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# Role of Primary Care and Challenges for Public–Private Cooperation during the Coronavirus Disease 2019 Pandemic: An Expert Delphi Study in South Korea

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**Purpose:** The aim of this study was to explore the role of primary care facilities and their support measures in response to coronavirus disease 2019 (COVID-19) and to identify challenges to achieving public–private cooperation in South Korea.

**Materials and Methods:** Twenty-four leading experts were selected and recruited to participate in this iterative web-based Delphi study. An open-ended questionnaire was administered to collect the expert panel's views in the first round. In the second round, the panel was asked to rate on a 5-point Likert scale their agreement with individual items gleaned from qualitative content analysis of views expressed in the first round. The participants were offered the opportunity to reevaluate and correct their initial responses in subsequent rounds. Responses in the second and following rounds were analyzed using quantitative descriptive statistics.

**Results:** The first and second rounds were completed by 54.2% (n=13/24) and 58.3% (n=14/24) of the selected panel, respectively, while 10 out of these 14 participants completed the third round. The panel cited in-person essential medical services, telehealth for fever/respiratory symptoms, surveillance for influenzae-like illness, and minimization of spread to staff as important and appropriate roles of primary care, which are urgent and feasible during a pandemic. Regarding conditions/support for these roles, the panel indicated that institutional support and funding for separate areas, workforce, and telehealth, along with public-private collaborative governance, are urgent, but not feasible.

**Conclusion:** This study provides guidance on strategies for continuing the required roles of primary care and highlights a need to strengthen public-private partnerships during pandemic events in Korea.

**Key Words:** Primary care, COVID-19, pandemics, Delphi technique.

## INTRODUCTION

Coronavirus disease 2019 (COVID-19) has spread worldwide since 2020. It is expected to continue to spread rapidly, owing to the emergence of new viral genetic variants and uncertainty about their characteristics.[1-3] With over 10 million confirmed cases of COVID-19 and approximately 2.5 million deaths, the disease poses significant threats to the general health status of people globally.[4,5] Although some countries have initiated vaccination programs, existing quarantine measures, including physical distancing, preemptive testing, and lockdown, are still

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being implemented to reduce disease spread in most countries influenced by COVID-19. Nevertheless, it is essential to prepare for the probable long-term existence of the COVID-19 pandemic.[6,7] And, policymakers must continue to prepare for COVID-19 outbreaks by setting clear roles for primary care facilities.[8-12]

The healthcare system in South Korea is characterized by a heavy reliance on private sector providers, with approximately 90% of all medical institutions operated as independent private facilities, with mostly being solo practices.[13-15] Under such unique circumstances, primary care facilities have acted in limited roles during the COVID-19 outbreak in South Korea through the provision of temporary volunteering support.[16,17] Therefore, investigating the roles of primary care facilities and their preparedness during this public health crisis could help with developing better quarantine measures.

The present Delphi study was conducted to explore the views of relevant leading experts on the role of primary care facilities and their support measures in response to COVID-19 and to identify challenges to achieving public–private cooperation in South Korea.

## MATERIALS AND METHODS

### Study overview

The Delphi method is a tool for collecting and coordinating relevant experts' views on a specific issue and for reaching compelling agreement through several rounds of deliberation.[18,19] We aimed to achieve a consensus among experts after revising opinions through an iterative survey technique using the Delphi method. We attempted to overcome the monopoly or bandwagon effect of face-to-face discussions by allowing experts to express their opinions free from the influence and persuasion of others by utilizing web-based surveys that guaranteed anonymity.[18-20]

In this study, selected opinions from an expert panel were collected through an unstructured open questionnaire in the first round, which were then categorized and converted into a structured questionnaire for the second round. Subsequently, the panel was provided the opportunity to reassess each initial response and provide feedback in the next round.[19] Repeated rounds were conducted until stability was achieved in the panel's responses.[20]

This study was granted ethical approval by the Institutional Review Board of Chung-Ang University (ref: 1041078-202009-HRBM-268-01) before sending informed consent forms and survey questionnaires to all experts.

### Panel of experts

The following process was employed to select and recruit panel members: 1) Potential candidates were recommended by certified professional organizations from related fields. 2) Experts with significant academic achievements and those with experience and expertise in public health, infectious diseases, primary care, and/or related fields were selected. 3) Participants belonging to various occupational categories were selected to create a heterogeneous panel. This was expected to facilitate the collection of diverse viewpoints on the given issue and finally to develop integrated approaches to COVID-19 response, thus providing more credible findings than those collected from a homogenous panel.[18,21] 4) Snowball sampling was employed to encourage potential panel members from our pool to send invitations to other relevant potential participants.[22] 5) Accordingly, the panel of experts participating in this study compiled a list of approximately 24 prospective candidates.

