Witness Name:
Professor Brooke Rogers OBE
Dated: 1 December 2022
Ref: M2/SAGE/01/BR

COVID-19 INQUIRY – MODULE 2

Questionnaire Response – Professor Brooke Rogers OBE

1: Overview of qualifications, career history, professional expertise and major publications:

Qualifications

1.1. The following table outlines my qualification and professional accreditation:

Table 1 – Qualification and professional accreditation

1998	BA Psychology (Cum Laude), Rollings College, Winter Park, Florida (USA)
01/2003	PhD in Psychology, Royal Holloway University
03/2011	Post-graduate Certificate of Academic Practice (PGCAP), King's College London (KCL)
04/2012	Fellow, Higher Education Authority

Career History

1.2. The following table outlines my selected career history:

Table 2 – Career History

Professional experience:	
08/2007 – 08/2011	Lecturer in Risk and Terror, Department of Geography/War Studies, KCL
09/2011 – 02/2013	Senior Lecturer in Risk and Terror, Department of War Studies, KCL
02/2014 – 08/2018	Reader in Risk and Terror, Department of War Studies, KCL
09/2018 – Present	Professor of Behavioural Science and Security, Dept. of War Studies, KCL
09/2019 – 08/2021	Deputy Head of the Department of War Studies, KCL
05/2021 – 06/2022	Academic Lead for the KCL Safe Campus Opening Team (SCOT) (Operational)
09/2022- Present	Vice Dean (People & Planning) in the Faculty of Social Science and Public Policy (SSPP), KCL
Advisory Roles:	
2013 – Present	UK Cabinet Office Communities Prepared National Group (CPNG)
2013 – Present	Chair: UK Cabinet Office Behavioural Science Expert Group (BSEG)
2014 – Present	UK Cabinet Office Infrastructure Security and Resilience Industry Forum (ISRIF)

2018	National Academies of Sciences, Engineering, and Medicine Workshop Committee on Epidemiological Surveillance following a Nuclear or Radiological Incident (USA)
2019 – Present	Chair: Home Office Science Advisory Council (HOSAC) (member since 2017)
2020 – Present	National Preparedness Commission
2020 – 2022	International Olympic Committee Independent Expert Panel (IEP)
2020 – Present	Defra Recovery Science Advisory Group (RSAG)
2020 – Present	The Prime Minister's Council for Science and Technology (CST)
2020 – Present	Co-chair of the Scientific Advisory Group for Emergencies (SAGE) Independent Scientific Pandemic Influenza Group on Behaviours (SPI-B) during the COVID-19 pandemic
2020 – Present	Scientific Advisory Group for Emergencies (SAGE) participant throughout COVID-19 (SAGE participant since 2014)
2021 – 2022	DfE/DHSC/UUK Covid Measures Higher Education Expert Group (COVID-19)
2021 – Present	Digital Security by Design Social Science Hub+ (DiscribeHub) Advisory Board
2021 – Present	PHE (now UKHSA) Behavioural Science Insights Unit (BSIU) External Advisory Group

2021	Swedish Research Council Interdisciplinary Expert Panel on Society Security
2021 – Present	The Welsh Government Technical Advisory Group (TAG) (COVID-19)
2021 – Present	The ONS Covid Infection Survey Advisory Board Sub-group (strategic forward look)

Professional Expertise:

1.3. I am a Professor of Behavioural Science and Security and Vice-Dean (People & Planning) in the Faculty of Social Science and Public Policy (SSPP) at KCL.

1.4. I am a social psychologist specialising in understanding how attitudes and beliefs are formed, and how these attitudes and beliefs inform behaviour. I use theories of risk perception, risk communication, and health psychology to investigate the behavioural science aspects of risks and threats traditionally addressed with physical, technological, or medical science approaches.

1.5. My multi-disciplinary, collaborative projects explore psychological and behavioural responses to low likelihood, high-impact events such as chemical, biological, radiological and nuclear (CBRN) incidents, public delivery of first aid during extreme events, communication with vulnerable groups, community and organisational resilience, the role of schools in building resilience, protecting crowded places, and the psychology of violent radicalisation.

1.6. My career is built upon a commitment to undertake high quality, empirically driven, translational research to guide and inform organisations in their planning, response, and recovery efforts.

1.7. My collaborative work has changed the landscape of emergency policymaking by demonstrating that emergency policies, plans, and responses are often based on inaccurate assumptions about public responses and information needs during extreme events. This precludes attempts to engage with members of the public, resulting in instances where unexpected public behaviours have overwhelmed emergency response systems. My work shows

that the public are largely resilient to extreme events; challenges the long-held misconception of the panic prone public; provides evidence for a range of behavioural responses (e.g., under-response to over-response) during a crisis; and demonstrates the importance of evidence-based public communication to inform and enable protective health behaviours before, during, and after an extreme event.

1.8. My research evidence has informed communication campaigns (i.e., Action Counters Terrorism (ACT); See It, Say It, Sorted; Get Ready for Winter), enhanced counter-terror (CT) training programmes (i.e., SERVATOR); improved the understanding of public impacts across the National Security Risk Assessment (NSRA); underpinned development of new NSRA public impact scales; and led to evidence-based public communications plans for NSRA risks and threats.

1.9. My ability to assimilate, evaluate, and provide evidence informs multiple scientific programme reviews (e.g., DSTL, Police, Home Office) and strategic discussions about the health of our future science and industry systems (e.g., Council for Science and Technology (CST)). I am recognised for my ability to establish, chair, re-structure, and advise local, national, and international organisations through contributions to assurance boards, programme reviews, and high-level fora.

1.10. I currently chair the Home Office Science Advisory Council (HOSAC) where I led a recent restructure to enhance the diversity of skills and voices contributing to, and transparency of scientific input into the HO science ecosystem. I have chaired the Cabinet Office Behavioural Science Expert Group (BSEG) since 2013, where I have provided science advice across the diverse range of National Security Risk Assessment (NSRA) risks and threats.

1.11. I have engaged in the UK's Science Advisory Group for Emergencies (SAGE) exercises in the past (since 2014). I became an independent participant in SAGE, and co-chair of SAGE's behavioural science sub-group (SPI-B) in response to the Covid-19 pandemic in 2020.

1.12. Other independent science advisory roles have included roles with Defra, UKHSA, Greater London Authority, the Prime Minister's CST, and contributions

to learned societies and professional bodies. I have also contributed evidence-based strategic and operational advice to international organisations including the Organisation for Economic Co-operation and Development (OECD), NATO, Department of Homeland Security, International Atomic Energy Association (IAEA), The International Olympic Committee, National Academies of Sciences, Engineering, and Medicine, and more.

Publications

1.13. A list of my publications can be found here. Some of my most significant peer-reviewed publications include:

1.14. Drury, J., Rogers, M. B., Marteau, T., Yardley, L., Reicher, S., D. & Stott, C. (2021). Re-opening live events and large venues after Covid-19 'lockdown': Behavioural risks and their mitigations. *Safety Science*, 139, 1-8.

1.15. Michie, S., West, R., Rogers, M. B., Bonell, C., Rubin, G. J., and Amlot, R. (2020). Reducing SARS-CoV-2 transmission in the UK: A behavioural science approach to identifying options for increasing adherence to social distancing and shielding vulnerable people. *British Journal of Health Psychology*, 25(4), 945-956.

1.16. Bonell, C., Melendez-Torres, G. J., Viner, R., Rogers, M. B., Whitworth, M., Rutter, H., Rubin, J., and Patton, G. (2020). An evidence-based theory of change for reducing SARS-CoV-2 transmission in reopened schools. *Health and Place,* 64, 1-6.

1.17. Pearce, J. M., Lindekilde, L., Parker, D. J., & Rogers, M. B. (2019). Communicating with the public about marauding terrorist firearms attacks: Results from a survey experiment on factors influencing intention to 'Run, Hide, Tell' in the UK and Denmark. *Risk Analysis, 39*(8), 1675-1694.

1.18. Rubin, G. J. and Rogers, M. B. (2019). Behavioural and psychological responses of the public during a major power outage: A literature review. *International Journal of Disaster Reduction*, 38, 1-13.

1.19. Patel, S., Rogers, M. B., Amlôt, R., & Rubin, G. J. (2017). What Do We Mean by 'Community Resilience'? A Systematic Literature Review of How It Is Defined in the Literature. *PLOS Currents: Disasters*, 1-32.

