FUJMA
Fundamental Journal of Mathematics and Applications

Special Issue Announcement

Epidemic Mathematical Models with Optimal Control, Stability, Chaos, and Bifurcation with Ordinary Derivatives, Fractional Derivatives with Delay

Special Issue Information

This Special Issue aims to highlight the latest developments in the field of mathematical epidemiology. In particular, we welcome contributions on the mathematical modeling of infectious diseases through discrete-time equations, though studies based on continuous-time equations are also encouraged.

- **Discrete models** treat time or system states as discrete.
- **Continuous models** incorporate time and system states as continuous.
- **Dynamic models** describe time-dependent changes in the state of a system, typically formulated using **differential equations** or **difference equations**.
- **Static models** are time-invariant, assuming system quantities remain unchanged over time.

Epidemiology studies patterns of health and illness, along with their associated factors, at the population level. Historically, until the twentieth century, epidemiological research was primarily focused on infectious diseases. In the modern era, however, the leading global causes of mortality include non-communicable diseases such as stroke and coronary heart disease—conditions that are not transmissible but remain a central concern in epidemiology.

Mathematical models are indispensable in the natural sciences, particularly in biology and epidemiology. They serve multiple purposes:

- Providing insights into complex systems,
- Organizing and interpreting biological data,
- Analyzing system behavior and responses,
- Designing effective intervention and control strategies, and
- Making reliable predictions about disease dynamics.

The primary focus of this Special Issue will be **mathematical models of infectious diseases**. A mathematical model is a formal description of a system expressed through mathematical language and tools. The process of constructing these models

"mathematical modeling" is essential for explaining system behavior, evaluating the influence of different components, and predicting possible outcomes under varying conditions.

We invite researchers working on any of these topics, or related areas with applications in **mathematical epidemiology**, to submit their **original research contributions** and support the success of this Special Issue.

Articles in the following areas are most welcome:

- Epidemiological mathematical models
- Reproduction number
- Endemic equilibrium points
- Global asymptotic stability
- Incidence rates
- Lyapunov functions
- Discretization methods
- Non-standard difference scheme
- Dynamical behavior
- Bifurcation analysis
- Sensitivity analysis

Please note that these topics are not exhaustive, and we welcome submissions on related areas as well.

Important Dates:

- Submission Deadline: 31.03.2026
- Publication of Special Issue: June 2026

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Submission Link:
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