Inferring R_t

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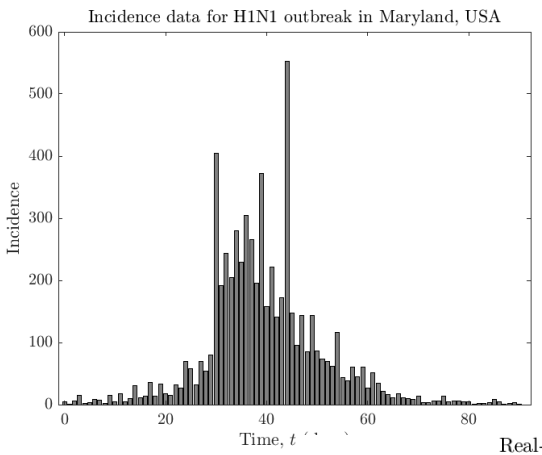

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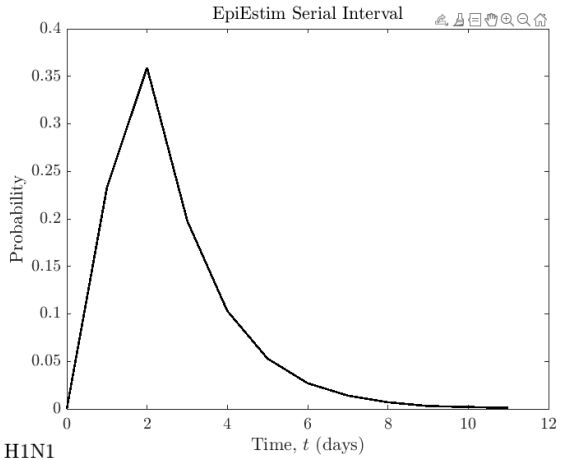

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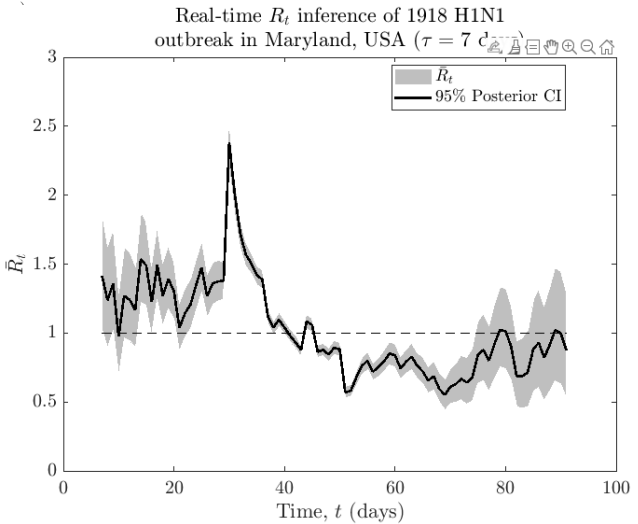

How to model varying serial intervals?