1.20. Rogers, M. B., Amlôt, R. & Rubin, J. (2013) Investigating the impact of communication materials on public responses to a radiological dispersal device (RDD) attack. *Biosecurity and Bioterrorism-Biodefense Strategy Practice and Science*, *11*(1), 49-58.

1.21. Lock, S., Rubin, G. J., Murray, V., Rogers, M. B., Amlôt, R., & Williams, R. (2012). Secondary Stressors and Extreme Events and Disasters: A Systematic Review of Primary Research from 2010-2011. PL o S Currents: Disasters, 4.

1.22. Rogers, M. B., Amlôt, R., Rubin, G. J., Wessely, S. & Krieger, K. (2007). Mediating the social and psychological impacts of terrorist attacks: The role of risk perception and risk communication. *International Review of Psychiatry*, *19*(3), 279-288.

1.23. Rogers, M. B. & Pearce, J. M. (2013). Risk communication, risk perception and behaviour as foundations of effective national security practices. In B. Akhgar, & S. Yates (Eds.), *Strategic intelligence management* (pp. 66-74). Oxford: Elsevier Butterworth-Heinemann.

2: List of groups I participated in and the relevant time period:

2.1. I have been participating in SAGE table-top exercises and roundtables (e.g., school closures) as an academic independent expert since 2014.

2.2. My SAGE Covid-19 participation includes:

(1) **SAGE** (13th February 2020 (Meeting 7) – 10 February 2022 (Meeting 105)

(2) **SAGE Science Coordination Group** (**SCG**) (9th November 2020 – 28th May 2022 – Suspended animation)

(3) **SPI-B** (14th February 2020 – 7th March 2022 – Suspended animation). On 28 February 2020 I became Deputy Chair; and on 11 April 2020 I became Co-Chair with Lucy Yardley and James Rubin.

(4) **SPI-B Senior Coordinating Group** (**SPI-B SCG**) (30th September 2020 – 8th February 2022 (last meeting) - Suspended animation)

(5) **SPI-B Group on Education (SPI-Kids) sub-group**. I created and chaired this group. (April 2020 set-up began – 4th February 2021)

(6) **Children's Task and Finish Working Group** (June 2020 – 9th February 2021)

(7) **SPI-B Security & Policing Sub-group**. I was the workstream lead, but did not chair this group. (April 2020 – uncertain of final meeting date/please confirm with the SPI-B Secretariat).

(8) **Celebrations and Observances Task and Finish Group (**October 2020-November 2020)

3: Overview of involvement in groups between January 2020 and February 2022:

When and how I came to be a participant

3.1. I have been part of the SAGE register of experts since 2014. This has been noted on my LinkedIn profile for many years prior to Covid-19, as well as on public declarations of interest for other Government science advice roles (i.e., Home Office Science Advisory Council (HOSAC); Council for Science and Technology (CST). I have participated in multiple SAGE table-top exercises and roundtables over the years.

Covid-19 Activity

3.2. On 11 February 2020, James Rubin and I were invited to meet with Dominic Cummings and his team at 10 Downing Street. We discussed the evidence around public responses and the data that would be needed to understand these responses during an infectious disease outbreak. This meeting was not part of the SAGE process or response, but it was related to the Covid-19 response.

3.3. On 13 February 2020, I attended my first Covid-19 SAGE meeting (Meeting 7). After the meeting Sir Patrick Vallance, the Government Chief Scientific Advisor

(GCSA) spoke with James Rubin and myself. He asked us to discuss and decide if one of us would chair SPI-B. James Rubin agreed to do this. I continued to comment on SAGE meeting notes and participated in the planning and setting up of SPI-B alongside James Rubin. We agreed with the GCSA that we would not focus on crafting communication, as communication was beyond SAGE's remit.

3.4. On 14 February 2020, I worked with James Rubin to help shape and develop SPI-B. This included working on the terms of reference (ToR) for SPI-B; agreeing a list of initial members; and the frequency of meetings.

3.5. On 19 February 2020, invites were sent to the original members of SPI-B to join.

3.6. On 24 February 2020, the first SPI-B meeting took place.

3.7. On 28 February 2020, I was asked to become deputy chair of SPI-B given the pace we were working at, volume of work, and the intention to hold weekly meetings. This message came from the SAGE Secretariat. I also continued to be involved in the planning and reporting for SPI-B, and to attend SAGE meetings as a participant.

3.8. On 11 April 2020, I was asked to become a SPI-B co-chair alongside Lucy Yardley and James Rubin in response to our high volume of work and emerging structures (sub-groups). The message came from James Rubin, but I am certain that this would not have been requested without a discussion with the Secretariat. We worked together to shape the SPI-B strategy and coordination, sign off on consensus statements, represent SPI-B at other sub-group meetings, participating in SAGE, and SAGE Science Coordination Group (SCG) meetings as needed.

3.9. In April 2020, SAGE 23 (7 April 2020) enabled SPI-M to focus on the role of children in transmission with input from SPI-B. We argued that we must also consider the wider impacts of the non-pharmaceutical interventions (NPI's) on children (e.g., development, mental health, socialisation).

3.10. I organised and chaired a new SPI-B sub-group, the SPI-B Group on Education (SPI-Kids). We worked with SPI-M to inform the report on the Role of Children in Transmission, where we were able to include insights into The Wider Impacts

of Current and Possible Interventions on Children, including a SPI-B Annex exploring The Wider Impacts of School Closures on Children. This collaboration with SPI-M and DfE (setting out scenarios) was incredibly effective.

3.11. It led to the development of the collaborative Children's Task and Finish Working Group (TFC) (see paragraph 3.13), of which I am a participant. SPI-Kids carried on feeding into the TFC and beyond. I recruited key members to SPI-Kids and the TFC, such as Professor Russell Viner.

3.12. In April 2020, SPI-B Security & Policing and Security SPI-B (S&P) sub-group was established. I was a workstream lead for the sub-group. I met with the sub-group chairs to help determine the shape of the group, and to help position the group to be able to speak about security issues in a transparent manner. As far as my records and memory serve me, I did not attend full SPI-B S&P sub-group meetings.

3.13. In June 2020, the TFC was created as a result of the collaborative effort around children, schools, and transmission as mentioned at paragraphs 3.9 and 3.10 above. The TFC is co-chaired by Professor Charlotte Watts and Mr Osama Rahman, Chief Scientific Advisors.

3.14. In September 2020, we began to consider SPI-B's ways of working in light of the start of a new academic year and the need to create a sustainable model. Other SAGE sub-groups were undertaking similar exercises. An e-mail dated 11 September 2020 sets out the rationale. Key changes included:

(1) Moving from regular, large meetings of SPI-B to creating smaller working groups around specific tasks. These groups were viewed as often being cross-disciplinary after our success in collaboration with SPI-M and EMG on HE/FE, Housing and Mass Testing.

(2) This also decreased pressure on SPI-B participants to dial in to every meeting.

(3) We set up a SPI-B Directory of Experts including all existing SPI-B participants who still wanted to engage, as well as new participants to enable us to expand/add additional expertise and to increase our diversity.

(4) We created a smaller Senior Coordinating Group (SCG) to review commissions before asking relevant experts to form a working group. Some of the working groups could be standing groups in their own right, and others could be task and finish groups.

3.15. On 16 September 2020, we started the set-up and consideration of Senior Coordinating Group (SCG) membership.

3.16. 22nd June 2021, James Rubin and Lucy Yardley stepped down from the co-chair roles to return to regular duties. I stayed on for consistency, and to help our new co-chair, Professor Ann John learn the role and the systems. I intended to stay on until September 2022 but carried on as we changed our footing and until we went into 'suspended animation'.

3.17. Our 22 June 2021 SPI-B meeting also communicated to SPI-B colleagues that the government had been building up capability and that some of the work that had been coming to SPI-B would be undertaken 'in house' in light of the new capability.

Non-SAGE related Covid-19 Activity

3.18. The work with the TFC and SPI-Kids also led to regular meetings and discussions with the Isaac Newton Institute (INI) Modelling working group on COVID-19 and Higher Education modelling group working on schools.

3.19. This, in turn, led to an opportunity to participate in the Universities UK (UUK) Higher Education Covid Measures – Universities Expert Panel.

3.20. I participated in the World Health Organisation MNCAH Covid-19 Research Network meetings, but I had very little time to give to this. I drew upon the resources and fed into conversations where I could, but I could not lead on work in this group due to demands on my time.

