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Reinforcing Primary Care in Korea: Policy Implications, Data Sources, and Research Methods

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ABSTRACT

Korea has undergone rapid transformation, achieving significant advancements in both economic development and social security. Notably, the country achieved universal health coverage within a remarkably short period, representing a significant institutional milestone in healthcare. However, the healthcare system faces substantial challenges due to limited resources, a reliance on private healthcare providers, and a rapidly aging population which threatens its sustainability. Various efforts have been made to strengthen Korea's primary care environment. This study aims to examine the multifaceted healthcare landscape surrounding primary care in Korea, analyze associated systems to identify institutional limitations, and propose strategies to enhance primary care in the future. Additionally, it seeks to raise awareness of the current state of primary care in Korea and serves as an example for other countries striving to improve their primary care systems. Furthermore, this review provides a comprehensive overview of key data sources relevant to primary care research in Korea, such as the National Health Insurance Service claims data and the Korea Health Panel Survey. It also outlines practical research methodologies—from epidemiological studies to policy analyses—serving as a valuable reference for both domestic and international scholars seeking to enhance primary care systems.

Keywords: Primary Health Care; Public Health; Health Policy; Health Care Reform

INTRODUCTION

The global burden of chronic diseases has been continuously increasing, particularly in high-income countries.[1] In Korea, the proportion of disease burden attributable to chronic diseases has been steadily rising,[2] underscoring the growing significance of chronic disease management.[3] Recent studies indicate that diabetes and low back pain account for largest share of disease burden among Koreans.[2,4] This further emphasizes the critical importance of effectively managing chronic diseases.

The rapidly aging population in Korea[5] raises concerns about the increasing prevalence of multimorbidity and the associated rise in healthcare expenditures. Korea is projected to

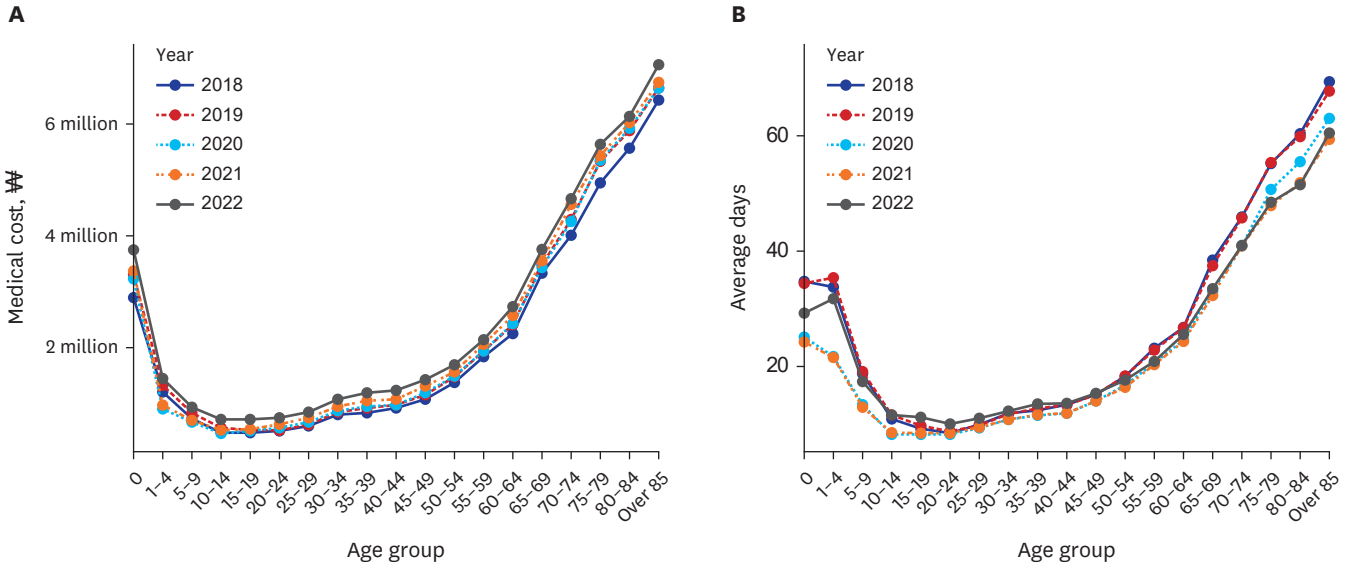

Fig. 1. Trends in healthcare utilization by age group. (A) Per capita healthcare benefits expenditure by age group for national health insurance beneficiaries. (**B**) Per capita number of total number of hospitalizations and outpatient visits at medical institutions, excluding pharmacy visits by age group for national health insurance beneficiaries.

become one of the countries with the highest life expectancy.[6] However, given that healthcare expenditures are highest among older people, managing the health and medical costs of the aging population is urgent.

An analysis based on data from the Health Insurance Review and Assessment Service (HIRA) revealed a U-shaped pattern in per capita healthcare expenditures and outpatient visits by age group (**Fig. 1**). This indicates that healthcare utilization and costs increase as health status deteriorates with age. Consequently, the ripple effects associated with the increasing older population could be significant.

