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**Module 2 of the UK Covid-19 Public Inquiry**
**Request for Evidence under Rule 9 of the Inquiry Rules 2006**
**Reference for Request - M2/SAGE/01/PO**

Dear Mr Suter,

Thank you for your letter of 2 September on behalf of Baroness Hallett, Chair of the UK Covid-19 Inquiry. Taking the questions in turn:

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

   https://www.imperial.ac.uk/people/p.openshaw
   Further details and publications at https://orcid.org/0000-0002-7220-2555

   **Qualifications:** MB BS BSc FRCP FRSB FMedSci CBE

   **Career history:**
   I qualified in Medicine at Guy's Hospital in 1979. After training in respiratory and general medicine I did a PhD at the National Institute for Medical Research at Mill Hill (1985-1988), then moved to St Mary's and later merged with Imperial College.

   Having spent about 20 years working on the fundamental basis of lung inflammation (much of it in mouse models), I ran a national consortium Mechanisms of Severe Acute Influenza Consortium MOSAIC), recruiting cases of severe influenza during the influenza pandemic of 2009-2010. I now Co-Lead on ISARIC4C https://isaric4c.net/, a UK-wide consortium established to study the COVID-19 pandemic. I also initiated and ran studies of human experimental infection of volunteers and am Director of the MRC-funded HIC-Vac consortium.

   I served as President of the British Society for Immunology (2013-18) and am a member of the Academy of Medical Sciences–British Society for Immunology expert taskforce on the immunology of COVID-19.

   I lead the NIHR-funded RSV Theme within the Health Protection Research Unit in respiratory infections between Imperial College London and Health Protection England. I was Clinical Consul at Imperial for 3 years, then elected Senior Consul for 2 years and am now an Imperial Proconsul and now Chair the Imperial Together Task Group, promoting ethical behaviour throughout the university. I am an NIHR Senior Investigator.

   I became a Commander of the British Empire in 2022 in recognition for Service to Medicine and to Immunology.

   **Professional Expertise:**
   I work on the pathogenesis of viral lung disease, aiming to understand protective vs. pathogenic immunity and to find ways to modulate virus-induced inflammatory disease. Academically, my work has focused on the effects of age on immune responses, the origins disease in infancy and in immune responses of old age. I developed methods to quantify disease by flow cytometry and lung sampling.

I have studied respiratory syncytial virus (RSV) and influenza since the mid-1980s and in the 1990s, developed methods of intracellular cytokine staining of cytokines made by T cells *ex vivo* and *in vitro.* I have been involved in vaccine testing and human volunteer challenge studies.

**Publications:** I have over 300 publications listed on PubMed https://pubmed.ncbi.nlm.nih.gov/?term=Openshaw-P* an H Index of 89 on Google Scholar

**Recent selected examples:**

Ben Killingley, Alex J. Mann, … Ferguson, Peter J. Openshaw, Garth Rapeport, Wendy S. Barclay, Andrew P. Catchpole & Christopher Chiu **(2022)** Safety, tolerability and viral kinetics during SARS-CoV-2 human challenge in young adults *Nature Medicine* **28:**1031–1041.

Kousathanas, A., Pairo-Castineira, E., Rawlik, K. *et al.* Whole-genome sequencing reveals host factors underlying critical COVID-19. *Nature* (2022). https://doi.org/10.1038/s41586-022-04576-6

Evans RA, McAuley H, Harrison … Brightling CE; PHOSP-COVID Collaborative Group Physical, cognitive, and mental health impacts of COVID-19 after hospitalisation (PHOSP-COVID): a UK multicentre, prospective cohort study. Lancet Respir Med. **(2021);** 9(11):1275-1287 PMID: 34627560

Openshaw PJM. Using correlates to accelerate vaccinology. **(2022)** ; Science 375(6576):22-23. doi: 10.1126/science.abn0007. Epub 2022 Jan 6. PMID: 34990231

Muge Cevik, Nathan D. Grubaugh, Akiko Iwasaki, Peter Openshaw (2021) COVID-19 vaccines: Keeping pace with SARS-CoV-2 variants. *Cell* https://doi.org/10.1016/j.cell.2021.09.010

Thwaites RS, Uruchurtu ASS, Siggins MK, Liew F, … Semple MG, Baillie JK, Openshaw PJM (**2021)** Inflammatory profiles across the spectrum of disease reveal a distinct role for GM-CSF in severe COVID-19 *Science Immunology* 6: 57, eabg9873 DOI: 10.1126/sciimmunol.abg9873

