

Space & Environment

is a quarterly English magazine intended to disseminate research output and international activities of Korea Research Institute for Human Settlements



COVID-19 and the Transition of Human Settlements

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COVID-19 and the Transition of Human Settlements

The Roles of Urban Research in Overcoming the COVID-19 Pandemic and Challenges Ahead

Hyun Soo Kang

With its outbreak at the end of 2019, COVID-19 devoured the world in a blink. It has affected hundreds of millions of people, and millions have died from it. The frightening pace of spread and fatality of the virus has gravely impacted the whole world, and major changes have been triggered by the pandemic.

The major changes driven by COVID-19 include the following: first, in an attempt to stop the spread by practicing social distancing and lockdowns, economies all over the world faced the worst recession and job loss since the Great Depression. To weather this crisis, governments are pursuing policies for economic stimulation and unemployment relief. Second, people avoided personal contact to evade the virus, leading to surges in demands for contact-free services. Third, the existing globalization trends halted, or even overturned. Fourth, while sorrow and pleasure alternate in different industries, regions, or classes, overall, socioeconomic inequalities are worsening. Facing the impact of the pandemic, the gaps between groups capable of going contact-free and those incapable, as well as between groups that see opportunities from the crisis and those that do not, are widening. COVID-19 has been the hardest blow to the most vulnerable.

In Korea's urban sector, the biggest impact of COVID-19 was soaring property prices. While safety and security in homes became even more important amidst the pandemic, housing price surges drove non-homeowning commoners and tenants to agony and a sense of deprivation. The most gravely affected group in Korea during the pandemic included those who lost their jobs, petty business owners and their employees in the face-to-face service sector that experienced serious loss of revenues. Meanwhile, social distancing and international travel restrictions led to reductions in overall traffic. However, courier and food delivery traffic surged following increases in

online purchases. Shrinkage of production and reductions in traffic temporarily improved air quality, but rapid increases in packing materials and disposables resulted in heavy increases in waste. While some saw silver linings from using the smart city technology for epidemiological investigation and disease control, others raised concerns that it would do nothing but allow the government to recklessly rake personal information in the name of disease control.

The intensity of the impact of COVID-19 on land, cities, and human settlements is proportionate to the scale and duration of the damages it causes. If we could overcome the pandemic in a short period of time with vaccines and treatments, the world will soon return to what it used to look like. If we face nastier variants of the virus or new infectious diseases, the world will drift toward a direction it has never been, as referred to some as the "post-COVID-19 era". It seems that humanity will overcome this pandemic given the remarkable advancement in humans' response to the disease. Still, even when we return to normal, the impact and scars of COVID-19 will remain everywhere in our space and society (Harari, Y 2020). For example, the work-from-home settings we were forced to employ are likely to remain in slightly modified forms, for example, hybrid work arrangements between work at offices and from home. Companies' preference to big cities is unlikely to change sooner, but it is probable that they adopt hub-and-spoke organizations where they have their head offices in metropolitan areas for key decision-making and run satellite offices in suburbs for the convenience of remote workers (Florida, R. et al. 2020). Like a country's territorial structure does not easily change, a city's spatial structure is resistant to change. However, as the digitalization trend accelerates with the impact of COVID-19, the types of demands for space in the city will change. Working-from-home and online shopping will lead to decreases in demands for office and commercial space, respectively. On the other

hand, demands for residential and warehousing space will be on the rise. Urban traffic demands will also change with fewer traffic for commuting and shopping and more traffic for courier and delivery services. A factor that has a bigger influence on a city's spatial structure is the deliberate and planned response to infectious diseases, i.e., urban planning. The history of urban planning has revolved around humans' response to infectious diseases. Deliberate urban planning endeavors to safeguard the city from infectious diseases will change the city's structure and land use.

As an institute dedicated to national territorial and urban policy research, what we at the Korea Research Institute for Human Settlements (KRIHS) can do to help overcome the pandemic? The most urgent need is to identify groups and areas most gravely affected by COVID-19 and find measures to relieve the impact. In other words, we need to find those with their lives and livelihood at stake and in urgent need of relief and help them. While these are urgent short-term studies, we also work on mid- and long-term research to alleviate the impact of infectious diseases and prevent them. Socioeconomically, we should focus on measures to curb the ever-worsening trends of inequality and polarization driven by COVID-19, and, space-wise, measures to protect our land and cities from infectious diseases. As a national policy research center, we at the KRIHS should turn our eyes to mid- and long-term research to make safe land and cities free from infectious diseases.

Our endeavors to make our cities safe settlements, free from infectious diseases, will revolve around the following axes: 1) transformation to sustainable and resilient environmentally friendly land and cities, 2) transformation to smart land and cities taking advantage of technical development and digitalization, and 3) transformation to inclusive land and cities where socioeconomic inequalities are alleviated and no one is left behind. In particular, we at the KRIHS should focus on 4) transformation to balanced cities where spatial inequalities are eliminated. This includes resolving inequalities on the national level, for example, capital versus non-capital regions, as well as inequalities in cities, such as old urban centers versus new towns.

The transformation to cities where citizens are protected from infectious disease, and where their lives and health are valued more than anything, will not occur by itself. Turning the COVID-19 crisis into an opportunity to make our land and cities greener, smarter, more inclusive, and more balanced requires efforts of and cooperation among the government, politics, and civil society, but above all, research should play pioneering roles in presenting the right directions and pathways in concrete and convincing ways. To produce visible outcomes from our research to overcome COVID-19, the following three points will matter: first, convincing policymakers and citizens requires evidence-based research. Second, the outcomes of our studies should be applicable to improving real-world institutions and policies. And lastly, our research should be timely.

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References

- Florida, R., Rodriguez-Pose, A. and Storper, M. 2020. *Cities in a Post-COVID World, Papers in Evolutionary Economic Geography*. Utrecht: Utrecht University.
- Harari, Y. 2020. The world after coronavirus. The Financial Times, 20 March. <https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75> (accessed April 1 2020).

Risk Society, COVID19 Risks, and Inequalities

Soo Jin Kim

1. COVID-19 Risks in Everyday Lives

Space is everywhere in our surroundings. We live in space, we move in space, and we engage with others in space. Coronavirus disease 2019 (COVID-19) declared by the World Health Organization as a pandemic in March 2020 is spread through space, as with any other rapid respiratory virus infection. In particular, COVID-19 infections are not only caused by virus transmission carried by droplets in close contact, it may also be spread by aerosols in the ambient air. The virus can be spread through symptomless infected people, and humanity has yet to pinpoint how long the virus can survive in an external environment when it is detached from the living host. This causes fear that the invisible virus may be present somewhere in our surroundings, in other words, fear of our living space itself. It also connects to fear of other people we encounter and engage with while moving and living in space.

2. Ulrich Beck's Risk Society: Social Change Starts with Risk Awareness

Ulrich Beck's monumental book *Risk Society* (1997, first edition published in 1986) provides us with a window through which we can view the post-COVID society. In this book, Beck's key message is that what really drives social change are the social production and distribution of risks. Looking at the changes taking place in our society since the outbreak of COVID-19, we can see they have things in common with Beck's risk society. First, the new global risk is a product of social development by humans. Second, in decision-making for risk management, there is a tendency to emphasize the views of experts with relevant knowledge and the roles of the state. Third, individuals are nonetheless finally responsible for risk management. As we see the pandemic prolonging, Beck's insight into risk society presents a viewpoint for us to interpret

the anxiety-encroached daily space of ours. Still, his view that risk status will be a substitute for the traditionally structured social classes remains arguable and warrants more in-depth contemplation.

3. COVID-19 Risk's Similarities to and Difference from Existing Disaster Risk Concepts

It is Beck's presumption that climate change, pollution, and other risks are equal to everyone, and no one is safe from them, whether they be rich or poor. However, the structure of the COVID-19 risk and inequality does not seem to be straightforward. From the perspective of disaster risk management and reduction (DRM/DRR), someone is merely relatively safer than others. We are equally exposed to risks, but the level of risks different individuals will face is another story. This is because the occurrence of hazard factors does not lead to the outbreak of risk straightaway. Rather, the level of risk is determined by the complexity of various factors. On the one hand, as Beck envisaged, individuals with capabilities to weather these new global risks may be able to climb up the ladder of class mobility. Or, on the other hand, vulnerable low-income classes may face newer and bigger risks, hence greater inequalities, as they lack access to information and professional knowledge and live in poor environments, meaning they have weaker capabilities to manage the risks.

4. Concentration of the COVID-19 Risk on Housing-Vulnerable Areas: Causes and Responses

The COVID-19 risk differentiates itself from existing disaster risks in terms of the exposure-vulnerability relation. Although it is still considered a systemic risk, the sub-elements of the COVID-19 risk are in different exposure-vulnerability relation

settings. In addition, COVID-19 also exerts non-physical impact, for example, prolonged threat to daily lives, and the scope of exposure cannot be specified.

