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Correction

Correction: New insights on novel coronavirus 2019-nCoV/SARS-CoV-2 modelling in the aspect of fractional derivatives and fixed points

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A correction on

New insights on novel coronavirus 2019-nCoV/SARS-CoV-2 modelling in the aspect of fractional derivatives and fixed points by Sumati Kumari Panda, Abdon Atangana and Juan J. Nieto. Mathematical Biosciences and Engineering, 2021, 18(6): 8683-8726. doi: 10.3934/mbe.2021430.

We would like to submit the following corrections to our recently published paper [1]. We also corrected some typos in the text.

First and second paragraphs in Section 2 (An extended orthogonal space and fixed points) has been updated.

The accessible collected works show that there is a clear connection between *Metric Fixed Point Theory* and many academic fields including but not limited to engineering, sciences, and technology. One of the clear applications of this is found in the theory of ordinary and partial differential equations. These equations are used to model real-world problems, thus their exact solutions are requested to be compared with experimental data. However on many occasions, exact solutions are impossible to be obtained, thus researchers relied on numerical approximation to provide a numerical solution that can be used for comparison with data. However, it is at least useful to provide conditions under which the model has an exact solution, in this case, *metric fixed point theory* is very useful. Several extensions or generalizations have been made and extensions have been done to capture problems that are more complex.

First paragraph in Section 3 (Existence of solutions for novel coronavirus 2019-nCoV/SARS-CoV-2 model in fractional scenario) have been updated.

Although humans have advanced their technologies and their medicine to protect the mankind, it is important to note that there are still diseases that continue to spread across the world that up to now humans have not found a permanent solution to eradicating these diseases. A few examples can be noted including HIV, malaria, Ebola, and other well-known infectious diseases that continue to take much life daily. In addition to these existing diseases, humans continue to be surprised by new ones that lead them to double their efforts to make their environment more saver, however, diseases are known to be the main source of death across the world. For example, information released by the WHO in 2001 indicated that diseases have added 26% of global mortality. From 2003, the world has witnessed a rise of different types of viruses for example SARS-CoV in 2003, Mers-CoV in 2012, Ebola in 2014, and now SARS-CoV-2 and others that are not listed here. Researchers from different backgrounds have investigated the biological structures, mode of transmission, and life span of these viruses. On the other hand, to protect life and livelihood medical bodies have developed several vaccines that could help prevent the spread of these diseases. Nevertheless, to have an idea of what could happen in a near future, mathematicians have developed some mathematical models that could be used first to provide the reproductive number of these diseases, second to predict the numbers of infected, recovery, and death cases. This was also valid with the breakout of the new virus known as covid-19, several investigations have been done, vaccines have been developed and some mathematical models have been proposed in the last two years with the aim to predict future behaviors of the spread. It's important to note that the use of mathematical modeling in the analysis of epidemiological disorders has risen significantly. In this work, we propose solutions for fractional-order models of the novel coronavirus 2019-nCoV/SARS-CoV-2.

First paragraph in Section 4.1 (Atangana-Baleanu fractional derivative sense) have been updated.

It has been recognized that dynamical spread exhibits nonlocal behaviors resembling processes like that of a power-law, fatigue, and crossover. These patterns are well described by some mathematical functions, for example, the power-law function is known to replicate power-law behaviors as time and power change. The fatigue effect can be well explained using an exponential decay function. The generalized Mittag-Leffler has been recognized to depict a passage from stretched fatigue effect to power-law. From these functions and the convolution, concepts of fractional differentiation and integration have been introduced and applied in many problems in the last decades. In this section, we investigate the model of 2019-nCoV/SARS-CoV-2 using differential operators based on the generalized Mittag-Leffler kernel.

References

1. S. K. Panda, A. Atangana, J. J. Nieto, New insights on novel coronavirus 2019-nCoV/SARS-CoV-2 modelling in the aspect of fractional derivatives and fixed points, *Math. Biosci. Eng.*, **18** (2021), 8683–8726. doi: 10.3934/mbe.2021430.

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