국외훈련
결과보고서

네트워크 거버넌스와 팬데믹 대응 분석: 메르스와 코로나19를 중심으로

2023년 5월

보건복지부
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- 목 차 -

1. 국외훈련 개요

(1) 훈련국 : 영국

(2) 훈련기관명 : 버밍엄 대학교 (University of Birmingham)

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2. 훈련기관 개요

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(3) 연혁 및 소개

영국 제2의 도시인 버밍엄에 소재한 버밍엄 대학교 (University of Birmingham)는 공립 종합 대학이다. 1900년 Queen's College, Birmingham (1825년 설립된 버밍엄 의과 외과 대학 Birmingham School of Medicine and Surgery)과 Mason Science College (1875년 Josiah Maso 경에 의해 설립됨)의 후신으로 1900년 영국 왕실 헌장을 받아 설립되었다. 붉은 벽돌 대학 중 최초로 왕실 헌장을 받았다. 영국 연구 대학들의 모임인 러셀 그룹 (Russell Group)과 국제 대학 연구 네트워크(Universitas 21)의 창립 멤버이다.

버밍엄 대학은 2019년에 QS 세계 대학 순위에서 영국에서 14위, 세계에서 79위를 차지했다. 2013년에는 타임즈 고등교육상 (Times Higher Education Awards)에서 '2014년의 대학'으로 선정되었다. 2017년 Global Employability University Ranking에서 버밍엄대학교는 전세계 142위, 영국 10위를 차지했다. 또한 The Times와 The Sunday Times Good University Guide 2018에서 대학원 유망 후보로 영국에서 5위를 차지했다.

학생 수는 22,440명의 학부생과 12,395명의 대학원 학생으로 구성되어 있으며, 영국에서 4번째(총 167개 대학 중)로 큰 규모이다. 대학의 2016-17년 연간 수입은 6억 3,560만 파운드였으며 이중 연구비 수입은 1억 2400만 파운드였고, 5억 9,730만 파운드가 지출되었다.

(4) 소속학과 소개

사회과학대(Colleage of Social Sciences) 내에 있는 사회정책학부(School of Social Policy)에 소속되어 있으며, 사회정책, 사회학, 범죄학과 (Department of Social Policy, Sociology, Criminology)를 이수하게 되었다.

< 훈련결과보고서 요약서 >

성 명	김예슬	직 급	행정사무관
훈 련 국	영국	훈련기간	2021.9.20. - 2023.7.19.
훈련기관	University of Birmingham	보고서 매수	92 매
훈련과제	네트워크 거버넌스와 팬데믹 대응 분석: 메르스와 코로나19를 중심으로		
보고서 제목	Network Governance, Policy Responses, and Pandemic Preparedness: A Comparative Analysis of South Korea's MERS and COVID-19 Responses and Implications for Future Pandemic Management		
내용요약	South Korea's infectious disease response system has undergone significant evolution through its experiences with the 2015 MERS outbreak and the 2019 COVID-19 pandemic. Despite ignoring the WHO's recommendation to prepare for MERS, the government was unable to prevent its spread due to inadequate preparedness in laws and manuals. Confusing manuals for health centers and hospitals, coupled with the proliferation of informal response		

	organizations without clear legal control, hindered information sharing, situation reporting, and effective policymaking. Furthermore, the government's consistent non-disclosure of patient movement information without standards for message management led to conflicts with local governments and increased public distrust and anxiety. In response to the failure of its MERS response, the government undertook a comprehensive overhaul of its infectious disease response system. These improvements proved highly effective in responding to COVID-19. Manuals related to infectious disease prevention laws were thoroughly reinforced and mock drills were conducted to ensure seamless operation of the delivery system. As the pandemic spread, the government raised its alert level to "severe" and established an overarching framework chaired by the prime minister. This framework mobilized resources from various ministries, communities, and hospitals to support the CDC's disease control and prevention efforts. Efficient information sharing and communication with the public were facilitated

	through regular meetings and public briefings. While it is too early to fully assess the long-term impact on public health or the economy, it is clear that Korea's infectious disease response system has been refined and improved through its experience with MERS. The system has become sophisticated and effective, particularly in its initial response, serving as a model for many countries. This success is due to the government's recognition of the importance of networked governance, which requires active collaboration with various stakeholders. However, there is still work to be done to ensure that this system remains effective in dealing with future infectious diseases. The administrative capacity and autonomy of local governments must be improved to enable them to respond independently of the central government. Additionally, careful prevention policies must be designed to account for long-term socioeconomic costs, as COVID-19 damage varies by class.

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Network Governance, Policy Responses, and Pandemic Preparedness: A Comparative Analysis of South Korea's MERS and COVID-19 Responses and Implications for Future Pandemic Management

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1. Introduction

Since the coronavirus outbreak (SARS-Cov-2, hereafter 'COVID-19') in December 2019 in Wuhan, it has spread globally. On 11 March 2020, the World Health Organization (WHO) declared a pandemic, a global spread of the disease, with "alarming levels of inaction" (Boseley, 2020). The virus has proven particularly challenging due to its high transmissibility, severe health consequences for vulnerable populations, difficulty achieving herd immunity, and potential for reinfection (Cascella et al., 2023; Centers for Disease Control and Prevention (CDC), 2023). It has continued to wreak havoc, causing deaths and infections worldwide. As of March 2023, global statistics indicate that over 65 million individuals have been infected, and 6,832 deaths have occurred in more than 200 countries due to COVID-19 (Worldometer, 2023).

The COVID-19 pandemic has had a profound impact on individuals and societies worldwide. It has posed life- and health-threatening risks at the individual level, necessitated the use of personal protective equipment (PPE) such as masks at the societal level, disrupted face-to-face schooling, healthcare, and other services, and caused a global economic downturn. With the development and availability of vaccines, many countries have returned to pre-COVID-19 living standards. However, governments continue to work to rebuild economies and societies devastated by the pandemic. In political and academic circles, there has been active debate around the so-called post-COVID-19 discourse, which calls for a rethinking of the role of government in responding to infectious diseases after the pandemic (Dionne & Turkmen, 2020). This includes discussions on how the role of administration and government will be expanded after overcoming COVID-19 and how it will respond to a rapidly changing social environment and new and diverse demands (Organization for Economic Co-operation and Development (OECD), n.d.).