3.21. I helped lead and participant in the UKRI Coronavirus: The Science Explained web updates.

The number of meetings I attended, and my contributions to those meetings

3.22. From my own records and the information obtained from the SAGE Secretariat I attended the following number of meetings:

(1) 65 x SAGE meetings

(2) 30 x SPI-B meetings

(3) 19 x SPI-B SCG meetings

(4) 5 x TFC meetings

(5) 4 x SPI-B Security & Policing meetings

3.23. The above numbers are estimates to the best of my knowledge and from the information I have been able identify. These do not capture the volume and pace of activity. Our days were full of sub-group meetings, Task and Finish Group meetings, Science Coordination Group Meetings, Senior Coordinating Group Meetings, Teach-ins, and a variety of other SAGE and SAGE sub-group project-related meetings. We had frequent 'quick check-in' meetings, and more. It is impossible to capture the sheer volume of meetings and collaborative work on shared documents (sometimes until sunrise the next morning). We worked all hours and it was not uncommon to see several colleagues dialled into and editing shared documents throughout the night.

3.24. For clarity I also attended meetings for the following, but I do not have exact numbers for them due to variations in titles on electronic meeting invitations:

(1) SAGE Science Coordination Group Meetings

(2) SPI-Kids Sub-group Meetings

(3) Celebrations and Observances Task and Finish Group Meetings

(4) Other Project/Report Meetings

My role in providing research, information and advice.

3.25. The scale and shape of participation is difficult to capture at times. The SAGE and SAGE sub-group processes operate by generating consensus statements.

For example, sub-groups working on a targeted project would come to a consensus before sending the report up to SPI-B to be reviewed and discussed (initially by all of SPI-B; later by the SPI-B Senior Coordinating Group) who would then discuss the work and request changes to enable a consensus or set out why a consensus was not possible. We co-edited the documents when and where we had information to contribute.

3.26. The reports would then go up to SAGE, which required another consensus process. As such, there are many reports and projects where I was one of the lead authors, or the lead author, and others where I was only responsible for helping to shape the commission, identify colleagues to respond to the commission, reviewing and, as needed, adding to work at the SPI-B consensus stage. These reports were then sent up for additional review and discussion at the SAGE consensus stage.

3.27. Additionally, we ended up with three SPI-B co-chairs to manage the volume of work, which helped us target and support specific areas of sub-group or Task and Finish Group work as it made its way through the SPI-B and SAGE consensus systems. We were also responsible for staying on top of the data, reading reports in the shared drive, pulling information/evidence in from our research networks, and identifying new networks/sources of information as the response progressed.

3.28. Beyond reporting, management of SPI-B and sub-groups required significant effort. I worked closely with my co-chairs, the SPI-B Secretariat, the SAGE Secretariat, and the chairs of other sub-groups and Task and Finish Groups.

3.29. My co-chairs and I helped develop Terms of Reference, considered and tried to enhance diversity across our groups, helped to identify subject matter experts, reached out to subject matter experts to invite them to join, supported colleagues as they responded to commissions (often under tight deadlines), represented the collective SPI-B effort at SAGE, and provided feedback to colleagues.

3.30. We also helped shape the commissions that came to us by identifying what we were able to respond to, and the items that we either could not answer or that fell beyond our remit.

3.31. We attended SAGE Science Coordination Groups to provide SPI-B updates and to shape the SAGE priorities going forward, led sub-groups, contributed to Task and Finish Groups, engaged in teach-ins, managed difficult situations as they arose, and tried to keep the lines of communication open at all levels of response.

3.32. I was also personally still standing up in my day job as a Professor of Behavioural Science and Security and Deputy Head of Department in the Department of War Studies, lecturing/running my modules, marking, supervising and supporting students, and ensuring that my research projects were still making progress. Additionally, some of my other government science advisory roles required engagement and input (e.g., CST, Defra Recovery Science Advisory Group, Home Office Science Advisory Group, etc.) once the Covid-19 response was underway.

4: Summary of documents to which I contributed for the purposes of advising the SAGE and/or its related sub-groups:

4.1. This is an incredibly challenging exercise. My SPI-B co-chair and SAGE participant roles, plus my roles on various sub-groups and task and finish groups mean that I have engaged with all of the SPI-B documents repeatedly, as well as documents originating in the Children's Task and Finish Group, and Celebrations Task and Finish Group. The same can be said for the SAGE publications, though I would not have been involved in writing, commenting on, and editing the SPI-M and EMG reports prior to going into SAGE.

4.2. This is further complicated by the fact that we did not record lead author status on SPI-B documents in the early days of the response as our reports were built upon a collaborative effort/response generated by SPI-B meetings and commenting on or contributing to drafts. Factor in the volume of requests and the pace of response in very uncertain times, and I am left feeling that I have been involved in every paper that I read at some level.

4.3. SPI-B published 77 papers over the course of 105 SAGE meetings. The themes covered by SPI-B papers include (but are not limited to):

(1) Potential effects of non-pharmaceutical interventions (NPIs) on Covid-19 infection rates

(2) Social and behavioural considerations of self-isolation and household isolation

(3) Social and behavioural science evidence to inform options for increasing adherence to social distancing measures

(4) Behavioural evidence on effective communications to improve protective behaviours

(5) Behavioural considerations in the role of children in transmission

(6) Evidence on behaviour of crowds for policing and security considerations in the context of Covid-19

(7) Behavioural considerations for implementing mass testing schemes

(8) Evidence on use of Community Champions schemes to increase engagement of vulnerable communities

4.4. I have narrowed down the selection of papers as much as possible, though I remain worried that I will fail to highlight activity that may be important as the Inquiry progresses. I will off course be happy to assist the Inquiry further if necessary. I have broken my contributions into:

(1) **Co-contributor:** Where we shaped the response through group discussion during a SPI-B meeting, and/or through commenting on and adding to drafts of papers as they emerged and progressed.

(2) **Lead co-author:** To indicate papers where I am certain that I held the pen and shaped significant aspects of the work for others to contribute to and comment on. This is often in partnership with a small group of SPI-B colleagues (or with colleagues from other sub-groups such as in the Children's Task and Finish Group) before sharing the paper for the SPI-B and SAGE consensus processes.

(3) **Co-author:** When I worked closely with a colleague or a small number of colleagues to generate a significant contribution to the paper, but I did not lead the overall structure and delivery.

4.5. I have tried to group the papers into general areas/headings for the purpose of providing a summary of the areas where I believe that I was most active. Some of the reports cover several issues and behaviours in one place, while others are more targeted.

Behavioural and social impacts of interventions

4.6. This category contains papers where we considered how best to achieve epidemiological goals (e.g., to reduce infections, risk to vulnerable groups) by offering principles for design of behavioural and social interventions. Much of our advice focused on clearly explaining rationale for any measures, engaging all sectors of society, providing support to enable behaviours, and positive strategies for sustaining behaviours.

Table 3 – Behavioural and social impacts of interventions

Date	Paper	Gov.uk Link	Role
26/02/2020	Potential effect of non-pharmaceutical interventions (NPIs) on a Covid-19 epidemic in the UK	Link	Co-contributor
03/03/2020	SPI-B return to SAGE on the use of behavioural and social interventions on a Covid-19 epidemic in the UK	Link	Co-contributor
04/03/2020	SPI-B insights on combined behavioural and social interventions	Link	Co-contributor
09/03/2020	SPI-B insights on self-isolation and household isolation	Link	Co-contributor

09/03/2020	Potential impact of behavioural and social interventions on an epidemic of Covid-19 in the UK	Link	Co-contributor
12/03/2020	SPI-B insights on public gatherings (We were asked to reconsider the impacts discussed in the previous paper)	Link	Co-contributor
21/04/2020	Principles for the design of behavioural and social interventions	Link	Co-contributor
25/04/2020	Behavioural principles for updating guidance to minimise population transmission	Link	Co-contributor
13/05/2020	Well-being and household connection - the behavioural considerations of bubbles	Link	Co-contributor
22/07/2020	Public Health Messaging for Communities from Different Cultural Backgrounds	Link	Co-contributor
20/09/2020	Summary of the effectiveness and harms of different non-pharmaceutical interventions	Link	Co-contributor
20/09/2020	NPIs table	Link	Co-author

10/02/2021	Behavioural and social considerations when reducing restrictions	Link	Co-contributor
14/10/2022	SPI-B: Behavioural considerations for maintaining or reintroducing behavioural interventions and introducing new measures in Autumn 2021	Link	Co-author
10/02/2022	SPI-B: Social and behavioural impacts for lifting restrictions	Link	Co-author

4.7. While the development of public messages was beyond the remit of SAGE, SPI-B produced reports that discussed evidence-based approaches to communication.

