

UK COVID-19 Inquiry: Module 2 - Rule 9

Request to Professor Graham Medley - Reference: M2/SAGE/01/GM

26 September 2022

1. A brief overview of your qualifications, career history, professional expertise and major publications.

Qualifications

BSc Biology & Computer Science, University of York, 1982

PhD Imperial College, University of London, 1989

Career History

2015-	Professor, London School of Hygiene and Tropical Medicine (LSHTM)
1997-2014	Lecturer, Reader, Professor, University of Warwick
1993-1997	Lecturer & Royal Society University Research Fellow, University of Warwick
1989-1993	Honorary Lecturer & Royal Society University Research Fellow, Imperial College
1983-1989	Research Assistant, Department of Biology, Imperial College, University of London
1982-1983	Research Associate, Department of Fire Safety Engineering, University of Edinburgh

Prizes

1990	Joint award of the 1990 "Outstanding Statistical Application" from the American Statistical Association for Medley, Billard, Cox, & Anderson (1988).
1989	Royal Society University Research Fellowship, and extension until 1997 in 1993.
2020	OBE for services to COVID-19 response
2022	Royal Society Gabor Medal for leading an interdisciplinary team of biologists, clinicians, mathematicians and statisticians who provided SAGE with epidemiological modelling expertise concerning the COVID-19 pandemic.

Professional expertise

I have worked on a wide variety of infections (first publication 1983) using a wide variety of techniques and approaches. I have provided policy advice to HMG on most, notably HIV/AIDS and vCJD. I have over 200 peer-reviewed scientific publications on the transmission dynamics of infectious diseases.

Major publications

A complete list of publications is available at: <https://orcid.org/0000-0002-0030-7278>

Perhaps most notable in the current context are:

- Medley, G.F. & Vassall, A. (2017) When an emerging disease becomes endemic. *Science* 357 (6347), 156-158. <https://www.science.org/doi/10.1126/science.aam8333>
- Green, L.E., Medley, G.F., 2002. Mathematical modelling of the foot and mouth disease epidemic of 2001: strengths and weaknesses. *Research in Veterinary Science*, **73** (3), 201-205. [https://doi.org/10.1016/S0034-5288\(02\)00106-6](https://doi.org/10.1016/S0034-5288(02)00106-6).
- McEldowney, J., Grant, W., Medley, G.F. (2013) *The Regulation of Animal Health and Welfare: Science, Law and Policy*. (Law, Science and Society). Routledge. ISBN: 978-0-415-5474-4.

I have an article submitted to a journal (an invited commentary) on the importance of consensus which I have also sent you, but please treat as in confidence until it has been published.

2. A list of the groups (i.e. SAGE and/or any of its sub-groups) in which you have been a participant, and the relevant time periods.

My role overall has been to provide support for provision of scientific evidence and advice to governments within the UK. All the meetings I attended were organised and documented by different public organisations.

- I have been academic co-chair of SPI-M-O (the modelling sub-group of SAGE) throughout the pandemic (January 2020 onwards). SPI-M-O met formally ~100 times, plus multiple other sub-group meetings and discussions from January 2020. All were organised and documented by the SPI-M-O secretariat.
- I have attended SAGE in the capacity of academic co-chair of SPI-M-O throughout the pandemic (January 2020 onwards). SAGE met formally 105 times of which I participated in 97. There were also multiple other sub-group meetings and discussions. All were organised and documented by the SAGE secretariat. The SAGE sub-groups I contributed to include:
 - Enduring prevalence sub-group
 - Care homes sub-group
 - Schools/children sub-group
 - Higher and further education sub-group
 - Nosocomial Transmission sub-group
 - Mass testing sub-group
 - Vaccine sub-group
- I attended Wales TAG from about November 2020 onwards. These were organised and documented by the relevant secretariat.
- I attended meetings with various NHS groups throughout the epidemic. These include:
 - One meeting with NHSX to discuss digital contact tracing.
 - Multiple meetings with NHSE to discuss SPI-M-O latest results and their interpretation, and hospital data and its interpretation.
- I attended multiple meetings with JBC and then UKHSA principally to support the transfer of responsibility of production of estimates of reproduction number from SPI-M-O.
- I attended meetings organised by Academy of Medical Sciences during 2020 and 2021 to discuss the two reports: *Preparing for a Challenging Winter 2020/21* and *COVID-19: Preparing for the Future* (2021). These reports were commissioned by SAGE.

