A Novel Approach to Increase Testing with Contact Tracing Apps in COVID-19 Pandemic

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Recent rise in COVID-19 cases has highlighted the need for effective and targeted measures to reduce the spread of the virus. Consequently, app-based tracing strategies have been proposed as an alternative to general lock down or other restrictive measures. Previous studies related to the effectiveness of these apps, have not explored the possibility of increasing testing with app-based tracing strategies. The purpose of this investigation is to evaluate the effectiveness of app-based tracing with increased testing as an alternative to reduce the spread of the virus. Puerto Rico demographic data and infectious rate parameters were incorporated to the open ABM model (Agent Based Model able to incorporate app-based tracing). The Puerto Rico pandemic was simulated for 141 days from April to August. As expected, an increase in the traceable interaction fraction resulted in higher daily tests. Unexpectedly, lockdown measures had to be disabled from the model to closely emulate Puerto Rico's epidemic curve. Simulation results indicate a reduction of up to 21% in cases when 90% of the interactions were captured by the app. Other results point to a nonlinear relationship between the total number of cases and the interaction fraction number. Results point to a synergetic relationship with traditional passive intervention methods like quarantine and technology-based contact tracing. The following report summarizes the rational, methodology, variables, data analysis and conclusions of this investigation.

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