Witness Name: Dr Edward Hayden

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UK COVID-19 INQUIRY

SECOND WITNESS STATEMENT OF DR EDWARD HAYDEN

Contents

Introduction

1. In June 2023, I succeeded Dr Stuart Wainwright OBE as Director of the Government Office for Science (GO Science). As I joined following the Covid-19 response, this Statement is a result of careful consideration of available records rather than from my own experience or recollection. I am duly authorised to make this statement on behalf of GO Science.

2. Neither GO Science nor the Government Chief Scientific Adviser (GCSA) had a role in the operational delivery of the NHS Test and Trace programme, nor were they responsible for the associated technologies or strategies, the structure of the systems, or the enforcement of procedures. These were matters for other bodies, such as Public Health England (PHE), the Department for Health and Social Care (DHSC), the NHS, the Office for National Statistics (ONS) and later the UK Health Security Agency (UKHSA), who would be in a better position to assist the Inquiry in relation to these issues.

3. However, due to the nature of their roles in providing science advice, there were specific instances where the work of GO Science and the GCSA both touched on testing, tracing and/or isolation. The Scientific Advisory Group for Emergencies (SAGE) provided science advice on both specific issues relating to testing, tracing and/or isolation, and the importance of effective test and trace systems.

4. We have outlined these below to assist the Inquiry and highlight evidence submitted in previous modules which we consider relevant to Module 7, with a particular focus on TTI (Test, Trace and Isolate), the Community Infection Survey and Mass Testing.

5. This statement is submitted to Module 7 of the Inquiry alongside a witness statement from Lord Vallance **[EH7/01 - INQ000575986]**, the GCSA at the time of the pandemic. As part of this statement, Lord Vallance's previous statement for Module 2 **[EH7/02 - INQ000238826]** is being re-submitted for the consideration of matters relevant to Module 7, and I will quote from that statement a number of times here. I will also refer to the second Module 2 witness statement of Dr Stuart Wainwright **[EH7/032 - INQ000252450]**, as well as SAGE minutes and papers which GO Science have previously disclosed to the Inquiry.

The role of the GCSA, SAGE and GO Science

6. As described in previous statements, 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 improving the quality and use of scientific evidence and advice in government. The GCSA is a permanent secretary level post and reports to the Cabinet Secretary. The GCSA is supported by GO Science, which administratively is an office of DSIT but operationally is independent.

7. SAGE's role is to provide coordinated, independent science advice to support decision makers for UK cross-government decisions in COBR (Cabinet Office Briefing Room) in the event of a national emergency. SAGE provides an assessment of science evidence and information relating to the specific emergency, including but not limited to providing advice on: scientific and technical concepts and processes, scenarios and their implications, risks and scientific and/or technical mitigations, the degree of consensus among experts, and the degree and causes of uncertainty. Along with producing advice, science advice and analysis is also presented to SAGE from relevant sources, such as PHE in the case of TTI, discussed below.

8. Lord Vallance's second witness statement provides further detail both on the operation of SAGE generally, and its specific operation during the Covid-19 pandemic. He addresses the importance of the method by which SAGE advice is given, that is, by way of a "*unified, rounded*" summary, reflecting the current state of understanding, including the uncertainties and unknowns, and drivers of any uncertainty **[EH7/02 INQ000238826**, paras 35 - 37**]**. Dr Wainwright in his second Module 2 witness statement also described how confidence levels are expressed in SAGE minutes, by way of *"high', `medium' and `low' confidence statements*" **[EH7/03 - INQ000036127,** para 1.3**]**. The exact nature of the questions posed to SAGE, and accordingly the role played by SAGE, are determined by the specifics of the emergency.

9. SAGE is not (and never has been) an appropriate body to design or review operational measures, and as such there was never a specific decision during the pandemic response for SAGE not to do so. Instead, responsibility for specific operational matters continued to lie with relevant departments. During the pandemic this meant that DHSC, and public

health agencies which sat within DHSC, held responsibility for much of the operational response.

