

## **A note on mass testing for COVID-19: preliminary analyses**

Carl Pearson, Nicholas Davies, and John Edmunds on behalf of LSHTM COVID-19 Modelling Team

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### **Aim:**

To assess the epidemiological impact of mass testing for COVID-19 in a post-lockdown epidemiological situation. In particular, we assume that a policy of self-isolation will remain in place, and testing is used to help improve compliance with this policy.

### **Methods:**

We adapted the model used to assess options for lifting the lockdown (Paper to SPI-M on 30<sup>th</sup> March and revised paper to Sage on 31<sup>st</sup> March). We assume that self-isolation modifies transmission from the symptomatic class only. That is there is no impact on pre/asymptomatic transmission. In effect, the self-isolating fraction have a 70% reduction in transmission (consistent with LSHTM contact survey results, indicating a 70% reduction in contacts).

At baseline we assume that compliance with self-isolation is at 75%. We assume a rapid diagnostic could increase this potentially up to 85% and 95% self-isolating fractions.

Mass testing is assumed to start on May 1<sup>st</sup> and is added onto the background of the “Minor Economic” and “Minor Social” lifting of lockdown restrictions, which both result in a reproduction number close to 1.

This approach aggregates the several testing factors into the increase in the self-isolating fraction: probability of testing, sensitivity of test, and compliance with self-isolation given positive test. Each of those will limit the potential achievable benefit -- e.g., it's impossible to get 4/5 of the non-self isolating population (+20%) with a test that's only 50% sensitive, even with 100% compliance.

### **Results**

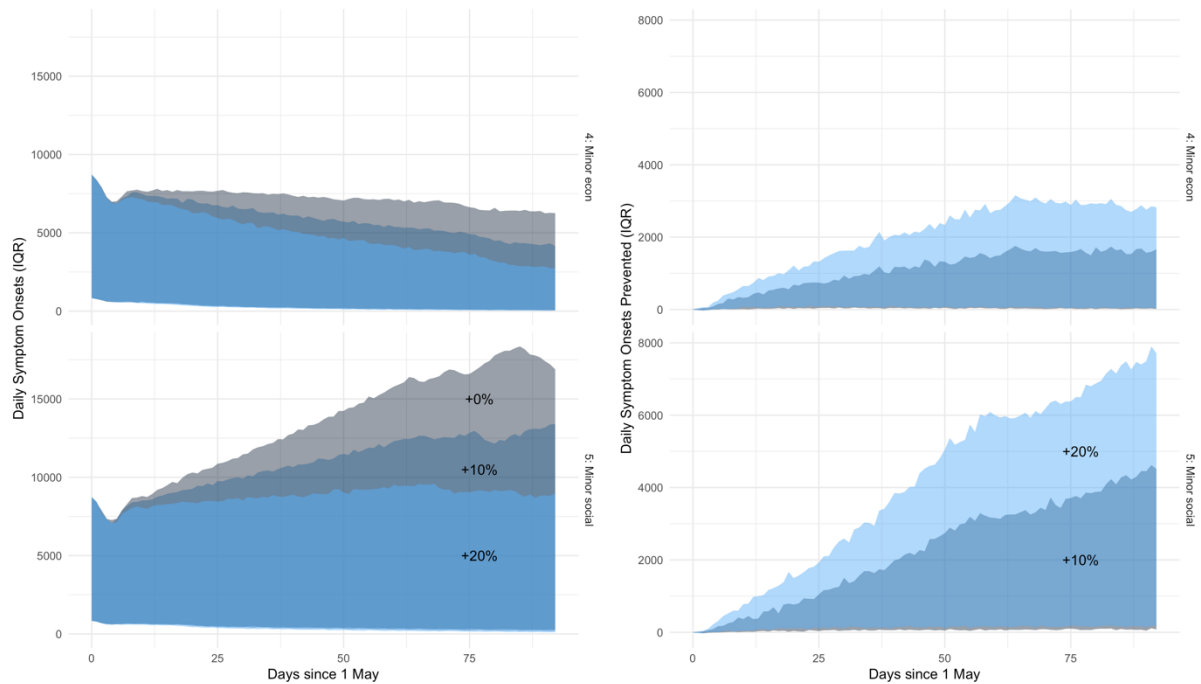


Figure: Daily new cases (left hand panel) for the two epidemiological scenarios: Minor Economic (upper panels) and Minor Social (lower panels). The effect of increasing self-isolation by 0%, 10% and 20% via the use of tests is shown. The right-hand panel shows the additional daily cases prevented by the policy.

## Discussion

The tests-administered would conservatively be the upper limit of the curves (i.e., everyone with symptoms would test) PLUS tests due to other-cause ARI, which could be between 50-330k per day, depending on what we assume for self-isolation without testing behaviour.

We have not explicitly modelled an imperfect test at this point, and we have assumed that the test occurs immediately after symptom onset. Hence, the results shown are optimistic. Indeed, an imperfect test may result in false-negatives being told not to self-isolate. Hence, the use of a non-specific test could reduce self-isolation. This scenario has not been specifically modelled, as yet.

The higher compliance of self-isolation without a test, the less the value of the test. We took as a base-case 75% compliance. At present we do not have a specific estimate of compliance with self-isolation. However, polling suggests that compliance with other measures is generally in the range of 85-95%. Hence, this analysis may over-estimate the impact of mass testing.

We have not, as yet, looked at the effect of linking mass testing with mass contact tracing.