

Scenario modelling: self-isolation when symptomatic (16 Mar 2022)

Summary: pressing questions, at this stage of the pandemic in the UK, concern public health messaging about personal risk assessment and mitigating sociobehavioural responses. An acute issue—at the time of writing—is guidance on **self-isolation when symptomatic**. This is particularly prescient for providing guidelines for institutions, employers and employees.

To inform this guidance, one can leverage the modelling of sociobehavioural responses to viral spread. Specifically, the following scenario modelling compares outcomes under the (default) assumption that people will isolate for several days when symptomatic, and the assumption that people will return to work or school after a couple of days. The default period of self-isolation is not assumed but is estimated as a free parameter of the model (estimated to be about eight days). To model a reduction in self-isolation, we set this period to two days and project the outcomes over the next year. In brief, rescinding guidelines about self-isolation (or a failure to clearly message the imperative for self-isolation when symptomatic) will incur a considerable toll in terms of morbidity (excess hospital admissions of about 240,000) and its financial costs (about an extra £12 billion).

Methods: In brief, this scenario modelling rolls out several months into the future (until 01-03-23) in the absence of any changes in the estimated duration of self-isolation when symptomatic (about 8 days) and when reducing the period of self-isolation when symptomatic to 2 days. The cost in terms of deaths, hospital admissions, deaths and economic burden are summarised graphically below.

Conclusion: a failure to encourage self-isolation when symptomatic will produce a spring peak in hospital admissions that will be intermediate between the first and second waves. The cumulative excess in hospital admissions over the next year will be about 240,000, costing about £12 billion¹. The excess deaths may approach 30,000 with a similar cost². These costs can be compared with a gain in gross domestic product (of about 3.7 billion)³.

Factor	£Billion
Cost of hospital admissions: 239512 x £50,000	£ 11.98B
Cost (£-QALY = £60,000) of deaths (1 death = 7.6 QALY): 29015 x £456,000	£ 13.23B
Saving to GDP: 0.18% per day x 350 days @ £560B per quarter	£ 3.77B

¹ Assuming the [cost of a hospital admission for COVID 19](#) is £50,000 (see [also](#)).

² Assuming a (Green Book) £-QUALY is £60,000 and one death entails 7.6 QUALY

³ Assuming [quarterly GDP](#) is £560 billion.

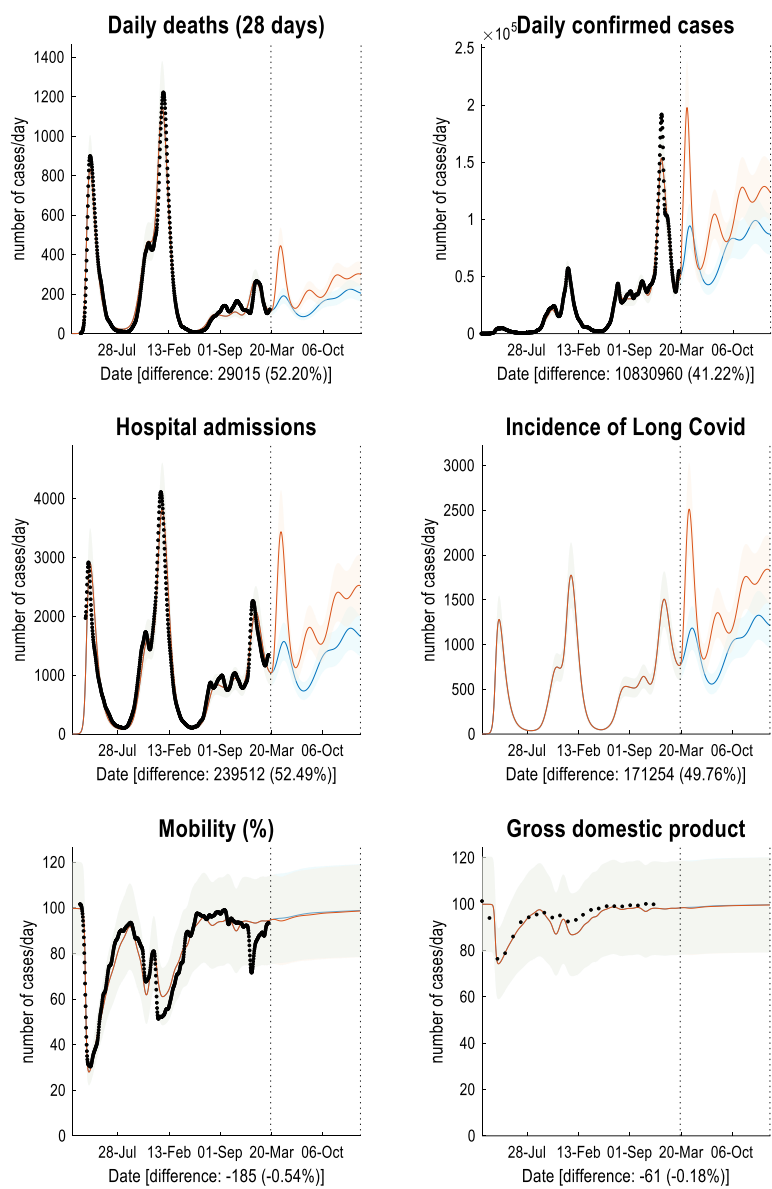


Figure 1: This figure reports the results of scenario modelling using the parameters of a [dynamic causal model](#) based on data covering the entire pandemic until 12 Mar 2022. The lines correspond to expected deaths per day, daily confirmed cases, hospital admissions, incidence of long COVID, mobility based upon Department of Transport data, and gross domestic product for the UK. The shaded areas correspond to 90% confidence intervals. The blue lines are the most likely estimates, while the black dots correspond to (smoothed) data from the [ONS](#). The orange lines show what might happen the period of self-isolation when symptomatic fell to 2 days on 16 March 2022. The differences under each graph are the cumulative differences over the period in question: **16 March 2022 to 1 March 2023**. The percentages refer to the cumulative differences relative to the baseline (predicted) outcomes.