Given that the COVID-19 risk is concentrated in housing-vulnerable areas, short- and long-term measures to reduce such vulnerability should be identified. Housing-vulnerable areas are the center of social vulnerabilities; hence, they have a higher risk for COVID-19. Such concentration of risks is associated with the living patterns of the residents in these areas, which are socioeconomically vulnerable classes. For example, people living in Bengaluru, India would face imminent difficulties in livelihood if they were self-isolated and had poor living environments, including their reliance on shared hygiene facilities in their neighborhood. These factors influence the intensity of their risk exposure.

In *Risk Society*, Beck predicted that the emerging risk status will replace the existing inequality structure. A crevice in his argument is that he missed that individuals' risk management capabilities may vary by their socioeconomic position. Unlike what he predicted in his book, what we have seen from housing-vulnerable areas across the globe shows us that risks are still produced and distributed according to the traditional

inequality structure (class, gender, race, age, etc.). The relation between COVID-19 risk and inequality implies that the risks are further worsening the gap. Given the characteristics of COVID-19, social vulnerability (which reflects existing inequalities) still plays determinant roles. For the efficient curbing of the COVID-19 risk, the outbreak and spread of the infectious disease itself should not be defined as the entirety of a disaster. Rather, the process through which the outbreak and spread of the infectious disease is combined with social vulnerabilities to lead to a disaster should be tracked and monitored.

In summary, efficiently curbing the COVID-19 risk requires continued discourses over the existing inequality structure. And it is warranted to develop methodologies to pinpoint hot spots in consideration of residents' living patterns, cross-validate the geographical distributions of COVID-19-sensitive groups and existing vulnerable groups, and build community-led databases of social vulnerabilities.

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References

- Kim Soo Jin. 2020. *International case studies of methodology to identify areas and groups posing high-risk for COVID-19 infections in housing-vulnerable areas and implications*. Working Paper 20-17. Sejong: Korea Research Institute for Human Settlements.
- Beck, U. 1997 (original work published in 1986). *Risk Society. Towards a New Modernity*. trans. Hong Seongtae. Seoul: Saemulgyul.
- Austrian, K., Pinchoff, J., Tidwell, J. B., White, C., Abuya, T., Kangwana, B., Ochako, R., Wanyungu, J., Muluve, E., Mbushi, F., Mwanga, D., Nzioki, M., and Ngo, T. D. 2020. *COVID-19 related knowledge, attitudes, practices and needs of households in informal settlements in Nairobi, Kenya*. <http://dx.doi.org/10.2471/BLT.20.260281> (accessed February 15, 2021).
- Bhardwaj, G., Thomas, E., Somik, V. L., Mattia, M., Maria, E. S., and Sameh, W. T. 2020. *Cities, crowding and the coronavirus: Predicting contagion risk hotspots*. Washington DC: World Bank. <http://documents.worldbank.org/curated/en/206541587590439082/Cities-Crowding-and-the-Coronavirus-Predicting-Contagion-Risk-Hotspots> (accessed July 13, 2020).
- Gordon, M. and Williams, S. 2020. *Why Does Understanding the Systemic Nature of Risk Matter in the Midst of COVID-19?* United Nations Office for Disaster Risk Reduction (UNDRR). <https://www.preventionweb.net/news/view/71228> (accessed February 19, 2021).
- UNDRR. 2019. *Global Assessment Report on Disaster Risk Reduction*. Geneva, Switzerland: United Nations Office for Disaster Risk Reduction. <https://digitallibrary.un.org/record/3825375> (accessed February 19, 2021).
- Wilkinson, A. 2020. Local response in health emergencies: Key considerations for addressing the COVID-19 pandemic in informal urban settlements. *Environment and Urbanization* 32, no. 2: 503–522.

Will COVID-19 Lead to Balanced National Development?

Kyung Hyun Park

1. Background and Purpose

We are well aware of the fear of fatal diseases and the grave threats they pose. We have been hearing forecasts that increasing density in the living environment would make pandemics occur more frequently. Such fears and warnings, however, could not put a brake on the acceleration of urbanization; the way we live and behave has not changed easily. That's because, while the potential threats of pandemics have always existed, the oblivious tendency of human beings is also powerful. On January 5, 2020, the World Economic Forum (the Davos Forum) pointed out in its 2020 Global Risks Report that though a pandemic is not highly likely to occur, if it does, it could be one of the ten most catastrophic risks, but people did not pay much attention to that either.

The COVID-19 pandemic has brought about enormous changes to politics, economics and society. In 2020, the total amount of expenditures G20 countries spent to tackle the pandemic was 10 trillion dollars, which was three times greater than what was spent during the 2008 global financial crisis (WEF 2021). 'Un-tact'⁰¹ and 'on-tact'⁰² economy is increasingly becoming our economic norm and most companies are competitively seeking to build or introduce a platform as a new business strategy to run their business more efficiently. On the social front, the increasing adoption of telecommuting is forecast to instill changes in the labor market.

At this point, it is important to look at different types of changes brought on by COVID-19; changes resumed, reinforced or newly created by the pandemic. In Korea, over 50% of the total population resides in the capital area as of 2021 and we

need to analyze what impact the pandemic has on balanced national development in three perspectives.

2. Legacy of the Pandemic

While a pandemic, such as COVID-19, is a sudden and temporary event, it serves as a critical variable that has transforming impact on every part of human life, from politics to economics, to society and personal life. Cities have historically fought wars on diseases by innovating industries and spatial structure. For instance, urban outbreak of cholera triggered an overhaul of urban water and sewage systems, and the SARS popularized 'un-tact' customer-to-customer (C2C) trade and transformed traditional retail market structure. The outbreak of an infectious disease whose cause and cure are not known strikes a detrimental blow to highly dense, large cities on both economic and demographic aspects. Ironically, however, diseases that pose a dismal threat to cities have succumbed to the creativity and innovation of cities.

Nevertheless, a pandemic leaves incurable scars in many ways. A case in point is deepening inequality. Researchers at IMF measured the impact of five different cases of a pandemic on income disparity; SARS (2003), H1N1 (2009), MERS (2012), Ebola (2014), Zika (2016) (Furceri et al. 2021). They also compared the impacts of a pandemic, financial crisis and economic recession and, as it turns out, a pandemic was found to have the greatest impact on income disparity. What concerns us is that the COVID-19 pandemic, given its huge impact matched by no previous pandemic cases, may deepen income disparity to a level not seen before.

01. Un-tact is a combination of "contact" with a negative prefix "un". It means non-face-to-face social and economic activities which are sharply on the increase after the COVID-19 pandemic.

02. On-tact is a new term that combines "un-tact" and "online", and refers to a method of continuing communication and external activities online.

What we fear is already happening in reality. According to the 2021 Average Citizens' Financial Life Report, unveiled by Shinhan Bank on 20th April, the monthly average household income fell to KRW 4.78 million in 2020, down by KRW 80,000 from KRW 4.86 million in 2019. The low-income group suffered the biggest drop. The average monthly income of the top 20% households which was KRW 8.95 million in 2020, decreased by 0.8% from the previous year, while bottom 20% households suffered a 3.2% reduction to KRW 1.83 million during the same period. As a result, the income ratio or the income gap between the low and the high income brackets rose from 4.76 times in 2019 to 4.9 times in 2020.

3. Pandemic and Mixed Forecasts Over Growth of Metropolises

COVID-19 has inflicted painful wounds and a shock on our society, but that does not mean everything will change after the pandemic. Which factors would continue to stay in the post-Covid-19 era? For one, there are forecasts that telecommuting and hybrid-telecommuting would stay even after the pandemic ends (WEF 2021; McKinsey Global Institute 2021). Rather, telecommuting which become reinforced as an 'un-tact' culture has spread due to COVID-19. In that case, demand for transportation, retail, and food service would decrease, and the functions of large cities would weaken, as some people put it. They suggest higher office vacancy rates as evidence to foretell reduced functions of metropolises in the wake of COVID-19. Large cities suffered a big jump in office vacancy rates—San Francisco (91%), Edinburgh (45%), London (32%), Berlin (27%)—while small cities such as Glasgow and Charlotte saw a reduction in vacancy rates.

By contrast, there are views that, though the implications of COVID-19 were disastrous, it is rather early to forecast weakening urban functions. Richard Florida and others insist global cities would stay competitive in the years after the pandemic. They argue early collective immunization with smooth vaccination would make it highly likely for cities to return to what they were before the pandemic. Historically, they claim, cities have continued to grow in the long term even with a pandemic such as the Spanish Flu and crises like the 9/11 terrorist attack.

Florida's argument deserves serious attention because he pointed out a realistic problem that, while urban functions may be adjusted in part, the winner-take-all structure of global cities

will remain unaffected. The COVID-19 pandemic may mean an opportunity for growth for those suburbs or cities neighboring global cities. However, under the winner-take-all structure, the status of metropolises would stay the same or grow stronger, thus deepening spatial disparity. Small and medium-sized cities and rural and fishing villages do not have many opportunities for growth, even after COVID-19. Those located too far to enjoy the dynamism of a metropolis are likely to further deteriorate, which is why we should ponder on both COVID-19 and its impact on balanced national development at the same time.

