Abstract

**Purpose:** The purpose of this study is to discuss what structural type of policy network, that is, inter-organizational relations, is effective for overcoming health crisis such as coronavirus outbreak and a pandemic. Assuming that Korea has been relatively successful in protecting the spread of infection, we attempt to select two main Korean cases and compare the structural characteristics, such as centrality of policy networks for those cases.

**Method:** It defines the scope of the network to major decision-making agencies, resource mobilization agencies, and other supporting agencies that officially participate in achieving the policy goals, and analyzes the urgency and importance of the policy goals, the public-good nature of policy, leading forces and authority, participants and their activities, etc. with qualitative data released by various experts and organizations including the government.

**Results:** In the corona response system, the policy goal is very urgent and important, so the government is in charge of it, and the network has been highly concentrated around disease control and prevention institutions that have specialized expertise while destroying the ranks. In the treatment and vaccine development support system, reduced concentration characterizes public-private partnerships, where the private sector wants actively participate due to the enormous opportunity to generate profits, while the private sector wants active leadership from the government due to the high risk of market failure.

**Conclusion:** Korea’s successful prevention of corona damage came from the role of the government, which effectively utilizes IT technology and medical resources and promotes public trust, leading to citizen participation. However, the symbolism of “the big government is back” is implied behind it. Now, at the time when the “big government” is about to return, it will not only expand the size and budget of the government as in the past, but will expand its character as a surveillance state and a health crisis state.

**Keywords** COVID-19, Policy Network, Korean Government, Pandemic, Coronavirus

1. Introduction

Public policy processes grow more complex with the increased involvement of business, not-for-profits, interest groups, and multiple levels and units of government. Furthermore, this complexity becomes more intense as policy actors create ties with each other and as they pursue their goals. In this context, much attention is given to the concept of network. In particular, a reason for the popularity is that network is understood by some scholars as an alternative inter-organizational model with an emphasis on interdependence, or an alternative analytical model that directs attention to a higher level of analysis.
If so, is it effective for the government to use networks with organizations other than the government even for the purpose of disaster response or national crisis management? According to organizational theory, it is understood that a centralized system such as the government, concentrating authority and roles to specific organizations, is more effective in emergency situations in crisis.

Here, in terms of organizational theory, the two demands collide. On the one hand, the general demands of the times require a decentralized network organization, while the situational demands of crisis on the other hand require a centralized government-led promotion system. What is the most effective network organization to respond to COVID-19 (Coronavirus disease-2019), acute respiratory disease, which is currently sweeping the world? Which of the decentralized networks and centralized initiatives is preferred, or what compromise model is being proposed?

COVID-19 is mainly spread by tiny droplets that occur when contacting, coughing, sneezing, and talking, and infected people can have mild to severe symptoms such as fever, cough, shortness of breath, and diarrhea. In particular, people with complications or illness, and the elderly are more likely to die. WHO declared a pandemic against COVID-19 on March 11, 2020. As of October 3, 2020, a total of more than 34 million confirmed cases and more than 1 million deaths were reported worldwide, so the contagion of the disease is frightening.

Korea is praised as a world-class model country in responding to the coronavirus. Many countries want to learn about Korea's effective corona response system. Therefore, this study attempts to approach the network perspective on what the Korean government has in the policy networks of 3 main cases including response system to COVID-19, COVID-19 treatment and vaccine development, and international standardization of K-Quarantine model. By this way, this essay attempts to draw some valuable concepts of network, especially about centrality and concentration, for public policy and administration as well as organization theory. Then, the essay discusses the potential and limitations of network research, emphasizing on its conflict with the concepts of organizations and institutions.

2. Literature Review

2.1. Network as an alternative governance and “hollow state”

Policy networks are the relationship between policy actors and the large structure, but each scholars define it slightly differently. Kenis & Schneider argues that the policy-making process is the informal and decentralized arrangement of policy decisions in which relations between actors are made horizontally[1]. Marin & Mayntz understands policy networks as a network between policy actors and their attribute is recognized as a resource-dependent relationship[2]. Policy networks are the type of interdependence between actors that are formed around a policy problem or limited resources, and this type of relationship is formed, maintained and changed by a series of games.