10. The activation and operation of SAGE is carried out according to the Enhanced SAGE Guidance **[EH7/04 - INQ000218362]**, which is also publicly available on GOV.UK. This document forms, in practice, the Terms of Reference for its work and is periodically reviewed and updated by the Cabinet Office. It sets out in detail the protocols in place for the provision of information to and from SAGE.

11. SAGE is not a membership body. There are no standing invitations to attend. Instead, the secretariat seeks expertise relevant to the emergency for which it is convened. Its attendance may change throughout the course of an activation, as the secretariat may seek experts to provide advice where required on an ad hoc basis. When identifying experts, the SAGE secretariat identifies individuals with relevant expertise who are willing to advise and attend meetings.

12. GO Science's primary role in provision of science advice in civil emergencies is to act as secretariat to SAGE and to support the GCSA who usually chairs the group.

13. It is particularly important to situate the role of GO Science, the GCSA, and SAGE, within the context of the other sources of science advice to decision-makers in government. Individual government departments are responsible for the provision of science advice relating to their own areas of policy. Scientific advice, including in emergency response, is provided by relevant teams within departments and is available from departmental Chief Scientific Advisers (CSAs), scientific and technical agencies (Non-Departmental Public Bodies and Public Sector Research Establishments), and those in the Government Science and Engineering (GSE) profession. I am unable, as Director of GO Science, to assist as to the provision of advice in relation to TTI from these other sources. SAGE was a recipient of both analysis and evidence from PHE (and others involved in TTI) and a customer for the resultant data from testing, which informed SAGE's work and understanding of the pandemic more generally. SAGE advice informed (rather than set) TTI aims and objectives, and was one of a number of sources of science advice for TTI (see paragraph 23). It is important that the scale of SAGE's involvement, and the attendant publicity it received during the pandemic, does not obscure the scope (or the limits) of

SAGE's role as one of a number of many sources of science advice and analysis. PHE, DHSC, NHS Test and Trace, UKHSA and the ONS were particularly important sources of evidence.

SAGE advice during the pandemic

14. As GO Science and Lord Vallance have set out in previous statements, the central structures for providing science advice during the pandemic were, for the most part, clear. With the assistance of the GO Science secretariat, the GCSA convened SAGE. The CMO (Professor Sir Chris Whitty) and the GCSA at the time (Lord Vallance) acted as co-chairs of SAGE and the minutes of each meeting served as the formal output of the group. The GCSA and CMO would report the SAGE evidence and advice to COBR. The GCSA and CMO would also provide briefings to the Prime Minister, the Cabinet Secretary and others in meetings as requested.

15. The published SAGE minutes, therefore, constitute a comprehensive and contemporaneous record of science advice provided by SAGE to decision-makers in the centre of government during the pandemic. At the Inquiry's request, we also provide a chronology of where SAGE advised on the importance of testing, both for case ascertainment and for surveillance of the state, and rate of growth, of the epidemic **[EH7/05 – INQ000587448]**. All SAGE minutes and meeting papers remain publicly available.

16. As outlined in previous statements, whilst GO Science provided secretariat support to both SAGE and a number of subgroups, the SPI-M-O secretariat was provided by DHSC, which will be better placed to assist the Inquiry in relation to SPI-M-O, modelling and other relevant matters.

Testing and SAGE advice

17. The purpose of testing in a pandemic is two-fold. Firstly, being able to quantify the incidence and prevalence in a population is critical to understanding the extent, spread and nature of a pandemic. Data from testing was, therefore, an important input into SAGE

advice. The main data sources on which SAGE drew during the pandemic are summarised in Table 1 below.

18. Secondly, by identifying those who are infected and isolating them for some or all of the duration of their infectious period, effective testing (when coupled with equally effective contact tracing and isolation) can demonstrably slow, contain or suppress the spread of a virus. This is the principle of TTI and as Lord Vallance has previously stated, this approach is most effective when rates of infection are relatively low, and it becomes less effective once the capability is overburdened by high rates of infection **[EH7/01 - INQ000575986,** paras 37 and 78**; EH7/02 - INQ000238826,** paras 89, 340, 399**]**.

19. A combination of testing, tracing and isolation is therefore one of a range of Non-Pharmaceutical Interventions (NPIs) which can be used to control or contain the spread of a virus, and if used effectively can avoid the need for more stringent measures.

