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**Global properties of a delayed SIR model with temporary immunity and nonlinear incidence rate.** (English) Zbl 1144.34374

Nonlinear Anal., Real World Appl. 6, No. 3, 495-507 (2005).

**Summary:** We derive and study a time-delayed SIR model with a general incidence rate. The time delay represents temporary immunity period, i.e. time from recovery to becoming susceptible again. Both trivial and endemic equilibria are found, and their stability is investigated. Using Lyapunov functional approach, the global stability of an endemic equilibrium is shown. Numerical simulations support our analytical conclusions and illustrate possible behaviour scenarios of the model.

**MSC:**

[34K20](#) Stability theory of functional-differential equations  
[37N25](#) Dynamical systems in biology  
[92D30](#) Epidemiology

Cited in **62** Documents

**Keywords:**

[SIR model](#); [Temporal delay](#); [Equilibria](#); [Global stability](#); [Numerical simulations](#)

**Software:**

[dde23](#)

**Full Text:** [DOI](#)

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