Witness Name: Professor Dame Anne Johnson DBE PMedSci

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UK COVID-19 INQUIRY

WITNESS STATEMENT OF PROFESSOR DAME ANNE JOHNSON ON BEHALF OF THE ACADEMY OF MEDICAL SCIENCES

I, Professor Dame Anne Johnson, will say as follows: -

0: Introduction

0.1. I am responding to the rule 9 request on behalf of the Academy of Medical Sciences (AMS). As President of the AMS, my role is to advise on, and have strategic oversight of, the Academy's activities. This includes oversight of its management, as well as the projects it undertakes. Like previous Academy Presidents, I meet regularly with the Government Chief Scientific Advisor (GCSA) and the Chief Medical Officer (CMO) for England, and I am an ex officio member of the Council for Science and Technology (CST). The Academy also has ad hoc meetings with senior government officials, key Ministers, Shadow Ministers, Select Committee Chairs and other senior stakeholders in relevant organisations (e.g. NHS England, MRC, NIHR, MHRA, UKHSA, among others). At these meetings, we will have discussed the findings of the reports outlined in this statement as well as issues that have been raised by the medical research community. Dates of the meetings that I attended can be provided if required. The Government Office for Science (GO-Science) and the Department for Health and Social Care (DHSC) will have records of meetings between the AMS and the GSCA or CMO for England respectively.

0.2. I was a member of the AMS Expert Advisory Groups developing independent advice in the form of the reports 'Preparing for a challenging winter 2020/21' (AJ/1 - INQ000130470) and 'Covid-19: preparing for the future' (AJ/2 - INQ000130481) (the first and second AMS winter reports, respectively) to inform the GCSA and GO-Science on Covid-19. A representative from GO-Science acted as an observer on the Expert Advisory Groups for the winter reports (AJ/1 - INQ000130470 and AJ/2 - INQ000130481). As such, they were not involved in the Expert Advisory Groups' deliberations nor in the development of its findings or conclusions but provided helpful support in making connections with relevant initiatives across Government. I also oversaw, in conjunction with Professor Sir Stephen Holgate CBE FMedSci, the development of the AMS's position paper, 'COVID-19: what next?' (AJ/3 - INQ000130492). The findings of the first AMS winter report (AJ/1 - INQ000130470) were discussed with the GCSA and CMO, including at SAGE meeting 46 on 9 July 2020, where the Chair of the winter reports, Professor Sir Stephen Holgate CBE FMedSci, presented its conclusions. The report (AJ/1 - INQ000130470) (with the exception of the reasonable worst-case scenario) was endorsed by SAGE subject to minor amendments. Following the meeting, the GCSA and CMO for England wrote to Heads of Departments with a copy of the report (AJ/1 - INQ000130470), which was also circulated to the Department for Health and Social Care; Department for Transport; Ministry of Housing, Communities & Local Government; COVID-19 Taskforce; and Crown Commercial Service by the SAGE secretariat. The AMS sent this report (AJ/1 - INQ000130470) directly to the GCSA, the Chief Medical Officers in all UK nations, key ministers and shadow ministers, among others.

0.3. The second winter report (AJ/2 - INQ000130481) was also circulated directly to the GCSA, the Chief Medical Officers and the Chief Scientific Advisers in all UK nations, key ministers and shadow ministers, among others. It (AJ/2- INQ000130481) was circulated to Heads of Departments and government department Chief Scientific Advisers by GO-Science, and was included in papers for information at SAGE meeting 94 that took place on 22 July 2021. SAGE welcomed the publication of the report (AJ/2 - INQ000130481) noting that the report has findings that should be considered by a number of government departments.

0.4. The findings of the winter reports were discussed at Teach Ins with different government departments and groups as follows:

(1) The Welsh Technical Advisory Group about each of the three reports on 20 July 2020, 16 July 2021 and 22 July 2022.

(2) 'COVID-19: preparing for the future' (AJ/2 - INQ000130481) with representatives from Cabinet Office and across UK Government on 29 July 2021.

(3) 'COVID-19: preparing for the future' (AJ/2 - INQ000130481) to the National Core Studies Leads on 30 July 2021.

(4) 'COVID-19: preparing for the future' (AJ/2 - INQ000130481) with representatives from Welsh, Northern Irish and Scottish Governments and their COVID-19 advisory groups on 20 September 2021. Please note that the report Chair, Professor Sir Stephen Holgate CBE FMedSci, also attended meetings of the Welsh, Northern Irish and Scottish COVID-19 advisory groups (on 27 April 2021, 10 May 2021 and 13 May 2021 respectively) to present the aims of the report and understand the perspectives and challenges facing the devolved administrations so these could be adequately addressed in the report.

(5) Winter respiratory infections with representatives from Cabinet Office and across UK Government on 11 November 2021.

(6) 'COVID-19: preparing for the future' (AJ/2 - INQ000130481) with representatives from Scottish Government on 2 December 2021.

(7) Non-Covid infections in winter 2022/23 with representatives from Cabinet Office on 2 February 2022 (please note that I was not present at this meeting).

(8) Covid-19 policy and research priorities to the Covid-19 Taskforce on 24 March 2022.

(9) The AMS policy statement 'COVID-19: what next?' (AJ/3 - INQ000130492) with representatives from the Cabinet Office on 18 August 2022 (please note that I was not present at this meeting).

0.5. The findings of the winter reports are discussed in sections below. Dissemination details are also provided in the table in Annex 1.

0.6. In my personal capacity, I am Professor of Infectious Disease Epidemiology at University College London and Co-Director of UCL Health of the Public, and a consultant in public health medicine. I was a member of the Royal Society's Data Evaluation and Learning for Viral Epidemics (DELVE) Committee addressing responses to the Covid-19 pandemic. On 19 May 2020, I attended part of SAGE meeting 37 to present the findings of a DELVE report on 'Test, Trace, Isolate' (AJ/4 - INQ000130498), which I contributed to as part of the DELVE Steering committee. From January 2021, I have been a member of the SAGE Environmental Modelling Group (EMG) subgroup on transmission. I also advised funding agencies and others during

the Covid-19 pandemic, including as a member of the oversight group for the new Covid-19 National Core Studies; a member of a high-level taskforce to assess projects submitted to a UKRI rapid call for projects to address Covid-19; and a member of the Pandemic Preparedness Partnership steering group as an expert co-lead for the clinical trials strand. I have Chaired the UK Committee for Strategic Coordination of Health of the Public Research (SCHOPR) since 2018.

0.7. The Academy of Medical Sciences is the independent, expert voice of biomedical and health research in the UK. Our Fellowship comprises some of the most influential scientists in the UK and worldwide, drawn from the NHS, academia, industry, and public service. Our mission is to improve the health of people everywhere by creating an open and progressive research sector. We do this by working with patients and the public to influence policy and biomedical practice, strengthening UK biomedical and health research, supporting the next generation of researchers through funding and career development opportunities, and working with partners globally.

