Witness Name:
Professor Susan Michie
Dated: 07/10/2022
Ref: M2/SAGE/01/SM

COVID-19 INQUIRY – MODULE 2

Questionnaire Response – Professor Susan Michie

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

Qualifications

1.1. The following table outlines my qualifications:

Table 1 – Qualifications

1976	B.A. in Experimental Psychology, Oxford University
1978	M.Phil in Clinical Psychology, London University
1982	D.Phil in Developmental Psychology, Oxford University
1978	Chartered Clinical Psychologist, British Psychological Society
1993	Chartered Heath Psychologist, British Psychological Society

Employment History

1.2. The following table outlines my employment history:

Table 2 – Employment History

2002-Present	Professor of Health Psychology and Director of the Centre for Behaviour Change, University College London.
1982-84	Clinical Psychologist, Guys Hospital

1984-91	Clinical Psychologist and Hon Lecturer in Developmental Psychology, Royal Free Hospital School of Medicine
1989-2002	Senior Research Fellow in Clinical Health Psychology (p/t after 1993) Royal Free and University College Medical School
1991-2002	Senior Clinical Psychologist and Hon Senior Lecturer in Health Psychology Royal Free Hospital School of Medicine
1993-2002	Deputy Director, Psychology and Genetics Research Group King's College London
1993-1996	Research Fellow, King's College London
1996-2001	Senior Research Fellow, Kings College London
2001-2002	Reader in Health Psychology, Kings College London
2002-	Co-Director, Centre for Outcomes Research and Effectiveness, University College London
2002-	Director of Health Psychology Research Group University College London
2002-2012	Director of Health Psychology Research C&I Mental Health & Social Care Trust, Camden and Islington PCTs
2002-	Honorary Consultant Clinical Psychologist Camden and Islington Mental Health and Social Care Trust
2002-2006	Reader in Clinical Health Psychology, University College London
2005-	Chair in Health Psychology, Department of Psychology University College London
2006-2009	Senior Scientist, MRC Health Services Research Collaboration (p/t secondment) University of Bristol
2009-2015	Co-director, National Centre for Smoking Cessation and Training UK
2013-	Director, Centre for Behaviour Change University College London
2015-2018	Scientific Advisor, National Centre for Smoking Cessation and Training, UK
2018-2023	Co-Director, Policy Research Unit in Behavioural Science Department of Health and Social Care

Professional Expertise

1.3. I am considered a global leader in behavioural science; my research focuses on behaviour change in relation to health and the environment: how to understand it theoretically and apply theory to intervention development, evaluation and implementation. My research, collaborating with disciplines such as information science, environmental science, computer science and medicine, covers population, organisational and individual level interventions. Examples include the Human Behaviour-Change Project and Complex Systems for Sustainability and Health. I am an investigator on more than 15 research projects and have published over 500 journal articles and several books, including the Behaviour Change Wheel: A Guide to Designing Interventions.

Publications

1.4. I have 580 publications, with the top 5 cited below:

1.5. Developing and evaluating complex interventions: the new Medical Research Council guidance; P Craig, P Dieppe, S Macintyre, S Michie, I Nazareth, M Petticrew 2008 BMJ 33, 10413 citations: This paper resulted from my work with the Medical Research Council's Health Service Research Collaboration which produced guidance aimed at increasing the effectiveness of trials of complex interventions and hence, knowledge that could be used to improve population health. It was very widely taken up in proposals and protocols for research, especially in the UK.

1.6. The behaviour change wheel: a new method for characterising and designing behaviour change interventions; S Michie, MM Van Stralen, R West 2011, Implementation science 6 (1), 1-12. 8576 citations: This paper reports a new, integrative framework for designing and evaluation of behavioural interventions. It was based on work that identified and synthesised 19 existing, partial and overlapping frameworks. It has had significant global impact on research investigating a wide range of behavioural interventions.

1.7. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide

1.8. TC Hoffmann, PP Glasziou, I Boutron, R Milne, R Perera, D Moher, ... S Michie 2014, Bmj 348. 5393 citations: This paper is the result of an international, multidisciplinary collaboration aimed at improving the reporting of interventions, on the basis that poor reporting has led to slow and inefficient accumulation of knowledge across clinical and public health domains.