The South Korean government is one of the countries doing just that. As with any country, infectious diseases have come to South Korea. Prior to COVID-19, the most recent major infectious disease outbreaks were Severe Acute Respiratory Syndrome (SARS) in 2003, novel swine-origin influenza A (H1N1) in 2009, and Middle East Respiratory Syndrome (MERS) in 2015 (Cheung, 2020). South Korea distinguished itself in its initial COVID-19 response. Living treatment centres and rapid and widespread diagnostic testing were introduced as best practices in the world's COVID-19 response (US Food and Drug Administration, 2021). It was one of the last countries to lift its quarantine measures, lifting indoor masks in 2023. Still, it has kept its borders open from the beginning, with no closures of borders or movement between regions. However, these examples did not happen in a vacuum. They result from learning from past failures in dealing with infectious diseases. In particular, the failure of the 2015 MERS outbreak was a wake-up call for contagious disease response authorities (Thompson, 2020). MERS, known to be transmitted through animals such as camels in the Middle East, was introduced to Korea in 2015 by a businessman

who travelled to Saudi Arabia. In 2014, the WHO alerted the world to the emergence of the MERS epidemic and advised countries to be prepared, but South Korean authorities did not take any action (Korean Ministry of Health and Welfare (MOHW), 2016). Despite the first case in South Korea, MERS was still not a controlled infectious disease. Even when patients visited hospitals with symptoms of the disease, the authorities withheld information from those hospitals, and there were no clear guidelines for other cases, such as quarantine. Furthermore, the governance system of the epidemic prevention authorities was not established, leading to administrative and social chaos.

This dissertation critically examines the South Korean government's response to the MERS and COVID-19 pandemics from a governance perspective. Given that pandemic present wicked issues, the MOHW, responsible for the health and medical care of citizens, must move beyond traditional problem-solving methods of regulation and management and involve other ministries, businesses, local governments, and civil society as problem-solving co-actors.

The role of a network coordinator is essential in this regard. Drawing on relevant literature and empirical evidence, this dissertation evaluates the effectiveness of governance for infectious disease response by addressing the following research questions: what capabilities are necessary for the government to act as a network coordinator in addressing infectious disease issues? Has the government's capability improved through its response to MERS and COVID-19? What response mechanisms are still valid for the future infectious disease crisis, and how can governance sustainability and responsiveness be enhanced? Through this assessment, this dissertation seeks to determine whether the Korean response system, which demonstrated exemplary performance during COVID-19, is equipped to remain effective in the face of future infectious diseases.

2. Literature Review

This dissertation explores the factors that facilitate effective governance in response to future infectious diseases, comparing the South Korean government's response to MERS and COVID-19. Before reaching the cases, reviewing the network governance literature in disaster management and infectious diseases is essential. As many countries have experienced through the COVID-19 response, infectious disease response has many factors to consider, and the impact on citizens' daily lives and the international economy is enormous. Network governance, which effectively mobilises the resources of governments, businesses, and civil society to solve problems, is instrumental in dealing with infectious diseases. Therefore, after reviewing what governments should consider in responding to infectious diseases and the literature on the usefulness of network governance, this dissertation will examine studies on Korea's response to COVID-19.

1) Network as a mechanism for solving modern society's challenges

Wicked issues refer to complex social problems that are difficult to predict in advance, whose causes are not clearly understood, and whose future effects are difficult to anticipate (Rittel & Webber, 1973; Stewart, 1996). These issues defy conventional, structured solutions and require public organisations to undertake strategic and creative efforts to improve their responsiveness (O'Toole, 1997). It is increasingly emphasised that governments must set aside their arrogance as omniscient problem-solvers and humbly accept the perspectives of various participants, collaborating with them in a low-key manner (Kwon & Yoon, 2020). This is because technology has enabled more actors to be involved in policymaking, their interdependence has increased, and the increasing unpredictability of disasters and diseases, such as climate change, has broadened and deepened the scope of policy issues beyond the reach of governments alone. As a result, the role of horizontal,

voluntary networks comprising various partners such as central and local governments, civil society organisations, businesses, and ordinary citizens is becoming increasingly significant (Agranoff & McGuire, 2003; Lee, 2006). Networks are increasingly utilised to solve social problems because they provide the flexibility and security needed to address these issues without significantly disrupting the various network partners' original activities, preventing them from fulfilling their original functions or maintaining their existing organisational forms (Agranoff, 2007).

In general, a society in which social coordination to solve problems results from goal-directed interaction among diverse participants rather than centralised control is called a "network society" (Castells, 2000). A key feature of the network society is that social problems are addressed through negotiated agreements rather than hierarchical directives and controls. In recent years, as the inherent limitations of government-led social problem-solving have been exposed, the importance of new forms of social problem-solving that rely on informal and voluntary

cooperation between various members of society has increased significantly (Blatter, 2003; Lee, 2006). Agranoff and McGuire (2001) view network governance as the coordination between related organisations to solve public problems that are difficult for a single organisation or group to solve alone. Sorensen and Torfing (2005) see it as a form of cooperation through networks, while Provan and Kenis (2008) understand it as three or more organisations working together to achieve their own objectives or collective goals. Network governance is seen as a new mechanism for improving policy outcomes, strengthening democratic elements in the policymaking process, and generating alternatives to solve complex problems (Eggers & Goldsmith, 2004; Kettl, 2002). Network governance can also reduce transaction costs or effectively provide necessary resources to stakeholders in the network (Lubell et al., 2002). Taken together, network governance is characterised by 1) the involvement of both government and private actors and organisations in the solution of public problems; 2) the blurring of the boundaries of ownership and responsibility for problem-solving; 3) the importance of power dependency

relationships between parties involved in collective action; 4) the existence of autonomous networks of actors; and 5) the ability to solve social problems without relying on the formal authority of government (Stoker, 1998). In other words, network governance is a new form of social coordination characterised by reciprocity, cooperation, mutual adjustment, shared purpose and commitment, and communication within trust (Rhodes, 1996; 2000; 2007; Lowndes & Skelcher, 1998; Newman, 2001; Bingham et al., 2005).

In modern societies, the complexity of problems means that the expertise, information, and technology needed to solve them cannot be monopolised by any one social unit, such as governments or civil society organisations (Ansell & Gash, 2008; Emerson et al., 2012). It is essential to recognise the differences among different social groups, engage in dialogue with them, and acquire and share knowledge and information from them to solve social problems (Bryson et al., 2006; Crosby & Bryson, 2010). For this reason, solving social problems requires organic cooperation between various

members of society, including the government (O'Leary & Vij, 2012). As society becomes increasingly dynamic, complex, and diverse, and as the proportion of voluntary interactions without formal authority or coercion in the process of solving social problems increases rapidly (Klijn & Koppenjan, 2016), the importance of close coordination between central government, local government, and civil society increases (Sørensen & Torfing, 2011), and the role of government is bound to change (Torfing et al., 2012). Network governance requires actors in horizontal or vertical relationships to work together as autonomous stakeholders to achieve common goals or to produce and deliver common goods or services (Provan & Kenis, 2008). When it is challenging to coordinate and integrate interests or when stakeholders find it difficult to cooperate due to resistance (Huxham & Vangen, 2005), the original objectives for which network governance was formed may not be achieved, leading to the need for mechanisms to guide coordination or collective action (Provan & Kenis, 2008). Network governance can also reduce transaction costs or effectively provide stakeholders with the resources they need (Lubell et

al., 2002; O'Toole, 1997), so the desirable government role is less about controlling the entire network and more about empowering the stakeholders involved in the network governance and facilitating their interactions as a facilitator (Agranoff & McGuire, 2003; Eggers & Goldsmith, 2004). In other words, the role of government in network governance is not declining but changing (Kettl, 2002; Sørensen & Torfing, 2005). Therefore, mutual trust between stakeholders and trust in the government as a facilitator is critical to ensure that participants can continue to co-steer and co-manage towards common goals (Giddens, 1984). In order to successfully deliver public services through network governance, governments need to recognise the usefulness and limitations of the hierarchical systems that have traditionally been used and pay greater attention to the importance of networks characterised by 'institutional diversity' to address a range of social problems (Lowndes & Skelcher, 1998; Newman, 2001).

