

Time will reveal value of India's lockdown

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In early March, my research group projected that by early August, at least 300 million Indians would be infected by the novel coronavirus. That was before there were any lockdowns or domestic travel restrictions. Viruses spread rather predictably – and the scenario we were modeling was rather straightforward, yet terrifying – the spread of a new coronavirus through a completely susceptible population.

During the past two decades, our group has published dozens of infectious disease modeling papers in well regarded scientific journals. That did not stop ad hominem attacks by some who did not believe that the infection could spread so widely. What they did not realize was that Covid-19 is unlike influenza, to which there is vaccination available or some degree of population immunity because of past exposure, or HIV/AIDS where it is possible to not get infected by taking personal protection. There was really no easy way to prevent its spread without extreme measures such as lockdowns.

We were not alone in projecting a large number of infections. A model published by researchers at the Indian Council of Medical Research predicted that in the absence of a lockdown, 25% of Delhi would be infected. Models from other groups, including Imperial College and the University of Cambridge arrived at similar or even higher estimates. All of these groups were using methods that date back to the earliest compartment models introduced by Daniel Bernoulli in 1776 and that have been remarkably useful at informing public health response, except for diseases like HIV/AIDS where individuals are able to change behaviour and alter the course of a disease in response to its spread.

All of these groups were clear that the bulk of infections would be mild or without symptoms. Although the proportion of severe cases would be small, the numbers would be large in India given its large population. The purpose of these projections was to communicate the seriousness of the epidemic both to policymakers and the public and to debunk theories about how Indians were somehow immune to Covid-19.

So where are those cases? The hospitals still seem to be relatively empty. Were the projections wrong? This is similar to going to a doctor who tells you that if you keep smoking and don't exercise you have a high risk of dying young. If you then quit smoking and started going the gym, does that mean that your doctor was wrong?. The lockdown changed the shape of the epidemic significantly not just in India but in every other country. Without enforced distancing measures, Paris, Milan and New York would still be reporting thousands of deaths a day. India was fortunate to have a lockdown early in the epidemic curve so that we never had to witness the kind of trauma that people in these cities had to go through. A recent French study showed that 6% of the population (about 4 million people) had already experienced Covid-19, even though there are only about 120,000 reported cases in that country. In India, unless we are able to test every single patient with Covid-19, a physical impossibility, modelling studies are the only way to study the progress of an epidemic.

Fortunately, India has among the lowest reported cases and deaths per capita in the world – the result of early measures to stop flights to China, close borders and impose a lockdown. The lockdown is projected to have pushed the epidemic peak out at least about eight weeks and possibly longer. The peak will also come down by as much as 50% if we diligently practice hand

washing, physical distancing, and expanded testing and containment, with periodic restrictive containment measures.

Some don't want lockdowns because of the economic and human costs. But they also don't want there to be a flood of cases into hospitals. Perhaps they are counting on chloroquine or BCG vaccination to save the day. Unfortunately, Covid-19 cannot be dealt with through wishful thinking.

The work of disease modelers, who are generally data scientists and not medical doctors, and generally work far away from the media glare is poorly understood. Models are useful in understanding what would happen without any intervention, but also in anticipating what would happen under various intervention scenarios. They are a validated and systematic way of understanding disease spread using the best of what we know about viruses. Without the benefit of these models, we would not be able to respond effectively. We would not know when to impose restrictions, or how many cases, Intensive Care Unit beds and oxygen cylinders to plan for. Time will reveal the value of India's lockdown, which was made on the basis of epidemiological projections and science.

Ultimately, as Jeremy Farrar, the director of the Wellcome Trust recently said – science is the only exit strategy from the Covid-19 pandemic. Now is not the time to replace respect and understanding of scientific expertise with gut feeling, and lessons from WhatsApp University.

(Ramanan Laxminarayan is director at the Center for Disease Dynamics, Economics & Policy, and a senior research scholar at Princeton University. Views expressed are personal.)