



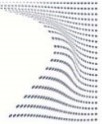
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Dipartimento Interateneo di Scienze, Progetto e Politiche del Territorio
Eccellenza MIUR 2018-2022

Doctoral Dissertation

Doctoral Program in Urban and Regional Development (XXXIV Cycle)

The role of density and population size in the pandemic-crisis experience of Covid-19

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Abstract

The unexpected situation of COVID-19 highlights the urgent knowledge need for integrating urban disciplines and public health subject. More specifically, the academic debate around the relationship between the spatial dimension and COVID-19 diffusion points out, among the others, a question: what is the role of a larger population density, or a larger size of the population in the diffusion of the COVID-19 virus? To provide and support an answer in the US metropolitan context, proper reflections should be taken to deal with three highly significant determinants of the spatial shape of the COVID-19 diffusion: the situation in terms of density and population size, the metro condition (separately from the non-metro division) at the county level, and the pandemic determinants in a specific phase of the pandemic. To carefully understand the effect of population size and density at the US county level, the thesis firstly explores the key theories referred to diffusion theory and complex urban systems, and then moves to an analytical and practical part. In this quantitative experimentation, the work distinguishes a group of “COVID-19 variables” and another heterogeneous collection of “COVID-19 reaction variables” which allow measuring, on one side, to what extent a pandemic wave behaved in a certain season, and on the other, in which kind of geographical and socio-economic context the surge impacted within the season observed. These interaction-variables have been collected distinguishing between metro and non-metro counties and are able to address some socio-cultural and economic differences that may have played a role in dealing with the virus.



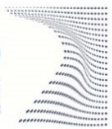
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To generally interpret the results from the single and multiple regression analysis and from the correlation and multicollinearity tests, there is no sufficient evidence to state that population density and size positively correlate with COVID-19 spread, since evidences from data-processing do not allow to assume rigid positions on that. They are mainly inter-related with the other independent variables, but less with the behaviour of COVID-19 cases and victims. However, as the literature suggests, while in the early phase of the pandemic, density had often a positive impact only in metro counties, then in later phases the effect of density decreased, in favour of other variables covering a greater role than expected.

The thesis effort of combining these different topics and dimensions has the potential to provide a ground-breaking contribution to the research on COVID-19 diffusion at the spatial level, as several built-environment properties will be “tested” in terms of efficacy along the crisis-steps and then will be probably discussed and re-organized (Samuelsson et al., 2020). Therefore, this work will firstly require extensive theoretical labour to collect the properties to address the research statement, and then a big data collection, processing and understanding, to provide first and reliable answers.

Insights of this research will certainly propose a new mix of disciplines, offer new perspectives for understanding the element of change in metropolitan counties, and advance the field of planning by understanding beyond their current state. In this scenario, the application of evolving concepts like diffusion theory applied to COVID-19 behaviour, system and complex theories, resilience perspective and adaptation approach may provide new insights for planning science and practice.

Finally, yet importantly, at the current time, this work does not know yet which changes will occur in people’s everyday urban life in the long-term, since the COVID-19 pandemic is still a relevant and existing topic. However, because of its global extension and spatial impacts, the vaccination process going on and the progressive confidence and coexistence with it, it is reasonable to sustain that urban contexts and functions may be (highly) affected by COVID-19 impacts and may not be able to go easily back in their business-as-usual habits as if nothing had happened. A deeper analysis in this sense will be beneficial to introduce the acceptance of the new crisis regime in the Anthropocene Era.

Keywords: COVID-19, density, population size, diffusion, planning, resilience, change