For consideration under COVID -19 Initiatives by NITs

Title: Predictive Models for COVID 19

Category: Data Analytics, AI to model epidemic patterns and disease dynamics

Abstract

The COVID-19 pandemic presents decision makers worldwide with unenviable policy choices. Intensive Care Unit capacity can be rapidly built up to meet the anticipated rise in numbers of very sick patients. Prioritizing resources is especially relevant as countries look to mobilize domestic and external support for the COVID-19 response within the important healthcare constraints. So, there is a need for us to be prepared well in advance in regulating medical devices used to diagnose, prevent and treat COVID-19, such as diagnostic tests, ventilators, and personal protective equipment (PPE)-including masks, face shields, respirators, gowns, and gloves. The system needs to ensure that patients and health care providers have timely and continued access to high-quality diagnostic and therapeutic medical devices to respond effectively to the COVID-19 pandemic.

In this project, we will be using data science to predict quantity of medical and personal requirements needed with the help of the present-day statistics of how many are being used, percentage of people getting affected with the disease, requirement of each patient etc. The dependency on data science, specifically machine learning algorithms to estimate the requirements based on the crisis demand. The lack of impact on clinical practice can largely be attributed to insufficient performance of predictive models, difficulties to interpret complex model predictions, and lack of validation via prospective clinical trials that demonstrate a clear benefit compared to the standard of care. The design of decision support system using Prediction models will be based on

1. Emphasizing essential emergency and critical care where appropriate for those patients who do become critically unwell.
2. Availability of Medical Equipment's, PPEs to protect frontline staff and prevent infections acquired in hospital.
3. Selection of appropriate surgical tools to guide effective care.
4. Shifting some tasks related to the care of patients to less specialized health workers.
5. Priority of patient's treatments based on the severity of their condition or likelihood of recovery with and without treatment.

Expected Time-line: 12 months

Remarks: Funding requirement -Rs. 1, 00,000/-

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