

The spread of COVID-19 in India and its impact: A mathematical analysis

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A mathematical analysis published in the *International Journal of Computational Biology and Drug Design* has revealed the impact of the spread of the COVID-19 pandemic in India on mortality rates and

suggests that the death toll may ultimately be in the millions before the pandemic subsides.

Physicists Bibhatsu Kuiri, Bubai Dutta, Saikat Santra, Paulomi Mandal, Khaleda Mallick, and Ardhendu Sekhar Patra of Sidho-Kanho-Birsha University in Purulia, India, have used the SEIR model as a fundamental tool to model the spread of the novel and potentially lethal coronavirus, SARS-CoV-2, which was first identified in China in late 2019 and the spread of which had reached [pandemic](#) proportions by February-March of 2020. This highly infectious disease spreads easily even when those infected are not yet showing symptoms and so has had an enormous and often devastating impact on society and economies around the world. Indeed, it is estimated that 80 percent of transmission is by people who are asymptomatic.

Theoretical tools that work with raw data can help us explain the spread of the disease and understand how it might continue, and hopefully when and where it will end in terms of its presence as a global pandemic. Ultimately, such models might also help us predict the behavior of subsequent emerging pathogens and ward off a future pandemic or at least ameliorate its impact by being better prepared for the possible consequences.

In the SEIR model, each letter is defined as follows: S for susceptibility humans, E for exposure, I for infected/infectious, and R for recovery rate. Additionally, D is the [death](#) count. Each SEIR parameter feeds into D at different points in the [model](#). The team's numbers are based on those available in October 2020 and so do not take into account the recent devastating wave of infections in that country. At the time of writing their paper, there were tens of millions of people across India who had been infected and recovered but many tens of thousands of deaths too.

The number infected has, as of the date of this Inderscience Research Pick, passed 30 million in India with almost 400,000 deaths and almost 29 million people have recovered. The number of those with long-COVID could well be significant.

More information: Bibhatsu Kuiri et al, The spreading of covid-19 in India and its impact: a mathematical analysis, *International Journal of Computational Biology and Drug Design* (2021). [DOI: 10.1504/IJCBDD.2021.115677](https://doi.org/10.1504/IJCBDD.2021.115677)

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