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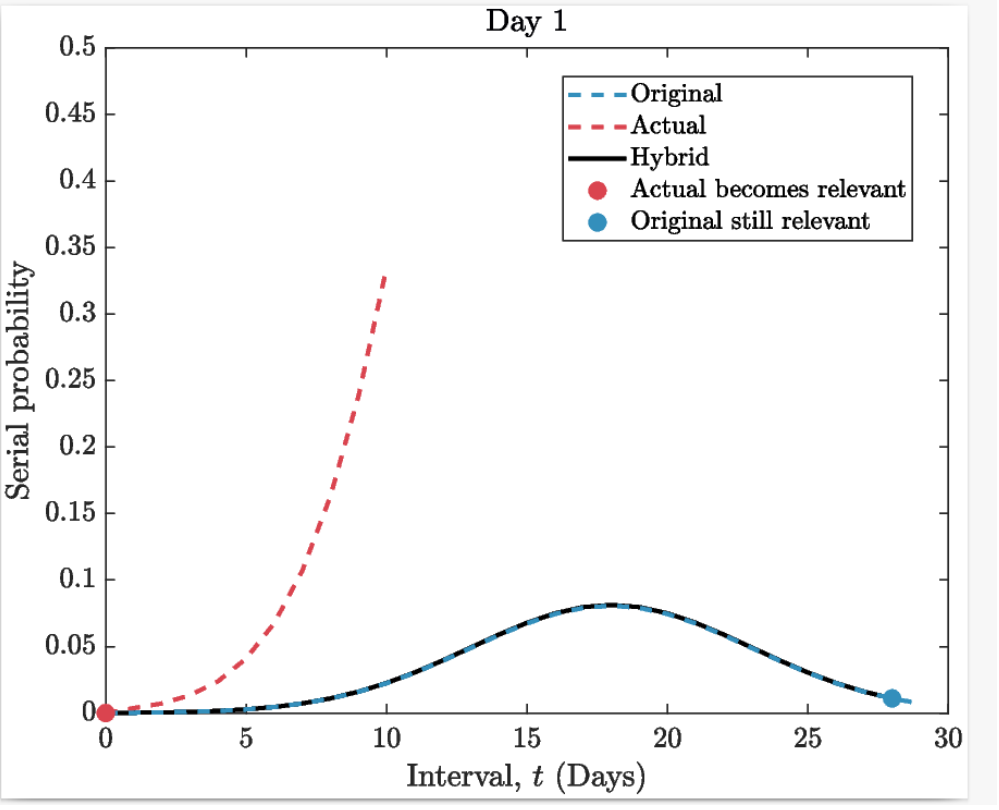
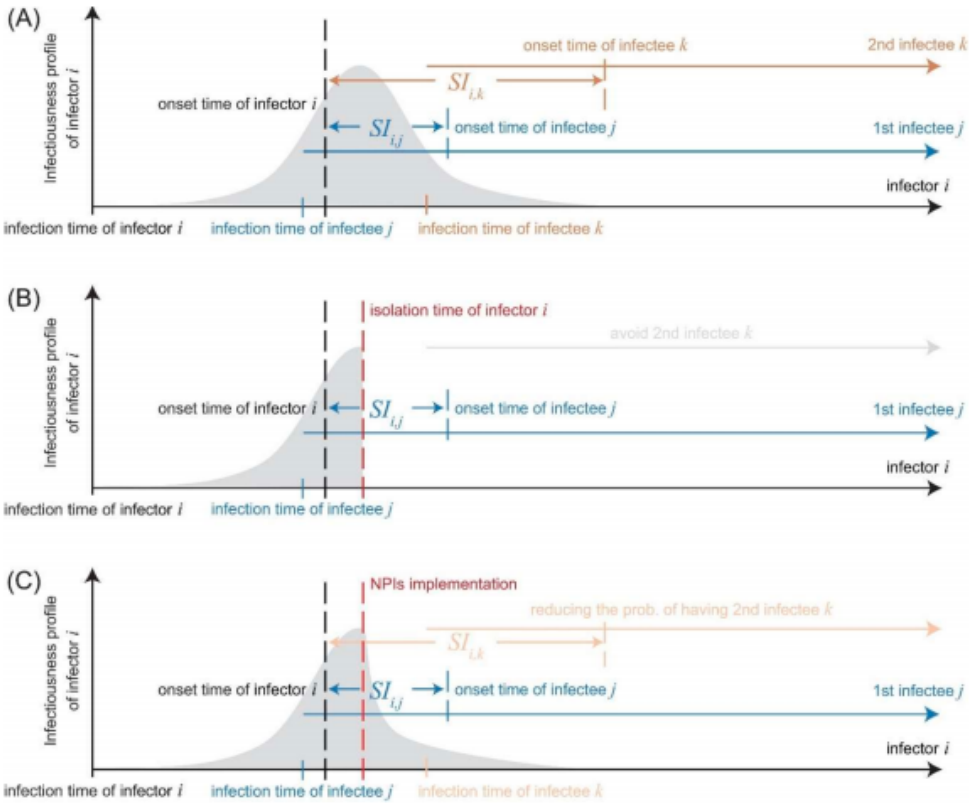