3. An overview of your involvement with those groups between January 2020 and February 2022, including:

- a. When and how you came to be a participant;
- b. The number of meetings you attended, and your contributions to those meetings;
- c. Your role in providing research, information and advice.

SPI-M-O

a. I was invited to be academic co-chair SPI-M in 2017. SPI-M is a DHSC working group providing modelling evidence to support DHSC and HMG preparation for pandemic. When I joined the group was specifically focussed on pandemic influenza, but this was changed during 2019 to any infectious epidemic. The webpage and preparedness document (focussed on influenza) is: <https://www.gov.uk/government/groups/scientific-pandemic-influenza-subgroup-on-modelling>

b. I chaired the great majority of meetings. I missed single meetings Feb 2020 (pre-planned holiday), July 2020, November 2020, May 2021. Attendance is recorded in the minutes of the meetings.

I interacted closely with the SPI-M-O secretariat throughout.

Chairing involved:

- Discussing the agenda and advising on how to present questions / issues to the members to get the best engagement. I was also able to raise other areas that I thought modelling could help address and which might be useful (but which we had not been asked).
- Chairing the meeting. The principal aim was to ensure that the secretariat had sufficient information and understanding to draft the consensus statement.
- Comment on and approve the consensus statement to ensure that it was a good and fair reflection of members' discussion. Particular attention was given to the uncertainty statements.
- Addressing changes to consensus statements after SAGE meetings
- Comment on and approve the minutes of SPI-M-O meetings.
- Attending SPI-M-O sub-group meetings.
- Attending meetings throughout government (and beyond) to represent SPI-M-O and to some extent "modelling".

c. SPI-M-O provided evidence rather than advice. I did very little direct research, although I was involved with the modelling centre within LSHTM (CMMID) and read drafts of research papers and attended discussions. I have been named on several papers as a contributing author as a result of these interactions but did not lead the work.

I endeavoured actively to keep lines of communication open with all SPI-M-O members throughout the epidemic.

SAGE

a. When I had chaired SPI-M-O I presented the consensus statement to SAGE, plus any other items on the agenda that had been discussed by SPI-M-O members.

- b. I attended the great majority of meetings to which I was invited. I did not attend SAGE when I had not chaired SPI-M-O (the established plan was to have SPI-M-O on Wednesdays to feed into SAGE on Thursdays). Attendance is recorded in SAGE minutes.
- c. I was very conscious that my role was to present the evidence from SPI-M-O rather than develop the evidence into advice. I highlighted when I was speaking as an individual rather than representing SPI-M-O.

Wales TAG

- a. I was invited to attend as the co-chair of SPI-M-O to help ensure that the modelling in Wales was consistent with SPI-M-O.
- b. I attended the majority of meetings to which I was invited. The secretariat recorded attendance.
- c. I offered advice and help in developing modelling capacity and interpretation of evidence. I read and commented on draft documents. I kept SPI-M-O secretariat and others informed of developments in Wales that were of interest to the remainder of the UK.

NHS

- a. I was invited, along with other SPI-M-O members, to attend meetings with NHSE and NHSX.
- b. I attended the majority of meetings I was invited to. Minutes were kept by NHSE and NHSX.
- c. These were largely informal meetings primarily for NHSE to be able to ask clarifying questions directly to SPI-M-O members, and for members to raise issues and get better understanding of health-care challenges. The meetings with NHSX were March-April 2020 to discuss the development of the tracing app and data provision.

JBC & UKHSA

- a. I was invited, principally in my position as co-chair of SPI-M-O having been through the experience of developing and publishing estimates of reproduction numbers from March 2020 to July 2021.
- b. Many meetings, all convened and organised by JBC, UKHSA and SPI-M-O secretariats.
- c. My contribution was to advise and support development of the infrastructure for providing and publishing estimates of reproduction numbers.

4. A summary of any documents to which you contributed for the purpose of advising SAGE and/or its related subgroups on the Covid-19 pandemic. Please include links to those documents where possible.

All documents are available on SAGE website and from the different secretariats listed in question 2. I worked through the secretariats and did not submit directly as my role was chairing a sub-group.

I contributed to research papers that are included in question 1.

5. A summary of any articles you have written, interviews and/or evidence you have given regarding the work of the above-mentioned groups and/or the UK's response to the Covid-19 pandemic. Please include links to those documents where possible.

