyone that needed it and keeping the number of cases below a certain level was the only realistic way of doing that.

6.149. As I have already explained, I consider it was reasonable to draw on pandemic influenza plans and assumptions to inform our initial response. It follows that I do not agree that too much weight was given to assumptions about infection fatality rate based on influenza. It is also my view that early estimates of infection fatality rate were in fact relatively accurate and, if anything, were underestimates. I would draw attention to the following:

- i. The estimated deaths in England and Wales as a result of the 1918 flu pandemic was in the region of 198,000³.
- ii. On 2 February 2020, Professor Neil Ferguson sent an email to the CMO, the GCSA and me setting out some estimates on potential case fatality rate for

³ Supplement to the Eighty-First Annual Report of the Registrar General of Births, Deaths and Marriages in England: Report on the Mortality from Influenza in England and Wales During the Epidemic of 1918-19 [1920] p.7

COVID-19. Professor Ferguson concluded as follows: *“Overall, assuming a reasonable proportion of mild cases, this is looking a bit like the 1957 or 1968 pandemics in terms of mortality patterns by age – albeit overall mortality may be somewhat higher. Likely not 1918, but statistically we can’t exclude that possibility yet”* [JVT2/121 - INQ000047653].

- iii. In mid-March 2020, modellers at Imperial College estimated that Covid-19 deaths in the UK could be in the region of 250,000 even if “optimal mitigations” are put in place (which would not include a full national lockdown) (see paragraph 6.132 above).
- iv. The number of actual deaths in the UK to date where COVID-19 is mentioned on the death certificate is more than 229,000 and that is despite the fact that we implemented three national lockdowns and were able to engineer an end to the pandemic via the rapid development of an effective vaccine.

6.150. Given the capacity constraints I do not regard it as a mistake to have stopped community testing and tracing in March 2020. In my view it was the only thing that could realistically be done because of the number of cases that were present in the UK and the limited testing capacity that was available. Focusing capacity on hospitals was a proportionate measure. Any suggestion that the decision to stop community testing and tracing at that time was due to the pursuit of a “herd immunity” strategy is in my view utterly preposterous, and I never once heard that argument aired.

Section 7: Advice and Decisions in Relation to NPIs

The first national lockdown (“Lockdown 1”)

7.1. “Lockdown” is the term used to describe a collection of layered NPIs that were implemented simultaneously for the first time from 23 March 2020. The minutes from SAGE meetings during the period January to March 2020 that are quoted in the Timeline above offer a useful summary of how the scientific knowledge and advice developed in the period leading up to the implementation of Lockdown 1. I did not personally provide advice to core decision-makers on the implementation of Lockdown 1. However, I attended SAGE meetings during the relevant period and I did not

disagree with the central conclusions that SAGE arrived at and that were conveyed to decision-makers.

- 7.2. At its twelfth meeting, on 3 March 2020, SAGE considered a GO-Science paper on the potential NPIs that the Government could consider implementing in response to COVID-19 and their impacts [JVT2/122 – INQ000056158]. That paper was then considered at COBR on 4 March 2020 (which I did not attend) [JVT2/123 – INQ000056218]. The paper described a range of NPIs including: stopping large events; closure of schools; various forms of household isolation; and various forms of social distancing. It then set out the potential impact of each on reducing the spread of the virus. The paper explained that it “*does not cover economic, operational or policy considerations*” and that “*SAGE has not provided a recommendation of which interventions, or package of interventions, that Government may choose to apply. Any decision must consider the impacts these interventions may have on society, on individuals, the workforce and business, and the operation of Government and public services*”. The paper was subsequently updated and a version dated 9 March 2020 set out the following advice:

“SAGE advises that a combination of individual home isolation of symptomatic cases, household isolation and social distancing of the over 70s could have a positive effect on: delaying the onset of the peak; reducing the number of cases during the peak; and reducing the total number of cases. Any decision must consider the impacts these interventions may have on society, on individuals, the workforce and businesses, and the operation of Government and public services” [JVT2/124 – INQ000194008]

- 7.3. A further COBR meeting was held on 9 March 2020 (again at which I was not present). The minutes of that meeting record that potential interventions were discussed and the GCSA and the CMO provided the following advice:

“The GCSA said that there were two aims of intervention measures: reducing the peak of the virus to enable the NHS to cope with demand and to reduce the mortality rate. The CMO said there were three stages of intervention with varying individual and combined efficacy:

1. *Self isolation of symptomatic individuals.*

2. *Full house-hold isolation where one individual is symptomatic.*
3. *A series of currently undetermined measures to safeguard the elderly and vulnerable individuals.” [JVT2/125 – INQ000056219]*

7.4. A document produced by the Cabinet Office records the following decision arising from that meeting:

“Committee agreed to proactively advise people with serious flu-like symptoms to stay at home today, in line with existing medical advice. COBR(M) on Wednesday 11 March to consider whether and when to move to advising people with mild symptoms to do the same” [JVT2/126 – INQ000056206].

7.5. The minutes of the COBR meeting on 11 March 2020 do not record further discussion of, or decisions about, the implementation of NPIs [JVT2/127 – INQ000056220].

7.6. A further COBR meeting was held on 12 March 2020. I attended that meeting as an observer, watching the proceedings from the observation room. The minutes of that meeting record extensive discussions about the implementation of NPIs and the decisions recorded include the following:

“ ...

2. Advice to be issued this afternoon that all those with mild symptoms (new continuous cough and/or fever) of COVID-19 should stay at home for seven days, without calling 111 unless necessary.

3. COBR will revisit the question of whether and when to implement household isolation next week” [JVT2/128 – INQ000056181]

7.7. As set out in the Timeline above (see paragraph 6.88), by 16 March 2020 the emerging data was showing that the situation was escalating faster than SAGE initially anticipated and therefore interventions were required sooner than had previously been advised. The minutes from a COBR meeting on 16 March 2020 record that the CMO advised, *“there had been an increase in confirmed cases, the UK was now at the cusp of a fast upward swing of the infection curve. On the basis of the NHS capacity model,*

further action should be taken” [JVT2/129 – INQ000056210]. The decisions recorded in those minutes are as follows: “The committee agreed that the package of measures as set out in the ‘summary and recommendation’ slide of the CRIP should be implemented and announced. Messaging should include that there may be a need to sustain these measures”. That package of measures was as follows:

*“1. **Household stay at home:** when any member of a household is symptomatic, the whole household should stay at home for 14 days.*

2. Social distancing:

- **Advice to the whole population:** to reduce social contact where they can through ‘soft’ social distancing – e.g. encouraging home working, advising against social mixing, not going into crowded areas when unnecessary.*
- **Advice to specific groups:** for those groups in a more vulnerable category the advice is to follow this social distancing guidance more rigorously: (i) 70+ (regardless of medical conditions); (ii) under 70 with defined long-term medical conditions; (iii) pregnant women.*

***3. Shielding the most vulnerable:** within the next week, we will move to shield the most vulnerable (c.1.4 million individuals). A full support package will be announced later this week for England. Individuals in this category will be contacted by their GP practice.*

***4. Large gatherings:** in light of the above measures, advice that large gatherings should not go ahead, and that public and emergency service cover would not be provided to any large events. This would be advice rather than a ban.” [JVT2/130 – INQ000056184]*

7.8. A further COBR meeting was held on 18 March 2020. The minutes of that meeting record that the GCSA advised that without further interventions the ICU capacity in London was at risk of being exceeded in two to three weeks. The minutes also record that it was agreed schools would be closed with effect from the evening of 20 March 2020, except for the children of key workers [JVT2/120 – INQ000056211].

7.9. The next COBR meeting was held on 20 March 2020. The minutes of that meeting record discussion of how to strengthen existing social distancing measures [JVT2/131

– **INQ000056212**]. The minutes also record agreement to the closure of a range of premises, as set out in Annex B of a paper that had been prepared for consideration [**JVT2/132 – INQ000106263**].

- 7.10. As recorded in the SAGE minutes set out above (see paragraph 6.93), by 23 March 2020, it was clear that case numbers in the UK were doubling at an alarming rate and NHS capacity in London was at risk of being overwhelmed in a matter of days. Following a further COBR meeting, it was decided that the Government would implement, with immediate effect, the further measures set out in the paper, ‘*Social Distancing: Temporary Additional Measures*’ [**JVT2/133 – INQ000056199**]. As that paper explained, these measures amounted to “*telling all citizens to stay at home, except for a very simple and restrictive list of permitted activities*” [**JVT2/134 – INQ000089938**].
- 7.11. As the foregoing makes clear, the risk of the NHS being overwhelmed was central to the implementation of Lockdown 1. Alongside that risk was the policy objective of reducing the number of deaths from COVID-19 and, as I have already explained, the two are inextricably linked.
- 7.12. I am not able to comment on the extent to which economic factors influenced the Prime Minister’s decision making on Lockdown 1. However, I was aware at the time that a lot of consideration of economic factors was taking place at more senior levels to mine.
- 7.13. When Lockdown 1 was implemented, I recall my overriding feeling being one of relief because I thought it would not be much longer before the NHS was unable to cope. Once the decision had been made, I believe implementation was carried out rapidly. Knowing what we now know, I would have wanted Lockdown 1 to be implemented earlier than it was, perhaps by up to one week. However, I am unable to say numerically what impact that might have had. That would be a question for scientific modellers.

7.14. In my view, a national lockdown was not realistically avoidable. The only thing that could have prevented it would have been more effective containment of the virus. However, knowing what we now know about the transmission dynamics of the virus, I do not consider that containing it after it spread beyond China was ever a realistic possibility.

Easing Lockdown 1 and the period thereafter

7.15. In the same way that NPIs had been gradually layered on top of each other until the full suite constituting Lockdown 1 were in place, so too were they gradually removed. The Government set itself five tests that it considered must be met in order for measures to be eased safely (as announced by the then Foreign Secretary, the Rt Hon Dominic Raab MP on 16 April 2020):

“First, we must protect the NHS’s ability to cope. We must be confident that we are able to provide sufficient critical care and specialist treatment right across the UK... Second, we need to see a sustained and consistent fall in the daily death rates... Third, we need to have reliable data from SAGE showing that the rate of infection is decreasing to manageable levels across the board. Fourth, we need to be confident that the range of operational challenges, including testing capacity and PPE, are in hand, with supply able to meet future demand. Fifth... we need to be confident that any adjustments to the current measures will not risk a second peak of infections that overwhelm the NHS...”
[JVT2/135 – INQ000086576].

I did not provide any advice on these five tests, but I thought they seemed broadly reasonable.

7.16. On 10 May 2020, the Prime Minister, announced the first stage in the easing of Lockdown 1: a change in guidance so that *“anyone who can’t work from home, for instance those in construction or manufacturing, should be actively encouraged to go to work... [but] should avoid public transport if at all possible”* **[JVT2/136 – INQ000075717]**. There followed a phased reopening of society.

7.17. In respect of the advice that I provided on the easing of Lockdown 1, I attended SAGE meetings at which the easing of measures was discussed and I agreed with SAGE's conclusions. On 26 May 2020, the CMO, the GCSA, Professor Harries and I sent a joint letter to the Permanent Secretary to the Prime Minister, Simon Case, on the approach to easing Lockdown 1. This stated:

“ ...

Given the economic impact of COVID-19, it is right and inevitable that different government departments are eager to restart their industries. We are also acutely aware of the harm that economic downturns can have on the health and welfare our societies, especially the most vulnerable. The societal impact of social distancing is also significant and there are clear reasons to reduce this when it is safe to do so.

We are comfortable with small, individual releases of specific industries in a 'COVID-safe' manner as laid out by SAGE. We need to think however not only about individual decisions but about the totality of the changes, how they interact in linking households and the pace at which these are planned to occur. Multiple, small changes, appearing reasonable when examined in isolation, can easily lead to R going above 1, and we will be at severe risk of a second wave. There is always a temptation to push the risk just a little bit further on every decision; this is happening across government, often by people unaware of the other changes.

...”

