
TOSHIKAZU KUNIYA, Kobe University

Global stability analysis for an age-structured multi-group SIR epidemic model

In this study, we investigate the global asymptotic stability of equilibria in a multi-group SIR epidemic model with discrete and continuous age structures. For both discrete and continuous cases, we obtain the basic reproduction number R_0 as the spectral radius of the next generation matrix/operator and show that if $R_0 < 1$, then the disease-free equilibrium is globally asymptotically stable. Furthermore, under the assumption that the disease transmission coefficient is independent from the age of infective individuals and the rate of removal from infective class is age-independent, we show that if $R_0 > 1$, then the endemic equilibrium is globally asymptotically stable. In the proof, we use the well-known graph theoretic approach developed by Professors Guo, Li and Shuai (2006) together with an approach of max function.