Korea's healthcare system provides high accessibility and freedom of choice in medical services.[7] Patients can freely choose and access healthcare services, regardless of the type of medical institution. The healthcare delivery system is structured into two tiers: tertiary hospitals and other medical institutions. To establish an effective referral system, measures have been implemented to increase out-of-pocket costs on patients who directly access tertiary hospitals without visiting other medical institutions.[8] However, it remains uncertain whether the current healthcare delivery system functions as intended,[9,10] and ongoing efforts to seek to address these challenges.

Korea's healthcare system operates under a single-payer model system, with health insurance-related responsibilities centralized within the National Health Insurance Service (NHIS) and the HIRA.[11] Additionally, healthcare providers are primarily private entities operating under fee-for-service model, which incentivizes increased service volume while lacking effective cost-control mechanisms. This results in a skewed allocation of resources toward high-demand medical services,[12] posing challenges in providing regionally tailored healthcare services.[13] Moreover, the hospital-centric nature of the system exacerbates regional disparities in health outcomes.[14,15]

In this context, the Essential Healthcare Policy Package[16] was announced, and the Presidential

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Commission for Healthcare Reform was established in February 2024.[17] These developments indicate significant policy changes aimed at innovating essential healthcare services. Notably, the introduction of this policy package has sparked debates over physician workforce expansion, culminating in medical resident strikes.[18,19] The policy package consists of four key components: increasing the number of healthcare professionals, strengthening local healthcare, establishing a safety net for medical malpractice, and enhancing fairness in the compensation system.[16]

Among these components, initiatives related to primary care are primarily embedded within the local healthcare strengthening measures. These include transitioning toward a function- and demand-driven healthcare delivery system, with primary clinics playing a central role. The reforms emphasize establishing foundational primary care functions centered on preventive and integrated health management while fostering multidisciplinary collaboration among clinics. Additionally, they incorporate pilot programs and institutionalization of performance-based primary care models. Amid these rapid transformations in Korea's healthcare landscape, long-standing challenges in primary care are being actively addressed.

Several prior studies have examined Korea's primary care system and assessed its impact. However, many evaluations have focused on individual programs effectiveness, limiting a comprehensive understanding of the broader primary care framework. While descriptive studies exist, most are government-led and published in Korean, restricting their accessibility to international audience.

Korea's unique healthcare system, characterized by the rapid achievement of universal health coverage and a private-sector-dominated provider network, shares similarities with nations seeking to implement universal coverage within predominantly private healthcare structures. Thus, Korea's primary care strengthening strategies may serve as valuable models for other countries. This study, conducted in English, aimed to address the need for a comprehensive analysis of Korea's primary care system and contribute to the global exchange of knowledge on primary care reform.

In this context, this study provides an overview of Korea's current primary care system and ongoing reform efforts. Additionally, it identifies components tailored to Korea's unique healthcare landscape, supporting strategies for primary care enhancement. This study also presents key data sources and research methodologies that future studies can leverage to advance evidence-based primary healthcare. Through this approach, we demonstrate how research-based evidence can contribute to the improvement of primary healthcare policies and systems and generate meaningful insights on system reform.

METHODS

To conduct a comprehensive review of Korea's primary healthcare system, this study primarily examined grey literature, including reports and announcements from key institutions responsible for Korean healthcare policies such as the Ministry of Health and Welfare (MOHW), the HIRA, the NHIS, and the Korea Disease Control and Prevention Agency (KDCA). Additionally, scholarly articles written in Korean that pertain to Korea's primary healthcare system were also reviewed. Relevant sources were identified using Google and Google Scholar.

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RESULTS

Past and present of healthcare and primary care in Korea

Korea is one of the few countries that has successfully transitioned from economic hardship to rapid economic development.[20] However, as Korea has ascended to the ranks of developed nations, life expectancy has increased, and the pace of population aging has accelerated sharply. By the end of 2024, the proportion of older adults exceeded 20% of the total population, marking Korea's entry into a super-aged society. Consequently, the burden of chronic diseases has been steadily rising over time. Chronic conditions such as diabetes and low back pain now account for a significantly larger share of the overall disease burden compared to the past, reinforcing the ongoing call for strengthening primary healthcare to effectively manage these conditions.

