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Xiang-Sheng Wang* (xswang@louisiana.edu), Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70503. *Traveling waves in epidemic models: non-monotone diffusive systems with non-monotone incidence rates.* Preliminary report.

We study the existence and nonexistence of traveling waves of diffusive epidemic models with general incidence rates. The model systems are non-monotone because of the intrinsic predator-prey interaction between the susceptible and infective compartments in epidemic systems. Moreover, the incidence rate may not be monotone in the infected population because social behaviors and collective activities may change in response to the prevalence of disease. To find positive traveling solutions of the non-monotone system with a non-monotone incidence function, we will construct a suitable convex set in a weighted function space, and then apply Schauder fixed point theorem. It turns out that the basic reproduction number of the corresponding ordinary differential equations plays an important role in the existence theory of traveling waves. Moreover, the critical wave speed can be explicitly obtained in terms of the diffusion coefficient, recovery rate and removal rate for infected group, and partial derivative of incidence function at the disease-free equilibrium. Finally, we prove that the positive traveling wave solution does not exist if the basic reproduction number is no more than one, or the wave speed is less than the critical value. (Received September 18, 2017)