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Stochastic Investigation of a Mathematical Model for Alcohol Addiction

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Abstract

Compartmental models of disease transmission form the basis for modeling studies in other contexts such as modeling the spread of bad habits for certain age groups or the spread of malware in networks. In this study, an existing deterministic model of alcohol addiction will be studied within the stochastic framework to investigate the overall effects of environmental factors on the dynamics of the spread of the addiction. The system of stochastic differential equations, obtained by using stochastic noise, is studied for the extinction or perseverance of addiction and long-term structure of the population, such as expected susceptible population size, both numerically and through theoretical calculations. A comparison of the findings from the deterministic modeling approach and the stochastic findings will also be used to underline the advantages of the stochastic approach.

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