[JVT2/137 – INQ00069418]

7.18. In addition, I provided advice in my capacity as DCMO on discrete issues as and when they arose. However, my primary area of focus at this time was vaccine development work. By way of example only:

- i. At various points throughout May 2020, I advised DHSC, PHE and DCMS on the resumption of elite sport (see, for example: [JVT2/138-143 – INQ000151901 / INQ000151902 / INQ000151903 / INQ000152078 / INQ000152079 / INQ000152081]).

- ii. On 13 May 2020, I advised DCMS on guidance for the phased return of outdoor sport and recreation [JVT2/144-145 – INQ000151916 / INQ000151917].
- iii. On 21 May 2020, I advised the Cabinet Office, MHCLG, DCMS, DEFRA, DfT, HMT and No.10 on the reopening of various types of business or activity that were currently closed [JVT2/146-147 - INQ000151965 / INQ000151966].
- iv. On 21 May 2020, I provided a note to the Cabinet Office on “Guiding principles for consideration of re-opening of outdoor leisure facilities and spaces” [JVT2/148-149 – INQ000151976 / INQ000151977].
- v. On 3 June 2020, I advised DCMS on social distancing at sports venues [JVT2/150-151 – INQ000152107 / INQ000152108].
- vi. On 4 June 2020, I advised the Cabinet Office, the Home Office and DHSC on the public health implications of protests [JVT2/152-153 – INQ000152123 / INQ000152125; JVT2/154 - INQ000069569]
- vii. On 12 June 2020, I advised the Cabinet Office on reopening the leisure and tourism sectors [JVT2/155-156 – INQ000152158 / INQ000152159].
- viii. On 22 June 2020, I advised the Cabinet Office on a note for COVID-S that was due to meet to consider a further package of easements from 4th July 2020 [JVT2/157-158 – INQ000069778 / INQ000069779].

7.19. The purpose of Lockdown 1 was to prevent the NHS from being overwhelmed and it achieved that. I nevertheless felt sure that there would have been instances in which lockdown had resulted in the degradation of other care and that was something that had been anticipated in the CMO’s advice on the four likely causes of excess mortality that was provided to Ministers in March 2020 [JVT2/159 – INQ000048167]. The main lesson I took from Lockdown 1 was that it was uncomfortable and difficult but could be achieved. I did, however, wonder whether people would be prepared to do it again.

Restriction on gatherings of more than thirty people

7.20. As Lockdown 1 was eased, a number of new measures were put in place that were designed to allow a semblance of normality to return, while still keeping some control on the spread of the virus and trying to avoid a second sharp peak in cases. One such

measure was the legal restriction on gatherings of more than thirty people. I did not provide any advice on this measure and I do not know of any modelling that was done around that specific number.

Two metre/ one metre rule

7.21. Another such measure was the guidance that people should maintain a distance of two metres from one another, wherever possible. That guidance was later changed to two metres where possible, or “one metre plus” (i.e. one metre with mitigations). I did not personally advise on that change. However, I do recall discussions between the OCMO and the Cabinet Office on the matter and, in preparing this statement, I have been shown a document, published by the Cabinet Office, entitled “*Review of two metre social distancing guidance*” and dated 24 June 2020 [JVT2/160 – INQ000181693]. I understand that the CMO was involved in that review, not least by providing the Cabinet Office with a note on the “*Principles to consider when reviewing the balance of risk for the 2m figure in social distancing*” [JVT2/161 – INQ000069693]. That note explained that “*There is strong evidence that the risk of being infected at 2m distance from an infected person, all other things being equal, is 2-10x lower than the risk of infection at 1m*”.

7.22. My understanding was that the decision to change the guidance on distancing was entirely about the impact that the two-metre rule was having on the economy generally and the hospitality sector specifically. That is borne out in the review document referred to above, which states, “*There are severe economic costs to maintaining 2m distancing. Reducing from 2m to 1m would allow more people to return to work and increase businesses capacity. With a 2m rule in place, it is not financially viable for many businesses to operate*” [JVT2/160 – INQ000181693]. There will have been a tension between the scientific and public health advice, which said that if you reduce the distance from two metres to one metre you increase the likelihood of transmission, and the economic argument, which said that certain businesses could not realistically function with a two-metre rule in place. How to resolve that tension was, of course, a political decision.

Eat Out to Help Out

7.23. At the beginning of August 2020, the Government launched its *Eat Out to Help Out* scheme that gave visitors to participating restaurants, pubs and cafes a 50% discount on their bill, up to a maximum of £10 per person, on certain days. The first I heard about this scheme was when it was announced by the Chancellor at the beginning of July 2020. It follows that I did not provide any advice on it and I did not have any discussions with the Prime Minister, the Chancellor or other core decision-makers about it. I did not consider that the scheme was consistent with suppressing the number of COVID-19 infections. However, the hospitality sector had reopened and social distancing measures were in place. I therefore could not see that the scheme would affect the likelihood of transmission in hospitality settings but it would tempt more people to enter such environments which, even with measures in place, would be more risky than a family group dining alone well away from others. Based on subsequent modelling, I now understand that the scheme did likely lead to the increased spread of the virus. For example, I note that a paper produced by SPI-B in February 2021 on *Behavioural and social considerations when reducing restrictions* observed that “*The implementation of Eat Out to Help Out subsidies for restaurants led to a substantial increase in dining out compared to the same period pre-pandemic, which has been associated with an increase in transmission in those areas with higher take up of the scheme*” [JVT2/162 – INQ000214011].

7.24. I am only able to comment on the public health aspects of the policy and from that perspective, it does now appear that the *Eat Out to Help Out* scheme was unhelpful.

‘Rule of 6’

7.25. From 14 September 2020, the Government introduced what was known as the “rule of 6”. This meant that it would be against the law for people to meet in groups of more than six. On 9 September 2020, I provided advice to the Health Secretary on this intervention by commenting on a submission document that had been prepared by policy colleagues [JVT2/163-164 – INQ000152787 / INQ000152788]. I also provided follow-up advice on clarifying the precise meaning of the rule by email the following day [JVT2/165 – INQ000152790]. My overall view was that, if well-observed, the rule would have some effect on suppressing transmission. It was better than people

meeting in groups of seven, but not as effective as people meeting in groups of no more than five or four etc.

10pm curfew

7.26. In the latter half of September 2020, the number of cases in the UK was rising significantly. At the fifty-seventh SAGE meeting on COVID-19, on 17 September 2020 (which I did not attend), the committee noted that:

“Incidence across the UK continues to increase rapidly, and data now show clear increases in hospital and ICU admissions. Medium-term projections indicate a rapid increase in hospital admissions in the coming weeks, and in a scenario where there were no interventions, this would have the potential to overwhelm the NHS” [JVT2/166 – INQ000120558]

At SAGE’s next meeting, on 21 September 2020 (which I did attend), the committee advised that a package of interventions would be required in order to reverse the exponential rise in cases [JVT2/167 – INQ000070908]. That package of interventions came to be known as the Winter Strategy (as set out in the following document: **JVT2/168 - INQ000185079**). One of the interventions that was adopted was to restrict the operating hours of hospitality and certain entertainment settings between the hours of 10pm and 5am.

7.27. My understanding is that before being implemented on a national level, the 10pm curfew was first introduced at a local level in response to rising case numbers in Bolton (see, for example, **JVT2/169 – INQ000089988**) in early September 2020. The objective behind the policy was quite straightforward: to reduce the amount of time that people were spending in settings that posed a high risk of transmission, such as pubs. Further, there was a prevailing view that consumption of alcohol increased transmission risk by lowering inhibitions and making close contact, shouting and revelry more likely (see for example, SPI-B’s consensus paper on the reopening of large events and venues dated 19 August 2020 [JVT2/170 – INQ000214019]). The 10pm curfew was seen as a way of allowing pubs and restaurants to maintain a revenue stream by serving food, while preventing people from staying in venues late into the night drinking and mingling. In terms of the specific timings, I am not aware of any scientific evidence in support of the 10pm cut off and, in fact, I recall having

discussions with the Cabinet Office and suggesting firmly that 10pm was too late and it ought to be earlier. That advice was given at a cross-departmental Cabinet Office meeting about social restrictions that was held via Microsoft Teams. I cannot recall further details of the meeting or specific attendees. Despite my advice, the Government ultimately decided to implement a 10pm curfew, that was a political decision.

'Circuit breaker' lockdown

7.28. In a Consensus Statement dated 16 September 2020 (updated 18 September 2020), SPI-M-O stated as follows:

"The epidemic is evolving rapidly... There are significant data uncertainties that make precise estimation impossible, but there is complete consensus that the epidemic situation is very serious... It is almost certain that an increase in infections will lead to increases in hospitalisations and deaths, and there are indications of hospital admissions increasing. Medium term projections are of a rapid increase in hospital admissions in the coming weeks... A planned "circuit breaker" period, where strict non pharmaceutical interventions are reintroduced for two weeks around the October half term, have the potential to reduce prevalence and prevent hospitalisations and deaths reaching high levels, whilst balancing non-COVID harms" [JVT2/171 – INQ000152838].

7.29. The minutes of SAGE's meeting on 17 September 2020 record the view that "A 'circuit breaker' type of approach, where more stringent restrictions are put in place for a shorter period could have a significant impact on transmission. Modelling indicates that a two-week period of restrictions similar to those in force in late May could delay the epidemic by approximately four weeks". I did not attend that meeting and I was not asked to advise on this issue by decision-makers. However, I was aware of the modelling and therefore conscious that a "circuit breaker" at this point could help prevent worse outcomes in the future. I was therefore sympathetic to the idea.

7.30. By September 2020, it had become clear to me that lockdown measures, i.e. a combination of NPIs layered on top of each other, had turned the curve downwards for the Summer and had avoided a situation in which the NHS is completely overwhelmed

and people are turned away from hospitals. I believe the scientific advice had matured and it was broadly recognised that those type of measures did work. In addition, by that time it looked hopeful, rather than likely, that we were going to have some vaccines either towards the end of the year or by early 2021.

7.31. I do not know why the Prime Minister decided not to impose a “circuit breaker” in mid-September 2020 and I cannot comment on the extent to which concerns about economic factors influenced his decision. However, I do recall a significant amount of political discussion between the end of Lockdown 1 and Spring 2021 about the economic impact of Lockdown 1.

7.32. If a “circuit breaker” had been imposed in mid-September 2020, I do not think it would have necessarily meant a second national lockdown could have been avoided entirely. However, it may have meant that the lockdown was shorter and less stringent. It may also have delayed the need for a second lockdown, making it more likely that when it did become necessary, we would have started to vaccinate people and that again may have impacted the nature of the lockdown as well as the need for future measures, such as a third national lockdown. It is difficult to develop these possibilities further without straying into using hindsight.

Tiers and local lockdowns

7.33. I was broadly supportive of the principle of tailoring NPIs to specific regions or localities, where the epidemiological data supported such a move. At the end of June 2020, I provided advice to the Health Secretary on the local lockdown in Leicester (see for example, **JVT2/172 – INQ000152321** and **JVT2/173 – INQ000069909**). At the beginning of October 2020, I supported a proposal from the Cabinet Office to impose tighter restrictions in certain parts of the North of England and I shared my view with OCMO colleagues that an option for five weeks of tighter restrictions was preferable to two weeks [**JVT2/174 - INQ000152935**]. However, I believe this approach was hampered by delays in implementation caused by local politicians arguing about their areas being subject to enhanced restrictions and negotiations over the financial support that central government would be providing to compensate for it.

7.34. To the best of my recollection, I did not provide advice on the creation of the three-tier system of restrictions. I had concerns about the system at the time and looking back, I do not think it was effective. My main concern at the time was to do with the transitions between tiers. I was concerned about whether the data would be granular and timely enough to allow efficient decision-making on moving areas between tiers and then, once a decision had been made, whether it would be practically feasible to move an area up a tier quickly if the disease started to turn. Personally, I felt the system would be difficult to operationalise and easy to game, by, for example, travelling to a pub in an area that was in a lower tier to the one in which you were living.

