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Testing, Testing, Testing

It's a lot of work, but it's worth it.

By Carl T. Bergstrom and Theodore C. Bergstrom

The pandemic is not going to go away over the summer, and a second wave in the autumn is all too likely. A vaccine will not be available for the 2020-21 academic year. Covid-19 is hard to control because most infected people can transmit the virus for a couple of days before showing symptoms, and some remain asymptomatic for the entire course of the disease.

Fortunately, testing can be used to detect presymptomatic and asymptomatic cases. This could be a highly effective means of disease control — if carried out with sufficient frequency and coupled with contact-tracing.

The benefits of testing depend on the time-course of the disease and the accuracy of the tests that are used. Current consensus suggests that an infected person is contagious for a week, and infected people test negative 30 percent of the time. Testing once a month is next to useless. In the absence of other control measures, we would probably need to test nearly every student every second day.

This sounds like a prohibitively large number of tests, but it may be feasible with intelligent planning. An approach known as batch testing allows us to stretch our testing capacity by tenfold or more. The idea is simple: Combine a group of samples — students from one floor of a dormitory, say — and test the pooled sample. If anyone in the group is positive, the test will come back positive. Then you go back and test each individual in the group. But unless disease prevalence is very high, most pools will test negative. More sophisticated mechanisms can provide even greater returns to scale.

The process of collecting samples also contributes to the cost of testing, but self-administered nasal swabs appear to work well, and saliva-based tests will very likely be commercially available by autumn.

In addition to frequent testing, universities can work to reduce transmission by restricting class sizes, discouraging large social gatherings and faculty meetings, encouraging use of face masks, and pleading with everyone to wash their hands. But these steps will not be enough on their own. If a university is to reopen safely, it needs a workable plan for frequent testing — every few days, not every few weeks.

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