Furthermore, many scholars in public administration view the network as an alternative governance, with an emphasis on interdependence, stability, and trust, at the inter-organizational level. The network perspective of public administrators is likely to supplement their conventional, hierarchy-oriented and market-oriented perspectives. O’Toole argues that networks involve “a very wide range of structures in between formal hierarchies and perfect markets.”[3]. Powell views the network as a distinctive form of organization that is “neither market nor hierarchy.”[4]. Kickert, et al. sees the network as an alternative to governance that is built on both top-down and bottom-up criticism[5].

The concept as alternative governance are also parallel to the newly emerging context of public policy and administration—the context of the ‘hollow state,’ a form of government in which the function of the government is significantly reduced by entrusting administrative ser-
vice work to a third party such as the private sector. In the network setting, state and bureaucracy have come to lose their authority considerably, and thus we see the emergence of what Milward terms the “hollow state”[6]. When raising its level of analysis, such a network perspective tends to underscore the influence of interdependence with others rather than the effect of structures, values, and institutionalization within a public agency, or its subunits.

2.2. “Hollow state” versus effectiveness of centrality

In addition to alternative governance, a group views network as a unit of analysis in research to public administration. It directs analytical attention to a higher level of analysis, diversity in constituency perspectives, or even epistemological assumption. Hence, it seems that network research in public administration can draw rich, theoretical implications from organization study, policy study, and political science, since the theoretical roots of policy networks encompass those three disciplines, as Kickert et al. assert in their book, Managing Complex Networks[5].

However, network analysis indeed encompass the lack of coherent theory of their origins, their causes, and the precise range of their occurrence. McCool points out that many scholars like to use the concept of policy subsystem(or policy network) but “there is little empirical evidence to support it”[7].

On the other hand, the limitation is contrast to academic accomplishment in organization study. Existing studies related to network analysis between organizations can be largely divided into studies from the perspective of egocentric networks and studies from the perspective of whole-network[8]. The former, after forming a network centered on “ego,” surveys “ego” about its relational factors with each of multiple “alters”[9][10]. The latter, whole-network studies shed light on how the structure, such as density and centrality, of the overall network evolves, what the power structure is, and what collaborations are drawn[11][12][13].

Centrality and density have been the most important and popular themes in the network analysis of organization study. A useful exemplar of empirical studies regarding networks is Provan & Milward’s article, “A Preliminary Theory of Inter-organizational Network Effectiveness,” which compared the effectiveness of the mental health services of four urban areas. Their study is noteworthy in that it takes advantage of a strength of network analysis in terms of effectiveness measurement. The authors point out that a real measure of effectiveness for inter-organizational networks should not be limited to any individual organization; instead, it must include various constituencies in the entire network. Hence, their network analysis is based on responses form clients, their families, and case-managers concerning the clients’ quality of life, their satisfaction with the services of the network, and their level of functioning. The authors found that the most effective of the four mental health service networks was centralized and concentrated around a primary organization[12].

While Provan & Milward recognize effectiveness of centrality and density in the network context as a result of their empirical study, they make seemingly inconsistent claims that state’s power and function have been declining as they term the “hollow state” as above. The emergence of the “hollow state” as a description is contrast to the positive causal relationship between centrality, or concentration, and effectiveness as empirical results. Does it possible for the “hollow state” to coexist with more centrality or density for inter-organizational effectiveness?

Answering the above questions can be summarized as follows. First, in modern society, the government cannot go alone as in the past to solve policy problems, and has a tendency to move in a structure of cooperation with other organizations in the private sector and third sector, so it is necessary to try to analyze it from a network perspective. Second, the more the authority and resource mobilization are concentrated in a specific organization within the network structure, the more effective the policy is.

2.3. Purpose and methodology of the study
Until recently, the “hollow state,” the newly emerging context of public policy and administration, has swept a number of countries over the new liberal world especially. Will this trend persist even after the coronavirus outbreak that has caused one of the most serious crises of mankind as well as states? Does government intervention, if any, take decentralized forms or centralized ones in representative two cases, respectively? This study aims at examining the degree of centrality as well as the role of the Korean government in a network context since the coronavirus outbreak.

