POLICY NOTE

MAKING GOVERNMENT-LED RISK AND CRISIS COMMUNICATION MORE EFFECTIVE – LESSONS LEARNED FROM SIX COUNTRIES DURING THE COVID-19 PANDEMIC

September 2023

Republic of Korea – World Bank Group Partnership
On COVID-19 Preparedness and Response

Making Government-Led Risk and Crisis Communication More Effective – Lessons Learned From Six Countries During the COVID-19 Pandemic

September 2023

Author

Myoungsoon You

Professor at the Graduate School of Public Health,
Seoul National University

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP
East Asia & Pacific

Ministry of Economy
and Finance

SNU Health
Graduate School of Public Health

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

Government-led risk and crisis communication (RCC) is an essential priority in directing and supporting effective pandemic response in a country. Ineffective RCC during public health emergencies such as the COVID-19 pandemic can lead to public confusion, fear, and distrust, which eventually become barriers to the acceptance and practice of risk-preventive behavior. In this analysis of five key RCC objectives in six countries (Ghana, Republic of Korea [Korea], Singapore, the United States [US], the United Kingdom [UK], and Vietnam), several lessons for future consideration are identified. First, governments ought to explore reasons for not being able to rapidly initiate and implement effective RCC so barriers can be identified and overcome before another crisis emerges. Second, public leaders must be committed to enhancing consistency, transparency, and accountability in their messaging, by prioritizing deference toward expert advice from scientific and public health experts. Third, it would be prudent to evaluate laws, standard operating procedures, and existing workflows to enhance public-private partnerships that enable cross-utilization of multistakeholder expertise and resources during a crisis.

With this goal, it may be useful to proactively identify and acknowledge the important role that information and communication technologies (ICT) can play during nonpandemic times in enhancing health literacy and health communication. Strengthening laws and regulations to ensure privacy and human rights protections for those using ICT should be an ongoing priority, so that when ICTs must be leveraged during a crisis, there is a baseline level of assurance and confidence surrounding their safe and responsible use. Efforts to encourage the familiarization of the public with how infectious disease outbreaks spread and how people can keep themselves and each other safe should also be an ongoing priority, as scientific and health literacy can help the public prepare itself to receive and interpret RCC that is provided during a crisis. The continuous exposure to the technologies and means of sharing health information throughout various subpopulations within a country is an essential part of trust building over time, thus mitigating the fear, anxiety, social stigma, and potential distrust that could occur in times of an evolving pandemic, when levels of uncertainty are still quite high. Routine, repeated assessments of the public's perceptions and needs during a crisis are key, as are other efforts to increase a nation's preparedness to launch RCC rapidly and effectively (for example, government commitment to exploring public-private partnerships).

1. BACKGROUND

Importance of government-led risk and crisis communication (RCC)

Government-led RCC in a public health emergency of international concern (PHEIC) refers to strategic plans and activities by governmental agencies related to public health, aiming to inform and motivate appropriate self-protective behavior and build trust (Vaughan and Tinker 2009). Hyland-Wood et al. (2021) define it as intentional government-led communication efforts to influence public decisions and behaviors to save lives during a PHEIC. Through a decade of experiences with outbreaks such as Severe Acute Respiratory Syndrome (SARS), H1N1, Zika, Ebola, and Middle East Respiratory Syndrome (MERS), governments around the world have learned that RCC makes a difference in the success of outbreak responses. The Governmental Communication Service in the UK reported that communication is an integral part of the PHEIC response system, allowing governments to save time organizing nationwide responses (UK Government Communication Service 2021). Specifically, effective RCC can influence behaviors through diverse interventions (examples include message tailoring or increasing the person-channel fit), reducing the likelihood of infection and severity of illness (Winograd et al. 2021).

From a policy perspective, the effectiveness of government-led RCC matters because public acceptance of policy measures, from physical distancing to vaccination, is significantly influenced by how relevant information is framed (Tien Thanh and Thanh Tung 2022). When government communication is ineffective in terms of urgency, consistency, or transparency, it can reduce public trust and increase inappropriate information sharing or contagion. This is why effective communication is a central element in risk and crisis management frameworks, along with scientific risk identification or assessment (IRGC 2017).

Overarching goal of government RCC during PHEIC

In an era of information overload, governments have been struggling with "infodemics," a phenomenon of overabundance of information, including inaccurate or false information with or without the intention of deceiving people, during all the phases of the COVID-19 pandemic. This implies that it is increasingly difficult for lay people to find trustworthy information sources and reliable guidance when needed (Xu and Cong 2021). In a similar vein, an individual's subjective risk judgment can often differ from an expert's risk assessment. If government-led RCC conflicts with other communication actors (such as politics, private industry, news media), the gap in appreciating subjective and objective risks can widen, which could make people more vulnerable to the risk of infection (Nelson et al. 2020).

This is why literature has emphasized the importance of governmental efforts to earn public trust and communication credibility during a health crisis. As Luhmann (1979) defined, the former reflects general public trust in public agencies and systems, and the latter refers to the audience's subjective evaluation of information sources and messages. In the context of COVID-19, where scientific uncertainty prevailed as the outbreak evolved, trust in and credibility of governmental RCC are critical as a "complexity-reducing mechanism" to support implementation of policies to contain the pandemic.

Analysis question to ask

Although the necessity of effective government RCC is evident, not all countries were successful in their RCC during the pandemic (Hyland-Wood et al. 2021). Ironically, traditional indicators, which reflect level of resources such as a nation's income level or number of experts, do not automatically guarantee higher efficiency in government RCC. Despite a large number of epidemiologists and communication experts, high-income countries have struggled with high vaccine hesitancy (Aw et al. 2021), impeding efforts to contain the COVID-19 pandemic. Similarly, countries that actively used ICT in information dissemination observed that communication

through online platforms, social media applications, and smartphone applications can become the source and enabler of the spread of false information and conspiracy beliefs, reducing the benefits of ICT-based RCC. Lastly, effective community engagement was a challenge for many countries, but it is a critical element that can impact community resilience to collective stress and fatigue during a prolonged pandemic.

Here, then, a question is raised. *What factors differentiated the efficacy of governmental RCC during the COVID-19 pandemic and what can we learn from each case?*

2. METHODS

Countries included in the analysis

This thematic note's analytical focus is on how strategic a government's RCC was in terms of the development and process of communication. This approach is in contrast to reporting only on specific policy indicators (for example, hospital beds per 100,000 people, or the number of patients with diabetes or obesity with a higher risk of COVID-19). More insights can be drawn using an approach that identifies examples of effective and ineffective RCC, rather than a country-to-country comparison of indicators. Taking this goal into account, a hybrid approach, considering country income level and geographic region (North America, Europe, Asia, and Africa), was used for the analysis. As a result, different RCC examples were found in three groups:

- Group 1: UK and US
- Group 2: Korea and Singapore
- Group 3: Ghana and Vietnam

Analytical framework

It is assumed that during an unprecedented event such as the COVID-19 pandemic, governmental RCC should be "strategic" in reaching the right people with the right messages, at the right time, on the right channel. However, there is no "one size fits all" framework to determine effective government RCC during a PHEIC. Instead, government RCC needs to achieve each of the key objectives of RCC. For the analysis, diverse materials were used, including RCC guidelines provided by health authorities (for example, the US Centers for Disease Control and Prevention [CDC] Crisis and Emergency Risk Communications [CERC] guideline), reports on COVID-19 responses published by international agencies such as the Organisation for Economic Co-operation and Development [OECD] and the European parliament, and peer-reviewed articles and grey literature addressing both RCC and COVID-19. The analysis was integrated across five themes, described below.