0.8. My response has been developed using reports and evidence produced by the AMS and, where stated, input from AMS Fellows with expertise in relevant areas. All documents referenced in my submission are in the public domain. I provide details of the circulation of publications in Annex 1. Reports produced by the AMS are published on its website and sent to relevant policy makers. They may also be promoted via media coverage, including broadcast, print and television, as well as social media. Over the course of the period examined, Academy Presidents would also have provided reactive statements to government policies and announcements in the form of statements to the media. These would also be published on the AMS website.

0.9. Please note that I have endeavoured to provide below as comprehensive a list as possible within the timeframe for collation of previous AMS work related to pandemic preparedness, planning and resilience. I provide this response in good faith and to the best of my knowledge. Any omissions or inaccuracies are unintentional. I would be happy to provide any further detail about the information below, or provide any further information in future.

0.10. In my response below, I highlight areas where the UK was prepared to deal with the Covid-19 pandemic, areas for future consideration in pandemic planning, and the importance of building the UK's resilience to future crises.

0.11. I emphasise the need to plan for inevitable future public health crises but, because of their unique and variable nature, highlight that they are unlikely to require the same response as the Covid-19 pandemic. The Inquiry will prove vital to ensure that the UK

learns from its response to Covid-19 and puts in place preparations for a wide range of future emergencies. This includes the necessary public health capability, workforce, research, international collaboration and communication and engagement with the public.

1: Areas where the UK was prepared to deal with the Covid-19 pandemic

1.1 There are several areas where the UK performed well in its response to the Covid-19 pandemic, which I outline in detail below, alongside possible lessons for further improvement that the Inquiry might want to consider to improve preparedness for future public health crises.

The UK did well in areas with previous investment

1.2 The AMS heard in 2021 that the UK's response to the Covid-19 pandemic was more successful in areas where there had been prior investment and years of previous research. This included vaccine research, clinical research within the NHS and genomics, which were able to swiftly pivot to work on COVID-19 (AJ/5 - INQ000130499).

Vaccine research

1.3 AMS Fellows felt that the UK did particularly well in developing and rolling out Covid-19 vaccines. In 2015, in the context of lessons learned from the Ebola outbreak, the AMS urged the government to continue to prioritise the rapid development of vaccines against the major pathogens that threaten the UK, as well as efforts to increase the UK's large-scale vaccine manufacturing capacity (AJ/6 - INQ000130500). Fellows have since reflected that the launch of the UK vaccines R&D network in 2015 to accelerate development of vaccines for pandemics post-Ebola was critical for the initiation of work on coronavirus that underpinned the development of the Oxford-AstraZeneca vaccine. Ongoing commitment to vaccine development is essential. Looking to a future pandemic, Fellows have highlighted the importance of identifying a clear pathway for funding vaccine development when a pandemic is declared, as well as the need for onshore vaccine manufacturing capabilities generally, not only during a crisis.

1.4 Another factor in the success of the vaccine rollout was the high trust in the NHS among the public. I hope that the Inquiry will focus on how future vaccine uptake and access can be improved for vulnerable groups, especially in relation to minority ethnic groups where vaccine uptake remains low (AJ/7 - INQ000130501). This should draw on the research that is being undertaken in this area and in partnership with the underserved groups themselves. For example, the work of the British Academy on Covid-19 vaccine engagement in the UK and USA (AJ/35 - INQ000147866).

Clinical research

1.5 At the start of the pandemic in May 2020, the AMS, in partnership with the British Society for Immunology, published a report on 'COVID-19 immunology research' (AJ/8 - INQ000130502), which identified priority areas where immunology research could deliver public health impacts in the short and longer term. The expert group that informed the report noted the advantage of having platforms in the UK that are already funded and able to start research immediately, such as the International Severe Acute Respiratory and emerging Infection Consortium (ISARIC), and of being able to mobilise existing research networks. Investment in such initiatives should continue as this would provide support for responses to future pandemics. Although the Government did not provide direct funding to the UK arm of ISARIC prior to the pandemic, the network is now maintained via funds from the NIHR.

1.6 The AMS heard from its Fellows that the well-established NIHR Clinical Research Network facilitated the rapid set up of national clinical studies to successfully identify effective Covid-19 treatments, for example through the RECOVERY trial. Emergency funding for Covid-19 studies through NIHR and UKRI was made available early on and allowed researchers to contribute to the response. Supporting researchers will be vital to respond to any future crises and funds should continue to be made available for a breadth of research. Similarly, the ability to access infrastructure and coordinate researchers will be required to respond in times of crises.

1.7 Priority research areas were established in the early stages of the pandemic and focused on physical health and disease prevention, such as vaccines. The AMS highlighted the need to also prioritise research into the mental health sciences, particularly data collection on the mental health impacts and development of interventions (AJ/9 - INQ000130503).

1.8 Clinical academics were vital to the pandemic response not only for their rapid response to carry out research, but also as they pivoted to provide frontline care. They will continue to play an important role in advising how the UK should prepare for a future pandemic, as well as ensuring that the UK can respond promptly and effectively to future health threats – as was done during the Covid-19 pandemic. The AMS has raised concerns about the decline in number of clinical academics before, including most recently providing evidence to the House of Lords Science and Technology Committee Inquiry on clinical academics in the NHS in November 2022. (AJ/10 - INQ000130471)

1.9 Looking to the future, the AMS statement 'COVID-19: what next?' (AJ/3 - INQ000130492) (2022) highlighted that there are several types of virus that pose a risk to human health and could lead to a future pandemic. Research into infectious agents

that pose the greatest risk is necessary to prevent, prepare for and limit the impacts of any future major outbreaks and pandemics. The Inquiry might like to consider how this research is being prioritised and how its outcomes are being fed into planning for future national emergencies.

1.10 I hope that the Inquiry will recognise the crucial importance of a strong, globally connected interdisciplinary research base (that includes clinical academics) in enabling the UK to prepare for and respond swiftly to future threats.

Genomics

1.11 The UK's well established genomic sequencing capabilities established prior to the pandemic facilitated a rapid response. Building on the UK's capabilities, the COVID-19 Genomics UK consortium (COG-UK) was established in March 2020 through its partnership with the Wellcome Sanger Institute, the NHS and public health agencies. Through COG-UK, the UK became a leader in Covid-19 surveillance and played a key role in sequencing of new variants of concern.

