

Contributed Talk

📅 Fri. Jul 11, 2025 3:00 PM - 4:40 PM JST | Fri. Jul 11, 2025 6:00 AM - 7:40 AM UTC 🏠 Room 10

[C20] Infectious Diseases

[C20-02] A Mathematical model for HIV/AIDS-Mpox Coinfection Considering Treatment and Chaotic Behaviour

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Keywords : HIV/AIDS, Mpox, Coinfection, Basic reproduction number, Chaotic behaviour, Global sensitivity analysis

In this talk, we introduce a coinfection model describing the interaction between HIV/AIDS and mpox, incorporating case detection and treatment for coinfecting individuals. We analyze both analytically and numerically the existence and stability of key equilibrium points, including the disease-free equilibrium, dominant endemic equilibria, and coinfection endemic equilibria. Using path-following techniques, we demonstrate that the model exhibits complex dynamics, such as periodic solutions and chaotic behavior. These results highlight the need for carefully designed intervention strategies, as the presence of chaos can lead to unpredictable epidemic outcomes. To identify the most influential factors, we perform a global sensitivity analysis using the Partial Rank Correlation Coefficient (PRCC) method, which reveals the parameters that most significantly affect disease dynamics.