1. Early initiation of information dissemination

To protect the public's health and well-being from the spreading of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection, effective information exchange between the scientific community, governmental agencies, and civic society was pivotal as it helped inform decisions at various levels (individual, organizational, public, private). As the US CDC emphasized, in terms of the preferred source of information and the speed of information sharing, recognized health authorities should be the first source of new information. Prompt initiation of information dissemination is vital, as it takes time for health authorities to combine diverse data, including epidemiological, medical, population-based, and institution-based (for example, mobility, work-from-home, and travel) data to provide critical recommendations for the public (Mahmood et al. 2020).

2. Active use of ICT in RCC

Many governments used ICT to magnify the impact of their RCC on the public's risk awareness and uptake of preventive behavior (Paek and Hove 2021). Benefits from the use of technology-based COVID-19 responses,

Communication does not take place in a vacuum; rather, it is influenced by the context in which it takes place.

such as digital contact tracing (DCT), reporting contact information through mobile applications, platform-based social warnings, and eHealth programs have been reported to support informed decision-making by the population (Soldano et al. 2021, Odone et al. 2021, Eslami et al. 2021). When stringent policy measures such as lockdowns were applied, people in those countries also sought information and connected with families, friends, and social communities through digital devices and other internet-enabled systems, including traditional media and social media (Lee, Malcein, and Kim 2021). However, ICT use in pandemic responses and RCC also revealed challenges involving transparency, accountability, and privacy. Governments that apply ICT would also need to be aware of these challenges and not violate basic human rights (Bajpai, Biberman, and Ye 2020).

3. Credible communication by public leaders

Communication does not take place in a vacuum; rather, it is influenced by the context in which it takes place (Bensing, van Dulmen, and Tates 2003). A country's RCC during the pandemic can also be evaluated by whether communication was addressed effectively by public leaders who were responsible for national-level responses. As Ahern and Loh (2021) described, when public communication by the president, prime minister, or top-ranked officers was unclear or undermined cardinal principles of transparency, consistency, and accountability, the collective benefits from adopting policy measures were not fully guaranteed. Contributing factors of public leaders' clear communication include efforts to be credible sources by providing accurate, relevant, and accountable information; being transparent in information disclosure, including negative features; and avoiding vagueness and inconsistency.

4. Prevention of social stigma associated with COVID-19 and misinformation

During the pandemic, health authorities also had to manage the spread of misinformation and social stigma (Bheekhun et al. 2021).

Social stigma is originally defined as "an attribute which is deeply discrediting" (Goffman 1963), and the World Health Organization (WHO) defines social stigma in the context of health as the negative association of a person, or a group of people, with certain characteristics and/or a specific disease. In an outbreak, stigma can be harmful as it creates a dichotomy between "being normal and acceptable" and "being tainted and undesirable" (Sotgiu and Dobler 2020). Governments need to be careful in RCC as stigma is constructed and communicated via social interactions. When government communication includes certain types of content—for example, group labeling or the attribution of responsibility of infection to the patient—social stigma could ensue.

5. Participatory RCC using community engagement strategies

In a health crisis like that caused by COVID-19, government RCC needs to go beyond a top-down, centralized approach and instead employ a strategy of widespread community engagement (CE). This is a process by which community members and organizations come together to make important decisions for their community (Tambo et al. 2021). The "governance approach" assumes that government RCC should be inclusive, aiming to increase the involvement of vulnerable groups (such as those with disabilities) or the minority (such as immigrant workers). Also, two-way communication, emphasizing public participation and feedback, is recommended to reduce knowledge, information, and communication gaps among experts and the lay public.

3. ANALYSIS

1. Early initiation of information dissemination

In the early stage of the COVID-19 pandemic, when vaccines and antiviral drugs were unavailable, fast and timely delivery of COVID-19-related risk information by central and local governments was as crucial as epidemiological or policy measures such as quarantine and travel restrictions.

However, some high-income countries (HIC), economically rich and resourceful in their health systems, have been evaluated as ineffective in carrying out the principle of being the first source of information. For instance, the US administration has been criticized for late decision-making that affected the timing and the scale of information delivery (Nelson 2020), even after WHO declared COVID-19 to be a PHEIC and issued global warnings to take urgent action (Rutledge 2020). The responses of the UK government to COVID-19 were also evaluated as neither time-sensitive nor proactive (Atkinson et al. 2020).

In contrast, Korea, an East Asian HIC, is considered to have taken swift action in disseminating information about COVID-19. The prime minister's office, as the head of the Central Disaster and Safety Countermeasure, the Ministry of Health and Welfare (MOHW), and the Korea Disease Control and Prevention Agency (KDCA), held twice-daily press briefings addressing the coronavirus emergency since January 30, 2020, when the number of confirmed cases was low. The ways through which the Korean government sends COVID-19 information to the public are diverse, including a portal site (http://ncov.mohw.go.kr/en/), a 24-hour coronavirus hotline (1399), and social media channels. Local governments also preemptively provided a summary of place and time details on patients through official websites and emergency alert text messages sent to residents' mobile devices. Public perception of, attitude to, and trust in the government-led COVID-19 daily briefings appears to be positive: according to a survey of 1,000 Korean adults 18 years old and older conducted in April 2020, the government's daily briefings are given attention (79.3 percent agreed), useful (77.4 percent agreed), and trusted (75.3percent agreed) (MOHW [Ministry of Health and Welfare] 2020).

Figure 1: Public Perception of Government Briefings
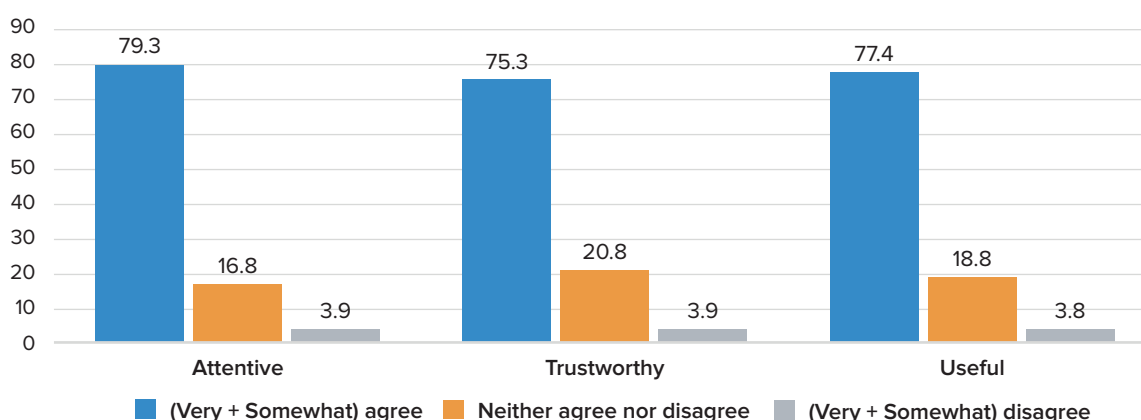
Source: MOHW (2020)

Similarly, Singapore, a high-income island country and city-state in Southeast Asia with 5.6 million people, organized a multiministry task force for rapid response to COVID-19 and increased the "Disease Outbreak Response System Condition" (DORSCON) level from yellow to orange (Tan et al. 2020) when the confirmed domestic cases were lower than 10. Owing to its early decision-making, RCC practices, including public briefings and transmission of emergency notifications through mobile applications such as WhatsApp, were implemented for citizens' informed decisions at the end of January 2020 (Chen et al. 2020). The same immediate decision to disclose information and increase risk alert level was found in Vietnam, although it is not a high-income country.

