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SHORT COMMUNICATION

Deepening regional disparities in primary health care during COVID-19 in South Korea

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ETHICS APPROVAL

This research is based on spatial information and does not involve any studies with human subjects, human material, or human data. As a result, it is deemed exempt from ethics approval, as it does not fall under the category of research manuscripts reporting on studies with human involvement.

ABSTRACT:

Introduction: This study investigated the impact of the COVID-19 pandemic on primary healthcare accessibility in South Korea, beyond infectious disease control. The pandemic led to financial challenges for primary healthcare providers, potentially causing clinic closures and exacerbating regional disparities in healthcare resources. The research aimed to analyze changes in private clinic numbers in different regions and assess the resulting shifts in regional disparities in primary healthcare access during the pandemic.

Methods: The study classified regions into three categories based on administrative districts: capital area, regional cities, and rural/small cities. Permit data from local governments, publicly disclosed by the national government, were used to analyze changes in private clinic numbers before the COVID-19 pandemic (2017–2019) and after the COVID-19 pandemic onset (2020–2022). Essential medical subjects (internal medicine, general surgery, obstetrics/gynecology, pediatrics (IGOP)) were also analyzed to understand the changes in specific healthcare services.

Results: During the onset of the COVID-19 pandemic in 2020, the rate of increase of private clinics decreased across all regions. From

2021, despite ongoing pandemic measures, the capital area and regional cities showed that private clinic increase numbers recovered and exceeded pre-COVID-19 levels in 2022. However, in rural/small cities, private clinic supply per million people in 2022 remained lower than in 2017–2018. Similarly, the supply of IGOP clinics experienced a decrease in 2020 but started to recover in the capital area and regional cities in 2021. In contrast, rural/small cities showed a continuous decrease in IGOP clinic supply during the pandemic period. Disparities between private clinic increases in the capital area/regional cities and rural/small cities intensified in 2021–2022. The overall number of primary healthcare facilities per population continued to increase across regions during the COVID-19 pandemic period. The increase was more pronounced in the capital area and regional cities compared to rural/small cities. Notably, after the onset of the pandemic, there was a reversal in the disparity between regional cities and rural/small cities in terms of primary health care per population.

Conclusion: The COVID-19 pandemic has deepened regional disparities in primary healthcare resources in South Korea. In particular, the supply of essential medical services in rural/small cities significantly decreased compared to regional cities during the pandemic. This exacerbates existing health disparities and may hinder equitable healthcare utilization in remote areas. To address this issue, proactive policies are needed, such as expanding public hospitals and increasing the public healthcare workforce in underserved regions. Future research should focus on exploring the underlying causes of healthcare disparities and implementing targeted policy responses to ensure universal and equitable access to healthcare services.

Keywords:

access, COVID-19, primary health care, regional disparity, South Korea.

FULL ARTICLE:

Introduction

The COVID-19 pandemic, which commenced in January 2020, prompted South Korea to adopt a test–trace–isolate strategy, utilizing advanced technologies, leading to successful outbreak control and low mortality rates[1]. Much research in South Korea during this period concentrated on infectious disease control[2,3]. In May 2023, WHO officially declared the end of the COVID-19 pandemic as a global health emergency, gradually restoring daily life towards pre-pandemic conditions worldwide. Our research aims to investigate the enduring impacts of COVID-19 on primary health care, extending beyond infectious disease control.

In South Korea, primary healthcare services are predominantly delivered through public health centers and private clinics. Approximately 97–98% of outpatient visits occur at private clinics[4,5], so any changes in the number of private clinics can have a significant impact on residents' access to health care. Throughout the pandemic, primary healthcare providers faced financial challenges due to social distancing measures and patient cancellations of clinic visits due to fear of infection[6,7]. The financial strain experienced by private clinics as a result of COVID-19 led to some clinic closures, directly affecting the provision of primary healthcare services in South Korea.

