

## ABSTRACT

Malaria affects over 100 million persons worldwide each year. The impact of malaria can cause approximately 2,414 deaths a day in average. Indonesia has a great number of incidents it is on the third highest position of malaria incident in South East Asia, with number of confirmed cases of 229,819 cases reported and 432 deaths only at 2010. The Malaria incidence prediction is badly needed so that the Health Department of Ministry of Indonesia is able to make the necessary preparation to prevent and reduce the impacts. Malaria incidence Prediction is a problem of Time series prediction, and a Time series prediction involves the determination of an appropriate model, which can encapsulate the dynamics of the system, described by the sample data. Previous work has demonstrated the potential of neural networks in predicting the behavior of complex, non-linear systems. Group Method of Data Handling (GMDH) Polynomial Neural Network was applied in a great variety of areas for data mining and knowledge discovery, forecasting and systems modeling, optimization and pattern recognition. This paper proposed a modified GMDH Polynomial Neural Network to reduce the learning time and computation while maintaining the accuracy. Based on the experiments, it was proven that the modified GMDH PNN was able to reduce the learning time by 72% and improve the accuracy by 7%, 5.37%, and 4.97% into the accuracy of 88.02%, 86.12%, and 83.90% for 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> month prediction compared to the original GMDH PNN.

**Keywords:** Malaria, Prediction, Polynomial Neural Network.