Considerations on the Implementation of the Telemedicine System Encountered with Stakeholders' Resistance in COVID-19 Pandemic

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Abstract

Background: *Non-face-to-face consultation, which ensures physical distance between patients and doctors, is increasing as a substitute mode for dealing with highly infectious diseases. Korea, with its remarkable Information and Communications Technology infrastructure, introduced telemedicine in 1988, yet it has not been formally accepted owing to stakeholders' resistance and legal restrictions.*

Purpose: *This study aims to determine the feasibility of implementing the telemedicine system and find solutions of its development and resistance by stakeholders.*

Method and Material: *The authors present a unique case of Korea where telemedicine, despite its solid technological base, has not yet gained a foothold 32 years after its first pilot project. A narrative review was condected according to the timeline of government-driven telemedicine adoption in Korea, and an analysis was performed on the tendency of stakeholder resistance.*

Results: *The analysis revealed that the relevant stakeholders were classified into doctors, patients, governments and some political parties. Among stakeholders as a whole, private healthcare physicians, who provide over 90% of primary care in Korea, amount to the largest demographic against the implementation of telemedicine. Their resistance was found to be the product of policies and problems arising from the coexistence of telemedicine and conventional healthcare regimes. With the COVID-19 pandemic, policymakers are at odds with these stakeholders while implementing a pilot project.*

Conclusion: *Fostering smooth policy implementation necessitates adopting an approach that reduces conflicts with private healthcare providers.*

Keywords: *telemedicine, stakeholder, resistance, COVID-19*

Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), known to be the pathogen responsible for coronavirus disease 19 (hereinafter "COVID-19"), was first reported in December 2019 in Wuhan City, Hubei Province, China.[1] Since then, it has spread rapidly and has become a public health emergency of international concern. The coronavirus infects through the respiratory tract, digestive tract, or conjunctiva, and its typical symptoms are fever, cough, and difficulty breathing.[2] Owing to the high transmissibility and virulence of SARS-CoV-2, COVID-19 was declared a global pandemic 11 years after the H1N1 swine flu outbreak in 2009.

According to the World Health Organization (WHO), as of June 20, 2020, >8.38 million people in 216 countries have been infected with SARS-CoV-2, including 450,000 deaths. The extent of the impact of COVID-19 on the human body can generally be categorized into five stages: (1) asymptomatic, (2) mild, (3) moderate, (4) severe, and (5) critically ill.[3] As of June 2, 2020, the treatment of noncommunicable diseases, such as hypertension, diabetes, cancer, and cardiovascular disease, has been severely disrupted because of the COVID-19 pandemic.[4] This highlights the importance of nonface-to-face consultation and treatment in reducing the potential impact of asymptomatic or mild cases difficult to be confirmed by diagnosis in circumstances of exhausted health care system capacity and lack of available medical resources.

Although Korea has long established a solid Information and Communications Technology infrastructure for telemedicine,[5] the implementation of patient–doctor telemedicine has been impeded by stakeholders' resistance since the first pilot project was conducted in 1988. To the best of the author's knowledge, no country or community has such a long history of resistance against establishing telemedicine as a viable mode of health care delivery.

This study introduces the Korean case of telemedicine, which has met with vehement resistance from stakeholders despite the threat of the COVID-19 pandemic. The aim is to emphasize the necessity of telemedicine as an alternative health care solution in disaster situations and to seek ways to overcome the barriers to telemedicine through descriptive reviews. This experience can provide important implications for

the smooth implementation and establishment of telemedicine in countries or communities stuck in a similar situation.

Outbreak of COVID-19 and a Growing Need for Telemedicine

The first confirmed case of COVID-19 in Korea was a 35-year-old woman from Wuhan who entered the country on January 19, 2020.[6] As of June 19, 2020, the total cumulative number of confirmed cases in Korea is 12,306, with the basic reproductive number (R0) estimated at 1.89 and a mortality rate at 2.28%.[1,7] The outbreak was amplified by the gatherings of a religious cult in Daegu, ~150 miles southeast of Seoul, and the surrounding province (Gyeongsangbuk-do), where the number of confirmed cases rapidly increased through local transmission, and soared to the red level on February 23, over a month after the first confirmed case.