1.12 Similarly, the rapid mobilisation of resources to develop population surveillance schemes such as the ONS Covid Infection Survey (AJ/36 - INQ000147867) and the ZOE COVID study (AJ/37 - INQ000147868) meant that the UK was able to establish surveillance of Covid-19 relatively quickly once the initial challenges of testing availability had been addressed (see section 2.1). Going forward, it will be vital to continue to maintain and develop the UK's surveillance capabilities by continuing investment in relevant infrastructure that would allow for high quality ongoing surveillance capability and early warning systems that can be scaled up and mobilised as needed in a crisis. Wastewater monitoring in particular could be a useful and low-cost tool for disease surveillance (AJ/5 - INQ000130499).

Regulatory agility and standards

1.13 I commend the regulatory agility which accompanied the swift approval of Covid-19 vaccines and therapeutics. Participants at the AMS roundtable 'Lessons learnt: the role of academia and industry in the UK's diagnostic testing response to COVID-19' (October 2020) (AJ/11 - INQ000130472) welcomed the regulatory agility that was catalysed by the Covid-19 pandemic and emphasised that it should be maintained beyond the pandemic to help position the UK as a leader in the regulation of vaccines, therapeutics and diagnostics in the long term. This would enable the rapid remobilisation of resources in the event of future epidemics.

1.14 The AMS also heard at its workshop on 'Antimicrobial resistance research: learning lessons from the COVID-19 pandemic' (December 2021) (AJ/5 - INQ000130499) that

regulatory bodies such as the Medicines and Healthcare Products Regulatory Agency (MHRA) have been willing to consider innovative trial designs and closer dialogue with intervention developers. There is a need to embed this new model, with regulators acting as flexible facilitators rather than simply as enforcers of regulation to swiftly respond to future crises.

1.15 The UK's response to future crises will require a similar agile approach to regulation. The progress gained in regulation during the Covid-19 pandemic should be capitalised upon to benefit the UK's biomedical and health research sector more broadly, including during inter-pandemic periods. MHRA, and the National Institute for Biological Standards and Control (NIBSC), post-pandemic must be resourced at a level that enables them to support the development, assessment and regulation of diagnostics, vaccines and therapeutics.

The role of scientific evidence in resilience and planning

1.16 Science and research are vital components of any crisis response preparations as they allow for the rapid development of evidence and innovations to address the crisis. The AMS has previously advised on the importance of evidence in improving preparedness for emergencies. In 2015, the AMS published a joint response to the consultation by the House of Commons Science & Technology Committee on the lessons from the Ebola outbreak for the UK about the use of scientific advice in similar emergencies (September 2015) (AJ/6 - INQ000130500). The response highlighted the importance of putting in place measures to improve the quality of evidence to build resilience in advance and ensure that structures are in place to enable governments to act quickly based on the latest evidence when an emergency happens.

1.17 I welcomed the publication of SAGE minutes, and such transparency should be in place for future crises. The AMS has also highlighted the need for transparency about how scientific advice reaches decision makers and what evidence is being utilised, as well as greater communication around the strengths and limitations of research findings and what remains uncertain (AJ/12 - INQ000130473). The way in which economic considerations or societal values are considered alongside the scientific evidence to inform decisions should be made clear (e.g. keeping the transmission rate of the virus low balanced against the risks of keeping children out of school, closing cancer clinics or widespread unemployment) (AJ/12 - INQ000130473).

2: Areas for future consideration in pandemic planning

Diagnostic testing capabilities

2.1 As mentioned above, areas where the UK was able to respond urgently to the pandemic were based on 'deep roots' resulting from substantial past investment in research. The UK was not able to be as responsive in areas that lacked such firm foundations.

2.2 For example, the AMS heard that the UK was not equipped with the required national or regional capacity for diagnostic testing at the start of the COVID-19 pandemic (AJ/11 - INQ000130472). Specifically, the AMS heard of challenges around:

(1) Obtaining clinical specimens to trial diagnostic tests.

(2) In the initial stages of the pandemic, due to its unknown effects, SARS-CoV-2 was designated a Group 3 pathogen, restricting the investigation of samples to Containment Level 3 laboratories. This limited the number of laboratories able to provide testing for the virus. Regular reassessment of the necessary containment levels for studying a particular pathogen is needed to ensure that research is not unnecessarily limited by the containment level. It will also be important to ensure the UK has sufficient capacity in containment level 4 facilities to investigate potential human Hazard Group IV pathogens such as Ebola, Lassa and Crimean-Congo Haemorrhagic Fever viruses.

(3) The lack of coordination between industry and others, particularly the NHS and public health agencies, for testing e.g., in terms of access to containment laboratories for early diagnostic testing research and development.

(4) The lengthy accreditation process required to deliver testing.

2.3 In various meetings the AMS has held, it has been suggested to us by experts that:

(1) It would have been beneficial to have established a government-led cross-sectoral diagnostics taskforce in the very early stages of the pandemic, and that going forward, there would be value in establishing a taskforce to inform future testing strategies. Such a taskforce could guide the governance and operation of any future testing strategies and include cross-sectoral representation from across the testing community (AJ/11 - INQ000130472).

(2) Adopting a more risk proportionate approach to the accreditation process to deliver testing in times of crisis could enable a more rapid scaling up of testing capacity (AJ/11 - INQ000130472).

(3) The UK should build on the achievements of the UK's diagnostic field during the COVID-19 pandemic and increase its diagnostic capability. This would drive the development of innovative tests that benefit patients in the future (AJ/13 -

INQ000130474). It will be important to consider how the diagnostic sector can better liaise with and support academia and the NHS (AJ/12 - INQ000130473).

2.4 It should be noted that the Test, Trace and Isolate (TTI) programme was set up as a national enterprise with significant investment. Uncertainty remains about its cost effectiveness, and the extent to which it limited transmission. A further consideration was whether there was sufficient linkage with existing public health capability in local authorities and use of existing knowledge and expertise in contact tracing etc.

2.5 The Inquiry should consider whether initiatives and interventions to limit the spread of Covid-19 developed at speed to respond to the pandemic were adequately evaluated such that findings are fed into future planning, while recognising that the next pandemic will be different.

Infection prevention and control in health and care settings

2.6 Reducing the spread of Covid-19 and other diseases is especially vital in health and care settings where the groups most vulnerable to disease reside. Further work is required in the UK and globally to understand and limit the spread of nosocomial infections.

2.7 Just before the pandemic, participants in the AMS's international epidemic preparedness workshop (2019) (AJ/14 - INQ000130475) (who came from low and middle income countries) highlighted the importance of research in inter-epidemic periods to improve the understanding of pathogens of epidemic potential and host responses. This included examining the role of health systems and individual healthcare workers, due to their potential contribution to the spread of infections. Multi- and interdisciplinary research into health system organisation and processes, as well as healthcare worker behaviour, was emphasised as revealing key vulnerabilities and highlighting opportunities to strengthen infection prevention and control.

