www.elsevier.com/locate/yjtbi

Interplay between epidemic spread and information propagation on metapopulation networks

Bing Wang, Yuexing Han, Gouhei Tanaka

PII: S0022-5193(17)30074-7
DOI: http://dx.doi.org/10.1016/j.jtbi.2017.02.020
Reference: YJTBI8976

To appear in: *Journal of Theoretical Biology*

Received date: 26 June 2016
Revised date: 13 February 2017
Accepted date: 16 February 2017

Cite this article as: Bing Wang, Yuexing Han and Gouhei Tanaka, Interplay between epidemic spread and information propagation on metapopulation networks, *Journal of Theoretical Biology* http://dx.doi.org/10.1016/j.jtbi.2017.02.020

Interplay between epidemic spread and information propagation on metapopulation networks

Bing Wang,[1,*] Yuexing Han,[1] and Gouhei Tanaka[2]

[1] *School of Computer Engineering and Science, Shanghai University, No. 99 Shangda Road, Baoshan District, Shanghai, 200-444, P. R. China*

[2] *Graduate School of Engineering, the University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, 113-8656, Japan*

(Dated: February 28, 2017)

Abstract

The spread of an infectious disease has been widely found to evolve with the propagation of information. Many seminal works have demonstrated the impact of information propagation on the epidemic spreading, assuming that individuals are static and no mobility is involved. Inspired by the recent observation of diverse mobility patterns, we incorporate the information propagation into a metapopulation model based on the mobility patterns and contagion process, which significantly alters the epidemic threshold. In more details, we find that both the information efficiency and the mobility patterns have essential impacts on the epidemic spread. We obtain different scenarios leading to the mitigation of the outbreak by appropriately integrating the mobility patterns and the information efficiency as well. The inclusion of the impacts of the information propagation into the epidemiological model is expected to provide an support to public health implications for the suppression of epidemics.

* bingbignwang@shu.edu.cn, bingbignmath@gmail.com