Private hospitals and clinics in South Korea have primarily concentrated in the capital area and large cities with high socioeconomic status, resulting in the widening of regional disparities in healthcare resources, healthcare utilization, and health outcomes[8]. Moreover, research indicates that individuals living in rural areas experience significant health disparities and encounter challenges in accessing healthcare services compared to their urban counterparts[9,10].

The objective of this study was to examine the changes in primary healthcare accessibility across all regions of South Korea during the COVID-19 period. While previous research by Son reported no significant overall change in the total number of private clinics during this time[11], we hypothesize that variations in the change of private clinic numbers have occurred, depending on regional characteristics. To test this hypothesis, we analyzed aggregated data on private clinics, considering spatial factors and focusing on changes in private clinic openings and closures in each region. Spatial accessibility to health care is considered a critical determinant of healthcare access and a significant contributor to regional disparities[12]. We expect our study to test the resulting shifts in regional disparities in primary healthcare access during the pandemic by comparing big cities and remote rural areas.

Methods

Study area

In this study we categorized regions based on three types of administrative district: capital area, regional city, and small and mid-sized city/rural area (rural/small city) (Fig1). Previous discussions on health disparities in South Korea have primarily focused on differences between the capital area and non-capital area, as well as those between regional cities and rural/small cities[8]. In particular, health inequalities in rural areas have been extensively discussed, and, more recently, small and medium-sized cities in South Korea have been experiencing challenges similar to those of rural areas, prompting separate comparisons to big cities[13,14].

As seen in Table 1, the capital area comprises Seoul Metropolitan City, Incheon Metropolitan City, and Gyeonggi-do, and it is the economic, political, and cultural hub of South Korea. The capital area is home to 50.5% of the country's population[15]. Given its centrality, the capital area was treated as a single area in this study.

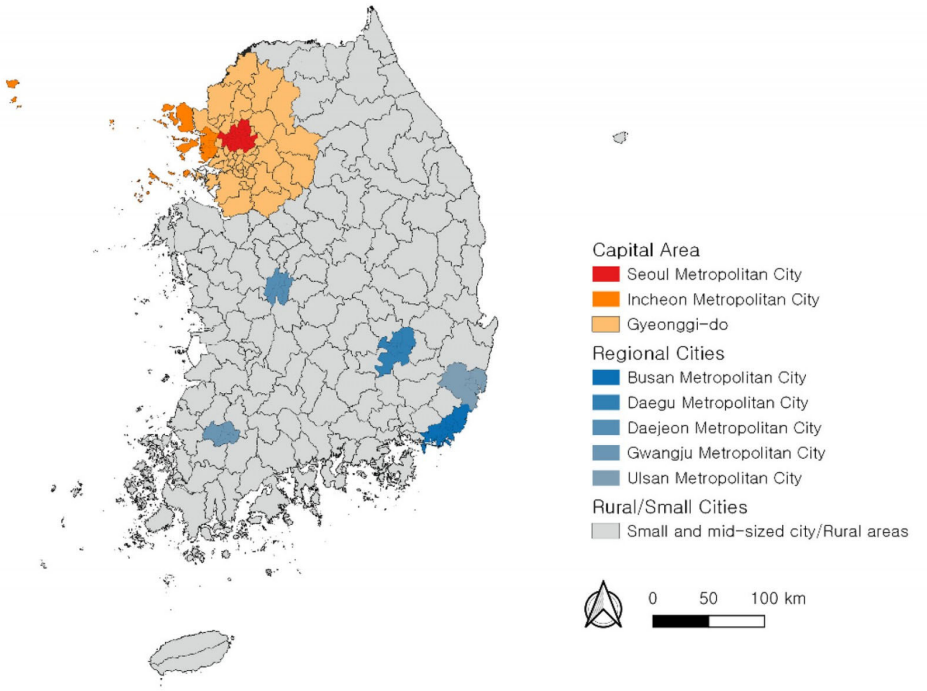
Regional cities consist of Busan Metropolitan City, Daegu Metropolitan City, Daejeon Metropolitan City, Gwangju Metropolitan City, and Ulsan Metropolitan City. With populations exceeding one million, the regional cities play a pivotal role in their respective regions in terms of politics, culture, economy, and transportation.

