

## عنوان مقاله:

A mathematical model of a diphtheria outbreak in Rohingya settlement in Bangladesh

## محل انتشار:

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## خلاصه مقاله:

In this paper, we study the dynamics of the diphtheria outbreak among the immunocompromised group of people, the Rohingya ethnic group. Approximately 1,00,000 Rohingya refugees are living in the Balukhali refugee camp in Cox's Bazar. The camp is densely populated with the scarcity of proper food, healthcare, and sanitation. Subsequently, in November 2017 a diphtheria epidemic occurred in this camp. To keep up with the pace of the disease spread, medical demands, and disaster planning, we set out to predict diphtheria outbreaks among Bangladeshi Rohingya immigrants. We adopted a modified Susceptible-Latent-Infectious-Recovered (SLIR) transmission model to forecast the possible implications of the diphtheria outbreak in the Rohingya camps of Bangladesh. We discussed two distinct situations: the daily confirmed cases and cumulative data with unique consequences of diphtheria. Data for statistical and numerical simulations were obtained from Matsuyama. We used the fourth-order Runge-Kutta method to obtain numerical simulations for varying parameters of the model which would demonstrate conclusive estimates. Daily and cumulative data predictions were explored for alternative values of the parameters i.e., disease transmission rate ( $\beta$ ) and recovery rate ( $\gamma$ ). Additionally, the average basic reproduction number for the parameters  $\beta$  and  $\gamma$  was calculated and displayed graphically. Our analysis demonstrated that the diphtheria outbreak would be under control if the maintenance could perform properly. The results of this research can be utilized by the Bangladeshi government and other humanitarian organizations to forecast disease outbreaks. Furthermore, it might help them to make detailed and practical planning to avoid the worst scenario.

## کلمات کلیدی:

SLIR model, diphtheria, stability analysis, model validation, numerical analysis

## لینک ثابت مقاله در پایگاه سیویلیکا:

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