

**THE EFFECT OF CONSTANT AND
MIXED IMPULSIVE VACCINATION ON SIS EPIDEMIC
MODELS INCORPORATING MEDIA COVERAGE**

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ABSTRACT. An SIS epidemic model incorporating media coverage is presented in this paper. Impulsive vaccination to susceptible individuals is considered. In general, impulsive vaccination is a proportional vaccination, but when the number of susceptible individuals is very large, the number of people who need to be vaccinated is also proportionally increasing, considering limited vaccination ability of an area. So we first investigate constant impulsive vaccination. Using the discrete dynamical system determined by the stroboscopic map, we obtain the exact periodic infection-free solution and show that it is globally asymptotically stable if some conditions are satisfied. After constant impulsive vaccination to a large number of susceptible individuals, the number of susceptible individuals will gradually decrease; if the number of susceptible individuals decreases below the above constant, we will not use the above vaccination strategy. In that case we will use a common proportional impulsive vaccination. So, we consider mixed impulsive vaccination, and we also obtain the exact periodic infection-free solution and show that it is globally asymptotically stable.

1. Introduction. Vaccination is a commonly used method for controlling disease: the study of vaccines against infectious disease has been a boon to mankind. Many authors have investigated constant vaccination and impulsive vaccination to susceptible individuals, see [5, 6, 9, 14, 15], and the difference between constant vaccination and impulsive vaccination has also been studied in [14], where impulsive vaccination is a proportional vaccination. However, when the number of susceptible individuals is very large, the number of people who need to be vaccinated is also proportionally increasing, considering limited

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