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Healthcare Policy Agenda for a Sustainable Healthcare System in Korea: Building Consensus Using the Delphi Method

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ABSTRACT

Background: The purpose of this study is to suggest priority tasks necessary for building a sustainable healthcare system in Korea based on the Delphi consensus among healthcare professionals.

Methods: Twenty-five items covering the three categories that make up healthcare policy (healthcare demand, supply, and environment) were selected based on a literature evaluation. Email surveys were also analyzed using a two-round modified Delphi method. Of 59 experts, 21 completed the first and second rounds. Each item asked about the degree of importance and urgency, and the answers were rated on a 9-point Likert scale. A coefficient of variation less than 50% for each item in the Delphi survey meant that consensus was reached. Only items that meet a predetermined threshold are prioritized (agreement ≥ 90%, average importance score and urgency score ≥ 6.5).

Results: Eight items that satisfy all three criteria were set as priorities for a sustainable healthcare system. These tasks are "Securing the financial soundness of the National Health Insurance (NHI)," "Solving the problem of low fertility," "Strengthening response to public health crises such as infectious or environmental diseases," "Bio-health technology innovation using D.N.A (Data, Network, AI)," "Intensive management of dementia patients," "Mental healthcare and suicide prevention," "Reform of the operation structure of the NHI Service," and "Reform the healthcare delivery system and payment system."

Conclusion: The eight items for which consensus was reached in this study should be prioritized for Korea's sustainable healthcare system. Health policy makers will need to put considerable effort into researching and establishing these priorities.

Keywords: Healthcare Policy; Sustainability; Delphi Method; Agenda

INTRODUCTION

The healthcare system in Korea is facing a rapidly changing environment. Its aging population, accompanied by a high prevalence of chronic diseases, has increased medical

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expenditures and emphasized the importance of prevention.[1] The coronavirus disease-2019 (COVID-19), which started in 2020, has threatened human lives for more than two years.[2] Along with the Middle East respiratory syndrome (MERS) in 2015, COVID-19 has prevented the healthcare system from focusing on the treatment of chronic disease. Together with the 4th industrial revolution, these changes in the healthcare environment became an opportunity to emphasize the role of information and communications technology (ICT) in the prevention, diagnosis, treatment, and rehabilitation of disease.[3]

The "Iron Triangle" of healthcare, often referred to in public health policy, consists of cost, quality, and accessibility. Alternatively, some scholars refer to equity (access by need and not by ability to pay), efficiency (generating incentives to reduce costs and improve quality), and cost as the "Iron Triangle" of healthcare.[4] The most ideal public health policy is achieved when the three components are balanced.[5] In other words, if a country's healthcare is sustainable, it can be assumed that the tensions in the three areas are being maintained at an optimal level. However, paradoxically, this means that improvements in one aspect of healthcare will always affect the other two. Therefore, for maintaining the sustainability of healthcare, it is crucial to balance the "Iron Triangle" by analyzing the current healthcare environment and supplementing the deficiencies.

In Korea, the areas in which the government focused on health policies differed according to the times. From the Korean War to the 1980s, improving accessibility was the top priority. In the 1990s, reduction of medical costs and improvement of quality became the center of health policy. Afterward, in the 2000s, the accessibility was emphasized again through strengthening health insurance coverage; in the 2010s, the improvement of quality, including quality evaluation, was again emphasized. As such, the area of the "Iron Triangle" that needs to be focused on depends on the circumstances of the times in which the country is located.

The World Health Organization (WHO) emphasized the need for a national vision, policy direction, and strategies to ensure public health.[6] In 2019, the UK set the innovation direction for their healthcare system through the "NHS Long Term Plan." The plan includes shifting to a service model that provides more options and better support. It aims to provide appropriate combined care in an optimal setting, which can help prevent disease and address health inequality by creating a more financially sustainable healthcare system. Technology upgrades and digitally enabled care are also part of the plan.[7] In 2015, Japan also released the report "Japan Vision: Healthcare 2035" to present its basic ideology, vision, and action plans for the establishment of a desirable healthcare system. In the report, lean healthcare, lean design, and global health leaders are set as key concepts for healthcare in 2035, with emphasis on the importance of value-based healthcare and an empowered society.[8] In Korea, the national health promotion plan based on the National Health Promotion Act has been continuously established and implemented, but plans for development of health and medical services stipulated in the Framework Act on Health and Medical Services has not been established 20 years after the law was enacted.[9]

As the development of the National Health Policies, Strategies and Plans differs according to the political, historical, and socio-economic circumstances of the country,[6] the policies of other countries can only be used as a reference. Moreover, even if a healthcare policy suitable for Korea's situation is established, its implementation would require numerous resources. Therefore, there is a need to prioritize reaching a consensus on the highest-priority model for the implementation of a sustainable healthcare system.