Relevant media contributions:

I gave multiple interviews and comments to many media outlets. I am unable to provide a complete list of them as I did not keep a record.

I deliberately did not discuss the above-mentioned groups and tried to steer clear of providing a commentary on the response to the pandemic as my role was to support provision of evidence to government rather than become involved in value-based and political discussion. I tried to provide scientific insight into the epidemic process. I was not always successful. Nonetheless, these four contributions give some idea of my involvement:

- BBC Newsnight interview, 13 March 2020: <https://www.bbc.co.uk/programmes/p086hjgc>
- Times interview, 4 April 2020: <https://www.thetimes.co.uk/article/boris-johnsons-coronavirus-adviser-calls-for-a-way-out-of-lockdown-rd58g6tc9>
- BBC Radio 4 interview, 1 August 2020: <https://www.bbc.co.uk/news/uk-53621613>
- Times editorial, October 2020: <https://www.thetimes.co.uk/article/scientists-shouldnt-have-the-final-word-on-covid-19-plans-hhk6hthl3>
- Book: *Coronavirus and Covid: A book for children about the pandemic*. <https://nosycrow.com/product/coronavirus-a-book-for-children-about-covid-19/>

Evidence:

I have appeared before the House of Commons Science & Technology Select Committee twice in April 2020 and February 2022.

Articles:

I have written a commentary, *A consensus of evidence: the role of SPI-M-O in the UK COVID-19 response*, for the journal *Advances in Biological Regulation* special issue which is yet to be published. I have attached a pre-print to this submission, but please treat as confidential until published.

I wrote two opinion pieces for The Guardian:

- <https://www.theguardian.com/commentisfree/2021/jul/26/when-england-peak-covid-infections-trajectory-pandemic>
- <https://www.theguardian.com/commentisfree/2021/feb/22/england-covid-roadmap-lockdown-experts-view>

I have also contributed to other's reviews but am unable to find the details at this stage.

6. Your views as to whether the work of the above-mentioned groups in responding to the Covid-19 pandemic (or the UK's response more generally) succeeded in its aims. This may include, but is not limited to, your views on:

- a. The composition of the groups and/or their diversity of expertise;*
- b. The way in which the groups were commissioned to work on the relevant issues;*
- c. The resources and support that were available;*
- d. The advice given and/or recommendations that were made;*
- e. The extent to which the groups worked effectively together;*
- f. The extent to which applicable structures and policies were utilised and/or complied with and their effectiveness.*

The effectiveness of provision of scientific evidence and advice can be approached from at least two directions. The most important is whether the evidence and advice was appropriate for and supported policymakers and decisionmakers, and I am not best placed to address that. The second, and lesser, is how the system for provision of evidence and advice worked for those providing it, and I have provided some views below.

SPI-M-O

- a. In January / February 2020 and again in June 2020 the membership and formation of SPI-M-O was actively considered. The principal consideration was to ensure that there was sufficient breadth and depth of modelling expertise to be able to address likely questions and sustain the committee through a period of intense work across the epidemic. Although I thought the epidemic would run for several years, I did not think that SAGE and SPI-M-O would be sitting until 2022. A balance had to be struck between mutual support and challenge. I believe that this was successful, and that SPI-M-O was appropriately composed.
- b. In April 2020 the commissioning procedure was changed so that all requests had to come through the SPI-M-O secretariat. Up until then, different government departments were asking separate questions directly to members. After April 2020 the system worked much better in terms of how SPI-M-O was commissioned. There was another step change in December 2020/January 2021 in terms of what SPI-M-O was asked to do. In particular, myself and the members started having direct interaction with policymakers to understand the context within which our (scenario) modelling was being used. This absolutely essential for modelling (unlike other types of scientific evidence) as a “policy neutral” model is not possible.
- c. The first few months of the epidemic felt like largely scrabbling for resources: especially data and computing power, and to a lesser extent for personnel within government to complete specific tasks.
 - a. The SPI-M-O secretariat increased capacity seamlessly and efficiently.
 - b. There is a significant issue for independent members of SPI-M-O and SAGE in terms of support for interaction with media. I had access to 3 media teams (SAGE, LSHTM and Science Media Centre) with different views on how to proceed. I suggest that thought is required for the role of and support for independent members of SAGE in terms of interaction with media and the public during an emergency.