4.8. SPI-B recognised that communication is a key driver of behaviour during a public health crisis, though it is not the only driver. Our advice on communication was primarily based on principles that we included in more than 100 documents from SPI-B and SAGE.

4.9. The main principles were identified early on and sent to the Cabinet Office communications team in a paper on 3 April 2020 ("Harnessing behavioural science to maintain social distancing ") and then published in the *Journal of Epidemiology and Community Health*.

4.10. The core principles included the use clear and specific guidance; use positive messages ("protect each other", "stand together"); co-design messaging. The core principles also asserted that government should avoid messages based on fear/disgust, and focus on support available to enable behaviours, not on punishments for breaching guidance.

4.11. SPI-B stressed repeatedly the role that many factors, such a social norms, perceived legitimacy, personal finances, and more, also play a significant role in informing public behaviour.

4.12. As such, subsequent SPI-B work focused on how to enable vulnerable groups to adopt behaviours that they themselves wanted to adopt by removing barriers to adherence, e.g., financial. For example, the SPI-B return to SAGE on the use of behavioural and social interventions on a Covid-19 epidemic in the UK (3 March 2020), highlighted several behavioural considerations including:

(1) Key to minimising barriers and facilitating compliance with the proposed interventions are communication, feasibility and equity.

(2) Coherent and unambiguous communication, and suggesting replacement behaviours, will help increase compliance.

(3) Encouraging positive behaviours as social norms can be powerful.

(4) Many of the proposed measures will be easier to implement for those on higher incomes. Government should address this to avoid tension within communities and detrimental effects on compliance.

(5) Unintended consequences should be considered – including potential alternative behaviours (e.g., people congregating elsewhere when events are cancelled).

(6) Consideration should be given to how and when measures will be removed, and any impact this may have on the transmission of the disease (e.g., causing a second peak).

4.13. This led to Public Health England (PHE) to begin drafting public guidance on potential interventions, informed by evidence of what constitutes effective guidance (including from behavioural science) – and to advise where there are evidence gaps requiring rapid research.

4.14. I highlighted a few moments that stand out in my memory in table 3 above. For example, I remember a very intense weekend of collaboration as we generated advice around the 'Summary of the effectiveness and harms of different non-pharmaceutical interventions' and the 'NPIs Table' in September 2020. We collaborated with SPI-M colleagues to consider the need for, potential

effectiveness, and potential impacts of a range of options, including a circuit breaker.

4.15. I also remember the government announcement that all Covid-19 restrictions were going to be removed while we were still working on the SPI-B: Social and behavioural impacts for lifting restrictions. I believe that we had not completed or submitted the advice at that point (February 2022).

Policing/Public Disorder

Table 4 – Policing/Public Disorder

Date	Paper	Gov.uk Link	Role
25/02/2020	SAGE return to CCS on risk of public disorder	Link	Co-contributor
21/04/2020	Neighbourhood-level release	Link	Co-contributor
29/07/2020	SPI-B Consensus Statement on Local Interventions	Link	Co-author
29/07/2020	Areas of intervention ('local lockdown') measures to control outbreaks of COVID during the national release phase	Link	Co-contributor

4.16. The SPI-B Return on risk of public disorder created the foundation for our dialogues and advice in this area. We defined public disorder to include actions from opportunistic crime, community tension and rioting. We argued that large-scale rioting is unlikely. It is rarely seen in these circumstances. We also argued advised that acts of altruism would predominate, and that government could readily promote and guide these.

4.17. SPI-B considered the risk of public disorder in scenarios where there are:

(1) staff absences in police forces,

(2) pressures on healthcare facilities,

(3) perceptions that there is limited resource, e.g., limited face masks or hand sanitiser,

(4) perceptions of inadequate government response to contain the outbreak.

4.18. There was agreement that the key factors that are likely to increase public disorder are similar across the scenarios.

4.19. SPI-B reports identified factors that were more likely to trigger public disorder, including by perceptions about the Government's response, rather than the nature of the epidemic per se. For example, a perception that the government response strategies are not effective in looking after the public may lead to an increase in tensions.

4.20. SPI-B recommendations to limit the risk of public disorder included (SPI-B Return on Risk of Public Disorder, 2020, p. 2):

(1) **Provide clear and transparent reasons for different strategies:** The public need to understand the purpose of the Government's policy, why the UK approach differs to other countries and how resources are being allocated. SPI-B agreed that government should prioritise messaging that explains clearly why certain actions are being taken, ahead of messaging designed solely for reassuring the public.

(2) **This should also set clear expectations on how the response will develop**: e.g., ensuring the public understands what they can expect as the outbreak evolves and what will happen when large numbers of people present at hospitals. The use of early messaging will help, as a) individuals are likely to be more receptive to messages before an issue becomes controversial and b) it will promote a sense the Government is following a plan.

(3) **Promote a sense of collectivism**: All messaging should reinforce a sense of community, that "we are all in this together." This will avoid increasing tensions between different groups (including between responding agencies and the public); promote social norms around

behaviours; and lead to self-policing within communities around important behaviours.

4.21. I was the workstream lead for this area. I helped the topics that were closer to the security and policing world dock into different departments (e.g., the Home Office) whilst keeping an eye on the SAGE intention to publish everything. The co-chairs of the SPI-B Security and Policing sub-group were my contact points with the sub-group. I co-authored some reports with the chairs, but only edited and commented on others.

Children – The benefits of remaining in school

Table 5 – Children – The benefits of remaining in school

Date	Paper	Gov.uk Link	Role
17/03/2020	School closures, note from SPI-B	Link	Lead co-author
16/04/2020	The role of children in transmission	Link	Lead co-author
30/04/2020	The role of children in transmission: Modelling and behavioural science responses to scenarios for relaxing school closures	Link	Lead co-author for behavioural input (SPI-Kids input)
30/04/2020	The role of children in transmission (Annex G: A full account of SPI-B input on the scenarios)	Link	Lead co-author for behavioural input (SPI-Kids)
10/07/2020	Risks associated with the reopening of education settings in September	Link	Lead co-author for behavioural science (SPI-Kids)

21/10/2020	SPI-B: Increasing adherence to COVID-19 preventative behaviours among young people	Link	Co-contributor
03/11/2020	Children and transmission	Link	Co-author
03/11/2020	Benefits of remaining in education: Evidence and considerations (This stands out for the short notice/urgency of the request and subsequent deadline. It is, potentially, one of the most important reports but we were only given a few hours to generate it).	Link	Lead co-author
17/12/2020	Children's Task and Finish Group: update to 4th Nov 2020 paper on children, schools and transmission	Link	Lead co-author for behavioural science (SPI-Kids)
18/01/2021	Return to campus for Spring term: risk of increased transmission from student migration	Link	Lead co-author
10/02/2021	Children's Task and Finish Group: update to 17th December 2020 paper on children, schools and transmission	Link	Lead co-author for behavioural science (SPI-Kids)

10/02/2021	Children's Task and finish Group: Paper on Higher Education Settings	Link	Lead co-author for behavioural science (SPI-Kids)

4.22. This is one of my most active areas and collaborative areas of SPI-B contribution. While the SPI-B insights on combined behavioural and social interventions (4 April 2020) was not specifically about school closures, this is the first paper in which we discussed the potential effectiveness and wider impacts of school closure. We opened with, '*SPI-B have a consensus view that school closures will be highly disruptive and likely to present an unequal burden to different sections of society*' (pg. 1), and concluded with:

> *"Specific, additional points, on school closure*
>
> - *The importance of schools during a crisis should not be overlooked. This includes*
> - *Acting as a source of emotional support for children*
> - *Providing education (e.g., on hand hygiene) which is conveyed back to families o Provision of social service (e.g., free school meals, monitoring wellbeing)*
> - *Acting as a point of leadership and communication within communities"* (pg. 4).

4.23. My concern in this area, which was shared by SPI-B colleagues, was that schools were being viewed as a primary area for reducing infection without truly understanding the wider impacts of school closures. SAGE colleagues took this seriously when I expressed my concerns strongly in SAGE meetings (e.g. SAGE 23 (7 April 2020). We were able to establish a SPI-B Group on Education (SPI-Kids) to better consider the wider impacts of the non-pharmaceutical interventions (NPI's) on children (e.g., development, mental health, socialisation).