4. Direction of Balanced National Development in the COVID-19 Era

Many people think their life would be different after the pandemic because telecommuting, 'un-tact' activities, etc. would become commonplace. There are positive forecasts, too, that people would spread to other cities to avoid expensive rents and house prices in downtown cities, which, however, is confronted by those who insist metropolises would come back as growth engines. They say digital transformation and the growth of 'un-tact' industries would propel spatial restructuring of urban areas which have an excellent environment for innovation. Would COVID-19 become a key to solving our headache of concentration in the capital area in Korea, or end up being a Trojan Horse that deteriorates national imbalance?

The economic impact of COVID-19 varies by region because each region has different functions and is affected by the pandemic to different extents. For instance, cities whose main industry is tourism or retail suffer a serious blow, as opposed to those that fare well with telecommuting. Gangnam and Pangyo, where non-face-to-face IT companies are concentrated, are flooded with many young people looking for jobs.

Korea has been dealing with COVID-19 in a considerably proactive manner, making various efforts to manage the crisis. The government strived to keep the overloaded public medical system from collapse, took emergency measures to guarantee at least minimum extent of economic activities, reinforced public services and spent emergency expenditures.

In that context, balanced national development is still the most important issue that holds a key to coping with the crisis, by minimizing unnecessary contacts among people, containing the spread of an infectious disease and enabling swift response to an outbreak. Measures of balanced national development are all the more needed, in order to shore up small and medium-

sized cities weighed by COVID-19, remote areas and rural, fisheries villages that suffer a sharp decline in population.

This calls for a new way of promoting balanced national development that serves different characteristics of different regions. More efforts should be made to promote collaboration for co-existence, to foster competitive ultra-metropolitan areas through solidarity between areas, support areas suffering the degradation of local industries, develop cities and neighboring areas in alignment, promote growth of innovation cities and nearby areas, and support the third sector connecting urban-rural activities.

Many areas are going through turbulent times due to COVID-19, but it is clear that exchanges and solidarity among different areas will be a key to exploring a new way of balanced national development going forward.

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References

- Park Kyung Hyun. 2021. "Will COVID-19 Lead to Balanced National Development?" in *COVID-19 and the Transition of Human Settlements*. Sejong: Korea Research Institute for Human Settlements.
- Shinhan Bank. 2021. *2021 Ordinary Citizens' Financial Life Report*.
- Florida, R. Rodríguez-Pose, A. and Storper, M. 2021. *Cities in a post-COVID world*. Urban Studies. ISSN 0042-0980 (in press). <http://eprints.lse.ac.uk/110333/> (accessed May 28, 2021).
- Furceri, D., Loungani, P., Ostry, J. and Pizzuto, P. 2021. *Will COVID-19 Have Long-Lasting Effects on Inequality? Evidence from Past Pandemics*. IMF Working Paper. WP/21/127 <https://www.imf.org/en/Publications/WP/Issues/2021/05/01/Will-COVID-19-Affect-Inequality-Evidence-from-Past-Pandemics-50286> (accessed May 21, 2021).
- McKinsey Global Institute. 2021. *The future of work after COVID-19*. <https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19> (accessed February 18, 2021).
- WEF. 2020. *The Global Risks Report 2020*. <https://www.weforum.org/reports/the-global-risks-report-2020> (accessed March 15, 2021).
- WEF. 2021. *Chief Economists Outlook 2021*. <https://www.weforum.org/reports/chief-economists-outlook-2021> (accessed May 21, 2021).

COVID-19 Brings Crisis in Urban Planning

Dong Kun Kim

1. Introduction

As of June 2021, COVID-19 has infected 177 million people and killed 3.84 million people since the first case of the disease was identified in China on December 30, 2019 (WHO statistics, last accessed on June 20, 2021).

Countries around the world rushed to develop treatments and vaccines for COVID-19 to reduce the damage, while taking measures such as movement control and isolation of people with COVID-19 to contain the spread of the disease. However, some argue that cities may never look the same again after the pandemic due to its direct and indirect impact. How will our cities look in the post- COVID-19 era?

2. COVID-19 and the Changing Aspects of Cities

Nearly all studies indicate the possibility of urban decline. Downtown areas are mostly covered by large commercial complexes, office buildings, and tourist accommodations that afford relatively higher land prices. Since the pandemic, however, the demands for land use in downtown have significantly declined due to a drop in international tourists, remote work arrangements, e-commerce, declines in visitors to entertainment facilities, and the lack of open spaces.

As people spend more time at home and nearby areas these days, neighbourhood units continue to maintain competitive advantages. Therefore, it is expected that the functions of urban centers will weaken and neighborhoods will become increasingly important.

Job opportunities in cities are no longer a strength in the COVID-19 crisis. Many companies located in cities had to close their business for a considerably long time due to the disease, which negatively affected the job market. The rise of work-from-home settings and virtual meetings testifies that we no longer need to have offices in the city.

In addition, many consider the densely-populated urban environment more vulnerable to infectious diseases. Cities have fewer open spaces where people can take a rest safely compared to regional areas. All of these serve point to a dismal future of cities after COVID-19.

3. Prospects for Urban Planning

We have adopted various urban policies and sophisticated urban plans to make the most of the benefits cities offer and overcome disadvantages. Changing behaviors of citizens and a series of measures introduced in response to COVID-19, however, are now shaking such plans and strategies.

• Walkable cities / Street revitalization policies

Many commercial facilities have recorded a drop in sales after the pandemic due to declines in floating population as people have refrained from going out following the government's social distancing mandate and ban on private gatherings of five people and over.

Such measures are the complete opposite of the street revitalization strategy. The purpose of street revitalization is to create urban spaces where citizens can meet and build relationships with each other more often. But such activities have been on the decline due to the social distancing and stay-at-home recommendations (Dongkun Kim, May, 2020).

• Tourist cities / Policies to foster global cities

The government decided to cut back flights and restrict the use of tourist attractions to prevent the spread of COVID-19. These measures had a great impact on urban areas where hotels and accommodations for foreign tourists were concentrated and ones that were primarily covered by commercial facilities. If this continues for a long time, urban policies may lock horns with mandates to curb the spread of the disease by blocking tourists.

- **Policies to encourage the use of public transport**

The public transport use has declined by 27% since the COVID-19 outbreak (Ministry of Land, Infrastructure and Transport, 2021). If transport facilities fail to maintain their planned use rates and are left underused for a long time, it will lead to a significant increase in operating costs. In particular, the adjustment of service frequencies, routes, etc., of buses and subways in response to the declines in passengers will affect their punctuality and accessibility, hence a vicious cycle where increasingly fewer people use public transport.

- **Compact city policies**

As more people have begun to think that high-density cities are particularly vulnerable to pandemics, compact city policies come under scrutiny. To be specific, the spread of virtual meetings and remote work settings continue to remove the temporal and spatial barriers and make physical proximity between homes and workplaces less important in urban planning.

4. The future of Urban Planning after COVID-19

- **Changes in policy priority in urban planning**

Cities have exposed many problems over the course of the outbreak and spread of and response to COVID-19. This process has posed many challenges to urban planning and city policies. The goals of urban planning, i.e., to allow more people to use more convenient urban services and encourage more efficient land use are inconsistent with the way COVID-19 is reshaping our daily lives. If the pandemic is not going away any time soon and leads to the second and third waves, we will need to discuss which one we should prioritize between urban policies and disease control measures. In this regard, we will need to reconsider and study urban policies from various perspectives. Also, we should introduce urban policies that will strengthen our capabilities to respond to infectious diseases that may come in the future.

- **Securing basic social infrastructure and building neighborhood units**

Basic social infrastructure can be used to supply daily necessities and personal protective equipment in crisis situations and public health services for disease prevention. For instance, grocery stores in neighborhoods can play a role in help people stay at home without the need to risk potential exposure to the virus by visiting megastores. Also, creating urban green spaces within walking distance can relieve psychological stress in disastrous pandemic situations.

- **Town-making strategies to build towns and local communities**

Building local communities can greatly contribute to relieving anxiety and minimizing secondary damage from panic buying in fear of disasters. Thus, we need to focus our urban planning efforts on the neighborhoods develop town-making and urban regeneration strategies to build on public trust in their society and local communities.

- **Developing digital infrastructure**

Additionally, there is a need to promptly isolate confirmed patients and close contacts to minimize the spread of the virus and collect data including their movement routes through digital infrastructure. Specifically, the digital infrastructure can partly replace paralyzed urban functions while responding to disasters. For examples, the digital infrastructure can be used for e-commerce, online education and training, video conferencing, remote medicine, etc. Although the digital infrastructure cannot prevent the disease by itself, it can be considered as an important element of public health for disease prediction, situation control, protecting urban functions, and enhancing resilience as the saying goes, “Digital infrastructure might be the sanitation of our time” (Klaus, I. 2020).