2.8 The importance of infection prevention and control in health and care settings was reinforced in the AMS's winter reports 'Preparing for a challenging winter 2020/21' (AJ/1 - INQ000130470) and 'Covid-19: preparing for the future' (AJ/2 - INQ000130481).

2.9 Given the high risk of transmission in health and social care settings, including between both staff and patients, the winter reports highlighted that minimising the infections acquired in health and care settings should be a priority. The winter reports called for:

(1) Better hospital infection control practices, as set out in the DELVE scoping report that I contributed to on 'Hospital and healthcare acquisition of COVID-19 and its control' (AJ/15 - INQ000130476).

(2) A standardised, nationwide hospital surveillance system to track and analyse nosocomial infections and inform locally-led outbreak control.

2.10 More might have been done at an early stage of, and even prior to, the pandemic to improve infection prevention and control in health and social care settings and thereby minimise the transmission of Covid-19. Improving infection control and prevention, particularly for respiratory infections, will be important in the future and includes consideration of how best to coordinate the infection control functions of the NHS and the infection prevention and public health role of the national public health agencies, as well as clarification of the role and responsibilities of public health agencies regarding infection control in healthcare settings. Through the pandemic, scientific research has greatly improved our understanding of infection transmission in health and social care. It is important to understand how this can be used to improve future resilience.

2.11 The Inquiry could examine whether efforts are being made to improve infection control and prevention measures to reduce hospital, health and social care-acquired infections on an ongoing basis as well as in the event of a future pandemic. This might include how control of health and social care associated infections might be better identified and prevented in the future in patients, clients and the large associated workforce. This would involve better understanding of the behaviours of health and social care workers, organisation of health care, availability and use of protective equipment and the quality of the physical environment, including ventilation. The Inquiry might want to focus on monitoring and evaluation, including access to data to enable independent analysis and evaluation of measures put in place.

2.12 The AMS 'COVID-19: Preparing for the future: Looking ahead to winter 2021/22 and beyond' report (July 2021) (AJ/2 - INQ000130481) also highlighted that evidence generated on the effective control of Covid-19 in hospitals and other health and social care settings needs to inform the next generation of buildings, and enable renovations of existing spaces to make them respiratory-infection safe. I was pleased that the GCSA commissioned the Royal Academy of Engineering to identify the interventions needed in the UK's built environment and transport systems to reduce infection transmission during the pandemic (AJ/38 - INQ000147869).

Engaging key stakeholders

Patients and the public

2.13 The public had a major role in mitigating the impact of the pandemic through rapid changes in behaviour and compliance with government interventions, including lockdown. Meaningfully engaging with the public is now considered best practice when

developing policies affecting them, and will be key when responding to any future crisis.

2.14 The pandemic highlighted pre-existing inequalities in health and in the varying degree to which individuals could be protected from infection – for example, in relation to ability to work from home, to isolate within households, etc.

2.15 At the start of the pandemic, little was understood about the likely compliance of the public with containment measures. The Inquiry might consider whether sufficient previous investment was given to behavioural and the wider social sciences, and to the use of communication science, in providing clear, practical and easily accessible advice to the public on risk mitigation.

2.16 The AMS addressed this before the pandemic. In 2015, the AMS joint response (AJ/6 - INQ000130500) to the consultation by the House of Commons Science & Technology Committee on the lessons from the Ebola outbreak for the UK highlighted that care should be taken to ensure that public messages regarding such outbreaks, especially in terms of risk and uncertainty, were accurate.

2.17 In 2016, the AMS report, which I chaired, on 'Improving the Health of the Public by 2040' (September 2016) (AJ/16 - INQ000130477), made recommendations on how to engage the public and others involved in public health. It emphasised in particular:

(1) The importance of public health messaging and its potential to act as a driver of positive health outcomes.

(2) The need for more information on how to improve health literacy while increasing the focus on health communication – bearing in mind the opportunities and challenges presented by new methods of communication, digital engagement, and social media.

(3) The methods of communicating health messages from trusted partners that are appropriate to the values, culture and norms of different sectors of society. Such methods need to be strengthened and developed, with a focus on those groups that do not traditionally engage in research and those most at risk of poor health.

(4) The need for more evidence from evaluation of the effects of local and national policies which are likely to affect health and health inequalities, whether by using larger scale and innovative trial designs or by using routine data to monitor natural experiments.

2.18 These recommendations were all highly relevant to the communication requirements during the pandemic.

2.19 Participants at the AMS international epidemic preparedness workshop (2019) (AJ/14 - INQ000130475) also highlighted that, as demonstrated by Ebola, public health interventions will only be successful if they are understood and supported by

communities. As such, interventions need to be based on strong community support and a deep understanding of factors contributing to transmission.

2.20 Similarly, the AMS winter reports (AJ/1 - INQ000130470 and AJ/2 - INQ000130481) discussed the importance of engaging the public and relevant communities in the development and production of guidelines to help improve people's understanding and ability to minimise Covid-19 transmission, as well as maximise their engagement in control measures. The Patient and Carer Reference Group that contributed to the AMS winter reports felt strongly that patients and carers should be better involved, with its first People's Perspective (AJ/1 – INQ000130470 - Annex 1) highlighting the importance of involving patients and the public from the outset in decision making, and its second People's Perspective (AJ/2 – INQ000130481 - Annex 2) proposing that public members should be better represented as members of SAGE and its subgroups (and their equivalents in the devolved administrations).

2.21 The Inquiry could assess whether more could have been done to meaningfully engage different communities in preparedness plans prior to the pandemic and the production of guidelines and other policies during the pandemic, and make recommendations for the future.

2.22 The AMS also understands from a FORUM workshop held in May 2020 that during the initial stages of the pandemic, the number of studies incorporating public involvement decreased from 78% in 2019, to 20% in the first 40 trial submissions received during the COVID-19 pandemic (AJ/17 - INQ000130478).

2.23 Engaging young people will be important in any future health emergency. During the pandemic, AMS supported the Planet DIVOC-91 project (AJ/18 - INQ000130479), a series of digital comics generated by 16-24-year-olds from the UK, India and South Africa, many of whom were managing physical and mental health conditions. It was valuable to understand their perspectives.

2.24 The Inquiry could also examine how views of patients and the public were considered more broadly from the beginning of the pandemic alongside scientific advice in government decisions. Ensuring that they are considered at the onset of any crisis will also be important in responding to future national emergencies.

Engaging frontline staff

2.25 Within the AMS response to the House of Commons Science and Technology Committee consultation on 'UK Science, Research and Technology Capability and Influence in Global Disease Outbreaks' (August 2020) (AJ/12 - INQ000130473), the AMS suggested that more could be done in the future to engage frontline healthcare staff that are delivering relevant components of the health service, as well as patients

and carers, in deciding and formulating policy. This will also be important in ensuring that the UK is prepared for a future public health emergency such as a pandemic.

