SPECIAL ISSUE EDITORIAL

The impact of the COVID-19 pandemic on regional mobility, economy, and sustainability: insights from Asia and beyond

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The emergence of the COVID-19 disease initially occurred in China, followed by its rapid spread across major cities in neighboring Asian countries and global hubs. However, as the pandemic continued, notable variations emerged between Asian and Western nations with regard to their rates of confirmed cases and mortality, as well as the extent and timing of their social distancing policies, which ranged from strict coercion to greater autonomy. These differences had consequential effects on people's perceptions and behaviors, which in turn impacted economic, environmental, and social sustainability (Gim 2022). COVID-19 has impacted all aspects of daily life, including economic and leisure activities, both directly through physical confinement due to social distancing regulations and indirectly through the avoidance of face-to-face contact, resulting in increased indoor personal activities and visits to green spaces in response to vague fears of infection. Specifically, the implementation of measures such as working from home, unpaid leave, and business closures have caused declines in revenue and sales in traditional industries. Meanwhile, these measures have also led to a surge in the platform-based non-face-to-face economy (e.g., delivery services) and hygiene-related businesses. Moreover, variations in the spread and control of (mis)information through mass media, social media, and government channels have resulted in societal differences with respect to the changes wrought by the pandemic.

The focus of this special issue, titled "COVID-19: Shock, Recovery, and Sustainability—Asian Perspective," was to explore the development, impact, and response to COVID-19, with a particular emphasis on Asian national and regional contexts. The objective was to provide implications for Western researchers and practitioners, ultimately catalyzing new and expanded discussions on improving regional resilience in controlling the spread of infectious diseases and mitigating risks, while

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offering a perspective on desirable post-pandemic cities. The session was delimited by three primary themes, namely (1) case and comparative studies on COVID-19 and subsequent adaptation/mitigation strategies, (2) research on mobility changes related to COVID-19 effects (on economy, industry, and transportation, for example), and (3) explanation and prediction of the impact of COVID-19 on industrial sectors and subsequent adjustment to the regional economic structure. The five papers included in this special issue have successfully achieved these goals.

One of the studies included in this special issue by Lee et al. (2022), titled "Online citizen petitions related to COVID-19 in South Korean cities: A big data analysis," adopted a less traditional approach in regional science by comparing online citizen petitions related to COVID-19 in four major metropolitan cities in South Korea, namely Seoul, Busan, Daegu, and Incheon. The study utilized text mining, topic modeling, and network analysis to examine the similarities and differences in the nature of the petitions across these cities in relation to their varied pandemic experiences and geographical locations. The petitions were categorized based on whether they pertained to financial and welfare support (such as masks, vaccines, and financial assistance) or quarantine and prevention measures (such as disclosure of information on vaccination and testing, and the movement path of confirmed cases). The findings indicated that petitions for prevention measures were more prevalent in densely populated cities within the capital area (Seoul and Incheon), while welfare petitions were more common in cities situated far from the capital (Busan and Daegu). Surprisingly, the study found that despite experiencing a rapid spread of the pandemic in its early stages, the citizens of Daegu did not request prevention measures but rather sought support. On the other hand, in Incheon where the pandemic's spread was less severe, petitions tended to emphasize quarantine measures. The study highlights the need for further research to provide a logical explanation for these results.

The aforementioned study suggested two areas of research that are conventionally explored in regional science to better comprehend the pandemic. The first one pertains to studying urban characteristics in relation to the propagation of COVID-19, such as the number of confirmed cases. The second involves examining landscapes such as urban density and traffic. The former has been tackled by Kim et al. (2022a, b), while the latter by Kwon et al. (2022). Notably, the studies conducted by Kim et al. (2022a, b) and by Roson and van der Vorst (2022) are noteworthy for their focus on regional economics, which was the first-mentioned scope of this special issue. Both studies utilized computable general equilibrium (CGE) modeling to analyze the topic.

Kim et al. (2022a, b) conducted a study on the effect of social distancing policies on the early spread of COVID-19 in South Korea. They used a mathematical SIRD model and analyzed the trend of COVID-19 prevalence using the reproduction number (Rt) from mid-January to the end of June 2020. They found that strong social distancing policies can control the spread of COVID-19, especially in the early stage of the pandemic, but when the intensity weakens, the disease can spread again (Rt > 1). Furthermore, the time lag until the change in policy took effect increased from 13–14 days to 18–19 days as the pandemic prolonged. This increase was attributed to a decrease in the willingness and motivation to implement preventive

measures, possibly due to an increase in the number of confirmed cases among one-self or others, or a decrease in risk perception and policy sensitivity.

