SAGE Checkpoint Review – Evidence Summary

Introduction
Scope and context for the review

1. Since early January, the Government Office for Science has been engaged in the emergency response to the novel coronavirus first identified in Wuhan, China. The Scientific Advisory Group for Emergencies first met to consider the incident on the 28th of January 2020.

2. The activation of SAGE to provide science advice to HM Government on the SARS-CoV-2 outbreak has been the longest-running and most resource-intensive since SAGE was created. It has continued to meet to consider scientific questions about the virus throughout the immediate emergency and into the chronic phase of the response.

3. This checkpoint review of SAGE was commissioned by the Government Chief Scientific Adviser and the Chief Medical Officer for England to review the SAGE response so far and to identify learning to inform any future surge.

4. The agreed scope of the review was to consider:
   - The effectiveness of SAGE and wider mechanisms in providing appropriate and timely science advice
   - The process for the commissioning of SAGE to provide science advice
   - The structure and governance of SAGE
   - The management of SAGE and its subgroups (issues such as balance of experts, conflicts of interest, diversity and inclusion)
   - Areas that should be considered for change as we enter the next phase of the SARS-CoV-2 response

Purpose of this document

5. This evidence summary is an internal document for the purpose of the review that compiles the key findings and feedback from stakeholder discussions. It is not the formal report of the review, but is intended as a brief synthesis of what the review heard in order to inform a short note prepared for the GCSA and CMO. It is not intended as an externally facing document.

Methodology

6. The review was designed as a light touch, mid-emergency review with two aims: to provide an open, joint learning environment through group sessions (similar to reviews conducted in the medical profession), and to provide a brief report of outputs from those group sessions. Three group sessions were conducted over a period of a few weeks with three stakeholder groups:

   - Chief Scientific Advisers
   - The main SAGE committee
   - Sub-group chairs from within the SAGE structure

7. A small number of informal discussions within the GO-Science SAGE secretariat and with key Government stakeholders were conducted.

Key themes

8. Through the evidence gathering process, six key themes have emerged. These form the sections of this evidence summary:

- o Commissioning, reporting and functioning of SAGE
- o Sub-groups
- o Science advice mechanisms across Government
- o Data
- o Recruitment and selection of participants
- o Media and transparency

Summary of Key Themes

Commissioning, reporting and functioning of sAGE

9. Agility and flexibility in the SAGE model have been key strengths in responding to an unprecedented event. SAGE has however very quickly outgrown its standard operating procedure. It has had to adapt to a fluid situation prompted by an evolving incident. Changes in the reporting structure for SAGE and wider Government governance increased the complexity of SAGE's role and meant, for example, that commissioning at times was not as streamlined as it could have been, leading to short timescales and duplicate commissions.

Sub-groups

10. A strength of the SAGE system has been the quick formation of cross-disciplinary sub-groups to examine particular issues such as care homes and nosocomial infection. However, the speed at which they were stood up and the lack of consistent process has risked fragmentation of the system and lack of clarity with remits and commissioning lines. Greater co-ordination through the regular sub-group chairs meetinghas been useful in taking a systems wide approach, and there are strong examples of cross sub-group collaboration. However, the overall structure of sub-groups may benefit from a review and refresh.

Mechanisms for science advice across government

11. The core function of SAGE is to provide clear, consensus-based science advice to Ministers at pace to inform key policy decisions. SAGE has consistently been able to provide this, as well as provide evidence to allow for greater situational awareness. The effectiveness of this advice in informing policy decisions may be improved by having clear lines for wider dissemination across government. SAGE's remit in providing advice on scientific issues has sometimes been made difficult by the blurring of the science and operational lines, however it has sought to provide the scientific principles on which policy can be made.

Data

12. The data needs for this incident have been complex, and data management approaches have had to be built in real-time during the response, relying on multiples sources both domestic and international. This led to unique challenges in the collecting and sharing of data, particularly during the initial phase of the response. While data flows have improved as the SAGE response has evolved, there remain challenges related to data sensitivity, availability and ownership. For the ongoing response and in planning for future incidents, prior thought about what data will be needed, how it

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will be obtained and how it will be shared will be critical in ensuring smooth data flows from the outset.

