A Workable Strategy for Covid-19 Testing:

Stratified Periodic Testing rather than Universal Random Testing

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Twitter Thread

1. As we end the lockdown, we need a workable testing strategy: who will be tested for Covid-19, and how often? This paper sets out such a testing strategy.

2. The aim of any testing strategy is to reduce the 'effective' Covid-19 reproduction rate, R', below 1, by testing and isolating those who test positive.

3. We show that **'universal random testing'**, where tests are randomly carried out on the entire population, is not a feasible way to get R'<1. Paul Romer has argued that that you only need to randomly test 7% of the population per day to get R'<1. But this rests on a mistaken calculation: using a corrected method, we show that you would have to randomly test 21% of the population per day to get R'<1 (equivalent to testing everyone, every five days). That is not a workable testing strategy, for obvious reasons.

4. We show that **'stratified periodic testing'** is instead a feasible way to get R'<1. The testing is 'stratified' in the sense that it is only done on specific groups (e.g. healthcare staff, other key workers, and those at high risk of infecting others). It is 'periodic' because the same people are tested at regular intervals (e.g. periodic testing of 25 percent of a group means that, on days 1 to 4, a different quarter of the group is tested each day, on day 5 the first quarter is tested again, and so on).

5. We argue that **testing of over 25% per day in certain groups could eliminate the spread of Covid-19 in those groups.** This would prevent the epidemic spreading where it is most damaging, and it may enable other lower-risk groups to return to work as well.

6. This approach has important benefits. First, **tests do not have to be perfect**. It is not the case that "no test is better than an unreliable test": our calculations assume a false negative of 0.3 (i.e. 30% of those who are infectious test negative). Secondly, **periodic testing is far more effective than random testing** -- particularly at high testing rates. (In short, you need to test far fewer people to get the same reduction in R'.) And thirdly, there are valuable ways in which these **'antigen' tests could work alongside 'antibody' tests** to reduce the spread of Covid-19.

7. So, in short, a workable testing strategy for Covid-19 should involve 'stratified periodic testing' rather than 'universal random testing'.

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