

On the Interplay of Regional Mobility, Social Connectedness, and the Spread of COVID-19 in Germany

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Abstract

Since the primary mode of respiratory virus transmission is person-to-person interaction, we should reconsider physical social interaction patterns to mitigate the number of people infected with COVID-19. While non-pharmaceutical interventions (NPI) had an evident impact on the national mobility patterns, only the relative regional mobility behaviour given the nationwide dynamic enables an unbiased look at the effect of human mobility on the spread of COVID-19. In this paper we therefore investigate the impact of regional human mobility patterns and social connectivity on the weekly rate of new infections in Germany between March 3rd and June 15th, 2020. We use data derived from Facebook activities and the results confirm that reduced social activity lowers the infection rate, accounting for regional and temporal patterns. The extend of social distancing has a negative effect and our results underpin that the geographic as well as the social position affects the incidence of COVID-19 in Germany.

Keywords: COVID-19, Infectious Disease Modelling, Multidimensional Scaling, Semi-parametric Regression, Spatial Network Data, Social Networks