<u>Recruitment and selection of participants</u>

13. Diversity of both background and academic discipline has been increasing as the response has evolved for SAGE participants. Further diversification would bring new perspectives and spread the workload. The demands placed on participants during this incident have been unprecedented and are unsustainable in the long term. More practical steps can be taken both to support current participants but also to onboard new ones.

<u>Media and transparency.</u>

14. Media interest in SAGE's work has been unique in its intensity. This has proven a challenge both for participants and for the functioning of SAGE. Attention from the media increased pressure and demand upon participants. There has been concern that intense media coverage of issues covered by SAGE, and media commentary by some SAGE and subgroup participants, has led to a loss of trust between policy makers and the group. Greater transparency has helped eased some of this pressure.

Commissioning, Reporting and Functioning of SAGE

<u>Nature of the response</u>

15. SAGE participants and the SAGE secretariat generally believed that SAGE adapted quickly to changing circumstances during the response. It continued in its core remit to provide timely science advice to HM Government throughout the changing phases of the response and often did so at great pace.

16. It is important to note that SAGE was not originally designed for the breadth and the duration of the role it has performed in the response. Typically, SAGE is stood up for a short period to provide advice on a discrete emergency, such as the Toddbrook Dam incident in 2019. As a result of the demands for science in the response to SARS-CoV-2, the committee has expanded beyond its core remit and previous operating models. There has been a role to ensure clear coordination of science advice across multiple Government departments that is atypical of previous SAGE activations which have been narrower in scope.

<u>Commissioning lines</u>

17. In its standard operating procedure, SAGE is commissioned by and reports to COBR. The chair of SAGE – the GCSA - sits on COBR and provides a feedback loop between the group and policy makers. This relationship is outlined in figure 1. For health-related emergencies, there is an agreement that CMO co-chairs SAGE. The Civil Contingencies Secretariat is SAGE's main interface with its primary policy customer - COBR.

18. The Government's approach evolved during the emergency response and this changed the primary customer for SAGE advice from CCS to a newly established C-19 Strategy Group in the Cabinet Office, as outline in figure 2. This change took a while to bed in.

19. As well as a change in customers in the Cabinet Office, wider demand for SAGE input from Ministers and officials in other departments increased quickly during the response. The process for commissioning advice from SAGE became more complex. Overlapping and duplicating requests

meant it was more challenging for SAGE participants and the secretariat to hold an oversight of the areas where SAGE might expect to be asked for advice.

20. There was a consensus that the establishment of a dedicated commissioning team within the SAGE secretariat, and a single interface point in the C-19 group, improved the coordination of commissions across the SAGE landscape. A further step that might be useful would be to provide induction training and support to policy customers of SAGE to help familiarise themselves with SAGE processes and become 'smarter' customers.

21. The model of policy customers asking specific questions of SAGE through a structured commissioning process was felt to be a clear one. It was noted that that this should not be an overly prescriptive process – the best questions come from close dialogue between policymakers, SAGE participants and the secretariat to set clear expectations on the science and to manage out any unhelpful ambiguities. Self-commissioning was also noted as an important aspect of the SAGE process. There is significant value in SAGE being able to identify issues or concerns and bring them to the attention of policy customers.

Science versus operational questions

22. Across policy customers and SAGE participants, there was consensus that the line between science advice and advice on operational issues had sometimes become blurred. This led to SAGE sometimes being asked to advise on matters that were more operational in scope, for example, in relation to environmental transmission and the science behind mitigating risks.

Feedback loops

23. In the initial phase of the response, there was a clear mechanism for feedback between policy customers and SAGE on how advice had been acted upon. The GCSA and CMO were able to feedback to the group directly through twice weekly SAGE meetings.