Data

20. SAGE and its subgroups relied on data from testing as an important input to science advice throughout the pandemic response. Data analysis and presentation to support central decision-making was carried out by the Joint Biosecurity Centre, established in May 2020 as described in Lord Vallance's statements for Module 2 **[EH7/02 - INQ000238826,** paras 48 and 714**]** and Module 7 **[EH7/01 - INQ000575986,** para 58**].**

Table 1 Summary of key testing data inputs to SAGE during the pandemic

Data Source	**Comment**
NHS	NHS Test and Trace established May 2020.
ONS' Covid -19 Infection Survey	A community survey identifying a percentage of people testing positive for Covid-19 in private residential households across the UK, which included regional and age breakdowns. Established in late April 2020.
The Covid-19 Clinical Information Network (CO-CIN).	CO-CIN collated clinical information from health care records of people of all ages admitted to hospital in the UK to characterise the clinical

[EH7/06 - INQ000061975]	features of patients with severe Covid-19 in the UK. Established in February 2020.
The Covid-19 Hospitalisations in England Surveillance System (CHESS)	Later renamed Covid-19 SARI-Watch. A data set relating to demographic, risk factor, treatment, and outcome information for patients admitted to hospital with a confirmed Covid-19 diagnosis. Launched in March 2020.
CoMix Social Contact Survey **[EH7/07 - INQ000317502]**	A survey in which participants reported the total number of direct contacts that they had on the day before the survey. This was overseen by the LSHTM Centre for Mathematical Modelling of Infections Disease (CMMID) Covid-19 working group. Its first weekly report was published on 7 May 2020.
The Real-time Assessment of Community Transmission (REACT)	Study undertaken by Imperial College on behalf of DHSC. Like the ONS survey, this was a community-based survey intended to measure the prevalence of Covid-19 in different areas of the country including in people who do not have any symptoms. Established in April 2020.

Test, trace and isolate

21. The purpose of TTI is to reduce or prevent transmission and therefore slow, contain or suppress the spread of the virus. If someone tests positive, that individual is advised or required to isolate, and efforts are made to trace contacts to advise them to get tested to the same end. Reverse contact tracing involves trying to work out where (or from whom) the infected individual may have caught the virus.

22. TTI is a well-known and well-established public health measure. The importance of testing, tracing and isolation was clear from the outset of the Covid-19 pandemic, as reflected from the first (i.e. precautionary) SAGE meeting onwards [SAGE 1 (22 January 2020) **[EH7/08 - INQ000061509].** *"SAGE agreed that DHSC and PHE criteria for testing potentially infected individuals were appropriate, those with symptoms or signs of WN-CoV, and a history of travelling to or living in Wuhan in the 14 days prior to symptom onset, including those who accessed Wuhan healthcare facilities. SAGE advised that DHSC and PHE should be ready to revise those criteria as the situation evolves."*

23. As the role of SAGE was not to consider operational questions, SAGE had no role in the operational development and delivery of NHS Test and Trace **[EH7/09 - INQ000061529, §17].** SAGE did not set the targets or parameters that governed the deployment of that service, but it did provide science advice that (along with other sources of advice) informed those targets and parameters. This is explained in the Module 7 witness statement of Lord Vallance, in which he sets out the nature of the role played by SAGE and the GCSA **[EH7/01 - INQ000575986,** paras 24 – 28**]**. The relevant advice that was given through the SAGE minutes and papers is set out in the Module 7 Chronology **[EH7/05 – INQ000587448]**. It is important to reiterate that SAGE was not the only source of science advice for the TTI system. The government departments and agencies that were involved in establishing, managing and operating TTI systems employed their own scientists, medics and experts in public health who would provide advice to them directly, as and when required. This would include advice on both strategic direction and day-to-day issues concerning the operation of TTI programmes.

