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Rigorous Analysis of Edge-Based Network Disease Models. Preliminary report.

Edge-based network disease models, in comparison to classical compartmental epidemiological models, can better capture heterogeneity in various aspects of disease transmission processes. Rigorous analysis will be provided to show that disease dynamics of such models are completely determined by the basic reproduction number. Specifically, if the basic reproduction number is below 1, then the disease dies out; while if the basic reproduction number is above 1, then there is an epidemic. (Received September 17, 2019)