2) Governance for infectious disease management in South Korea

As disasters such as infectious diseases are characterised by uncertainty and complexity, it is argued that in order to address these 'challenges', they must be organised as complex adaptive systems that can self-organise through processes of mutual adaptation, learning, and variation to maximise resilience from disasters (Comfort et al., 2004; Kapucu, 2008). Self-organisation is achieved through ongoing communication between external actors within the system, processes that shape the system's adaptive capacity, and information processing capabilities (Norris et al., 2008). The efficiency of information production and processing enables complex systems to respond to disasters with such flexibility and self-organisation (Comfort et al., 2004). Under uncertainty, a significant amount of information is required for effective coordination among system members to respond effectively. This information is produced, analysed, interpreted, and

processed by complex response system actors rather than a single, centralised body (Comfort et al., 2004). In other words, network governance is a valid approach to disaster response (Kapucu & Garayev, 2011).

Research on disaster management in South Korea has only been conducted since the 1990s (Ahn & Ryu, 2007). Early studies focused on establishing structures such as the national management system and disaster management reorganisation, using traditional bureaucratic methods such as command and control (Ko & Kim, 2020). Since the 2000s, the disaster management paradigm has changed accordingly with the emergence of governance and network concepts in public administration (Ko, 2007). On the other hand, the outbreaks of SARS in 2003, H1N1 in 2009, and MERS in 2015 provided an opportunity for research on infectious disease management to become more active, and infectious disease management began to be recognised as one of the essential crisis response fields such as defence and

firefighting (Joo & Jang, 2020). Subsequently, the government proposed a plan to reorganise the national epidemic prevention system, including reorganising the national disaster response system and disease management organisation (Bae, 2016; Byun et al., 2018). After the MERS outbreak, there were also state-centric studies that recognised infectious disease disasters as security crises and suggested that the central government should respond as a unified control tower (Jung & Choi, 2017), and studies on the governance of infectious disease disasters were also presented (Go & Park, 2018). Seo et al. (2015) pointed out the lack of relevant laws and manuals and unestablished organisational systems in Korea compared to infectious disease crisis management systems in the US and Japan, and Kwon (2020) suggested the direction of governance change for strategic and innovative administration using the concept of public value. In addition to transnational governance, Joo and Jang (2016) cited the case of Taiwan to illustrate that infectious disease management can be expedited through a dense network of disease control departments at the central and local levels, as well as regional emergency response

hospitals and collaborating hospitals. However, Kim et al. (2016a) pointed out that despite the importance of the role of local governments, stating that there is an absolute lack of human resources and organisation, as well as wide variation in policymaking capacity among local governments.

In contrast to the MERS outbreak, which highlighted deficiencies in the national epidemic prevention system, research following the emergence of COVID-19 has underscored the significance of a coordinated response involving local communities and civil society. Effective communication is crucial to achieving this goal and enhancing the government's epidemic prevention system. One study examined the impact of social distancing and other measures on epidemic prevention efficacy and proposed healthcare, economic, and societal alternatives. Scholars in public administration, economics, and healthcare have argued that the healthcare system's response capacity and infection status are common factors considered when implementing quarantine measures. They emphasise the

importance of basing infectious disease responses on healthcare data (Kwon, 2020). For instance, the Korean government's phased return to normalcy plan released in October 2021 included criteria such as vaccination coverage, availability of intensive care and inpatient beds, the weekly incidence of severe illnesses and deaths, and the epidemic scale reproduction index (MOHW, 2021) for easing quarantine measures. Due to the interplay between healthcare and social and economic sectors, the intensity of control measures necessitates policy coordination. Increasing the intensity of control measures may reduce the scale of the outbreak but may also result in economic downturns, such as unemployment and increased healthcare utilisation due to deteriorating public health over time. However, by enhancing the healthcare system's response capacity, the intensity of mitigation measures can be reduced, thereby mitigating adverse economic and social impacts. Kwon (2020) argues that increasing the healthcare system's capacity and reducing the intensity of countermeasures can reduce the total cost to society. The significance of risk communication has been underscored in both the MERS and COVID-19

epidemics. Cho (2016) highlights the importance of rapid and seamless information sharing in infectious disease governance, while Lee et al. (2020) advocate for a comprehensive management system through effective risk communication in infectious disease situations.

To sum up, network governance analysis entails consideration of three key factors: the central government's significance as a network coordinator and facilitator, the necessity to fortify the role of local governments for prompt and flexible responses while ensuring collaboration with the central government, and the criticality of transparent and efficient communication management by governments to elicit citizens' engagement and cooperation. Nonetheless, extant studies fail to scrutinise the COVID-19 situation in isolation and either overlook or merely touch upon the improvements in response following the MERS. Additionally, such studies adopt a retrospective perspective while evaluating the government's COVID-19 response, neglecting the need to analyse the requisite governance direction for

effectively addressing future infectious diseases. Accordingly, this dissertation seeks to explicate the extent to which Korean infectious disease governance has advanced following the MERS and COVID-19 pandemics and outline the direction of governance necessary to achieve sustainability in combating future infectious diseases.

3. Methodology

A case study is an intensive study of one or several cases rather than a mass observation or representative sample. The study of a single case allows for intimate exploration over a long time and is often used as an initial step towards conducting a complete study of a complex issue (Feagin et al., 2016). In general, case studies can be very effective in situations where the object and context of the study are not separable, where multiple independent variables need to be addressed, or where the focus is on answering 'how' or 'why' questions. However, despite their usefulness, there is a group of scholars that do not consider case studies to be a valid methodology. As a result, they are treated as less desirable than experimental studies or surveys. Some reasons for this include a research interest in structured methodologies, a tendency to rely too heavily on the researcher's skills, and concerns about ensuring the rigour and objectivity essential to the research process. Nevertheless, case studies can offer several advantages. Firstly, it focuses on the core issue under investigation,

which allows for a deeper understanding of the facts; secondly, it can be used as a preliminary investigation for a full-fledged research method through exploration; thirdly, it allows for a clear understanding of the specificity of a situation; and fourthly, it allows for a holistic understanding of the cultural environment and background associated with each situation (Stake, 1995; Yin, 2013; Dul & Hak, 2008).