A challenge to network research may be the difficulty of defining boundaries between a network and its environment, but a clue may be found from sociologists’ two approaches to boundary definition: the one is the realist approach, in which an analyst adopts the presumed vantage point of the actors themselves in defining the boundaries of social entities; and the other is the nominalist approach, in which an analyst self-consciously defines boundaries to serve his or her own analytic purposes.

This study defined the scope of the network based on the data on the policy implementation system officially distributed by the government. The corona crisis, as it is called a pandemic, is so wide that it is difficult to analyze groups or regions as in sociology. Instead, it was limited to major decision-making agencies, resource mobilization agencies, and other supporting agencies that officially participate in achieving the policy goals. Based on the qualitative data released by the government, we attempt to evaluate the structure and concentration of the network by analyzing various factors: the urgency and importance of policy goals, the public-good nature of policy, leading forces such as authority and position, the participating organizations, etc[14][15].


3.1. Network for response to COVID-19

A. Policy Context and Mission

South Korea has experienced two national public health crises over the past decade. The failure of the 2015 Middle East Respiratory Syndrome-Coronavirus(MERS-CoV) response to address coordination issues or rights conflicts provides a legitimacy to renovate the national disease control system prior to the 2020 Coronavirus Disease 2019(COVID-19) crisis. It has been argued that centralized coordination efforts at the national level are desirable rather than fragmented local, urban or regional efforts in a national epidemic or pandemic[16][17][18].

In more detail, the main causes of the MERS failure were late diagnosis, ‘super spreader’ quarantine failure, family care and visits, patient privacy, poor communication by the Korean government, and so on. This outbreak occurred entirely in hospitals and was primarily due to infection control and policy failures rather than biomedical factors[19].

Korean government refined the related legal basis, on which it shall respond to COVID-19 by applying 'Class 1 Infectious Disease New Infectious Disease Syndrome' until information about the clinical characteristics and epidemiological characteristics is revealed. Corresponding directions include early recognition and identification of outbreak patterns, rapid epidemiological investigation, patient and contact management, environmental management, and strengthen education and publicity for prevention of corona 19 about personal hygiene, social distance, etc.

Grounded in the above legal basis and directions, management policy aims to prevent the transmission of infectious diseases through monitoring-epidemiological investigation-management as well as infection through personal hygiene education and publicity such as hand washing and cough etiquette. From the network perspective, the policy also aims to strengthen community capacity by establishing a cooperative system of local governments, private medical institutions, and related organizations.
B. Shape of Policy Network

As the Korean government raised Crisis Alert Level to the highest (Level 4) in February 23, 2020, the government operated the Central Disaster and Safety Countermeasure Headquarters headed by the Prime Minister as the organization for responding to Corona 19 to support government-wide responses to COVID-19. As shown in <Figure 1>, the quarantine control tower, the Central Disease Control Headquarters (KCDC, Korea Centers for Disease Control & Prevention) serves as the command center of the prevention and control efforts because of its specificity and expertise of infectious disease response, assisted by The Vice Head 1 of the Central Disaster and Safety Countermeasure Headquarters, who also serves as the Head of the Central Disaster Management Headquarters and Minister of Health and Welfare [20].

The Minister of Interior and Safety, head of the Pan-government Countermeasures Support Headquarters, which also serve as Vice Head 2 of the Central Disaster and Safety Countermeasure Headquarters, provides necessary assistance such as coordination between the central and local governments. At each local government, heads of the local governments establish Local Disaster and Safety Management Headquarters to secure an enough number of Infectious Disease Hospitals and beds. If the countermeasure required is beyond the capacity of local governments, the central government may support necessary resources including beds, personnel, and supplies [20].

Figure 1. Korean government’s response system at the crisis alert level IV [20].

The Working Group is established for the coordination between Central government and local governments at cities and provinces under the Deputy Head of the Central Disaster Management Headquarters, that is Vice Minister of Health and Welfare.

