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Individual risk and discomfort perceptions, NPI policies and the evolution of the pandemic in Ontario 2020

In this work, we provide a granular view of factors affecting COVID-19 disease transmission across Ontario, Canada and the 34 public health units composing it. We estimate the perceived risk of infection and perceived personal discomfort of complying with non-pharmaceutical interventions (NPIs) in each PH region. With the use of dynamic programming and a simple NAsh game model, we estimate the expected NPI adoption proportion across Ontario from March to December 2020. Finally, we use an SEIRL compartmental model for Ontario to study the interplay between the estimated NPI adoption from the game and the actual evolution of the infection. Finally, we explore the limitations of our work, discuss the success of our computations and highlight possible avenues of further refinement. This is joint work with: Sarah Smook (U. Guelph), David Lyver (U. Guelph) and Edward W. Thommes (U. Guelph)