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Title: Elimination versus mitigation: what's the optimal strategy for controlling COVID-19?

Abstract: We formulate an optimal-control problem for the control of the COVID-19 outbreak in Ireland. Using a standard multi-compartment SEIR model, we fit the model to the first wave of the outbreak in Ireland (March-May 2020). We then investigate counterfactual scenarios, with the objective of finding the optimal strategy for controlling the epidemic. We focus on non-pharmaceutical controls that correspond to reducing social contacts. We also impose state constraints, which ensure that ICU capacity is not exceeded. The controls carry an economic cost, and we seek to minimise this cost while satisfying the state constraints. Our results advocate for elimination over mitigation, i.e. a strict lockdown that eradicates the virus is more cost-effective than long-term restrictions that reduce the spread of the virus.