This dissertation employs a case study methodology to conduct a qualitative comparative analysis of the governance of infectious disease crisis response in Korea during the MERS and COVID-19 outbreaks, in line with theories of crisis response and network governance for a crisis such as infectious diseases. Drawing upon Herriot and Firestone's (1983) and Yin's (2013) approaches, this dissertation aims to set the direction for desirable governance to tackle future infectious diseases. To this end, it first reviewed general theories and methodologies on crisis response governance and identified the status of Korea's response to MERS in 2015 and COVID-19 since 2019. Utilising available literature

from the University of Birmingham and various media as primary sources, the purpose, content, and implementation of the response policies established by the MOHW and the KCDC are analysed, with a comparison of network forms and contents in light of network theory.

4. Analysis of South Korea's Infectious Disease Response

1) Response system aspects

MERS is an acute respiratory infection caused by a coronavirus (WHO, n.d.). It was first reported in Saudi Arabia in 2012 (WHO, n.d.). The WHO held MERS emergency meetings from 2013 to 2015, encouraging member states to conduct MERS research and take measures to prevent and prepare for the disease (WHO, 2015a). In April 2015, MERS was introduced to South Korea when a businessman visited the Middle East and was first confirmed on 20 May (Kim et al., 2016b). Due to the lack of a MERS response policy in medical institutions, the patient was discharged from the first hospital after being hospitalised for three days. He was first reported to health authorities when he was confirmed to have MERS after visiting another higher-level general hospital because his high fever and shortness of breath did not improve (Kim et al., 2016b;

MOHW, 2016)—almost two weeks had passed since the patient returned home (Cho et al., 2016).

Responding to infectious diseases requires a rapid and efficient initial response (European Centre for Disease Prevention and Control (ECDC), 2022). This necessitates well-structured manuals and robust testing capabilities to promptly identify diseases once they are introduced. There are 15 established capabilities that serve as national standards for public health preparedness planning. These capability standards provide a vital framework for state, local, tribal, and territorial preparedness programs as they plan, operationalise, and evaluate their ability to prepare for, respond to, and recover from public health emergencies (ECDC, 2022). Based on the Infectious Diseases Control and Prevention Act and the Framework Act on the Management of Disaster and Safety, South Korea has defined infectious diseases as social disasters and assigned the role of the ministries to manage resources, provide information, and coordinate and control the roles of response actors at each stage of disaster response (law.go.kr, n.d.). According to this disaster management framework, in the event of a disaster,

such as a general natural disaster, the Minister of Interior and Safety (MOIS) oversees disaster and safety management in general, deliberates on essential policies and plans at the Central Safety Management Committee under the Prime Minister, and takes overall responsibility for implementation, including disaster response and recovery, and takes necessary measures. It covers the overall management system of disasters through the stages of prevention, preparedness, response, and recovery and stipulates that the MOIS is in charge of crisis management activities. On the other hand, in the event of an infectious disease outbreak, the Korea Centers for Disease Control and Prevention (KCDC) is in charge of infectious disease management according to the stage of the disaster, but in the case of a severe infectious disease, the Ministry of Health and Welfare (MOHW) takes over the role of the control tower. Despite this, the system did not work well after the MERS outbreak and was labelled an initial response failure (Chung, 2015) because the manual was weak and the administrative system did not work well as a control tower.

One reason for the failure of the MERS response was the failure to designate MERS as a legal infectious disease, despite WHO recommendations at the time (ECDC, 2015). MERS was first detected in the Middle East in 2012 and officially named by the WHO in 2013. By then, it had spread so widely worldwide that in May 2015, the WHO urged countries to increase quarantines and communicate the risks to the public (Lindmeier, 2015). The pre-designation of a statutory infectious disease is very important because it requires the designation of an organisation capable of identifying the pathogen as a confirmatory organisation (e.g., KCDC) to quickly identify the outbreak and prevent the spread of the disease. However, MERS had not been added to the list of statutory infectious diseases until July 2015, two months after the first patient, meaning that the role of medical institutions and public health centres in a domestic introduction scenario had not been established before the first outbreak. Also, measures such as forcing medical institutions and public health centres to report outbreaks of infectious diseases or establishing emergency prevention budgets for local governments to

prevent community transmission were considered to have no legal basis, contributing to the difficulty of proactive administrative measures, including urgent budget planning (Bae, 2016; Koo & Na, 2018). The hospital that the first patient visited with symptoms was, therefore, unable to treat him in an isolation bed or recommend home quarantine, which acted as the first trigger for the spread of MERS to the local community.

The manual was unclear and could not be immediately applied on the frontline to match the disease characteristics of MERS. Since the seriousness of emerging infectious diseases has been highlighted following the controversies over zoonotic infectious diseases such as SARS and avian influenza, the Korean government revised some relevant manuals. These include the creation of the Standard Manual for Crisis Management of Emerging Infectious Diseases and the Manual for Prevention of Human Infections in 2005, and a national response strategy was established in 2012, including the roles of each response stakeholder and robust

coordination among them. However, the detailed implementation plan according to the level of infectious disease crisis warning – interest, caution, alert, serious – was not stated clearly enough, and the conceptual distinction between infectious disease patients and suspected patients made it difficult to define who should be the one quarantined at home (Park & Lee, 2015), and waste disposal generated by patients were unclear (Bae, 2015; Go & Park, 2018).

The overlapping and inefficient establishment of the MERS response system prevented the leadership of the statutory organisation, the Central Disaster Management Headquarters (hereafter 'DCMH'), from being effective (Park, 2016). The control tower is supposed to be a centralised authority that supports subordinate agencies and implements disaster recovery plans. Nevertheless, if the control tower is pluralised and the chain of command is confused, the chances of initial response failures increase (Koo & Na, 2018). Following the outbreak of the first case, the infectious disease crisis alert was upgraded to the

second level of 'caution' from 'concern', and the Central Disease Control Headquarters was established, headed by the head of the KCDC (MOHW, 2016). As the situation worsened, the organisation was expanded and reorganised into the 'Central MERS Management Task Force' on 28 May, headed by the Vice Minister of MOHW. As the situation became severe, with the number of quarantined people exceeding 1,000, the chairman of the task force was changed from vice minister to the minister of MOHW. However, the Central MERS Management Task Force was an informal, temporary organisation that does not legally exist under the Prevention of Infectious Diseases Act and the Standard Manual for Infectious Disease Crisis Management. The standards for organisation and operation set out in the law and regulations were not applied, adding to the confusion in the operation of the task force (Bae, 2016). It was not until a week later, in early June, that the pan-governmental MERS response support centre, which included 11 relevant ministries, was activated, and the first meeting chaired by the president was held only after the first death of a third non-quarantined patient. In other

words, the government's view at the time can be viewed that the spreading of MERS was an incident, not a national disaster. Response organisations have become redundant and overlapping, and reporting has become complex. For example, another MERS Emergency Task Force was established within the Blue House, the executive office for the president, and a Public-Private Joint Response Task Force within the MOHW (National Assembly, 2015; MOHW, 2016; Koo & Na, 2018). Leadership for the response to the epidemic was prolonged, and the multiplicity of task forces and committees confused leadership. The WHO Joint Evaluation Team has called it a failure of governance, and the National Audit Office and the National Audit Office have also defined the MERS response as a failure (WHO, 2015b, the Board of Audit and Inspection (BAI), 2015).