The targeted panel size was determined based on prior evidence-based recommendations for achieving optimal content validity and reliability of results. Accordingly, we aimed to recruit more than 10 individuals participants from multiple areas of expertise to account for attrition of participants between rounds.[21,23] The selected 24 potential panel members were approached via e-mail to invite them to participate in this study. We also made a phone call to inform them about the study before sending the e-mail. Once they confirmed that they understood the contents of the study and agreed to participate, the study was conducted through an online questionnaire.[24] The panel members were given a small reward at the completion of each round of the online questionnaire to encourage them to participate in the survey.

### Study procedures

We conducted three rounds of surveys and data collection. Panel members were given 1 to 2 weeks to respond to each round. Prior to their implementation, the questionnaire used in each round was revised based on comments of outside reviewers proficient in public health and the findings of the preceding Delphi round. A flow chart of the process employed in this Delphi study is presented in Fig. 1.

This study was conducted by employing an online survey using Google Forms (Google Inc., Mountain View, CA, USA), web-based survey administration software. In the first round, a questionnaire comprising 10 open-ended items was sent to the selected experts via e-mail, and unstructured response forms were used and collected. The items were presented in the following four sections: 1) role of a primary care facility during COVID-19 and reasoning in support thereof (1 question); 2) conditions that enable a primary care facility to perform said role and supported reasoning (4 questions); 3) support measures required by the primary care facility to perform said role and supported reasoning (4 questions); and 4) factors necessary to establish a public–private partnership (1 question). Based on these responses, a structured questionnaire was created through content analysis for subsequent rounds that comprised 51 items across the following three sections: 1) the role of a primary care facility during the COVID-19-related

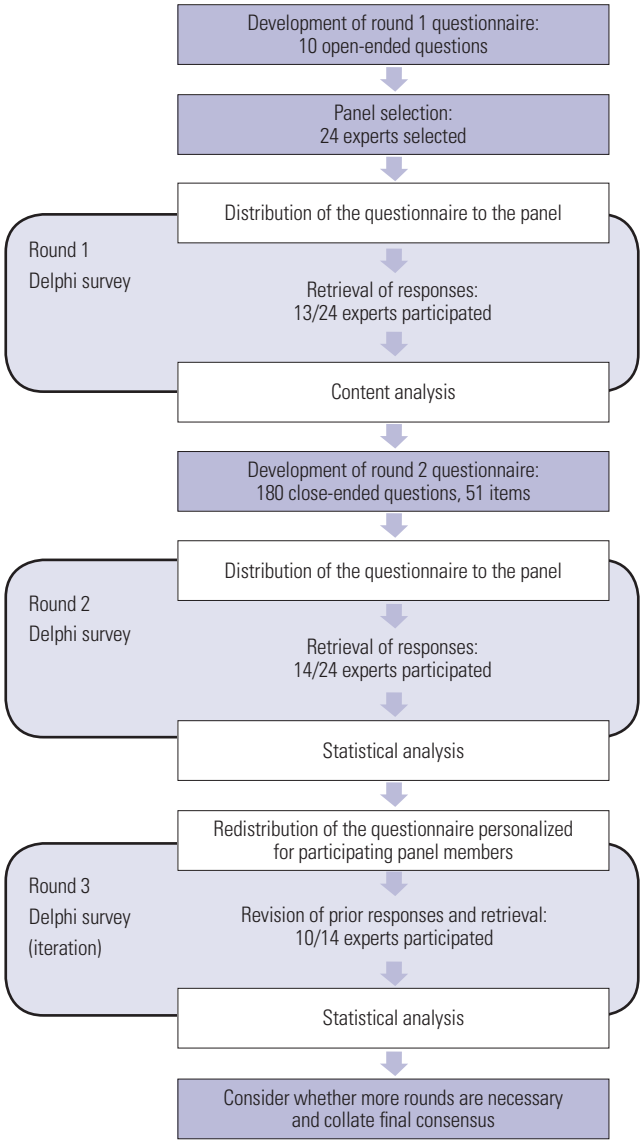


**Fig. 1.** Flow chart of the process used in the Delphi study.

public health crisis (14 items); 2) the conditions that enabled a primary care facility to perform the role (13 items); and 3) support measures required by a primary care facility to perform the role (24 items).

In the second round, a closed-ended questionnaire was distributed to participating panel members using the same online method as in the first round. They were asked to rate their agreement with each item using a 5-point Likert scale (1 to 5 points) ranging from "strongly agree" (5 points) to "strongly disagree" (1 point). The higher the score, the more positive the corresponding item was rated; a score of 3 points was judged as neutral. In addition, the panel was requested to determine which organization was the most responsible for each item, as an appropriate support entity, among primary care facilities, local medical associations representing physicians in the primary care sector in their community, and central/local government in the jurisdiction. The retrieved responses were analyzed statistically. In the next round, a questionnaire comprising the same questions as those used in the second round was readministered to the participants. In this round, they were provided the analyzed results and their responses from the previous round, and they were offered the opportunity to reevaluate and correct their responses (Fig. 1).

