

**AN OPTIMIZATION MODEL FOR NON-PHARMACEUTICAL INTERVENTION
TO CONTROL THE OUTBREAK OF COVID-19 EPIDEMIC IN SRI LANKA**

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COVID-19 became a global pandemic in the latter part of the year 2019 which impacted immensely on the general public not only by infection but also by creating social and economic chaos among the communities. Until an appropriate curative remedy or vaccine is found, the World Health Organization (WHO) proposed to implement certain non-pharmaceutical interventions (NPIs) to mitigate its spread. Policymakers resort to implement strict NPI strategies without a proper understanding on the impact of the implementation, especially the mental condition of the people due to travel restrictions and continuous lockdowns. The purpose of this study is to analyse the situation carefully and propose an optimization model that combines social constraints, with the objective of minimizing frustration among the general public when implementing certain strict NPIs. In order to get the support from the citizens for the implementation of NPI in their respective districts, while minimizing the mental stress, public opinion was incorporated into the optimization model. In the proposed model, the opinion of the general public is incorporated in the objective function as penalties and the objective function attempts to minimize the total penalty. Penalties are the coefficients in the objective function in the scale from 0 to 10. The developed Mixed Integer Linear Programming optimization model is solved using the Optimization Programming Language solver and hence, determined the optimal values of the non-zero binary decision variables in the objective function. By optimizing these limitations, the model was able to determine the best weekly NPI schedule for every district that reduces the overall level of public discontent.

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