Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

# Modeling and forecasting of epidemic spreading: The case of Covid-19 and beyond

The Covid-19 pandemic is the most significant global crisis since the Second World War. Exceeding the size and range of the repercussions of a World War, it has affected all the Countries of our planet.

The health consequences of the pandemic are devastating. To date the number of Covid-19 deaths exceeds 75,000 and is unfortunately destined to exponentially grow in the coming weeks.

Furthermore, the pandemic has led to unprecedented social consequences and upheaval. It is estimated that more than 4 billion people (a half of the entire mankind) are today affected by drastic restrictions in their movements and social relationships.

The pandemic has also triggered a global economic crisis, quite unlike those of the previous decades, whose shock will be felt for years to come. Already due to the pandemic the vast majority of our habits, trade, social and economic relations, methods, forms of work, and political organizations have already fundamentally changed.

It is surprising that our governments, our social policies and our health systems were globally unprepared to manage such a situation, even though we all knew an impending pandemic was simply a matter of time – *a time which has now arrived.*

Such abject lack of preparedness, from day one of the outbreak, is the main cause of the delays and inadequacies of our decisions and actions, taken at the local, national and international levels, to contain the virus.

The large-scale spreading of viral or bacterial pathogens is to be considered among the main threats to humanity and society.

This is just one reason why it is urgent that we act today.

Here is a pressing and immediate need for the scientific community to come together and provide novel and better methods, strategies, forecasting techniques and models, to understand and mitigate the effects of this and future pandemics.

Such advances are needed in both the short and longer term to inform effective and objective policies and strategies to be adopted.

As editors of *Chaos, Solitons and Fractals*, a fundamentally interdisciplinary journal, we are deeply convinced that addressing epidemic spreading requires a broader scientific debate and a more profound interplay between the disparate scientific communities that have tried to tackle the problem so far.

Indeed, we have identified at least three scientific communities that may auspiciously cooperate in the effort to deal more successfully with circumstances like the current pandemic – (1) the community of applied mathematicians, virologists and epidemiologists, who for years have been developing ever more sophisticated diffusion models which are increasingly attentive to the specific properties of a given pathogen; (2) the community of complex systems scientists who have approached the study of the spread of infections by means of compartmental models in networked populations, and used the arsenal of methods and principles borrowed from statistical mechanics and nonlinear dynamics; and (3) the community of scientists who are advancing science through the incorporation of artificial intelligence and deep learning, to produce successful and productive predictive models driven by vast amounts of data.

Emboldened by our convictions and spirit, we propose to launch an open Focus Issue of *Chaos, Solitons and Fractals* dedicated to all aspects of epidemic spreading, with the aim of providing a unique (but desperately needed) forum where ideas, studies, concepts, methods arising from the applied mathematics, the virology, the epidemiology, the nonlinear science and the artificial intelligence communities can be shared and integrated, to enrich our global efforts for understanding and mitigating the effects of the current pandemic while enabling us to avoid the worst effects of future pandemics.

We are strongly aware that such an initiative requires (in order to be attractive and inclusive) editorial procedures which have to be different from those adopted with regular submissions to the journal. We need to be nimble and timely!

To ensure the maximal rapidity in the diffusion and dissemination results and ideas we propose to commit ourselves, as Guest Editors, to rapidly process, review and come to a decision on all submissions. We propose to reach the quickest decisions by the means of utilizing, as Referees, experts from the journal's editorial board.

Moreover, in order to have all information instantly available for consultation, we decided to adopt a novel publication model: articles submitted to this Focus Issue will be published in regular issues of the Journal as soon as accepted, while the entire Focus Issue content will be brought together in an online special issue, easily accessible and navigable on ScienceDirect.

The call for Manuscripts will close on September 31st, 2020, with a final online publication of the entire Focus Issue proposed for November, 2020.

We hope you are able to enthusiastically embrace and approve our proposed Focus Issue so we can get started immediately!

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