The purpose of this study is to achieve consensus on the most important and urgent topics in Korea to maximize the sustainability of its healthcare system using the Delphi method. The study contributes to the formation of the research agenda in the field.

METHODS

Tools and development of questionnaire

The Delphi approach refers to a structured, iterative process of gathering and summarizing opinions from experts in a field. It aims to reach a consensus on a specific issue and create a forecast based on these expert opinions.[10] This study was designed using a 2-staged Delphi method through a structured questionnaire. The Delphi method provides the advantage of anonymity, which reduces the likelihood that some participants will change their responses based on the opinions of highly influential experts.[11]

First, the top 25 out of 80 topics on the development of Korea's healthcare system were selected from previous research as tasks for sustainable healthcare.[12] Using the framework of the healthcare system developed based on Kleczhowski's guidance,[13,14] 130 policy agendas were discovered in 11 areas constituting the healthcare system, and 80 topics were selected through expert discussion. Subsequently, 25 topics evaluated to be of high importance were selected in the previous study through a questionnaire in which 78 healthcare professionals participated,[12] and these topics were set as tasks for the sustainable healthcare system of this study. They were selected from three key categories: healthcare demand, supply, and environment. Details on topic selection are described in **Supplementary Data 1**.

Expert opinions on the importance and urgency of the 25 items were collected to achieve consensus. Consensus was reached when the coefficient of variation (CV) was less than 0.5 (50%) with respect to the points of importance and urgency of each topic.

The experts responded to structured questions using a 9-point Likert scale. They were allowed to provide their individual opinions under the "Other suggestions" portion of the questionnaire. Each item was associated with two questions. The first was "How important do you think this topic is for a sustainable healthcare system? Please rank its importance on a scale of 9 (most important) to 1 (least important)." The second question was "How urgent do you think this topic is for a sustainable healthcare system? Please rank its urgency on a scale of 9 (most urgent) to 1 (least urgent)."

Survey and participants

Researchers and participants communicated via email. No face-to-face meetings or conference calls were held. Researchers provided potential participants with an explanation of the goals of consensus building through the Delphi survey and the topics were selected. In addition, potential participants were informed via email about the purpose of the study and how to participate. An email was sent to each potential participant containing the first survey wherein they were asked to evaluate the importance and urgency of the 25 items. Only those who completed the first survey received an email for the second survey. The second survey included the participants' own scores for each of the 25 items in the first survey, as well as the mean and quartiles of the scores given by all participants.

Table 1. Characteristics of Delphi surveyees

Characteristics	Respondent
	First & second round (n = 21)
Age, yr	
50–59	9 (42.9)
60–69	10 (47.6)
≥ 70	2 (9.5)
Affiliations	
National Academy of Medicine of Korea	13 (61.9)
Korean Academy of Medical Sciences	8 (38.1)
Field of study	
Basic medicine	7 (33.3)
Clinical medicine	14 (66.7)
Final degree	
PhD or higher	21 (100.0)
Working period in healthcare field	
20–29 yr	11 (52.4)
More than 30 yr	10 (47.6)

Values are presented as number(%).

Emails were sent to 59 experts, among whom 21 (36%) completed the first survey. We selected healthcare professionals to serve as executives in two different organizations: National Academy of Medicine of Korea (n = 33) and Korean Academy of Medical Sciences (n = 26). The second survey was commissioned by 21 experts who completed the first survey. All 21 experts who completed the first survey also responded to the second one, resulting in a 100% response rate. The characteristics of Delphi surveyees are presented in **Table 1**. Delphi respondents included seven professors of basic medicine. In addition, clinicians have been active in their respective fields for more than 20 years, and they indirectly influence health policies in various positions. No further surveys were required as the CVs did not exceed 0.5 for any topic in the secondary survey.