1.9. The behaviour change technique taxonomy (v1) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions: S Michie, M Richardson, M Johnston, C Abraham, J Francis, W Hardeman, 2013, Annals of behavioural medicine 46 (1), 81-95. 5028 citations: This paper has transformed behavioural science as previously there was no systematic and shared way of specifying the 'active ingredients' of behavioural interventions. It has led to much improved intervention design and evaluation, evidence syntheses and implementation of effective interventions.

1.10. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science EA Holmes, RC O'Connor, VH Perry, I Tracey, S Wessely, L Arseneault, 2020 The Lancet Psychiatry 7 (6), 547-560. 4479 citations: I was invited to join this group of eminent international scientists early on in the Covid19 pandemic to provide a behavioural science lens in developing recommendations for mental health science within the pandemic context.

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

2.1. I participated in SPI-B between 2 March 2020 and 3 Feb 2022; I attended SAGE on three occasions; meetings 18 (23rd March 2022), 73 (17th December 2020) and 87 (22 April 2021).

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

When and how you came to be a participant

3.1. I was invited to be an inaugural participant in SPI-B on 19 February 2020 and its first meeting was held on 24th February: The first meeting I attended was I think its second.

The number of meetings you attended, and your contributions to those meetings

3.2. I attended 20-25 meetings between 2 March 2020 and 3 Feb 2022. I contributed to discussion at most meetings I attended, reflecting my knowledge of the theory, methods, evidence and practice of behavioural interventions; my experience of having participated in SAGE in 2009 on the H1N1 pandemic and conducting research relevant to this pandemic; and my more general public health expertise having worked in the behavioural aspects of public health over 20+ years.

Your role in providing research, information and advice

3.3. I provided advice and relevant research and information verbally during meetings, via email for inclusion in reports and by drafting or commenting on reports drafted by other participants. This reflected my experience summarised in the point above and other expertise in communication and public engagement.

4: Summary of documents to which I contributed for the purposes of advising the groups above:

4.1. I contacted Go-Science on 11 September 2022 and requested a summary of documents to which I contributed for the purpose of advising the relevant groups, including links to these documents where possible. Unfortunately, Go-Science do not hold complete records of participants contributions to documents in this way and they were only able to provide me with the dates of the meetings that I attended and links to the publicly available minutes for those meetings.

4.2. This required me to search a large data set of minutes and supporting documents for the documents that I contributed to. As this was extremely time consuming, and in the interests of providing a prompt response to the Inquiry, I have provided a summary of documents based on my own best recollection and the material available to me.

I contributed to many SPI-B reports and co-led three. As with all SAGE/SPI-B reports, they addressed questions posed to us by Government:

4.3. The following reported a piece of work that required a very fast turnaround. It identified options for maximising adherence to the two social distancing measures that were seen as most important at the time: 1. General social distancing by everyone and 2. Shielding for vulnerable people for at least 12 weeks. It used a framework 'The Behaviour Change Wheel' to identify 10 options for promoting social distancing: types of education, persuasion, incentivisation, and coercion. For promoting shielding of vulnerable people, four options were identified covering types of incentivisation, coercion, and enablement: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/882722/25-options-for-increasing-adherence-to-social-distancing-measures-22032020.pdf

4.4. The following addressed the possible impact of the COVID-19 vaccination programme on adherence to rules and guidance about personal protective behaviours aimed at preventing spread of the virus and how any adverse impacts may be mitigated. We recommended implementing: a) A culturally tailored communication strategy targeted and stratified by different sectors in society to ensure that people fully understand why it is vital to continue to adhere to protective behaviours, whether or not they have been vaccinated, b) Using both vaccination appointments as opportunities to communicate the importance of continuing protective behaviours, c) ensuring that people realise that vaccination, however effective, leaves some risk, and ensure that communications promoting vaccination do not unintentionally undermine communications promoting adherence to protective behaviours, e) Adding monitoring of vaccine status and vaccine-related beliefs and behaviours to existing monitoring of adherence to Covid-19 rules and guidance, and e) Developing a system of rapid alerts to allow timely intervention if adherence starts to fall. https://www.gov.uk/government/publications/spi-b-possible-impact-of-the-covid-19-vaccination-programme-on-adherence-to-rules-and-guidance-about-personal-protective-behaviours-aimed-at-preventi