C. Network Participants and Changes at the Central Level

Ministry of Health and Welfare, as Central Disaster Management Headquarters, supports Central Disease Control Headquarters activities and pan-government counter-measures. It consults between ministries related to disaster response and control of infectious disease in hospitalization, treatment, life support, damage compensation, psychological support, etc. The Ministry, a communication hub, is also responsible for the issue of crisis alerts and dissemination of the situation as well as support for crisis communication to the public by unifying communication channels to the disease management headquarters [21].
Ministry of Health and Welfare is used to play the role of the control tower with the above tasks, but its role as the central tower has been transferred to Korea Disease Control and Prevention Agency (KDCA), which has been promoted from the former KCDC in September 12, 2020. KCDA, as Central Disease Control Headquarters, conducts epidemiological investigations and supports on-site measures such as quarantine as well as dealing with transition to high-risk and critical patients. To attain the goals, the Agency conducts crisis monitoring and evaluation enhancement, strengthens the operation of the emergency room for 24 hours, and prevents additional inflows through strengthening quarantine. Furthermore, it supports base hospitals to change their function from outpatient care to hospitalization and intensive care as well as controls surveillance system for critical patients such as the dead[21].

In fact, the Agency covers almost all kinds of on-site works related to the response, such as driving cooperation and coordination of related organizations and offering briefing, press releases, coverage support for media communication as well as civil complaint response and communication to the public.

As crisis levels rise with some serious outbreaks, a major transformation took place in the centralization and power structure within the network. It was the health care community that called for organizational reforms aggressively. According to the community, in order to effectively respond to infectious diseases, the health and welfare functions of the Ministry of Health and Welfare should be separated. The community also pointed out that it was unable to secure the expertise and independence of the quarantine system against the outbreak of MERS in 2015. The Centers for Disease Control and Prevention did not have personnel rights and budget rights, and that there was no executive organization for each region, and that it did not have the authority to command and lead other ministries in crisis situations. Therefore, it was necessary to follow the decision of an administrative bureaucrat who is an unprofessional. At the same time, they continuously insisted that the Centers for Disease Control and Prevention be promoted to the Korea Centers for Disease Control and Prevention[22].

The National Assembly smoothly passed a bill to promote the Korea Centers for Disease Control and Prevention to the Korea Centers for Disease Control and Prevention. Despite the intensifying conflict between the ruling party and the opposition party in the 21st National Assembly, consensus was formed regardless of the opposition party regarding the serious national and global crisis. In particular, it was the opposition party that proposed the same bill in the 20th National Assembly before the corona crisis. It was also an election pledge of the current president and opposition candidate.

As promoted from the Center to the Agency, as an independent central administrative agency, KCDA can operate the organization, personnel, and budget independently. The size of the organization is composed of 1 director, 1 deputy director, 8 bureaus, 16 government departments, and a total of 1476 people. 350 people are being supplemented compared to the previous one. Unlike the administration of affairs commissioned by the Ministry of Health and Welfare, it has jurisdiction over six laws including the Infectious Disease Prevention Act and has the authority to execute. With the promotion, the regional response system also will change. While there was no central dedicated organization previously, five disease response centers and Jeju branch offices will be established in the metropolitan area and dedicated organizations will be established in all cities and provinces. As its affiliated institution, the National Institute of Infectious Diseases, will also promote the commercialization of vaccines and treatments.

D. Network Participants at the Local Level

City/Province and City/County/District are responsible for the operation of Regional Disaster and Safety Management Headquarters and Regional Disease Prevention and Control Teams. They do not only strengthen local patient monitoring system and operate regional quarantine infrastructure, but also offer regional epidemiological investigation, on-site quarantine measures, patient transfer, contact identification support, patient and contact management, quarantine release, etc[21].
The local governments plan management of quarantine beds and quarantine facilities in the region and additional securing. Their severity classification teams and hospital bed allocation teams operate patient management classes in all cities and provinces nationwide. If necessary, they reorganize health centers focused on quarantine services and reinforcement of inspection personnel. At the local level, they play central roles in the response network. To do works fluently, they strengthen the cooperation system with relevant local organizations and cooperate for the operation of the working group between central and local governments. They also strengthen communication such as education and promotion for local residents.