### Data analysis and statistical methods

The responses retrieved from the first round in this Delphi study were summarized and examined through qualitative content analysis. The factors reported by the panel were derived and categorized into several items that were used in the questionnaire for the subsequent rounds. The 5-point Likert scale ratings collected in the second and third rounds of this study were coded and analyzed through quantitative descriptive statistics using IBM SPSS Statistics 26 (IBM Corp., Armonk, NY, USA). Mean scores and standard deviations were computed for the following indicators corresponding to each question: importance, appropriateness, urgency, and feasibility. Responses with a mean score of 4.0 or higher were considered to represent agreement among the participants with the corresponding item. The panel was requested to identify the support entity responsible for each item considering a primary care facility's ability to perform these roles during the COVID-19 pandemic.

A Delphi study is conducted in an iterative fashion to reach consensus, and therefore, stability and reliability were estimated to determine whether additional rounds were necessary in this study. Stability refers to the degree of agreement between participant responses on each question. The panel is considered to exhibit agreement when a certain level of stability is reached.[19,25] As the first round was a brainstorming process for collecting ideas using an open-ended questionnaire, stability was measured only for the second and third rounds using coefficients of variation (CV). Consensus was confirmed when the CV value was less than 0.5.[25] A CV value below this cutoff is considered to indicate that no further round of survey is required, while that ranging from 0.5 to 0.8 is considered relatively stable.[25] Reliability was verified using Cronbach's alpha, which measures the internal consistency of items. An absolute value of 0.7 or higher is deemed to indicate optimal degree of consistency between the items in the given round.[26]

## RESULTS

The first round was completed by 54.2% of the selected panel participants (n=13/24). The second round was completed by 14 out of the 24 experts (58.3% response rate), while 10 out of these 14 participants completed the third round (Fig. 1). The demographic characteristics of the participating panel of experts are presented in Table 1. All participants had a minimum


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**Table 1.** Demographic Characteristics of Panel Participants

| Characteristics | Round 1 (n=13) | Round 2 (n=14) | Round 3 (n=10) |
|---|---|---|---|
| Age (yr) | | | |
| 40–49 | 4 (30.8) | 4 (28.6) | 3 (30) |
| 50–59 | 8 (61.5) | 7 (50.0) | 5 (50) |
| 60–69 | 1 (7.7) | 3 (21.4) | 2 (20) |
| Affiliation | | | |
| Public healthcare institution (public general hospital, public health center) | 2 (15.4) | 4 (28.6) | 3 (30) |
| Private hospital (university hospital) | 6 (46.2) | 4 (28.6) | 3 (30) |
| Local medical association (primary care facility) | 5 (38.5) | 6 (42.9) | 4 (40) |
| Job title | | | |
| Professor | 7 (53.8) | 6 (42.9) | 5 (50) |
| Primary physician | 5 (38.5) | 6 (42.9) | 4 (40) |
| Public officer | 1 (7.7) | 2 (14.3) | 1 (10) |
| Work experience | | | |
| 10–19 yr | 3 (23.1) | 3 (21.4) | 2 (20) |
| 20–29 yr | 6 (46.2) | 7 (50.0) | 5 (50) |
| 30 yr or more | 4 (30.8) | 4 (28.6) | 3 (30) |

Data are presented as n (%).

of 10 years of experience in relevant fields and belonged to various areas of expertise (Table 1).

In this study, the responses obtained from the third round were considered as the final results, with a high level of reliability and acceptable stability to indicate consensus. The datasets for the second and third rounds are presented in Supplementary Tables 1 and 2 (only online). A summary of the final results is presented in Tables 2 to 4. Among the items pertaining to the role of primary care facilities during COVID-19, telehealth service for fever/respiratory symptoms, enhancing existing surveillance, preventing the spread of infection among staff, and maintaining in-person essential medical services were considered appropriate, important, feasible, and urgent (mean scores of 4.4, 4.3, 4.5, and 4.1; 4.5, 4.2, 4.3, and 4.1; and 4.7, 4.9, 4.3, and 4.3; 4.5, 4.8, 4.4, and 4.1 for each indicator of appropriateness, importance, feasibility, and urgency, respectively) (Table 2). Conditions that enabled the facility to perform its roles were divided into three sub-categories: facility, equipment/system, and workforce. The panel considered the following items as important, urgent, and feasible: personal protective equipment (PPE), infection prevention protective equipment, infection control education among staff, and simulated training to enable staff to respond to an infection (mean scores of 5.0, 5.0, and 5.0; 5.0, 5.0, and 4.9; 4.9, 4.9, and 4.7; and 4.7, 4.6, and 4.7 for each indicator of importance, feasibility, and urgency, respectively) (Table 3). The government was identified as the most appropriate support entity that could enable primary care facilities to perform their roles during the COVID-19 pandemic. The support measures required to perform the roles were divided into five sub-categories: organization, facility, equipment/system, workforce, and policy. The following items were assessed as important, urgent, and feasible: establishment of a medical delivery system; supply of PPE; supply of infection prevention protective equipment; infection control education support; training for response; infection control fees; and provision of response manuals (mean scores of 4.9, 4.0, and 4.8; 4.6, 5.0, and 4.9; 4.7, 4.9, and 4.9; 4.9, 5.0, and 4.9; 4.7, 4.7, and 4.8; 4.6, 4.0, and 4.8; and 4.4, 4.7, and 4.3 for each indicator of importance, feasibility, and urgency, respectively) (Table 4).