4.5. The following addressed how to sustain Covid protective behaviours in the long-term as legal restrictions are eased, as we moved from a rules-base to a risk assessment/management approach. We concluded that maintaining low levels

of transmission will require continuing policies that promote COVID-19 protective behaviours. We advised that what was needed was a multi-layered, multifaceted approach to long-term behaviour change with the co-ordinated participation of an array of public and private sector organisations rather than a series of separate interventions. Governance of the design and implementation of policies was advised to be important in achieving this: the design and implementation of each policy would benefit from being supported by technical expertise, a logic model, co-production between internal and external stakeholders and a scientific evaluation plan. https://www.gov.uk/government/publications/spi-b-sustaining-behaviours-to-reduce-sars-cov-2-transmission-30-april-2021/spi-b-sustaining-behaviours-to-reduce-sars-cov-2-transmission-22-april-2021 Whilst this was 'published' by SAGE in April, it was held back from release by Government till July 19, 'Freedom Day'.

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

5.1. Michie S, West R, Rogers MB, Bonell C, Rubin GJ, 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, 945–956. 10.1111/bjhp.12428: This article focused on the methodology of producing advice in a very rapid timescale (3 days) and issues relevant to implementation of the options identified in the SPI-B report using a framework called APEASE. We stressed the tentative nature of advice presented in such a short timescale and identified uncertainty around equity issues and the potential for differential effects of interventions on advantaged and disadvantaged sections of society, which suggested that this is an area requiring more research. The translation of scientific advice into policy and practice was discussed, including that it can lead to unintended consequences with the potential to undermine the rationale informing the advice (e.g., policing sun-bathers who were following the 2 metres apart rules of social distancing in parks). We advised that thought should therefore be given to ensuring that the principles underpinning behavioural science-based advice are not lost in translation between the point of advice and the point of delivery.

5.2. Michie S, West R, Pidgeon N, Reicher S, Amlôt R, Bear L. (2021) Staying 'Covid-safe': Proposals for embedding behaviours that protect against Covid-19 transmission in the UK. British Journal of Health Psychology, 26, 1238–1257. 10.1111/bjhp.12557 : This article maintained that embedding infection control behaviours in the long-term will require a co-ordinated programme to shape the financial, social, and physical infrastructure so that people in all sections of society have the capability, opportunity, and motivation needed to embed 'Covid-safe' behaviours into their everyday routines. This requires building Covid-safe educational programmes, regulating to ensure minimum standards of safety in public spaces and workspaces, using communications and social marketing to develop a Covid-safe culture and identity, and providing resources so that all sections of society can build Covid-safe behaviours into their daily lives.

5.3. Article written in response to the misleading term "behavioural fatigue" that had been ascribed inaccurately to SAGE/SPI-B: Michie S, West R & Harvey N. (2020) The concept of "fatigue" in tackling covid-19. BMJ; 371:m4171. 10.1136/bmj.m4171: It outlined three scientific meanings of fatigue: a) A subjective feeling of mental or physical tiredness, which can be caused by mental or physical exertion, sustained activity, lack of sleep, or a health condition, b) An impaired ability to perform a mental or physical task as a result of depleted mental or physical resources, c) Distress resulting from prolonged exposure to an aversive set of circumstances. We conclude that, overall, in the UK, we had not yet seen evidence for the kind of decreasing trend in compliance with regulations that could be construed as fatigue, but that there were substantial capability, opportunity, and motivational factors that could be contributing to lower levels of adherence than are needed to prevent the spread of the virus.

5.4. There have been 16 articles to date reporting the findings of the CORSAIR study commissioned by the Department of Health and Social Care to inform communication and potentially policy (https://osf.io/gfs9x/). The first is: Smith, Potts, Fear, Michie, Rubin (2021) Adherence to the test, trace and isolate system: results from a series of 37 nationally representative surveys in the UK (the COVID-19 Rapid Survey of Adherence to Interventions and Responses

[CORSAIR] study) *BMJ*;372:n608. https://www.bmj.com/content/bmj/372/bmj.n608.full.pdf

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

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

6.1. SPI-B: Excellent quality, range and diversity of expertise. The groups worked well together and were able to produce about 30 reports often with very tight deadlines.