7.35. In practice, I consider the system to have been ineffective because of the same issues that I have highlighted in respect of local lockdowns. When the epidemiology changed in a particular area and there was a reasonable case for it entering a higher tier, the matter became highly politicised. There was often political resistance at a local level and, again, complex negotiations over financial support for the particular area. With case numbers doubling every 5-10 days, it simply took too long to move a particular area into the next tier. The result was that, in an area that was showing accelerating growth in infections, the tier system probably held the situation where it was, rather than turning it downwards. We therefore moved slowly towards the inevitable, which was, by then, another national lockdown. I made this point at a COVID-O meeting on 27 October 2020, during discussions about increasing case numbers and enhanced restrictions in the Nottinghamshire area. The minutes of that meeting record my contribution in the following terms:

“The Deputy Chief Medical Officer said that he had some family connections in the area, but this would not change his views. This was a major situation with enormous healthcare pressure. He supported the measures that were proposed. Nottingham had been epidemiologically ready for restrictions for the previous ten days. A problem continually faced was that, from the point of epidemiological readiness, it took seven to ten days to get local agreement. In public health terms, this was almost a doubling time, which was disastrous”
[JVT2/175 – INQ000090164].

7.36. I do not know whether the public understood the three-tier system, but I can imagine that lots of people would have found the communications around it very hard. I recall some conversations around the difficulty of having, for example, one set of rules on one side of a road and another set of rules on the opposite side of the road that happened to be in another tier.

The Prime Minister's views of Lockdown 1

7.37. I have been asked by the Inquiry whether I heard the Prime Minister express the view that he had been pushed into imposing Lockdown 1 and that he had been “*gamed on the numbers*”, or words to the same effect. I never witnessed the Prime Minister saying anything to that effect. I do recall hearing that the Prime Minister had expressed views to that effect, but I cannot recall who I would have heard it from and it would amount to nothing more than hearsay.

7.38. I have also been asked by the Inquiry whether I heard the Prime Minister express the view that there should be “*no more f***ing lockdowns – let the bodies pile high in their thousands*” or that he would rather “*let the bodies pile high*” than implement another lockdown. I never witnessed the Prime Minister saying anything to that effect and I don't know if he held those opinions.

The second national lockdown (“Lockdown 2”)

7.39. By the end of October 2020, it was clear to me that the three-tier system was not going to adequately slow the spread of the virus and there was no realistic option other than to implement some form of second national lockdown. On 29 October 2020, I advised at a COVID-O meeting in the following terms:

“The Deputy Chief Medical Officer said that it was clear England was now in a very bad place and would be in an extremely bad place by the end of November. The best case scenario reading of the current situation was that England would be entering winter with a very high coronavirus case burden. Any slip up in terms of maintenance of non-pharmaceutical interventions would cause us to lose control of the virus from a very high starting point. The worst case reading was that control of the virus had already been lost. Two weeks

ago, it had seemed inappropriate to take action in a low prevalence area such as the South West. This was no longer the case. The Government had to do more” [JVT2/176 – INQ000090176]

- 7.40. On 30 October 2020, DHSC colleagues circulated a note on options for increasing social restrictions and I provided my comments on it [JVT2/177-178 – INQ000153076 / INQ000153077]. The note proposed a more stringent package of measures for certain parts of the country (i.e. “Tier 4”), but also acknowledged that the new tier “*could also be applied across England as a full lockdown, akin to March, with the ambition of keeping education and workplaces open where possible*”.
- 7.41. I am not aware of when the Prime Minister decided to implement enhanced restrictions on a national level (i.e. Lockdown 2) and I do not have any recollection of the timeliness of the implementation once that decision had been made.
- 7.42. My understanding is that the purpose of Lockdown 2 was to reduce the spread of the virus and, in doing so, relieve the pressure that was building on the NHS and reduce the number of deaths from COVID-19. I believe it did achieve those purposes.
- 7.43. To the best of my recollection, I did not provide any advice to core decision-makers about the decision to keep schools open during Lockdown 2.

Easing Lockdown 2 and the period thereafter

- 7.44. Lockdown 2 was eased at the start of December 2020. I do not recall whether I considered that to be the correct decision. However, I certainly did not think that restrictions could be removed and the pandemic would draw to a close. I was clear that when restrictions were removed there would be an increase in transmission. By the beginning of December 2020, I was confident that we were on the cusp of having an effective vaccine, but I also knew that we were some way off from deploying it and seeing its effects on population levels of disease.

7.45. I did not consider that the tier system was effective in controlling the virus after Lockdown 2 was eased, for the same reasons that it was not effective prior to Lockdown 2. On 14 December 2020, colleagues in DHSC circulated a note that was intended for the Health Secretary on options for strengthening the tier system and creating a fourth tier [JVT2/179-180 – INQ000236514 / INQ000234650]. On 15 December 2020, I sent some comments on the note to the CMO and Professor Harries [JVT2/181 – INQ000236516]. I recall thinking at the time that the creation of Tier 4 was not going to be sufficient to slow the spread of the virus and prevent another national lockdown.

Kent (Alpha) variant

7.46. As far as I am aware, the OCMO and core decision-makers were informed about the emergence of a potential new variant in Kent (the Alpha variant) in a timely manner. On 10 December 2020, Dr Meera Chand of PHE sent a note to me and the CMO on “*Expanding cluster of a SARS-CoV-2 variant in Kent and London*” [JVT2/182-183 – INQ000236513 / INQ000153472]. The emerging variant was then discussed by NERVTAG at a meeting on 11 December, which I attended as an observer. The minutes of that meeting record as follows, “*It was noted that this was a recent issue which had only emerged in the last few days; identified following a rapid increase in case numbers in Kent over the past few weeks. PHE are carrying out enhanced investigations*” [JVT2/184 – INQ000120390]. On 12 December 2020, I attended a call with the Health Secretary, the CMO and others at which the emerging variant was discussed. A note of that discussion is exhibited at JVT2/185 – INQ000072127. It records that the CMO and I advised that the disease was growing quickly in London and the South-East but it was not clear whether the new variant was the reason for that. In any event, the advice to the Health Secretary was that the relevant areas ought to be moved into Tier 3. The note also records my concern about the possibility of mass migration out of London for Christmas compounding the problem. I understand that, following that discussion, the CMO updated the Prime Minister and Cabinet Secretary by telephone.

Christmas 2020

7.47. The OCMO advice on arrangements for Christmas in 2020 was largely provided by the CMO. In terms of the Prime Minister's announcement on 19 December 2020 regarding social restrictions over the festive period, I do not recall providing any advice to core decision-makers on this. As for its timing, my understanding is that the Prime Minister was reluctant to make the unpopular decision to cancel Christmas. I believe the decision was therefore delayed while he considered alternative options.

The third national lockdown (“Lockdown 3”)

7.48. I believe the decision to implement Lockdown 3 was dictated by the epidemiological situation in early January 2021. On 4 January 2021, following advice from the JBC, the UK CMOs agreed to move to Alert Level 5 in all four nations (i.e. “COVID-19 is in general circulation in the UK; transmission is high; direct COVID-19 pressure on healthcare services is widespread and substantial or rising; and there is a material risk of healthcare services being directly overwhelmed by COVID-19”) **[JVT2/186 – INQ000072317]**.

7.49. During this period, I was primarily focused on plans for rolling out the vaccine programme. I felt that Lockdown 3 was absolutely necessary, but I did not advise on it. I do not recall any particular delay in its implementation.

7.50. For the reasons that I have already explained above (see paragraph 6.134), I regard it as regrettable that attendance restrictions at schools had to be re-introduced at this time. However, I do think it was the correct decision. The disease was rampant across the UK at the time and the vaccine programme had not yet begun in earnest. It was necessary to reduce transmission between families by stopping transmission between school children.

7.51. The purpose of Lockdown 3 was, once again, to turn back the tide of rising infections and hospitalisations. The way I framed it in my head was that it was also a way of buying time while we vaccinated those over the age of seventy. I believe it did achieve those purposes.

Easing Lockdown 3 and the period thereafter

- 7.52. In my view it was right to ease Lockdown 3 in mid-April 2021. My feeling was that public tolerance for lockdown was waning and with the vaccine programme progressing at speed, I felt it was the right time.
- 7.53. I reviewed and commented on a paper that was intended to set out the collective DHSC view of the Government's "Spring 2021 Roadmap" [JVT2/187-188 – INQ000153723 / INQ000153724]. I did not have a firm opinion on the specific timings for the various steps set out in the Roadmap. However, I did feel that it was right to structure them so that moving to the next step was contingent on meeting certain defined criteria and also that there was sufficient time built into the Roadmap to allow proper analysis of the effect that a specific step had before moving to the next. That was a point I made when reviewing the DHSC paper, *"In my view a major failing of the summer easements was to do something else before we could be truly sure we could see the effect of previous easements. This may be why the north never got down as low as the south"*.

Face coverings

- 7.54. The position in respect of face coverings at the beginning of the pandemic was based on what we knew about their utility in relation to the spread of influenza. There had been some studies done that had, at best, been inconclusive on the value of face coverings. In addition, there was, and still is, some scientific uncertainty about whether influenza is transmitted predominantly by contact transmission or via respiratory droplets and aerosols and the relative contribution of each of the latter two. This is relevant because only respirators (fitted, filtering facepieces) commonly denoted by FFP2, FFP3, N95 and N99 ratings, are effective in preventing the movement of aerosols. Cloth face coverings of the type widely worn by the public and surgical face masks would have limited effectiveness, but the latter more than the former. In short, the science was uncertain on the utility of face coverings in reducing the spread of respiratory viruses in the community and the type of face coverings was known to vary widely. There was, however, stronger evidence on the utility of face coverings in hospital and care settings and in those settings the PPE on offer tended to be of at

least surgical face mask quality. One of the reasons for not recommending the universal use of face coverings was therefore to avoid a situation in which limited supplies were diverted away from settings in which their utility was better established and towards settings in which their utility was less certain.

7.55. Another factor that militated against recommending the use of face coverings at the beginning of the pandemic was the state of knowledge on asymptomatic and pre-symptomatic transmission. The evidence from SARS-CoV-1 and MERS-CoV was predominantly in the direction that asymptomatic and pre-symptomatic transmission were not important for SARS coronaviruses on the grounds that the period of infectivity was fairly well known to be after the onset of symptoms. If symptomatic people were isolating at home and non-symptomatic people were thought to not transmit the virus, then there was little logic in recommending the use of face coverings in the community.

7.56. The evidence on both of the factors outlined above developed over the course of the pandemic, such that the balance ultimately tipped in favour of recommending the universal use of face coverings. Over time, it became increasingly clear that respiratory droplets and aerosols from people breathing, coughing and sneezing were an important route of transmission for SARS-CoV-2. In addition, voices came forward in the aerosol science space that said there was physical evidence of face coverings acting as partial barriers to transmission. As I have already described above, it also gradually became clear that asymptomatic transmission was occurring. Because of this, SAGE pivoted to say that use of face coverings in the community won't do any harm and it may do some good. In reaching that conclusion, SAGE drew on a paper that had been prepared by NERVTAG in mid-April 2020 that summarised the evidence and relevant factors. I would refer the Inquiry to that paper [JVT2/189 – INQ000074918].

My assessment of the use of NPIs in responding to COVID-19

7.57. I am asked by the Inquiry to address various general questions on the use of NPIs in responding to the COVID-19 pandemic. I do so in the following paragraphs.

7.58. On 20 January 2021, Sir Patrick Vallance gave an interview to Sky News in which he was asked “if you could go back to March 2020, what measures would you recommend to the Government, knowing then what you know now?”. Sir Patrick’s response was “the lesson is, go earlier than you think you want to, go a bit harder than you think you want to, and go a bit broader than you think you want to in terms of applying the restrictions”. I would agree with Sir Patrick’s comments.