There are two probable reasons that explain the difference in the initiation of information dissemination among high-income countries. One is whether there had been a recent outbreak that was a threat to the public's health, together with how much the whole society could be motivated to make its systems work better—even before the pandemic. For instance, the nation-wide experience of Korea's response to the Middle East Respiratory Syndrome (MERS) in 2015 motivated key institutions and the government to reform relevant laws, response plans, and protocols to respond to the emergence of the next novel health crisis. The MERS experience also conveyed a key lesson to the country that the outbreak response should be preemptive (Noh et al. 2020).

The other reason is whether there is a lack of deference to expertise. As an example, the office of the previous US president underestimated expert opinion on social distancing and the wearing of face masks (Sauer et al. 2021). The often-publicized conflicts and tensions between the president's office and health authorities regarding the COVID-19 threat, even when domestic confirmed cases were increasing, fueled polarized public debate (Pasual-Ferra et al. 2021). According to the Kaiser Family Foundation (KFF) Health Tracking Poll conducted in fall 2020, a majority of the survey participants opined that the president was intervening with the work of the Food and Drug Administration (FDA) and the CDC on the pandemic and viewed it as a bad thing. The independent role of scientific expert groups during the pandemic is also addressed in the case of the UK. In a qualitative analysis of four European countries, Hodges and his colleagues (2022) pointed out that an expert group, the Scientific Advisory Group for Emergencies (SAGE), in the UK could have asked for the government's immediate decision to organize policy measures to contain COVID-19, rather than supporting a "slow and gradual" approach to the outbreak, which turned out to be inadequate (Lavazza and Farina 2020; Michie et al. 2022).

2. ICT use

Internet networks and electronic devices are widely distributed worldwide. By 2020, high-income countries such as the United States (90.9 percent), the United Kingdom (94.8 percent), the Republic of Korea (96.5 percent), and Singapore (92.0 percent) had more than 90 percent of their total population using the internet. However, there are countries where certain populations had less access to the internet, such as Ghana (58.0 percent) and Vietnam (70.3 percent).

ICT has helped reduce the cumulative number of confirmed cases, fatality rate, and initial speed of transmission across different countries, as shown in data controlling for cultural characteristics of different countries (Eum and Kim 2022). In 2021, the second year of the pandemic, the global economy seemed to recover from the negative growth of 2020, with the following positive growth rates for the six countries: the US (7.4 percent), Singapore (7.6 percent), the UK (5.7 percent), Ghana (5.4 percent), Korea (4.0 percent), and Vietnam (2.6 percent). Depending on the extent of economic recovery and digital infrastructure, the cumulative number of deaths per million people by the end of 2021 in these countries varied.

Figure 2 below illustrates the proportion of people using the internet in 2020 and the annual gross domestic product (GDP) growth in 2021. The size of the bubble for each country is proportional to the cumulative number of deaths per million people by 2021.

Figure 2: Cumulative Deaths by GDP Growth and Internet Users (as of December 31, 2021)
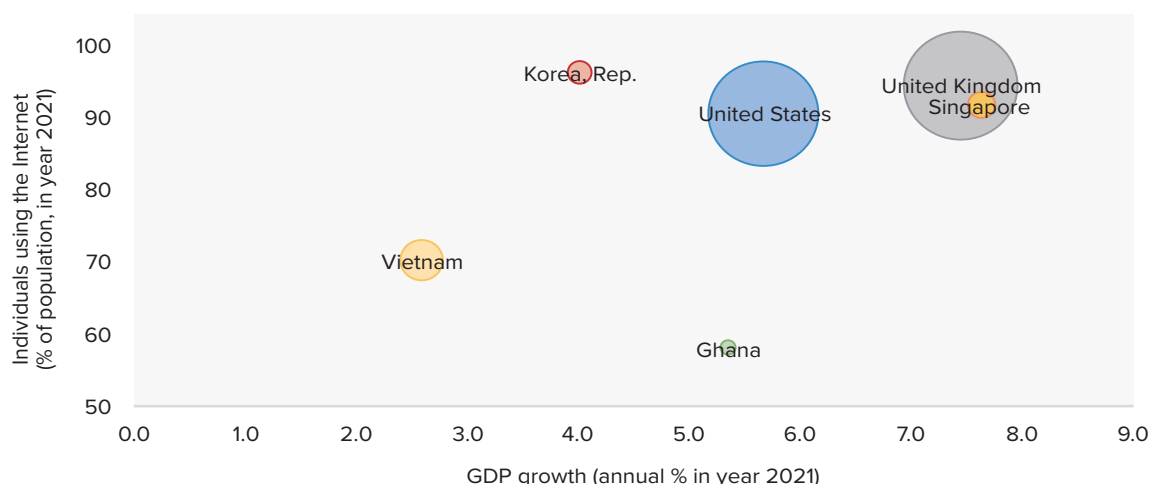
Source: World Bank Databank

In Figure 3, the y-axis is replaced by fixed telephone subscriptions. Figures 2 and 3 show that countries struggling with a severe infodemic such as the UK (2,635 deaths/million) and the US (2,449 deaths/million) had the biggest bubbles, while countries that maintained government-driven information dissemination strategies had a relatively small bubble regardless of GDP growth: Vietnam (332 deaths/million), Singapore (151 deaths/million), Korea (108 deaths/million), and Ghana (39 deaths/million).

High-income countries, especially in Asia, were ready to use ICT in their pandemic response. In 2018, Korea ranked as the country with the highest penetration and usage of the internet in the World (Pew Research Center 2018). Also, Singapore and Korea were among the top 5 countries with the highest average number of mobile apps installed per user (Google 2013) (Figure 3).

Figure 3: Cumulative Deaths by GDP Growth and Fixed Telephone Subscriptions (as of December 31, 2021)
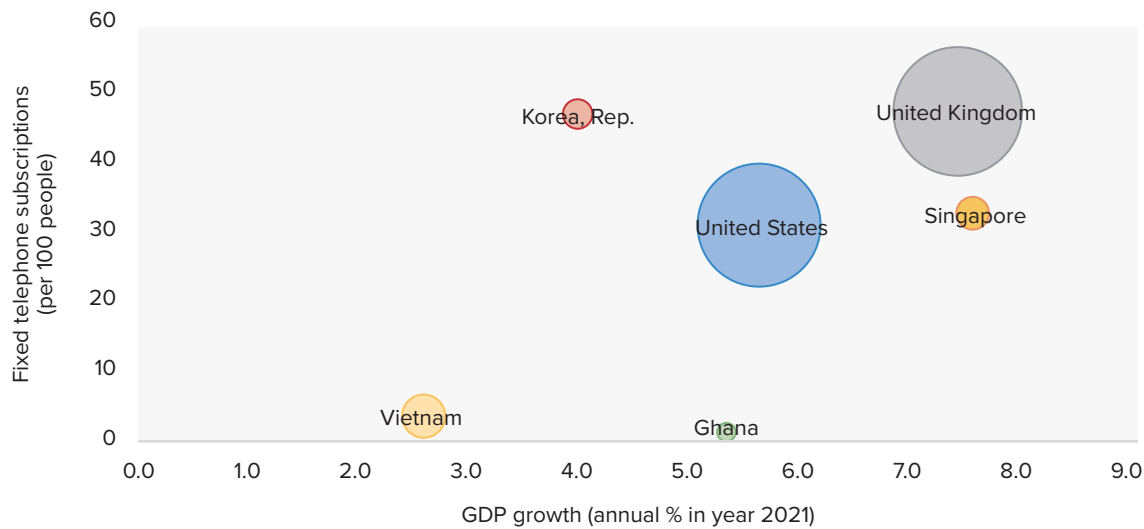
Source: World Bank Databank