The small and mid-sized city/rural areas (rural/small cities) encompass 75 cities, Sejong Special Self-Governing City, and 77 towns (excluding five towns included in regional cities), representing areas outside of the capital area and regional cities[16]. Although these areas occupy 84.4% of the total land area[17], the number of residents is small, and the population density is relatively very low.

Table 1: Population data for capital area, regional cities, and rural/small cities in South Korea, 2022

Category	Administrative district	Population	Proportion of total population (%)†	Proportion of total area (%)†	Density (persons/km²)¶
Capital area	Seoul Metropolitan City	25 985 118	50.5	11.8	2189.5
	Incheon Metropolitan City				
	Gyeonggi-do				
Regional city	Busan Metropolitan City	9 669 288	18.8	3.7	2573.7
	Daegu Metropolitan City				
	Daejeon Metropolitan City				
	Gwangju Metropolitan City				
	Ulsan Metropolitan City				
Rural/small city	Gangwon-do	15 784 632	30.7	84.4	186.1
	Chungcheongbuk-do				
	Chungcheongnam-do				
	Jeollabuk-do				
	Jeollanam-do				
	Gyeongsangbuk-do				
	Gyeongsangnam-do				
	Jeju Special Self-Governing Province				
	Sejong Special Self-Governing City				

† Based on population and area in comparison to total population and total area of South Korea in 2022.
¶ Number of persons per square kilometer in the respective administrative districts as of 2022.



IGOP, internal medicine, general surgery, obstetrics/gynecology, and pediatrics.

Figure 1: Locations of the capital area, regional cities, and rural/small cities in South Korea.

Data

This study relied on permit data from local governments, which was publicly disclosed by the national government[18]. The data pertained to the establishment of private clinics in South Korea. In this study, private clinics referred to healthcare services excluding general hospitals (with more than 100 beds) and hospitals (with more than 30 beds) based on national standards[19]. Additionally, dental clinics and oriental clinics were excluded from the analysis.

To categorize the private clinics, the first healthcare service indicated in the registration information for the business opening was used. Specifically, essential medical subjects, including internal medicine, general surgery, obstetrics/gynecology, and pediatrics (IGOP), were extracted and separately compared. These subjects are classified as compulsory courses in general hospitals according to Article 3 of the *Medical Service Act 2023*[19].

The study compared the years 2017, 2018, and 2019 (before the COVID-19 pandemic onset) period with the years 2020, 2021, and 2022 (after the COVID-19 pandemic onset). The analysis involved examining the number of private clinics opened and closed in each region during these periods to assess the extent of increase or decrease in the number of private clinics by region.

Data were collected from the national licensing records on private clinics that commenced and ceased operations between 2017 and 2022. The information was then organized by the geographical location of each clinic, facilitating an annual calculation of the openings and closures within each administrative unit. To provide a comprehensive analysis, the net change in the number of clinics was calculated for each unit. The data were then reclassified into three distinct types of geographical area: the capital area, regional cities, and rural/small cities. To normalize the data and facilitate comparative analysis, the number of clinics was converted to a per-million population metric, based on the population of the reclassified areas for the respective years. The focus was narrowed down to clinics specializing in essential majors, referred to as IGOP for this study.

A comprehensive count of total primary healthcare facilities, encompassing both private clinics and public health centers, was conducted. This total was then divided by the population of the respective year and area to provide a per-capita perspective on healthcare availability. The data were further categorized into the aforementioned three types of geographical area to enable a focused, region-specific analysis.

Results

Changes in private clinic supply before and after the COVID-19 pandemic

The changes in the number of private clinics were driven by openings and closings per million population (Table 2). In 2020, during the onset of COVID-19, the rate of private clinic increase decreased across all regions, with changes ranging from 2.9 to 4.1 private clinics per million. From 2021, even during the ongoing pandemic and social distancing measures, the increase in private clinics in the capital area and regional cities began to recover. In 2022, the supply of private clinics in the capital area and regional cities exceeded pre-COVID-19 levels. However, in rural/small cities, the supply of private clinics per million people in 2022 was lower than in 2017–2018.