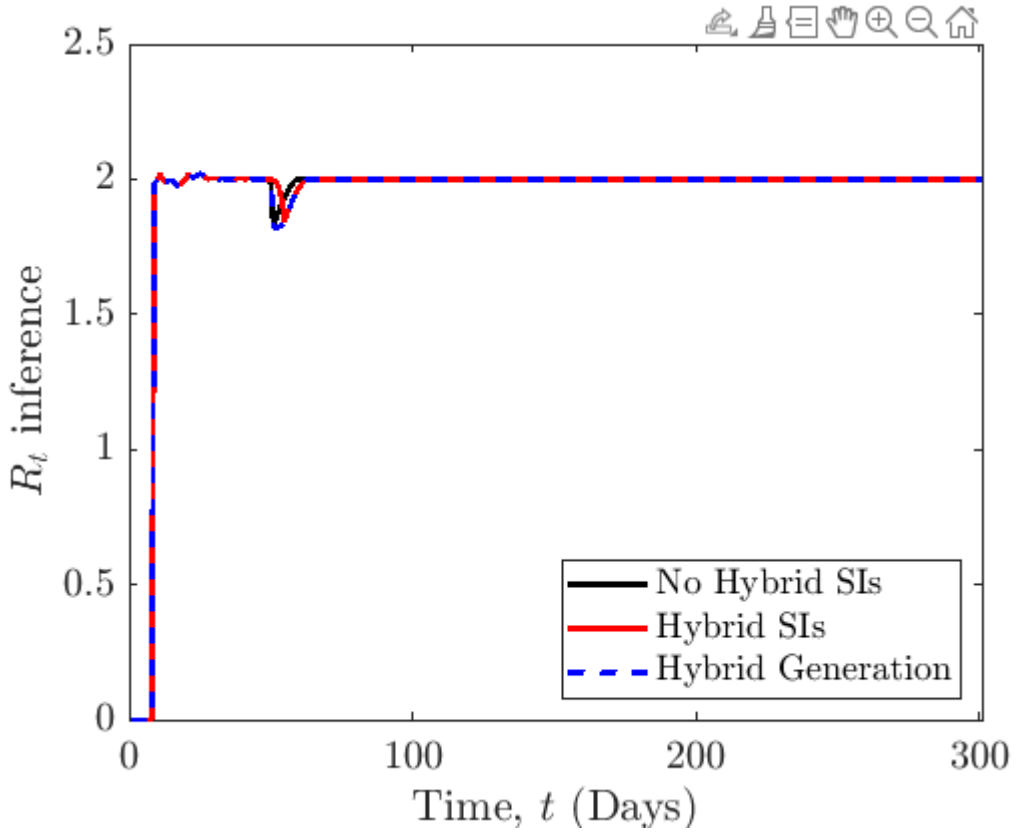
How to model varying serial intervals?

SI depends on infectivity profile, incubation period and population bheaviour



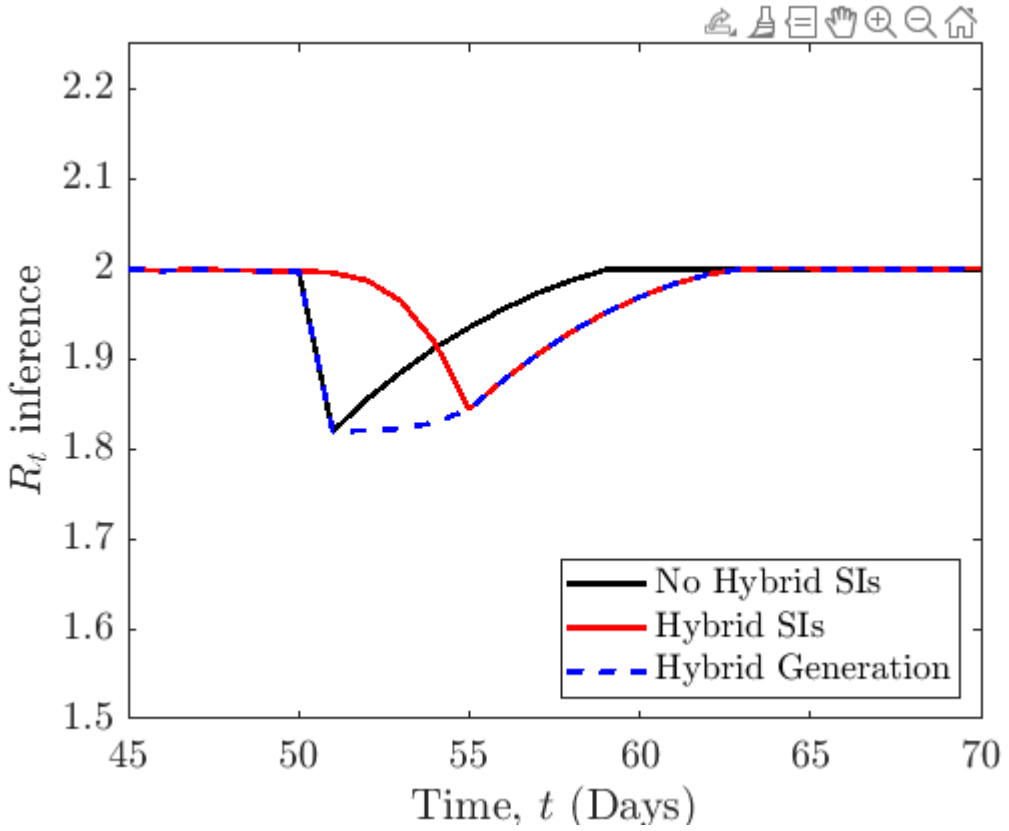
Trivial R inference with varying SIs

Incidence data is generated from a constant R (=2)