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References

- Dong Kun Kim. 2020. A direction of urban planning for responding to infectious diseases in the post-COVID-19 era, *KRIHS Issue Report No. 17*. May 18, 2020.
- Ministry of Land, Infrastructure and Transport. Analysis of traffic card big data reveals a decline in public transport use by 27%. MOLIT Press Release, Mar 23, 2021.
- Klaus, I. 2020. Pandemics Are Also an Urban Planning Problem. Mar 7, 2020. *Bloomberg CityLab*. <https://www.citylab.com/design/2020/03/coronavirus-urban-planning-global-cities-infectious-disease/607603/>
- WHO. 2020. *Coronavirus disease (COVID-19) Situation Report–104*. World Health Organization. <https://apps.who.int/iris/bitstream/handle/10665/332058/nCoVsitrep03May2020-eng.pdf?sequence=1&isAllowed=y>

People Who Worry Making a Living than Being Infected with COVID-19

So Yang Jung

COVID-19, which was first detected in Wuhan, China, is still exerting significant influence on our lives even after one year since the declaration of the pandemic. Unlike other disasters⁰¹, the infectious disease required measures such as social distancing, quarantine and lock-down to prevent the infection and spread of the virus as it was known to spread through contact between and movement of people. This led to significant socioeconomic damage and constraints in people's daily lives as well as health impact. There are groups of people and areas that are more vulnerable to disasters. "Those who are well-off are concerned about the infection, and those who are poor are concerned about making a living"⁰². The spread of COVID-19 has worsened global poverty and unemployment (Lee Hyeon Joo 2020, 5), and the impact is disproportionately higher on socially vulnerable groups (Kim Yoon 2020, 5). In addition, communities' abilities to respond to crises also have an impact on the severity of damage and the level resilience, so it is necessary to improve these capabilities at the regional level. This report shows the results of a survey of local residents on their thoughts about the indirect impact of COVID-19 with a particular focus on vulnerabilities. It also delves into how to support these increasingly vulnerable and weaker areas and residents⁰³.

1. Vulnerability to COVID-19 (Infectious Disease) and Vulnerable Areas

Given the characteristics of COVID-19 and its impact on overall society, vulnerability to infectious diseases may convey many implications. The vulnerability can be defined in three ways as follows: an aspect that even if someone has the same COVID-19, the condition can easily worsen (epidemiological vulnerability); an aspect that is more exposed to conditions under which infectious diseases can spread rapidly (transmission vulnerability); and finally an aspect of suffering more socioeconomic damage due to measures to prevent the spread of infectious diseases (vulnerability to control measures)⁰⁴. The epidemiological vulnerability, transmission vulnerability and vulnerability to control measures are closely linked together and influence each other rather than being independent. Vulnerable areas include areas where the quality of life such as safety and hygiene is marginal, residential environments are substandard, and socially vulnerable people (vulnerable groups) are densely populated (MOLIT 2015, 1). On-site survey⁰⁵ on representative areas within vulnerable areas where damage and shock to daily lives, in particular, 'vulnerability to control measures' is expected to be high was

01. 'Disaster' means a sudden and catastrophic event that causes damage to people's property, economy or environment, deteriorating the function of a community or society (<http://www.ifrc.org>, accessed May 21, 2021).

02. Cited from *COVID-19 Pandemic* by Sucharit Bhakdi. Dr. Bhakdi is a specialist in microbiology and infectious medicine and immunology and is one of the leading medical scientists in Germany (Bhakdi, S. and Reiss, K. 2020).

03. In this article, vulnerable area is used as a policy terms and refers to 'urban vulnerable residential area'. In Korea, programs related to vulnerable areas are implemented continuously.

04. Wilkinson et al. (2020) categorized vulnerabilities to COVID-19 into 1) epidemiological vulnerability, 2) transmission vulnerability, 3) health system vulnerability, 4) vulnerability to control measures, and 5) systemic vulnerability. This article is based on the classification by Wilkinson et al (2020) and the concept of vulnerability to COVID-19 was redefined by the author given the spread of COVID-19 and countermeasures taken in Korea.

05. The on-site survey was conducted as part of the author's study in 2021 at KRIHS, 'Analysis on the impact of infectious diseases on vulnerable residential areas and policy measures'.

conducted to examine vulnerable physical and environmental factors and their impact on the life of residents. **Figure 1**

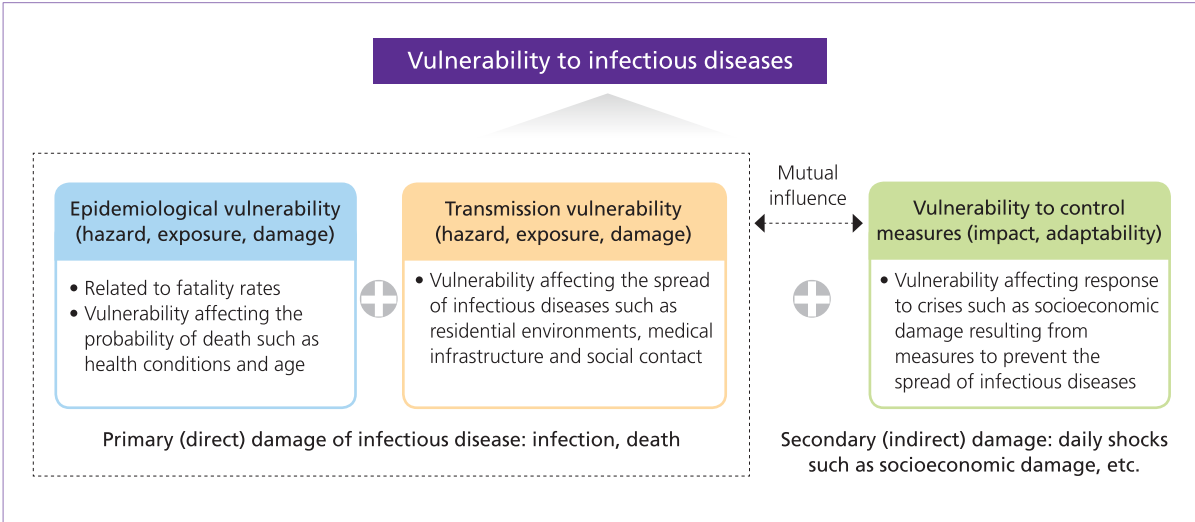
2. Physical and Environmental Factors Vulnerable to Infectious Diseases

Critical vulnerability factors include not only socio-economic conditions such as occupation, income and education levels of residents in a given area but also poor residential environments and infrastructure. **Figure 2**

Vulnerable people normally live in a small multi-household building, making it impossible to keep social distancing and

self-isolate. The housing structure that mold covers the whole wall due to the poor ventilation make it to increase the risk of getting infectious diseases as well as other diseases. In places where residents rely on shared water supplies or shared restrooms, they cannot but come into contact with others daily. After the COVID-19 pandemic, the needs for policy improvement on abandoned empty houses, the lack of public spaces and etc. increased further. In addition, there are fewer medical institutions in these areas, and the residents have limited access to medical services. The disruption of local public healthcare services made them even more anxious about infectious diseases.

Figure 1. Types of vulnerability to infectious diseases



Source
The authors' own work.

Figure 2. Physical environment of the communities vulnerable to infectious diseases



Source
Photos taken by a sharing house counseling center, except for the far right photo taken by the author.

3. Changes in Daily Lives Caused by COVID-19 in Vulnerable Areas

Residents in vulnerable areas were facing difficulties in many ways. First, they were concerned about making a living and taking care of their children and even socializing with neighbors has become difficult. Of course, all people are facing difficulties. Some people are adapting to the new normal after the pandemic, while avoiding direct contact with other and giving up their leisure activities. Others, however, are facing serious problems in eating and taking care of their children, and they have no choice but to spend time watching TV and drinking alcohol. Those who had benefited from basic living allowances and worked as public workers could withstand the challenges, but irregular workers such as temporary construction workers and part-timers at restaurants faced difficulties due to decreases in job opportunities and unemployment and were troubled for how to make a living and where to stay. When schools were closed and children had to take online classes, it was not easy to make room for them in a one- or two-bedroom house. It was difficult for the children of single-parent families and who grandparents raise to receive proper support through emergency childcare. Many elderly people in vulnerable areas used to flock together to have fun, but the closure of senior centers deprived them of these social activities and chances to go out for a walk with others. They sometimes skip meals, which makes them weak physically and mentally. Even worse, they face more mental difficulties during the COVID-19 pandemic as they cannot receive information

and communicate with other people in a timely manner and have no access to helping hands in emergency situations.

4. Conclusion

The importance of managing the risk for COVID-19 infections cannot be overstated. However, the loss of opportunities to work, eat, learn and interact with other people is a more serious problem than we may think it is. If we turn away from this problem, its impact and aftereffect will become deeper and stay longer. Different areas have different vulnerabilities, and responses thereto should be different depending on their characteristics. For areas where multi-purpose facilities are concentrated and population is densely located, considerations should be given to these factors when establishing response and management plans. For areas with poor hygiene and health conditions, unfavorable socioeconomic conditions and low responsiveness to crisis, appropriate responses and policy support should be provided. It is time to consider what we can do to facilitate returning to normal after the COVID-19 pandemic and provide customized care in consideration of area-specific characteristics to prepare for disasters that may occur in the future.

