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COVID19: Erroneous Modelling and Its Policy Implications

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Since March 2020 there has been a rapidly expanding research effort dedicated to COVID19 analysis across disciplines, inter alia, in Economics. A typical analysis posits an economy, which is subject to a model of COVID19 epidemiological dynamics.

One type of economic analysis describes a social planner problem that seeks to derive optimal policy. The planner, interested in public well-being, wants to minimize both the costs of public health outcomes, such as breach of hospitals ICU capacity and death, and the economic costs of suppression policy, including declines in GDP. There is a tradeoff, however, between these two aims, hence this is not a straightforward problem. The result is the modelling of the well-known concept of "flattening the curve" policy. The dynamics of the disease and its features are at the core of the analysis.

This paper makes two contributions: one is to place this analysis on the foundations of an epidemiological analysis of SARS-CoV-2 properties, particularly, its transmission timescales. The main elements of the ensuing model are two blocks: an infection transmission block, where the number of new cases is determined; and a clinical block, which characterizes the development of symptoms, hospitalization, ICU admission and recovery or death. The former block derives from an epidemiologically-grounded analysis and defines epidemiological dynamics; the latter block models the dynamics within the health system. We offer a complete model of these two different dynamics, including the relevant parameterizations.

The second contribution is to show that there is often serious misspecification of the model, due to errors in the set-up and in the parameterization, at odds with the epidemiological evidence. The underlying cause for the misspecification is the failure to make the distinction between the epidemiological and clinical aspects of COVID19. Due to the erroneous modelling structure, wrong

values are assigned to key parameters of disease dynamics and important parameters are omitted. These errors have significant consequences for optimal economic planning related to COVID19. In particular, they are manifested in erroneously characterizing a relatively slow-moving disease, thereby distorting the policymaker decisions where the price of wrong policy is human life and substantial output loss. Moreover, the scale of the disease is under-estimated.

The analysis points economic researchers at the correct way to model the dynamics of the disease. The analysis may also be useful for other epidemics beyond COVID19, as much of the discussion is

pertinent to other forms of infectious diseases. Note, in this context, that the set of epidemics since 1980 is quite large and includes, inter alia, HIV/AIDS, SARS, H5N1, Ebola, H7N9, H1N1, Dengue fever, and Zika.