In Korea, ICT technologies enabled the government to organize faster responses by sending emergency alert text messages to the public on a large scale. As part of a survey, more than 85 percent of participants responded that they read the messages most of the time or every time. Timely messaging helped increase risk awareness, which in turn influenced behavioral decisions that were vital for risk reduction. ICT has also been used to ease the difficulties that arose. For instance, when face mask shortages emerged in the spring of 2020, an ICT-based strategy combining public data from health insurance or the post office, open data from private pharmacies and retailers, and information from mobile devices played an important role in resolving the problem (Paek and Hove 2021). ICT-based systems were used to encourage citizens to get vaccinated and this helped increase vaccination rates (Kwon and Oh 2022).

Singapore has also demonstrated the innovative use of ICT for contact tracing and enforcement of quarantine rules. Like COVIDSafe in Australia, the Singapore government provided citizens with a virtual map (TraceTogether app) through mobile applications. Once the app is downloaded, it uses Bluetooth capability to detect physical proximity among users. Thus, if a user tests positive for COVID-19, all app users who have come within close physical proximity of the patient and thus could potentially have been infected receive a notification for self-isolation (Chen and Thio 2021).

Two preconditions are found in the countries that maximized the benefits of ICT in their pandemic response. One is the need for there to be an established IT infrastructure with the latest digital technologies, and the other is the coordination capability between the private and public sectors prior to the COVID-19 crisis. The importance of pre-existing ICT partnerships is well supported in low- and middle-income countries (LMICs), where ICT infrastructure is limited.

For some other countries, the pandemic presented a challenge to ensure the public could access, interpret, and use key information related to the outbreak (Bakibinga-Gaswaga et al. 2020). Some countries were able to leverage partnerships with an international agency (Vietnam's case) or private industry (Ghana's case) to increase ICT use in their pandemic response. Vietnam, a developing country where ICT infrastructure is less well established than in Korea or Singapore, has also actively used ICT for surveillance and contact tracing

(for example, the national electronic communicable disease surveillance system [eCDS]), risk information dissemination (with technologies such as the smartphone app called Việt Nam Health), and telemedicine and AI-based medical consultation programs to promote virtual medical examination and treatment (Bui et al. 2021). This was possible because the government already had an established public data collection and aggregation system. A long partnership with the US Centers for Disease Control and Prevention (CDC) provided an advantage in that virtual training and technical support through online platforms were available to support the government's COVID-19 response.

In Ghana, cooperative partnerships between the government and private start-up IT companies and universities helped with data acquisition for surveillance and to send communication alerts to the public regarding COVID-19 symptoms. Real-time data platforms (such as Opine) were accessible through mobile technology (such as Unstructured Supplementary Service Data), enabling individuals to self-report COVID-19 symptoms and share information with other stakeholders using visual infographics.

The use of ICT in RCC during the COVID-19 pandemic also revealed some challenges that required additional strategies, including: (i) protection of privacy and human rights while publicizing private information of contacts (including data obtained from GPS information from telecommunication companies, CCTV videos, and credit card transactions) (Kim 2021, Lee and Lee 2020), (ii) prevention of infodemics during wide-scale promotion of ICT technologies to help the public make informed decisions, and (iii) reduction of the digital divide in many populations or subpopulations (Lu 2001).

3. Credible communication by public leaders

Effective crisis management starts with national level leadership. A public leader should be perceived as credible and trustworthy in his or her communication. This requires transparency, honesty, and accountability. Acknowledging scientific uncertainty in an effective way is also important for reducing extreme public outrage (Coombs 2004). This was well demonstrated during the early phases of the COVID-19 pandemic, when scientific knowledge and precise information were evolving. Leaders were expected to be candid about the uncertainty, while still communicating clearly and instilling confidence in the message being shared.

In two comparative analyses of public leaders' risk communication among European countries (one study comparing France, Sweden, the UK, Germany, and Switzerland; and the other comparing Germany, Italy, Spain, and Sweden), messaging inconsistencies between the UK government and public health experts in the summer of 2020 were noted. For example, the government messages about supporting the economy, such as "Eat Out to Help Out" and "great British summer," conflicted with "Stay home, Protect NHS, Save lives."

The importance of clear and coordinated messaging by scientific experts and policy makers is exemplified in a study of 13,598 pandemic-relevant tweets, from 67 federal and state-level agencies and stakeholders in the US, posted from January to April 2020 (Wang et al. 2021). Inconsistencies and incongruencies were detected on four key topics (wearing masks, assessment of risks, stay-at-home orders, and disinfectants and sanitizers). The authors explained that communication congruence and consistency, and sufficiency of detailed information, is vital to appropriately motivate behaviors that help prevent infections like COVID-19.

4. Prevention of social stigma and infodemic during the COVID-19 pandemic

An issue that underscores the importance of RCC efforts in preventing infodemic is vaccine hesitancy (VH), a widespread public health concern during the COVID-19 pandemic. VH refers to the delay in acceptance despite availability of vaccination services; it is probably better understood as "a spectrum of concerns" related to decision-making surrounding vaccination (McGee and Suh 2019). Whereas developing countries faced difficulties acquiring vaccines and ensuring vaccine rollout, developed countries in Europe and the US struggled to convince their citizens that vaccines were safe and effective (Cardenas 2022). In a survey conducted in 2020 (Rozek et al. 2021), the vaccination acceptance rate among US participants (55.84 percent) was lower than that in Singapore (61.34 percent) and Vietnam (72.58 percent).

In a 2021 survey conducted by IPSOS, a global research company, on vaccination intention in 15 countries, vaccination intent was also lower in the US (71 percent agreed) than in the UK (89 percent agreed) and Korea (78 percent agreed).

Figures 4 and 5 demonstrate the drastic change in attitude toward vaccination among people living in high-income countries, especially in the Asia Pacific and the Global North regions. The willingness of unvaccinated people to get vaccinated was pronounced in countries with high vaccination rates.

