

Optimal intermittent social distancing control strategy considering behavior changes: flattening COVID-19 epidemic curve in Korea

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ABSTRACT

Many researchers have claimed that the intermittent on-off type of social distancing could flatten down epidemic curve and last long. In our study, we developed the COVID-19 model considering behavior change of population and set the social distancing as control measure which suppresses population to be eased. Our goal was to minimize the number of incidence and relative intervention costs in optimal control theory frame. Surprisingly, the optimal control solution came out in on-off type, although we did not assume on-off control but the time-dependent control function. Furthermore, we set intervention cost differently and found that the on-off ratio of optimal control showed relatively small change compare to the change of intervention cost. In last, we suggested suboptimal control which is periodic and has the on-off ratio of optimal control with more applicable duration.

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