6.2. SAGE: Lacked public health expertise, especially those with experience of public health during pandemics. It was very large and my experience of the three meetings I went to was that there was a very packed agenda and not time to deliberate sufficiently on topics. This is in contrast to 2009 when I was a member of SAGE and there was I think fewer than 20 scientists and there was time to discuss topics in depth when needed. The lack of public health, and specifically pandemic public health, was one of the reasons that Independent SAGE was formed.

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

6.3. SPI-B was only allowed to provide advice on specific issues about which Government had sought advice. There was no mechanism for us to suggest areas in which we thought our advice would have been helpful in (e.g. enabling behaviours to reduce transmission, reducing harm and inequalities). Some of the commissions were hard to understand and seemed quite restrictive.

6.4. We were referred to as participants and were not allowed to describe ourselves as members of the group/s. This was explained as reflecting our temporary nature with the implication that we could be removed at any time but it was not clear who would take this decision and on what basis. This is unlike any other scientific advisory group I have sat on and seems to undermine our status as independent of the Government and civil service.

The resources and support that were available

6.5. The resources were minimal for the work that was needed, so many of us were working evenings and weekends in addition to very busy day jobs. Occasionally some research support was provided if a suitable person happened to be identified. The Go-Science secretariat were very well organised, supportive, helpful and professional and I only have praise for those I worked with there.

The advice given and/or recommendations that were made

6.6. There were about 30 reports produced by SPI-B with I estimate several hundreds of pieces of science-based advice; we were told we were not allowed to provide evidence-based policy recommendations. On some occasions, it did not feel like we were giving our scientific advice completely independently as we were given many steers about what would or would not be acceptable in terms of scope, messages, language and reference to policy.

6.7. Many of us have worked with Government policy makers for years or decades and know that for policy makers to engage with scientific advice it is important to talk in terms that they can easily understand, and that often means giving concrete examples of what we are referring to. However, we were given strict instructions not to 'stray into policy areas' and were not allowed to make recommendations. In the 'sustaining behaviours in the long-term' SPI-B report, the writing group included examples of policies that would be consistent with the various pieces of advice. We were instructed by the CSA to take these out. The mantra – 'scientists advise, politicians decide' is of course correct. However, this should not prevent understanding that there is a translational pipeline between scientific evidence and it being understood in order for it to influence policy and practice. Providing scientific advice is about enabling scientific evidence which is often very foreign to those who might use it, to be comprehensible and useable. In my experience having direct communication between scientists and policymakers can lead to the scientists having a better understanding of the policy context and policy makers having a better understanding of the science.

6.8. There is a science to this process (indeed a journal called *Implementation Science*) but this was never drawn on to inform the process of translating

evidence into policy and practice. I raised this a few times at SPI-B, including with the CSA, but there was no interest in using this evidence to improve our translational work. This is understandable in the context of an emergency but should in my view be taken on board in reviewing processes for the future.

6.9. There were many substantive pieces of advice that did not appear to have shaped Government policy or practice: behaviour-specific communication, engage with communities, don't blame or punish; support and enable and long-term maintenance of behaviour

6.10. There were gaps between scientific advice given and policy and practice observed; six examples are provided below:

Behavioural fatigue

6.11. The term 'behavioural fatigue' in relation to a pandemic appears to have been introduced into SAGE and Government discourse as a justification for delaying lockdown, with negative consequences. It was not a behavioural science term (e.g. it did not feature in behavioural theories and there was no measure of it) and it was not a term that originated from SPI-B nor were SPI-B consulted about it. No-one admits introducing it although when Dr David Halpern, a Government Covid advisor, was asked by a Select Committee whether it originated from him, he said no and later said he couldn't remember.

6.12. A petition signed by more than 600 psychologists and behavioural scientists challenged its use and asked to see the evidence on which it was based or to withdraw it as a concept to be used to inform policy: *"If 'behavioral fatigue' truly represents a key factor in the government's decision to delay high-visibility interventions, we urge the government to share an adequate evidence base in support of that decision. If one is lacking, we urge the government to reconsider these decisions."*(https://behavioralscientist.org/why-a-group-of-behavioural-scientists-penned-an-open-letter-to-the-uk-government-questioning-its-coronavirus-response-covid-19-social-distancing).