The number of newly diagnosed cases in Korea has reduced as a result of meticulously sharing of information by sending text messages and conducting quarantine in an open and transparent manner to minimize the fatal effects of the rapidly spreading highly infectious SARS-CoV-2[8,9] (*Fig. 1*). Anonymized information about the infected persons is shared with the public so that they know where the infected persons stayed and can act accordingly, and their contact persons are identified and informed about the need for self-isolation. In all 83 cities across the country, including the 8 metropolitan cities, a total of 597 screening clinics are providing large-scale free diagnostic tests, including 334 COVID-19 carefree hospitals (with separate clinics for outpatients with respiratory diseases), 51 drive-through screening centers, and automated screening stations.[10]

Regions or countries with high population density are at higher risk of contracting COVID-19. With 529.4 people per square kilometer, Korea is a land-scarce country with the highest population density among Organization for Economic Co-operation and Development (OECD) countries.[11] The elderly population (≥65 years) accounted for 14% of the total in 2017, and Korea is estimated to become an ultra-aged society by 2026.[12] In densely populated communities[11] with a large proportion of the elderly,[12] outbreak of an infectious disease can result in a serious crisis by rapidly spreading among the elderly and chronically ill who are vulnerable to infection.

In the current critical situation wherein an infectious disease is ravaging society, telemedicine may be useful as a supplementary or alternative mode of health care delivery that

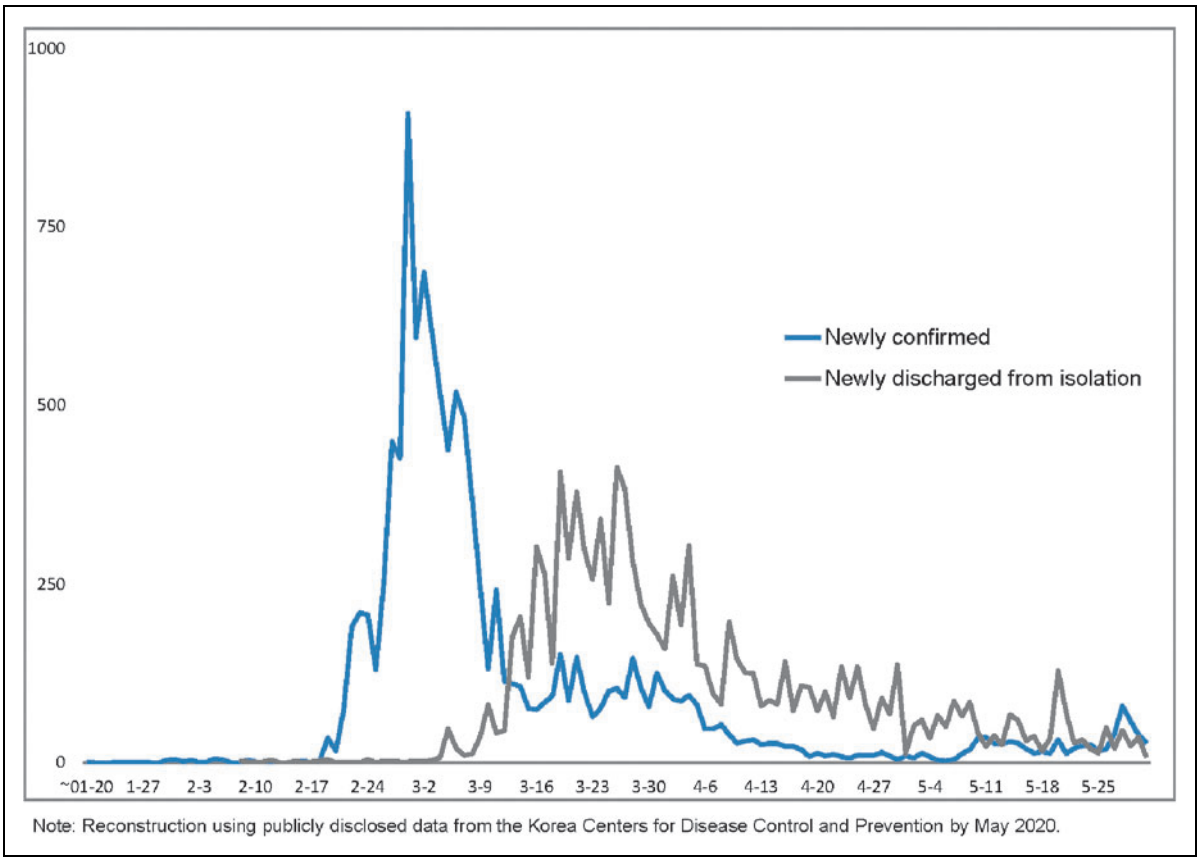

Fig. 1. COVID-19 daily confirmed cases trend in Korea. COVID-9, coronavirus disease 19.