24. As the response grew in complexity, both in terms of Whitehall structures and the numbers of academic experts involved in SAGE and its subgroups, feedback became harder to cascade though the system. Clear feedback on how their advice was used did not always reach the academic experts. This made it more challenging for them to provide science advice that was based on a full understanding of the context. It also impacted motivation as SAGE and subgroup participants were not seeing the impact of their work.

25. There is a balance to be struck. While policy is in development it may not always be appropriate to provide feedback to external experts. It is also the case that not every piece of advice SAGE produced was used in ministerial decision points but may have been used for wider situational awareness. Nonetheless, there was a clear point about the value of regular and timely feedback to support SAGE and subgroup participants to give the best advice and feel that they are having an impact.
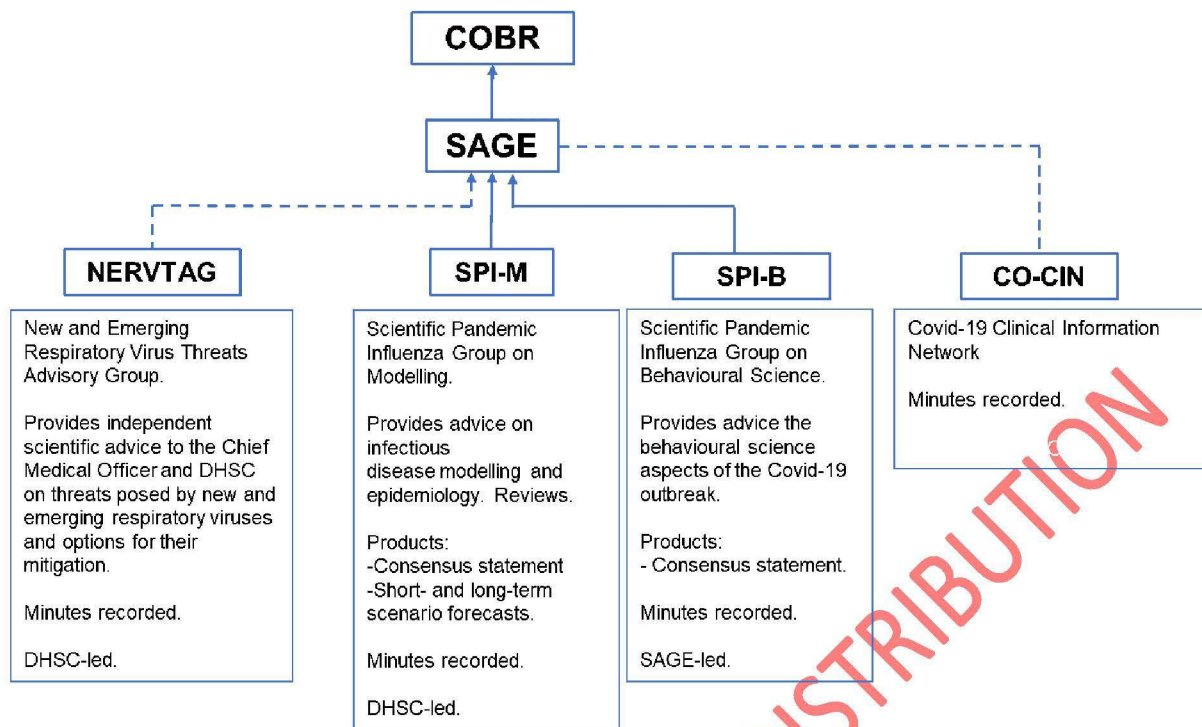
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NERVTAG	SPI-M	SPI-B	CO-CIN
New and Emerging Respiratory Virus Threats Advisory Group. Provides independent scientific advice to the Chief Medical Officer and DHSC on threats posed by new and emerging respiratory viruses and options for their mitigation. Minutes recorded. DHSC-led.	Scientific Pandemic Influenza Group on Modelling. Provides advice on infectious disease modelling and epidemiology. Reviews. Products: -Consensus statement -Short- and long-term scenario forecasts. Minutes recorded. DHSC-led.	Scientific Pandemic Influenza Group on Behavioural Science. Provides advice the behavioural science aspects of the Covid-19 outbreak. Products: - Consensus statement. Minutes recorded. SAGE-led.	Covid-19 Clinical Information Network Minutes recorded.