6.13. There is a BMJ article (authored by myself, SPI-B members West and Harvey and summarised above) explaining the unscientific way in which the term had been used in the context of adherence to Covid19 rules. The term had several negative consequences, undermining both policy and science: A) The term was

used by CMO Whitty in a 9th March press conference, suggesting that people would get tired of adhering to restrictive rules so it was important not to ask people to do this too early e.g. the CMO saying "There is a risk that if we go too early, people will understandably get fatigued and it will be difficult to sustain this over time" (https://www.youtube.com/watch?v=Yc1alOEjDVA), b) The term was taken up by the UK media, attributed to unnamed experts, despite there being clear evidence of people working from home without Government advice to do so, c) It was taken up internationally e.g. a WHO report using that term in its title. Despite its title, the report was actually about waning motivation to adhere to protective restrictions, not 'fatigue' (which means tiredness). In science, precision of terms is important for understanding and policy implications, d) Despite Vallance stating on 12th March said the decision to delay was not based on behavioural science (implying that the term did not come from SPI-B), it undermined psychology and behavioural science, as argued by SPI-B member Professor Stephen Reicher in a Guardian article (24 June 2021), e) It enabled behavioural scientists to be blamed for the delayed first lockdown which cost many lives. For example, Dominic Cummings in testimony to a House of Commons hearing, attributed lockdown delay to 'charlatan' behavioral scientists who were said to have pronounced that *"the British public will not accept a lockdown or what was thought of as an east Asian-style track and trace-type system".* In testimony to a House of Commons Health and Science Committee, (June 2021) Health Secretary Hancock blamed unnamed 'behavioral science' for the advice to delay.

6.14. These following are relevant excerpts from SPI-B and associated SAGE minutes which make it clear that behavioural science advice within these structures were not to delay lockdown and did not invoke the concept of 'behavioural fatigue':

- **Minutes of SPI-B of 12th March** state *"While there may be concerns about the sustainability of adherence for difficult behaviours such as entering isolation for weeks or months, it is not clear that these concerns apply to the specific context of making day-to-day adjustments to reduce social contact. We are concerned that our comments about the difficulty of maintaining behaviours should not be used as a reason for not*

communicating with the public about the efficacy of the behaviours" and *"Expectations of how the Government will react will be set by media reports public health strategies in other countries. This increases the risk of public concern if interventions that are perceived to be effective are not applied. A clear explanation as to why expected interventions are not being implemented may be necessary."* Interventions here include lockdown: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/874289/13-spi-b-insights-on-public-gatherings-1.pdf

- **Sage minutes of 13th March:** At clause 29 state that **'***There is no strong evidence for public compliance rates changing during a major emergency. There is, however, a link between public anxiety and protective behavioural change'* and at clause 30 state that *'Difficulty maintaining behaviours should not be treated as a reason for not communicating with the public about the efficacy of the behaviours and should not be taken as a reason to delay implementation where that is indicated epidemiologically'*. The behaviours referred to in Clause 30 include social distancing and adhering to lockdown.

Behaviour specific communication

6.15. SPI-B/SAGE mentioned in several of their reports the importance of ensuring that communication was not only tailored to populations that the communication was aimed at but that it was clear, concise and consistent and was precise in what people were being asked to do, and why (i.e. explain the rationale). This advice was not followed when the main messaging changed to "Stay Alert" and communications became vague and imprecise, lacking precise information to guide people's behaviour and explain the underlying principles underlying the requests or demands.

Engaging with communities

6.16. A common theme of many SPI-B/SAGE reports was to provide advice about the importance of engaging, consulting with and listening to the diverse range of communities that were being asked to follow Government rules or advice,

especially those in situations that made following such rules of advice challenging. Advice was also given about ways of engaging communities, such as : communicating via trusted sources who those communities identified with, using modes of communication (media, meetings etc) that were familiar and already engaged with by those communities, using language and visual communication in a culturally sensitive way, and co-producing engagement and communication strategies with people from relevant communities. This advice was consistently not followed, to the extent that SPI-B decided to stop providing new advice in this area but rather referred back to past reports and advice.