As for another scope/theme of this special issue, mobility-centered covid impacts, Kwon et al. (2022) responded to the second research proposal suggested by Lee et al. (2022) on the impacts of urban density and traffic on the pandemic, and on mobility-centered covid impacts in their paper titled "Viability of compact cities in the post-COVID-19 era: Subway ridership variations in Seoul Korea." Their study compared the relationships between covid spread, government intervention, and subway rider-ship in Seoul and New York and confirmed their close association. They then used a time-series clustering analysis to identify the relationship between disease incidence and density in six clusters created from the variation in the number of passengers in all 296 subway stations in Seoul between 2019 and 2020. Finally, they used multiple regression analysis to examine how subway ridership in Seoul relates to build environment, demographics, and station characteristics. They discovered that land use mix has a negative correlation with the number of passengers, and thus suggested a pandemic-resilient alternative in the form of a multi-nuclear decentralized urban structure.

The last two papers share a common theme of exploring the impact of COVID-19 on industry and the economy, which is a critical subject of regional science and also a third focus of this special issue. However, despite the fact that both papers used CGE modeling, they differed in terms of the geographic scale being either country-wide or regional and whether they analyzed an entire industry or a specific sector (tourism). Thus, it is especially interesting to compare their CGE models' proce-dures, outcomes, and interpretations. In their paper titled "The economic damage of COVID-19 on regional economies: An application of a spatial computable general equilibrium model to South Korea," Kim et al. (2022a, b) argued that a 10% reduc-tion in spatial interaction caused by social distancing (a 10% increase in travel time/cost) resulted in a 0.815–0.864% decline in gross domestic product (GDP), which was further broken down into losses of agglomeration, health (due to medical care and premature death), and labor. Meanwhile, for a follow-up study, they requested a study that assesses the net economic effect of social distancing measures by taking into account not only the negative impact on industrial productivity (increased travel distance and cost), but also the positive effect due to increased speed and reduced travel cost, specifically better accessibility.

A partial response to this request is the paper by Roson and van der Vorst (2022) titled "Assessing the economic and environmental consequences of the COVID-19 tourism collapse in Andalusia: What lessons can we draw for South-East Asian regions?" This study differs from Kim et al. (2022a, b); in that it employs CGE mod-eling at the micro-level to analyze the regional economy of the tourism industry, rather than the national economy or the entire industry. Additionally, this study is unique; in that it focuses on a region in Europe (Spain) to draw lessons for South-east Asian regions, while all other studies in this special issue analyze the impact of COVID-19 in Asia.

This particular study aimed to investigate the effects of COVID-19 preventative measures on the regional economy of Andalusia, focusing on the impact of reduced tourism spending on mobility and consumption, as well as changes in environmental

quality such as reduced greenhouse gases and air pollutants. Furthermore, the authors also examined the potential transferability of their findings to Southeast Asian countries. Regarding what was suspected above by Kim et al. (2022a, b), the study empirically confirmed that the decline in tourism demand due to the pandemic had a redistribution effect, benefiting some industries while negatively affecting others. Specifically, unemployment increased in tourism, construction, and R&D sectors, while jobs increased for agricultural and unskilled workers. The authors also noted that the reduction in industrial activity did not necessarily improve environmental quality overall. Although emissions from most pollutants decreased, certain polluting industries experienced an expansion in activities, resulting in an increase in some pollutants.

The COVID-19 pandemic has had a significant and multifaceted impact on various aspects of life, including people's activity space, mobility, quality of life, regional economy, and natural environment. The pandemic has brought about both risks and opportunities to society, leading to changes in people's perceptions and behaviors. The studies in this special issue have highlighted the complexity of the pandemic's impact but have also shown that it is possible to explain, predict, and respond to its effects. Regional science will play an essential role in promoting resilience and sustainability in the post-pandemic era and will be called upon to take on new and extended roles and responsibilities.

References

Gim T-HT (2022) The corona blues according to daily life changes by COVID-19: a partial least squares regression model. Growth Chang. https://doi.org/10.1111/grow.12655

Kim E, Jin D, Lee H, Jiang M (2022a) The economic damage of COVID-19 on regional economies: an application of a spatial computable general equilibrium model to South Korea. Ann Reg Sci. https://doi.org/10.1007/s00168-022-01160-8

Kim M-H, Lee J, Oh H-J, Bayarsaikhan T, Gim T-HT (2022b) A modeling study of the effect of social distancing policies on the early spread of coronavirus disease 2019: a case of South Korea. Ann Reg Sci. https://doi.org/10.1007/s00168-022-01140-y

Kwon D, Oh SES, Choi S, Kim BHS (2022) Viability of compact cities in the post-COVID-19 era: subway ridership variations in Seoul Korea. Ann Reg Sci. https://doi.org/10.1007/s00168-022-01119-9

Lee T, Paik W, Lim S, Lee SY (2022) Online citizen petitions related to COVID-19 in South Korean cities: a big data analysis. Ann Reg Sci. https://doi.org/10.1007/s00168-022-01133-x

Roson R, van der Vorst C (2022) Assessing the economic and environmental consequences of the COVID-19 tourism collapse in Andalusia: what lessons can we draw for South-East Asian regions? Ann Reg Sci. https://doi.org/10.1007/s00168-022-01162-6