Of the 180 questions in the second round, the panel reached a consensus on 96.7% (174/180 questions), with CV values lower than 0.5. In the final round, consensus was achieved on 99.4% (179/180 questions) of the 180 questions, with CV values lower than 0.5. The only item with a CV value higher than 0.5 was that on the feasibility of diagnostic testing with reverse-transcription polymerase chain reaction (CV 0.52), as indicated in Table 2. The Cronbach's alpha values were 0.95 for the second and third rounds. The results of the third round were confirmed to meet pre-defined criteria of stability and reliability of the achieved consensus. Therefore, the study was deemed complete, without the need for conducting further rounds of survey.

## DISCUSSION

We conducted a Delphi study to explore the views of relevant leading experts on the role of primary care facilities and the required support measures in wake of the COVID-19 pandemic in South Korea. To our knowledge, this is the first study outline conditions related to preparedness during the COVID-19 pandemic in the context of primary care, considering the distinctive healthcare system of South Korea.

In this pandemic-related public health crisis, our experts indicated that maintaining in-person essential medical services

**Table 2.** Expert Panel's Scores on the Appropriateness, Importance, Feasibility, and Urgency of the Roles of Primary Care Facilities in the COVID-19-Related Public Health Crisis*

| Category | Item No. | Item | Appropriateness | | Importance | | Feasibility | | Urgency | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean† (SD) | CV | Mean (SD) | CV | Mean (SD) | CV | Mean (SD) | CV |
| Early detection of infectious diseases | 1.01 | Healthcare services for fever/respiratory symptoms: "face-to-face" | 3.8 (0.6) | 0.2 | 4.3 (0.7) | 0.2 | 3.7 (0.7) | 0.2 | 3.9 (0.9) | 0.2 |
| | 1.02 | Healthcare services for fever/respiratory symptoms: "telehealth" | 4.4 (1.0) | 0.2 | 4.3 (1.3) | 0.3 | 4.5 (1.0) | 0.2 | 4.1 (1.3) | 0.3 |
| | 1.03 | Diagnostic testing for infection: RT-PCR | 2.6 (1.1) | 0.4 | 2.8 (1.3) | 0.5 | 2.6 (1.4) | 0.5 | 2.8 (1.2) | 0.4 |
| | 1.04 | Diagnostic testing for infection: rapid antigen | 3.4 (1.1) | 0.3 | 3.2 (1.1) | 0.4 | 3.6 (0.8) | 0.2 | 3.3 (1.3) | 0.4 |
| | 1.05 | Diagnostic testing for infection: rapid antibody | 3.4 (1.1) | 0.3 | 2.8 (1.1) | 0.4 | 3.5 (1.2) | 0.3 | 2.9 (1.3) | 0.4 |
| | 1.06 | Enhancing existing surveillance, such as for influenza-like illnesses | 4.5 (0.7) | 0.2 | 4.2 (0.8) | 0.2 | 4.3 (1.0) | 0.2 | 4.1 (0.9) | 0.2 |
| Preventing transmission of infectious diseases | 1.07 | Monitoring and management of patients under self-isolation | 4.1 (0.9) | 0.2 | 4.2 (0.9) | 0.2 | 3.5 (1.5) | 0.4 | 3.3 (1.1) | 0.3 |
| | 1.08 | Measures to prevent the spread of infection among healthcare workers | 4.7 (0.5) | 0.1 | 4.9 (0.3) | 0.1 | 4.3 (0.5) | 0.1 | 4.3 (0.7) | 0.2 |
| | 1.09 | Education and consultation on infectious diseases for local residents and visiting patients | 4.3 (0.7) | 0.2 | 4.2 (0.8) | 0.2 | 4.0 (0.7) | 0.2 | 3.9 (0.7) | 0.2 |
| Treatment of infectious diseases | 1.10 | Monitoring and management of patients at living treatment centers | 3.7 (0.8) | 0.2 | 3.6 (0.7) | 0.2 | 3.4 (1.2) | 0.4 | 3.1 (0.9) | 0.3 |
| | 1.11 | Treatment of confirmed cases with mild symptoms | 3.1 (1.0) | 0.3 | 3.0 (0.9) | 0.3 | 2.4 (1.1) | 0.5 | 2.5 (0.9) | 0.3 |
| Support in response to infectious diseases | 1.12 | Maintaining the delivery of essential medical services via telehealth: for patients with non-infection or existing chronic conditions | 4.5 (0.5) | 0.1 | 4.5 (0.5) | 0.1 | 4.1 (1.0) | 0.2 | 3.8 (1.0) | 0.3 |
| | 1.13 | Maintaining the delivery of face-to-face essential medical services: for patients with non-infection or existing chronic conditions | 4.5 (0.5) | 0.1 | 4.8 (0.4) | 0.1 | 4.4 (0.8) | 0.2 | 4.1 (0.9) | 0.2 |
| | 1.14 | Volunteer medical services according to the seriousness of the situation (supporting screening clinics, etc.) | 4.2 (0.6) | 0.2 | 4.3 (0.7) | 0.2 | 3.3 (0.8) | 0.3 | 3.5 (0.9) | 0.2 |