2.26 Local public health structures are vital to managing outbreaks of any disease, but were especially vital in responding to the Covid-19 pandemic. As highlighted in the AMS winter reports (AJ/1 - INQ000130470 and AJ/2 - INQ000130481), public health practitioners were key to disease surveillance and coordinating initiatives locally (e.g. vaccination programmes, test and trace systems, and implementation of local behavioural and environmental interventions).

2.27 The winter reports (AJ/1 - INQ000130470 and AJ/2 - INQ000130481) emphasised that there needs to be a collaborative partnership between central government, which provides standards and consistency, and local authorities, which can use their extensive local knowledge to coordinate initiatives locally within a national framework.

2.28 The Inquiry could explore whether lessons can be learnt in terms of how to best engage frontline healthcare, social care and public health staff in pandemic preparedness planning and response.

Planning for a range of possible future pandemics

2.29 The independent review of the UK response to the 2009 influenza pandemic (the Hine review) outlined several recommendations on how to best prepare and respond to pandemics. The Inquiry may wish to reflect on the findings of the Hine review and examine to what extent they were considered by government (AJ/19 - INQ000130480).

2.30 In 2015, the AMS highlighted, in its joint response to the consultation by the House of Commons Science & Technology Committee on the lessons from the Ebola outbreak for the UK (2015) (AJ/6 - INQ000130500), that contingency planning for a range of possible epidemiological scenarios should be in place, with an emphasis on flexibility and adaptability and without becoming too focussed on the specifics of the scenario under consideration to ensure preparedness for a wide range of scenarios.

2.31 The AMS's response emphasised the need for a standard plan for the health service to deal with imported infectious disease threats that can be rapidly adapted to rare diseases or common ones. It suggested that written protocols with contingency planning for the main threats identified via risk assessment should be developed, and that these should be reviewed at least on an annual basis to facilitate planning and response activities.

2.32 The AMS also heard from Fellows that learnings from the experiences of nations in the SARS outbreak in 2003, MERS outbreak in 2012, and from countries affected earlier on in the Covid-19 pandemic could have been beneficial to build a response to Covid-19.

2.33 I look forward to the Inquiry's conclusions on this aspect of preparedness.

3: Building the UK's resilience to future crises

Investing in public health

3.1 There has been well-documented disinvestment in public health structures in England since the Health and Social Care Act 2012, which saw the formation of Public Health England (PHE) and responsibility for public health transferred from the NHS to local authorities, themselves subject to highly constrained budgets (AJ/20 - INQ000130482).

3.2 Following the formation of PHE in 2012, the AMS convened a high-level meeting in 2013 between research leaders and representatives from PHE to consider their research strategy (AJ/21 - INQ000130483). Following the meeting, the AMS President at the time, Professor Sir John Tooke FMedSci, wrote to the Chair of the House of Commons Health Select Committee to highlight the findings of this meeting (AJ/22 - INQ000130484). Many of the resulting issues outlined are still relevant today. For example, the role of public health agencies in bringing together researchers, public health practitioners and policy makers; the need for multidisciplinary working; and the need for public health agencies to ensure that they build a reliable evidence base from a broad range of sources to inform policies aimed at diminishing health inequalities. Similarly, the AMS report 'Improving the Health of the Public by 2040' provided recommendations on how to ensure research underpins strategies to improve public health (AJ/16 - INQ000130477). The Inquiry may wish to consider how these priorities fed into preparedness prior to the pandemic, as well as how they can be learnt from.

3.3 A strong, efficient and well-funded national public health system is vital to respond to any crisis, but especially to infectious disease outbreaks. The Covid-19 pandemic placed the public health agencies, including PHE, and local public health structures under immense pressure, and the Inquiry should consider whether decreased investment, a smaller workforce and less well-defined interfaces with the NHS impacted the ability to optimise public health responses.

3.4 The recognition of the need to strengthen public health capacity and capability led to the restructuring of England's public health system during the Covid-19 pandemic. This was a complex task which could have risked temporarily impeding elements of public health functions. The Inquiry may wish to consider the extent to which

resourcing challenges prior to, and restructuring of the public health system at the height of the pandemic, impacted the UK's preparedness and response capabilities.

3.5 The AMS highlighted resourcing challenges for the health and public health research and practice systems prior to the pandemic. For example, the Academy's joint response (AJ/6 - INQ000130500) to the consultation by the House of Commons Science and Technology Select Committee on the lessons from the Ebola outbreak for the UK emphasised that the government must ensure that financial pressures on the health and public health systems did not adversely affect the ability of the NHS and public health structures (PHE at the time) to deal with future public health emergencies. It also emphasised that more needed to be done to ensure that measures were put in place to deploy staff quickly in response to an epidemic.

3.6 Since the pandemic, the AMS has advised on the restructuring of England's public health system. I highlight this as the Inquiry may wish to consider the principles outlined in my letter (AJ/23 - INQ000130485) to the Secretary of State for Health and Social Care in October 2020 as potential lessons. The AMS has also since advised (AJ/24 - INQ000130486) that the UKHSA must develop national and regional surge capacity for local and national responses to public health crises, such as outbreaks of infectious disease. I place particular emphasis on the need for local authorities to work with NHS and social care settings where outbreaks are often first identified, as well as the need for surge capability to ensure a multidisciplinary response to future outbreaks.

Embedding research in the public health system

3.7 The AMS has highlighted the importance of funding and coordinating multidisciplinary research and harnessing the UK's evidence base to improve resilience and better respond to crises in several publications prior to the pandemic, including that:

(1) The UK should capitalise on its strong research base to conduct research before, during and after an epidemic (AJ/6 - INQ000130500).

(2) The Department of Health (now the Department for Health and Social Care) and research agencies should ensure that processes are in place to collect and share data, and to conduct scientific studies and clinical trials quickly. ISARIC is playing an important role in this and, as mentioned above, continued investment in such initiatives is necessary to support responses to future pandemics.

(3) As highlighted in the AMS response to the consultation on the public health white paper, 'Healthy lives, healthy people' (2011) (AJ/25 - INQ000130487), there is a need to understand the distribution of disease within a population through the use of surveillance data and research into the social determinants of

health, including effective interventions, to reduce health inequalities. Following this response, the AMS President at the time, Professor Sir John Bell GBE FRS HonFREng FMedSci, wrote to the Secretary of State for Health at the time, The Rt Hon. the Lord Lansley CBE, to emphasise the importance of ensuring an evidence-based approach to new public health initiatives (AJ/26 - INQ000130488).

3.8 Further relevant points on the importance of public health research were outlined in publications from the AMS, including:

(1) The need for coordination of research to tackle health inequalities, including across government and with budgets and strategies to support (AJ/27 - INQ000130489).

