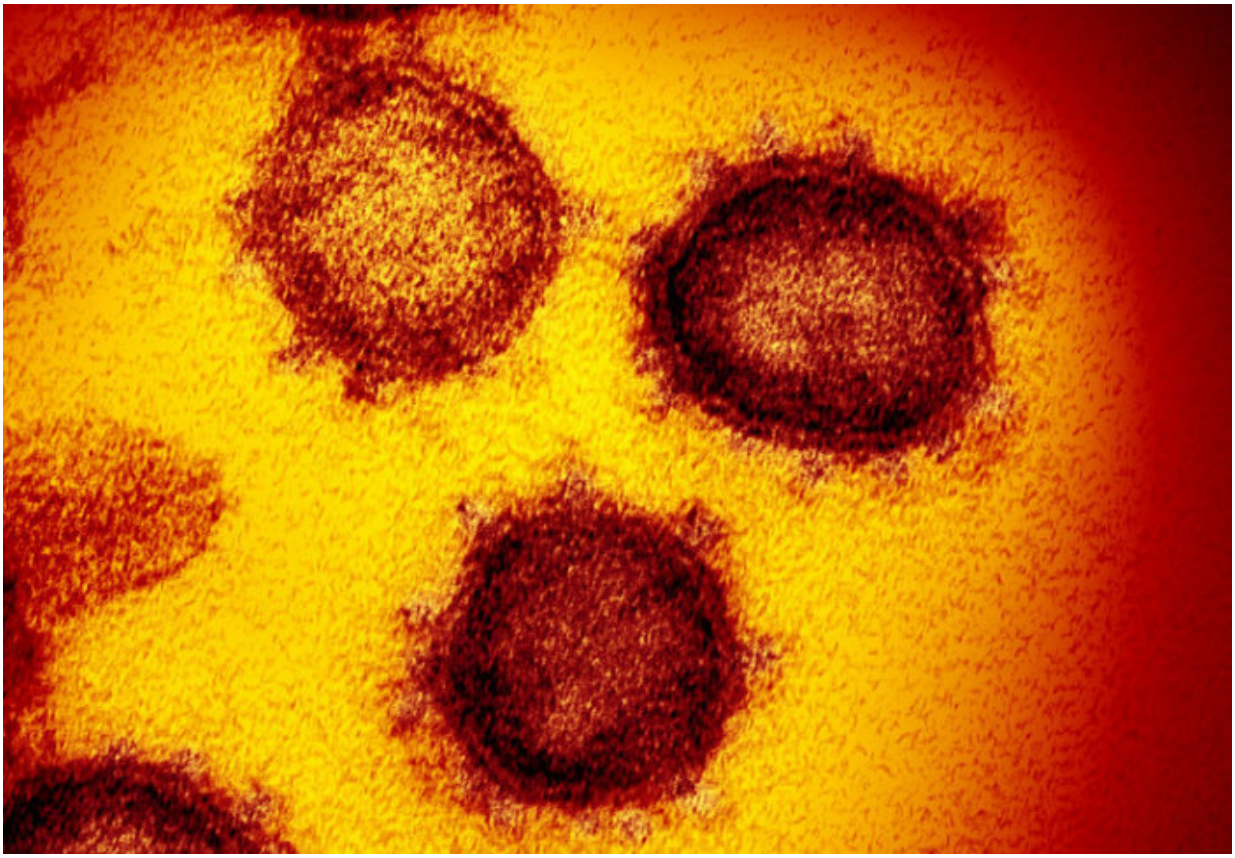
Crunching the numbers for coronavirus

March 16 2020, by Ryan O'hare



Credit: NIH / Flickr

As the world responds to the continued spread of COVID-19, mathematical models are providing vital insights into the nature of the outbreak.

In the three months since the initial reports of a respiratory disease emerged from Wuhan in central China, the numbers of confirmed cases of COVID-19 have climbed steadily.

But as cases have increased, so too has the wealth of data capturing all aspects of the virus, enabling scientists to model the outbreak and build a clearer picture of its spread and risk.

One team at Imperial has been poring over the numbers, providing governments and health organizations with vital information needed to plan effectively.

The MRC Centre for Global Infectious Disease Analysis has been a crucial information source feeding into national plans for dealing with the coronavirus.

"Now that we have moved from a containment phase in the UK to a delay phase and potential mitigation, we're producing detailed scenarios of what might happen to inform healthcare planning," explains Professor Azra Ghani, Chair in infectious disease epidemiology at Imperial is one of those leading the analysis.

"We now have over 50 scientists working on COVID-19 [within the Centre] just to get the best possible sense of all the scientific information out there," she adds.

Outbreak insights

Having worked on modeling for both SARS in 2002 and H1N1 'swine flu' in 2009, Prof. Ghani has insights into how viral outbreaks on this scale unfold, as well as how this new strain of coronavirus compares to previous outbreaks. But the data the team collects have also helped to develop a clearer picture of the clinical course and severity of people

coming into contact with the virus.

"The characteristics we're finding for this new COVID-19 are different and perhaps a little bit more worrying. Although the case fatality ratio is significantly lower than SARS, the spread has been much, much greater, so that is concerning—and it is proving somewhat more difficult to contain," says Prof. Ghani.

"The typical disease progression is that's there's around a week of fairly mild symptoms, much more like a cold or flu that people experience over the winter.

"After that, some people will go on to develop viral pneumonia, which is clearly much more serious and will often require hospitalization."

The team continues to gather data, with further reports expected in the coming weeks and months as the outbreak plays out in the UK and around the world.

Their work will continue to feed into advisory committees for government to plan and make necessary decisions to protect public health.

"We have definitely seen a clearly higher risk in those that are older or who have underlying health conditions, so really the strategies that we would like to focus on need to protect the most at risk groups, while trying to reduce its overall impact across the population."

Provided by Imperial College London