SD, standard deviation; CV, coefficient of variation; RT-PCR, reverse-transcription polymerase chain reaction.
*The presented scores were assigned during the final Delphi round, †A 5-point Likert scale was used by the expert panel for rating the appropriateness, importance, feasibility, and urgency of each item, with 5=strongly agree, 4=slightly to moderately agree, 3=neutral, 2=slightly to moderately disagree, and 1=strongly disagree.

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**Table 3.** Expert Panel's Scores on the Importance, Feasibility, and Urgency of and Selected Support Entities for Primary Care Facilities to Perform Their Roles in the COVID-19-Related Public Health Crisis*

| Category | Item No. | Item | Importance | | Feasibility | | Urgency | | Support entity (n)‡ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean† (SD) | CV | Mean (SD) | CV | Mean (SD) | CV | Primary care facility | Local medical association | Central/local government |
| Facility | 2.01 | Separation of space within the primary care facility to segregate suspected cases from others | 4.5 (0.5) | 0.1 | 2.3 (1.0) | 0.4 | 3.5 (1.1) | 0.3 | 1 | 1 | 8 |
| | 2.02 | Separate dedicated toilets | 3.9 (0.6) | 0.2 | 1.9 (0.9) | 0.5 | 2.5 (1.0) | 0.4 | 1 | - | 9 |
| | 2.03 | Accessibility facilities for individuals with disabilities (slope, elevator, etc.) | 3.5 (0.9) | 0.2 | 2.3 (0.7) | 0.3 | 2.8 (0.6) | 0.2 | 1 | - | 9 |
| Equipment/ system | 2.04 | Personal protective equipment (mask, gloves, etc.) | 5.0 (0.0) | 0.0 | 5.0 (0.0) | 0.0 | 5.0 (0.0) | 0.0 | 2 | 1 | 7 |
| | 2.05 | Infection prevention protective equipment (thermometer, hand sanitizer, acrylic plate, etc.) | 5.0 (0.0) | 0.0 | 5.0 (0.0) | 0.0 | 4.9 (0.3) | 0.1 | 2 | 1 | 7 |
| | 2.06 | Simple diagnostic test with high sensitivity and specificity | 3.7 (0.8) | 0.2 | 3.6 (0.8) | 0.2 | 3.9 (0.7) | 0.2 | 7 | - | 3 |
| | 2.07 | Telehealth system | 4.1 (0.7) | 0.2 | 3.1 (1.0) | 0.3 | 4.1 (0.7) | 0.2 | 1 | 1 | 8 |
| | 2.08 | Integrated healthcare services appointment system§ | 3.7 (0.8) | 0.2 | 2.9 (0.9) | 0.3 | 3.4 (0.7) | 0.2 | - | 1 | 9 |
| | 2.09 | Open wireless networks | 3.8 (0.8) | 0.2 | 3.2 (0.6) | 0.2 | 3.2 (0.8) | 0.3 | 1 | - | 9 |
| Workforce | 2.10 | Infection control education for healthcare workers | 4.9 (0.3) | 0.1 | 4.9 (0.3) | 0.1 | 4.7 (0.5) | 0.1 | 2 | 3 | 5 |
| | 2.11 | Simulated training for healthcare providers to enable them to respond to the infection crisis | 4.7 (0.5) | 0.1 | 4.6 (0.5) | 0.1 | 4.7 (0.5) | 0.1 | 2 | 3 | 5 |
| | 2.12 | Workforce for quarantine (in-facility infection prevention and environmental disinfection) | 3.9 (1.2) | 0.3 | 2.9 (1.3) | 0.4 | 3.8 (1.1) | 0.3 | 1 | 1 | 8 |
| | 2.13 | Two or more doctors | 2.6 (0.8) | 0.3 | 1.8 (0.8) | 0.4 | 1.8 (0.6) | 0.4 | 8 | - | 2 |

