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Stability for a Class of Epidemic Models with Mass Action Incidence

Many epidemic models with mass action incidence can be written as a sum of constant, linear and quadratic terms:

$$x' = K + Nx + Qx_1x_2$$

where K and Q are constant vectors and N is a matrix. Under very reasonable assumptions on K , N and Q , it will be shown that this n -dimensional system has a globally asymptotically stable equilibrium. The result resolves the asymptotic behaviour of several models in the literature for which the global dynamics had not been determined. The main results are obtained by the use of a Lyapunov function.