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J. Sooknanan, D.M.G. Comissiong

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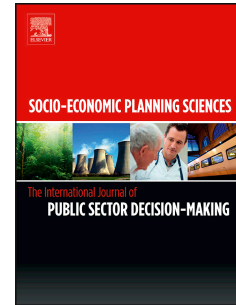
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A Mathematical Model for the Treatment of Delinquent Behavior

J. Sooknanan^a, D.M.G. Comissiong^{b,*}

^aCentre for Education, University of Trinidad & Tobago, Corinth Campus, Trinidad

^bDepartment of Mathematics & Statistics, The University of the West Indies, St. Augustine Campus, Trinidad

Abstract

A key predictor variable for juvenile delinquency is the presence of delinquent peers. Consequently, delinquent behavior may be treated as a socially infectious disease spread by peer influence and its spread modelled using a compartmental model from mathematical epidemiology. A Public Health Approach was used to design the model and this system was found to have three equilibrium states – two with no serious delinquents (non-status offenders) and one with both serious delinquents and status offenders coexisting. We employed a sensitivity analysis on the basic Reproductive number R_0 , and identified the parameters that should be targeted by treatment strategies to curb the spread of juvenile delinquency. This model may be used by policy makers to provide insights to inform policy creation as well as to set tangible targets for the proportion of delinquents treated and the detention rate.

Keywords: Juvenile delinquency, Infectious disease model, Compartmental model, Bifurcation analysis

2010 MSC: 92D30, 91F99, 34D20

1. Introduction

Juvenile Delinquency has become a rapidly growing challenge in Trinidad with an increasing number of youth entering the criminal justice system [36].

*Corresponding Author: Donna M.G. Comissiong
Email address: Donna.Comissiong@sta.uwi.edu (D.M.G. Comissiong)

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