Data analysis

The process of data analysis is depicted in **Fig. 1**. The priority items were selected based on predetermined thresholds for three criteria: agreement, importance, and urgency. The following thresholds were established to determine whether participants agreed on the importance or urgency of each item: If ≥ 90% of the experts gave a score ≥ 6, the item was defined as having been agreed upon in terms of importance or urgency. The thresholds for importance and urgency were reached if the items had an average score of 6.5 or higher. Items satisfying these thresholds were selected as priority tasks for a sustainable healthcare system in Korea.

Based on these predetermined thresholds, we decided that only those items that satisfy the agreement on importance, average score ≥ 6.5 on importance, agreement on urgency, and average score ≥ 6.5 on urgency will be considered as priority tasks. The ranking was selected by considering only importance and urgency scores among the priority tasks. Secondary priority tasks were defined as items with an average score ≥ 6.5, with agreement in only one category among importance and urgency.

Ethics statement

This study adhered to the tenets of the Declaration of Helsinki and was approved by the Institutional Review Board (IRB) of National Evidence-based Healthcare Collaborating Agency (NECA IRB no. 21-071-1). Written informed consent was obtained from all participants.
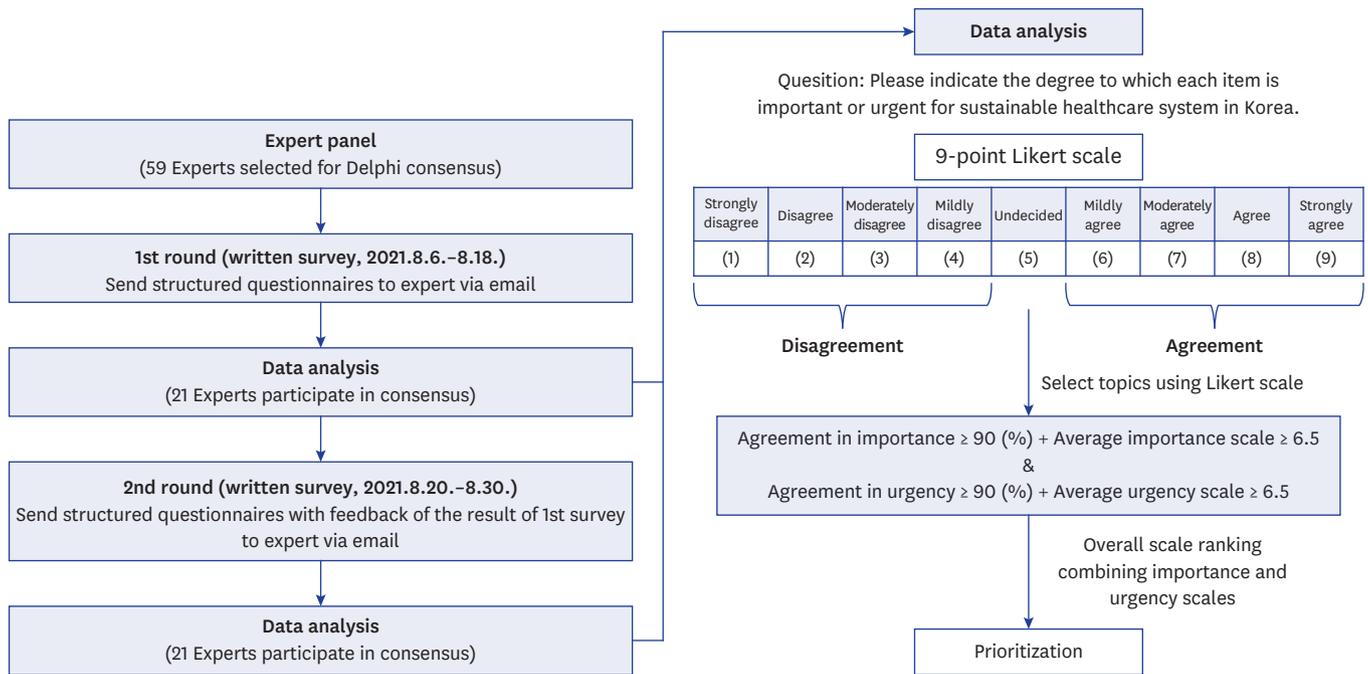
Fig. 1. Details of modified Delphi consensus process.

RESULTS

The results of the first Delphi survey are presented in the **Table 2**. In the importance category, "Solving the problem of low fertility," "Securing the financial soundness of the National Health Insurance," and "Strengthening response to public health crises such as infectious or environmental diseases" ranked 1st to 3rd, respectively. In the urgency category, "Strengthening response to public health crises such as infectious or environmental diseases" took 1st place. Although the rankings in the urgency category differed compared to the importance category, the top three items were the same.