Siggins MK, Thwaites RS, Openshaw PJM. **(2021)** Durability of Immunity to SARS-CoV-2 and Other Respiratory Viruses [Apr 8]. *Trends Microbiol*. 2021;doi:10.1016/j.tim.2021.03.016

EC Thomson, LE Rosen, JG Shepherd, R Spreafico *et al* (**2021**) Circulating SARS-CoV-2 spike N439K variants maintain fitness while evading antibody-mediated immunity. *Cell* https://doi.org/10.1016/j.cell.2021.01.037

Pairo-Castineira, E., Clohisey, S., Klaric, L. *et al.* **(2020)** Genetic mechanisms of critical illness in Covid-19. *Nature* https://doi.org/10.1038/s41586-020-03065-y

Gupta RK, Harrison EM, Ho A, Docherty AB, Knight SR, et al., **(2021)** Development and validation of the ISARIC 4C Deterioration model for adults hospitalised with COVID-19: a prospective cohort study. *The Lancet Respiratory Medicine DOI: 10.1016/S2213-2600(20)30559-2*

Habibi MS, Thwaites RS, … Johansson C, Chiu C and Openshaw PJM **(2020)** Mucosal neutrophil activation during exposure to RSV enhances infection and opposes early

inflammatory responses that prevent disease. *Science* 9;370(6513):eaba9301. doi: 10.1126/science.aba9301 PMID: 33033192

Docherty AB, Harrison EM, Green CA, … Dunning J, Openshaw PJ, Baillie JK, Semple MG; ISARIC4C investigators. (**2020).** Features of 20 133 UK patients in hospital with covid-19 using the ISARIC WHO Clinical Characterisation Protocol: prospective observational cohort study *Brit Med J* 369:m1985. doi: 10.1136/bmj.m1985.BMJ. PMID: 32444460

Peng Y, Mentzer AJ, Liu G, Yao X, Yin Z, Dong D, Dejnirattisai W, Rostron T, Supasa P, Liu C, Openshaw PJM. et al. **(2020)** Broad and strong memory CD4(+) and CD8(+)T cells induced by SARS-CoV-2 in UK convalescent individuals following COVID-19. *Nat. Immunol.*, 04 Sep 2020 doi: https://www.nature.com/articles/s41590-020-0782-6

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.

    - *NERVTAG – since Jan 2015*
    - *UK Coronavirus Immunology Consortium (UK-CIC) – since August 2020 (when it was formed)*

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 (in each group):

    *I was a member of the UK Scientific Advisory Group for Emergencies (SAGE) in (2009-12), Chair and then vice-Chair or NERVTAG (2015-2022).*

    *I am a member of the UK Vaccine Network since 2017 and several committees and Boards that oversee research on the immunology of respiratory infection*

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

    *Between January 2020 and February 2022, I attended NERVTAG 65 times (second only to Peter Horby in number of meetings attended). I was one of the main contributors to the debates around decision making in areas of my own expertise (especially in immunology, clinical and virology).*

    c. Your role in providing research, information and advice.

    *I was an active participant in discussions.*

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.

    *View on SARS-CoV-2 protective immunity, 27 April 2020*
    *Tests for antibodies against SARS-CoV-2, 2 July 2020*
    *Respiratory viral infections, their interactions with SARS-CoV-2 and implications for a winter resurgence of COVID-19, 16 July 2020*
    *Update on immunity to SARS-CoV-2, 2 September 2020*
    *Immunity certification, 9 December 2020*
    *Multicentre cohort study on in-hospital complications in COVID-19, 4 February 2021*
    *Immunity certification update, 4 February 2021*

*Respiratory infections, their interactions with SARS-CoV-2 and implications for winter 2021 to 2022, 20 September 2021*
*Multicentre cohort study on symptoms and quality of life following hospitalisation for COVID-19 - presentation, 25 February 2021*
*Update note on immunity to SARS-CoV-2 after natural infection, 27 May 2021*
*Comparison of children and young people admitted with SARS-CoV-2 across the UK in the first and second pandemic waves – prospective multicentre observational cohort study, 9 September 2021*
*Co-infection with influenza viruses associated with worse outcomes in severe COVID-19, 7 February 2022*

*As a member of the COVID-19 Clinical Information Network (CO-CIN) we provided weekly reports to SAGE which collated information from healthcare records to track the number of patients admitted to hospital with COVID-19.*

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.