Comparing the average increase in private clinics per million people between the pre-COVID-19 period (2017–2019) and the COVID-19 period (2020–2022), the rate of change in private clinic increase during the pandemic was 26.0% in the capital area, 18.8% in regional cities, and –34.1% in rural/small cities. While the supply of total private clinics increased in the capital area and regional cities during the COVID-19 period, it decreased in rural/small cities. The disparity in private clinic increase between the capital area/regional cities and rural/small cities was already present before COVID-19 but became more pronounced in 2021–2022.

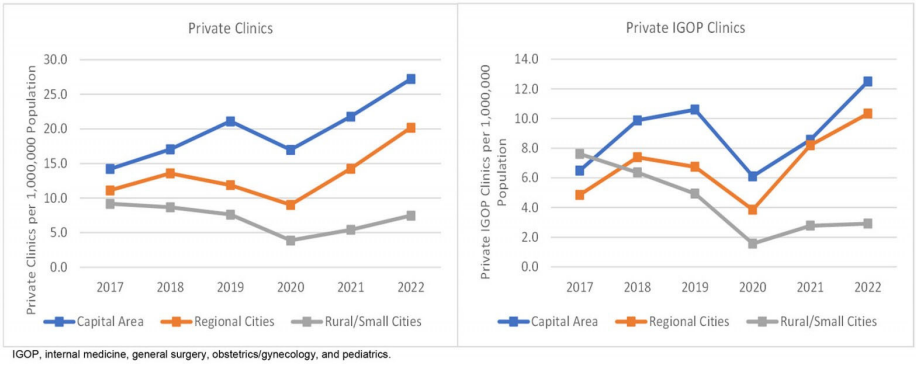
Similarly, when examining the change in essential medical subject clinics (IGOP) per million population, a decrease in the rate of increase was observed in 2020 during the COVID-19 period. The recovery in the supply of IGOP clinics from 2021 was evident in the capital area and regional cities, although the rate of increase was lower compared to the overall increase in private clinics. In contrast, rural/small cities experienced a continuous decrease in the supply of IGOP clinics during the pandemic period. The rate of change in IGOP clinic increase during the pandemic was 0.7% in the capital area, 17.9% in regional cities, and –61.6% in rural/small cities.

The change in number of IGOP clinics in the capital area remained relatively stable before and after COVID-19 pandemic onset, while an increase was observed in regional cities. However, in rural/small cities, the changes in IGOP clinics significantly declined during the COVID-19 period. Regarding the disparity in IGOP clinic increase, rural/small cities initially had a higher supply per capita in 2017, but from 2018 onwards, the capital area and regional cities surpassed rural/small cities (Fig2).

Table 2: Changes in supply of private clinics and private IGOP clinics per million population, 2017–2022

Category	Private clinic number per million population before COVID-19 onset¶			Private clinic number per million population after COVID-19 onset¶			Absolute rate change (%)	Change in rate (%)
	2017	2018	2019	2020	2021	2022		
Capital area	14.2	17.1	21.1	17.0	21.8	27.2	+4.5	26.0
Regional city	11.1	13.6	11.9	9.0	14.3	20.2	+2.3	18.8
Rural/small city	9.2	8.7	7.6	3.9	5.4	7.5	–2.9	–34.1
Difference (capital area – rural/small cities)†	5.0	8.4	13.5	13.1	16.4	19.7	–	–
Difference (regional cities – rural/small cities)†	1.9	4.9	4.3	5.1	8.8	12.7	–	–
Category	**Private IGOP clinic number per million population before COVID-19 onset¶**			**Private IGOP clinic number per million population after COVID-19 onset ¶**			**Absolute rate change (%)**	**Change in rate (%)**
	2017	2018	2019	2020	2021	2022		
Capital area	6.5	9.9	10.6	6.1	8.6	12.5	+0.1	0.7
Regional city	4.9	7.4	6.7	3.9	8.2	10.3	+1.1	17.9
Rural/small city	7.6	6.4	4.9	1.6	2.8	2.9	–3.9	–61.6
Difference (capital area – rural/small cities)	–1.1	3.5	5.7	4.5	5.8	9.6	–	–
Difference (regional cities – rural/small cities)	–2.8	1.0	1.8	2.3	5.4	7.4	–	–

