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AGENT ORIENTED METHODOLOGY FOR MALARIA TRANSMISSION MODELLING AND SIMULATION

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ABSTRACT. Epidemiology study like malaria study is receiving much attention among the researchers nowadays. To model the epidemiology study like malaria, one can adopt different equations to formulate the problem. Alternatively, individual based modelling is started to emerge and useful for epidemiology study due to the nature of flexibility and emergence behaviour of individual based modelling. Since various epidemiology mathematical models have been introduced and implemented, can we reuse the models in individual based modelling? In fact, it is possible but not a straightforward process. This paper presents a systematic approach for individual based epidemiology modelling and simulation by reusing the existing mathematical models on epidemiology study. With the systematic approach, a rapidly prototyping of epidemiology study is introduced. Also, it promotes the comprehensiveness and model transformation across technical and non-technical person.

Keywords: agent oriented modelling and simulation, epidemiology modelling

INTRODUCTION

Epidemiology study like malaria transmission model is used to simulate malaria outbreak which can aid in creation of a disease control systems that are appropriate for vector control units and health ministries. According to Jane (Kon and Jane, 2013), malaria transmission model describes spread of malaria in terms of flow of humans and mosquitoes between two states: Susceptible and Infectious. Susceptible represents the state of human and mosquito that are not infected yet but vulnerable to infection. Infectious represents the state of human and mosquito that have been infected with disease and are capable of spreading the disease to susceptible. The cycle of disease transmission begins when a Susceptible mosquito is feeding on blood of an Infectious human. This mosquito will become Infectious and continues spreading the disease to another Susceptible human through bites. The cycle of transmission repeats again when another Susceptible mosquito bites this recently Infectious person.