During the MERS outbreak, various problems were pointed out, including poor initial response by the epidemic prevention authorities, delayed disclosure of information, confusion among control agencies, lack of infrastructure

related to infectious diseases between the KCDC and medical institutions, and inadequate infection control in medical institutions, and the government proposed a plan to reorganise the national epidemic prevention system to improve it (Joo & Jang, 2020). In 2015, the response system was improved by establishing and operating an emergency situation room (EOC) under the KCDC to collect information on infectious disease situations and take immediate command and control and upgrading the legal position of the KCDC from under the MOHW to the vice-ministerial level to serve as a control tower for epidemic prevention. In addition, the revised infectious disease response manual effectively responded to COVID-19, leading to an adequate initial response with accurate situational judgement and rapid response policies, and received praise from the OECD, WHO, ADB, and foreign countries as a best practice in coronavirus prevention.

Unlike MERS, COVID-19 was prepared for by the CDC before it entered the borderline. After the official announcement of the outbreak in late December 2019 by the Wuhan Municipal Health Commission of Hubei Province, the KCDC held a mock drill on 17 December, assuming an infectious disease similar to COVID-19, including fever, cough, and respiratory pain. The detailed simulation helped the city quickly mobilise its preparedness after the outbreak. The governance of the coronavirus response network also operated efficiently. On 3 January 2020, the KCDC issued a blue-level crisis alert, immediately set up an internal "Wuhan City Unexplained Pneumonia Task Force", and tightened quarantine for people arriving directly from Wuhan. On 20 January 2020, the first domestic case was confirmed, and the epidemic alert was upgraded to "caution". The Central Disease Control Headquarters, which is the statutory epidemic response body, was activated under the chairmanship of the then Commissioner of KCDC, Jung Eun-Kyeong, as well as provincial and municipal epidemic prevention and control teams to react at the local level [Table 1]. By 27 January, three more cases were confirmed,

the alert was raised to the “orange“ level, and the Central Disaster Management Headquarters, led by the Minister of MOHW, was established, creating a powerful national epidemic prevention system. On 23 February, after the number of cases related to the Church of God in the New Heaven and Earth skyrocketed and community transmission was confirmed, the government raised the infectious disease crisis alert to the highest level of “severe“. It activated the Central Disaster and Safety Countermeasure Headquarters, led by the Prime Minister. All the organisations were established in stages in response to the infectious disease alert system, and all have an official, legal basis under the Prevention of Infectious Diseases Act. Unlike MERS, responsibilities have been subdivided into areas for each stage. Core prevention tasks, such as quarantine and inspection, were handled by the KCDC, or the Central Disease Control Headquarters, while other ministries, including the MOHW and the Ministry of the Interior and Safety, supported the KCDC. The MOHW was primarily in charge of medical and healthcare policies, such as treating patients, managing medical institutions, and providing medical

personnel and supplies. The Ministry of Public Administration and Security was responsible for managing quarantine and support through local health centres. This crisis management governance helped to ensure that leadership was driven and provided the impetus for a consistent and rapid response by the various actors in the governance while sharing the common goal of preventing and responding to the pandemic. One example of inter-governmental cooperation was developing a pan-coronavirus diagnostic kit before the outbreak in January. Then Prime Minister urgently encouraged more than 20 bio companies to develop diagnostic kits a week after the outbreak. With the cooperation of the Ministry of Food and Drug Safety, the diagnostic kits were quickly reviewed, resulting in the development of a diagnostic kit that can test up to 700 to 800 thousand people per day. Other examples of cooperation include creative and efficient testing practices, such as drive-through and walk-through screening and living treatment centres. These policy implementations include the so-called 3T (test - trace - treatment) policy.

During the coronavirus response, the Central Disaster Management Headquarters and the Central Disaster and Safety Countermeasure Headquarters acted as brokers of network actors for epidemic prevention and medical response, bringing together initiatives. As a result, the Prevention of Infectious Diseases Act has been amended several times, 28 times in total since 2020 [Table 2] (law.go.kr, n.d.), to implement necessary policies on a case-by-case basis. This suggests that while COVID-19 was a national crisis that made it easier to gain public attention and parliamentary consent to amend the law, deliberations among relevant ministries and stakeholders to prepare specific legislation were carried out quickly under the leadership of the quarantine authorities. From the beginning of the COVID-19 response in February 2020, mid-session meetings chaired by the Prime Minister were held almost daily but were reduced to 2-3 times a week until February 2023, as the COVID-19 situation stabilised. It can be seen that with the help of a frequent and day-to-day meeting system, the revision of the Prevention of Infectious Diseases Act was discussed steadily while sharing the status of the

COVID-19 response and discussing necessary policy measures. Strong initiatives have also led to the rapid development of a COVID-19 budget. As soon as the COVID-19 crisis broke out, a reserve fund was set aside to secure urgent epidemic prevention resources, and three supplementary budgets were prepared to raise additional financial resources to overcome the crisis. Accordingly, the Ministry of Strategy and Finance (MOEF) set dual policy goals of supporting the epidemic prevention system and stabilising the health supplies market as a comprehensive response to the civilian economy and allocated KRW 11.7 trillion in the first supplementary budget (MOEF, 2020).

<Table 1> Revised Alert System According to Alert Level (MOHW, 2015)

Alert level	Current system	Revised system
ATTENTION -Prevalence of an infectious disease in foreign countries	-Situation monitoring -Border quarantine measures -Prevention education and campaign (KCDC)	-Situation monitoring -Border quarantine measures -Prevention education and campaign (KCDC)
CAUTION -Emergence of an infectious diseases in the country -Nosocomial infection	[Central Infection Response Task Force (KCDC)] *At the level of CAUTION, both the Central Accident Response Headquarters and the Central Disaster and Safety Countermeasures Headquarters are operated	Government-Wide Meeting (Presided by the prime Minister) Management Task Force (MOHW) / Support Task Force (Ministry of Public Safety and Security) Response Task Force (KCDC)
ALERT -Community transmission	Same as CAUTION	Same as CAUTION
EMERGENCY -Spread throughout the country	Central Disaster and Safety Countermeasures Headquarters (Prime Minister or Ministry of Public Safety and Security Central Accident Response Headquarters *The two Headquarters are operated when the Prime Minister deems it necessary or the Minister of Public Safety and Security makes a suggestion	Central Disaster and Safety Countermeasures Headquarters (Supervised by the Prime Minister, and supported by the Ministry of Public Safety and Security Central Accident Response Headquarters (MOHW) Response Task Force (KCDC)

<Table 2> Amendments to the Infectious Disease Act in response to COVID-19 (law.go.kr, n.d.)