SD, standard deviation; CV, coefficient of variation.
*The presented scores were assigned during the final Delphi round, †A 5-point Likert scale was used by the expert panel for rating the importance, feasibility, and urgency of each item, with 5=strongly agree, 4=slightly to moderately agree, 3=neutral, 2=slightly to moderately disagree, and 1=strongly disagree, ‡The data are as the number of panel members who responded to the corresponding choices, §Community-wide integrated appointment platform for healthcare services of patients with specific conditions, such as vaccination and fever/respiratory symptoms.

**Table 4.** Expert Panel's Scores on the Importance, Feasibility, and Urgency of Support Measures with Which to Perform Primary Care Facility Roles in the COVID-19-Related Public Health Crisis*

| Category | Item No. | Item | Importance | | Feasibility | | Urgency | |
|---|---|---|---|---|---|---|---|---|
| | | | Mean† (SD) | CV | Mean (SD) | CV | Mean (SD) | CV |
| Organization | 3.01 | Public–private collaborative governance | 4.7 (0.7) | 0.1 | 3.8 (0.8) | 0.2 | 4.5 (0.7) | 0.2 |
| | 3.02 | Establishment of a medical delivery system (including a patient transfer system) | 4.9 (0.3) | 0.1 | 4.0 (0.9) | 0.2 | 4.8 (0.4) | 0.1 |
| Facility | 3.03 | Support for the expenses incurred in the separation of space for distancing within the primary care facility | 4.5 (0.9) | 0.2 | 3.4 (1.1) | 0.3 | 4.0 (1.2) | 0.3 |
| | 3.04 | Support for the expenses incurred in the installation of separate dedicated toilets | 3.9 (0.9) | 0.2 | 2.9 (1.0) | 0.3 | 3.4 (1.0) | 0.3 |
| | 3.05 | Support for the expenses incurred in the installation of accessibility facilities for individuals with disabilities | 3.7 (1.0) | 0.3 | 2.3 (1.0) | 0.4 | 2.9 (0.7) | 0.3 |
| Equipment/ system | 3.06 | Supply of personal protective equipment | 4.6 (1.0) | 0.2 | 5.0 (0.0) | 0.0 | 4.9 (0.3) | 0.1 |
| | 3.07 | Supply of infection prevention protective equipment | 4.7 (0.7) | 0.1 | 4.9 (0.3) | 0.1 | 4.9 (0.3) | 0.1 |
| | 3.08 | Development and dissemination of a simple diagnostic test with high sensitivity/specificity | 3.7 (0.7) | 0.2 | 3.9 (1.0) | 0.3 | 3.8 (1.0) | 0.3 |
| | 3.09 | Provide equipment for telehealth systems | 4.0 (0.7) | 0.2 | 3.4 (1.1) | 0.3 | 3.5 (1.3) | 0.4 |
| | 3.10 | Support for medical service appointment systems | 3.6 (0.8) | 0.2 | 3.1 (1.1) | 0.4 | 3.3 (1.2) | 0.4 |
| | 3.11 | Support for (the costs of) open wireless networks | 3.3 (0.8) | 0.3 | 3.5 (1.2) | 0.3 | 3.3 (1.1) | 0.3 |
| Workforce | 3.12 | Infection control education support for healthcare workers | 4.9 (0.3) | 0.1 | 5.0 (0.0) | 0.0 | 4.9 (0.3) | 0.1 |
| | 3.13 | Simulated training for healthcare workers to enable them to respond to infection | 4.7 (0.5) | 0.1 | 4.7 (0.5) | 0.1 | 4.8 (0.4) | 0.1 |
| | 3.14 | Providing supporting personnel or covering expenses for personnel recruitment | 4.1 (0.7) | 0.2 | 3.2 (1.0) | 0.3 | 4.0 (0.9) | 0.2 |
| | 3.15 | Support for the joint opening of the clinic (tax benefit, etc.) | 3.9 (1.0) | 0.3 | 3.2 (1.2) | 0.4 | 3.6 (1.1) | 0.3 |
| | 3.16 | Support plan for the workforce in an emergency | 4.5 (0.5) | 0.1 | 3.6 (1.1) | 0.3 | 3.8 (1.0) | 0.3 |
| Policy | 3.17 | Establishment of infection control fees | 4.6 (0.5) | 0.1 | 4.0 (1.2) | 0.3 | 4.8 (0.4) | 0.1 |
| | 3.18 | Providing incentives for infection control education and simulated training | 4.6 (0.5) | 0.1 | 3.8 (1.1) | 0.3 | 4.6 (0.5) | 0.1 |
| | 3.19 | Establishment of legal grounds for support to primary care facilities in the pandemic | 4.6 (0.5) | 0.1 | 3.7 (1.2) | 0.3 | 4.6 (0.5) | 0.1 |
| | 3.20 | Doctor registration program | 3.8 (0.8) | 0.2 | 2.9 (0.9) | 0.3 | 3.9 (0.7) | 0.2 |
| | 3.21 | Provision of manuals on response to the pandemic (by situation and facility, etc.) | 4.4 (0.7) | 0.2 | 4.7 (0.5) | 0.1 | 4.3 (1.0) | 0.2 |
| | 3.22 | Incentives for telehealth | 4.3 (0.7) | 0.2 | 3.9 (0.7) | 0.2 | 4.2 (0.6) | 0.2 |
| | 3.23 | Incentives for medical services appointment systems | 3.8 (1.0) | 0.3 | 3.3 (1.1) | 0.3 | 3.7 (1.0) | 0.3 |
| | 3.24 | Policy for encouraging the culture of public–private mutual trust and respect | 4.6 (0.7) | 0.2 | 3.5 (1.1) | 0.3 | 4.3 (0.5) | 0.1 |