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References

- MOLIT. 2015. *'Saeddel Village Project (Project to improve living conditions in vulnerable residential area)'. 2015 Urban Regeneration*. Sejong: Ministry of Land, Infrastructure and Transport.
- Kim Yoon. 2020. Establishment of infectious disease care system to prepare for the second wave of COVID-19 pandemic. Participation Solidarity Social Welfare Committee. *Monthly Welfare Trend* 259 : 5-10.
- Masatsug, N. and Lim Dong Kyun. 2020. Exposure of social and economic vulnerability due to COVID-19 and role of social economic organizations. *Korea Autonomy Administration Book* 34. Vol. 4: 237-253.
- Bhakdi, S. and Reiss, K. 2020. COVID-19 pandemic, by Kim Hyeon Soo, Kim Dae Jung. Seoul: The Bom.
- Lee Hyeon Joo. 2020. *Impact of COVID-19 on household income and policy tasks*. Sejong: Korea Institute for Health and Social Affairs.
- The International Federation of Red Cross. <http://www.ifrc.org> (accessed May 21, 2021).
- Wilkinson, A. and Contributors. 2020. Local response in health emergencies: Key considerations for addressing the COVID-19 pandemic in informal settlements. *Environment and Urbanization* 32, no.2:502-522.

Healthy Urban Life with Green Infrastructure

Eun Joo Yoon

Urban green infrastructure represents the notion that all green spaces and open spaces in a given city form part of the city's infrastructure. The most distinctive feature of these spaces is multifunctionality that serves (or benefits) both humans and wildlife. To allow such multifunctionality to be fully exerted, organic interconnections among various forms of green infrastructure, whether they be points, lines, or areas, are essential (Natural England, 2009). Green infrastructure in the city is something we should strategically plan and manage, rather than preserving as we do for natural forests.

COVID-19 has changed how we live our daily lives, and some of these changes are likely to become the "new normal." How people see urban green infrastructure and how they use it has also changed, posing a few challenges we will need to ponder. First, increases in demand for green infrastructure near residential areas have contributed to the worsening of the spatial inequality of green infrastructure (Venter *et al.*, 2020). Green infrastructure provides relatively safe (low risk for infections) nature-friendly space for people to exercise and interact amid the social distancing settings. However, some areas are in "blind spots" where people cannot access infrastructure on foot. While some people can leave their home and access parks, forests, and woods straightaway through greenways, others have only a few trees in their entire neighborhood. Oftentimes, green infrastructure is scarce in settlements of the vulnerable such as low-income classes and migrants, leading to questions about environmental justice.

Second, people are increasingly interested in taking advantage of green infrastructure to create pleasant urban environments. Plunges in socioeconomic activities forced by COVID-19 resulted in cleaner skies and rivers, albeit only momentary. In Korea, reductions in microparticles introduced from China and less local traffic led to a 27% decrease in microparticles in 2020 (Ministry of Environment, 2020), and

international media reported the Taj Mahal clearly visible under the clear sky, and dolphins returning to Venice, Italy. In other words, we have witnessed that what we do could make our urban environment more pleasant. Green infrastructure not only offers purification effects but also serves as a producer of clean, cooling air and travel channels for the winds. However, areas that urgently need improvement in air quality, among others, often lack green infrastructure (Kang *et al.*, 2021), and these areas are frequently overlooked in plans that aim to supply more green-friendly infrastructures.

Third, the outbreak of a new pandemic, which once was an intangible awareness of danger, stirred up people's interest in a greater threat, climate change. Green infrastructure is emerging as a measure that offers strong co-benefits for climate change curbing and adaptation. Trees that form green infrastructure absorb carbon in the air and at the same time contribute to controlling urban heat island and flood effects. In the same context, green infrastructure is attracting attention as an environmentally friendly measure to stimulate the economy in the post-COVID-19 era. The government's "Korean New Deal" plan includes projects to create forests to block microparticles, 215 neighborhood forests, and green forests for children (Government of Korea, 2020), and the Korea Forest Service unveiled its plan to plant three billion carbon-absorbing trees at home and abroad by 2050. However, there lack discussions over how we should spatially allocate these projects. Also, efforts are being made to understand the contribution of small green spaces in cities, which was often overlooked, to carbon capture and manage them.

What should be our response, from the urban planning perspective, to these issues and problems highlighted by COVID-19? First, access and connectivity to green infrastructure should be improved. Doing so requires identifying blind spots, i.e., areas isolated from green infrastructure services, and

introduce green infrastructure that fits each space's context. Where there is not enough space to create an urban park, using niche space, for example, rooftops, public voids, and unused space between buildings, can be an idea. Adding a touch of green infrastructure to monotonous space will refresh and revitalize the space. Connecting green infrastructure hubs with green ways passing through the blind spots is an effective strategy to resolve the accessibility issue. Improved connectivity will allow for incorporating the blind spots into the green infrastructure network and (by connecting between habitats) supporting biodiversity in the city.

Second, efforts should be made to identify areas with relatively lower-quality urban environments and prioritize them in supplying green infrastructure. Expanding green infrastructure without priority will yield fewer benefits compared to costs. In a given city, the density and intensity of microparticle and heat island effects will vary depending on location, which should be mapped and reflected in the green infrastructure spatial structure. The latest development of remote sensing, numerical model-based prediction, and drone technologies has enabled us to develop high-resolution maps of microparticles and heat island effect distribution. Even so, caution should be used that the more topical maps are taken into consideration in green infrastructure planning,

the more complicated the planning process will be. Different cities may give different priorities to accessibility, connectivity, microparticles, and urban heat island effects, and a particular methodology may be needed to support reasonable decision-making in that regard.

COVID-19 has been a threat to our daily lives, but at the same time, it has also triggered discussions over how we should respond to various risks in the future. Although there is consensus on the necessity to expand green infrastructure, no marked changes have been made while we have maintained our habitual routine of assigning "leftover" space to green infrastructure after drawing up development-oriented plans. As we face transformation driven by COVID-19, we should establish the model of the environmentally friendly city that our society needs and achieve it with green infrastructure. The directions presented in this article may help establish a green infrastructure planning system where all citizens can fully benefit from the green infrastructure services and capably respond to whatever threats may come.

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References

- Kwon, H., Choi, T., Park, C., and Kim, S. 2021. Spatial Analysis on Mismatch Between Particulate Matter Regulation Services Supply and Demand in Urban Area—A Case Study of Suwon. *J. Korean Env. Res. Tech.* 24(2): 57–69.
- Governments of the Republic of Korea. 2020. *Korean New Deal – National Strategy for a Great Transformation*.
- Ministry of Environment. 2020. Fine dust seasonal management ends as fine dust decreases, April 1. Press release.
- Natural England. 2009. *Green Infrastructure Guidance*. York: Natural England.
- Venter, Z. S., Barton, D. N., Gundersen, V., Figari, H., and Nowell, M. 2020. *Urban nature in a time of crisis: Recreational use of green space increases during the COVID-19 outbreak in Oslo, Norway*. *Environ. Res. Lett.* 15: 104075.

In the Era of Isolation, International Development Cooperation for Resilient City

Youn Hee Jeong

1. Background and Purpose

International cooperation is becoming increasingly important as the spread of COVID-19 has deteriorated the economic and social vulnerability of developing countries. According to World Bank, the number of people in absolute poverty has decreased with hard work and struggles since the financial crisis in 1998, but again showed a considerable increase within just one year after the outbreak of the pandemic. Both the poverty rate and the income gap went up. Before the crisis, rapid urbanization in developing countries, as well as climate change were two main challenges tackled by the international community; now, one more is added to the list—the frequent outbreak of infectious diseases. Addressing this issue calls for international cooperation to support the development of resilient and sustainable cities in developing countries, along with prompt humanitarian assistance.

As COVID-19 is protracted, people are now talking about the “Era with Coronavirus” where we return to our normal way of life and acknowledge having to live with the disease, instead of the “Post-Corona era” that presumes the end of COVID-19. In the field of international development cooperation, it is necessary to explore sustainable ways to promote development cooperation under the premise of changes seen in the wake of COVID-19. In this report, the changing environment of international cooperation after the outbreak of the pandemic was analyzed through surveys and in-depth interviews with experts, in hope of proposing new directions and tasks for cooperation on urban development.

2. COVID-19 and its Implications on International Development Cooperation and Tasks

Transmission of coronavirus through human droplets and

the rapid spread that went beyond what the public health sector could cope with have led many countries to implement strong restrictions on movement and to close national borders. Such strong reactions had an inevitable impact on development cooperation. Development workers dispatched to developing countries were retrieved or could not return, which resulted in suspension or deferment of many development cooperation activities.

In order to analyze the response to COVID-19 and the changing environment in the field of development cooperation, the Global Development Partnership Center of the Korea Research Institute for Human Settlements surveyed and held meetings with experts who have been working for overseas urban and infrastructure development cooperation activities. The survey was conducted among 32 experts in development cooperation, and the in-depth interview was conducted among 14 officials from development cooperation organizations and government agencies. This research has therefore aimed to understand the impact of COVID-19 on the planning, promotion and execution of development cooperation projects, and to review strategies to counter the impact.

