

MODEL DINAMIK SEDERHANA UNTUK MASALAH PENINGKATAN POPULASI PEROKOK

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Abstract. In this article, a simple dynamical model derived from the SIR Model that has been known in epidemiology is applied to study qualitatively the growth of smoker population in a closed population system. The population in the system is divided into three groups: potential smokers, active smokers, and quitted smokers. We derive the model by assuming that the quitted smokers can relapse into active smokers. The model consists of three nonlinear and autonomous differential equations, and is then investigated by applying the linear stability theory. We find that the increase of a number of smokers mainly depends on three parameters: how big the interaction between an active smoker and a potential smoker, an average time for being a smoker, and an average time for being a quitted smoker before relapsing into an active smoker. These three parameters are represented by a number R_0 , so called a threshold condition. For $R_0 > 1$, we find that the population of active smokers always exists. Results also show that low interaction is enough to increase a number of active smokers.

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