

A Study on the Effects of Urban Density, Sociodemographic Vulnerability, and Medical Service on the Impact of COVID-19

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Abstract : The outbreak of the COVID-19 pandemic brought reconsiderations and doubts about urban density as compact cities became epidemic hot spots. Density, though, provides an upside in that medical services required to protect citizens against the spread of disease are concentrated within compact cities, which helps reduce the mortality rate. Sociodemographic characteristics are also a crucial factor in determining the vulnerability of the population, and the purpose of this study is to empirically discover how these three urban factors affect the severity of the epidemic impacts. The study aimed to investigate the influential relationships between urban factors and epidemic impacts and provide answers to whether superb medical service in compact cities can scale down the impacts of COVID-19. SEM (Structural Equation Modeling) was applied as a suitable research method for verifying interrelationships between factors based on theoretical grounds. The study accounted for 144 municipalities in South Korea during periods from the first emergence of COVID-19 to December 31st, 2022. The study collected data related to infection and mortality cases from each municipality, and it holds significance as primary research that enlightens the aspects of epidemic impact concerning urban settings and investigates for the first time the mediated effects of medical service. The result of the evaluation shows that compact cities are most likely to have lower sociodemographic vulnerability and better quality of medical service, while cities with low density contain a higher portion of vulnerable populations and poorer medical services. However, the quality of medical service had no significant influence in reducing neither the infection rate nor the mortality rate. Instead, density acted as the major influencing factor in the infection rate, while sociodemographic vulnerability was the major determinant of the mortality rate. Thus, the findings strongly paraphrase that compact cities, although with high infection rates, tend to have lower mortality rates due to less vulnerability in sociodemographics, Whereas death was more frequent in less dense cities due to higher portions of vulnerable populations such as the elderly and low-income classes. Findings suggest an important lesson for post-pandemic urban planning-intrinsic characteristics of urban settings, such as density and population, must be taken into account to effectively counteract future epidemics and minimize the severity of their impacts. Moreover, the study is expected to contribute as a primary reference material for follow-up studies that further investigate related subjects, including urban medical services during the pandemic.

Keywords : urban planning, sociodemographic vulnerability, medical service, COVID-19, pandemic

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