24. In their capacities as advisers on scientific and technical topics, Lord Vallance and SAGE repeatedly emphasised the importance of TTI. SAGE advice relevant to testing, tracing and/or isolation can be found in the Module 7 Chronology **[EH7/05 – INQ000587448].**

25. I am also asked about the ways in which TTI may be more effective. As SAGE had no involvement in its implementation or review, and as I was not in post during the pandemic, I am not in a position to assist the Inquiry as to this question and would refer the Inquiry to the Module 7 statement of Lord Vallance which sets out his reflections on this topic **[EH7/01 - INQ000575986,** paras 76 - 80**]**.

Community Infection Survey

26. A community infection survey is a process whereby a statistically representative sample of a population is tested for Covid-19 in order establish the incidence and prevalence of infection within the population. When repeated over time, this allows for incidence and prevalence to be tracked, and trends identified. This assists in the analysis of the extent, spread and nature of an epidemic, including the emergence of significant new variants.

27. As Lord Vallance describes in his Module 7 statement, testing of this type serves a different purpose from TTI and is achieved through different means. In the UK during the Covid-19 pandemic the principal method of establishing incidence and prevalence of infection in the community was the ONS Covid-19 Infection survey, which was established in late April 2020. Initially, PHE was asked to undertake this survey, but it was unable to do so because of resource constraints (see below).

28. That is not to say that data from the UK's TTI programme did not also inform understanding of the pandemic in the UK. They did, but this was a by-product of TTI. In contrast, providing such data was the sole rationale for the community testing survey, which was established, designed and operated accordingly.

ONS survey

29. Lord Vallance's previous evidence **[EH7/02 - INQ000238826]** concerning the transition from early community testing to the establishment of the ONS community infection survey was as follows:

> **[503]:** *"SAGE 15 was informed on 13 March 2020 that community testing was ending that day* ***[PV2/131 - INQ000061523, §33].*** *This was a policy decision, and I understand that the purpose was to prioritise the UK's limited supply of tests for hospital patients. It was not a matter on which SAGE was asked for advice. On 23 March, SAGE 18 advised that increased community testing and surveillance would be 'invaluable to measure the effects of interventions taken'… PHE, SPI-M and Professor McLean were tasked with reviewing how the true infection rate in the community could be ascertained. At SAGE 21 on 31 March 2020 the SAGE secretariat was tasked with updating a paper on future questions for SAGE, which were to include community testing strategies and options. At the same meeting DHSC and PHE were asked to define future UK testing requirements at an upcoming meeting, including in respect of community testing. The following meeting, SAGE 22 on 2 April 2020 tasked SPI-M to advise on volumes for community testing. LSHTM provided an initial assessment by the time of SAGE 23 on 9 April 2020, which was reviewed at SAGE 26 on 16 April 2020. That meeting advised that 'sufficient testing capacity needs to be reserved for repeated large-scale community testing'."*

[504]: *"Until that meeting, on 16 April 2020, the expectation had been that PHE would take responsibility for such a community testing programme. However, as the minutes of SAGE 26 record 'PHE confirmed it was unable to deliver a community testing programme. SAGE agreed that if PHE is unable to undertake the programme then this should be undertaken within a repeated ONS-led household survey programme'."*

30. As GO Science had no role in the design and implementation of this survey, I am unable to add anything substantive to these remarks.

Mass Testing

31. Mass testing is related to TTI and has the same intention of identifying infected individuals and thereby containing or slowing the spread of the virus. As the name suggests, it involves conducting a very large number of Covid-19 tests within a given population (which could be a city or a country) and limited timeframe, with the intention of identifying (and ideally separating) those who are positive from those who are not.

32. The principal distinction between mass testing and TTI (as the terms are used here) is one of scale and duration. Mass testing is potentially larger and takes place over a single limited time period across an entire population. Mass testing was trialled in Slovakia during the Covid-19 pandemic and also in Liverpool as part of Operation Moonshot.

33. In August 2020, the Multidisciplinary Task and Finish Group on Mass Testing was established, with the aim of examining, from technological, epidemiological, and behavioural perspectives, the benefits and challenges of mass testing for SARS-CoV-2.