Providing practical and material support for self-isolation

6.17. In March 2020, the Director General of the WHO, Dr Tedros, made it clear that an effective Test, Trace and Isolate system was a cornerstone of pandemic management. SPI-B provided advice based on an understanding that behaviour required the appropriate opportunity as well as the capability (e.g. knowledge) and motivation. This was supported by data from the Corsair project, commissioned by the Department of Health and Social Care, whose weekly national data were used to inform Government communication strategy. Data shared with the DHSC in the first half of 2020 showed that <50% of the sampled population reported isolating when symptomatic were isolating and also that <30% reported testing as required (https://www.bmj.com/content/bmj/372/bmj.n608.full.pdf)- These findings were based on 74 697 responses from 53 880 symptomatic people in 37 nationally representative surveys. These surveys also found that predictors of not isolating were low income job and financial hardship, with reasons given for non-adherence including barriers of work, low income and employment insecurity, caring responsibilities outside of the home, and having to go out to get provisions.

6.18. Informed by these data, SPI-B and SAGE advised the Government to provide financial and tangible support. Whilst some financial support was offered, very few were eligible and of those applying, very few were allocated grants. The amount of money was very low, less than the minimum wage and much less than that provided by other European countries.

6.19. See also, the paper titled 'The impact of financial and other targeted support on rates of self-isolation or quarantine' [SPI-B: 16 September 2020] which made the following key points:

- The effectiveness of the NHS test, trace and isolate system in reducing transmission of SARS-CoV-2 depends critically upon self-isolation of people who may have COVID-19 and their contacts.
- Current rates of full-self isolation are likely very low (less than 20%) based on self-report. They are particularly low among the youngest and the poorest, thereby likely contributing to inequalities in the impact of COVID-19.
- Self-isolation rates would likely be improved with the addition of different forms of support. These include:
  - Financial support: Ensuring that those required to self-isolate would not experience financial hardship in doing so.
  - Tangible, non-financial support: Proactive outreach is needed to identify and resolve any practical needs that people have (e.g. access to food, care for elderly relatives)

Don't blame or punish; support and enable

6.20. SPI-B was clear that the best way of enabling people to adhere to rules and advice was by taking a positive approach, avoiding blame and punishment and focusing on enabling people, rather than relying on enforcement. Key messages included: a) Provide positive feedback about the great efforts people are making to control the virus and the success these efforts are having in reducing infection rates , b) Emphasize that **everyone has an important part to play** in keeping infection levels low and avoid singling out particular activities, settings or people, c) Promote and support **positive alternatives** whenever activities that people value must be restricted, d) Help people change their environments and form new social customs to prompt and sustain new safer habits , e) Focus on helping people identify and **manage risky situations** rather than assessing 'compliance' with 'rules' and relying on enforcement

approaches, f) Target more **intensive information and practical support** where needed for specific behaviors, settings and populations.

6.21. A SPI-B report advising against using punishment - *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/887472/28-easing-restrictions-on-activity-and-social-distancing-comments-suggestions-spi-b-01042020.pdf.*

6.22. Whilst adequate financial and practical support were not provided, a fine of £10,000 for non-compliance was introduced in September 2020.https://www.theguardian.com/world/2020/sep/28/new-covid-fines-of-up-to-10000-come-into-force-in-england. SPI-B was not consulted about the introduction of the £10, 000 fine for not self-isolating when symptomatic or testing positive. SPI-B discussed risks of unintended consequences; in this case unintended consequences of such a fine would be to discourage people from testing to find out whether they were positive, reporting symptoms and providing contacts. An evaluation of a pilot of free mass Covid testing in Liverpool November 2020 found test uptake was low, especially in disadvantaged groups (https://news.sky.com/story/covid-19-liverpool-mass-testing-pilot-not-reaching-citys-poorest-people-leaked-documents-show-12158317) .

Long-term maintenance of behaviour

6.23. SPI-B was advised on how best to enable the population to maintain protective behaviours whilst the Government transitioned away from use of rules to manage the pandemic. The report was published in April 2021: https://www.gov.uk/government/publications/spi-b-sustaining-behaviours-to-reduce-sars-cov-2-transmission-30-april-2021/spi-b-sustaining-behaviours-to-reduce-sars-cov-2-transmission-22-april-2021.The report advised that to suppress Covid19 as soon as possible *and* reduce chances of future pandemics, there was a need to bring about and sustain population-wide changes in: embedding behaviours into everyday life across population, e.g. keeping physical distance, ventilating indoor spaces, wearing face masks, and moving to a risk-assessment/risk-management approach. Drawing on the COM-

Bmodel(https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-6-42), it recommended how to increase capability, opportunity and motivation to sustain behaviours in the long-term:

6.24. Increasing capability: a) Multichannel information and comms campaigns, including in schools, workplaces, venues; explain rationale for behaviors e.g. outdoors vs indoors or face coverings can reduce transmission, b) Education & training on infection risk management across educational settings: schools, FE/HE, professional development, c) Providing resources that are easily accessible and usable by all members of the community.