Figure 1: COBR Commissioning Mechanism

If evidence exists, return commission with evidence to departments

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Departmental      C-19 Strategy   SAGE            Check if        Sub-Groups     SAGE – For
Commissions for   Group (CO)      Commissioning   evidence                       Discussion and
Science advice                    Hub (SAGE        already                       Endorsement
                                  Secretariat)     exist
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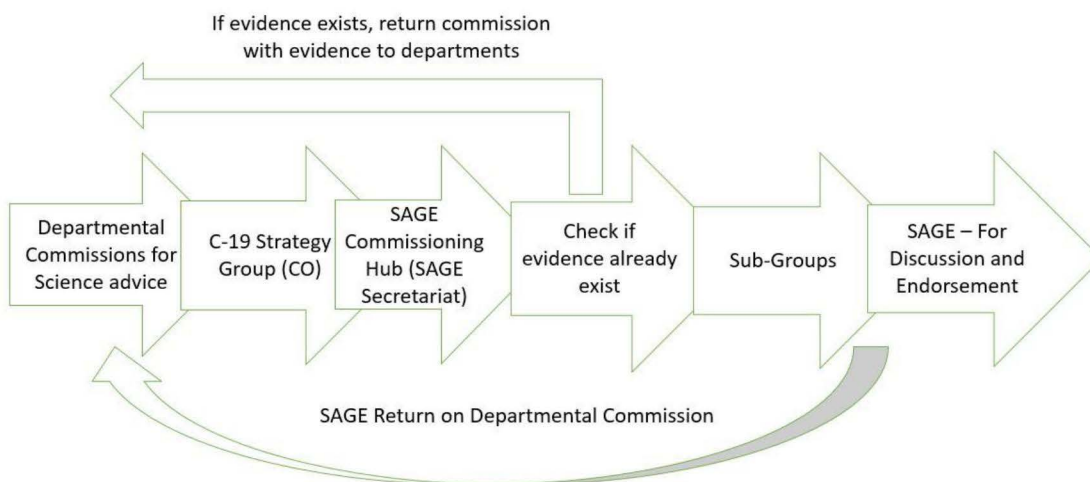SAGE Return on Departmental Commission

Figure 2: C-19 Commissioning Mechanism

Sub-Groups

<u>Understanding of SAGE landscape</u>

26. During the SARS-CoV-2 response, several new sub-groups of SAGE were created. Some groups already existed, such as the Scientific Pandemic Influence – Modelling group (SPI-M), and temporarily transferred their reporting lines to SAGE. Others such as the Environmental Modelling Group (EMG) were created during the response.

27. This led to a fast-evolving landscape of subgroups with different remits and approaches. This variability in approach was also the case with commissioning lines. EMG could be commissioned by both the Health and Safety executive and SAGE, and SPI-M could also be directly commissioned by Department for Health and Social Care. The New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) was never a formal sub-group of SAGE, however it could be actioned by SAGE through the CMO. The complexity and variety in sub-groups' commissioning lines caused some confusion and was sometimes compounded by other departments going directly to sub-groups for advice, rather than coming through the GO-Science secretariat.

28. As the response has evolved some sub-groups, such as the Care Homes Working Group have been transferred from SAGE to other government departments, with others remaining under the SAGE umbrella.

29. The evolving nature of the response meant that groups could be stood up quickly when they were needed. However, some participants found that they lost sight of the overall landscape of SAGE. There could be confusion about who did what within the SAGE structure and how they fed into the system. Regular sub-group chairs meetings led by GCSA allowed for better coordination across the sub-groups.