34. As with TTI, whilst SAGE had no formal role in the development or delivery of mass testing, relevant work was occasionally presented to the group (see Chronology **[EH7/05 – INQ000587448]**). In his role as GCSA, Lord Vallance was at times also required to provide general advice on scientific and technical topics directly to the Prime Minister and Cabinet Ministers. One example where general advice was required in relation to mass testing and Operation Moonshot was detailed by Lord Vallance in his Module 2 statement **[EH7/02 - INQ000238826]:**

[508]: *"Operation Moonshot was principally an operational and policy issue and I was not greatly involved in it, though I gave specific science advice when asked. Several pilot studies were established including the one in Liverpool […]. Before the policy was announced, SAGE commissioned work on mass testing from the multi-disciplinary Mass Screening Task and Finish Group. This was considered and endorsed at SAGE 53 on 27 August 2020."*

Asymptomatic Transmission

35. As early as SAGE 2 on 28 January 2020 **[EH7/10 - INQ000061510]** it was recognised that there was some evidence of asymptomatic transmission, and as the pandemic progressed and data increased, the existence of asymptomatic transmission was confirmed.

36. Lord Vallance has addressed the developing understanding of asymptomatic transmission and testing of asymptomatic individuals in detail as part of his Module 2 statement **[EH7/02 - INQ000238826**]. The key passage is as follows:

> **[511]** *"… as early as the first formal SAGE meeting (SAGE 2 on 28 January 2020) it was recognised that there was some evidence of asymptomatic transmission* ***[PV2/29 - IN0000061510, §16].*** *The meeting anticipated a specific test for Covid-19 being available by the end of that week, but in low numbers, and advised that: "Currently it would not be useful to test asymptomatic individuals, as a negative test could not be interpreted with certainty" This did not mean that the test would not work on asymptomatic people, it meant that a negative test result could not be safely interpreted as evidence that an individual was not infected. It was a question about test sensitivity and not using it to assure non-infectiousness."*

37. I understand that Lord Vallance has addressed the relevance of asymptomatic transmission and infection to TTI and other forms of testing in his Module 7 witness statement **[EH7/01 - INQ000575986,** paras 67 and 68**]**.

Inequalities

38. Advice given by SAGE often concerned issues highly relevant to the issue of inequality in the UK (for instance, in relation to those who were less able to access testing, were experiencing financial or other barriers to self-isolation, or were living in closed communities e.g. prisons, or with chronic health conditions), which was in turn relevant to policy-making on testing. While formulation of policy in relation to equalities considerations is a matter for policymakers, several instances of such scientific advice are set out in the Module 7 Chronology **[EH7/05 – INQ000587448]**.

39. GO Science played no direct role in developing UK Government and Devolved Administration policies or strategies relating to test, trace, and isolate systems and therefore does not have any further information or reflections to offer on inequalities in relation to TTI.

Lessons Learned

40. GO Science played no direct role in developing UK Government and Devolved Administration policies or strategies relating to test, trace, and isolate systems and therefore does not have substantive information to provide on specific lessons learned. The Inquiry may find it useful to refer to the statements and papers below.

41. Dr Stuart Wainwright's fourth witness statement, produced for Module 1 **[EH7/11 - INQ000148406]** provides two key papers presented at SAGE and gives a more detailed account of wider lessons learned. These papers were Expert Advisory Group at the Academy of Medical Sciences (AMS) Report I - Preparing for a challenging winter 2020/21 **[EH7/12 - INQ000062402],** and DELVE: Report on test, trace, isolate and support, 18 May 2020 (SAGE 37) **[EH7/13 - INQ000440246]**. Lord Vallance offers his reflections on TTI as part of his Module 7 witness statement, to which I would refer the Inquiry **[EH7/01 - INQ000575986,** paras 75 – 80**]**.

42. I would, however, make the point (also made by others) that a future pandemic will be different to Covid-19. We do not yet know the nature of the threat that we will face and hence a degree of flexibility must be maintained when planning the response including in

respect of testing and any future TTI programme. The 100 Days Mission, which aims to ensure vaccines, therapeutics and diagnostics are ready for scaled production within 100 days of a declared Public Health Emergency of International Concern is something to which Lord Vallance has referred in his Module 2 **[EH7/02 - INQ000238826]** and Module 7 statements **[EH7/01 - INQ000575986].** I would invite the Inquiry to consider that work during Module 7.

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: 20 May 2025