(2) Ensuring all new public health policies are supported by evidence-based decision making, robust piloting and rigorous evaluation (AJ/27 - INQ000130489).

(3) Developing evidence from disaster risk and resilience research to enable the UK to prepare for and respond rapidly to shocks and disruptive events at a local, regional, national and international level (AJ/16 - INQ000130477).

(4) Expanding existing health protection capabilities, which requires maximising the potential of data generated within and outside the health system (AJ/16 - INQ000130477).

(5) Developing a permanent and flexible workforce that can be rapidly mobilised for research and investigation in an epidemic outbreak (AJ/16 - INQ000130477).

3.9 Since the Covid-19 pandemic, the AMS has developed several pertinent publications, including a response to the House of Commons Science and Technology Committee consultation on 'UK Science, Research and Technology Capability and Influence in Global Disease Outbreaks' (August 2020) (AJ/12 - INQ000130473); a response to the Department for Health and Social Care 'Transforming public health' consultation (April 2021) (AJ/24 - INQ000130486); a policy statement Covid-19: what next? (July 2022) (AJ/3 - INQ000130492); a workshop report Embedding evidence in public health (October 2022) (AJ/28 - INQ000130490). These reports have outlined the need to:

(1) Better align public health and clinical practice when responding to crises.

(2) Build innovation in health security, particularly for the development of improved national surveillance, early warning, and response capabilities.

(3) Consider the most vulnerable groups when developing any policies for the future health and care of the population.

(4) Place greater value on building sustainable relationships across the public health system.

(5) Develop aligned research strategies and joint programmes of work that intersect health promotion and health protection.

(6) Capitalise on the willingness of patients and the public to get involved in research.

(7) Maintain and develop the UK's research infrastructure to ensure all those willing to participate in research are able to do so.

3.10 I would encourage the Inquiry to consider these priorities in recommending how the UK's resilience can be increased ahead of any future crises.

Building resilience in health and social care

3.11 Health and social care policy is not a primary focus area for the AMS. However, around half of the AMS Fellowship includes clinical Fellows that work at the interfaces between academia and the NHS and social care. As I mention above, these clinical academics were central to the Covid-19 response as many pivoted to frontline care.

3.12 The widespread pressures already experienced by the NHS and social care were only further exacerbated by the Covid-19 pandemic. The lack of surge capacity in the health and care system meant that it was unable to maintain usual activities during the pandemic while caring for patients.

3.13 Despite the challenges, I believe the health and care practitioners did their utmost. They have worked tirelessly throughout the pandemic, and since, in spite of the immense uncertainty and constrained resources. The Inquiry may wish to investigate the impact of resourcing challenges, particularly the workforce challenges, on the UK's response to the Covid-19 pandemic.

3.14 Further learnings to build a health and care system that is resilient to future shocks are outlined within the second AMS winter report, 'COVID-19: Preparing for the future' (July 2021) (AJ/2 - INQ000130481) and the AMS policy statement 'COVID-19: What next?' (July 2022) (AJ/3 - INQ000130492). These include ensuring adequate resourcing in the form of primary care services, mental health services, workforce and bed capacity. The use of remote or digital medicine where appropriate could also provide an improved service of care and relieve some pressures. However, there is a need for further evidence on their safety, efficacy and acceptability.

1.

Addressing inequalities in health and healthcare

3.15 Prior to the pandemic, there were notable inequalities in the access to and quality of care for people living in deprived areas and people of minority ethnicity, as well as inequalities in many health outcomes (AJ/29 - INQ000130491).

3.16 The pandemic highlighted these significant inequalities and identified key risk factors associated with high mortality from Covid-19 (such as prior health conditions, obesity, ethnicity), as well as wider structural inequalities (such as overcrowded and multigenerational housing, lower paid or less secure employment).

3.17 There has been a long-standing need to address these inequalities. Prioritising interventions to address health inequalities would improve the UK's resilience and ensure we are better prepared for future health threats.

3.18 While the effects of SARS-CoV-2 on vulnerable populations were initially unknown and only observed through epidemiology and surveillance data, the AMS heard from Fellows that scenario planning could have been undertaken to consider how these groups would be affected. The Inquiry could explore the importance of scenario planning in informing preparedness plans.

3.19 Since the pandemic, AMS policy reports have highlighted the need to learn from and address the wider social determinants of health. For example, the AMS 'COVID-19: Preparing for the future: Looking ahead to winter 2021/22 and beyond' report (July 2021) (AJ/2 - INQ000130481), emphasised the need for public health agencies and policy makers across all UK nations to address the wider social determinants of health, with a focus on decreasing health inequalities to improve the UK's resilience ahead of any future outbreaks or new threats.

3.20 Similarly, within the roundtable report that the AMS undertook with the British Academy 'Historic and Geographic Patterns of Health Inequalities' (March 2022) (AJ/30 - INQ000130493), participants emphasised that future policy should focus on how regions and communities can be made more resilient to future 'health shocks'.

3.21 I note that one of the few positives from the pandemic is the greater research focus given to underserved communities (e.g. research into inequalities is being conducted within the National Institute for Health and Care Research Applied Research Collaborations).

3.22 Going forward, it will be necessary to address the wider societal determinants of health such as environment, housing, income and occupation, education and healthcare. Without addressing these factors with input from those most affected, many groups will remain at greater risk of adverse outcomes during any future crises.

Collaboration is key

Collaborating internationally

3.23 Collaboration with international partners is vital when responding to any global crisis. In 2015, the AMS provided suggestions to improve international collaboration in its

joint response (AJ/6 - INQ000130500) to the consultation by the House of Commons Science & Technology Committee on the lessons from the Ebola outbreak for the UK, including that:

(1) The UK government, working in collaboration with international partners, should ensure that appropriate systems are in place to collect real-time data on global disease surveillance in humans and animals, and to enhance early detection and warning systems.

(2) The UK must also consider ways to build international networks to improve detection and containment of outbreaks that occur overseas before they reach UK shores to help to ensure that the impact on countries elsewhere will be considerably lessened.

(3) The future risk of pandemics can be reduced by supporting the recovery of affected countries. The UK Government should invest in and strengthen detection and response capability globally, especially in places where additional support was needed.

3.24 The Inquiry may wish to consider whether the government was adequately prepared to engage international partners when responding to the pandemic.

3.25 Since the pandemic, the AMS has outlined in several publications the potential ways of enhancing collaboration internationally. These include:

(1) Implementing strategies to promote international research to strengthen public health guidance and responses (AJ/31 - INQ000130494).

(2) Exploring mechanisms to engage with the European Centre for Disease Prevention and Control. Enhancing these international connections will be especially important for the UK following its departure from the EU (AJ/31 - INQ000130494).

