Name of the Research Scholar:

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Broad Topic of Research:

Mathematical Modeling in Epidemic Model

A BRIEF RESEARCH PROPOSAL

Introduction

A mathematical model is a description of a concepts and language. A model may help to explain a system and to study the effects of different components, and to make predictions about behavior.

There is a large element of compromise in mathematical modeling. The majority of interacting systems in the real world are far too complicated to model in their entirety. Hence the first level of compromise is to identify the most important parts of the system. These will be including in the model, the rest will be excluded. The second level of compromise concerns the amount of mathematical manipulation which is worthwhile.

Epidemic Model

Historically the mathematical modeling of epidemics has started since the time of Graunt. In fact, Kermack and Mc Kendric describe some classical deterministic mathematical models of epidemiology by considering the total population into three classes namely Susceptible (S) individuals, Infected (I) individuals and recovered (R) individuals which is known to us as SIR epidemic model. This SIR epidemic model is very important in today's analysis of diseases. in recent years, epidemiological models have been studied by a number of authors.

The basic and important research subjects for these systems are the existence of the threshold value which distinguishes whether the infectious disease will die out, the local and global stability of the disease-free equilibrium and the endemic equilibrium, the existence of periodic solutions, the persistence and extinction of the disease, etc. Many models in the literature represent the dynamics of disease by systems of ordinary differential equations without

time delay. In order to reflect the real dynamical behaviors of models that depend on the past history of systems, it is reasonable to incorporate time delays into the systems.

Movitated by the works ([2],[6]), I have worked on " *Qualitative Analysis and Optimal Control Strategy of A New SIR Epidemic models with Saturated Incidence rate*" . I am Interested to do research more an Epidemic Model.

Research Objectives:

I have proposed to study Epidemic Models from the base of Mathematical Modeling problems

- Infectious Diseases in Human (COVID- 19, Typhoid, Malaria, HIV/AIDS, Dengue, Tuberculosis,etc…)
- Infectious Diseases Caused in animals and plants
- Drug addiction / Mobile addiction
- Corruption with Punishment
- Road accident with controlling factor

Reference:

[1]. Elazzouzi. A and Lamrani Alaoui. A: Global Stability analysis for a generalized delayed SIR Model with vaccination and treatment, Published 21st December 2019.

[2]. Herbert W. Hethcote . The Mathematics of Infectious diseases.

[3]. Jasmine. D and Surjith Jiji. D : Mathematical Modeling on Industrial Pollution and Spread of Infectious Disease with Incidence Rate Using SIR Epidemic Model with Controlling Factor. International Journal of Research in Advent Technology (IJRAT) Special Issue, January 2019.

[4]. Jayanta Kumar Ghosh and Uttam Ghosh : Qualitative analysis and optimal strategy of an SIR epidemic model with saturated incidence rate and treatment.

[5]. Junyuan Yang and xiaoyan wang: Threshold Dynamics of an SIR Model with non-linear Incidence Rate and Age- Dependent Susceptibility, Published 14th October 2018

[6]. Kaddar. A : Stability analysis in a delayed SIR epidemic model with a saturated incidence rate, Published 17th September 2010

[7]. Zhixing Hu and Wanbiao Ma : Analysis of SIR epidemic models with nonlinear incidence rate and treatment.