Under each City/Province government, several subsidiary organizations work for response under local governments. First, Institute of Health and Environment conducts Corona 19 pathogen laboratory test. Second, Infectious Disease Management Support Unit is responsible for technical support such as city/province corona19 monitoring, epidemiological investigation, data analysis, etc. as well as technical support for customized Corona 19 management by city or province. Third, Local Medical Institutions offer diagnosis and treatment for Corona-19 patients, and report Corona 19 on occurrence, death, discharge, etc. They also play the role of a corona-19 patient screening clinic, offering economic investigation and infectious disease management cooperation in case of corona-19 patients.

3.2. Network for COVID-19 treatment and vaccine development

A. Policy Context and Mission

COVID-19 vaccine is a private goods as well as a public goods. It is analyzed that 20% of the population vaccination is insufficient to achieve collective immunity. For this reason, some countries have direct vaccine supply contracts with vaccine developers. For example, the United States has professed not to join COVAX, an international Project for vaccine joint purchase and distribution. The UK also signed a separate purchase contract with researchers and pharmaceutical companies, apart from the contract with COVAX. If production volumes are insufficient at the initial stage of vaccine development, bilateral transactions between high-income countries and vaccine manufacturers are expected to increase.

Albert Bourla, Pfizer's CEO, said it was unethical to set prices according to "open market principles" and not "doing business as usual" for companies in a pandemic. There are still "great commercial opportunities," he said. The company has never been involved in research to pursue a return on investment, he said, rather it was seeking "a return on effort." Under the global competition for the vaccine, in April 9, 2020, the Korean government formed a joint public-private government support group to intensively support the development of COVID-19 treatments and vaccines on the occasion of the joint meeting of industry, academia, research, and hospital, presided over by the President, to quickly create results. The support team comprehensively checks the development status of COVID-19 treatments and vaccines, and establishes a rapid decision-making system to quickly discover and resolve difficulties in the field such as regulations.

In particular, the support group develops the “Corona 19 Therapeutic and Vaccine Development Pan-Government Roadmap”, which includes expansion of government R&D investment for promising corona 19 treatment and vaccine items in Korea, to support full-cycle research and development from basic research to commercialization, and measures to improve regulations related to licensing and commercialization.

B. Shape of Policy Network

The public-private partnership is actually the network form that needs the active role of the government because Korea Pharmaceutical and Bio-Pharma Manufacturers Association has asked for it. According to the Chairman of the National Bio-Health Industry Innovation Strategy Promotion Committee, for global competitiveness, the industry must come up with a solution
to unmet need, and the government should create an ecosystem of medical, industrial, academia, and research networks, while uniting the industrial command system. Emphasizing the necessary of a control tower, he said that the decentralization of the command system is limited to affect universities and research institutes, so that only artificial and temporary convergence can be induced to secure research funding, and a fundamental convergence ecosystem to produce creative ideas cannot be established. Most members of the Korea Pharmaceutical Bio Association asked for creating a government-led fund and expanding the role of a large government for the globalization of the domestic pharmaceutical bio industry.”[26]

The governmental responded to the business request by standing at the hear of the network, as shown in <Figure 2>. Participants, co-directed by Minister of Health and Welfare and Minister of Science and ITC, include Vice Ministers of related ministries in Economy and Finance, Industry, Small and Medium Industry, and Government Policy Coordination Office, Commissioner of Korea Disease Control and Prevention Agency, and Minister of Food and Drug Safety as well as private experts.

Figure 2. Support group for COVID-19 treatment and vaccine development[27].

To this end, the working group under the support group discovers and discusses detailed agendas through regular and intensive discussions every week in three sub-divisions including treatments, vaccines, and quarantine supplies & devices. Private experts in those sub-divisions participate in the group. On the government side, the head of the National Institute of Health and the director of the Research and Development of the Ministry of Science and ICT are co-directors, and the director-level officials of the Ministries of Economy and Finance, of Industry, of Food and Drug Safety, and the relevant departments additionally attend[27].