<u>Process of creating a sub-group</u>

30. Some sub-groups, for example on nosocomial infection and transmission in care homes, were created very quickly during the peak weeks of the pandemic to grip fast-emerging issues. There was no formal process for creating a sub-group or on-boarding participants until May 2020. Sub-group participants and secretariat support were drawn from relevant departments or from SAGE participant's networks. This approach presented risks on diversity and to bringing in the breadth of expertise needed.

<u>Forward planning</u>

31. The rapid proliferation of sub-groups may have left to overlapping remits in groups or gaps in coverage or expertise. A forward look to anticipate the issues that may emerge may be of benefit during slower phases of the response. This will allow for a more strategic sub-group structure should the response need to surge again. It would also allow more time for identifying and on-boarding participants and identifying sustainable secretariat support.

Mechanisms of Science Advice Across Government

<u>Impact of advice</u>

32. Policy customers on-the-whole found SAGE advice to be clear and helpful in informing policy decisions. In the early stages of the response where there were many unknowns, SAGE played a

helpful role in guiding decision-makers on the key questions to ask to increase situational awareness.

Timeliness of advice

33. The SAGE mechanism has generally delivered timely advice in rapidly changing and fluid situations, often under extreme time pressure to inform Ministers' decision-making on major policy changes in response to the virus. This high pace has been maintained over a period of months.

34. There have been challenges with balancing speed and clarity of advice. Limited understanding of the complexity of modelling and evidence synthesis work taking place in SAGE and its sub-groups meant that policy review timescales did not always allow sufficient time for analysis. Clearer communication between policy makers and SAGE participants and/or the secretariat would allow for a better understanding of the timing on decision-points, and the time needed for scientific analysis.

Dissemination of advice

35. The COBR structure provided a forum for the wider dissemination of advice across HM Government and the Devolved Administrations at pace. This had been useful in the early stages of the response to allow other key stakeholders to have sight of advice on decisions that had been made in COBR.

36. As the response evolved and more departments became involved with a complex set of decisions to be made, disseminating advice to where it was needed became more challenging. Not all departmental CSAs were participants or observers at SAGE, so could not feed back to departments on conversations that had happened in the group. Whilst SAGE minutes provide a record of the discussions and were disseminated across government, by their very nature they cannot capture the full depth of the conversation which CSAs in particular thought was helpful to feed back to their departments

37. Wider mechanisms for disseminating advice across government may benefit other government departments in formulating their own policy decisions. The Chief Scientific Adviser network may already be doing this in certain areas.

Other advice mechanisms within HM Government.

38. SAGE participants expressed a lack of clarity about other sources of advice, for example on economic or public communication considerations, that HM government was receiving alongside the advice from SAGE. This added to a further lack of clarity surrounding how their advice was being used in decision making.

39. There was also an asymmetry regarding the transparency of advice the government was taking into consideration in its decision-making once the GCSA and CMO committed to publishing papers and minutes of meetings midway through the emergency response. This created the situation where SAGE advice was published, whereas other sources of advice were not. This may have resulted in additional scrutiny of SAGE advice, with added pressure on participants. It will have also influenced SAGE's positioning in the public eye. These issues are covered in more detail in the Media and Transparency section below.

Data
Data flows

40. A number of participants felt there had been issues with data throughout the response that had inhibited SAGE's ability to give the best science advice. There were issues around the quality of operational data, the timeliness of provision and the complexity of reconciling data from multiple sources. Some felt that data availability had improved during the response - new data streams through ONS and CO-CIN were flagged as particularly useful and behavioural data was helpful. Co-ordination of data access and presentation of data with Devolved Administrations, publishing R numbers for example, has been challenging and complex.

International data

41. Data proved challenging when needed from international sources. In the early phase of the response international data, such as case numbers and fatality rates, was difficult to obtain. This impacted upon early situational awareness. This improved as the response developed and more systematic methods for data gathering were developed. For future activations or emerging issues within the SARS-CoV-2 response, prior strategic planning on international data needs would be useful for ensuring early sharing of data.