can reduce the risk of person-to-person transmission through direct contact and, above all, block possible transmissions to unspecified number of people by medical staff. Furthermore, nonface-to-face consultation can maintain the patients' quality of life, save medical expenses, reduce patient anxiety, and help keep medical staff safe.[13,14] The COVID-19 pandemic has triggered fundamental changes in the health care services system of every country. As of May 2020, the use of telemedicine has increased in >125 countries across the globe.[15] Such a prompt and adequate response requires a meticulous and well-integrated coordination among the stakeholders of different telemedicine-related functions.[16,17]

Conditions Favoring Face-to-Face Consultation

The Korean conditions favoring face-to-face consultation have been the main cause of the low acceptance of telemedicine. First, regarding access to medical care, a welfare-oriented health insurance was introduced in 1977, and the current national health insurance service for the entire population with 100% coverage of core medical care has been in place since 1989.[18] The small land area provides an easy environment for face-to-face consultation.[19] In particular, the urban versus rural physician distribution (total number of physicians per 1,000 population) is 2.5:1.9 (1.32 as ratio), which is more equitable than the OECD average (4.3:2.8 [1.54]).[20] The geographic distribution of physicians is 12.1 physicians per 10 square kilometers, ranking third among OECD countries after Israel and Belgium (estimated by deriving the number of physicians from the OECD Health Statistics, and the land area from a list compiled by the World Bank)[11,20] in terms of the distance to the nearest health care provider. Second, with regard to the expenditure on health care per capita in USD purchasing power parity (PPP), Korea's average expenditure is 48 USD PPP (US = 100), 67% of the OECD average (72 USD PPP).[20] Third, in terms of demographics, the number of physicians on duty almost doubled (98% increase) over the past 17 years, marking the highest increase rate among the 34 OECD member countries.[20] Fourth, the quality of medical care is rather high; specialists account for 73% of all doctors, higher than the OECD average (65%). In 2020, 3,025 physicians newly entered the doctor's register and 3,516 physicians entered the specialist register. Consultation with a specialist is readily available.[20] Finally, the quality of face-to-face consultation is high, as shown by various indicators, such as waiting time for consultation and surgery in a tertiary referral or specialist hospital, and outcomes of cancer and cardiovascular diseases.[20] Considering that telemedicine primarily aims to enhance the quality of and access to medical care,[21] it is understandable that people receiving high-quality medical care in a land-scarce country have no compelling demand for telemedicine.

Stakeholders of Telemedicine

This environment conducive to face-to-face consultation has led to residents' indifference to nonface-to-face health care services and low acceptance by civic organizations and stakeholders. Among the various public and private sector stakeholders of telemedicine,[22] including the government, primary care clinicians, entrepreneurs, patients, and general hospital staff, primary care clinicians are the largest stakeholder group in the supply of health care.[16,23]

As the whole nation was struck at the nationwide spread of an epidemic transmitted by an unprecedented fatal and nosocomial pathogen, its unclear progress, warning mass media reports, and subsequent social anxiety,[22] policymakers saw sufficient cause to temporarily relax the legal restrictions on patient–doctor telemedicine to eliminate local transmission. The Korean government, as the policymaker, hastened to implement telemedicine on February 24, 2020, without prior consultation with or involvement of the stakeholders, including doctors as telemedicine providers and patient groups as users.[24] However, even in this pandemic situation, the decision has met with concerns about the sustainability of telemedicine applications.[25]