Table 3 shows the second Delphi result, which is the final result of converging consensus. On one hand of the 25 topics, 11 items (3 in the healthcare demand section, 3 in the supply section, and 5 in the environment section) satisfy an average of 6.5 or higher in importance and 90% or higher in agreement of importance. On the other hand, in the urgency category, only eight items exceeded the threshold and contributed to the selection of priorities.

We selected eight topics that obtained agreement for both importance and urgency, and each had an average score of 6.5 or higher as priority tasks for a sustainable healthcare system in Korea (**Table 4**). The priorities are listed in the overall scale ranking as follows: "Securing the financial soundness of the National Health Insurance," "Solving the problem of low fertility," "Strengthening response to public health crises such as infectious or environmental diseases," "Bio-health technology innovation using D. N. A (Data, Network, AI)," "Intensive management of dementia patients," "Mental healthcare and suicide prevention," "Reform of the operation structure of the National Health Insurance Service," and "Reform the healthcare delivery system and payment system."

Table 2. Results of first round in Delphi survey

No.	Section	Topic	Importance scale	Urgency scale
1	Healthcare demand	Solving the problem of low fertility	7.95	7.57
2		Intensive management of dementia patients	7.24	7.24
3		Mental healthcare and suicide prevention	7.19	7.14
4		Health promotion to prevent chronic diseases	6.76	6.24
5		Integrated care of chronic diseases centered on primary care and community	6.71	6.48
6		Customized care using ICT	6.57	6.57
7		Securing the right to self-determination of health	6.57	5.81
8		Creating a healthy environment and system	5.90	5.67
9	Healthcare supply	Bio-health technology innovation using D.N.A (Data, Network, AI)	7.29	6.86
10		Reform the healthcare delivery system and payment system	7.00	6.71
11		Supply and training of health and medical personnel	7.00	6.90
12		Redefining the role of healthcare delivery system and medical institutions	6.76	6.81
13		Expansion of research funds for healthcare	6.76	7.05
14		Unification of the licensing system for doctors and oriental medicine doctors	6.24	5.24
15		Community care with a focus on healthcare	6.05	5.43
16		Integration of healthcare and welfare resources with a focus on healthcare	5.86	5.29
17	Environment	Securing the financial soundness of the National Health Insurance	7.76	7.62
18		Strengthening response to public health crises such as infectious or environmental diseases	7.43	7.81
19		Establishment of the Ministry of Health and reorganization of related institutions	7.33	6.76
20		Reform of the operation structure of the National Health Insurance Service	7.19	6.90
21		Consideration of health in all policies	6.43	5.71
22		Strengthening the health and medical capacity of local governments through establishment of regional health departments, etc.	6.33	6.00
23		Strengthening the link between medical insurance and social security	5.81	5.43
24		Development and promotion of policies to become a global leader in healthcare	5.76	5.29
25		Research and planning of healthcare policy for Korean unification	5.33	4.76

Topics are sorted according to the importance scale of each section.
ICT = information and communications technology.

Table 3. Results of second round in Delphi survey

No.	Section	Topic	Importance scale	Agreement (%): importance	Urgency scale	Agreement (%): urgency
1	Healthcare demand	Solving the problem of low fertility	7.95	95.24	7.71	95.24
2		Intensive management of dementia patients	7.19	95.24	7.33	90.48
3		Mental healthcare and suicide prevention	7.10	95.24	7.14	95.24
4		Health promotion to prevent chronic diseases	6.90	85.71	6.29	76.19
5		Integrated care of chronic diseases centered on primary care and community	6.62	80.95	6.33	76.19
6		Securing the right to self-determination of health	6.38	76.19	6.00	66.67
7		Customized care using ICT	6.29	80.95	6.33	85.71
8		Creating a healthy environment and system	5.95	66.67	5.71	61.90
9	Healthcare supply	Bio-health technology innovation using D.N.A (Data, Network, AI)	7.48	95.24	7.10	95.24
10		Reform the healthcare delivery system and payment system	7.05	90.48	6.90	90.48
11		Supply and training of health and medical personnel	7.00	85.71	6.76	80.95
12		Redefining the role of healthcare delivery system and medical institutions	6.95	95.24	6.81	80.95
13		Expansion of research funds for healthcare	6.71	80.95	7.10	85.71
14		Unification of the licensing system for doctors and oriental medicine doctors	6.38	71.43	5.62	61.90
15		Community care with a focus on healthcare	5.81	66.67	5.19	42.86
16		Integration of healthcare and welfare resources with a focus on healthcare	5.76	71.43	5.19	42.86
17	Environment	Securing the financial soundness of the National Health Insurance	7.95	95.24	7.76	95.24
18		Strengthening response to public health crises such as infectious or environmental diseases	7.43	95.24	7.76	100.00
19		Establishment of the Ministry of Health and reorganization of related institutions	7.38	90.48	6.95	85.71
20		Reform of the operation structure of the National Health Insurance Service	7.14	90.48	6.95	90.48
21		Consider health in all policies	6.57	90.48	5.62	57.14
22		Strengthening the health and medical capacity of local governments through establishment of regional health departments, etc.	6.19	71.43	5.95	71.43
23		Strengthening the link between medical insurance and social security	5.86	71.43	5.38	57.14
24		Develop and promote policies to become a global leader in healthcare	5.76	61.90	5.29	52.38
25		Research and plan healthcare policy for Korean unification	5.29	52.38	4.71	33.33