7.59. I believe the prospect of having an effective vaccine did impact the strategic response to COVID-19 and the use of NPIs. As I have explained above, once we had confidence that vaccines were coming, lockdowns could be framed as possibly the last. We then saw evidence in early 2021 of fast deployment and very high uptake amongst the elderly, followed by data in around February 2021 that showed hospital admissions declining. We could therefore be more confident that the vaccine was preventing severe disease and impacting the trajectory of the pandemic, with less and less need for stringent NPIs. As I have intimated above, I believe the easing of Lockdown 3 was possible in mid-April 2021 in large part because of the speed and success of the vaccine programme.

7.60. There was clear understanding within the OCMO of the wider health impacts of NPIs and I would again refer the Inquiry to the CMO’s paper that explained the four possible causes of excess mortality during the pandemic [JVT2/159 – INQ000048167]. On 11 October 2020, I published a statement that made the point that reducing the pressure caused by COVID-19 was one of the best ways to also reduce the indirect harms that the virus was causing:

“People point out that we must not lose sight of the indirect harms of Covid-19. They are absolutely right. We need to keep elective surgeries and non-urgent services open for as long as we can; we need to keep cancer treatment and diagnostic services going; and we need to continue to provide mental health services. And importantly, we need people to come forward for that care when they need it and we know that, during the first peak, fear of virus put many off from doing so. The best way we can do this is to keep the number of Covid-19 cases down. If cases rise dramatically the NHS will need to focus more on dealing with the life threatening situations immediately in front of them... We

need to help the NHS by keeping Covid-19 numbers low; and in turn the NHS will be there for us, our families and loved ones.” [JVT2/190 – INQ000238827]

- 7.61. With regard to the data that were available for monitoring the effectiveness of, impact of, and compliance with, NPIs, I believe that good data sources were available and utilised once the JBC was established. I recall having access to a range of socioeconomic data such as credit card transaction data (from Mastercard), travel data from across the transport network and footfall data from large shopping centres and other venues. I believe this came from the Cabinet Office dashboard. In addition, the Office for National Statistics produced reports that fed into SAGE. Throughout the pandemic, SAGE and its subgroups undertook a great deal of work to understand the impact of NPIs. It also drew on external scientific studies. By way of example only:
- i. At the beginning of February 2020, SPI-M-O produced a consensus statement on the impact of possible interventions [JVT2/191 - INQ000087430].
 - ii. At the beginning of March 2020, SPI-B produced a paper on the effects of possible behavioural and social interventions [JVT2/116 – INQ000129014].
 - iii. Towards the end of March 2020, SPI-B produced a paper on *Current adherence to behavioural and social interventions in the UK* [JVT2/192 – INQ000236528].

Section 8: Borders

- 8.1. Advice to Government on border measures in the early weeks of the pandemic was primarily provided by the CMO, the GCSA, SAGE and NERVTAG. SAGE and NERVTAG advice is summarised in the Timeline subsection of Section 6 above, as are the few instances in which I personally advised on border matters during that period.
- 8.2. In the period following March 2020, I responded to a number of ad hoc requests for advice on border-related issues as they arose. For example:
- i. On 18 April 2020, I provided advice to DHSC colleagues on border measures following a request from No.10. My advice at that point was that with so much

internal UK transmission, any border measures were unlikely to have a significant impact. In terms of future measures and keeping the Reproduction number (“R”) below one, my view was that R would have to be well below one before ingress from international travellers started to make a significant difference to overall disease burden in the UK. I also suggested that diverting limited PHE resources towards border measures may be counter-productive in the long run [JVT2/193 – INQ000151755].

- ii. On 20 April 2020, I provided comments, along with Professor Harries, to the Cabinet Office on a paper discussing border measures [JVT2/194 – INQ000068877].
- iii. On 24 April 2020, I responded to a number of questions about border measures that had arisen following a meeting between the Cabinet Office, the Home Office, DHSC and No.10. One such question was “*would temperature screening and/or testing for inbound visitors have any positive effect*”. My response was as follows:

“Basic answer

Yes: some effect

A small proportion of the total number of inbound cases will be picked out by temperature screening (assuming the temperature machinery works very well – performance of the kit is a technical not a clinical matter). Cases picked out will be the subset of true cases that have a measurable fever; some fevers will be very mild e.g. 37.5 C but still entirely consistent with having C-19, some will have no fever but other symptoms and some will have not at all asymptomatic or pre-symptomatic [sic]. Tom might be able to advise on the max proportion likely detected based on SPI-M deliberations. Testing is a different matter. PCR is gold standard. PCR will pick up cases who are shedding virus (even small amounts – PCR detects fragments of RNA and will detect virus that is ‘live’ (culturable) and virus residues (still a positive test but the virus quantities can’t be cultured)). PCR takes 3-4 hrs if there are no transport times for the specimens (the lab is at the port and functional during all port operation hours). PCR will pick up asymptomatic infections in people shedding virus, some presymptomatic infections and all symptomatic infections and some people who have resolved symptoms but who may be shedding virus in low titres. PCR yield will be better than temp screening by some margin but the point is defeated unless testees are held at the port until

the result has cleared. There also needs to be a handling procedure for positive identified cases in BN and visitors” [JVT2/195 – INQ000151784].

- iv. On 17 May 2020, I advised on draft guidance relating to border measures that was due to be published on gov.uk [JVT2/196-198 – INQ000151934 / INQ000151935 / INQ000151936].
- v. On 10 June 2020, I advised on a draft paper for COVID-O on an exit strategy for the health measures that had been introduced with the Health Protection (Coronavirus, International Travel) (England) Regulations 2020 (SI 2020/568) from 8 June 2020 [JVT2/199 – INQ000236500] and a briefing note for the Health Secretary on the same [JVT2/200 – INQ000236502].
- vi. On 17 June 2020, I advised DHSC following a request regarding whether a traveller arriving from a low-risk country who would be exempt from the requirement to self-isolate for fourteen days should be certifying that they have been in the low-risk country for fourteen or thirty days. My advice was that either option was supportable, thirty days would be “*ultra safe*”, however fourteen days “*make[s] sense in an exact way more than 30 and [is] less likely to be construed as overkill*” [JVT2/201 – INQ000152199].
- vii. At various points throughout November 2020, I provided advice on the emergence of a COVID-19 variant linked to mink farms in Denmark and the associated travel restrictions that were implemented as a result. For example, on 6 November 2020, I attended a COVID-O meeting and advised on the issue [JVT2/202 – INQ000091123]. Following that meeting, a ban on travel from Denmark to the UK was implemented. On 24 November 2020, I sent a synthesised CMO and DCMO view on the situation to the Cabinet Office, which advised lifting the travel ban, keeping a fourteen-day quarantine period for arrivals and not considering a travel corridor for Denmark until at least 15 December 2020 [JVT2/203 – INQ000153316]. I attended a further COVID-O meeting on 26 November 2020, at which it was agreed that the restrictions on travel from Denmark would be lifted [JVT2/204-205 – INQ000091024 / INQ000091140].
- viii. On 14 January 2021, the CMO and I provided joint advice for the PM on other variants and associated travel restrictions. That advice included the following:

“ ...

7. Current variants of concern are ones originating (or first reported) in England, South Africa and Brazil.

8. These variants have the potential to spread faster and diminution of vaccine effectiveness. The former is proven for England and Brazil and likely for South Africa. The latter is a possibility with all three relatively but complete loss of vaccine effectiveness is highly unlikely.

...

12. Given the infancy of the UK vaccine programme and its critical importance to eventual UK recovery, we advise short term, time limited, 'hard' travel measures to prevent further ingress of variant viruses into the UK.

13. This would buy time to establish a more systematic approach and response to novel variants, and potentially allow time to build international coordination efforts.

14. Any measures should be short term (we suggest one month initially) and subject to regular review, pending clearer data on vaccine effectiveness against novel variants and the points in 13 above" [JVT2/206 – INQ00072452].

8.3. In addition to the above, I also advised in relation to the impact of the vaccine programme on travel restrictions. For example, on 19 May 2021, I attended a roundtable meeting on the role that vaccination might play as a risk reduction mechanism for inbound travel. On 21 May 2021, I advised DHSC by email on the same matter [JVT2/207 – INQ000153924].

8.4. To the best of my recollection, I did not otherwise directly advise on "travel corridors" or the "traffic light" system. The JBC took the lead on those matters.

8.5. My views on border restrictions in the period January to March 2020 are summarised in the advice and SAGE minutes set out above. In short, my view by mid-February was that the virus was seeded in the UK and there was widespread undetected domestic transmission. I therefore felt that border restrictions might, at most, delay the peak of the pandemic in the UK, but would not make a material difference to its trajectory in

the long term. I therefore did not feel that deploying the UK's limited testing and surveillance resources at the border was appropriate.

- 8.6. On reflection, my views have not changed. In order for border closures to have even delayed the pandemic peak in the UK, they would have had to have been much wider than simply closing off incoming travel from China and the Far East. That is because a large proportion of the COVID-19 infections which occurred in the UK in the first phase of the pandemic originated in Europe, particularly in Spain, Italy and France. Given the obvious logistical and diplomatic difficulties involved in closing the UK border to Europe, I do not believe that was ever considered as a viable option.
- 8.7. I am asked by the Inquiry whether I witnessed the Prime Minister express the view, or words to the effect of "*aren't people going to think that we are mad for not closing the borders?*". I did not witness the Prime Minister saying anything to this effect and I was not aware of his views or concerns on the subject of border closures.
- 8.8. I was broadly supportive of the "enhanced monitoring" measures that were put in place on 22 January 2020 in respect of direct flights from Wuhan to the UK, the OCMO comments of 17 January 2020 having been taken on board (see paragraph 6.31 above). I felt that these were reasonable, proportionate and timely. As indicated above, I did not consider that entry screening, either by temperature testing or by people self-reporting symptoms, would be efficient. However, the provision of information to passengers and having a Port Health team on hand at airports to support anyone who felt unwell were sensible steps to take. With that said, I was also clear that there would come a point when even these measures would become unjustifiable. In the paper for Ministers that I amended on 24 January 2020 (referred to above at paragraph 6.40) I set out the following advice:

"...spread of the diseases could also be at a scale that suggests containment in one or two cities is no longer viable, e.g. there is sustained community transmission in multiple loci across Asia. At this point, public health advice would be that the port health measures in place would no longer provide the same benefit, beyond the public information advice in place. Importation of cases into the UK would at this point become inevitable (if it had not already

happened), and we would recommend standing down the ‘enhanced monitoring’ that attempts to identify cases on flights (which is already unlikely), and instead focus public health resources on identifying, and isolating cases in the UK with the intention of preventing or delaying the establishment of sustained community transmission in the UK...” [JVT2/043 – INQ000047541].

- 8.9. The reason that NERVTAG advised against temperature screening, and I agreed, was because it would have been a highly inefficient means of detecting cases of COVID-19. Firstly, it would not detect pre-symptomatic or asymptomatic cases; secondly, it would only detect those symptomatic cases where the individual was displaying a high temperature, which may occur late in the illness and may not occur at all; and thirdly, the use of standard medication such as paracetamol could lower a patient’s temperature and make them undetectable (as occurred during the Ebola outbreak in 2014). As NERVTAG summarised at its first COVID-19 meeting on 13 January 2020, *“the body of scientific evidence and previous experiences indicate that port of entry screening, whilst not having zero effect, has very low efficacy and the benefit is very unlikely to outweigh the substantial effort, cost and disruption”* [JVT2/020 - INQ000023107]. I note that both Italy and the US implemented port of entry screening and still experienced rapid escalation of case numbers. I therefore do not regard the Italian or US approaches as models for success.
- 8.10. I do not recall being directly involved in discussions about which particular flights should be stopped in the early stages of the pandemic. However, my view was always that passengers’ travel itineraries can be complex and are often circuitous, such that a ban on direct flights would likely be an ineffective blunt instrument (a point I made in my advice of 9 January 2020 to PHE, set out at paragraph 6.13 above). The possible impact of international travel associated with Chinese New Year on 25 January 2020 was considered and on 9 January 2020, I provided comments on draft PHE guidance for travellers over the Chinese New Year period before it was cleared by the CMO [JVT2/208 – INQ000151306]. While I felt that the occasion was likely to amplify the outbreak within China, at that time I did not think there was evidence to support travel restrictions between China and the UK.