Barriers to Telemedicine Implementation

When a new system is introduced into an existing system, it is often met with resistance.[26] In many countries, telemedicine has not yet been established due to its low acceptance among the users[16,17,27,28] owing to social, technical, political, legal, and contextual factors. Of these, social factors are perceived to be the most complex.[29] Implementation of telemedicine has been delayed for various reasons, including repeated and persistent resistance by stakeholders, legal limitations, indifference of patients, lack of a consolidated rationale, and disharmonious implementation by policymakers.[30,31] The reasons for the stakeholders' refusal include high investment costs for technology, uncertainty about the return on investment, eligibility for reimbursement, and factors originating from the loopholes in the health insurance system.[16,32,33]

In Korea, the proportion of public health care providers is as low as 3.76%, and private health care providers perform >90% of all primary care.[18] Likewise, public coverage for outpatient care is 58%, lower than the OECD average (77%).[20] Accordingly, the Korean Medical Association, an interest group representing all primary care providers, is aware of the threat posed by a coexistence of telehealth and face-to-face health care services in relation to the problems inherent to the health insurance system.[16] The Korean health care system is not up to its role as a gatekeeper in the process of referral from a primary care provider to a tertiary referral hospital.[16] In many countries where telemedicine was introduced at the community level, primary care providers experienced a threat to their economic standing by tertiary referral

hospitals' superiority in readiness, technological capacity, available human resources, and financial conditions, making them mount organized resistance to change.[17]

Some civic groups, as long-standing stakeholders, have proposed privatization of deteriorating public health care services. This is relevant to the last three administrations' unwavering position in pursuing telemedicine policies as an engine for the country's industrial development.[34] Policymakers' uncompromising pursuit of such policies disregarding the opinions of important stakeholders within the value chain of health care delivery and consumption is not different from the previous administrations' attitudes.

Even while facing the challenges of large-scale outbreaks of various fatal infectious diseases over the past decades, the Korean government failed to adopt telemedicine due to the resistance of stakeholders including doctors.[25,35] Among the pre-COVID-19 fatal infectious diseases, SARS spread to 30 countries and infected 8,437 people, killing 10% of them.[36] In 2012, Middle East Respiratory Syndrome (MERS) outbreaks caused 2,519 confirmed cases and 868 deaths (case–fatality rate: 34.3%).[37] Even in 2009, when 570,000 people died in the novel H1N1 pandemic,[38] telemedicine could not be properly utilized in Korea, although people were gripped by the fear of pandemic. Looking back on this decades-old history of resistance by stakeholders, the current unilateral telemedicine policy, riding the bandwagon of the atmosphere generated by the COVID-19 crisis, raises concerns about its sustainability.

Timeline and Content of the Incidents of Stakeholders' Resistance

The history of resistance of the stakeholders, including doctors' groups, began in 2002, the year when the Telemedicine Act was amended (*Fig. 2*). In 2009, the Lee Myung-bak administration promoted patient–doctor telemedicine as one of the high value-added growth engine industries. However, policymakers' attempts were thwarted in the face of the resistance. The government attempted neither to seek agreement on policy decisions with stakeholders nor to make concrete investment plans, focusing only on the expected and predicted effects of implementing the policies.[16]

Type of Telemedicine *	Region where the Pilot Telemedicine Trial was Conducted	Distance (mile)	Duration (months)	Time (year)	The Resistance by Stakeholder **
TR	Yeoncheon Healthcare Center – Seoul National University Hospital	33	24	1988	
TR/TC	Hwacheon Healthcare Center – Hallym University Hospital	9	24	1990	
TR/TC	Uljin Healthcare Center – Kyungpook University Hospital	90	24	1994	
TR	Gurye Healthcare Center – Chonnam National University	30	6		
TC	Jeongeup Asan Hospital – Seoul Asan Hospital	137	12	2002	KMA, NGOs
RTV	World-Cup Stadium – Yonsei University Hospital	3.6	1		
An amendment to the medical law allowing telemedicine between patients and medical doctors				2013	DG, KMA, LFG, NGOs, OP
RTV, TM	5 Healthcare Centers, 2 Correctional Institutes, 12 Primary Care Clinics	Nationwide	6	2014	KMA, DG, RP, OP
RTV, TM	Rural areas, Military units, Correctional Institutes, Deep-sea fishing vessels, 50 Primary Care Clinics	Nationwide	6	2015	KMA, DG, OP, NGOs
TM	1,870 Primary Care Clinics	Nationwide	6	2016	
TM, TC, TE	870 Primary Care Clinics	27 Districts	12	2019	KMA, DG, RHA, NGOs, RP

* TR = Teleradiology; TC = Teleconsultation; RTV = Real-time Videoconferencing; TM = Telemonitoring; TE = Tele-education

**KMA = Korean Medical Association; NGOs = Non-government organizations; DG = Doctor's groups; LFG = Labor & Farmers' group, OP = the Opposition Parties; RHA = Regional Hospital Association; RP = some members of the Ruling Party

Fig. 2. Timeline of pilot trials and the resistant stakeholders.