4.24. I was able to recruit colleagues with expertise in children and young adults, including Dr Gavin Morgan (via the British Psychological Society) and Professor Russell Viner (Royal College of Paediatricians), and more.

4.25. We worked as a sub-group to make the case for the importance of engaging with education staff and parents to develop effective communication, and to better understand the wider impacts of Covid-19 restrictions on children.

4.26. We also worked with SPI-M to inform the report on the Role of Children in Transmission, where we were able to include insights into The Wider Impacts of Current and Possible Interventions on Children, including a SPI-B Annex exploring The Wider Impacts of School Closures on Children. This collaboration with SPI-M and DfE (setting out scenarios) was incredibly effective.

4.27. It led to the development of the collaborative Children's Task and Finish Working Group (TFC) (see paragraph 3.13), of which I am a participant. SPI-Kids carried on feeding into the TFC and beyond.

4.28. This was a difficult area to gain traction in on the policy front in spite of strong and positive engagement with DfE and their Chief Scientific Advisers (CSA), Osama Rahman alongside skilled leadership from a Charlotte Watts. The advice provided by SAGE on this front did not seem to be implemented extensively or effectively in schools.

4.29. SPI-M and SPI-B had an excellent and effective collaboration in this area. The Children's Task & Finish group demonstrated that our response to Covid-19 is stronger when we consider the impacts of our response holistically.

4.30. In spite of my concerns about the uptake of evidence provided from the collaborative efforts of SPI-M and SPI-B on this front, many of us believe that our work informed the government decision for schools to be the first to open and last to close.

Social Distancing and High Connectivity Settings

Table 6 – Social Distancing and High Connectivity Settings

Date	Paper	Gov.uk Link	Role
05/05/2020	Consolidated return to SAGE commission on	Link	Co-contributor

	easing social distancing measures		
27/05/2020	Communicating behaviours to reduce transmissions between social networks	Link	Co-contributor
05/06/2020	Reducing transmission in highly-connected occupations	Link	Co-author
15/06/2020	Managing infection risk in high contact occupations	Link	Co-author
29/06/2020	High connectivity situations outside the occupational/workplace context	Link	Co-author
26/11/2020	EMG and SPI-B: Mitigating risks of SARS-CoV-2 transmission associated with household social interactions	Link	Co-contributor

4.31. The driving force in this area was Professor Lucy Yardley with her insights and experience in infection control and public campaigns in this area. I was able to draw upon my past critical national infrastructure research into staff willingness and ability to return to work during a biological event (pandemic influenza), as well as my insights into risk communication during extreme events.

4.32. We were also able to build upon my pre-existing experience with the Centre for the Protection of National Infrastructure (CPNI) and knowledge of their organisational training and communications approaches. Professor Lucy Yardley and I worked together to shape the guidance in this area, but she was the primary author.

Celebrations and Observances

Table 7 – Celebrations and Observances

Date	Paper	Gov.uk Link	Role
28/10/2020	Executive Summary – SPI-B Insights on Celebrations and Observances during COVID-19	Link	Lead co-author
28/10/2020	SPI-B Insights on Celebrations and Observances during COVID-19	Link	Lead co-author
05/11/2020	Key Evidence and Advice on Celebrations and Observances during COVID-19	Link	Co-author

4.33. This was another area of significant effort as the holiday seasons were soon to be upon us. I was the lead co-author, with SPI-B colleagues commenting on and editing the initial draft of the SPI-B Insights on Celebrations and Observances during COVID-19 report + the Executive Summary – SPI-B Insights on Celebrations and Observances during COVID-19. We were able to see the diversity of responses to important events internationally. We were sensitive to creating an evidence-based approach to thinking about safer ways of celebrating or commemorating special events throughout the pandemic.

4.34. The SPI-B Insights on Celebrations and Observances during Covid-19 report explored the possible behaviours of interest, potential alternative behaviours and messaging around celebrations and observances during the COVID-19 pandemic in the UK. We argued that:

(1) Interventions that are based on assumptions about the value assigned to different celebratory practices are highly likely to be less effective than

those based on collaboration and co-design with communities and religious groups.

(2) A multi-disciplinary approach was needed to draw upon SPI-M insights into the transmission risks associated with traditional behaviours, EMG insights into the risk of infection in settings in which events take place, and SPI-B insights into individual and group behaviour around celebrations and observances.

(3) It is important to recognise that some celebration behaviours can still take place during the Covid-19 pandemic and alternative behaviours can take place alongside traditional behaviours.

(4) Promoting outdoor activities provides an important opportunity for celebrations and observances to take place, given the lower risk of transmission during socially distanced outdoor activities.

(5) Any messaging/decisions around Christmas needs to be sensitive to and acknowledge what happened earlier in the pandemic when some celebrations were the focus of targeted guidance in advance, while others such as Eid ul Adha were disrupted at short notice due to rising local infections.

(6) Families and groups must be made aware of the risk of infection when they are considering temporary exceptions to public health guidance around social distancing, hand washing, and reduced contact over the holidays.

4.35. Our communication recommendations were grounded in the SPI-B principles that underpinned our work throughout the Covid-19 response. This included clarity, co-design, and recognition of the challenges experienced by different groups, among others.

4.36. This work was taken further through the creation of a Celebrations Task and Finish Group. We focussed on the risks associated with the activities that make up widespread national celebrations and the potential impact of these events on the pandemic.

4.37. We identified potential ways to help minimise the increased nationwide transmission that will occur because of widespread national celebrations. We created a table identifying common behaviour associated with UK celebrations, risk factors, and examples of potential mitigation measures in our Key Evidence and Advice on Celebrations and Observances during COVID-19.

Re-opening large events

Table 8 – Re-opening large events

Date	Paper	Gov.uk Link	Role
19/08/2020	SPI-B consensus on the reopening of large events and venues	Link	Co-author
21/08/2020	SPI-B extended paper - behavioural evidence on reopening of large events and venues	Link	Co-author
Unknown	Science framework for opening up group events	Link	Co-author

4.38. Finally, I contributed to the SPI-B reports and discussions around re-opening large events and venues during Covid-19. This fed into a larger piece of work and committee being led by Professor Dame Theresa Marteau. Our work informed the Science Framework for Opening Up Group Events commissioned by DCMS.

5: Summary of articles, interviews and/or evidence:

5.1. The list provided below are to the best of my knowledge and from the information I have been able to identify from my personal records.

Media

5.2. On 24 November 2020, I was interviewed about 'Communicating in a Crisis' on David Spiegelhalter's *Risky Talk* (the Winton Centre).

5.3. Between 31 March 2021 and 1 April 2021, I contributed to a public health campaign picked up across several newspapers. This included a few radio interviews, too. While I do not have a record of all of these articles, I have been able to identify the following:

(1) 31st March 2021, The Times, Something in the air: Our safe route of out lockdown.

(2) 31st March 2021, The Sun, Get out in the Sunshine: 'We are on a journey but it is not over yet'.

(3) On 1 April 2021, Slough and South Bucks Express, Enjoy the outdoors safely as lockdown restrictions ease.

5.4. On 8 September 2021, I was interviewed by The Independent as part of a public health campaign, 'Hands, Face, Space, and Fresh Air: Why sticking to Covid advice is key even as rules are eased.

5.5. On 31 March 2022, I contributed to a University of York 'York Ideas' panel on 'Parallels with the Pandemic: Living through Coronavirus and World War Two.'

Academic, Government and Practitioners

5.6. On 15 March 2020, I was interviewed by the British Psychological Society (BPS) publication, The Psychologist special issue on Covid-19. I argued that 'all interventions must stand up to scientific scrutiny'.

5.7. On 10 June 2020, I contributed to a King's College London School of Security Studies panel on 'Global Shocks: Security implications of worldwide crisis'. My talk was entitled: Learning from the past, looking to the future: The role of behavioural science in evidence-based policy and practice: 'Responses to Covid-19: Mapping intersections between security and health'.

5.8. On 12 August 2020, The UKI Children's Commissioner hosted a session where children were able to ask SAGE scientists questions, which I participated in,

Government scientists respond with more answers from children's coronavirus questions.