In addition, in connection with the “Company Difficulties Relief Support Center(Korea Health Industry Development Agency)”, which will be installed under the Pan-Governmental Support Group, the support group provides professional consulting to quickly resolve the difficulties of domestic treatment and vaccine development companies. The support group cooperates with other organizations on finding solutions to scientific and technological difficulties through the “R&D Support Council” consisting of research institutes and universities[27].

C. Network Participants and Activities

The government collected on-site difficulties, such as support for licenses and permits, and promptly resolved or presented important matters to the pan-government support group meeting. The support group analyzed the R&D status of treatments and vaccines as well as research support plans. The group also analyzed the supply and demand status of quarantine products
and devices, and prepared for the support plans of their localization. Furthermore, the group expanded infrastructure for developing treatments and vaccines such as international joint research support plans, open research data, and animal models [27].

The 4th meeting (July 14) invited the Bio Association, Biopharmaceutical Association, Medical Device Industry Association, and Global Pharmaceutical Industry Association to hold a pan-governmental support plan briefing session for COVID-19 treatment and vaccine development, and support measures and promotions there. The current status and the execution plan of the related budget were also explained and communicated. The 5th meeting (August 21) discussed strategies for promptly introducing overseas vaccines through participation in the COVAX Facility and negotiations with individual companies, as well as vaccine vaccination strategies such as vaccination timing and those who are recommended for priority vaccination. The 6th meeting (September 25) provided opportunities for conglomerates to communicate the progress and difficulties in the development of treatments and vaccines, reports on the status of additional executions and the government budget for the next year, and clinical trials to speed up the development of treatments and vaccines. Finally, the 7th meeting (October 30) discussed the plan to support clinical trials for COVID-19 treatments and vaccines, the current status and plan for the introduction of the COVID-19 vaccine abroad, and the promotion to apply the research results of various National Research Institutes to the quarantine field [28].

4. Comparative Analysis of Policy Networks

Above, we reviewed the structure of two corona-related policy networks formed by the Korean government during the corona outbreak: response system to COVID-19 and support system for treatment and vaccine development. By reviewing them, we became aware of the purpose and performance of each network, participants and their roles, and inter-relations and interactions between participants in respective network. In Table 1, we will analyze their structural characteristics by comparing them in five aspects.

Table 1. Comparison of 3 policy networks.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Response system to COVID-19</th>
<th>COVID-19 treatment and vaccine development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgency and importance of policy goals</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Public-good nature of policy</td>
<td>Stronger</td>
<td>Weaker</td>
</tr>
<tr>
<td>Leading forces and authority</td>
<td>Disease prevention and control</td>
<td>Bio R&amp;D and industry</td>
</tr>
<tr>
<td>Main participants</td>
<td>Governmental agencies</td>
<td>Public-private partnership</td>
</tr>
<tr>
<td>Centrality</td>
<td>Higher</td>
<td>Lower</td>
</tr>
</tbody>
</table>

The characteristic of the corona response system is that the policy objectives are very urgent and important, so the network is showing a centralized appearance, and the fact that Korea Disease Control & Prevention Agency (KDCA, the former KCDC) has been highly recognized for its speciality and expertise to respond to the pandemic. The Agency served as the control tower and practical command center of prevention and control efforts as Central Disease Control Headquarters. A considerable level of decision-making authority was delegated to the Agency from high-ranking institutions or political circles, and the Agency prepared guidelines for actions to be followed by various governments, public institutions, private institutions, and citizens in
Korean society, communicated with the public, and provided professional advice. With the prime minister as the peak, related ministries were superior institutions in order to the Agency, but in reality, physically or legally, they showed a breakdown in order to support the Agency's leadership.

In view of this, it can be said that the KDCA constitutes a concentric circle-shaped network supported by other ministries. In addition, at each local level, the head of health-related departments with the highest expertise for each local government was in charge, and Local Disaster and Safety Management Headquarters played a central executive role. In addition, they could receive professionalism or legal and material support from the central government. These institutions also played a central role in the concentric circle-shaped network, especially in a structure that received strong central support[29].

