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Reclustering populations based on mobility driven well-mixing using reinforcement learning - disease spread insights

In this talk we present an algorithm designed to recast a population (here that of the US) through the lens of county population's mobility patterns. The result is a reclustering of the US population in regions that are not geographically distinct, but instead have low inter-region travelling. Such subpopulations are now well-mixed from the perspective of a ODE model of SEIR-type, hence in-depth analyses of infection spread are much better supported. We highlight differences and similarities in the epidemic evolution of Covid-19 in 2020 in the US, following the population reclustering, and the interplay between population socio-demographic factors, NPI compliance (i.e., masks) and sizes of the initial local reproduction numbers, R0, and time delays between local peaks and sizes of reported incidence throughout 2020. Further, we look at ways to use the current Covid-19 based modelling to derive insights on the impact of different pathogen scenarios such as flu.