

Re: Role of mathematical modelling in future pandemic response policy

Dear Editor,

This article is seriously flawed. Our comments on the four 'Key Messages' in order:

“Mathematical modelling is intrinsically difficult given the complexity of relationships between parameters and difficulty quantifying those parameters”

The role of mathematical models is to predict the future, if only in a limited and provisional manner. In the case of epidemics there is no excuse for the failure of the experts to make even moderately accurate predictions about the progress of Covid-19. Most critically they failed to provide accurate forecasts for hospital admissions, the sine qua non in pandemic response.

“Modelling needs input from a much wider range of sources including domain experts”

A single source that works is much more useful than multiple sources that don't. Taking the average or median from a collection of poor predictions cannot give reliable results (as one may see by consulting the CDC forecasts for US Covid-19 hospitalisations).

<https://www.cdc.gov/coronavirus/2019-ncov/science/forecasting/hospitaliz...>

“Data sharing and communication of results could be improved”

Hospital admission data in England was publicly available with only a two day lag, until recently. This lag could have been shortened or removed but the data was more than sufficient to provide useful forecasts had the correct approach been employed. (A. Cascon and W.F. Shadwick Predicting the course of Covid-19 and other epidemic and endemic disease <https://www.medrxiv.org/content/10.1101/2021.12.26.21268419v1>)

“Policy makers and the public often had poor understanding of key concepts such as exponential growth and the limitations of long-term forecasting.”

Exponential growth is not a feature of epidemic data. (G. Chowell, C. Viboud, L. Simonsen, S.M. Moghadas (2016) Characterizing the reproduction number of epidemics with early subexponential growth dynamics. J.R. Soc Interface 13 : 21060659

<https://royalsocietypublishing.org/doi/epdf/10.1098/rsif.2016.0659>)

It's a feature of epidemic models.(A. Cascon and W.F. Shadwick

<https://www.medrxiv.org/content/10.1101/2021.12.26.21268419v1> Section 5).

The constant recitation of the horrors of completely implausible exponential growth has been a hallmark of the singular failure of epidemic models to connect with data. The general public is, at this juncture, well aware of the limitations of the epidemiological forecasts that they have suffered under.

What the UK Covid Inquiry should ask about epidemic models is the question that ought to have been asked from the outset, both by politicians and their scientific advisors.

“What is the factual basis for the belief that current epidemic models represent the real world with sufficient accuracy that they should be used to inform policy?”

Then the Inquiry should ask the politicians and their scientific advisors if that question was ever asked, and, if not, why not. With those questions answered, we'd be making progress.

Competing interests: No competing interests

18 September 2022

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