*With the encouragement of Prof Van Tam and the DH, I have been very active on Twitter, on news articles, radio and TV broadcasts. For example, Between 1st January and 9th July 2021, I gave 83 interviews to journalists on radio, for TV or for newsprint in addition to responding to requests from journalists or the Science Media Centre for comments or information. Recent examples of include:*

- *BBC Newsnight (21 February 2022) – Discusses lifting of restrictions in UK https://www.imperial.ac.uk/news/234059/its-certainly-over-warns-imperial-academic/*
- *BBC Question Time (2 December 2021) – On Omicron variant (From 15m 04s) https://www.bbc.co.uk/iplayer/episode/m00123bl/question-time-2021-02122021*
- *"Britain to infect healthy volunteers with coronavirus in vaccine challenge trials" Washington Post (20 October 2020) https://www.washingtonpost.com/world/europe/covid-challenge-trials-uk/2020/10/20/00a31136-026c-11eb-b92e-029676f9ebec_story.html*
- *"The race to decipher Omicron: will it take days, weeks or months?" Financial Times (Big Read) (3 December 2021) https://www.ft.com/content/e742a4bf-3e72-4551-bf72-df73cb35436f*
- *"'Unacceptable number of people still dying of Covid', says Professor Peter Openshaw" Channel 4 News (23 October 2021) https://www.channel4.com/news/unacceptable-number-of-people-still-dying-of-covid-says-professor-peter-openshaw*
- *"UK must be poised to introduce swift Covid curbs, says NHS leader" The Guardian (31 December 2021) https://www.theguardian.com/world/2021/dec/31/uk-must-be-poised-to-introduce-swift-covid-curbs-says-nhs-leader*
- Science Media Centre: Results from the COVID-19 human challenge study (02 Feb 2022)
- Science Media Centre: New study from ISARIC 4C looking at inflammatory markers for severe and fatal COVID-19 (10 Mar 2021)
- Science Media Centre: Ethical approval and the start of virus characterisation study for Human Challenge Trials (17 Feb 2021)
- Science Media Centre: Vaccines Q&A for journalists (21 Dec 2020)
- Science Media Centre: Genetic links to critical illness caused by COVID-19 identified (11 Dec 2020)

- Science Media Centre: British Society for Immunology report on Ageing and COVID-19 (10 Nov 2020)
- Science Media Centre: Expert partnership to explore and establish Human Challenge studies of Covid-19 in the UK (10 Oct 2020)
- Science Media Centre: £8.4m announced for new research into COVID-19 and immunology (28 Aug 2020)
- Science Media Centre: ISARIC 4C study – characterising the clinical features of patients with severe COVID-19 in the UK (29 April 2020)

This was apparently appreciated by those who were very exposed to the media (including Jonathan Van Tam, Patrick Vallance and Chris Whitty). My general approach has been to work with journalists to explain and educate, following the most mainstream scientific and medical advice.

- *Lib Dem Party Conference fringe event with UK National Academies 25 September 2020*
- *Public Administration and Constitutional Affairs Committee on COVID-19 Vaccine Certification, oral evidence 24 May 2021*
- *European Scientific Working Group on Acute Respiratory Virus Infections: Disease in a COVID-19 Era, intro remarks 11 October 2021*

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: To my mind, the expertise was relevant and sensible. I saw no evidence of political interference and a general sense of trying to gather the best evidence available at the time. It would have been ideal to get more systematic input from other expert bodies (for example, on face masks and ventilation), but time was short.*

    b. *The way in which the groups were commissioned to work on the relevant issues: It is possible that the commissioning of responses could have been more thought through but was often based on who was available and able to give useful input. It was very hectic, and there was sometimes no time to gain wider input. I would say that at times there was too much being asked of us, rather than asking us to say what we were best able to consider. We were expected to respond to questions from above, leaving less time for us to say what we thought the key issues were.*

    c. *The resources and support that were available: The staff were excellent but over-stretched. We were aware that they were often serving several committees and were being asked to work round the clock (as were we).*

    d. *The advice given and/or recommendations that were made: in retrospect, there were some things that we did not get right. Masks seem remarkably effective, and vaccines were developed much faster than we thought possible.*

    e. *The extent to which the groups worked effectively together: The atmosphere was good and mutually supportive. Consensus was mostly easy to achieve.*

    f. *The extent to which applicable structures and policies were utilised and/or complied with and their effectiveness: We used our knowledge of flu planning to a large extent, but I would say this was reasonable. There were things which were not so applicable but in general the flu planning was relevant to COVID.*

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.

   *I will need to reflect on this in more detail, but more investment in the advisory committees would have been helpful. We are regarded as world leaders in this respect and the envy of many other nations. We should use and strengthen our advisory structures and preserve them from political interference; bypassing the well-considered views of experts by inviting those with fringe views to act as personal advisors to political leaders would risk derailment of the systems we have in place.*

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.

   *Acknowledged.*

Peter Openshaw
22nd September 2022