Figure 4: Attitudes to COVID-19 Vaccinations in High-Income Countries (as of March 15, 2021)
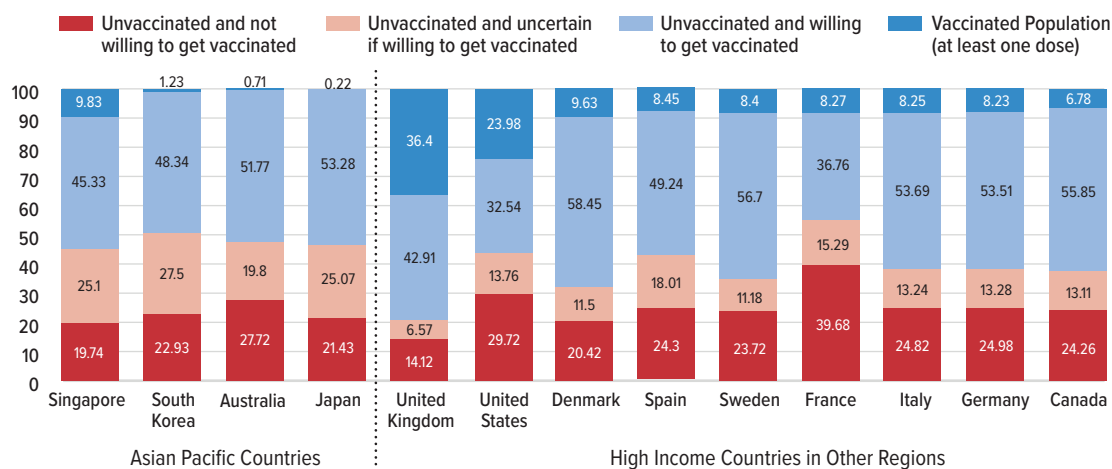
Sources: (Primary) Imperial College London YouGov Covid-19 Behaviour Tracker Data Hub; (Secondary) Our World in Data (OWID). https://ourworldindata.org/grapher/covid-vaccine-willingness-and-people-vaccinated-by-month?country=~FRA

Figure 5: Attitudes to COVID-19 Vaccinations in High-Income Countries (as of September 15, 2021)
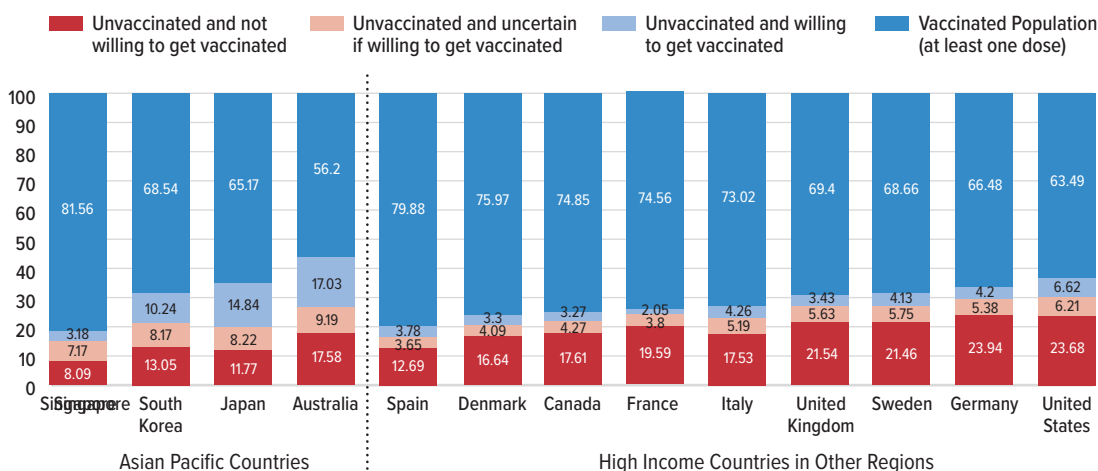
Note: Data for Singapore was as of August 15, due to limitations in data availability.

Sources: (Primary) Imperial College London YouGov Covid-19 Behaviour Tracker Data Hub; (Secondary) OWID. https://ourworldindata.org/grapher/covid-vaccine-willingness-and-people-vaccinated-by-month?country=~FRA

Vaccine hesitancy is complex and influenced by several factors, and this was starkly evident during the pandemic (Nguyen et al. 2022). These factors include cultural beliefs, ethnicity, trust in the health care provider, and vaccine-related factors (such as the source of manufacturing). The lack of culturally relevant and reassuring public health information can lead to anxiety and a lack of trust in health authorities (Troiano and Nardi 2021). In addition, rumors, myths, conspiracy theories, and other inaccurate and incomplete information on vaccination have resulted in "antivaccine" campaigns. Such misinformation was disseminated through online platforms (Facebook, Twitter, or YouTube) faster than the government's vaccination programs.

From a mental health perspective,
the stigmatization of COVID-19-infected
persons based on certain characteristics
(such as nationality) has led to psychological
stress, verbal and physical violence, and
hate crime (Gover et al. 2020).

McGee and Suh (2019) provided recommendations for vaccine hesitancy, suggesting that focusing on the vaccine-hesitant group rather than on antivaccination or provaccination groups is more effective. Early effective communication is vital to prevent individuals who are vaccine hesitant to become vaccine refusers. Strategic communication planners should acknowledge that antivaccine messaging is noted to be simpler to understand, more emotionally appealing, and easily available for people through social media.

During the pandemic, the fear of stigmatization has often led to a delay in getting tested or the propensity to provide false information to epidemiological investigators during contact tracing. From a mental health perspective, the stigmatization of COVID-19-infected persons based on certain characteristics (such as nationality) has led to psychological stress, verbal and physical violence, and hate crime (Gover et al. 2020).

Social stigma has been reported in the countries included in this analysis. Patients or health care workers who tested positive for COVID-19 were more likely to experience social stigma (Dye et al. 2020, Gutierrez et al. 2022, Tavernise and Oppel 2020) A longitudinal analysis of panel data from a nationally representative sample of US adults enrolled in the Understanding America Study (UAS) showed that COVID-19-associated discrimination (CAD) was higher among US residents who wore a mask before August 2020, but that later on in the pandemic, a reversed stigma was found (Kwon 2022).

In Korea, there were concerns about social stigma when large cluster infections were publicized through emergency text alert messages or when information shared included the patient's age, gender, geographical location, and places visited (Yi and Lee 2020).

Huda et al. (2020) provide insightful recommendations to mitigate misinformation and avoid infodemic and social stigma. These include strengthening government efforts, increasing the role of social media corporations, providing adequate education, training health care workers, creating an enabling environment, maintaining confidentiality, and strengthening laws.

5. Participatory RCC using community engagement strategies

Community engagement (CE) strategies in RCC during the COVID-19 pandemic have been emphasized, as they enable collaborative and inclusive participation of various stakeholders. Participatory RCC is important as there is a disparity in health, income, and other resources among people, and the gap makes a difference in risk of becoming infected with the virus and ability to recover from the disease.

An example of leveraging CE to address disparities among minority groups in the US is well described by McElfish et al. (2020). CE strategies were promptly employed in Northwest Arkansas, where the majority of the reported COVID-19 cases were identified as Latinx or Pacific Islanders. CE partnerships were used to address health challenges in underrepresented populations through an existing community-based participatory research network, consisting of members of the University of Arkansas for Medical Sciences (UAMS) and Latinx and Pacific Islander community leaders. Communication materials were developed and disseminated in English,

Spanish, and Marshallese (the native language of most Pacific Islanders in Northwest Arkansas). For COVID-19 testing and contact tracing, mobile testing teams were accompanied by bilingual staff at churches, worksites, and housing complexes. When individuals in the Pacific Islander and Latinx population tested positive and needed to stay home for self-quarantine, case management teams consisting of bilingual social workers, nurses, and community health navigators provided support services including essentials like food and medications, coordination with worksites, and community behavioral health services.

CE programs were also organized through social media platforms in many countries. For instance, there was a participatory campaign on social media in Korea—the #thank you challenge—that used sign language to show respect and gratitude to the dedicated health professionals and frontline health workers during the pandemic (ADB [Asian Development Bank] 2021).