Revision date	Contents
05/09/2020	• Set up an infectious disease pathogen identification authorisation such as KCDC, National Quarantine Service, Health and Environmental Research Institute, health centres, medical institutions, medical schools, etc. • Created a ban on the export of medicines in the event of an infectious disease crisis that could compromise public health. • Mandatory isolation of suspected cases (at home or in a facility) and symptom management via mobile and landline phones. • Increased deployment of epidemiologists
12/09/2020	• Reorganise authority by promoting KCDC from under MOHW to under Prime Minister
29/09/2020	• Closure of infectious disease contaminated facilities or places within three months, cessation of operations orders, and new grounds for compensation for losses. • Provide psychological support to patients and their families.
16/06/2021	• Allow limited in-person care to protect healthcare workers, patients, and institutions

2) Communication and cooperation between central and local governments

Crisis response emphasises the importance of responding through local authorities and, more broadly, communities. This is because they are best able to identify and mobilise the resources available to all parties in the event of a disaster. The United States Centers for Disease Control and Prevention (2011) identifies strengthening public health infrastructure and municipal public health capacity as an important task, providing standard capabilities for states and other subnational governments to develop proactive disaster preparedness plans based on public health preparedness capabilities (PHPC). In responding to infectious diseases, the central government sets standards to be applied uniformly across the country and prevent the spread of infectious diseases (Park, 2020). Local governments take into account local circumstances, such as the specificity of the area where an infectious disease occurs, the amount of human and material movement with neighbouring areas, the distribution of the population in the area, and the capacity

of local medical institutions to receive patients with infectious diseases (Bak & Choi, 2021). As such, the role of local governments is as important as that of the central government in responding to a pandemic, but in reality, there are limitations due to differences in resources available and governance capacity among local governments (Perez-Chiques et al., 2020).

South Korea has a low level of local government maturity. Due to the lack of local financial independence and the low proportion of unique local government services, local governments are often criticised for being subcontractors of the central government rather than independent local governments (Yoon, 2021). The same is true for infectious disease response. During the MERS outbreak, municipalities were severely under-resourced. Not only was there an absolute shortage of public hospitals in terms of number and size but there was also an uneven distribution across the country. In particular, there was a shortage of negative pressure isolation rooms and single

rooms, essential for preventing and controlling the spread of infectious diseases and treating patients. In the case of negative pressure rooms, the MOHW wanted to install them in 99 hospitals across the country, but only 47 were secured, falling short of the target (National Assembly, 2015; Go & Park, 2018). Health workers responding to MERS were easily fatigued due to the surge in patients, and there was confusion in their work because they were sent to the field without sufficient training beforehand (MOHW, 2016).

In addition to the uneven distribution of resources among local governments, poor communication also makes it difficult for the governance of infectious disease response to work. One of the significant failures of the MERS response is the lack of communication between the central and local governments. From the time of the first case of MERS, the MOHW did not disclose information to the public, such as the hospitals visited by MERS patients. At the time, then Mayor of Seoul City, Park Won-soon, held an emergency briefing on the 35th patient and unilaterally disclosed the

hospital information that the central government had kept private, criticising the MOHW for controlling relevant information, saying “it was better to overreact than underreact“(Chosun Ilbo, 2015). While this was welcomed by some citizens who had grown tired of the government’s secrecy, the Blue House and the MOHW expressed regret, and a lack of a coherent voice within the government has publicly emerged. In addition, the mayor of Seoul said that the KCDC and the MOHW do not have accurate information about the 35th patient, do not know his whereabouts, and cannot even contact the director in charge of the case, which resulted in the public’s distrust of the government increased. In this way, while the central government was confused with a response organisation without a control tower, there was a temperature difference between the local and central governments’ perceptions of the MERS outbreak (MOHW, 2016), and consultations were not coordinated (Choi & Cho, 2019). In the end, the delay in disclosing information due to a lack of coordination within the government was pointed out as a major cause of the spread of MERS by the WHO MERS Joint Assessment Team

and the National Assembly in Korea (WHO, 2015b; National Assembly, 2015).

Since the MERS outbreak, measures have been implemented to strengthen local infectious disease response capabilities. In general, regional infectious disease management support groups and infectious disease management organisations were established to strengthen the response capacity of local governments. At the end of 2015, a minimum standard was set for the mandatory appointment of at least two epidemiological investigators per city. During the COVID-19 era, the autonomy of local governments in the pandemic response process was broadly recognised by allowing cities and districts to appoint epidemiological officers and investigators at each authorities' will and budget.

Although there were no conflicts caused by the lack of information sharing between the central and local governments during the COVID-19 response, the autonomy of local governments is fully guaranteed in actuality. This can be explained into two main categories: limitations in local government capacity and the immaturity of the local government system. First, the capacity of local government is limited. Resources for responding to infectious diseases were not addressed not only during MERS but also during the COVID-19 response. First of all, the authority to allocate beds, especially for critically ill patients, was centralised. This was because there was a nationwide shortage of respiratory intensive care beds with the necessary equipment and facilities, such as negative pressure isolation beds. The urgency of the situation was such that the existing patient triage system could not be operated in emergency circumstances. Communication between patient transporters, such as 119, hospitals and local governments, was also done through mobile phone messages and phone calls rather than a separate solid system. The capacity of public health centres, primarily responsible for local epidemic prevention, was also still inadequate. A white paper

(2016) published by the MOHW after the MERS outbreak also pointed out the need to strengthen the capacity of health centres to provide an initial response to prevent the spread and transmission of the disease in Korea (MOHW, 2016; Bak & Choi, 2015). In addition to health centres, the shortage of frontline human resources has not improved significantly during the COVID-19 crisis. A large proportion of the health centre workforce is made up of civil servants, which is difficult to maintain since the Korean civil servant workforce rotates every two to three years, and it is also difficult to deploy highly qualified personnel due to the culture of avoiding of high-pressured infectious disease response work (Lee et al., 2018).