† Differences in the number of clinics per million population between the respective categories.
¶ South Korea's first COVID-19 case was confirmed on 20 January 2020, with the first wave commencing on 18 February 2020. The WHO declared a global pandemic on 11 March 2020. Consequently, we categorized 2016–2019 as 'before COVID-19 onset' and 2020–2022 as 'after COVID-19' onset, establishing 2020 as the delineation.
IGOP, internal medicine, general surgery, obstetrics/gynecology, and pediatrics.



IGOP, internal medicine, general surgery, obstetrics/gynecology, and pediatrics.

Figure 2: Changes in supply of private clinics and private IGOP clinics per million population by region, 2017–2022.

Changes in regional disparity in primary health care before and after the COVID-19 pandemic

During the COVID-19 period, the regional disparity in primary healthcare resources was examined based on the number of private clinics and public health centers per million population. Despite the pandemic, the overall number of primary healthcare facilities per population continued to increase across regions (Table 3). When comparing the average number of primary healthcare facilities per million people from 2017–2019 to 2020–2022, the rate of change in primary healthcare per population during the pandemic was 8.1% in the capital area, 8.0% in regional cities, and 3.4% in rural/small cities. The increase in primary healthcare supply per population was more pronounced in the capital area and regional cities compared to rural/small cities.

Notably, there was a reversal in the disparity between regional cities and rural/small cities in terms of primary healthcare per population after the onset of the COVID-19 pandemic (Fig3). This can be attributed to the higher supply of private clinics in regional cities, while rural/small cities have not seen a comparable increase in public health centers, which were established to address regional discrepancies in healthcare access.

Table 3: Changes in regional disparity in primary healthcare supply per million population, South Korea, 2017–2022

Category	Primary healthcare number per million population before COVID-19 onset¶			Primary healthcare number per million population after COVID-19 onset¶			Absolute rate change (%)	Change in rate (%)
	2017	2018	2019	2020	2021	2022		
Capital area	651.6	663.9	681.8	695.8	718.0	746.3	+54.2	8.1
Regional city	663.3	679.7	696.9	710.8	733.0	759.4	+54.5	8.0
Rural/small city	688.4	695.9	703.8	710.5	718.8	730.1	+23.8	3.4
Difference (capital area – rural/small cities)†	–11.7	–15.8	–15.1	–15.0	–15.0	–13.1	–	–
Difference (regional cities – rural/small cities)†	–25.2	–16.1	–6.9	0.4	14.2	29.3	–	–

† Differences in the number of clinics per million population between the respective categories.
¶ South Korea's first COVID-19 case was confirmed on 20 January 2020, with the first wave commencing on 18 February 2020. The WHO declared a global pandemic on 11 March 2020. Consequently, we categorized 2016–2019 as 'before COVID-19 onset' and 2020–2022 as 'after COVID-19 onset', establishing 2020 as the delineation.

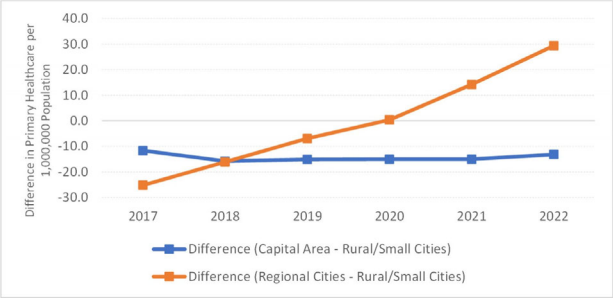


Figure 3: Differences in primary healthcare supply per million population among regions, South Korea, 2017–2022.