- 8.11. I was supportive of the FCO's decision to advise against all but essential travel to mainland China from 28 January 2020 and, on reflection, I think that advice could have been given slightly earlier. However, I say that not because of the potential impact of cases returning from China to the UK, which as I've explained would likely be negligible, but rather because it would simply not be a good idea on a personal level to be in China when it was experiencing such an outbreak and accessing healthcare may have been extremely difficult. As I have explained, by that point in time cases were entering the UK from a number of other countries and the virus was likely already seeded here.
- 8.12. I am not aware of why testing of passengers arriving in the UK was not introduced in the period January to March 2020. However, I suspect it was largely due to the lack of testing capacity that I have already alluded to. As explained in my advice of 24 April 2020 (quoted above at paragraph 8.2iii), testing would only have been effective if passengers had also been held at the port of entry until the test results were available. In the early weeks of the pandemic, tests were taking more than twenty-four hours to turn around. In addition, for the reasons I have already outlined, it would not have been sufficient to just test passengers arriving from mainland China. For all those reasons, I do not think testing passengers on arrival would have been a realistic or effective measure to adopt.
- 8.13. I am asked to comment on the guidance that was issued in the period February to March 2020 around self-isolation for travellers arriving in the UK. The relevant guidance was developed by PHE with input from the OCMO and was ultimately signed-off by the CMO. On 25 February 2020, guidance was issued to the public (via online publication) and to the medical profession (via a CAS alert) that updated previous guidance and included a list of "Category 1" countries/territories, from which returning travellers should self-isolate even if asymptomatic and a list of "Category 2" countries/territories, from which returning travellers should self-isolate if they develop symptoms. This guidance was based on the perceived risk of transmission within those countries/territories at the time. That guidance and the lists of countries/territories was updated on 5 March 2020, 10 March 2020 and 12 March 2020 respectively. On 12 March 2020, the geographical element of the guidance was removed, such that the advice was that anyone with symptoms should self-isolate and people without

symptoms did not need to self-isolate regardless of their travel history [JVT2/209 - INQ000048070]. I was not involved in taking that decision.

Section 9: Testing and Contact Tracing; Testing and Care Homes

9.1. As I have outlined above, one of the most significant challenges in the early part of the pandemic was scaling up the UK's testing capacity at speed. I was aware of the WHO's advice as to the importance of testing and considered it did apply to the UK. But even before that advice was issued, I was very aware of the importance of testing. It was vital for infection control purposes and for treating patients presenting with pneumonias who may or may not have had COVID-19. However, in the early stages of the pandemic we were constrained in the UK by our limited testing capabilities and decisions had to be made about where to prioritise our resources. In my view, there were two key questions:

- i. how do you keep COVID-positive and COVID-negative patients apart in hospitals; and
- ii. how do you minimise the ingress of COVID-19 into care homes?

9.2. Taking each of these in turn, nosocomial (i.e. hospital-acquired) infection was a significant problem throughout the pandemic. It is not something that I directly advised core decision-makers on, but I was involved in discussions with the Chief Nursing Officer ("CNO"), Ruth May, and other senior individuals at PHE and NHSE about the problem.

9.3. On 31 March 2020 Professor Calum Semple of Liverpool University, Chair of CO-CIN, first alerted me by email to possible evidence of an increase in nosocomial infection:

"This morning's rolling analysis of CO-CIN data (n=3354) is showing a sudden rise in nosocomial SARS-CoV2 infection, defined as symptom onset date recorded later than hospital admission date. We spotted this at 9.30 and have been doing checks in the last hour."

The rise exceeds the previous proportion of nosocomial cases. While there may be some reporting bias in magnitude, the trend and signal is considered reliable” [JVT2/210 - INQ000151689].

9.4. My response was:

“If the symptom onset data is after hospital admission how does this work?”

Example:

If admitted 30/3, and symptom onset 2/4 for example, it is certain they were not admitted with CV19 I get that. But...given mean incubation period of 5 days and range up to 14 days, we’d have little or no confidence this was nosocomially acquired until after 6/4 at the earliest and more likely admitted with something else but probably had incidentally acquired in the community.

Have I missed something?”

9.5. Professor Semple replied:

“You are correct for any given time point in isolation, but the proportion-trend has been rising steadily over the last two weeks and that trend is a signal for increase in nosocomial infection...”

9.6. I requested that further analysis be carried out:

“I’ll push back again. Agree the trend in your data is real. But this could signal a much higher circulation of virus in the community and an increase in people hospitalised with other things who happen to be infected with CV and are incubating at the point of first contact with the hospital.

Two points arise:

- 1. If most of your cases are post 7 or post 14 days, then agreed it’s true nosocomial.*
- 2. If most of your cases are 1-5 days, many (30%) may be shedding and this is how HCWs are getting infected (seeing patients that don’t yet obviously have CV but being exposed to heavy shedding).*

Let's do the analysis"

9.7. On 1 April 2020, Professor Semple responded:

"... As requested by SAGE we have now applied a conservative cut to the data, defining nosocomial transmission as symptom onset on or after 14th day of hospital admission.

Using a seven day rolling average, the proportion of patients with apparent nosocomial infection is sitting above 12% and the trend has been rising steadily since 15th March.

The signal for nosocomial transmission on preliminary analysis which we flagged yesterday to SAGE stands..."

9.8. I forwarded the exchange to the CMO, the GCSA and Professor Steve Powis (NHSE), copying Professor Harries and others:

"Following the debate at SAGE, CO-CIN data are now censored for nosocomial infection defined as symptom onset > 14 days after admission. The data suggest there is a nosocomial transmission problem..."

9.9. On 18 April 2020, Professor Keith Willett (NHSE) sent me, the CMO, the CNO and others within PHE and NHSE, a report from a Professor of Orthopaedic Surgery at Tsinghua University, Beijing, addressing how Beijing hospitals had kept infected patients segregated from non-infected patients during the pandemic [JVT2/211-212 – INQ000151757 / INQ000151758]. My response was as follows:

"Even without this email I was already absolutely convinced we have to consider this segregated model after the summer if not sooner. It is the same as in Taiwan where they have essentially no nosocomial spread. I do recognise this won't be possible in places like the Pilgrim, but probably there can be some wing-based segregation at most sites. Catherine Noakes, Professor of Infection Control Engineering (Leeds), would be a good source of advice. There are similar experts at UCL I'm sure." [JVT2/213 – INQ000151759]

- 9.10. Thereafter, I attended a call with colleagues at NHSE and it was agreed that I would reach out to international counterparts for information on their approaches to managing COVID-19 segregation in hospitals [JVT2/214 – INQ000236489]. I engaged in email correspondence with public health officials in Germany, Sweden, Norway and Singapore, and forwarded responses to NHSE. I also attended some follow up calls with international and NHSE colleagues. I maintained some oversight on this issue, but the responsibility for developing and implementing any plans lay with NHSE. On 11 June 2020, I emailed NHSE to ask for an update on the work that had been done in response to the international information that had been gathered. That resulted in a phone call with the relevant team at NHSE and an email from Kiran Loi (Head of Antimicrobial Resistance, NHSE) that confirmed the Health Secretary, SAGE and the Cabinet Office had been kept updated on progress, and also attached a paper that had been prepared for COVID-O on the matter [JVT2/215-217 – INQ000236504 / INQ000236505 / INQ000236507].
- 9.11. On 25 June 2020, I had a robust conversation with the CNO, Professor Mark Wilcox (NHSE), Professor Susan Hopkins (PHE) and Professor Powis about the issue of nosocomial infection. I questioned whether we could implement the Chinese model of “fever hospitals” – i.e., patients with suspected COVID-19 would be taken to one hospital and patients who required elective care or treatment for other illnesses would be taken to a different hospital [JVT2/218 – INQ000069847]. I recall the response was that implementing such a system would be practically very difficult. However, I am not aware of the extent to which the suggestion was explored by PHE and NHSE following that discussion.
- 9.12. The second point (ingress into care homes) was linked to the first. It was important to discharge vulnerable and elderly individuals from hospitals wherever possible in order to reduce their risk of nosocomial infection. However, carrying out those discharges in a way that reduced the risk of onward transmission was challenging for two reasons. Firstly, because there was insufficient testing capacity; and secondly, because a negative test by no means guaranteed that an individual was not carrying the virus by the time they were actually discharged.

- 9.13. The incubation period of COVID-19 meant that someone could be infected and still potentially produce a negative test result. A negative test did not tell us that someone was not infected, it just told us that they didn't have enough virus in their nasopharynx to trigger a positive result at that time. There was also the possibility of someone who wasn't infected at the time of the test, becoming infected in the periods between taking the test, receiving the result and then actually being discharged. By way of example, if a patient was due to be discharged on a Friday, they would need to be tested on the Thursday at the very latest and hope that the laboratory could turn the test around in under twenty-four hours (something that was not routinely possible in the early weeks of the pandemic). If that person became infected on the Thursday evening, they could be discharged into the community or a care home carrying the virus but having obtained a negative PCR test on the Thursday morning. The only way of achieving near certainty that an individual wasn't being discharged while infected would be to test them on the Thursday, hold them in isolation within the hospital, perform another test on the Saturday and then discharge them on the Sunday once a second negative test had been obtained and they were not displaying any symptoms. Implementing such a system was not practically possible given the testing capabilities and hospital resources that were available⁴.
- 9.14. While it is true that testing patients prior to discharge could not guarantee that they would not be infectious on arrival at a care home, that is not a reason for not doing it.
- 9.15. Residents returning from hospitals was not the only way in which COVID-19 entered care homes. I was always clear that there were three primary routes of ingress: 1) current residents returning from hospitals or new residents arriving from the community; 2) visitors; and 3) care home workers moving in and out of homes. I regarded the third of those routes as a significant risk because of the likely demographics of care home workers. There are a large number of care home workers in the 18-29 age bracket, and we know that section of our population has the highest number of social interactions and always had the highest rates of infection during the

⁴ I was well aware of the vulnerable situation of those in care facilities and had in fact co-authored a paper on the subject several years before the COVID-19 pandemic (see Lansbury et. al. *Influenza in long-term care facilities* (2017) [JVT2/219 - INQ000269388], but advice that was given at the time had to account for these practical limitations.

pandemic. In addition, care home workers are often on low wages or are agency workers and have put together a package of work for themselves that involves working varying shifts at multiple different homes. Those factors, combined with the problems associated with testing that I have outlined above, meant that it was always going to be extremely difficult to keep infection out of care homes; and in my view, the only way of doing that was probably to require workers to live in the home in which they worked for an extended period of time.

9.16. I remember the Health Secretary saying, “*we have tried to throw a protective ring around our care homes*”. My view on that statement is that a ring is a circle without a break in it. If you want to achieve that, you have to close off the three routes of ingress identified above that create a break in the circle. Doing that would have required more testing, more resources for isolating individuals in both hospitals and care homes, and far more stringent policies on care home workers moving in and out of homes.

9.17. I was cognisant of these issues and I discussed them with OCMO colleagues, DHSC, NHSE and PHE. For example, on 9 April 2020, I sent an email to the CMO and Professors Hopkins and Peacock attaching the latest PHE surveillance report and commenting as follows:

“I thought I’d better sight you at once in case not aware...”

The latest PHE epi report (attached and under discussion by NERVTAG right now) indicates well over 800 outbreaks in care homes in the last week. 400+ confirmed COVID-19, but the epi scientists say there are pretty much no other viruses out there to be causing outbreaks at present (even flu B essentially is gone). I confess I haven’t seen this report for a week or two and the rate of increase is very steep.

NERVTAG expressing spontaneous concern that the data suggest that the community outbreak may be peaking or in decline; but that the overall epidemic is now being driven by care homes, prisons and hospital nosocomial. They are expressing some concerns that this might be being seeded by hospital discharges to care homes, even though we have a 14 day rule which on the face of it seems precautionary.