(3) Maintaining and enhancing the international structures and collaborations to identify research priorities and to share protocols and information rapidly (AJ/32 - INQ000130495).

(4) Capitalising on the role of online networks in bringing together researchers with common interests from different countries. Adopting the principles of 'open science', including timely sharing of data and open access publication of findings (AJ/31 - INQ000130494).

3.26 The Pandemic Preparedness Partnership steering group, which was established during the pandemic, has set out the 100 Days Mission (AJ/33 - INQ000130496) for developing safe, effective diagnostics, therapeutics and vaccines at scale and ready to be deployed equitably. The Inquiry may wish to consider this valuable initiative as it will be vital in responding to future pandemics.

Collaborating across sectors and disciplines

3.27 Joint working across sectors and disciplines has proved crucial to responding to the Covid-19 pandemic, and will be equally necessary when responding to future crises.

3.28 The AMS previously heard concerns around the challenge to public health of bringing together disparate disciplines, such as general practice and public health, in an era of increasing specialisation. In 2013, at the roundtable 'Public health research: reflections from the CDC' (AJ/34 - INQ000130497), participants expressed that the UK had not done enough to engage social scientists with public health challenges such as during influenza outbreaks. This is despite the recognition that social science is essential to understand how to change behaviour, prevent disease, support communities and build predictive models.

3.29 The importance of transdisciplinary teams when conducting research into public health was explored in the 2016 AMS report 'Improving the health of the public by 2040' (AJ/16 - INQ000130477). The report highlighted the need to develop UK-wide transdisciplinary research capacity with a holistic understanding of the wide range of determinants of health, and the skills and approaches necessary to address them.

3.30 Participants at the AMS workshop on international epidemic preparedness (2019) (AJ/14 - INQ000130475) noted the need to increase training in epidemiology and health security. The need for interdisciplinary research to understand the factors underpinning the behaviour and decision-making of groups is also important, particularly for communities at risk or affected by outbreaks. Participants recommended that such research should be integrated with wider climate change preparedness activities, due to the likelihood of the climate emergency increasing the risk of infectious disease outbreaks.

3.31 Improving the permeability of researchers across sectors is vital to support diagnostic testing staffing needs, while enhancing expertise and collaborations across sectors in the longer term (AJ/11 - INQ000130472).

3.32 Maintaining relationships that have been established between academia and industry during the Covid-19 pandemic is vital, particularly as similar connections built during the swine flu epidemic in 2009 were not maintained. (AJ/13 - INQ000130474).

4: Concluding remarks

4.1 The scientific community and health and care practitioners responded well and at speed, despite the immense uncertainty and wider challenges they faced when tackling the Covid-19 pandemic, and the limited resources available to them.

4.2 The AMS policy position paper, 'COVID-19: What next?' (July 2022) (AJ/3 - INQ000130492), emphasised that the systems and processes implemented to tackle

Covid-19 must be evaluated and, where appropriate, retained or evolved to address other infectious diseases more broadly, not just for pandemic response. This can help to inform the effective use of interventions now and in the future (for example, if more pathogenic variants of concern or similar diseases emerge). Investment in the required workforce and scientific capability will allow the UK to better detect and respond to future crises.

4.3 Future pandemics will occur, although they may not have the same determinants or require the same responses as Covid-19. Other future crises may relate to slower acting forces such as climate change or antimicrobial resistance – areas about which I, the AMS and its Fellows are increasingly concerned. Applying the learnings from the Covid-19 pandemic to improving overall health security in the UK while building resilience and response capability for future emergencies will ensure that the knowledge, networks and processes established during the Covid-19 pandemic are put to optimal use.

Statement of Truth

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

Signed: Personal Data

Dated: 21/04/2023

Annex 1

Summary of relevant dissemination of referenced AMS documents published before 21 January 2020			
Title	**Publication Type**	**Date Published**	**Disseminated To**
Reaping the rewards: a vision for UK medical science (AJ/27 - INQ000130489)	Working Group Report	January 2010	
Response to the consultation on the public health white paper 'Healthy lives, healthy people' (AJ/25 - INQ000130487)	Consultation Response	November 2010	Department of Health and Social Care
Letter from John Bell to Andrew Lansley SoS for health (AJ/26 - INQ000130488)	Letter	November 2010	Lord Andrew Lansley CBE, Secretary of State for Health, The Health White Paper Team
Public health research: reflections from the CDC (AJ/34 - INQ000130497)	Roundtable Discussion	January 2013	Participants within the roundtable: Dr Jenny Amery, Chief Professional Officer for Health and Education, Department for International Development (DFID); Dr Paul Cosford, Regional Director, Public Health England; Professor David Heymann CBE FMedSci, Chair, Health Protection Agency (Chair of the roundtable); Dr Ruth Hussey, Chief Medical Officer for Wales; Mr Duncan Selbie, Chief Executive, Public Health England; Dr Hilary Walker, Deputy Director

			Health Protection, Department of Health; Professor Chris Whitty FMedSci, Chief Scientific Advisor and Director Research and Evidence, Department for International Development (DFID)
Research in the UK Public Health system (AJ/21 - INQ000130483)	Meeting Summary	June 2013	
Letter from the President Professor Sir John Tooke to Stephen Dorrell, Chair of the House of Commons Health Select Committee (AJ/22 - INQ000130484)	Letter	November 2013	Stephen Dorrell: Chair of the House of Commons Health Select Committee
Joint response to the consultation by the Commons S&T Committee on the lessons from the Ebola outbreak for the UK about the use of scientific advice in similar emergencies (AJ/6 - INQ000130500)	Joint Consultation Response	September 2015	House of Commons Science & Technology Committee
Improving the health of the public by 2040 (AJ/16 - INQ000130477)	Working Group Report	September 2016	Government? Chief Scientific Adviser, Chief Scientific Adviser for the Department of Health, CMO for England and Scotland, key ministers and shadow ministers. Circulated to representatives from: BBSRC, EPSRC, ESRC, MRC, NERC, STFC, UKRI, NHS England, PHE, PHA NI, NHS Health Scotland, PH Wales.