42. Availability of International data allowed for greater analysis of international comparison. Participants and CSAs noted that the International Join Comparison's Unit had provided a more systematic approach to international data, which was welcomed. The need for SAGE and ICJU to be closely aligned was flagged, to ensure there was no duplication in issues being considered through the different mechanisms. Strong links between SAGE and the ICJU moving forward are crucial to ensure SAGE's needs for international data flows are aligned with ICJU activities.

Sensitivity and data ownership

43. Participants and CSAs noted that there had been difficulty in bringing together the data needed due to sensitivity surrounding certain data sets. Some governmental data sets are held at a high classification level, which led to difficulty in allowing academics to access it. While these issues were resolved, they led to a delay in securing the necessary data.

44. As well as this, the variety of sources SAGE used for its data led to multiple different data owners. This not only impacted upon the sharing of data across HM Government and the Devolved Administrations, but also upon the release of SAGE evidence into the public. On occasions, data owners denied permission to release papers into the public domain if those papers included their data. This added another layer of complexity onto the document release process.

Planning for data availability

45. A suggestion for improving future data availability is to anticipate data needs and sources in advance of an emergency. Identifying data sources and implementing a plan for obtaining data flows for scenarios outlined in the National Security Risk Assessment may improve the reactive capabilities of SAGE and HM Government as a whole.

Recruitment and Selection of Participants

Process for recruiting SAGE participants

46. The SAGE Standard Operating Procedure contains lists of experts to be stood up in an emergency. During the initial stage of the response, this was used to source participants for SAGE. However, the needs for the SARS-CoV-2 quickly evolved beyond the initial expert lists. The experts attending SAGE evolved over time, with new academics being brought in to cover emerging issues

47. While the SOP expert list was helpful in the initial stage of the response, participants believed that in the chronic phase, quieter periods could be used to plan ahead to refresh SAGE attendees. This would give experts that had contributed during the emergency phase time to refresh and allow for greater diversity of experts. This is closely linked to previous points on the creation of sub-groups.

Diversity and breadth of expertise

48. While there was a good diversity of institutions amongst SAGE participants, the diversity in terms of demographics during the early response was not as developed. This has improved as the response had grown over time. However, there was concern that there was not enough diversity in meeting participation, with similar participants making the majority of the contributions. Early SAGE meetings tended to have a stronger voice from epidemiologists, however this may have reflected the stage of the pandemic when there was limited information on the virus.

49. SAGE participants noted that overall they were mostly well established academics who had built a reputation. One suggestion put forward to increase diversity of thought and of background within SAGE and its sub-groups may be to include more early career academics to broaden representation.

50. Overall, the consensus was that SAGE had a good balance of expertise with regards to discipline and this had successfully evolved over time as new demands had arisen, for example around environmental transmission.

51. The suggestion of including a broader range of expertise from outside of the 'hard-science disciplines' such as economists and sociologists was made by some. Such a suggestion would need to be considered within the remit of SAGE as a science advice mechanism.

Workload and demands

52. There was consensus amongst participants that they found SAGE to be an incredibly rewarding experience. They particularly noted the cross-disciplinary working as being beneficial, especially in sub-groups such as the Children's Task and Finish Group.

53. However, there was also consensus amongst the secretariat and participants that the workload had been incredibly intense. While this was manageable in a short-term crisis, it was not sustainable long-term. This would be especially marked for academics with the return to teaching at the beginning of the 20/21 academic year.

54. Participants on SAGE receive no remuneration for their time on the group. This allows for the group to have a large degree of independence. However, during long-term response such as SARS-CoV-2, it means academics have received no monetary support towards their participation on SAGE. There was caution amongst participants regarding receiving remuneration about how this would impact upon perceptions of their independence.

55. While participants had been provided secretariat support for their SAGE work from the Government Office for Science, this did not wholly compensate for the competing demands of their institutions. A more open dialogue between the SAGE secretariat and participants' institutions may have helped with this, including more specific conversations about priorities and acceptable trade-offs on work demands.