Topics are sorted according to the importance scale of each section.
ICT = information and communications technology.

Table 4. Priority innovation plans for sustainable healthcare system of Korea

Ranking	Topic	Category	Overall scale (importance & urgency)
Priority tasks			
1	Securing the financial soundness of the National Health Insurance	Environment	7.86
2	Solving the problem of low fertility	Healthcare demand	7.83
3	Strengthening response to public health crises such as infectious or environmental diseases	Environment	7.60
4	Bio-health technology innovation using D.N.A (Data, Network, AI)	Healthcare supply	7.29
5	Intensive management of dementia patients	Healthcare demand	7.26
6	Mental health care and suicide prevention	Healthcare demand	7.12
7	Reform of the operation structure of the National Health Insurance Service	Environment	7.05
8	Reform the healthcare delivery system and payment system	Healthcare supply	6.98
Secondary priority tasks			
1	Establishment of the Ministry of Health and reorganization of related institutions	Environment	7.17
2	Redefining the role of healthcare delivery system and medical institutions	Healthcare demand	6.88

The following items were selected as secondary priority tasks because agreement was obtained and the average score was 6.5 or higher for the importance category, but the threshold for the urgency category was not satisfied: "Establishment of the Ministry of Health and reorganization of related institutions," and "Redefining the role of healthcare delivery system and medical institutions."

The item with the highest CV in the 2nd Delphi survey was the unification of the licensing system (0.384) in the importance category, so no additional survey was needed.

DISCUSSION

The balance between access, quality, and costs, which constitutes the "Iron Triangle" of healthcare, is the most important factor in the sustainability of the healthcare system. The premise for balancing the three areas is to diagnose the current healthcare situation in Korea, find out where it is lagging, and solve it. Compared with Organisation for Economic Co-operation and Development (OECD) countries, Korea has good access to healthcare.[15] In particular, Korea ranks first among OECD countries in terms of vaccination rate and number of outpatient visits. In terms of quality of care, the 5-year survival rate for cancer is good, but the quality of mental health and primary care is poor. Moreover, it is necessary to consider the continuously increasing healthcare expenditure.[16]

Under these circumstances, this study proposed priority tasks for a sustainable healthcare system in Korea using the Delphi method. To establish and promote healthcare policies, a healthcare policy framework (model) is needed. Among several published healthcare policy models, we used the model that synthesized the WHO[13,17] and OECD models[18] based on Aday et al.'s model[19] for policy evaluation as the basis for reaching consensus on healthcare policy tasks. In other words, healthcare policy should be implemented within a series of organic relationships that start from people's healthcare demand in the environment surrounding healthcare and supplying healthcare in line with this demand. Among the eight priorities for which consensus was reached, three items correspond to healthcare demand, two correspond to supply, and three correspond to the environment surrounding healthcare. Taken together, the eight items that reached consensus in this study can be considered important execution tasks that comprehensively encompass healthcare policies.

We derived a consensus that the most important task to be solved for sustainable healthcare system in Korea is "Securing the financial soundness of the National Health Insurance." "Reform of the operation structure of the National Health Insurance Service," which ranked 7th on the priority list, and "Reform the healthcare delivery system and payment system," which ranked 8th, are also indirectly related to the National Health Insurance's (NHI) financial position.