The officials in charge of overseas development cooperation projects expressed the same view that COVID-19 had a negative and complex impact across all stages of the projects, from ideation of new projects to executing, managing and evaluating the results of projects. Here are some examples as follows: deteriorated finance reduced resources for development cooperation; border closure and social distancing which made it difficult to conduct field investigations and obtain information; delayed business discussions and project execution; and non-face-to-face communication deteriorated work efficiency and challenged project management. The gap in digital infrastructure and competency resulted in a deepened imbalance as well. The way people work together is rapidly migrating to non-

face-to-face, but the digital infrastructure gap between project execution agencies and recipient countries increased uncertainties over project implementation. Furthermore, suspension or cancellation of activities, as well as the long-term extension of activities without cost support add to challenges facing project execution in terms of manpower and finance.

On the other hand, non-face-to-face communication as a more flexible way of work and is said to be a positive change introduced by COVID-19, as it became easier for people to hold meetings more often, save project implementation costs and better utilize local offices and the workforce. However, the criticism that transitioning to non-face-to-face meetings does not ensure quality communication should not be overlooked.

In particular, many of them pointed out that non-face-to-face cooperation still has limitations as urban development projects require discussions with a number of stakeholders and trust-building is essential. Specifically, they expressed deep concerns about the effectiveness of implementing capacity-building projects online for government workers and policymakers of developing countries. This is because online training cannot replace the effect of on-site training and visits.

The experts expressed that the demand for international development cooperation has shown a steady increase despite challenges inflicted by COVID-19. As for the most needed support in the field, they suggested that inter-government cooperation facilitate entry/departure of overseas dispatched workers and support, and digital infrastructure for holding discussions and providing advisory consultation and training online. In preparation for further protraction of COVID-19, they also stressed the necessity of preparing guidelines for substituting projects that reflect the changing work environment after the pandemic. As non-face-to-face collaboration is gaining ground as a new way of international cooperation, demand for non-face-to-face programs for capacity building, including contents and program operation, has increased, so that they can substitute the effect of offline capacity building activities.

3. Importance of International Development Cooperation for Resilient Cities in the COVID-19 Era

In June 2020, the Secretary-General of UN Habitat

and the representative of the United Nations International Strategy for Disaster Reduction declared in a joint statement that many countries around the world do not have a system to cope with COVID-19 even after they had already suffered serious epidemics before. They emphasized that sustainable urbanization is the only way that cities can secure social, economic and environmental resilience from the dangers of epidemics and climate change. Korea was mentioned as an example of a country making successful response to COVID-19 despite its high urbanization rate, and they said cities should focus on policies to cope with and recover from the pandemic. In order to ensure that developing countries make a sustainable, inclusive and resilient recovery, prudent policies and decisions should be made to address the issue of imbalance in cities, strengthen capacities of urban municipalities, and achieve inclusive and environmental recovery from the crisis, for which development cooperation has an important role to play.

In the field of international cooperation, Korea pursues the policy goal of creating values for the international community and promoting national interest as win-win outcomes through cooperation and solidarity. If we are to pursue development cooperation activities satisfying the policy goal, it is important to carry out projects in ways to promote long-term and sustainable development of partner countries. To that end, the importance of cooperation in the urban and infrastructure sector cannot be overemphasized.

4. Challenges to International Development Cooperation in Sustainable Urban Development

In order to support the international community in dealing with COVID-19, Korea has decided to contribute \$570 million towards the COVID-19 response, including \$87 million in humanitarian aid to 120 countries and \$480 million in emergency loans for health care, and conduct a comprehensive emergency support program worth 36 billion won for base countries and organizations in certain regions.

Korea has also joined in global efforts to deal with the pandemic, participating in international discussions through multilateral diplomacy and sharing information through international organizations. However, there are areas to improve in as well. For instance, there is no systemic governance at the pan-government level that enables effective response to the

increasing demand for international development cooperation. Activities are fragmented among government ministries and agencies in charge of development cooperation. There should be more alignment among development agencies and organizations, and between mid- to long-term strategies and projects for international development cooperation.

Cooperation and information sharing among institutions are especially critical when it comes to development cooperation in the land and urban sectors, as there are many organizations and stakeholders in charge of development cooperation even within recipient countries. There needs to be a strategy to enhance the effectiveness of development cooperation projects by putting in place a framework to systematically implement and efficiently manage development cooperation projects.

There should be a system for close-work cooperation, so that we can closely collaborate with international organizations and actively utilize development project implementation institutions, local offices and manpower of recipient countries. In particular, it is necessary to consider strengthening the support from the public sector. For instance, establish a system to share information and data with key partner countries, guarantee related institutions and companies access to information by providing information on recipient countries, and provide infrastructure for quarantine and digitalization.

In order to foster an environment where experts specializing in land and urban development can continue to use their capabilities in the field of development cooperation, working conditions such as labor costs should be improved. While maintaining the evidence-based principle for project management and performance evaluation, it is also important to find ways to improve the existing performance evaluation system by reflecting the changed work environment and the characteristics of the urban sector in the “Living with COVID-19” era.

Korea has accumulated extensive experience from national land and urban development, and it works as our strength in the field of development cooperation. In order to make the most of our competitiveness, as such, and contribute to the mid- to long-term goal of Korea leading agenda in the international community, it is recommended that the national land and urban sector should be selected as Korea’s strength, and support measures and implementation strategies should be mapped out in the master plan for international development, which is a high-level national strategic plan. Precise recognition of our strength and challenges forms the basis, whereby we can contribute to sustainable urban development in developing countries and, furthermore, lead agenda for development cooperation in the international community.

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References

- Youn Hee Jeong. 2021. In the Era of Isolation, International Development Cooperation to Foster Resilient Cities, in *COVID-19 and the Transition of Human Settlements*. pp.317-335. Sejong: Korea Research Institute for Human Settlements.
- Related Government Ministries. 2020a. *The 3rd Comprehensive Master Plan for International Development Cooperation (2021-2025)*.
- _____. 2020b. *2021 Comprehensive Implementation Plan for International Development Cooperation*.
- Youn Hee Jeong, Min Ji Kim, Eun Hwa Kim, Jong Jun Won, and Chae Wook Lim. 2021. *A study on the direction of international development cooperation in the land and urban sector in response to the changing conditions in the post-Corona era*. Sejong: Korea Research Institute for Human Settlements.
- Mahler, D., Yonzan, N., Lakner, C., Aguilar, R. A., and Wu, H. 2020. Updated estimates of the impact of COVID-19 on global poverty: Looking back at 2020 and the outlook for 2021. World Bank. <https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-turning-corner-pandemic-2021>
- UN-Habitat. 2020. Opinion: COVID-19 demonstrates urgent need for cities to prepare for pandemics. United Nations Human Settlements Programme. <https://unhabitat.org/opinion-covid-19-demonstrates-urgent-need-for-cities-to-prepare-for-pandemics> (accessed June 18, 2021).

Comparing Impact of COVID-19 on Public Transportation in the United States and in the Republic of Korea

Kevin Heaslip

As the novel Coronavirus (SARS-CoV-2) traveled quickly around the world, precautions like washing hands frequently, avoiding crowds and staying home when one felt sick were suggested to contain the spread of the virus. Countries worldwide took different approaches in attempting to slow the spread of the virus. At the time of this article, the United States (US) had confirmed over 49.9 million cases of COVID-19 with over 796,000 deaths, while the Republic of Korea (ROK) had confirmed over 517,000 cases with only 4,253 deaths. Worldwide confirmed cases had topped 270 million, with over 5.3 million deaths caused by the virus. (JHU Coronavirus Resource Center, 2021)

The ROK is one of the few countries that has successfully flattened the COVID-19 curve for much of the pandemic (Fisher and Sang-Hun, 2020). Diverse strategies that help prevent virus spread, including contact tracing and releasing patient trip

information, were implemented to help contain the spread of the virus. Learning from other country's experience with SARS in 2002-2003 and the outbreak of Middle East Respiratory Syndrome (MERS) in the ROK in 2015, the ROK passed a law to manage and publicly share information on infectious diseases. The law enables the government to release the confirmed person's trip information to the public. The purpose of the release is to encourage people who visited the places where a confirmed positive case had been to get a COVID-19 test and provide citizens the confidence to continue traveling domestically as much as possible and keep the ROK economy moving.

In March 2020, many US states began to mandate stay-at-home orders. Essential workers were allowed to go to work, but unnecessary trips were discouraged, which greatly decreased the demand for transportation. As the situation got



worse throughout 2020, businesses began to close in the US or move to an online platform.

These conditions significantly impacted the ridership of public transport in both countries since fewer people were making trips for commuting and leisure. Throughout the summer months of 2020, states in the US began to implement multiple-phase plans to reopen businesses and restart the economy. However, entities that could stay remote were encouraged to continue so. The reopening of the US generated more demand for transportation, but the demand for public transit lagged. The approach taken by the ROK allowed for more domestic travel overall and a much faster recovery of public transit ridership.