I think this does raise a number of issues in care homes about:

1. *Possible adherence to/understanding of infection control guidance in care homes*
2. *Possible (and now largely historic) PPE difficulties*
3. *Staff possibly working in an itinerant shift fashion between homes in the same locality (whether our guidance not to do this is currently strong enough)*
4. *Testing and discharge policy for patients with CV19 (at present there is a rule of: test where possible pre-discharge + afebrile for 48h + at least 14 days after sx onset. Testing is "if possible" do we need to change that?*

I thought I should raise this at once as NERVTAG can be expected to formally minute its concern about this in the next few days. It may be that discharge to NH will be part of Sharon's consideration of nosocomial issues." [JVT2/220 – INQ000151735]

9.18. Professor Peacock responded to my email saying that *"It certainly should be part of our thinking in the nosocomial WG" [JVT2/221 – INQ000236484]*. The nosocomial working group, or Hospital Onset COVID Working Group (HOCWG), was a subgroup of SAGE established on 3rd April 2020. It was co-chaired by the CNO and Professor Wilcox and was tasked with monitoring and advising on the issue of hospital-acquired COVID-19 infection. To the best of my knowledge and recollection, the OCMO did not have any substantive involvement with HOCWG.

9.19. On 13 April 2020, I received an email from Professor Robert Dingwall (a member of NERVTAG) that forwarded correspondence describing an incident in which a care home had resisted re-admitting an un-tested patient from a hospital. I forwarded the email to Jonathan Marron (Director General for Public Health within DHSC), Professors Powis, Hopkins, Peacock and Willett and the CMO, stating as follows:

"You'll want to be aware of this I'm sure, and it may hit the media in a more central way.

Robert Dingwall is a trusted member of NERVTAG and MEAG.

My understanding was that the current discharge criteria for return to care home were:

- 1. Patient well enough to go home*
- 2. Minimum 14 days after Sx onset*
- 3. Test pre-discharge where possible*

Looking at the dashboard we do seem to have an excess of testing capacity over NHS usage, so shouldn't testing have been possible?

It seems like the Care Home sector are mobilising to demand pre-Dx testing [JVT2/222 – INQ000236485]

9.20. I cannot now recall what dashboard I was referring to (but believe it was the Cabinet Office dashboard) or why it was suggesting there was an excess of testing capacity over NHS usage. I read that phrase to mean that the NHS was not using all available testing capacity. Although I have little recollection of this email, I assume I was raising the possibility of that testing capacity having been used to test this patient prior to their discharge . That is a different question from whether there was sufficient testing capacity in the UK in the initial stages of the pandemic. As I have mentioned above and is widely accepted, there was not.

9.21. My email was then forwarded by Jonathan Marron to Rosamond Roughton (Director General for Adult Social Care within DHSC), who responded in the following terms:

“Thanks all. We have been round this several times. It is very pertinent for the document on social care we plan to publish tomorrow, if everything gets across the line.

- 1. I understood that the advice was that testing asymptomatic patients on leaving hospital and before going into a care home was not clinically useful. So we are not recommending that as a policy – BUT WOULD BE HAPPY TO CHANGE THIS IF COLLEAGUES RECOMMENDED IT. Instead, we are therefore trying to get agreed with NHSE – and a draft is with Matthew Winn now – a policy where Covid 19 patients complete their ‘isolation’ period in the NHS before going back to a care home, or entering one for the first time.*

2. *For non Covid patients going from hospital into a care home, we are recommending isolation for 14 days in line with the agreed and published guidance on transfers from hospital. Recognising that not all care homes can currently provide that, because of the PPE shortages, we are asking local authorities to take a stronger role in helping with isolation, or finding alternative ways of isolating people e.g. bringing back on stream mothballed care homes (this is already happening) to act as a kind of step down quarantine facility.* [JVT2/222 – INQ000236485]

9.22. On 7 August 2020, I had an email exchange with Professors Wilcox, Willett and Powis and the CNO about testing hospital patients prior to discharge into care homes. NHSE had undertaken some research that potentially supported a policy change to test patients twice before discharging them. I responded as follows:

“Given the problem of care home outbreaks, I think the data are telling us Mark that by putting in two pre-dx tests (I suggest at a minimum interval of 24h) we could get a 6% risk of export rate down to much closer to zero.

6% is low risk but set against the number of discharges to care homes (which could then seed outbreaks) this still seems to be quite a lot of patients. These ‘potential false negatives won’t get special IPC precautions in the home either will they?’ [JVT2/223 - INQ000152667]

9.23. Professor Wilcox replied to my email as follows:

“Agreed JVT.

Patients with a negative result will likely be assumed to be free of COVID-19 risk and so extra IPC precautions would not be implemented.

I do not know how many extra tests this would mean – to be clear, this would only apply to discharges to care homes/vulnerable settings.

I think it is difficult not to do this given we have (albeit imperfect) data.” [JVT2/224 – INQ000236510]

Operation Moonshot

9.24. The idea behind “Operation Moonshot” was mass population testing. I was a member of the “Moonshot Scientific Advisory Group” [co](#)-chaired by Lords Bethell and Darzi, which held its first meeting on 25 August 2020. I had real doubts about whether it was workable and while I attended further meetings, I did not have any significant involvement in taking it forward. I did not want to dismiss out of hand something that others clearly thought could work, but I had concerns related to the feasibility and practicality of such a scheme. For example, it seemed to me that the problems I have identified above in relation to testing prior to discharge into care homes were equally applicable to this idea. If, for example, someone was exposed to the virus on Monday and the testing took place on Tuesday, they might well receive a negative result on Thursday because there was so little virus in their system. They would then be free to leave their home and mix with others despite being highly infectious. I also had concerns about the sensitivity of the tests that would be used, i.e. about what percentage of positive cases they would detect accurately. My contribution to the Advisory Group meetings included the following:

- i. On 25 August 2020, I encouraged the Group to consider what mass population testing would look like in practice and emphasised the importance of developing incentives around testing to encourage take up [JVT2/225 – INQ000269376].
- ii. On 11 September 2020, I agreed with John Edmunds that the accuracy of the tests was a significant issue and that they would need to be identifying 90% of positive cases as a starting point [JVT2/226 – INQ000269377].
- iii. On 18 September 2020, I raised the issue of funding models and suggested that the Group focus on a few key settings, for example: stadia, cinemas, theatres, conferences, nursing home visitors, aviation etc [JVT2/227 – INQ000269378].

Contact tracing

9.25. The strategy of contact tracing was considered by PHE from the very beginning of the outbreak. That is standard operating procedure for an infectious disease occurrence in the community and PHE did it for other diseases such as meningitis or measles. However, it was very clear that PHE were never resourced to contact trace for COVID-19 for any length of time. The Health Protection Agency, which was better resourced and larger than those components of PHE which replaced it, was tasked to contact trace for swine flu from May 2009 to July 2009. The Chief Executive of the HPA, Justin

McCracken, later told me in person that by July 2009 the HPA was all but broken by the effort it had been asked to make in response to swine flu, which I would point out was much less infectious than COVID-19. My view therefore was that it was totally impossible to have envisaged PHE as being capable of this exercise for more than a short few weeks before it was deluged.

9.26. My involvement with the testing and tracing strategy was only ever at a very high level. I reviewed and commented on policy documents and guidance, and I provided advice on specific points as they arose. By way of example:

i. On 14 April 2020, I provided the following advice to colleagues within DHSC:

“I really support track and trace as part of a truly rigorous and intense even military style approach to contact tracing (possibly the only way be [sic] really get out of lockdown to any great extent). But it will not work unless testing is really accessible. For this to work, driving miles to a drive-in test centre like Ikea or Chessington Zoo is simply non-viable (capacity already exceeds take up at these locations suggesting the delivery model is wrong). We will have to get to a point where PCR testing is very geographically dispersed (local) or pre-positioned in homes/local shops with a self-swab postal kit approach”
[JVT2/228 – INQ000236486].

The point I was making was that several countries, like Vietnam, with very highly disciplined and ordered test and trace and quarantine activities were holding the virus back. I didn't think we'd ever replicate Vietnam because we already had too many cases in play, but I did think that if the system was strict and efficient it could have helped slow the spread.

ii. On 6 May 2020, I provided comments to DHSC, NHSE and PHE colleagues on policy decisions that had been reached in relation to test and trace **[JVT2/229 – INQ000151836].**

iii. On 22 May 2020, I reviewed and commented on a DHSC document that laid out the test and trace strategy. My overarching comment was that the document needed to be more upfront about the need to improve turnaround times in the testing process **[JVT2/230-231 – INQ000151984 / INQ000151985].**

- iv. On 27 May 2020, I reviewed and commented on four pieces of test and trace related guidance [JVT2/232-238 – INQ000152026 / INQ000152027 / INQ000152028 / INQ000152029 / INQ000152030 / INQ000152031 / INQ000152032]

9.27. My views on the efficacy of the NHS Test and Trace Service are based on my personal experiences with it as an end user. As an end user, I had two different experiences. The first was when my elder son tested positive after travelling from Nottingham to London and back again in order to watch a football match at the Loftus Road stadium. In that instance, the Test and Trace Service were in contact with us promptly and the individual that we spoke to was so detailed that they wanted to know the departure time of the tube that my son had taken to get from Kings Cross to the football match. That was a very diligent, if somewhat unrealistic approach. The second incident was when my younger son tested positive having been at a very crowded official reception with my wife and I in London. On that occasion, the person that we spoke to from the Test and Trace Service did not ask any of the right questions (as an epidemiologist I know what they are) and I was distinctly unimpressed with the quality and rigour of that exercise. My personal experience with the implementation of the Test and Trace Service was that it was therefore extremely patchy in terms of quality and rigour.

Section 10: Covid-19 Disparities

- 10.1. Early clinical data about COVID-19 in late February and March 2020 indicated that severe morbidity and mortality would be higher for people with underlying medical conditions and the elderly. The policy of seeking to protect these vulnerable groups through social distancing and shielding was maintained to a greater or lesser extent throughout the pandemic.

- 10.2. The data showing that ethnic minorities experienced worse health outcomes from COVID-19 developed over a longer period and as a result of research from CO-CIN, PHE, NIHR and other academics. On 8 April 2020, the OCMO asked Professor Semple:

“...if there was any signal out of CO-CIN on:

- 1. Covid-19 having a disproportionate impact upon ethnic minorities*
- 2. Covid-19’s impact upon healthcare workers” [JVT2/239 – INQ000068735]*

10.3. Professor Semple’s response in respect of question 1. Was as follows:

“We do collect data on ethnicity in CO-CIN. That data is sparse in relation to the overall data...

As the outbreak moves through the country we can expect an apparent effect upon ethnicity that is due to both location and density of ethnicity.

The other confounder is deprivations.

For DPA reasons we do not collect postcodes so can not correct for local level multiple deprivations. This is the trade-off that allows rapid collation of clinical information without consent. Once we have more data we could look at attempting to normalise for deprivation at CCG level.”

Professor Semple then referred to a paper looking at the effect of ethnicity on care pathway and outcomes in patients with influenza in the UK that I was a co-author of. He summarised that the conclusion of that paper was *“there were no significant differences by ethnicity in delayed admission, severity at presentation for admission, or likelihood of severe outcome”*. Professor Semple then explained that *“It is too early to come to the same conclusion for COVID-19, but in the absence of other evidence, this is the more likely effect that we would expect” [JVT2/240 – INQ000236483]*.

