Reviewer's report

Title: Evaluation of the potential incidence of COVID-19 and effectiveness of containment measures in Spain: a data-driven approach

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Reviewer: Oliver Brady

Reviewer's report:

This manuscript by Aleta and Moreno aims to use a simple metapopulation model of COVID-19 applied to Spanish movement data to elucidate insights about control. Given there are many unknowns about COVID-19 many of the modelling assumptions are difficult to prove or disprove at this stage, but I don't think many of the findings of this analysis will be particularly controversial (i.e. that movement restrictions are largely ineffective and that social distancing should be the primary focus). Given that a number of similar analysis have now been done in various countries (e.g. the UK: https://www.medrxiv.org/content/10.1101/2020.02.12.20022566v1 and China: https://www.medrxiv.org/content/10.1101/2020.03.03.20029843v2) and that (aside from the human movement data that appears to have limited impact on the findings) few of the parameters of this model are specific to Spain, it is worth clarification by the authors what their model adds to the existing (if fast moving) international evidence base on how countries should contain COVID-19.

Major comments:

Looking at other modelling analysis addressing similar questions I'd say the key gaps in this analysis are:

1. No uncertainty in parameter estimates- there are a variety of different estimates for R0, incubation period etc than mean one single number inadequately captures the uncertainty around the true values (or distributions) of these parameters. Not accounting for this means it is difficult to state with what certainty your findings can be interpreted

2. No seasonality- still very much an unknown, but might be important for peak timing

3. Not fitted to any epidemiological data from Spain- appreciate there might not have been much data when this manuscript was submitted, but now more case data are available, it would be nice to know how consistent these predictions are with observe data. I suspect we now know more about the origins of the epidemic in Spain as well.

Minor comments:
"contention measures" -&gt; "containment measures"
Paragraph around line 142: is there any sensitivity of outputs to size of initial number of cases? - 10 does seem high

More descriptive detail is required for the inter-province human mobility datasets. The cited source mentions a range of methods used and the authors should consider how various biases and gaps in these datasets might affect the application of this data to these specific COVID-19 questions - e.g. long distance movements less likely in very young and very old who are typically under-sampled by some of these data sources.

I find figure 4 very difficult to read - at least need more space between text labels

Line 225: "Being able to hospitalize all individuals, on average, in less than 1 day enables to effectively stop the disease " - is this assuming hospitalisation == isolation?

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Unable to assess

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

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Not relevant to this manuscript

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