6.25. Increasing opportunity: Ensure that all sectors of society and organisations work together to: a) Provide practical, regulatory, and financial support for the creation of home, work, leisure and transport environments that enable maintenance of behavior, b) Maintain resource provision to communities e.g. to support Mutual Aid groups, c) Ensure people have sufficient and sustained financial and other resources, including employment protection, to maintain behavior , d) Build strong social norms around infection control behaviors to embed them culturally, as in some other countries.

6.26. Increasing motivation: Ensure that people & organisations attach high value to infection control and how this is embedded into daily lives by: a) using multiple communication channels to strengthen social-identities, values, and emotional responses around infection control, and a sense of personal control, b) having Specific community engagement initiatives with minorities and marginalised social groups and c) building habits and routines into people's lives by providing training and resources.

6.27. After SAGE released this important report in April, its publication was delayed by 3 months, the reason given to wait until July 19th, "Freedom Day". There was no publicity about the advice given in this report and no identifiable evidence of efforts to translate this into means for supporting people to keep protective behaviours going in the long-term.

The extent to which the groups worked effectively together

6.28. My experience was that the scientists in SPI-B worked very well with each other and with the secretariat. My only experience of a full SAGE meeting was of it

being dominated by an extremely large number of items and reports, and very little time for in-depth discussion. This was the first meeting I attended; for the other two I was only allowed to attend for the item at which the SPI-B report I was bringing was discussed; in all cases there was minimal engagement with the substance of the reports. In the 2009 H1N1 pandemic SAGE that I was a member of there was interdisciplinary exchange and interest and learnings across disciplinary boundaries. This was also true of SPI-B. However, my limited experience of SAGE and reports of how busy and crowded its agendas were, suggested that whilst it had participants with a wide range of disciplinary backgrounds (albeit with important gaps in public health and global pandemic expertise already noted), it had little interdisciplinary interchange.

6.29. SPB-I work was in my view limited by lack of feedback from SAGE and the other sub-groups – we were working very much in a silo. This differed from 2009 where there were smaller groups both for SAGE and its sub-groups and good communication between groups e.g. observers from SPI-B and SPI-M attending each others' groups so that we were better informed about each others' work and ways in which exchanging information could be helpful. For example, SPI-B could quickly pick up what behavioural assumptions were being made in models and improve these where needed. There was also a standing item for SPI-B matters to be brought to it by its Chair (myself); we could actively bring issues to SAGE not just wait to be handed down commissions.

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

6.30. At the beginning SPI-B was a size in which it was possible and productive to discuss issues as a group and volunteer to work on reports on topics about which we had particular expertise, experience or interest. This was also how the group operated effectively in 2009 during the H1N1 pandemic.

6.31. However, the group grew in size and this ceased, with a small 'co-ordinating group' taking decisions and others had to wait to be invited to participate in discussions and report writing. Concerns were expressed by participants that this meant little communication to those participants outside the core group. Although in response to this, an effort was made to improve this, the result was

a small active group who were relatively well informed and a large passive group who were on the periphery of SPI-B work.

6.32. Several SPI-B participants expressed frustration at the lack of feedback about what happened to our reports and advice – who were they passed to, what committees discussed them, what was the reaction, was any advice taken forward and if so how?

6.33. There are several problems about having no mechanism in place to monitor pathways of impact of scientific advice: It is demoralising for scientists who are giving up many hours a week, sometimes a day to work at great intensity on SAGE/SPI-B work, to not know whether their advice is being communicated effectively to the quarters it should be communicated to, without feedback, the nature of the advice can't improve if, for example, reports are too long or being written in too technical language, or not sufficiently connected to policy questions and issues, the infrastructure cost of supporting SAGE and all its groups was high; politicians and taxpayers alike should be able to know how well this system was working in terms of the process at least, even though impact will depend on many factors, such as the political inclinations of the Government, and the introduction of the unscientific term 'behavioural fatigue' to justify delaying lockdown may have cost lives. It is of concern that SPI-B were never consulted on the concept before its use.

