Review of: "Qualitative Analysis of a Time-Delay Transmission Model for COVID-19 Based on Susceptible Populations With Basic Medical History"

Jia Liu

Potential competing interests: No potential competing interests to declare.

In this study, the authors established a class of COVID-19 time-delay transmission model, and obtained the basic reproduction number of its transmission, and determines the existence of the equilibrium point of the model. The global stability of the equilibrium point was proved by constructing the Lyapunov function and using the LaSalle invariance principle. The theoretical results are verified by numerical simulation, and the impact of different time delays on the spread of COVID-19 was discussed.

Overall, the article is well organized. However, some issues still need to be improved:

1. English needs improved and typos and grammar should be well checked.

1) Page 6 , there should be a full stop after equation $f(I) $ not a comma;

2) Page 8, there is an extra comma between $(d+\thetat)$, and …..

3) Page 8 , It should delete the dot in $c_1\dot c_2-c_3$;

4) Page 9, line 5 from the bottom, $e^{\lambda\tau}$ should be $e^{\lambda t}$;

The authors should check carefully to avoid this problem.

2. Theorem 6, the authors discussed the locally asymptotically stability of the endemic equilibrium point. The authors have proved that $c_3>0$, so give the conclusion that Eq.(8) has no positive roots. I think that this may be a problem. Under the condition $c_3>0$, if $a_3>0$ or $b_3>0$, Eq.(8) may also have two positive, which means that the Hopf bifurcation may occur. Please check this carefully.

There are also a number of grammatical errors throughout the document that need rectification if the manuscript were to go further toward publication.

After these problems have been revised, the paper can be accepted for publication.