CE in RCC is strongly recommended for countries with limited economic and health system resources, as engaged community groups can play an important role in facilitating residents' actions to reduce their risk of getting infected. Ghana's CE strategies included organizing online and in-person meetings and conversations by grassroots organizations, volunteers, and local faith-based support institutions. Executive briefings held with parliament and the media, relevant stakeholders, and community leaders were also conducted. Through cooperation with religious organizations in the community, a well-established network of community health officers and community volunteers provided outreach services for the isolated, quarantined, and vulnerable groups (Gilmore et al. 2020).

In Vietnam, there were CE efforts to improve science literacy among the lay public. The Oxford University Clinical Research Unit (OUCRU), a collaborative research network with Vietnam, Indonesia, and Nepal, provided virtual communication programs where the focus was on science communication. Young Vietnamese were engaged in "Online science debates," and digital youth engagement platforms such as Voices of Science were made available for sharing health research activities with students in Vietnam. During the lockdown, advisory group meetings and learning programs were made available to the citizens (Akintobi et al. 2020).

4. CONCLUSION

Effectiveness of government RCC during the COVID-19 pandemic has been contingent on: (i) time-sensitive dissemination of relevant information to the population in a nation; (ii) the nation's capacity for handling information and communication, establishing effective public-private ICT partnerships, and guaranteeing the protection of privacy and human rights; (iii) transparency in times of scientific uncertainty, and credibility in terms of the consistency and coherence of messages from public leaders who are in charge of crisis responses; (iv) communication efforts to prevent infodemic and social stigma through all phases of the pandemic; and (v) community engagement and participation to enable sustainable RCC as the pandemic persists.

5. RECOMMENDATIONS

1. **Government should rapidly initiate and implement effective RCC to identify and overcome barriers against preparedness and response to the next pandemic crisis.** Despite having relatively more resources, some high-income countries such as the US and the UK were not able to effectively disseminate risk information to their citizens due to an underestimation of the risk of COVID-19 among policy makers and political leaders. On the other hand, countries with a relatively recent experience of an outbreak were able to organize rapid and preemptive information sharing nationwide. These countries seem to have learned that outbreaks with newer contagions could very quickly threaten lives and challenge government legitimacy. This implies that for the world to be better prepared for the next PHEIC, governments need to be committed to learning from the challenges that hinder their ability to make sense of a crisis early on, when there are still plenty of uncertainties and unknowns, and to use RCC to reduce the impact of a crisis (Boin et al. 2020).

2. **National leaders are the key for credible communication to implement RCC.** The COVID-19 pandemic revealed the complexity surrounding the politically neutral role of public health and scientific advisory groups and their usefulness in helping governments, which are political entities, to respond to a pandemic. Governments need to find a better approach to ensure the independence of scientific risk assessment so as not to be influenced by political motives. At the same time, the scientific community must acknowledge increasing public demands on the transparency of the processes through which experts generate scientific evidence, review reports, and discuss cost-effectiveness of various policy measures and scenarios that they eventually recommend to the government for implementation. The cases show that inconsistency between a public leader's message and policy measures advised by scientific experts or health authorities negatively influences the credibility of RCC. A leader's capability for dealing with uncertainty, a defining characteristic of a crisis (Rosenthal, Charles, and 't Hart 1989), seems critical for credible RCC. An important government responsibility in ensuring credible RCC involves timely convening of multidisciplinary groups of experts and the facilitation of coordinated advice throughout a crisis.

3. **Leaders from public and private sectors should build trust and close partnership.** Given ample evidence on the usefulness of technological innovations and applications in fighting the pandemic, it will be important for governments to proactively build technology partnerships with private partners. Efforts to find the best fit to accommodate local regulatory environments are needed, particularly pertaining to challenges around security, privacy, ethics, and the digital divide.

4. **Those leading RCC need to be cognizant of and learn from the social stigma and discriminatory behaviors.** An emerging and evolving infectious disease can induce risk and uncertainty threatening social solidarity, as demonstrated during the COVID-19 pandemic. Governments should seek technical advice to identify vulnerable groups that could be stigmatized and discriminated against and ensure inclusion of their voices in anti-stigmatization campaigns and messages.

5. RCC plays a key role in effectively mobilizing and empowering diverse communities to engage in the efforts to mitigate the impact of COVID-19. **Community leaders and diverse minority groups should be engaged in collaborations with the government on a regular and routine basis.** This would enable existing partnerships to rapidly organize themselves when a response to a PHEIC is required. The involvement of academia, local governments, and private actors working together was demonstrated during the pandemic.

REFERENCES

ADB (Asian Development Bank). 2021. *The Republic of Korea's Coronavirus Disease Pandemic Response and Health System Preparedness*. September, 2021. Manila: ADB. https://www.adb.org/publications/republic-korea-coronavirus-disease-pandemic-response

Ahern, S., and E. Loh. 2021. "Leadership During the COVID-19 Pandemic: Building and Sustaining Trust in Times of Uncertainty." *BMJ Leader* 5(4): 266–69. doi:10.1136/leader-2020-000271

Atkinson, P., N. Gobat, S. Lant, H. Mableson, C. Pilbeam, T. Solomon, S. Tonkin-Crine, and S. Sheard. "Understanding the Policy Dynamics of COVID-19 in the UK: Early Findings From Interviews With Policy Makers and Health Care Professionals." *Social Science & Medicine* 266: 113423. https://doi.org/10.1016/j.socscimed.2020.113423

Aw, J., J. J. B. Seng, S. S. Y. Seah, and L. L. Low. 2021. "COVID-19 Vaccine Hesitancy—A Scoping Review of Literature in High-Income Countries." *Vaccines* 9: 900. https://doi.org/10.3390/vaccines9080900

Bajpai, Nirupam, John Biberman, and Yingxin Ye. 2020. "Technology-Led Growth and Development ICTs and Public Health in the Context of COVID-19, ICT India." Working Paper #30, April 2020. https://csd.columbia.edu/research-projects/ict-and-covid-19

Bakibinga-Gaswaga, E., S. Bakibinga, D. Bakibinga, and P. Bakibinga. 2020. "Digital Technologies in the COVID-19 Responses in Sub-Saharan Africa: Policies, Problems and Promises." *The Pan African Medical Journal* 35(Suppl 2): 38. https://doi.org/10.11604/pamj.supp.2020.35.2.23456

Bensing, J., S. van Dulmen, and K. Tates. 2003. "Communication in Context: New Directions in Communication Research. Patient Education and Counseling." 50(1): 27–32. https://doi.org/10.1016/s0738-3991(03)00076-4

Bheekhun, Z., G. Lee, and S. Camporesi. 2021. "Challenges of an 'Infodemic': Separating Fact From Fiction in a Pandemic." *International Emergency Nursing* 57: 101029. doi: 10.1016/j.ienj.2021.101029.