This research aimed to understand the influences of the Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) outbreaks on policy in each country through a literature review. The next step was to help determine what factors influenced rider's mobility decisions in the US as the country reopened during the COVID-19 pandemic. This was accomplished by implementing a stated preference survey in Blacksburg, Virginia, and using the data from that survey to compare the experiences of public transit rider recovery in the US and the ROK.

Previous Pandemic Transport Responses

Current understanding and infection prevention strategies for COVID-19 were developed from the global experience with the SARS epidemic in 2003 and MERS in 2015. The number of infections and deaths for both SARS and MERS was vastly smaller than the COVID-19 pandemic. However, valuable lessons were learned to help inform the transport response to COVID-19. SARS spread to 37 countries, infecting 8,098 people and killing 774 of those infected (Olsson et al., 2011). Asia, especially China, where the virus originated, was hit hardest, followed by Canada. MERS only had 2574 cases total and 866 deaths. However, the ROK had the second highest number of cases and deaths of MERS after Saudi Arabia (WHO, 2020).

In Taiwan, if someone was determined to have SARS or was known to or suspected of having close contact with someone diagnosed with it, they were put into quarantine. By quarantine laws, these people's use of public transit was forbidden (Tyshenko & Paterson, 2010). In Canada, health care workers

were put on "Work Quarantine," which meant they could only go to work and home without using any public transit for fear of spreading the virus to other people through shared mobility (Ries, 2006). Some governments mandated lower public transportation usage by people that could potentially spread the virus. However, the perception of risk or the fear of encountering the virus influenced public transportation ridership the most during the SARS pandemic. Fear of the virus scared people away from public transportation because it was advised to avoid close contact areas (Wang, 2014).

In Toronto, even though no data supported the notion that SARS was overrunning the city, people perceived it as a large risk and therefore acted with fear. Residual fear, which is defined as the fear that persists after a new SARS case was reported, affected ridership too (Wang, 2014). Risk communication efforts proved very important in influencing the ridership of public transit during the SARS pandemic. The ROK was able to learn from the experiences in other countries and their own experiences with MERS to develop robust plans for future pandemics.

Methodology

This study focused on determining important factors and considerations that potential riders consider when choosing their transportation mode. Specifically focusing on the COVID-19 pandemic, the survey determined the importance of risk and safety when choosing to ride transit. A survey was distributed to the Blacksburg community to conduct this analysis. The survey's responses determined important factors of ridership preferences for public transit.

This survey was designed to capture respondents' stated preferences for mode choice and factors that influenced this choice during the COVID-19 pandemic. After a two-month collection period (from June 5, 2020 to July 5, 2020), a total of 400 people responded to the survey.

The survey respondents were asked to rank seven defined factors from most important to least important when considering what transportation mode to choose during the pandemic. Overall, cleanliness was most often ranked as number 1, as most important, with the physical distance between riders getting the most common number 2 ranking.

The factors ranked highest for first and second choices are displayed in Figure 1. [Figure 1](#)

Like many states, Virginia had a three-phase plan to reopen as more was learned about the virus. On May 15th, Virginia went into Phase 1. On June 12th, Virginia entered Phase 2, and on July 1st entered Phase 3. The restrictions for each of the phases are shown in Figure 2. The attitudes revealed in the survey regarding using transit during each phase are presented in Table 2. [Figure 2 Table 1](#)

From this analysis, the only notable difference is that a higher percentage of people in Phase 3 were willing to take public transit with safety measures taken compared to Phase 1 and 2, shown in Table 1. It is concluded that the Phase of

reopening may have had some influence as the restrictions on the state of Virginia were loosened, and the virus was better understood. However, there is no statistical difference across the reopening phases.

Impact of COVID-19 on Public Transit

There have been significant decreases in transit ridership in the US in 2020 and 2021 compared to the 2019 year's transit usage (Transitapp, 2021). Throughout all of 2021, transit ridership had not moved above 60% of the ridership from 2019, as shown in Figure 3. At the low point in April 2020, total ridership on the nation's transit systems fell to 20% of the 2019 ridership.

Figure 1. Ranking distributions for the top two important things to transit riders

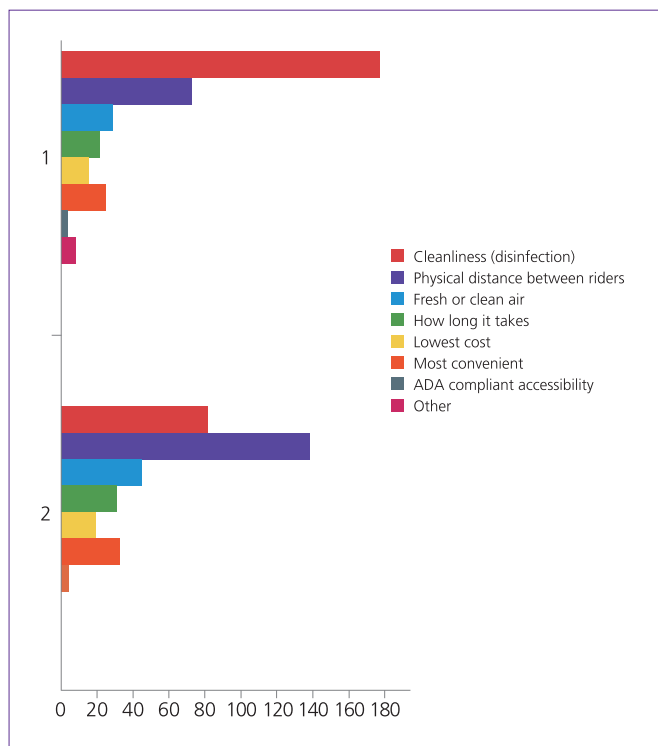


Figure 2. Description of the Virginia reopening phases (VDH, 2020a & b)

Forward Virginia: Phase One		
	NOW	PHASE ONE
NON-ESSENTIAL RETAIL	Open with 10 person limit	Open with 50% capacity
RESTAURANTS AND BEVERAGE SERVICES	Takeout and delivery	Takeout and delivery; outdoor seating at 50% capacity
ENTERTAINMENT AND PUBLIC AMUSEMENT	Closed	Closed
FITNESS AND EXERCISE	Closed	Closed (limited to outdoor fitness classes)
BEACHES	Exercise and fishing only	Exercise and fishing only
GATHERINGS	10 person limit	10 person limit
TELEWORKING	Strongly encouraged	Strongly encouraged
FACE COVERINGS	Strongly encouraged	Strongly encouraged
CHILDCARE	Open for working families	Open for working families
PLACES OF WORSHIP	Drive-in services; 10 person limit	Drive-in services; 50% capacity
PERSONAL GROOMING	Closed	Appointment only
PRIVATE CAMPGROUNDS	Closed	Open
OVERNIGHT SUMMER CAMPS	Closed	Closed
STATE PARKS	Day use only	Day use; Overnight in phases
VEHICLES	Closed	Closed

Forward Virginia: Phase Three		
	PHASE TWO	PHASE THREE
NON-ESSENTIAL RETAIL	Open with 50 percent capacity	Open
RESTAURANTS AND BEVERAGE SERVICES	Indoor and outdoor seating at 50 percent capacity	Open
ENTERTAINMENT VENUES	Low-contact indoor and outdoor open; high-contact closed	Open with 50 percent capacity
FITNESS AND EXERCISE	Open with 30 percent capacity	Open with 75 percent capacity
BEACHES	Open	Open
GATHERINGS	50-person limit	250-person limit
TELEWORKING	Strongly encouraged	Strongly encouraged
FACE COVERINGS	Required	Required
CHILDCARE	Open	Open
PERSONAL GROOMING	Appointment only	Open
PRIVATE CAMPGROUNDS	Open	Open
OVERNIGHT SUMMER CAMPS	Closed	Closed
STATE PARKS	Open	Open

Table 1. Public Transit Ridership Preferences during Opening Phases

Opening Phase	Phase 1	Phase 2	Phase 3
I would not feel comfortable using public transit	35%	35%	33%
I would only use public transit with safety measures taken	45%	47%	57%
I would use public transit regardless of the health crisis	19%	17%	10%

Source
The authors' own work.