5.9. On 4 September 2020, I gave a presentation to the OECD Asia Public Governance Forum. The title of my talk was, 'How Can Governments Effectively Use Public Communication to Inform and Enable Public Behaviours?'.

5.10. On 14 January 2021, I gave a presentation to government Behavioural Science (BSCI) Network. My presentation explored 'The role of behavioural science in evidence-based policy and practice'. It was not Covid-19 specific, but I did reflect upon SAGE and SPI-B.

5.11. On 30 March 2021, I contributed to the Universities UK Roundtable on Covid-Safe Behaviours and Returning to Campus.

5.12. On 21 June 2021, I gave a presentation to the Government Social Research (GSR) profession conference on 'The Role of Behavioural and Social Science in Informing and Influencing Policy and Practice'.

5.13. On 14 October 2021, I gave a presentation to the Behavioural Science Insight Unit (UKHSA). My presentation explored 'The role of behavioural science in evidence-based policy and practice'. It was not Covid-19 specific, but I did reflect upon SAGE and give examples of SPI-B principles and input during the presentation.

5.14. On 2 November 2021, I gave a presentation to the Modelling Behaviour to Inform Policy for Pandemics conference: 'Translating Behavioural Science Principles and Evidence into Modelling for Extreme Events'.

5.15. On 17 November 2021, I gave a presentation to the Deloitte Resilience Leaders Club. My presentation explored 'The role of behavioural science in evidence-based policy and practice'. It was not Covid-19 specific, but I did reflect upon SAGE and give examples of SPI-B principles and input during the presentation.

5.16. On 14 March 2022, I gave presentation to the Association of Directors for Public Health (UK): 'What have we learned from psychology for the next pandemic?'.

Articles and other publications

5.17. Drury, J., Rogers, M. B., Marteau, T., Yardley, L., Reicher, S., D. & Stott, C. (2021). Re-opening live events and large venues after Covid-19 'lockdown': Behavioural risks and their mitigations. Safety Science, 139, 1-8.

5.18. Michie, S., West, R., Rogers, M. B., Bonell, C., Rubin, G. J., and Amlot, R. (2020). Reducing SARS-CoV-2 transmission in the UK: A behavioural science approach to identifying options for increasing adherence to social distancing and shielding vulnerable people. British Journal of Health Psychology, 25(4), 945-956.

5.19. British Science Association (BSA) (2021). For Thought: Developing a New Relationship with Risk. I contributed to this report, but I did not author it.

Teach-ins

5.20. Teach-ins were online events organised by the SAGE and SPI-B Secretariat to create an opportunity for discussion for those interested in and responsible for aspects of each topic across government. This gave us an opportunity to present the key messages and to answer questions about advice generated by the SAGE sub-groups and SAGE.

5.21. On 6 November 2020, SAGE Celebrations & Observances during COVID-19.

5.22. On 22 January 2021, Higher Education Return to Campus.

5.23. On 15 February 2021, Joint Universities Pandemic and Epidemiological Research / London School of Hygiene & Tropical Medicine (JUNIPER / LSHTM).

5.24. On 28 February 2022, Social & behavioural impacts of lifting remaining restrictions.

5.25. The above list are teach-ins I was able to identify from my own records. Should you require a full list, this can be provided. The SAGE Secretariat is the principal organiser of these who will hold records.

6: Views as to whether the work of the above groups in responding to the Covid-19 pandemic succeeded in its aims.

6.1. After re-reading the SAGE and SPI-B Terms of Reference in the light of the Inquiry, I am confident that SAGE and SPI-B fulfilled the clearly stated roles. Specifically, SAGE's role is 'to provide independent scientific advice to support decision-making in the Cabinet Office Briefing Room (COBR) in the event of a national emergency'. SPI-B's role is to 'provide behavioural science advice aimed at anticipating and helping people adhere to interventions that are recommended by medical or epidemiological experts'. Our Terms of Reference state that SPI-B advises on:

(1) Behavioural and sociological drivers of the covid-19 epidemic, and how this impacts different sociodemographic groups;

(2) Understanding of the range of public responses to the epidemic and associated government policy in this context;

(3) Best practice in monitoring and evaluation of social and behavioural interventions in response to the Covid-19 epidemic;

(4) Strategies for behaviour change, to support control of and recovery from the epidemic and associated government policy.

6.2. A review of the SAGE Covid-19 response publications document demonstrates that we provided relevant independent scientific advice to support UK decision-makers. It is important to note that SAGE, SPI-B, and related sub-groups/Task and Finish groups are advisory groups only. They do not make decisions or set policy and form one aspect of the information being considered by Ministers. These groups build a cross-disciplinary consensus view based on the best available evidence at the time.

The composition of the groups and/or their diversity of expertise

6.3. Our group membership, structures, and processes evolved as the pandemic progressed. This can be seen in SAGE as we incorporated experts in Ethics and BAME, as well as an independent advisor to assess our processes and issue challenges. This can also be seen on SPI-B as we adapted and

incorporated ethicists, historians, anthropologists, a paediatrician, individuals with experience in researching children and young adults, and more.

6.4. SPI-B had to begin the response from a standing start. We do not exist, operate, or receive Secretariat support beyond SAGE responses. I have captured some of that evolution in the timings noted above. This standing start meant that we took 11 days to hold our first full SPI-B meeting (24th February 2020) from the point of being asked to do so on 13th February.

6.5. We were able to recruit skills as needed to suit particular commissions. We worked with the SPI-B Secretariat closely during the September 2020 SPI-B restructure. Our focus was on identifying additional expertise with the aim of diversifying insights, experience, and representation on SPI-B.

The way in which the groups were commissioned to work on the relevant issues

6.6. We had a difficult start on this front. The questions coming in were too broad and beyond our remit in some cases. We had to learn to reject questions that were not a good fit, or that could be answered by the government. We were also left wondering what the underpinning plans or assumptions were when questions arrived. The learning curve was steep around the commissioning process.

6.7. The SAGE Secretariat and SPI-B Secretariat got on top of this rapidly, shaping and honing questions with departments before they were given to SPI-B. Greater clarity was provided through round table discussions with commissioning departments (i.e., what can we provide/what can't we provide), which also gave us a chance to ask questions and clarify understanding. The feedback loops that the teach-ins created also provided a useful platform for sharing the process and discussing the advice in greater detail.

6.8. The commissioning process took a lot of time and effort to get right, but it began to feel like a well-oiled machine.

6.9. Challenges in the commissioning space were evident throughout. For example, important issues could not be addressed if a 'customer' was not identified. We

also noticed that there was a lack of clear targets for behaviour. For example, we would be asked how to increase a specific behaviour (e.g. handwashing), but departments struggled to tell us what level they needed to get to. Not having these targets means that government was more likely to prioritise the easier interventions, such as communications, which are not sufficient to reach the levels of behaviour desired. Examples include the lack of incentives for Lateral Flow Device (LFD) tests in the Liverpool pilot, or how long it took to get meaningful financial payments for people isolating.

The resources and support that were available

6.10. The support offered by the SAGE Secretariat, SPI-B Secretariat, and SPI-M Secretariat was outstanding. They worked hard behind the scenes on commissioning, managing deadlines, helping our reports to land, and protecting our time. The Secretariat helped us when we needed to restructure, identified, and supported new ways of working, and did everything in their power to support us in our roles. I cannot emphasise strongly enough what an important and fundamental role that members of the Secretariat played in enabling this response.

6.11. This support grew and evolved as the pandemic progressed. I am also grateful for the wellness checks, security briefings, and more. I have never felt so supported in a role.

6.12. The support did not extend beyond SAGE in spite of the GCSA and Secretariat's best efforts to alert my university to my role and to thank them for my time. I was still running an academic department as Deputy Head, lecturing online, delivering projects, supervising undergraduate, graduate, and PhD students, and more. The SAGE response has been an intense and demanding voluntary role across several years. Managing this on top of a demanding university job can be challenging.

6.13. SAGE made a small payment to the university to be used for academic purposes (e.g., teaching support, research support, etc.), but this came too late to make a difference in the first year. Additionally, the retrospective time reporting systems did not capture my effort and, to be honest, it was too difficult

to go back through my diary and notes to make a case about time commitment while still trying to support the SAGE response alongside my university roles.

6.14. The SAGE response is a voluntary role. Future SAGE responses should have a system for seconding academics into the role/ensuring that they are not stretched completely thin trying to support a long-running SAGE response and trying to deliver on their day jobs at the university at the same time.

