

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

THE STUDY OF H5N1 BASED ON SIR MODEL

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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ABSTRACT

There are two scenarios created on the human part of the H5N1 model. They are pre-pandemic scenario model and pandemic scenario model. Pre-pandemic scenario model is the model of the current situation where humans infected with avian flu via bird versus human infection. Meanwhile, the pandemic scenario model is the model for a hypothetical scenario in which a pandemic strain arises and humans have been infected via human to human transmission. In this research, we are only focusing on the pre-pandemic scenario model. It is because we want to clearly understand how humans can be infected via bird transmission. In this case, we consider the domestic birds only. As a whole, this research is restricted to highly pathogenic H5N1 avian influenza and we include the domestic bird population only. The aim of this research is to derive the models of both epidemic which are among domestic birds by SI model (Susceptible-infected) and among humans by SIR model (Susceptible-Infected-Recovered). These modified models are derived from each variables to determine their relationship with each other. Second, we fit the data into that model. Then we plot a graph by using MAPLE software to display the results. Furthermore, we discuss the graph as in section result and discussion.

1 INTRODUCTION

Avian Influenza or commonly known as bird flu is one of the harmful disease. It is caused by influenza virus called H5N1. This virus can lead to a highly infectious condition and is related to severe respiratory disease among birds. Until now, there is only a small case among human related with avian influenza H5N1. Normally, this disease is very difficult to transmit from human to human. But once human is getting infected, the mortality rate will rise up to 60%.

Mostly people that have been reported with infection H5N1 come from close contact with infected live or dead birds, and with the environment itself that maybe contaminated with H5N1. Actually, human is not easily infected from this virus. From our reading, this disease can spread to human when food that was eaten are not properly prepared and not cooked thoroughly.

We do not know one day there is easily infected by this virus through transmission from human to human while its still remains to cause severe disease.

For information, an influenza virus always undergoing genetic changes hence, there is possibility to spread among human easily. There are some symptoms of avian influenza H5N1 among humans that should be recognize to everyone as a step to prevent from infected by this disease.

Once human getting infected with this disease, they may give symptom such as fever (normally high fever greater than 38°C), malaise, cough, sore throat and muscle aches. Besides that, they must know also the first symptom of this disease. There are including as dominant pain, chest pain and diarrhea. This infection also can give a faster progress to severe respiratory illness for examples, difficulty in breathing, pneumonia, Acute Respiratory Distress Syndrome and neurological changes which means changes in mental status and seizure.

To date, it is safe to eat chicken, poultry products and other wild game birds. This virus is very sensitive to heat actually. Hence, as a precaution, the normal temperatures for cooking