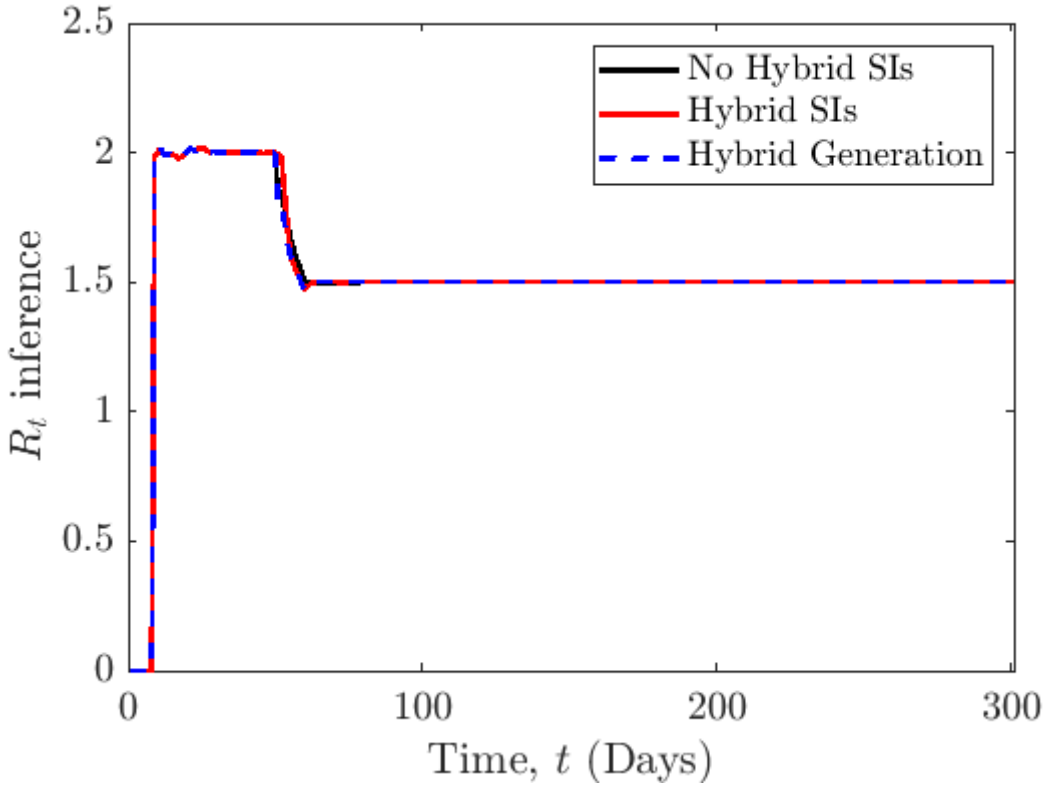


Which method is best?

Black inference is (I think) not using a good model. Red is (I think) the best using the most realistic model.



In reality, we'd expect something more like this:



Idea

CORONAVIRUS

Serial interval of SARS-CoV-2 was shortened over time by nonpharmaceutical interventions

Sheikh Taslim Ali[1]*, Lin Wang[2,3]*, Eric H. Y. Lau[1]*, Xiao-Ke Xu[4], Zhanwei Du[5], Ye Wu[6,7], Gabriel M. Leung[1], Benjamin J. Cowling[1]†

- Use this paper to look at how R inference is different with and without using varying serial intervals AND with and without hybrid serial intervals
- See how R_t inference tracks interventions
- This paper also looks at continuously changing SIs

Ideal: Novel Case Study

- Ideal situation is having data where we either: a) have the serial interval varying through time or b) have data where we can generate the serial interval in a sliding window.
- Then we can use R_t inference using different techniques. Although in this kind of analysis, it’s tricky to decide which technique is optimum.

Issues

- How to use negative serial intervals? This is very important for diseases like Covid.
- However, I don’t think it is simple to implement this into our inference technique?
- Is the hybrid solution useless? We need to have instant access to the new SI (unrealistic) and it is only helpful for a few days. More likely that SI prediction is useful/possible.