

Review of: "Analysis of the Spread of Covid-19 via Atangana-Baleanu Fractional Derivatives"

Rudra Pratap Ojha

Potential competing interests: No potential competing interests to declare.

The novelty of the paper is not clearly mentioned.

The dynamic behaviour of Covid-19 is properly discussed in the paper, but a lot of improvement is required:

1. Preliminaries have been discussed before the model equations. This is already proved, but how this is justified with the proposed model needs to be illustrated in the paper.
2. Why the Atangana-Baleanu fractional derivative is most suitable for the analysis of Covid-19 should be discussed and their evidence shown. Why not use ODE in place of the fractional derivative? Justify.
3. The individuals move from susceptible to quarantined, but it has been observed that during Covid-19, exposed individuals E_1 as well as infected individuals I can be moved to quarantined; this has not been considered in the model. Explain it.
4. In section 4, the stability results of the equilibrium point have been discussed. Find the expression for all the eigenvalues.
5. From figure 2 to 8, in all the figures, the value of the variable λ is given, but in the equations, λ is nowhere to be found. How to realize the actual outcome from these simulation results? Need to correct all figures and analyses presented in the paper. In the paper, variables are λ_1 , λ_2 , and λ_3 . Need to analyze the impact of other parameters on the spread of Covid-19.

Real-world data needs to be incorporated with the proposed model, and mathematical proofs are also required.

Major revision due to:

- The novelty of the paper is limited.
- The other reasons are listed.