ABSTRACT

Influence of opinions on vaccines on the evolution of a disease

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Some doubts about the effects, beneficial or not, of vaccines arose in recent years. As a consequence some people decide to not vaccinate themselves and/or their relatives. This attitude in face of vaccines has clear consequences in the spread of diseases. In this paper we study, in a simultaneous way, the changes of opinions on vaccination together with the evolution of a disease that can become epidemic. To do so we consider a bi-layered complex network. One of the layers corresponds to a social network where people share their opinions and influence the opinions of the others. This network may be of real or virtual contacts. The second layer corresponds to a network of physical contacts that can cause contagion of a disease. The dynamics of opinions makes use of a model where intermediate opinions are possible, and the evolution is such that with a given probability p opinions evolve towards extremes (In favor or against vaccination), while with probability 1-p opinions evolve to a middle term position[1]. The results are sensitive to the ratio p/(1-p) and to the efficacy of the vaccine that we call W. If the efficacy is lower than 80% opinion evolves against the vaccine, while for higher efficacy most of the populations decide to vaccinate.

1. *The influence of persuasion in opinion formation and polarization.* C. E. La Rocca, L. A. Braunstein and F. Vazquez, Europhys. Lett.**106**, 40004 (2014).