UK COVID-19 Inquiry: Module 2 response

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1) I was a Post-Doctoral Research Associate in mathematical epidemiology at The University of Manchester since receiving my PhD in applied mathematics in 2018. The project, led by Dr. Lorenzo Pellis, concerned the mathematical modelling of HIV but shifted focus to SARS-CoV-2 in late 2019. This was in line with the shifting focus of the entire mathematical epidemiology group at The University of Manchester (hereon abbreviated to mathepiUoM). Since April of 2021 to February of 2022, I have continued research on SARS-CoV-2 as an Alexander von Humboldt Research Fellow in Berlin.
My professional expertise is in the areas of mathematical modelling and data science. I include a short CV with details of these appointments and relevant publications.

2) I have contributed work to SPI-M-O since 20/3/2020, but have seldom attended meetings. The first meeting I attended dates 10/6/2020.

3) My involvement in SPI-M-O:
   a) My line manager, Lorenzo Pellis, joined SPI-M-O on 23/3/2020. The requests which arrived to him (and the other leads in mathepiUoM) were supported by the entire group, myself included. I was first indirectly involved when papers were sent to SPI-M-O to which I had contributed. I later joined a few calls, either to present findings or as a fact-checker if my work was being presented as part of a wider report.
   b) I attended SPI-M-O meetings on 10/6/2020, 17/6/2020 and 14/10/2020. I presented findings of data trends across infections in school settings on 17/6. This was also the intention on 10/6, but there was insufficient time to do so. On 14/10 I attended to support a colleague presenting in the event questions were raised about my work which she would be unable to answer. The presentation concerned the functioning of the Test, Trace, and Isolate system.
   c) My role has been to contextualise data trends across different countries and data streams within the UK, and to carry out mathematical modelling of specific transmission settings (not directly related to the Road Map). My role has not been advisory, but to provide data and models for the consideration of senior colleagues.

4) I have contributed to a number of Situational Awareness Documents (overview of transmission in the UK split by age and geography) released on a weekly basis to SPI-M-O. I have also contributed findings on transmission in school and higher education settings, as well as analysis on testing strategies and the emergence of new variants. Many of these documents were sent as "for info" to SPI-M-O and I do not have direct links.

5) A large number of the findings initially sent to SPI-M-O as data were later refined into published works. As such, there is large overlap between the overarching themes of the documents in 4) and the below list.
   a) https://rss.org.uk/RSS/media/File-library/Publications/Special%20topic%20meeting/Pellis_Final_Manuscript_JUNIPER.pdf
   b) https://www.gov.uk/government/publications/tti-modelling-group-on-the-use-of-lateral-flow-antigen-tests-in-contact-tracing-preliminary-findings-15-november-2020/on-the-use-of-lfa-tests-in-contact-tracing-preliminary-findings-15-november-2020
   c) https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1010406
   d) https://www.medrxiv.org/content/10.1101/2021.06.05.21258365v1
   e) https://www.sciencedirect.com/science/article/pii/S2468042720300245
   f) https://wellcomeopenresearch.org/articles/5-213/v2
   g) https://royalsocietypublishing.org/doi/full/10.1098/rsos.210310
   h) https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(21)00234-4/fulltext?s=09
   i) https://www.sciencedirect.com/science/article/pii/S1755436522000081
   j) https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0264
   k) https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0277

6) SAGE, SPI-M-O, and SPI-B are groups that contain a wide variety of expertise and experience. I have never worked as closely and effectively with people as I did in 2020 and 2021 with colleagues who were all united in wanting to assist as best we could with the crisis at hand. It is my firm belief that the differences in background and expertise allowed for a broader, more inclusive, perspective to be formed in our joint research efforts. I can think of no better people with whom to have worked and supported each other.

What is easily obvious in hindsight, but was painfully felt at the time, is how rapidly and diversely the unknowns evolved with time. From basic epidemiological quantities, to new variants, the possibilities of testing and vaccines, and long-term immunity and disease burden, the specific aims have changed with time and new knowledge. So, too, has it been clear that the "success" of any aims must also account for the overall wellbeing of individuals and society, including mental health and financial burdens. There is no model or scientific relationship which can accurately encompass all of this, and such balancing of competing priorities falls to the policy-makers.

Many of these policies are still producing ripple effects, and thus my personal opinion (how unhelpfully philosophical) is that the UK government's overall response can only be assessed in the years and decades to come. I believe our scientific body of work (at least what I have seen of it), was done to the best of our abilities given the information and resources at hand. There are clear successes, and likely also analyses which might have focused on other scenarios if we knew what lay ahead.

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7) Almost all models and analyses I have worked on during 2020 and 2021 have emphasised the crucial role of adherence to public health and social measures and engagement with public initiatives, including testing and vaccination. Adherence has changed throughout the pandemic, including due to communication issues and lacking practical or economic ability to adhere. Although the relevant details are not my expertise as a mathematical modeller, I'm aware that many of these questions remain open and may well return as challenges in future pandemics. Better understanding, incorporating and facilitating challenges in adherence are key lessons to be learned going forward.

8) I have pre-print versions of documents eventually sent to publication, presentations pertaining to the results therein.

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