Boin, Arjen, Martin Lodge, and Marte Luesink. 2020. "Learning From the COVID-19 Crisis: An Initial Analysis of National Responses." *Policy Design and Practice* 3(3): 189–204. DOI: 10.1080/25741292.2020.1823670

Bui, L. V., S. T. Ha, H. N. Nguyen, T. T. Nguyen, T. P. Nguyen, K. Tran, T. V. Tran, T. H. Nguyen, T. H. Tran, N. D. Pham, and H. M. Bui. 2021. The Contribution of Digital Health in the Response to Covid-19 in Vietnam. *Frontiers in Public Health* 9. doi: 10.3389/fpubh.2021.672732

Cardenas, N. C. "'Europe and United States vaccine hesitancy'": Leveraging Strategic Policy for 'Infodemic' on COVID-19 Vaccines." *Journal of Public Health* (Oxford) 44(2): e315-e316. doi: 10.1093/pubmed/fdab228

Chen, A., and K. Thio. 2021. "Exploring the Drivers and Barriers to Uptake for Digital Contact Tracing. *Social Sciences and Humanities Open* 4(1): 100212. https://doi.org/10.1016/j.ssaho.2021.100212

Chen J. I., J. C. Yap, L. Y. Hsu, and Y. Y. Teo. 2020. "COVID-19 and Singapore: From Early Response to Circuit Breaker." *Annals of the Academy of Medicine, Singapore* 49(8): 561–72.

Coombs, W. T. 2004. "Impact of Past Crises on Current Crisis Communications: Insights From Situational Crisis Communication Theory."*Journal of Business Communication* 41: 265–89.

Dye, T. D., L. Alcantara, S. Siddiqi, M. Barbosu, S. Sharma, T. Panko, and E. Pressman. 2020. Risk of COVID-19-related bullying, harassment and stigma among healthcare workers: an analytical cross-sectional global study. *BMJ Open* 10(12): e046620. doi: 10.1136/bmjopen-2020-046620.

Eslami, P., S. R. Niakan Kalhori, and M. Taheriya. 2021. "eHealth Solutions to Fight Against COVID-19: A Scoping Review of Applications." *Medical Journal of the Islamic Republic of Iran* 35: 43. doi: 10.47176/mjiri.35.43

Eum, N.J., and S. H. Kim. 2022. The Role of Information and Communications Technology Policies and Infrastructure in Curbing the Spread of the Novel Coronavirus: Cross-country Comparative Study *JMIR Public Health Surveillance* 8(1): e31066 doi: 10.2196/31066

Gilmore, B., R. Ndejjo, A. Tchetchia, et al. 2020. "Community Engagement for COVID-19 Prevention and Control:A Rapid Evidence Synthesis." *BMJ Global Health* 5: e003188.

Goffman, Erving. 1963. *Stigma: Notes on the Management of Spoiled Identity.* New York: Simon and Schuster.

Google. 2013. *Our Mobile Planet.* Think with Google. In Richter, F. 2013. *The Average Smartphone User Has Installed 26 Apps.* Statista. Retrieved from https://www.statista.com/chart/1435/top-10-countries-by-app-usage/

Gover, A.R., S.B. Harper, and L. Langton. 2020. Anti-Asian Hate Crime During the COVID-19 Pandemic: Exploring the Reproduction of Inequality. *American Journal of Criminal Justice* 45(4): 647-667. doi: 10.1007/s12103-020-09545-1.

Henry Akintobi, T., T. Jacobs, D. Sabbs, K. Holden, R. Braithwaite, L. N. Johnson, et al. 2020. "Community Engagement of African Americans in the Era of COVID-19: Considerations, Challenges, Implications, and Recommendations for Public Health." *Preventing Chronic Disease* 17: 200255. http://dx.doi.org/10.5888/pcd17.200255

Hodges, R., E. Caperchione, and J. van Helden. 2022. The Role of Scientific Expertise in COVID-19 Policymaking: Evidence from Four European Countries. *Public Organization Review* 22: 249–267 https://doi.org/10.1007/s11115-022-00614-z

Huda, M. N., R. Islam, M. O. Qureshi, S. Pillai, and S. Z. Hossain. 2020. "Rumours and Social Stigma as Barriers to the Prevention of Coronavirus Disease (COVID-19): What Solutions to Consider?" *Global Biosecurity* 1(4). https://doi.org/10.31646/gbio.78

Hyland-Wood, B., J. Gardner, J. Leask, and U. K. H. Ecker. 2021. "Toward Effective Government Communication Strategies in the Era of COVID-19." *Humanities and Social Sciences Communications* 8(30). https://doi.org/10.1057/s41599-020-00701-w

IRGC (International Risk Governance Center). 2017. *Introduction to the IRGC Risk Governance Framework* (revised version). Lausanne: Ecole Polytechnique Federale de Lausanne/IRGC. 10.5075/epfl-irgc-233739

KFF (Kaiser Family Foundation). 2020. "Poll: Most Americans Say President Trump Is Intervening With the FDA's and CDC's Coronavirus Work, But Trust the Agencies at Least a Fair Amount to Do the Right Thing," KFF newsroom, October 20, 2020. https://www.kff.org/coronavirus-covid-19/press-release/poll-most-americans-say-president-trump-is-intervening-with-the-fdas-and-cdcs-coronavirus-work-but-trust-the-agencies-at-least-a-fair-amount-to-do-the-right-thing/

Kim, Younsik. 2021. "Uncertain Future of Privacy Protection Under the Korean Public Health Emergency Preparedness Governance Amid the COVID-19 Pandemic." *Cogent Social Sciences* 8(1). https://doi.org/10.1080/23311886.2021.2006393

Kwon, S. L., and J. Oh. 2022. "COVID-19 Vaccination Program in South Korea: A Long Journey Toward a New Normal." *Health Policy and Technology* 11(2): 100601. https://doi.org/10.1016/j.hlpt.2022.100601

Lavazza A., and M. Farina. 2020. The Role of Experts in the Covid-19 Pandemic and the Limits of Their Epistemic Authority in Democracy. *Front Public Health* 8:356. doi: 10.3389/fpubh.2020.00356. PMID: 32760690; PMCID: PMC7372112.

Lee, T., and H. Lee. 2020. "Tracing Surveillance and Auto-Regulation in Singapore: 'Smart' Responses to COVID-19." *Media International Australia* 177(1): 47—60. https://doi.org/10.1177/1329878X20949545

Lee, Y. C., L. A. Malcein, and S. C. Kim. 2021. "Information and Communications Technology (ICT) Usage During COVID-19: Motivating Factors and Implications." *International Journal of Environmental Research and Public Health* 18(7): 3571. doi: 10.3390/ijerph18073571. PMID: 33808218; PMCID: PMC8036312

Lu, M. 2001. "Digital Divide in Developing Countries." *Journal of Global Information Technology Management* 4(3): 1–4. DOI: 10.1080/1097198X.2001.10856304

Luhmann, N. 1979. *Trust and Power.* Wiley.

Mahmood, S., K. Hasan, M. Colder Carras, and A. Labrique. 2020. "Global Preparedness Against COVID-19: We Must Leverage the Power of Digital Health." *JMIR Public Health and Surveillance* 6(2): e18980. doi: 10.2196/18980

McElfish, P., A. Cleek, D. Willis, R. Purvis, and L. James. 2021. "Leveraging Community Engagement Capacity to Address COVID-19 Disparities Among Pacific Islander and Latinx Communities in Arkansas." *Journal of Clinical and Translational Science* 5(1): E81. doi:10.1017/cts.2020.562

McGee, L. U., and J. Suh. 2019. "Communication Strategies to Address Vaccine Hesitancy in Healthcare Settings and on Social Media." *Journal of Applied Research on Children: Informing Policy for Children at Risk* 10(2) Article 7. https://digitalcommons.library.tmc.edu/childrenatrisk/vol10/iss2/7

Michie, Philip Ball, James Wilsdon & Robert West (2022): Lessons from the UK's handling of Covid-19 for the future of scientific advice to government: a contribution to the UK Covid-19 Public Inquiry, Contemporary Social Science, DOI: 10.1080/21582041.2022.2150284

Nelson, T., N. Kagan, C. Critchlow, A. Hillard, and A. Hsu. 2020. "The Danger of Misinformation in the COVID-19 Crisis." *Missouri Medicine* 117(6): 510–12.

