

Istvan Kiss

SCHOOL OF MATHEMATICAL AND PHYSICAL SCIENCES, DEPARTMENT OF MATHEMATICS, UNIVERSITY OF SUSSEX, UK

e-mail: i.z.kiss@sussex.ac.uk

Vasilis Hatzopoulos

UNIVERSITY OF SUSSEX, UK

Michael Taylor

UNIVERSITY OF SUSSEX, UK

Peter L. Simon

EOTVOS LORAND UNIVERSITY, HUNGARY

Multiple sources and routes of information transmission: implications for epidemic dynamics

In a recent paper [1], we proposed and analyzed a compartmental ODE-based model describing the dynamics of an infectious disease where the presence of the pathogen also triggers the diffusion of information about the disease. In this paper, we extend this previous work by presenting results based on pairwise and simulation models that are better suited for capturing the population contact structure at a local level. We use the pairwise model to examine the potential of different information generating mechanisms and routes of information transmission to stop disease spread or to minimize the impact of an epidemic. The individual-based simulation is used to better differentiate between the networks of disease and information transmission and to investigate the impact of different basic network topologies and network overlap on epidemic dynamics. The paper concludes with an individual-based semi-analytic calculation of R_0 at the non-trivial disease free equilibrium.

REFERENCES

- [1] I.Z. Kiss, J. Cassell, M. Recker, and P.L. Simon. (2010) The effect of information transmission on epidemic outbreaks. *Math. Biosci.* 225, 1-10.