In 2013, the Park Geun-hye administration also promoted telemedicine as a tool to foster national competitiveness and develop the health care industry. Another amendment to the Medical Service Act passed the national assembly to allow patient–doctor telemedicine, promoted unilaterally by the government, leading to strong resistance by various groups, such as doctors, workers, farmers, civic organizations, and opposition parties.[24,25]

Unlike the previous projects, which targeted vulnerable regions, a nationwide pilot project was launched in 2014. Upon completion of the project, stakeholders required risk verification, such as the safety and efficacy of telemedicine and protection of personal information, but the government's promise was not put into practice. Consequently, not only the stakeholders and opposition party lawmakers, but also some ruling party members[39] raised questions about telemedicine policies. The minister of health and welfare, responsible for the implementation of the policy, acknowledged the limitations of their initiative, admitting that they could not verify the stability and risk of telemedicine.[28,40] However, the government continued its unilateral policy implementation without seeking stakeholders' consensus.

In 2016, 30,292 primary care providers across the country were encouraged to adopt telemedicine, of which 6.2% ($n = 1,870$) joined the undertaking. A majority of the primary care providers eventually withdrew, resulting in 870 participating facilities in 27 districts in 2019.

In 2020, as is the case with many countries in the wake of the COVID-19 pandemic, patient–doctor telemedicine was temporarily applied to the entire population of Korea (51.6 million, 2018). According to data released by the ministry of health and welfare dated April 12, 2020, 103,988 telephone-based consultations were conducted in an initiative undertaken with the participation of 3,072 primary care providers, starting from February 24, 2020,[41] that is, 0.69 teleconsultations per day per health care institution. This suggests that the resistance of stakeholders mounted during the SARS and MERS crises is repeating itself even in the COVID-19 crisis.

The government's position as the major policymaker for COVID-19 management and prevention is facing another crisis. Sixteen newly confirmed cases were reported on May 25, 2020,[42] while the community sense for telemedicine has been weakened due to citizens' fatigue from the burden of long-sustained attention to COVID-19. Although the government issued no recommendation to discontinue the use of telemedicine, the number of telemedicine users ceased to increase, indicating patients' stagnating interest in nonface-to-face care and doctors' continuing resistance to the government policy.[16,22]

Telemedicine as a Means of Disaster Medicine

COVID-19 is a global disaster combating that requires community sense and solidarity. Behavioral changes, such as social distancing, wearing mask, eye protection, and telemedicine, are timely and useful measures to significantly mitigate the spread of pandemic and to block possible transmissions by medical staff.[43,44] Unlike other services or goods, health care services are primarily conducted at the community level of a country. Global disasters, such as the COVID-19 pandemic, have brought forth changes in medical system and nonface-to-face cultural change across the entire spectrum of society. The role of telemedicine is rapidly going mainstream as an auxiliary health care delivery mode by protecting patients vulnerable to infection and saving the stock of medical resources by minimizing physical contact between people, which is inevitable in face-to-face consultation.

Conclusions

This article explored the difficulties associated with telemedicine as a useful future mode of health care service delivery in disaster situations with the purpose of finding solutions to the resistance of stakeholders, using the Korean example of 32 years of resistance of stakeholders. To achieve the objectives of the policy pursued by an organization, it is necessary to reach a consensus to resolve the resistance of stakeholders affected by the implementation of new policies. Unilateral imposition of regulations and coercion by an entity that determines the power balance prevent organizations and society from accessing the desired future in the long term, and can act as a hindrance. Therefore, the authors highlight the inappropriateness of unilateral implementation of policy, and emphasize the need to maintain the universality and soundness of a telemedicine system, especially in the COVID-19 crisis situation.

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