7: Lessons that can be learned

7.1. The secrecy of membership, minutes and reports at the beginning of SAGE's work was concerning given the importance of public trust in advisors and advice in adherence to policies based on that advice. This secrecy was one of the reasons that a past UK Government Chief Scientific Advisor, Sir David King, formed Independent SAGE: he considered that the public had a right to know who was giving scientific advice and what that advice was. Without this, the public are unable to evaluate the relationship between Government policy and scientific advice. In future there should be openness, transparency and clear accountability of the provision and translation of scientific advice (in relation to the latter, please see earlier comments about the lack of monitoring and information about what happened to the scientific advice). For the future, I think

there should be a process agreed in advance for monitoring and evaluation the provision and translation of scientific advice.

7.2. As SPI-B/SAGE members, we were not encouraged to speak to the press and broadcasting media. Whilst we were told we were allowed to speak with them, the tone of secretariat briefings was that they were problematic and would try to trap us. It would have been more useful to have had training sessions about how to handle the media, as many of those I spoke with were intelligent, informed and wished to provide a service to the public in terms of communicating scientific knowledge and thinking. However, there were those who wrote misinformation about our advice and us as individuals and many scientists were, and still are, trolled and abused on social media.

7.3. I think a better strategy would have been to have had a broader briefing about communicating our science through all the channels between us and the public and to have offered training and support to those who wished to engage with communication beyond our scientific circles. Some of us felt a social responsibility to do this and were employed by Universities committed to public engagement with science. Some of us also suffered harm as a result, and the strategy of saying that science was divorced from policy was neither a wise one in terms of effective scientific advisory process (see my earlier comments) and did not protect scientists from attack when they expressed views based on scientific evidence and thinking that diverged from Government policy.

7.4. There were distinct groups attending SAGE, for example core independent scientists who attended on an ongoing basis; independent scientists who attended on an ad hoc basis either from other committees or invited from outside SAGE structures; scientists and advisors working for Government or Public Health England; government advisors and civil servants. These groups were never made clear and listed as such on the Government website so it was unclear who was independent and who was not, who had attended only once and who may have attended most meetings. This should be rectified in future so it was clear who was attending in what capacity.

7.5. I think there should be a core group of members of SAGE and its groups, with others brought in on an ad hoc basis depending on expertise needed at any

time. This would provide clear responsibility and accountability. The size should be commensurate with good interchange and collective decision-making. There should be more feedback to groups as to what was happening in other groups and exchange between groups should be supported e.g. contact details provided where members were happy with this.

7.6. The range of bodies and individuals advising Government was not clear or transparent, nor were lines of accountability. There was a general understanding that SAGE and its groups were the main scientific advisory structures but when comments were made that our advice didn't seem to be making a difference, we were told that there were other advisory structures in Government, we weren't the only ones. A clear example of this was when SAGE refused to shift from its advice that keeping 2m distance was safer than 1m, a 'Downing St' review body was set up to advise the nation's CMOs, but no information was provided about the advice given or who gave it. In future, clear lines of accountability should be provided so scientists, policy makers and the public are able to evaluate the relationship between scientific advice given and advice acted on.

7.7. The CORSAIR study, collecting data from about 2000 people a week in a nationally representative survey, was commissioned by Government and funded by NIHR as part of its 'sleeping' research programmes, commissioned after the research delays encountered during the 2009 H1N1 pandemic. It was conducted by a team of seven researchers, six from Universities and one from PHE; all were members of SPI-B. As independent researchers with a commitment to publishing data and sharing findings in a timely fashion with the range of constituencies (e.g. local government, charities and NGOs) who could find them useful for informing policy and practice, we were disturbed to find that we were forbidden to do this. We spent many weeks, possibly months, trying to appeal this decision, including to the CSA, Sir Patrick Vallance, without success.

7.8. I think that for the future research data that can inform policy and practice in relation to pandemic management should be allowed and encouraged to be published.

7.9. The misuse of the concept and term 'behavioural fatigue' underlines the need to have transparent, accountable behavioural science at the top of the Government; an obvious route would be to have a Chief Scientific Advisor with this expertise.

8: Documents that I hold

8.1. I have a large number of word documents from my SPI-B work in my computer folders, including draft reports, meeting notes and other documents circulated to inform our work. I also have emails to and from GO-Science secretariat and SPI-B members.