10.4. At a Senior Clinicians call on 9 April 2020 (which I did not attend), PHE was commissioned to conduct an analysis on the impact of COVID-19 on ethnic minorities [JVT2/241 – INQ000068764]. PHE subsequently appointed Professor Kevin Fenton to undertake this work. There then followed some discussions about whether this review ought to look at factors beyond just ethnicity. On 22 April 2020, I contributed to those discussions by email [JVT2/242 – INQ000236487]. It was ultimately decided that Professor Fenton’s work on ethnicity would be supplemented by a wider review that would look at age, sex, underlying health conditions and occupation. The terms of reference for the review were agreed between OCMO, DHSC, PHE and No.10 and on

3 May 2020 a final version was circulated by the Health Secretary's office. The terms of reference explained as follows:

"The Chief Medical Officer for England, Professor Chris Whitty, has already asked Public Health England (PHE) to examine inequalities in the risk and outcomes from COVID-19 by ethnic group.

However, there is a need to examine disparities across all dimensions of inequality and among other population groups, where possible. PHE will undertake a review of the epidemiological evidence on disparities in the risk and outcomes of COVID-19 using available data sources...

This work will be led jointly by Professors Yvonne Doyle and John Newton and initial findings should be available by the end of May." [JVT2/243 – INQ000236491].

- 10.5. In addition to the broader work being undertaken by Professor Fenton, the CMO also asked Professor Newton to produce a rapid review of the data that was already available to PHE on ethnicity. Professor Newton did so and sent his report to the OCMO on 5 May 2020 [JVT2/244-245 – INQ000236493 / INQ000236494]. The CMO then produced a summary note for the Health Secretary, which highlighted the following points:

“...

17) These are very clear and well analysed data, with overlap with other recent analyses (unsurprising given much of the source data on COVID-19 cases is in common between the studies).

18) They indicate evidence of increased rates of COVID-19 infection severe enough to need hospitalisation in several ethnic minority groups. These could be due to multiple overlapping factors, including socioeconomic, the occupation of those of working age, genetic factors and high rates of co-morbidities.

19) They also indicate evidence of increased progression to severe disease at a younger age, and probably increased mortality, in some BAME ethnic groups.

20) The data will be easier to interpret in the context of the work on other risk factors PHE is leading.

...” [JVT2/246 – INQ000069222]

- 10.6. At the beginning of June 2020, PHE published two reports:
- i. *Beyond the data: Understanding the impact of COVID-19 on Black Asian and Minority Ethnic (BAME) communities*, which incorporated Professor Newton’s rapid review; and
 - ii. *Disparities in the risk and outcomes of COVID-19*, which analysed the following factors: age and sex, geography, deprivation, ethnicity, occupation and comorbidities.
- 10.7. I was aware, and took note, of these reports. However, I did not provide any advice to core decision-makers on their conclusions outside of the context of SAGE and the advice that it provided to the Government.
- 10.8. At the end of May 2020, I contributed to the ISARIC4C paper: *Ethnicity and outcomes from COVID-19: the ISARIC CCP-UK prospective observational cohort study of hospitalised patients* [JVT2/247-248 – INQ000236496 / INQ000236497]. The conclusion of that paper was as follows:
- “Ethnic minorities in hospital with COVID-19 were more likely to be admitted to critical care and receive IMV than Whites, despite similar disease severity on admission, similar duration of symptoms and being younger with fewer comorbidities. South Asians are at greater risk of dying, due at least in part to a higher prevalence of pre-existing diabetes.”*
- 10.9. To the best of my recollection, I did not directly advise core decision-makers on COVID-19 disparities. However, I did contribute to discussions within the OCMO that would have informed advice emanating from the Office. For example, on 8 June 2020, the OCMO received a request from the Government Equalities Office for input on work that was being carried out in response to the PHE reports described above. On 11 June 2020, I sent an email to my colleagues within the OCMO setting out my broad thoughts:

“This is really tricky. I have been cogitating on this for a while. Where I have landed for now is laid out below, though these are personal views and I am very much open to a proper collegiate debate.

Thesis:

- 1. There are now enough data to recognise a clear unadjusted BAME signal for increased: likelihood of infection; disease severity/progression in hospital; mortality.*
- 2. However this is against a backdrop of even clearer data signals for age, sex, obesity, comorbidity, occupational groups associated with frequent person-person contact (e.g. social care), elementary job roles, deprivation, overcrowding and household size (inferred), socio-economic status.*
- 3. There may also be overlays related to cultural and religious behaviours and multi-generational households.*
- 4. A genetic susceptibility component is neither ruled in nor ruled out but is definitely plausible.*
- 5. There are emerging data on interdependencies for risk, e.g. prevalence of diabetes in south Asians.*
- 6. Notwithstanding I believe there is a residual BAME signal (of indeterminate final size) after adjustments for known interdependencies (in 2 above) which would be attributable to genetic factors; albeit with some possibility of an element confounding that is still unmeasured.*

Interventions:

- 1. If the above is true, then interventions targeting BAME per se are probably too coarse and would fail to properly account for the other factors: e.g. that a Caucasian overweight male with diabetes aged 62 and working in a care home is at high risk of infection and a bad outcome. In comparison a BAME female, graduate, aged 23, thin, hyperfit, with no comorbidities and about to go off to Sandhurst is at much lower risk of a bad outcome.*
- 2. However BAME ought to be part of a combined, individualised risk/exposure score that might then be used to offer improved risk profiling and greater workplace protection (enhanced) on a like for like basis taking other known factors into account alongside.*
- 3. This ‘enhanced protection’ might be associated with higher than standard level PPE, increased intensity of monitoring (including testing frequency or*

threshold), employment role modification or redeployment (but the exigencies of the service would need to be considered).

4. *The above approach to measures would also fail to take into account risks that were more engrained into non-work lifestyle/living conditions/behaviours but employers can't readily influence these. I have stressed to young elite footballers this is more likely to be a hazard than the safety of the training facility.*

5. *I think the key is individual risk-profiling and information.” [JVT2/249 – INQ000236503]*

10.10. In short, I felt it was always going to be very difficult to disentangle all of the socio-economic and cultural factors from the genetic and racial factors. My understanding is that there is currently no proven link between genetics and poor outcomes from COVID-19. In my view, it is far more likely that pre-existing structural and health inequalities meant that ethnic minorities were at greater risk of poor outcomes. I think there are deep socio-economic divisions in our society that were laid bare by the pandemic. I do not suggest that those problems are easily solved, but I do think that the experience of COVID-19 will make it easier to anticipate similar patterns in a future pandemic and ensure that we are looking out for signals of health disparities a bit earlier. That is assuming sufficient corporate memory is laid down in the system at this point.

Section 11: Long Covid

11.1. In the early stages of the pandemic, it was not possible to foresee the long-term sequelae of the disease. Prolonged fatigue following a viral infection is well documented but the condition now known as “Long Covid” is still not fully understood and appears to comprise several different syndromes.

11.2. As knowledge of the longer-term effects of COVID-19 developed, the OCMO advised Ministers on the subject. I had little or no involvement with that advice, which was provided by the CMO. I understand that more detailed evidence on this subject has been provided by the CMO in both his personal statement made for the purposes of

this module and the OCMO Module 2 Corporate Statement. I would respectfully refer the Inquiry to that evidence.

11.3. I was aware of the work undertaken by the Health Protection Research Units at the NIHR, commencing at the OCMO's request in June 2020 [JVT2/250 – INQ000069876] and the subsequent NIHR report published on 15 October 2020 [JVT2/251 – INQ000236442]. However, I was not directly involved with commissioning this work or advising core decision-makers on its conclusions.

11.4. On 11 February 2021, the OCMO provided a note to the Prime Minister that set out a brief summary of the CMO's current understanding of Long Covid [JVT2/252-253 – INQ000072751 / INQ000072752]. I did not contribute to that advice, which I have now been shown. It sets out a helpful summary of our early analysis in the following terms:

“Long COVID is defined by NICE as:

- *ongoing symptomatic COVID-19, meaning symptoms lasting 4-12 weeks, or*
- *symptoms that develop during or after an infection consistent with COVID-19 that continue for more than 12 weeks and are not explained by an alternative diagnosis.*

What is currently termed ‘Long COVID’ is probably several different syndromes, that may overlap. These include:

- ***Post-Intensive Care symptoms.*** *Common following any serious infection requiring intensive care. Often very debilitating but will likely pass in time.*
- ***Post-Viral Fatigue syndrome.*** *Also, common post some serious viral infection and usually passes in time but can cause medium term health issues.*
- ***Long-Term Covid syndrome.*** *This syndrome with intermittent or prolonged combined shortness of breath and fatigue seems distinct from most other viral infections and requires further research. It may itself have several types.*
- *Those who develop permanent organ damage, especially scarring of the heart or lungs, visible on CT or other testing.*

...”

- 11.5. On 31 May 2021, the CMO provided updated advice to the Prime Minister on Long Covid [JTV2/254-255 – INQ000073416 / INQ000073417]. I similarly did not contribute to that advice but have since seen and entirely endorse its analysis.
- 11.6. By 2021, my attention was focused almost entirely on the development and distribution of vaccines which was an urgent national priority. Therefore, I cannot usefully add to the evidence that the Inquiry will receive from the CMO on this issue.

Section 12: Covid-19 Deaths

- 12.1. I am asked by the Inquiry to comment on DHSC's reporting of deaths from COVID-19 across all settings and the changes made to reporting deaths at various points throughout the pandemic. I was not involved in the operational reporting methods employed by DHSC and did not advise on the issue during the pandemic.
- 12.2. I would respectfully direct the Inquiry to the evidence of DHSC's witnesses in respect of reporting and to the Technical Report exhibited to the OCMO Module 2 Corporate Statement, which addresses reporting as part of its analysis of lessons learned from the pandemic and the UK response (see pages 130-131 of that report).
- 12.3. As to the metrics used to measure the impact of the UK response to COVID-19, I would again respectfully suggest that DHSC and other Government witnesses are better placed to opine.
- 12.4. My own view is that both total excess deaths over a particular period and the total number of deaths from COVID-19 over that same period can be useful and important metrics. If excess mortality were not considered, the true impact of the pandemic would be missed. Excess mortality encompasses deaths where COVID-19 may have been an indirect contributory factor even if not the sole or primary cause. In circumstances in which testing capacity was limited, some diagnoses of COVID-19 may have been missed but would nonetheless appear in the data when total excess mortality was

considered. In less affluent countries which had very limited (or initially no) testing capacity, the excess deaths metric was even more important and acted as a signal of the impact of the pandemic even where few or no confirmed COVID-19-attributed deaths occurred.

Section 13: Covid-19 Public Health Communications

13.1. My role in respect of UK Government public health communications during the pandemic was to provide clear and independent advice and information. I did that most visibly at the daily press conferences that were held at No.10 and broadcast across the country. In addition, I was sometimes asked to advise on statements that politicians were intending to give, to make sure that they were scientifically accurate. I have been recognised for my contribution to public health communication with the following awards:

- i. Communiqué Awards: Healthcare Communications Advocate of the Year, 2021;
- ii. Toastmasters International: Communication and Leadership Award, 2022; and
- iii. Royal Society: David Attenborough Award for public communication of science, 2022.

13.2. My approach to dealing with misinformation was simply to highlight it as that and then refuse to engage with it. If asked about a specific view that I thought was misleading or false, I would simply say that, explain my own view and explain the evidence and rationale for it.

13.3. I am not in a position to assess the effectiveness of the UK Government's public health communications during the pandemic. In my personal experience, I had members of the public telling me that they looked forward to my No.10 press briefings and that they found them a source of comfort and simplicity in a time of great uncertainty and confusion. Conversely, towards the end of the pandemic, I also had members of the public telling me that they had completely lost touch with the Government's guidance. Whether that is because it was unclear or because they were fatigued by the multiple layers of advice that they had been asked to absorb, I don't know.