- d. SPI-M-O provided evidence rather than advice. There was apparently limited capacity to understand the value and potential of modelling within government (as per Hine recommendation 7), at least until January 2021.
 - a. The primary value of modelling is to understand the dynamics of transmission, including potential relative scales, durations and patterns. The lines on graphs and numbers are not the most important output, although as modellers we understand that graphs and maps can be extremely persuasive and should be used with caution.
 - b. The potential of modelling is to be able to explore the entire duration of the epidemic and understand the influence of different outcomes/decisions now on future patterns. This potential was underused and, I suggest, needs to be done before an epidemic starts.
- e. The effectiveness of inter-group working increased during the early stages of the epidemic. The formation of inter-disciplinary subgroups to consider particular issues (listed in question 1) was very useful for cross-group interaction and learning. There could have been more preparedness in terms of interaction between disciplines. It would, for example, have been extremely helpful if I had met the chairs of other subgroups and members of SAGE.
- f. I do not have any views on the effectiveness of structures.

7. Your views as to any lessons that can be learned from the UK's response to the Covid-19 pandemic, in particular relating to the work of the above-mentioned groups. Please describe any changes that have already been made, and set out any recommendations for further changes that you think the Inquiry should consider making.

This is a very broad question, and it is not possible to compile all my views about these groups from all perspectives and contexts. I am happy to answer specific questions.

Nonetheless, there are several issues that might be worth considering during the Inquiry which I have outlined below.

- Data: the provision of data for modelling was not seamless at the start of the epidemic. This improved dramatically up to end of April 2020, and incrementally from then. The SPI-M-O secretariat have all the details. My understanding is that UKHSA have taken this up, and are addressing it so that at the start of the next pandemic this will be less fraught.
- Funding: SPI-M-O ran entirely on voluntary effort, which lasted much longer than anticipated when most members volunteered initially. Government appeared to be reluctant to fund work directly because of issues of independence, but this meant that SPI-M-O was entirely reliant on what members wanted to provide. Members were left seeking funding from UKRI and other bodies, which carries a relatively large overhead including writing applications and reporting progress. The breadth and depth of work that SPI-M-O was able to contribute would, in my opinion, have been improved by being able to direct members to particular areas of enquiry, although I recognise that this might not have increased the quality of evidence provided.
- Consensus: the development of scientific evidence through consensus felt slow and cumbersome at times, but ultimately improves the quality hugely and allows a wider contribution. Note that consensus does not imply “group think” – disagreement was common, but we were able to come to a consensus about the basis of the disagreement and its potential implications. Please see the commentary (in press) that I have forwarded to you.
- Government capacity: SPI-M-O provided official weekly estimates of the reproduction number for over one year (June 2020 until July 2021). This has now been taken over by UKHSA. It is not ideal that official government statistics are provided by a voluntary group. Members willingly took on the task, developing the approaches and technical underpinning rapidly, but I was often uncomfortable with the situation.
- Four nations: epidemiologically, there was one epidemic. Wales, Scotland and England are sufficiently connected by travel that transmission in one nation influenced transmission in all the others. As health is a devolved responsibility, the understanding of the epidemic (e.g. data definitions, availability etc) and the measures introduced were different. Northern Ireland was different again, with a much closer epidemiological connection to Ireland. This created a number of problems in terms of understanding and providing evidence from the SPI-M-O viewpoint. A valuable outcome from the Inquiry would be a deeper understanding of the extent to which the differences were problematic, and potential mitigations.

8. A brief description of documentation relating to these matters that you hold (including soft copy material held electronically). Please retain all such material. I am not asking for you to provide us with this material at this stage, but I may request that you do so in due course.

Communication between myself and the SPI-M-O secretariat was almost entirely through email and Slack (<https://slack.com/intl/en-gb/about>). All emails have been archived by my employer (London School of Hygiene and Tropical Medicine) and I have been informed that the SPI-M-O Slack is archived. These items contain conversations regarding all aspects of my involvement.

After 20 March 2020 all meetings were virtual (on Zoom or Teams or Google Meet) and the chat was saved for some, but none of the meetings were organised by me (so I could not save it). These were mostly “side chats” between participants about the meeting.

I have ~10Gb of electronic files archived. These are largely drafts of documents now in public domain or working files associated with meetings.

I do not have any paper documents. The majority of meetings were virtual and paperless. I took handwritten notes during meetings, but these were single word jottings to remind me of actions immediately after the meeting and discarded very soon afterwards.