SD, standard deviation; CV, coefficient of variation.
*The presented scores were assigned during the final Delphi round, †A 5-point Likert scale was used by the expert panel for rating the importance, feasibility, and urgency of each item, with 5=strongly agree, 4=slightly to moderately agree, 3=neutral; 2=slightly to moderately disagree, and 1=strongly disagree.

is an important and appropriate role of primary care facilities that is both urgent and feasible. Considering the prolonged pandemic circumstances, current research and guidelines in several countries have increasingly emphasized that primary care needs to be adapted to maintain essential healthcare services, including the management of non-COVID-19-related noncommunicable diseases (NCDs) in the community.[1,27] A survey conducted among 194 countries in May 2020 reported that healthcare services for NCDs have been severely disrupted since the COVID-19 pandemic began.[28] Accordingly, several countries have included essential health services in their national COVID-19 response plan.[27,29]

Our experts focused more on reinforcing primary care practices related to the implementation of basic quarantine measures, including minimizing the risk of spread among healthcare workers and enhancing existing surveillance for influenza-like illnesses, to protect the community from the risk of transmission and the strengthening of existing barriers, rather than performing active and aggressive interventional roles, such as diagnostic testing and curative management for patients who are highly suspected or confirmed to have COVID-19. The panel also mentioned that face-to-face medical services for fever/respiratory


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symptoms are not appropriate under the current primary care circumstances, although such services are important. These findings differed from the role assigned to other higher-level medical facilities or public healthcare institutions. This may be because the participants considered the vulnerability of the South Korean primary care system in terms of the availability of a capable workforce and separate areas for quarantine.[13-15] In contrast, some countries, such as Singapore and Australia, have executed swift and proactive responses at the primary care level, including the implementation of new models of care and innovation, such as redirecting patient flow through dedicated respiratory clinics.[11]

The experts reported that some items, including management of patients under self-isolation, provision of volunteer support at screening clinics, and offering essential medical services via telehealth, were important and appropriate, but not urgent, at the time of the present study. However, this assessment may change as circumstances evolve, in which the disease continues to move into a long-term pattern. Therefore, relevant authorities need to perform careful and regular monitoring to ensure the ongoing implementation of timely responses that cater to constantly changing situations.

With reference to the conditions or institutional support required to enable primary care facilities to fulfill their roles during the pandemic, the experts acknowledged the urgent need for supporting the expenses involved in structuring separate areas for segregating suspected cases from others within the facility to ensure continuity of care in a safe environment. Similarly, provision of institutional support and funding for hiring a temporary workforce was identified as important and urgent. These findings suggest that the present participants believed that few primary care facilities in South Korea met such conditions. In the current healthcare system, primary care services are mostly provided by the private sector, and they are paid retrospectively based on a Fee-for-Service system as a part of the national health insurance. Consequently, primary care providers have few other special incentives to focus on infection control or health prevention during the pandemic.[15,30] Some countries have arranged for or planned additional financial support to compensate healthcare providers for their efforts, stress, and strains of working during the pandemic and to cover for losses in income or revenue and extra expenses due to COVID-19.[29] Therefore, it is essential to provide financial support for the development of a long-term plan to maintain the quality of existing primary care services through public–private cooperation among medical institutions during the COVID-19 pandemic.[29]

