Malaria Outbreak Prediction using Machine Learning

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Abstract—India is prone to a multitude of diseases due to the huge population, area and lack of development. Early prediction of these diseases is the key to controlling the mortality rates and helping in the control of the spread of the disease. Predicting the probabilities of the occurrence of diseases will allow the population to be aware of the risks possible and take preventive measures. Additionally medical resources and aid can be made available to those who require it as early as possible. In this study we will be using machine learning algorithms like Support vector machine to predict the possibility of occurrence of diseases malaria in yes or no class. This study will focus on the possibility of occurrence of diseases with climatic conditions that they have been established to have a relationship with.

Keywords — Malaria, Support Vector Machine, Outbreak, Machine Learning, Public Heath, Epidemic, Artificial Intelligence, Prediction.

I. INTRODUCTION

Malaria has been a problem in India for quite sometime. Malaria has been around for a long time but during the 1990s it made a comeback with different and new features that were not seen as majorly in the period of the pre-eradication days. These are the vector resistant to different materials such as insecticides, that are called as exophilic vector behaviour, the large amount of vector breeding locations that occurred due to the water resource development projects, growing urbanization and increasing industrialization.[5] Based on the statistics published by World Malaria Report in 2017, in the year 2016, a majority of the population, that is almost around 698 million people were at risk contradicting of malaria. Based on this very Report, India was responsible for 6% of the complete malaria occurrences in the world, 6% of the fatalities, and 51% of the the world over P. vivax cases.[3] The Report estimates the total cases in India at 1.31 million (0.94-1.83 million) and deaths at 23990 (1600-46500) and that 90 per cent of the deaths were recorded in rural areas, of which almost 86 per cent occurred at home without any kind of medical attention.

According to the National Vector Borne Disease Control Programme (NVBDCP) to assess India's actual malaria death burden, the total annual number of cases in India may be about or more than 9.7 million, with about 30,014 – 48,660 deaths (40,297 on an average). There are various factors which are major reasons that cause malaria for e.g. climatic factors like temperature, rainfall, humidity etc and non-climatic factors like different human hosts, human migration etc.[11]

Malaria is caused by Plasmodium Falciparum carried by antelopes mosquito[4]and is spread by the antelopes mosquito Mosquitoes carry diseases that are vector borne and these diseases usually have a relationship to the climatic conditions because of the vector borne nature of the disease.[13]
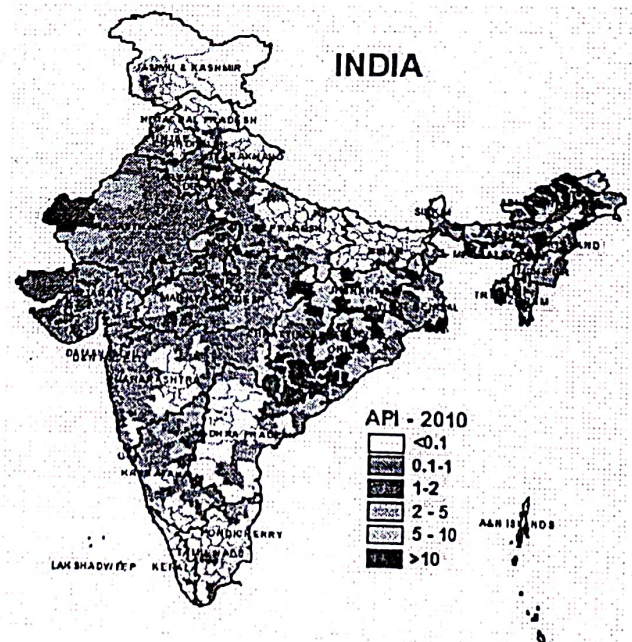

Fig 1[2]