Discussion

Healthcare resources in South Korea have tended to be concentrated in urbanized areas, leading to significant regional disparities between cities and rural areas. The issue of healthcare concentration in large cities has been a persistent concern[20,21]. Simultaneously, there has been a steady rise in the problem of health disparities occurring in rural areas[13,14]. Our study highlights that this regional disparity in primary healthcare resources was further exacerbated during the COVID-19 pandemic in South Korea. Specifically, the supply of essential medical services provided by IGOP clinics has significantly decreased in rural/small cities compared to regional cities during the COVID-19 period. These changes have intensified regional disparities in primary health care, which is expected to contribute to greater inequalities in healthcare utilization and deepen health disparities in remote cities and rural areas.

Rural/small cities experiencing population decline often have inadequate health infrastructure and poor health conditions[22], necessitating the implementation of policies to bridge this gap. The deepening disparity in access to primary health care during the pandemic period in these areas is expected to further exacerbate the problem. For rural/small cities with relatively small populations and situated away from a regional center, various measures are being discussed in the public sector, including the provision of well-coordinated health services[23]. However, the South Korean government's policy tools for public health care are currently inadequate, with the proportion of public hospitals being the lowest among OECD member countries[24]. Based on the findings of the present study, South Korea should adopt a more proactive approach, such as securing direct policy tools from the government, including the expansion of public hospitals and public doctors[25]. This will contribute to enhancing proportional access for vulnerable groups and regions such as rural/small cities while ensuring universal access to essential health care[26].

Future research should aim to explore regional disparities in health care resulting from the impact of the COVID-19 pandemic from multiple perspectives, including the availability of other health resources such as medical personnel and medical equipment, patterns of medical service utilization, and health outcomes. Additionally, analyzing the underlying causes through research on barriers and drivers will enable the development of more targeted policy responses. In practice, conducting studies that examine spatial disparities at a micro-level using spatial accessibility analysis methods, such as analyzing the arrival time to healthcare facilities, would contribute to a more in-depth understanding of the specific characteristics of healthcare access disparities.

Conclusion

This study reveals the deepening regional disparities in primary healthcare resources during the COVID-19 pandemic in South Korea. The pandemic resulted in various changes in the number of private clinics across different regions, with notable decreases observed in rural/small cities. This has widened the gap in healthcare accessibility between concentrated urban areas and remote rural regions, posing challenges for vulnerable populations. To address this issue, proactive policy measures, such as expanding

public hospitals and the healthcare workforce, should be considered to ensure equitable access to essential health care. Future research should further explore the impact of COVID-19 on healthcare disparities and identify underlying factors to guide targeted policy responses.

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Conflicts of interest

The authors declare no competing interests related to this study.

REFERENCES:

1 Dighe A, Cattarino L, Cuomo-Dannenburg G, Skarp J, Imai N, Bhatia S, et al. Response to COVID-19 in South Korea and implications for lifting stringent interventions. *BMC Medicine* 2020; **18(1):** 1-12. DOI link, PMid:33032601

2 Choi JY. COVID-19 in South Korea. *Postgraduate Medical Journal* 2020; **96(1137):** 399-402. DOI link, PMid:32366457

3 Park S, Choi GJ, Ko H. Information technology-based tracing strategy in response to COVID-19 in South Korea-privacy controversies. *JAMA* 2020; **323(21):** 2129-2130. DOI link, PMid:32324202

4 Kim HJ, Lee JY, Jo M-W, Eun SJ. Investigating the level of competition between public health centers and private clinics in Korea. *Korea Journal of Hospital Management* 2016; **21(2):** 37-49.

5 Lee JY, Min-Woo J, Kim HJ, Minsu O, Hyemin J, Eun SJ. Are the public health centers real threats to private clinics in Korea? *Iranian Journal of Public Health* 2016; **45(4):** 535-536.

