

# EFFECT OF INTERVENTIONS ON EBOLA PANDEMIC IN WEST AFRICA USING OPTIMAL CONTROL THEORY

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## ABSTRACT

The epidemics of Ebola virus disease threaten a public health with a high fatality rate and an absence of licensed treatment and vaccines. On August 8, 2014, the World Health Organization declared the epidemic a “Public Health Emergency of International Concern”. The control interventions of public health measures are crucial factors for stopping Ebola transmission. Especially in West Africa, the dead people but not yet buried is one of major sources of infection transmission. Families or friends touch and kiss the dead body during traditional funeral ceremony. In this work, we propose optimal intervention strategies of preventing the Ebola epidemics by a mathematical model. The SEIR type model incorporated with time-dependent control measures was developed and optimal control theory has been applied to this controlled Ebola model. One burial control and three distancing controls in the community, at the hospital and during burial were considered to investigate optimal intervention strategies for minimizing the infectious individuals while keeping the cost implementing the controls. Simulation results show that the distancing control in the community is the most important control measure. However, if we do controlling only the dead people but not yet buried, optimal control interventions show dramatically reducing the Ebola transmission.

## REFERENCES

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