- 13.4. I am asked by the Inquiry to opine on the practice of SAGE scientists publicly expressing their personal views on scientific issues relating to COVID-19 that were inconsistent with the central advice agreed by SAGE. There is a risk of detriment to public health if inconsistent messages are given to the public, but freedom of speech is an important principle for any functioning democracy and I am not in favour of restricting what scientists can say in public. However, if members of SAGE are going to make public statements that are not in line with SAGE's view, then it is vital that they make it clear that: 1) they are expressing their own personal opinion; and 2) that opinion fed into SAGE but is not in line with the collective view that SAGE ultimately arrived at. As long as these two things are made clear, I believe the risk of public confusion would be reduced.
- 13.5. I do not know what the Government meant to communicate by saying that it was "*following the science*". However, to me the phrase meant asking whether the scientific voice in the room had been properly heard. I never asked a Minister to follow the science to the detriment of making a "balanced scorecard" decision, taking into account the social, economic and political factors. I understood that a Minister must balance all of those competing factors when making a decision. I did not assert and insist that the science should be followed, but I did assert and insist that the science should be heard.
- 13.6. In my view, the OCMO was very good at understanding where the science advice ended and the political decision making began. By way of example, on the issue of compulsory immunisation of healthcare workers, I was very clear (having studied the matter and advised the WHO on it) that influenza vaccine uptake in healthcare workers could be dramatically improved by employers mandating it and having effective employment sanctions in place for non-compliance. That indirect science advice derived from influenza studies was what I could offer to Ministers who were deliberating on making COVID-19 vaccines compulsory in NHS and social care settings. Indeed, I forwarded the relevant papers to policy colleagues in DHSC following a request for clinical advice on the matter in June 2021 [JVT2/256-263 – INQ000269380 / INQ000269381 / INQ000269382 / INQ000269383 / INQ000269384 / INQ000269385 / INQ000269386 / INQ000269387]. Having provided this science advice, it was then very

much a political decision about how to use it in the context of COVID-19 and I made that clear in the way my advice was framed: “...*If mandation were decided on by Ministers... “...if Ministers decide to do this...”*”.

- 13.7. In terms of the accessibility of public health communications, I always did my best to communicate in straightforward and non-technical language. I didn't specifically tailor my presentations at the daily press conferences for a specific group. I simply tried to convey the facts and the evidence in a way that could be understood by as broad an audience as possible. Where specific minority groups had particular concerns or requested more nuanced advice, OCMO was happy to provide it. For example, I had a number of conversations with the Chief Rabbi at various points throughout the pandemic on matters of particular concern to the Jewish community. I was also heavily involved in delivering vaccine information to groups that had specific concerns or displayed signs of vaccine hesitancy (professional footballers and sports clubs, for example). The background to that issue and the plan to address it was set out in a paper for COVID-O on 25 January 2021 [JVT2/264 – INQ000092296]. I understand that that will be a matter to be more fully explored as part of the Inquiry's fourth module.
- 13.8. I have already explained that the scientific understanding of COVID-19 developed significantly over time. As scientific advisers, we tried very hard to convey the fact that there was uncertainty about the disease and to gradually remove that uncertainty as much as we could as data and evidence became available to us. I do not feel capable of commenting on the extent to which we were successful in achieving that. With the benefit of hindsight, I think it is quite possible that the Government's public health communications in the initial period of the pandemic placed too much emphasis on surface transmission and handwashing. The evidence for contact transmission as an important route for SARS-CoV-2 remains uncertain. In contrast, there is now better understanding about the importance of close range between individuals for transmission. I therefore believe that if we knew then what we know now, there may well have been less emphasis on contact transmission and more emphasis on airborne transmission and ventilation.

13.9. For my part, I was clear that the messaging I admired most, and indeed wanted the UK to adopt, was the Japanese “Three Cs”. The Japanese Government advised citizens to avoid the “Three Cs”: 1) closed spaces; 2) crowded places; and 3) close-contact settings. In mid-June 2020 the Cabinet Office ‘Covid Campaigns Hub’ circulated a proposed outline for the next phase of the “Stay Alert Coronavirus Public Information Campaign”. In response, I forwarded a poster that outlined the Japanese “Three Cs” approach and suggested as follows:

“I really think people now need to be told that with our new found freedoms these (attached) are still the main risk factors. I think we should unashamedly copy the Japanese who have done very well. The three Cs are really a clever way to live. The stuff you attached is very much what to do. But not what to avoid. Could this be looked at?” [JVT2/265-266 – INQ000152206 / INQ000152207]

I then exchanged some further emails with Miriam Wraight from the ‘Covid Campaigns Hub’, who informed me that they would “[*explore*] how this type of messaging could be integrated into the wider campaign” [JVT2/267 – INQ000236508]. I also emphasised the importance of the “Three Cs” for the transmission of COVID-19 at a data briefing at No.10 on 12 October 2020. I believe my ideas gained no traction at all. I don’t know why.

13.10. I did not contribute to the creation of any of the following messages:

- i. “Stay Home. Protect the NHS. Save Lives”
- ii. “Stay Alert. Control the Virus. Save Lives”
- iii. “Hands. Face. Space”
- iv. “Hands. Face. Space. Ventilate”
- v. “Hands. Face. Space. Fresh Air”
- vi. “Stop COVID-19 Hanging Around”

13.11. However, once they had been devised, the campaign materials such as posters and television adverts were sent to the OCMO for comment and approval.

13.12. I did not have any concerns about the Government's public communications concerning COVID-19 being characterised by a "fear" narrative. At various points during the pandemic there was a genuine concern that the NHS could be overwhelmed and, in my view, that possibility was quite rightly at the centre of public messaging. I never heard any politician or civil servant say anything to the effect of "let's scare the public".

13.13. I am asked by the Inquiry to comment on alleged breaches of social restrictions and lockdown rules by Ministers, officials and advisers, and the impact they might have had on public confidence. In my view, when senior people (be they politicians or civil servants) fail to lead by example it weakens public confidence and public observance. Indeed, it weakens overall public faith and trust in the integrity of the leadership cadre in society. It accentuates an "us and them" mentality. I find the whole thing abhorrent. It violates the principle of servant leadership. I was asked about this issue at a press conference on 30 May 2020 and I gave the following answer:

"In my opinion, the rules are clear and they have always been clear. In my opinion, they are for the benefit of all and, in my opinion, they apply to all"

I stand by those remarks.

13.14. I cannot recall an instance in which public health communications departed from the advice I had given. There were instances in which policy decisions did not align with my advice. For example, I have already outlined the tension that existed around the two metre/one metre rule (see paragraphs 7.21-7.22). There were also times when the OCMO was particularly careful to ensure that the public messaging was right. For example, in the joint letter I have already referred to above at paragraph 7.17, the CMO, the GCSA, Professor Harries and I urged caution about the approach to lifting lockdown and suggested that *"We also need to get the tone right so that the decision to release several sectors in a safe way does not inadvertently send a signal that people can relax social distancing"* [JVT2/137 – INQ000069418]. However, I do not recall any examples of public health communications departing from my advice.

13.15. Overall, I consider that the UK Government successfully communicated its rationale for the decisions that were made in response to COVID-19. The overriding message was that case numbers had to be controlled or the NHS risked being overwhelmed, and until we developed a vaccine the only tools we had at our disposal were NPIs. I believe that message was clearly communicated. In terms of what could have been done to improve public communications during the pandemic, one idea that I expressed to OCMO and DHSC comms colleagues was that I host televised “fireside chats”, at which we could walk the public through the evidence and give them the opportunity to ask questions. I felt the public might benefit from some more nuanced explanation than timespan and often quite political nature of the daily press conferences allowed for. I can’t remember who I made the suggestion to. It was not a formal request and I do not know why it was not taken forward.

Section 14: Public Health and Coronavirus Legislation and Regulations

14.1. I was not involved in the drafting of public health and coronavirus legislation and regulations in any significant way. However, the OCMO was sent drafts of the coronavirus regulations to review from a public health and scientific perspective. For example, at the beginning of February 2020, I was sent a draft of the Health Protection (Coronavirus) Regulations 2020 to review. The only significant input I had was on the definition of “infected area”.

Section 15: Lessons Learned and Recommendations

15.1. I contributed to the OCMO Technical Report, a 381-page report that contains many lessons learned and I hope that in combination this report, and this and other OCMO witness statements, set out many of the key lessons to be learned.

15.2. In preparing this statement I have revisited the headline reflections that are set out at the end of each chapter of the OCMO Technical Report [**JVT2/268 – INQ000203933**].

Bearing in mind the questions that have been put to me by the Inquiry, the reflections that I consider to be most pertinent for the purposes of Module 2 are as follows:

i. Scientific and medical advice will often need to be formulated on the basis of limited data

This was the case for SARS-CoV-2 in early 2020 with respect to several areas, including, for example, asymptomatic transmission or spread via aerosols. This cannot be avoided but it is critical therefore to explain in the advice the strength of the evidence and the degree of uncertainty about the conclusions, and to prepare the ground for the advice to change as evidence accumulates. (Chapter 1, p.60)

ii. Good data are essential for an effective pandemic response – otherwise decision-makers, service providers and researchers are flying blind

Lack of even basic data was particularly acute in the early stages of the pandemic but difficulties with accessing, sharing and linking data persisted for much longer, although the situation improved significantly thanks to the efforts of those involved. (Chapter 4, p.158)

iii. Data sharing and linkage is essential from the outset

In any health emergency, data from hospitals, primary care, health protection agencies and academic research will need to be shared rapidly between a range of government departments, public sector organisations and academic researchers. This requires data governance processes and interoperable data platforms to support data sharing and interorganisational collaboration. (Chapter 4, p.158)

iv. Modelling is not forecasting

It proved difficult to communicate this important distinction to decision-makers, the press and the public. (Chapter 5, p.179)

v. There were 2 important questions at the outset: 1) What do we need?; 2) How should we prioritise that we have while we build up to what we need?

Limitations in testing capacity and an end-to-end system to effectively use the output testing were initially a major constraint. The magnitude and speed of scale-up required in the testing system for COVID-19 was unprecedented. The major efforts required to expand testing capacity highlighted the importance of building testing systems that maintain some form of contingency response, or at least

retain some expertise on how to surge in the event of a new variant or an entirely new pandemic. The diagnostics industry should be included in planning as they may be a key partner (for example, in providing rapid surge capacity). (Chapter 6, p.207)

- vi. *It was important – and the UK did not always get this right – to align testing aims, use cases, technologies, data flows and communications in coherent testing strategies***

This can be challenging in the context of new systems and processes, new testing technologies and use cases, and inter-organisational working. An agreed plan for prioritising usage was also required – for example, targeted at high-risk settings (staff and patients in hospital and care homes) and for outbreak management. (Chapter 6, p.207)

- vii. *Testing was deployed for a wide range of use cases in this pandemic, some of which may be required in future pandemics***

Some use cases were very similar to normal use of tests in infectious disease outbreaks, including for clinical diagnosis, infection control in hospitals, case finding, surveillance and research. Others, such as repeated testing using self-read and self-reported testing, were new at this scale. Once reliable lateral flow tests were available it significantly improved people's ability to manage their own risks and the risks for those they were meeting, as well as supporting surveillance at scale. (Chapter 6, pp.207-8)

- viii. *In the absence of pharmaceutical interventions, NPIs are the only option for pandemic control***

Adherence was generally very high across a range of NPIs in all 4 nations of the UK and in all groups with the public proving willing to take extraordinary measures in order to protect one another in a public health emergency. This included, for example, the efforts made by young people even though they correctly perceived limited personal risk. (Chapter 8, p.259)

- ix. *Residents of care homes for older adults are very likely to be at high risk of serious disease in any respiratory disease epidemic***

Measures to reduce ingress to care facilities (via staff or visitors) and minimise transmission while maintaining quality of care will be a high priority. (Chapter 8.2, p.304)

x. *The control of transmission in care homes also depended on alignment with wider public health, social care and healthcare systems*

Preventing ingress into care homes proved extremely difficult during periods of high prevalence in the community. High case rates in hospitals required careful management of discharges into care homes. The structure of the care sector presented challenges: there is enormous diversity of facilities and many staff move from one facility or care role to another within the same week or even day. The adult social care workforce, although trained to provide care, lacks the status of registered professionals and is relatively poorly paid and insecurely employed, with high vacancy rates and poor sick pay provision. (Chapter 8.2, p.305)

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 or without an honest belief of its truth.

Signed:

Personal Data

Dated: 8 September 2023