Interdisciplinary research in epidemic preparedness and response (AJ/14 - INQ000130475)	Workshop Report	October 2019	Disseminated to workshop participants: representatives from PHE, DHSC, ESRC, AHRC, MRC,

Summary of relevant dissemination of referenced AMS documents published after 21 January 2020			
Title	**Publication Type**	**Date Published**	**Disseminated To**
Research priorities for the COVID-19 pandemic: a call for action for mental health science (AJ/9 - INQ000130503)	Expert Advisory Group Paper	April 2020	Sir Patrick Vallance, Government Chief Scientific Adviser; Professor Chris Whitty, Chief Medical Officer for England; Dame Ottoline Leyser, CEO UKRI; Professor Fiona Watt, Executive Chair, MRC; Professor Patrick Chinnery, Clinical Director, MRC.
Immunology and Covid-19 (AJ/8 - INQ000130502)	Expert Advisory Group Report	May 2020	CMO in all UK nations. Circulated to representatives from: UKRI, MRC, PHE, DHSC, BBSRC, Commons Science & Technology Select Committee Clerk, House of Lords Science & Technology Committee Clerk
Public involvement and engagement in research during the COVID-19 pandemic (AJ/17 - INQ000130478)	FORUM Workshop Report	May 2020	Circulated to representatives from: HRA, DHSC, MRC, HDR UK, NIHR INVOLVE, HCR Wales, MHRA, NIHR Clinical Research Network

Preparing for a challenging winter 2020/21 (AJ/1 - INQ000130470)	Policy Report	July 2020	The findings of this report were presented to SAGE at meeting 46 by the Chair of the Expert Advisory Group, Professor Sir Stephen Holgate CBE FMedSci, on 9 July 2020. The report (with the exception of the reasonable worst-case scenario) was endorsed by SAGE subject to minor amendments. Following the meeting, the GCSA and CMO for England wrote to Heads of Departments with a copy of the report, which was also circulated to the Department for Health and Social Care; Department for Transport; Ministry of Housing, Communities & Local Government; COVID-19 Taskforce; and Crown Commercial Service by the SAGE secretariat. The AMS sent this report directly to the GCSA, the Chief Medical Officers in all UK nations, key ministers and shadow ministers, among others. Teach ins as follows: • The Welsh Technical Advisory Group on 20 July 2020.

Addressing the challenges of the COVID-19 pandemic in low- and middle-income countries (AJ/31 - INQ000130494)	Workshop Report	June 2020	Circulated to representatives from: DHSC, UKHSA, NIHR, Public Health Wales, MHRA, NHSEI, MRC, Environment Agency, NICE.
Academy of Medical Sciences response to R&D Roadmap consultation (AJ/32 - INQ000130495)	Consultation Response	August 2020	Department for Business, Energy & Industrial Strategy
Response to House of Commons Science and Technology Committee consultation on 'UK Science, Research and Technology Capability and Influence in Global Disease Outbreaks' (AJ/12 - INQ000130473)	Consultation Response	August 2020	House of Commons Science and Technology Committee
Lessons learnt: the role of academia and industry in the UK's diagnostic testing response to COVID-19 (AJ/11 - INQ000130472)	Roundtable Report	October 2020	CMO in all UK nations, key ministers and shadow ministers. Circulated to representatives from: NHS Test and Trace, NHS England and NHS Improvement, DHSE, PHE, NHS England, MRC, MHRA, NHS Scotland, NHS Wales, Health Education England, Committee on Fuel Poverty, NI Assembly, Scottish Government.

Letter from Robert Lechler to Secretary of State for Health and Social Care, Matt Hancock (AJ/23 - INQ000130485)	Letter	October 2020	Matt Hancock, Secretary of State for Health and Social Care
Building a sustainable diagnostics sector (AJ/13 - INQ000130474)	FORUM Workshop Report	March 2021	
Academy of Medical Sciences response to the Department for Health and Social Care 'Transforming public health' consultation. (AJ/24 - INQ000130486)	Consultation Response	April 2021	Department for Health and Social Care
COVID-19: Preparing for the future: Looking ahead to winter 2021/22 and beyond (AJ/2 - INQ000130481)	Policy Report	July 2021	Report sent directly to the GCSA, the Chief Medical Officers and the Chief Scientific Advisers in all UK nations, key ministers and shadow ministers, among others. It was circulated to Heads of Departments and Government department Chief Scientific Advisers by GO-Science, and included in papers for information at SAGE meeting 94 that took place on 22 July 2021. SAGE welcomed the publication of the report noting that the report has findings that should be considered by a number of government departments.

			Teach Ins as follows: • The Welsh Technical Advisory Group about each of the three reports on 16 July 2021. • 'COVID-19: preparing for the future' with representatives from Cabinet Office and across UK Government on 29 July 2021. • 'COVID-19: preparing for the future' to the National Core Studies Leads on 30 July 2021. • 'COVID-19: preparing for the future' with representatives from Welsh, Northern Irish and Scottish Governments and their COVID-19 advisory groups on 20 September 2021. Please note that the report Chair, Professor Sir Stephen Holgate CBE FMedSci, also attended meetings of the Welsh, Northern Irish and Scottish COVID-19 advisory groups (on 27 April 2021, 10 May 2021 and 13 May 2021 respectively) to present the aims of the report and understand the perspectives and challenges facing the devolved administrations so these could be adequately addressed in the report. • Winter respiratory infections with representatives from Cabinet Office and across UK Government on 11 November 2021. • 'COVID-19: preparing for the future' with representatives from Scottish Government on 2 December 2021. • Non-Covid infections in winter 2022/23 with representatives from Cabinet Office on 2 February 2022 (please note that I was not present at this meeting).

			• Covid-19 policy and research priorities to the Covid-19 Taskforce on 24 March 2022.
Antimicrobial resistance research: learning lessons from the COVID-19 pandemic (AJ/5 - INQ000130499)	FORUM Workshop Report	December 2021	Chief Scientific Advisers, DHSC. Circulated to representatives from: Scottish Chief Nursing Directorate, DHSC, NHSEI, UKSA, Public Health Wales Microbiology, MRC, MHRA, NIHR, Environment Agency, DEFRA,
Historic and Geographic Patterns of Health Inequalities (AJ/30 - INQ000130493)	Roundtable Report	February 2022	Circulated to representatives from: UKRI, GO-Science, NICE, DHSC, NHS England, ONS
COVID-19: What next? AMS Policy Position (AJ/3 - INQ000130492)	Policy Report	July 2022	This paper was sent directly to the GCSA and the Chief Medical Officers in England and Northern Ireland, Representatives from GO-Science, among others. Teach ins as follows: •The AMS policy statement 'COVID-19: what next?' with representatives from the Cabinet Office on 18 August 2022 (please note that I was not present at this meeting).

House of Lords Science and Technology Committee Inquiry on clinical academics in the NHS (AJ/10 - INQ000130471)	Consultation response	November 2022	House of Lords Science and Technology Committee
Embedding evidence in public health (AJ/28 - INQ000130490)	Workshop Report	December 2022	Dr Jeanelle de Grucy. Deputy CMO, OHID. Professor Yvonne Doyle, Medical Director for Public Health, NHS England. Circulated to representatives from: National Healthcare Inequalities Improvement Programme, NHS England, Public Health Wales, Health and Care Research Wales, DHSC, Chair of the NHS Race and Health Observatory, UKHSA North West, UKHSA, NICE, NHS Confederation, MRC, OHID, PHS.