

Stability and oscillations of multistage SIS epidemic models

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In this talk we consider a multistage SIS model, where infected individuals are passing through infectious stages I_1, I_2, \dots, I_n and then return to the susceptibles. First we calculate the basic reproduction number R_0 , and prove that the disease dies out for $R_0 \leq 1$, while a unique endemic equilibrium exists for $R_0 > 1$. Our main result is that the stability properties of the endemic equilibrium depends on the number of stages: it is always stable when $n \leq 3$, while for $n > 3$ it can be stable or unstable, depending on the particular choice of the parameters.

References

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