6 Barnett ML, Mehrotra A, Landon BE. Covid-19 and the upcoming financial crisis in health care. *NEJM Catalyst Innovations in Care Delivery* 2020; 29 April.

7 Lee M, You M. Avoidance of healthcare utilization in South Korea during the coronavirus disease 2019 (COVID-19) pandemic. *International Journal of Environmental Research and Public Health* 2021; **18(8):** 4363. DOI link, PMid:33924096

8 Kim JW, Ahn Y-J. Empirical study on the disparity between capital region and non-capital region in terms of quality in cancer treatment. *The Geographical Journal of Korea* 2014; **48(1):** 149-159.

9 Young TK, Chatwood S. Delivering more equitable primary health care in Northern Canada. *Canadian Medical Association Journal* 2017; **189(45):** E1377-E1378. DOI link, PMid:29133538

10 Yuan L, Cao J, Wang D, Yu D, Liu G, Qian Z. Regional disparities and influencing factors of high quality medical resources distribution in China. *International Journal for Equity in Health* 2023; **22(1):** 8. DOI link, PMid:36627636

11 Son K-B. The impact of COVID-19 on the number of active small primary care businesses by severity of the pandemic: evidence from South Korea. *BMC Primary Care* 2022; **23(1):** 67. DOI link, PMid:35379183

12 Basu J. Research on disparities in primary health care in rural versus urban areas: select perspectives. *International Journal of Environmental Research and Public Health* 2022; **19(12):** 7110. DOI link, PMid:35742359

13 Yoon T-h, Kim J-H. Health inequalities between rural and urban areas in South Korea. *Journal of Korean Academy of Rural Health Nursing* 2006; **1(1):** 11-20.

14 Kim HS, Kang DR, Kim I, Lee K, Jo H, Koh SB. Comparison between urban and rural mortality in patients with acute myocardial infarction: a nationwide longitudinal cohort study in South Korea. *BMJ Open* 2020; **10(4).** DOI link, PMid:32273319

15 Statistics Korea. *Population and population density by regions.* [In Korean]. 2022. Available: web link (Accessed 23 February 2023).

16 Ministry of the Interior and Safety. *Administrative districts and population status of local governments.* [In Korean]. 2021. Available: web link (Accessed 23 February 2023).

17 Statistics Korea. *Area by regions 2022.* [In Korean]. Available: web link (Accessed 28 February 2023).

18 Ministry of the Interior and Safety. *Local administration permit data.* [In Korean]. 2023. Available: web link (Accessed 9 March 2023).

19 Government of Korea. *Medical Service Act Article 3. Condition for designating compulsory courses in general hospitals.* [In Korean]. 2021. Available: web link (Accessed 9 March 2023).

20 Jeon B-Y, Choi S-M, Kim C-Y. Socioeconomic equity in regional distribution of health care resources in Korea. *Health Policy and Management* 2012; **22(1):** 85-108. DOI link

21 Song YJ. The South Korean health care system. *Japan Medical Association Journal* 2009; **52(3):** 206-209.

22 Yim J. Deepened Instability in the Korean Socio-Economic Structure and Health Care Reform. *Journal of Critical Social Welfare* 2021; **71:** 291-328. DOI link

23 Ahn YH, Kim MJ. Health care needs of elderly in a rural community in Korea. *Public Health Nursing* 2004; **21(2):** 153-161. DOI link, PMid:14987215

24 Organisation for Economic Co-operation and Development. *OECD health statistics 2022.* 2022. Available: web link (Accessed 15 March 2023).

25 Lee DH, Moon M-e, Go Y, Song J, Kim J, Kim C, et al. Appropriateness of task of public health doctors in South Korea. *Rural and Remote Health* 2018; **18:** 4723. DOI link, PMid:30424679

26 Yim J. Measures for strengthening public health care. *Health and Welfare Policy Forum* 2022; **2022(311):** 6-22.