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22/9/2022

Dear Baroness Heather Hallett,

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/AG

I am writing in response to the questionnaire you sent on 2 September 2022.

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

I hold a Diploma in Mathematics and Economics (Dipl Math.-oec) from the University of Ulm, Germany and a Masters in Mathematics from Syracuse University, NY, USA (both completed in 2002). My doctoral degree is a Dr. rer.-nat. from Ulm University. After a postdoc in Oslo, Norway. I joined the Department of Mathematics at Imperial College London in 2006 and was appointed as Chair in Statistics in 2015.

Key publications in Epidemiology:
Flaxman, S., Mishra, S., Gandy A. , …, S Bhatt (2020) 'Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe', Nature, 584(7820), pp. 257–261. doi:10.1038/s41586-020-2405-7. [only joint first authors listed]

Volz, E., Mishra S., …, Chand M., Barrett J.C., Johnson R., Gandy A., Rambau A, Ferguson N.M.. (2021) 'Assessing transmissibility of SARS-CoV-2 lineage B.1.1.7 in England', *Nature*. doi:10.1038/s41586-021-03470-x. [only joint first authors listed]

Key publications from other areas of research:
Gandy, A. and Kvaløy, J.T. (2013) 'Guaranteed conditional performance of control charts via bootstrap methods', Scandinavian journal of statistics, theory and applications.
https://onlinelibrary.wiley.com/doi/abs/10.1002/sjos.12006.

Gandy, A. (2009) 'Sequential implementation of Monte Carlo tests with uniformly bounded resampling risk', *Journal of the American Statistical Association*
https://www.tandfonline.com/doi/abs/10.1198/jasa.2009.tm08368.

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.*

I have been a member of the SPI-M-O sub-group of SAGE since October 2020.

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.*

I was asked to become a member of SPI-M-O as I was regularly running a spatial model for the pandemic. From 29 October 2020, the Scottish government reported these local area estimates and has been using them as criteria for areas transitioning between lockdown tiers for some time [https://www.gov.scot/publications/coronavirus-covid-19-allocation-of-levels-to-local-authorities/]

I have been attending most main meetings of the SPI-M as well as meetings of a regional subgroup and have contributed estimates regularly, which fed into many SPI-M reports.

A key SAGE report I contributed to was, the following, where I was involve in estimating the transmissibility of the Alpha variant:

Assessment of B.1.1.7 (Alpha) variant (collaborative with PHE) – SAGE document https://www.gov.uk/government/publications/phe-analysis-of-transmissibility-based-on-genomics-15-december-2020 . Note that most early discussions of Alpha occurred at NERVTAG, but minutes/conclusions from NERVTAG submitted to SAGE under 22 December Meeting at https://www.gov.uk/government/collections/sage-meetings-december-2020)

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.*

I contributed to most reports from the regional subgroup of SPI-M-O – which should be available from the SPI-M secretariat. These then fed into SPI-M and SAGE reports.

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.*

I have contributed to several articles during the epidemic, see https://scholar.google.co.uk/citations?user=1mIFoNAAAAAJ&hl=en for a list of my publications.

I have given several interviews during the pandemic. Specifically, my comments featured on the BBC evening news in January 2020 (on the transmissibility of the Alpha variant) and in January 2021 (on the transmissibility of the Delta variant).

I have given evidence to a House Select Committee on "Coronavirus: lessons learnt" on 21 October 2020 (https://committees.parliament.uk/event/2362/formal-meeting-oral-evidence-session/)

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 pandemic was an exceptional event, and in my opinion, SAGE and its subgroups should be commended for their work, in particular SPI-M. In all meetings I participated in, it was clear that members strived to give the best evidence possible, often under immense time pressure, going well beyond what could be expected. The groups worked as effective as can be expected under these situations. There seemed to be appropriate expertise available.

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.*

The pandemic response was happening a very dynamic environment, with advice (by the advisory committees) and decisions (by policy makers) having to be made at a rapid rate – and I think that the committees worked very well – I would particularly commend the collaborative spirit in SPI-M.

With the benefit of hindsight, e.g. on the effect of interventions, on the fact that successful vaccines were available when they were available, and on when variants would appear, one could certainly imagine other paths that one might have taken through the pandemic. I would caution against trying such counterfactual approaches – as all decisions were taken under considerable uncertainty.

One key lesson to take away is that having reliable data was crucial in any modelling – thus I would recommend that data should be made (widely) available in future pan-/epidemics. This will help the scientific community give insights to decision makers. It was good to see that during the pandemic the data availability and quality improved, which I very much hope will be a model for the future.

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.

I hold code that was used to generate simulation and predictions, as well as publications/reports I contributed to.

Please do not hesitate to contact me should there be any follow-up questions.

Yours sincerely,

Personal Data

Professor Axel Gandy