MOHW (Ministry of Health and Welfare of Korea). 2020. "COVID-19 Outbreak in Korea." Press release, May 5, 2020, MOHW, Sejong, Korea. http://www.mohw.go.kr/react/al/sal0301vw.jsp?PAR_MENU_ID=04&MENU_ID=0403&page=1&CONT_SEQ=354363

Nguyen, L. H., A. D. Joshi, D. A. Drew, et al. 2022. "Self-Reported COVID-19 Vaccine Hesitancy and Uptake Among Participants From Different Racial and Ethnic Groups in the United States and United Kingdom." *Nature Communications* 13: 636. https://doi.org/10.1038/s41467-022-28200-3

Noh, J. W., K. B. Yoo, Y. D. Kwon, J. H. Hong, Y. Lee, and K. Park. 2020. "Effect of Information Disclosure Policy on Control of Infectious Disease: MERS-CoV Outbreak in South Korea." *International Journal of Environmental Research and Public Health* 17(1): 305. doi: 10.3390/ijerph17010305.

Odone, A., V. Gianfredi, S. Sorbello, M. Capraro, B. Frascella, G. P. Vigezzi, and C. Signorelli. "The Use of Digital Technologies to Support Vaccination Programmes in Europe: State of the Art and Best Practices From Experts' Interviews." *Vaccines (Basel)* 9(10): 1126. doi: 10.3390/vaccines9101126.

Paek, H.-J., and T. Hove. 2021. "Information Communication Technologies (ICTs), Crisis Communication Principles and the COVID-19 Response in South Korea." *Journal of Creative Communications* 16(2): 213–21. https://doi.org/10.1177/0973258620981170

Pascual-Ferrá, P. N. Alperstein, D. J. Barnett, and R. N. Rimal. 2021. "Toxicity and Verbal Aggression on Social Media: Polarized Discourse on Wearing Face Masks During the COVID-19 Pandemic." *Big Data & Society* 8(1). https://doi.org/10.1177/20539517211023533

Pew Research Center. 2018. Spring 2018 Survey Data. Pew Search Center. https://www.pewresearch.org/global/dataset/spring-2018-survey-data/

Rosenthal, Uriel, Michael T. Charles, and Paul 't. Hart, eds. 1989. *Coping with crises: The management of disasters, riots, and terrorism.* Springfield: Charles C Thomas Pub Limited.

Rozek, Laura, Pauline Jones, Anil Menon, Allen Hicken, Samantha Apsley, and Elizabeth King. 2021. "Understanding Vaccine Hesitancy in the Context of COVID-19: The Role of Trust and Confidence in a Seventeen-Country Survey." *International Journal of Public Health* 66 (May 14, 2021). DOI=10.3389/ijph.2021.636255

Rutledge, P. E. 2020. "Trump, COVID-19, and the War on Expertise." *The American Review of Public Administration* 50(6–7): 505–11. https://doi.org/10.1177/0275074020941683

Sauer, M. A., S. Truelove, A. K. Gerste, and R. I. Limaye. 2021. "A Failure to Communicate? How Public Messaging Has Strained the COVID-19 Response in the United States." *Health Security* 19(1): 65–74. doi: 10.1089/hs.2020.0190.

Soldano, G. J., J. A. Fraire, J. M. Finochietto, et al. 2021. "COVID-19 Mitigation by Digital Contact Tracing and Contact Prevention (App-based Social Exposure Warnings)." *Scientific Reports* 11(14421). https://doi.org/10.1038/s41598-021-93538-5

Sotgiu, G., and C. C. Dobler. 2020. "Social Stigma in the Time of Coronavirus Disease 2019." *European Respiratory Journal* 56(2): 2002461. doi: 10.1183/13993003.02461-2020.

Tan, J. B., M. J. Cook, P. Logan, L. Rozanova, and A. Wilder-Smith. 2020. "Singapore's Pandemic Preparedness: An Overview of the First Wave of COVID-19." *International Journal of Environmental Research and Public Health* 18(1): 252. doi: 10.3390/ijerph18010252.

Tambo, Ernest, Ingrid C. Djuikoue, Gildas K. Tazemda, Michael F. Fotsing, and Xiao-Nong Zhou. 2021. "Early Stage Risk Communication and Community Engagement (RCCE) Strategies and Measures Against the Coronavirus Disease 2019 (COVID-19) Pandemic Crisis. *Global Health Journal* 5(1): 44–50. https://doi.org/10.1016/j.glohj.2021.02.009

Tien Thanh, P., and L. Thanh Tung. 2022. "The Role of Government Risk Communication in Public Health Emergencies: Evidence From the COVID-19 Pandemic." *Transforming Government: People, Process and Policy* 16(3): 277–91. https://doi.org/10.1108/TG-01-2022-0009

Troiano, G., and A. Nardi. 2021. "Vaccine Hesitancy in the Era of COVID-19." *Public Health* 194: 245–51. doi: 10.1016/j.puhe.2021.02.025

UK Government Communication Service. 2021. *UK Government Communication Plan 2021/2022: Build Back Better.* UK Government Communication Service. https://communication-plan.gcs.civilservice.gov.uk/wp-content/uploads/2021/03/UK-Government-Communication-Plan-2021_22_FINAL_WEB.pdf

UN ESCAP (United Nations Economic and Social Commission for Asia and the Pacific). 2021. *Combating COVID-19 with ICT: Effective practices and policies in the Asia-Pacific region.* ESCAP Policy Brief. Bangkok: ESCAP. https://hdl.handle.net/20.500.12870/4516

Vaughan E., and T. Tinker. 2009. "Effective Health Risk Communication About Pandemic Influenza for Vulnerable Populations." *American Journal of Public Health* 99(Suppl 2): S324–32. doi: 10.2105/AJPH.2009.162537

Winograd, D., C. Fresquez, M. Egli, E. Peterson, A. Lombardi, A. Megale, Y. Cabrera, T. Michael, M. Verile, A. Phillips, J. Breland, S. Santos, and L. McAndrew. 2021. "Rapid Review of Virus Risk Communication Interventions: Directions for COVID-19, Patient Education and Counseling." 104(8): 1834–59. https://doi.org/10.1016/j.pec.2021.01.024

Wang, Y., H. Hao, and L. S. Platt. 2021. "Examining Risk and Crisis Communications of Government Agencies and Stakeholders During Early-Stages of COVID-19 on Twitter." *Computers in Human Behavior*. 114:106568. doi: 10.1016/j.chb.2020.106568

Yi, J., and W. Lee. 2020. "Pandemic Nationalism in South Korea." *Society* 57: 446–51. https://doi.org/10.1007/s12115-020-00509-z

Xu, J., and C. Liu. 2021. "Infodemic vs. Pandemic Factors Associated to Public Anxiety in the Early Stage of the COVID-19 Outbreak: A Cross-Sectional Study in China." *Frontiers in Public Health* 9: 723648. DOI=10.3389/fpubh.2021.723648