Telehealth systems were also identified as an important and urgent condition that would aid primary care facilities in fulfilling their roles. Additionally, they acknowledged the importance and urgency of providing healthcare services for fever/respiratory symptoms via this system. However, it was not assessed to be feasible in the primary care setting. To mitigate the gap in this condition, our panel identified the provision of equipment and incentives for the use of telehealth as important support measures. In South Korea, medical consultation and prescription through mobile phones have been allowed temporarily since the outbreak of the COVID-19 pandemic. However, discrepancies have been reported in the satisfaction and acceptability perceived by the users and providers of such services.[31] Accordingly, it is important to provide financial support to both patients and providers to encourage the reasonable use of telehealth. General practitioners in England can receive reimbursement for setting up or enhancing their telehealth-related equipment and capacity.[11] Some countries have started providing additional fees for services related to COVID-19 responses, reimbursing extra spending, covering fixed expenses, or setting incentives for primary care physicians who use telehealth.[11,29] However, as telehealth systems are, as of yet, unable to replace face-to-face medical services, it is important to identify methods that can aid in effective and safe application of telehealth using evidence-based guidelines.[12,32]

A consensus among the panel participants was expressed regarding appropriate support entities that can help primary care facilities in fulfilling their roles. In this regard, central/local governments were identified as the most important entity for all conditions. Relevant national health authorities or local governments should focus on items with limited feasibility, but high importance and urgency. Additionally, they should identify barriers to the achievement of these conditions. To facilitate response support measures and overcome related barriers, relevant laws need to be developed or adapted appropriately and swiftly.

The present participants also exhibited consensus on the importance and urgency of implementing public–private collaborative governance accompanied by a policy encouraging coordinated partnerships between relevant national health departments and primary care facilities in the community. This is currently a common global concern. A study conducted in England reported that primary care is inadequately represented at the strategic level in coping with ongoing challenges related to the pandemic.[5,11] Advisory committees in the United Kingdom have predominantly included public health and specialist care stakeholders, without the inclusion of practicing general practitioners.[5,11] It is essential to include primary care facilities in efforts to develop a coherent strategy on managing COVID-19. To achieve this, ongoing communications need to involve primary care, public health, and secondary/tertiary care facilities as part of strong community networks.

There were some limitations to the present study. As with all Delphi studies, there is no guarantee of objectivity in the panel's views. However, the opinions were collected systematically from experts in this study. Unfortunately, not all invited participants proceeded to complete all three rounds of this study, and the participants' response rate was not high in the third round, which might result in some level of response bias and might impact the generalizability of our findings. However,

we obtained statistical confirmation of consensus among our panel on items that were regarded as important. Although the participants were invited using various methods, including telephone and e-mail, a relatively limited number of experts in the public sector participated due to the urgent public health crisis at the time. However, our panel comprised leading experts with various medical backgrounds and sufficient experience in related fields. In general, the reliability of a Delphi study is dependent on the professional knowledge of the participants.[33] Because this study was conducted before the recent third wave of COVID-19 in South Korea, there may be discrepancies in the cited roles of primary care facilities and their related conditions, especially in terms of urgency. This study was tailored to the situation of South Korea. Therefore, it may be difficult to apply these findings directly to other countries. Nevertheless, this study highlighted the need for developing evidence-based strategies and tailored policies to support healthcare systems during the COVID-19 pandemic in South Korea. The results of this study may be somewhat superficial or less specific to put into practice. In the future, in-depth studies on detailed disturbing or contributing factors for each item found in this study need to be conducted to determine strategies with which to enable effective infection control and preparedness in the community.

This study provides guidance on strategies for enabling primary care facilities to fulfill their roles during the COVID-19 pandemic. Additionally, it highlights the need for strengthening community partnerships between the public and private sectors in the healthcare system. Although the COVID-19 pandemic has become a major challenge globally, especially because there is no evidence of a cure for the disease, it has brought meaningful lessons on the importance of primary care. The suggestions obtained from the present study could enable primary care facilities to better cope with pandemic-related challenges. Such preparedness during this public health crisis could guarantee the availability of a health safety net for the community in the near future.

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Conceptualization: Won Lee and Jung-ha Kim. Data curation: Woo-young Shin, Won Lee, and Jung-ha Kim. Formal analysis: Woo-young Shin, Won Lee, and Jung-ha Kim. Funding acquisition: Jung-ha Kim. Investigation: all authors. Methodology: Changsoo Kim, Won Lee, and Jung-ha Kim. Project administration: Jung-ha Kim. Resources: Woo-young Shin and Jung-ha Kim. Software: Woo-young Shin. Supervision: Changsoo Kim, Sei Young Lee, Won Lee, and Jung-ha Kim. Validation: Changsoo Kim, Sei Young Lee, and Won Lee. Visualization: Woo-young Shin and Jung-ha Kim. Writing—original draft: Woo-young Shin and Jung-ha Kim. Writing—review & editing: all authors. Approval of final manuscript: all authors.

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