On the other hand, the severity of the pandemic situation was reflected in administrative rigidity, which did not allow for local autonomy. When the government announced the social distancing plan, it allowed local governments to autonomously adjust the distancing level to suit the situation, including the number of COVID-19 cases

and the speed of spread. In January 2021, Daegu City announced that it would allow the business hours of multi-use facilities until 11:00 p.m. from 9:00 p.m., which the central government set as a standard. However, then Prime Minister Chung Sae-gyun issued a stern warning to Daegu City to relax the social distancing guidelines without prior consultation with the Central Headquarters. In an official letter to local governments the next day, the central government set out guidelines for "items that cannot be changed," stipulating that core measures such as "prohibiting private gatherings of five or more people" and "prohibiting business after 21:00" cannot be changed by local governments. It also changed the policy to require "prior consultation with the central government" when deciding on quarantine policies. While there were some administrative shortcomings in the original decision to set core measures that could not be changed in advance, it could also be seen as a reflection of the lack of respect for the autonomy of local governments and a sign that local control over epidemic prevention is not mature enough.

3) Engage with civil society

Networks are the most basic and typical element of governance and entail information sharing and communication (Rhodes, 1996). Risk communication is the process of exchanging and communicating information between relevant parties in a risk situation and can be defined as any intentional exchange of information between stakeholders involved in a risk (Fewtrell & Bartram, 2001). In risk situations such as disasters, clear and sustained communication has a significant impact on citizens' perceptions and behaviour (Atman et al., 1994), and such risk communication should be done in a way that enables them to respond quickly to crisis response challenges whenever they arise (Mileti & Sorensen, 1990; Pechta et al., 2010). Government risk communication to the public plays a crucial role in influencing the public's trust in the government to lead the response to risk, which can either plunge our society into further disruption or pull us out of danger (Lee et al., 2021). Government information must be trustworthy (Siegrist et al., 2003; Fakhoury & Aubert, 2015),

as unreliable information can lead to citizens not utilising appropriate information their individual crisis responses and relying on fake news, exacerbating risk and damage. Communication is a non-negotiable condition for citizens' trust in and engagement with the government, especially in infectious disease outbreaks, where mature citizenship and civic engagement are essential for collective overcoming.

The essential element of the MERS response, a network of central and local governments and disaster-related organisations, was not established (MOHW, 2016). This is due to the government's lack of communication skills and civil society's lack of trust in the government. As mentioned above, the central government did not share MERS-related information with other local governments or the public, thus monopolising important information, which hindered the development of mutual trust among actors involved in disaster response. In other words, the government neglected to recognise local governments and civil society as essential actors that should be included

in the MERS response system. This is also reflected in various documentation. The MERS guidelines at the time did not assign an active role to civil society, focusing on the responses of administrative and medical institutions in the event of a MERS outbreak and only secondarily on citizens' autonomous prevention and reporting of infectious diseases and precautions for dealing with infectious disease patients (Choi & Cho, 2019). The government was hesitant to disclose information, such as the hospitals visited by infected patients and their travel routes, and anxious citizens spontaneously created a MERS map to share information about the hospitals where patients were being treated or quarantined. The government responded with warnings to shut down sites, which led to a vicious cycle of public distrust and confusion, making it more challenging to deal with the outbreak. Nature (2015) also cited a lack of preparedness for risk communication as a problem in the Korean MERS outbreak.

Since then, the government has made institutional improvements to enhance crisis communication. For example, in 2016, the KCDC established the Office of the Crisis Communication Officer. In 2017, it published the Guidelines for Public Health Crisis Communication and the Standard Operating Procedure (SOP) for Public Health Crisis Communication, emphasising the importance of crisis management. These include the five principles of risk communication, which are “prompt,“ “accurate,“ “transparent,“ “trust,“ and “empathy,“ and they declare that risk communication should be based on information disclosure (KCDC, 2018). These improvements appear to have been effective during the COVID-19 response. Many infectious disease experts attribute the success of the South Korean model to the rapid and systematic government response to COVID-19, as well as the active cooperation of civil society with the government’s mitigation policies (Park & Kim, 2020).

Suppose civil society was the target of the government’s infectious disease response policy during the

MERS pandemic. In that case, the COVID-19 pandemic has shown that civil society has been transformed from a passive subject protected by the state as a target of infectious disease policy to a policy actor that realises policies with the government. This is because the government could share information and situations through good communication. Infectious disease experts have emphasised that the success of the South Korean model is not only due to the government's swift and systematic response to COVID-19 but also to the active cooperation of civil society with the government's measures (Park & Kim, 2020). The collaboration between the South Korean government and civil society in dealing with the COVID-19 crisis can be seen through various examples. For example, South Korean citizens' perceptions of the government's mandate to wear masks were that wearing a mask was a way to protect others and the community from themselves and that wearing a mask was a ritual or social nudge to keep themselves and the community safe, which led to active participation. This is a different civic culture in South Korea than in Western societies, where the government mandating citizens to wear masks is perceived as an

infringement on personal freedom, and it has been suggested that the voluntary wearing of facial coverings by South Korean citizens may have contributed to the difference between the number of COVID-19 cases and deaths (Park & Kim, 2020).

The government's information sharing directly led to civil society cooperation. Due to the rapid spread of COVID-19 in early 2020, there was a shortage of masks and other prevention products, and the government banned the export of masks and provided public masks through pharmacies nationwide. However, the supply and demand of masks did not match by region, causing chaos in some places where there was excess demand, with people queuing for hours to purchase masks. In response, the government and the private sector collaborated to develop mobile apps (e.g., Good Doc, Jik Doc, WearMask, MyMask, Kolok KolokMask) that provide information on the number of masks available. To improve the accuracy of mask inventory information provided by mobile apps, public information owned by government agencies (e.g., Health Insurance

Review and Assessment Service, Korea Information Society Agency) was used in collaboration with private sector information technology (IT) companies and citizens to develop a mobile app that provides the location of mask inventory, contributing to the smooth supply and demand of masks (Ministry of Science, Technology and Innovation, 2020). It is highly unusual for the government to share government-owned information with the private sector, and quick policy decisions and voluntary civil society participation were crucial for averting the mask crisis (Our World in Data, 2021; World Bank, 2023).

5. Complementary needs for future infectious disease response

Based on the above discussion, it is clear that South Korea has made significant improvements to the governance of its infectious disease response system since MERS, and it appears to have been effective in its response to COVID-19. However, the COVID-19 situation is not yet over globally, and while South Korea has terminated mandatory prevention measures such as social distancing and wearing facial coverings, the pandemic response system is still in place. As the COVID-19 outbreak prolonged in mid-2020, the South Korean government had already activated the organisations required to operate under the pandemic alert, namely the Central Disease Control Headquarters. The KCDC became independent of the MOHW, and its staff and budget were expanded. It operates an organisational structure with a rapid response team in KCDC, regional disease response centres, and primary local health centres. However, for this organisational structure to work well, it needs to be enhanced qualitatively and quantitatively. Infectious disease

response personnel must have access to adequate education and training, and private sector resources, such as intensive care beds, must be rapidly mobilised to ensure no waiting lists when the number of cases spikes. To increase medical response capacity, the government has announced plans to expand the number of public hospital beds to 5,000 by building or expanding 20 new public hospitals, including local medical centres (MOHW, 2020), that can respond to infectious diseases and severe emergencies by 2025, so it is vital to ensure that this policy is implemented as planned to build capacity to respond flexibly to a pandemic.