The other case, Support System for Treatment & Vaccine Development, shows the shape of network in which the concentration in the corona response system has been significantly reduced. The public sector and the private sector form partnerships and work together to achieve common goals, and it cannot be found here that the urgency and importance of the policy goals, as seen in the corona response system, show a correlation with the concentration of the network. The policy goal of treatment & vaccine development is relatively less urgent and important than responding to COVID-19, so the development support system is limited to justify the network concentration led by the government. Furthermore, companies are highly encouraged to join the partnership because the private sector is the subject of R&D and production, and the profits are directly returned to the private sector.

What is interesting is that coronavirus-related companies, afraid of investment failure, also want the government to support, even to lead, the partnership more actively in various aspects such as funding, planning and globalization as well as supporting such as hearing and solving on-site difficulties. In other words, businesses in treatments, vaccines, and quarantine supplies & devices want “a bigger government” in the direction of easing government regulation and strengthening government support. We can see an aspect of industrial nationalism in which the government and companies of a country create an industrial ecosystem together in response to global competition.

5. Conclusion

Recently, as of early November 2020, Korea has achieved remarkably reducing the number of new cases to around 100 per day. Korea’s response to the coronavirus would have been impossible without a sound citizenship of citizens to voluntarily participate and cooperate with government guidelines to overcome the national crisis. Another success factor was the oriental sense of community that prioritized the well-being of the community over individual freedom. Behind this, the role of the government was large. The government tried to gain public trust through communication and information disclosure, and took quick and flexible measures to meet the changing circumstances[30]. In addition, the infection tracking and surveillance system worked effectively through Korea's excellent IT technology, and the dedication and teamwork of the medical staff were added[29][31][32].

However, the government’s role is creating a new administrative environment. In other words, "the big government is back". Global crises such as World Wars and the Great Depression led to the formation of a “big government” and continued to expand until the 1970s, but new liberalism regarded “big government” as sin. Now, at the time when the “big government” is about to return, it will not only expand the size and budget of the government as in the past, but will expand its character as a surveillance state and a health crisis state.

The structure of coronavirus response system examined in this study shows a concentric circle shape showing a high level of concentration, centered on the government, especially the KDCA, so that the so-called “hollow state” is overshadowed. On the other hand, the treatment
& vaccine development support system encompasses the forms of public-private partnership with their concentration being considerably relaxed. While the private sector wants to participate actively for the high opportunity to make profits and strong nature of private goods, it wants government’s leadership due to the high risk of market failure and the weak nature of public goods. The role and intervention of the government is expected to increase in cases where the urgency and importance of policy goals is high, and in cases where investment is widely open to market failure under the era of COVID-19.

Network research, including this study, is methodologically limited in catching the internal characteristics of organizations as independent variables. That is, it tends to overlook the effects of those characteristics on constituency satisfaction or network effectiveness as well as their internal response to an increase in environmental complexity and uncertainty. From institutional perspectives, it is expected that further studies explore the question of how public organizations, or their members, arrange structures, values, and institutionalization processes in order to interact with their networked environment under the era of COVID-19[33][34].

5. References

5.1. Journal articles

(2017).

5.2. Books

5.3. Conference proceedings

5.4. Additional references
6. Appendix

6.1. Authors contribution

<table>
<thead>
<tr>
<th>Initial name</th>
<th>Contribution</th>
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| DWK          | ✓ Set of concepts  
|              | ✓ Design  
|              | ✓ Getting results  
|              | ✓ Analysis  
|              | ✓ Make a significant contribution to collection  
|              | ✓ Final approval of the paper  
|              | ✓ Corresponding  
|              | ✓ Play a decisive role in modification  
|              | ✓ Significant contributions to concepts, designs, practices, analysis and interpretation of data  
|              | ✓ Participants in Drafting and Revising Papers  
|              | ✓ Someone who can explain all aspects of the paper |

6.2. Funding agency

This work was supported by Incheon National University Research Grant in 2016.