In many countries, rising healthcare expenditure is a very important but difficult challenge for the healthcare system. Various measures are being proposed and tested worldwide to reduce healthcare expenditure and improve the quality and equity of healthcare.[20-23] Healthcare expenditure currently accounts for 8.4% of gross domestic product (GDP) in Korea, which is relatively low compared to other OECD countries, but it is continuously rising.[3,24] An aging population, prevalence of chronic and complex diseases, and policies to benefit expansion in NHI are driving increased healthcare expenditure.[25-27]

Korea's NHI mostly covers all citizens, which sets it apart from other countries.[28] Although this special health insurance system brings the benefits of affordable healthcare to most people, the increase in expenditure may become unsustainable.[29] The structural reform of the NHI system, the only insurer in Korea's healthcare system, and improvement of the medical delivery system have a significant impact on securing financial soundness with the NHI. Therefore, a policy that comprehensively takes this into consideration should be established.

Among the items for which consensus has been achieved, "Solving the problem of low fertility," which ranked second among the priority tasks, needs attention. Korea's total fertility rate in 2019 is 0.92, the only country among OECD countries with a total fertility rate less than one.[3] The number of births decreased significantly from about 1,110,000 in 1970 to 270,000 in 2020.[30] Even though 15 years have passed since the establishment and implementation of a plan to counter the low fertility rate, the number of births still has not improved. The low fertility problem is not just a healthcare issue. However, our results suggest that experts judged that taking the issue of low fertility rates into account while developing healthcare policies is a step in the right direction as the problem may worsen the finances of healthcare insurance and lead to the collapse of some healthcare systems.[31]

The COVID-19 pandemic disrupted advancements in healthcare systems with regard to non-communicable diseases.[32] Furthermore, since these infectious diseases can cause enormous social and economic losses, it has become an essential task to prevent the emergence and spread of infectious diseases in the process of reforming the healthcare system.[33] However, due to the COVID-19 pandemic and the fourth industrial revolution, the use of big data, network, and artificial intelligence has expanded[34] and become an unavoidable trend in healthcare.

This study has some inherent limitations. First, rather than letting the respondents propose tasks for the healthcare system, we suggested the research items, and this may have caused several problematic issues including selection bias.[35] However, the factors involved in the healthcare system are very diverse and the healthcare system as a subject field is broad. We therefore tried to select a model of the healthcare system and achieve consensus on specific details that can be realized within the model. Accordingly, based on a previous study,[12] 25 items in 3 categories (healthcare demand, supply, and environment) were presented as tasks for sustainability in the healthcare system of Korea. These items started from 130 topics

selected within the framework of the healthcare system devised in the previous studies, and only 25 of the most important topics remained through expert discussions and online surveys. Therefore, the possibility of selection bias for closed-ended questions in the Delphi survey is very low. Second, seven of the respondents (33%) majored in basic medicine, but the composition of many surveyees was biased toward experienced clinicians. Clinicians with less experience or public officials who implement health policies may have different opinions, so further investigation with a more diverse group of experts may be necessary. Third, the threshold of agreement, which is one of the criteria, is not objective, and a relatively high level (90% or more) is required. However, we demanded a relatively high level of agreement in order to first propose the consensus needed for a sustainable healthcare system. Furthermore, proposals were made in the order of consensus. Thus, a cut-off value may not affect the priority ordering of the tasks. Finally, only 21 of 59 respondents (36%) participated; hence, gathering more expert opinions was limited. Moreover, the low response rate for the invited panel may further strengthen the limitations of the ambiguous methodological design inherent in the Delphi method.[36]

Despite these limitations, we have obtained the essential tasks for a sustainable healthcare system in Korea through the Delphi method, and the consensus reached in this study must be considered in future Korean healthcare policies.

We propose eight important and urgent priorities for Korea's sustainable healthcare system. A lot of effort is needed to improve the financial soundness of health insurance, which is unprecedented around the world. Furthermore, the low fertility problem, strengthening response to public health crises triggered by MERS and COVID-19, and bio-health technology innovation using big data and AI in the healthcare field are inevitable trends. Health policy makers are urged to take these priorities into account to formulate and develop future healthcare policies.

SUPPLEMENTARY MATERIAL

Supplementary Data 1
Supplementary Methods: How to Select 25 Topics Used in the Delphi Survey.

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