6.15. It would also be helpful to have additional administrative support in responding to the Covid-19 Inquiry. It is challenging to work through masses of information in a timely manner without additional administrative support.

The advice given and the recommendations that were made

6.16. SPI-B had to set everything up from a standing start. Our approaches to reporting evolved throughout the pandemic. For example, the SPI-B Secretariat supported us in developing use of uncertainty ratings, development of executive summaries, creation of shorter reports, contributions to teach-ins to reach a wider audience, and in linking new commissions to advice that SPI-B had already generated to avoid recreating the wheel.

6.17. It is difficult to comment on this. SPI-B and SAGE provide evidence-based advice. We do not make decisions. We understand that the decision-makers must consider this advice in light of other advice and information that we do not have sight up. I can point to our advice when it was taken up (e.g., schools first to open, last to close; bubbles; social distancing, etc.). I can also identify moments where, when it was acted upon, it was applied unevenly and too late to truly be effective.

The extent to which the groups worked effectively together

6.18. We were able to reach and work within and across the SAGE sub-groups (SPI-M, EMG) with ease where we could access and draw upon their networks. We were also able to reach out to and engage with learned societies, and with our international networks. This ability to access and work across the disciplines was a key strength to our response.

6.19. Task & Finish (T&F) groups made this collaboration easier, building up networks that lasted beyond the T&F Group effort was delivered.

6.20. Our working practices evolved into such an efficient, effective manner that I was left feeling that this is what true multi-disciplinary collaboration could and should be.

The extent to which applicable structures and policies were utilised and/or complied with and their effectiveness

6.21. Please see paragraphs 6.1 to 6.2.

6.22. In addition to the statements that I made in paragraphs 6.1 to 6.2, I would like to comment upon the SPI-B structures.

6.23. Unlike SPI-M and the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG), SPI-B is not a standing committee. We had to stand up to support the Covid-19 response without any tried and tested structures and processes built into our ways of working. The Secretariat had to be built around us, and we expended a lot of time and energy setting up structures, TORs, reaching out to participants and identifying ways of working while also trying to respond to Covid-19. Paragraph 6.4 indicates that we took 11 days to put everything in place to hold our first full SPI-B meeting (24th February 2020) from the point of being asked to do so on 13th February.

6.24. The early days of the response were absolutely non-stop. It was impossible for a single point of contact to sign off on all of the activity taking place whilst trying to set up SPI-B. I supported Professor James Rubin and the Secretariat as much as I could during this time, but we are very lucky that Professor James Rubin was on sabbatical to enable this. I was happy to step into the deputy-chair role to relieve some pressure, and happy to step into the co-chair role when asked to do so.

6.25. The co-chair approach worked very well. Our structures demanded engagement and oversight across many areas. Professor James Rubin, Professor Lucy Yardley, and Professor Ann John were unfailingly professional and committed to the response throughout.

6.26. We couldn't have done any of this without the unfailing support of the SPI-B and SAGE Secretariats. We evolved the processes and systems together. There were difficult issues to manage (e.g., delayed publication of advice, some aspects of SPI-B participant engagement with the media and Indy-SAGE, workloads, and more).

6.27. The SAGE Secretariat listened to and responded to our concerns honestly and openly at all times, even when some of the issues could not be addressed easily or quickly because of systematic challenges.

6.28. Our approach to presenting evidence also evolved as we grew in experience. Collective SPI-B and SPI-B Secretariat insights into commissioning, structuring and presenting our work, presenting uncertainty, and 'landing' our work were all areas that changed in positive ways across the pandemic. The support that the SPI-Secretariat and SAGE Secretariat provided in ensuring that our advice reached as many ears as possible through teach-ins, and more, was transformative.

7: Lessons that can be learned

7.1. This has been the most challenging and most rewarding scientific engagement I have experienced throughout my career. There have been moments when many of us have been exhausted. This is balanced out by observing the immeasurable energy, dedication, and commitment of colleagues to provide evidence and advice that could save lives and decrease the negative impacts of interventions.

7.2. It is important to recognise the (many) things that worked well to ensure that we carry these practices into the future.

(1) **Clarity around roles (Strength):** The internal clarity around our roles, remit, and purpose on SPI-B, SAGE, and for the other SAGE sub-groups was excellent. Our TORs and constant sense-checking to identify 'owners'/responsible departments kept us focussed and increased the possibility of our advice landing well.

(2) **The value of independent advice (Strength):** The expectation that we were there to act independently and to speak truth to power underpinned everything that we did. The value placed on our independence and the strength (even ferocity) of GO-Science in protecting our independence was appreciated beyond belief. Political pressures were not allowed to enter the room. Sir Patrick Vallance, Sir Chris Whitty, and the SAGE Secretariat managed these challenges behind the scenes.

(3) **Respect (Strength):** Sir Patrick Vallance and Sir Chris Whitty were absolutely brilliant chairs who kept us well-informed focussed. Their leadership was unfaltering. They expected robust discussion and debate but ensured that this was done in a respectful manner. This is a difficult feat in fast-paced, pressurised environments. They were surrounded by a talented, capable, and dedicated Secretariat.

(4) **Support (Strength):** We have been involved in the Covid-19 response, but we have also been living through a pandemic. We were allowed to be human as we worked from home, delivered our university roles, and managed the impacts of Covid-19 on our health and well-being as well as the health and well-being of those close to us. The pressure of deadlines could disappear in an instant and be absorbed by other parts of the system if and when SPI-B, SPI-M, EMG, and SAGE participants needed to step away for a limited or extended period of time.

SAGE well-being checks and security advice sessions were greatly appreciated. The reminders that these services were available if needed were welcome. Whether or not they were needed, the benefit of knowing that help and support was available was significant.

(5) **Collaboration across the disciplines (Strength):** I pray that we will not require another response on this scale and across this period of time. I also worry that the collaborative, multi-disciplinary effort that has become such an asset and such a natural way of thinking about responding to extreme events will lose its recognition and momentum as we return to our disciplinary silos.

There is much that we can do to prevent this, including setting the expectation that evidence from across the disciplines will underpin all of our future our planning, response, and recovery plans.

7.3. It is equally important to consider the aspects that were more challenging to ensure that we design systems and practices that decrease the likelihood of occurrence, or that we are, at the very least, aware of and prepared for them.

(1) **Clarity around government roles is too rigid at times (Challenge):** Important issues floundered without 'customers' (government departments) who could be single-issue focused or too narrow in their view of issues that were in their power to address. Task & Finish groups helped address this to some extent as they enabled us to engage with multiple potential customers who could hive off the elements that were relevant to them.

(2) **Lack of media and public understanding of independent science advisory roles and processes (Challenge):** In spite of the high levels of internal clarity, we must work on external understanding of the role of independent scientific advisors and scientific evidence in policy-making.

This must be a public dialogue carried out prior to extreme events taking place. The lack of public understanding enabled the media to frame SAGE scientists and politicians as combative and undermined trust in the evidence, as well as trust in the decisions.

Simple explanations and illustrations of the process would, at the very least, help the media understand that SAGE processes create a 'safe space' for policymaking.

For example, we provide advice, and Ministers have time to consider that advice. The advice will not be released until a decision is made to avoid putting pressure on the decision-makers. Advice is only released once a decision is made. The lack of understanding about this process/sequencing better-enabled the media to set us (SAGE and decision-makers) against one-another. This was constantly framed as 'SAGE is angry' or 'SAGE is too powerful' when neither was true.

The role of science advisors in providing advice, not decisions is an important concept to drive home.

(3) **The de-valuing and undermining of independent scientific advice (Challenge):** Government tendencies to make policy decisions by leaking information to test the water undermined the value of independent advice and the trust that should exist between independent scientific advisors and decision-makers.

The 'safe space for policy-making' did not always translate into feeling like we were in a safe space for science advice in light of public displays of 'throwing scientists under the bus', and misinformed, biased, inaccurate, and politically motivated formal committees (i.e., Science & Technology Committee). Our structures and processes helped us to maintain our focus during these events.

Clear expectations about Ministerial behaviour need to be created, with the potential to follow-up on inaccurate statements about the remit of SAGE and the quality of advice received. Failure to do so risks undermining the entire system of independent science advice.

Similarly, clear expectations and guidance about academic media engagement when standing in an independent science advisory role would benefit from co-development across the disciplines.