56. The workload demands were also exacerbated by short commissioning deadlines or conflicting commissions from multiple departments. A more strategic approach to commissioning earlier may have eased workload on participants but would have also allowed participants to focus on the bigger picture, rather than short deadlines.

57. There were several practical solutions that were suggested that may have helped participants manage the demands of SAGE. Participants expressed a lack of clarity over how government worked, so an onboarding process with an introduction to the workings of the civil service as well as emergency response training may have proved useful to easing workload demands. The length of papers was also cited as a potential issue. Most participants did not have enough time to read the number of long evidence papers that went to SAGE in advance of the meetings. Summaries of these papers would have proved more useful in informing discussion.

Media and Transparency
Media handling

58. There was consensus that this incident had prompted an unprecedented level of demand on SAGE participants. Unlike in other incidents where SAGE was activated, SAGE itself generated intense media coverage and interest in the group and its participants. Whilst SAGE participants are free to talk to the media about their work as academics, there was difficulty in managing the intense media interest and the desire to link back comments made by academics to their work on SAGE and its subgroups.

59. Media engagement across participants varied, with some participants choosing not to engage and others engaging regularly. Some media engagement from participants was seen as beneficial. In particular, participants discussing their work outside of SAGE was beneficial in educating the public around the science issues connected to the pandemic.

60. In a small minority of cases, participants chose to engage with the media to voice disagreements with the consensus view of SAGE or to voice differing opinions with government decisions. There was concern across stakeholder groups that this may have negatively impacted upon the public's trust in SAGE. It also will have impacted on Ministers and officials' views on working through SAGE on sensitive policy and operational issues, given concerns about leaks.

61. Participants may have benefited from more extensive media training earlier in the response, perhaps tailored to working in a Government context. This may have helped them feel more confident in handling the media or may have mitigated any pressure brought to bear by media attention.

62. There may also be benefit in laying out a clear terms of reference for SAGE and subgroup participants on what they are and are not able to do in relation to media engagement. The Monetary Policy Committee (MPC) of the Bank of England was referenced as a model for press engagement that SAGE could learn from. The MPC lays out clear, standing media guidance for its members and directs members to channel press requests through the press office. Such clear communication of

engagement at the beginning of the response, and then reinforcing them when new participants join, may have clarified to individuals what their terms of engagement were with the media.

Publishing and communications with the public

63. Many participants believed the public release of SAGE materials eased media attentions as SAGE was no longer seen as a secretive body. Some commented that the media interest in SAGE lessened after the SAGE minutes were released. However, this high level of transparency did have implications for policy makers in terms of the communications around the policy making process.

64. Participants also voiced concern about the public discourse on the evidence that had been released. This was especially a challenge where the released advice did not line up with a ministerial decision. More transparency around other pieces of advice that were being taken into consideration may have abated this, but it is important to recognise that there is a particularly strong, embedded culture of transparency in science and research that does not exist to the same level in other areas.

SAGE branding

65. The SAGE 'brand' has become a strong one both within HM government and externally with the public. In part, this reflects the group's ability to provide high quality advice to policy makers when it was required.

66. However, the strength of this brand had two consequences. It led to the demand from departments to have advice of a scientific nature 'rubber stamped' by SAGE when perhaps it did not need to be. The suggestion was made that this may be less prominent in the future if department built their own science capabilities in both the immediate response but also as a long-standing capability.

67. There was also diverging opinion on whether there should be an 'Voice of SAGE' that would appear externally from policy makers. There was concern that SAGE did not have a strong enough public presence of its own and relied on GCSA and CMO who are officials and bound by the Civil Service Code. A stronger set of messages around the independence of SAGE may have been helpful to clearly differentiate it from the Government decision-making process.

68. However, there were reservations around such an idea. Having an independent voice for SAGE raised the concern that this could bring SAGE into open conflict with ministers. This could diminish trust with policy makers and lessen the use of SAGE advice.

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