AN INTEGRO-DIFFERENTIAL MODEL FOR THE SPREAD OF ALCOHOL ABUSE

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Abstract. Alcohol abuse is an important public health problem. There are many factors that can affect the spread of alcohol abuse in a neighborhood; "peer influence " is one such factor, especially in the alcohol consumption of college students. The goal of my research is to develop a mathematical understanding of the effects of peer influence on the spread and persistence of alcohol abuse. Braun et. al (2006) introduces a simple network model for this phenomenon consisting of a large system of ordinary differential equations. A mechanism to simulate the treatment of the most serious abusers is also provided. We introduce a spatially continuous version of the Braun model and an associated treatment scheme. Our model involves an integro-differential equation. Using perturbation and phase plane techniques as well as scientific computations, we investigate solution behavior and, in particular, look for traveling waves.

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