(4) **The challenge of landing behavioural and social science advice (Challenge):** Collaboration across the disciplines was one of the most impressive and rewarding aspects of the SAGE response. In spite of this, SPI-B contributions struggling to realise their full potential at times, even during collaborative reporting.

This is disappointing in light of the number of SPI-M and SAGE reports concluding that, without a vaccine, health outcomes were primarily determined by behaviours. Even with a vaccine, behaviours have a significant role to play (e.g., vaccine uptake, ventilation behaviours, isolation if testing positive, etc.).

We must dissect and, where possible, address this challenge to ensure that SPI-B advice is as effective and impactful as it can be throughout

future SAGE responses. Areas for consideration include, but are not limited:

(1) **Awareness of, confidence in, and understanding the data:** Policy-level familiarity with and understanding of the robust, well-tested theoretical and methodological procedures underlying behavioural and social science data could be improved. A systematic approach to understanding these aspects of the policy-world, and to increasing knowledge and understanding of the potential of behavioural and social science data sources to inform and improve the effectiveness of our emergency planning, response, and recovery efforts would be of value for future SAGE responses.

(2) **Ability to present and summarise different types of data:** The behavioural and social sciences generate diverse outputs that can be challenging to translate into SAGE-ready inputs. This is a concern as research into extreme events draws upon qualitative methods frequently (e.g., flood diaries, focus groups). This data can sit comfortably alongside and enhance the quantitative evidence generated in each area. Additional effort should go into creating a shared behavioural and social science standard and understanding of the effective presentation of evidence to science advisory committees such as SAGE.

(3) **Structures to enable greater effectiveness:** Unlike SPI-M and Nervtag, SPI-B is not a standing committee. We had to stand up to support the Covid-19 response without any tried and tested structures and processes built into our ways of working. The Secretariat had to be built around us, and we expended a lot of time and energy setting up structures, TORs, reaching out to participants and identifying ways of working while also trying to respond to Covid-19. I have already noted (paragraphs 6.3 and 6.23) that we took 11 days to hold our first full SPI-B meeting (24th February 2020) from the point of being asked to do so on 13th February.

We have the potential to increase our familiarity and understanding of SAGE processes and the shape of reporting required if we have the

opportunity to engage with systems through practice/more regular engagement. At the very least, it would be useful to include SPI-B reporting in SAGE exercises.

(5) **Returning to our disciplinary silos (Challenge):** I worry that the collaborative, multi-disciplinary effort that has become such an asset and such a natural way of thinking about responding to extreme events will lose its recognition and momentum as we return to our disciplinary silos. There is much that we can do to prevent this, including setting the expectation that evidence from across the disciplines will underpin all of our future our planning, response, and recovery plans.

(6) **SPI-B Media Engagements (Challenge):** GO-Science is very supportive of scientists speaking to the media.

They emphasised the importance of our independent views on this front repeatedly. SAGE and SAGE sub-group participants are welcome to speak to the media in their personal capacity (i.e., not speaking on behalf of SAGE or SAGE sub-groups).

SPI-B participation with the media was challenging, placing a great deal of pressure on the SPI-B co-chairs to manage the dynamics between SPI-B sub-group participants engaging with the media, and SAGE/Ministerial frustration with what was being said. Some of our members were targeted by the mainstream and social media for sharing their views. We were not the only sub-group to struggle with this.

Additional thought, time, and guidance must be provided to participants in future SAGE engagements. Social and behavioural scientists are often required to consider the policy implications of their findings, while the SAGE preference is that they only speak about the evidence and not the implications. Co-creation of effective guidance and practice in this space would be valuable for future SAGE responses.

(7) **Lack of transparency across other sources (Challenge):** Lack of transparency of the other sources of information and advice considered by policymakers. SAGE advice is only one stream of advice that Ministers must consider when making decisions. Where possible, a

move towards transparency in decision making during extreme events would enable all parties to understand the challenges of decision-making in this space, and the trade-offs that decision-makers are forced to make. Consideration should be given to enabling other advisory bodies to adopt a transparent/publication of advice approach where possible.

(8) **Data and Information flows (Challenge):** SPI-B and other SAGE sub-groups struggled with a lack of access and, at times, the inability to cite sources of data (e.g., Cabinet Office polling, DHSC focus groups). Some of this information appeared to be restricted as a result of over-enthusiastic use of Official-Sensitive designations. SPI-B was also over-reliant on self-report data. Additional thought must go into more diverse evaluation of interventions. Finally, SPI-B was challenged by the Infodemic, where information was flowing in at such speed that it was challenging to manage and challenging to assess the quality at times.

(9) **Sexism:** This is certainly not the norm, but there were some obvious instances in the treatment of the SPI-B female participants by very small number of SPI-B colleagues.

Some of this took the form of micro-aggressions, while others were more obvious. The female participants were experienced enough to be able to manage incidents of sexism, but they should not be forced to do this.

Some of these interactions were noticed and commented on by other colleagues. One of the engagements moved beyond robust acceptable discussion to the extent that the SAGE Secretariat were informed. Additional guidance or training may be needed on this front for SAGE and SAGE sub-group participants.

Other challenge areas that improved with time:

Processes:

7.4. Lack of awareness about what policy makers were worrying about, focusing on, taking away from our reports (gains made).

7.5. Initial commissioning (significant improvements)

7.6. The time that it took to convey the importance of designing policy so that it impacts on the most disadvantaged least (great gains made here).

7.7. Difficult to judge our impacts. Teach-ins helped here, though it is still difficult to understand how and where our advice was translated into policy at times.

7.8. Wonderful collaborations with government departments where it was evident that the Civil Servants understood the issues inside out. Translation into policy did not always seem to reflect understanding and certainty.

7.9. Lack of clear targets for behaviours, prioritisation of easier interventions (mostly communications). This improved on some fronts when we adopted the use of SPI-B/departmental roundtables to discuss what could be done in the areas that were being considered for commissioning, as well as through the use of scenarios during Task & Finish Group projects.

Consider for the future:

7.10. **Create a process for addressing issues of concern without a clearly identifiable responsible customer (see paragraph 7.3, 1).** This will ensure that aspects of the response do not fall through the cracks if they do not fit the remit of a single department. Task & Finish Groups can be effective in this space.

7.11. **Consider developing a public dialogue (e.g., proactive educational and/or media campaigns, etc.) to explain the ways in which scientific evidence informs policy making**. This will have the added benefits of building trust in the decision-making processes, making science careers and pathways more interesting and attractive, and in creating a well-informed media base for future extreme events. to address lack of public understanding enabled the media to frame SAGE scientists and politicians as combative and undermined trust in the evidence, as well as trust in the decisions (see paragraph 7.3(2)).

7.12. **Co-design clear expectations about ministerial and scientific advisor behaviours during emergencies** (see paragraph 7.3(3)).

7.13. **Improve the ability of behavioural and social scientists to have their advice realise its full potential.** This may include making SPI-B a permanent,

standing SAGE committee similar to SPI-M (i.e., not requiring a standing start when activated). Other options include:

(a) Improving awareness of, confidence in, and understanding of behavioural and social science data;

(b) Creating and shared behavioural and social science standard and understanding of the effective presentation of evidence to science advisory committees;

(c) Creating standing structures that enable social and behavioural scientists to increase their familiarity and understanding of SAGE-worthy outputs and processes.

(d) Including SPI-B reporting in SAGE exercises. (see paragraph 7.3.(4)).

7.14. **Set the expectation that evidence from across the disciplines will underpin all of our future our planning, response, and recovery plans** (see paragraph 7.3(5)).

7.15. **Develop a Chief Medical Officer level role for behavioural and social science.** We need someone with the authority of the Chief Medical Officer to ensure that the behavioural and social science evidence is being generated, interrogated, valued, and understood when communicated to Ministers and beyond. Establishing a figure of authority in this type of position would better enable us to reap the rewards of adopting an approach based on collaboration amongst equals across the sciences and evidence-based policy-making landscape. This would also go some way in addressing many of the challenges identified above, and implementing actions to consider for the future.

8: Documents that I hold

8.1. I hold several different types of documents including:

(1) Emails related to SAGE, SPI-B, SPI-B Sub-group, and Task & Finish Group reporting and management.

(2) Handwritten notes from meetings.

(3) WhatsApp messages with colleagues

(4) Slides/presentations for teach-ins and other engagements where I shared my thoughts about SPI-B and evidence-based policymaking.

(5) Drafts of reports with comments/edits.