At the same time, some further improvements are needed to ensure a sustainable pandemic response. In the unique context of COVID-19, governments have not excelled in all areas, and in some cases, human rights violations undermine the foundations of a healthy democracy and effective governance. Firstly, privacy and protection of vulnerable populations.

The mortality rate of COVID-19 varied by age, with a near-zero mortality rate in the under-50s, a sharp increase in the 60s, and a 20% mortality rate in those over-80s. In the early stages, the nature of COVID-19 was not understood, and the elderly were not well protected, which led to tremendous sacrifice among the elderly (Kwon, 2020). Korea has been relatively successful in getting people to participate in quarantine voluntarily, but there is a need for an institutional mechanism to increase the incentive for people to voluntarily participate in quarantine in the event of future infectious diseases. To do so, a combination of policies must be designed with a robust social safety net to ensure that people do not have to give up their livelihoods or earned income to protect themselves in everyday life. Social distancing has caused economic downturns around the world and has been costly. COVID-19 's impact on employment has been more severe than the financial crisis in the late 90s (Kochhar, 2020). While social distancing has encouraged telecommuting, it has often led to unemployment rather than increased work flexibility for small and

medium-sized enterprises, temporary workers, and micro-entrepreneurs.

Given the nature of infectious diseases, which spread through contact between people, minimising physical contact is arguably an obvious way to reduce transmission. However, given the economic, social and political costs of completely stopping human contact and movement in the modern world, complete lockdowns are not viable. However, deteriorating economic conditions, such as rising unemployment and underemployment, falling incomes and rising poverty, could have a cumulative effect in the future, significantly worsening public health (Rosen & Stenbeck, 2021). During COVID-19, the government compensated for operating losses resulting from policy compliance, such as business restrictions, with government funds, costing a total of KRW 1 billion. This is not sustainable, as the scale and duration of the outbreak are unpredictable and open to exploitation. The lack of access to paid sick leave at work, not only for the self-employed, is another area that needs to be addressed. As Korea is one of the few OECD countries

without a public sickness benefit system (Kim, 2020), it is essential to introduce a sickness benefit to cover income losses due to illness, thereby contributing to the maintenance of workers' healthy productive capacity. A careful analysis of how the COVID-19 response policies have generated prevention effects and costs by population and facility characteristics will enable the adoption of prevention policies that minimise social costs in the long run, thereby increasing the sustainability of prevention policies.

A shift in risk communication must also occur to increase the sustainability of mitigation policies. Historically, governments have focused on communicating how scary COVID-19 is and how to avoid its harm. While the nature of COVID-19 is not fully understood, this approach to messaging has contributed to reducing the number of cases by encouraging people to take precautions and be cautious in their daily lives. South Korea has a high suicide rate and a high healthcare utilisation rate compared to other OECD countries (OECD, 2019), so excessive fear-based messaging

by the government could lead to a deterioration in the country's mental health or an excessive increase in healthcare utilisation, which could result in people who are more in need of infectious disease treatment not being able to access healthcare and worsening healthcare finances. National Institute for Health and Social Research statistics show that suicidal ideation has increased significantly since COVID-19. Politicians are also likely to make conservative policy decisions that minimise blame rather than balancing the social costs and benefits of prevention. This is because if the number of cases increases due to not increasing the social distancing level, the public will strongly condemn it, whereas if strong quarantine measures are implemented, the socioeconomic costs will be higher in the long run, but the immediate perceived cost will be less depending on the time discount rate. Unlike MERS, which had the stigma of being uncommunicative, government communication during COVID-19 positively affected epidemic prevention performance. However, if such a prolonged epidemic situation occurs again in the future, the government should consider the long-term cost and epidemic prevention

effectiveness and adjust the intensity of message delivery to manage the epidemic at a moderately low level rather than completely suppress it.

6. Conclusion

South Korea's infectious disease response system has evolved through the 2015 MERS outbreak and the 2019 COVID-19 response. Ignoring the WHO's recommendation to prepare for MERS, the government could not prevent the spread of MERS to the community because of the lack of preparedness in laws and manuals. While the manuals were confusing for health centres and hospitals, the proliferation of informal response organisations, such as the Central MERS Response Task Force, without a clear legal control tower, hindered information sharing, situation reporting, and effective policymaking. In addition, the government's consistent non-disclosure of patient movement information without standards for message management led to conflicts with local governments, and the government's inability to speak with one voice only increased public distrust and anxiety.

Following the failure of the MERS response, the government undertook a significant overhaul of its infectious disease response system, and these improvements have proved effective in response to COVID-19. First of all, the manuals related to the law on infectious disease prevention were thoroughly reinforced, and mock drills were conducted to ensure that the delivery system, including hospitals and health centres, operated without any confusion. As the pandemic spread to the community, the government raised the pandemic alert level to “severe,“ the highest. It established an overarching framework chaired by the prime minister, under which the Ministry of Public Security and the Ministry of Health and Welfare mobilised resources, including communities and hospitals, to support the CDC’s disease control and prevention work. While each actor in the COVID-19 response governance system could stick to its work, the situation was shared efficiently through regular meetings and communication, and communication with the public was facilitated through public briefings.

It is too early to comprehensively assess the long-term impact on public health or the economy. What is clear, however, is that through the experience of the MERS outbreak, Korea's infectious disease response system has been refined and improved to be sophisticated and effective, especially in the initial response, and has become a model for many countries. This is due to the government's recognition of the importance of networked governance, which means that overcoming a complex crisis such as an infectious disease cannot be solved through traditional top-down problem-solving but requires active collaboration with stakeholders such as various ministries, local governments, the medical community, and civil society. Nevertheless, there is still work to be done to ensure that the system established during the COVID-19 response remains effective in dealing with future infectious diseases. The nature of the infectious disease requires immediate response through local governments, but the administrative capacity and level of autonomy of local governments are not yet high enough to respond to the epidemic independently of the central government. In addition, as the

extent of COVID-19 damage varies by class, such as the elderly, small business owners, and irregular workers, it will be necessary to design careful prevention policies that take into account long-term socioeconomic costs.

On the other hand, this study has limitations as a case study because it is impossible to generalise the infectious disease response system discussed above to infectious diseases with different characteristics from COVID-19. The COVID-19 period was a time of many creative policies, including the 3Ts, and it is difficult to distinguish which policies were particularly effective in the governance of infectious disease response among them, which should be considered in further research.

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