This has been caused by the significant community spread of the virus and many workers still working from home. There has been a systematic shift in workers in knowledge-based fields to Work From Home (WFH) every day or a hybrid schedule where people WFH for a portion of the week. In many cities in the US, people in knowledge-based fields made up a significant percentage of the commuting riders. **Figure 3**

In Seoul, there has been a reduction in transit ridership since the pandemic began, but significantly less than in the United States. Since the first COVID-19 case occurred in Seoul on January 23, 2020, transit ridership decreased significantly (Seoul Metropolitan Government, 2020). Before January 23, 2020, the subway ridership changes compared to the previous year's same weekday shows almost 0% except for the Korean New Year's Day. However, after January 23, the ridership decreases radically and shows an approximately 50% decrease from the previous year. Note that some points above 0%, which means increased ridership compared to the same weekday last year, are caused by holidays. Overall, for 2020, bus ridership fell 23.6%, and subway ridership fell by 27%. As shown in Figure 4, there was robust recovery for commuting trips, as businesses did not close as they did in the US, and WFH was implemented much less. However, weekend and off-peak trips decreased as residents chose not to take trips that were not necessary. **Figure 4**

CONCLUSIONS

The US and ROK have had significantly different experi-

ences throughout the COVID-19 pandemic, and those experiences mostly cause different effects on public transportation. The experience with the MERS outbreak in 2015 allowed the ROK to pass laws that allowed for centralized management of cases and a robust plan for a pandemic. These laws, coupled with a population that had memories of the MERS outbreak in the recent past, caused the ROK to have high compliance with public health measures. Since the US had very little experience with SARS and MERS, the last airborne pandemic that affected the US was the Spanish Flu from 1918-1920. With no collective memory of a pandemic in recent memory, the US did not have laws and processes in place to effectively manage the pandemic. In addition, each state took different measures to contain the virus.

The ROK approach was able to work because of the shared experience of the people and the government system, which allowed for centralized planning of the response to the pandemic. Some states, such as California, had more restrictions on businesses than the ROK. These restrictions did not help to contain the virus partially because of a lack of coordination between the states and federal government.

Even though the ROK approach was much more successful at containing the virus than in the US, it is unlikely that such an approach would have been feasible in the US. The distributed government at the state level and American reluctance to be surveilled by the government would not allow for the implementation of QR codes in public places as seen in the ROK or the gathering and publishing of personal information to

Figure 3. National transit ridership in the US before and during COVID-19

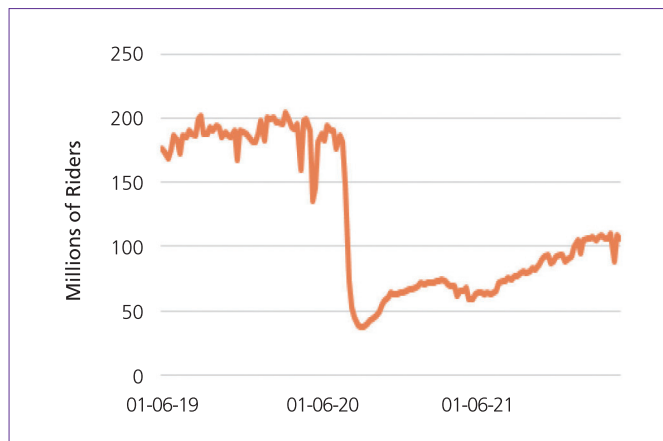
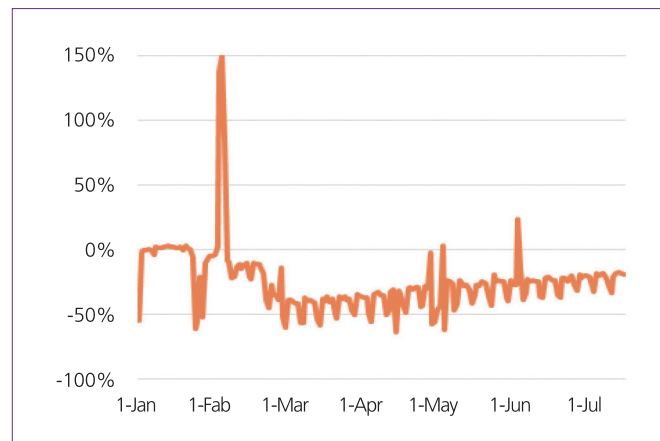


Figure 4. Transit ridership changes in Seoul, ROK in 2020



aid in contact tracing. These differences show in the utilization of transit in both countries, with US transit ridership decreases throughout 2021 continuing to be larger than the 2020 Seoul overall decrease.

This study determined many important factors that have influenced ridership decision-making during the Coronavirus pandemic. Riders' opinions were collected and analyzed using a stated preference survey to understand their thought process best when making shared transportation decisions. One of the key takeaways from this study was that potential riders want to feel in control and as protected as possible during the pandemic. Public transportation providers should provide disinfectant options and mandate mask-wearing to make riders feel more comfortable riding public transit.

Providing a well-designed and functional platform containing all vehicle data would also encourage shared transportation. Blacksburg Transit has the platform already established, the BT app, to plot routes and track buses' progress along a route. Using this same platform, Blacksburg Transit incorporates a section with real-time data, publishing constant updates on each vehicle's cleanliness and the percentage capacity being used on each bus in real-time. Riders expressed that they would feel much more comfortable knowing when the vehicle was last cleaned and how many people were currently riding. Publishing this real-time data would help make people feel more in control of their environment and more likely to utilize public transportation.

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References

- Fisher, M. and Sang-Hun, C. 2020. How South Korea Flattened the Curve. *The New York Times*.
- Johns Hopkins University Coronavirus Resource Center, "Coronavirus Cases", <https://coronavirus.jhu.edu>, (accessed on December 13, 2021).
- Olsson, E.-K., Stern, E. K., Xue, L., Atkinson, L., Buus, S., Deppa, J., Deverell, E., Markel, D., Seaberg, A., and Shen, S. 2011. *SARS from East to West*. Lexington Books.
- Seoul Metropolitan Government. 2020. Seoul Open Data Portal. <https://data.seoul.go.kr/>
- Tyshenko, M. G., and Paterson, C. 2010. *SARS Unmasked: Risk Communication of Pandemics and Influenza in Canada*. MQUP.
- Transitapp. 2020. Transit demand changes in the U.S. In: TRANSITAPP (ed.).
- Virginia Department of Health. Phase One Opening Summary. 2020a, Richmond, VA.
- _____. Phase Two and Three Opening Summary. 2020b, Richmond, VA.
- Wang, K.-Y. (2014). How Change of Public Transportation Usage Reveals Fear of the SARS Virus in a City. *PLoS ONE*, 9(3). <https://doi.org/10.1371/journal.pone.0089405>
- World Health Organization. "MERS situation update, January 2020". January 2020. <http://www.emro.who.int/pandemic-epidemic-diseases/mers-cov/mers-situation-update-january-2020.html>

Seminar in Celebration of KRIHS' 43rd Anniversary

On October 19, KRIHS held a seminar entitled “the future directions for urban policy in Korea” in celebration of the KRIHS' 43rd anniversary in its auditorium. The seminar served as a forum to discuss where the nation's urban policy should head at this point in time when the National Land Planning Act and the Urban Regeneration Act mark their 20th and 10th anniversary, respectively.

In his opening remarks, KRIHS President, Hyun-Soo Kang, said, “We've done much in the past 43 years, but we still have piles of challenges including



territorial imbalance, urban issues, and real estate problems, and we also face urban problems in the new era. We at KRIHS should play pioneering roles in resolving these challenges with untiring

efforts for research and endeavors to explore new policies.”

The presentation topics at the seminar included “new administrative city Sejong and the future of urban policy,” “accomplishments of the National Land Planning Act in the past 20 years and future policy tasks,” “orientations of future land and urban planning,” “accomplishments of urban regeneration projects and future directions,” and “neighborhood vitalization based on residential partnership,” followed by enthusiastic discussions over the future directions for the nation's urban policy.



Talk Session to Discuss New Balanced National Development Policy

On May 20, KRIHS held a talk session themed around new balanced national development policy in its auditorium. The talk session was organized with the aim to understand the accomplishments and limitations of the existing balanced national development policy and explore orientations for a new balanced national development policy. In this welcoming address, KRIHS President, Hyun-Soo Kang said, "The Ministry of Land, Infrastructure and Transport (MOLIT) has important roles in additional investment in megapolitan areas and carbon neutral policy... I look forward to experts in relevant disciplines continuing their studies and exploring new policies." The speakers, KRIHS Research Fellow, Soo-Jung Ha, Korea Planning Association President, Hyun-Soo Kim, and Kongju National University Professor Jong-heon Jin, emphasized that resolving regional inequalities and ensuring balanced national development would

require contemplating existing policies and finding success stories to change young generations' recognition. In the discussions, KRIHS President, Hyun-Soo Kang, KRIHS National Balanced Development

Research Center Director, Tae-Hwan Kim, MOLIT Director, Heung-jin Kim, and MOLIT Policy Officer, Won-guk Baek, shared insights and presented new policies.



KRIHS-Gangneung City Exchange and Cooperation Agreement Signing Ceremony

On October 19, KRIHS and Gangneung City signed an agreement on mutual exchange and cooperation for efficient land use and balanced national development in the institute's conference room.

The key activities envisaged under the agreement include joint research projects and the sharing of research data for efficient land use and balanced national development.

KRIHS President, Hyun-Soo Kang, said, "We at KRIHS will actively work with Gangneung City to achieve our shared goal of balanced national development and the pursuit of key projects in Gangneung."

Gangneung Mayor, Han-Geun Kim, replied, "Agreements with specialist institutions will help us further strengthen our expertise and proactively respond to paradigm shifts in industry and logistics."





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