In terms of social security, Korea has transitioned from a multi-payer to a unified single-payer system.[21] However, due to limited financial resources, collaboration with private healthcare providers has been necessary, compensating them through a fee-for-service model.[22] This system has resulted in low contributions rates and limited benefits,[12] leading to relatively lower healthcare expenditures as a percentage of gross domestic product (GDP) compared to other Organization for Economic Co-operation and Development (OECD) countries. Nevertheless, healthcare expenditures have risen sharply, and Korea's healthcare spending as a percentage of GDP has now surpassed the OECD average.[23]

Two primary OECD indicators are commonly used to evaluate Korean primary care: hospitalization rates due to diabetes[24,25] and the annual number of outpatient visits per capita. These indicators reflect the outcomes of diabetes management, a condition primarily addressed in primary care, and the extent of accessibility and patient autonomy in healthcare utilization, respectively.[23] Based on these measures, it is often argued that despite high healthcare utilization, the outcomes are suboptimal. Furthermore, Korea has the highest number of outpatient visits per physician among OECD countries, raising concerns about whether sufficient consultation time is provided during outpatient care.[23]

Primary care is often characterized by key attributes such as comprehensiveness, coordination, continuity, and first-contact accessibility.[26,27] However, based on internationally-recognized core indicators, identifying strong primary care functions and their associated outcomes within the current Korean healthcare system is challenging.

In Korea, primary care is predominantly provided by independent clinics operated by specialists.[28] These clinics often lack effective mechanisms for care coordination and patient information sharing, making integrated healthcare service delivery difficult. Consequently, ensuring comprehensive, continuous, and well-coordinated primary care services remains challenging.

Several studies have been conducted to identify practical healthcare providers capable of delivering primary care in the current healthcare setting.[29-31] These studies found that among the various clinics distributed across Korea, internal medicine and family medicine practices predominantly fulfill primary care functions.

Korea's primary healthcare reimbursement system primarily operates under a fee-for-service model, which covers over 90% of the medical care costs.[32] This structure is deeply

entrenched and is unlikely to change without broad societal consensus developed over an extended period. As noted in previous studies, the fee-for-service model conflicts with the core attributes of primary care, which emphasize integrated and continuous patient management. This payment system also complicates collaboration with other healthcare institutions.[33] Additionally, because reimbursement is directly tied to service volume, it encourages frequent patient visits to healthcare institutions[34] while lacking incentives for health promotion and preventive care.

Under this payment system, the provision of patient-centered, integrated healthcare services remains difficult. In particular, the incentive to increase service volume due to low reimbursement rates[12] presents a complex issue that cannot be easily resolved. Moreover, the availability of resources for primary care varies significantly across regions.[35] Therefore, efforts to improve the overall primary care infrastructure must consider the entrenched characteristics of Korea's healthcare landscape along with regional disparities.

Additionally, due to low reimbursement rates, out-of-pocket expenses for patients remain high, leading to the widespread use of private health insurance. However, the coverage provided by private insurance has contributed to moral hazard. Since patients perceive lower financial burdens, the cost barrier to excessive healthcare utilization is significantly reduced, increasing the likelihood of unnecessary medical services. As a result, certain procedures have been oversupplied in some areas, while primary care services in high-demand sectors have benefited from a favorable environment. This has not only led to regional disparities but also highlighted the need for better coordination within primary care to ensure comprehensive medical services across different healthcare sectors.

Trends in Korea's primary care policy

Efforts related to primary care in Korea have been ongoing for several years. Before the 2000s, universities played a central role in conducting research and implementing community health initiatives. In the 2000s, with the emergence of the importance of chronic disease management, the MOHW began leading policies related to chronic diseases and primary care.[36]

The Community-Based Hypertension and Diabetes Control Program, initiated in 2007, is a representative primary care policy in Korea.[37] As of 2024, 19 local governments have participated in this initiative. Managed by the Department of Chronic Disease Prevention and Control at the KDCA, the program targets patients aged 30 and older with hypertension and diabetes. Under this program, clinics register and manage patients with diabetes and hypertension, education centers provide counseling and reminder services, and public health centers reimburse medical and prescription costs.[38]

In 2012, the Clinic-Based Chronic Disease Management Program was introduced to support outpatients with hypertension and diabetes who sought continuous management at primary care clinics. This initiative, overseen by the Bureau of Health Policy at the MOHW, primarily focuses on financial support for clinics and reducing patient out-of-pocket expenses. Specifically, patients typically pay 30% of their medical costs at primary care clinics; however, for program participants, the copayment is reduced to 20%.[39] As of 2024, the program remains active.

Subsequently, the Community-Based Primary Care Pilot Project was launched in 2014, focusing on comprehensive patient evaluations and the development of personalized

care plans.[40] Notably, this model addressed the unique challenges in Korea, where direct education and counseling at medical institutions are often difficult to implement. To this end, Health Partnership Centers were established to provide a referral-based model for education and counseling.[41]

Following this, the Chronic Disease Fee Pilot Project was introduced in 2016 to incorporate remote management services into the ongoing monitoring and counseling of patients with chronic diseases in primary care. The program showed no correlation between prescription adherence and socioeconomic status, which was observed in non-participating groups.[42] However, the program faced limitations due to a high dropout rate among participants. Both pilot projects focused on patients with hypertension and diabetes.[40]

In 2019, the Community-Based Primary Care Pilot Project and Chronic Disease Fee Pilot Project were integrated into the Primary Health Care Chronic Diseases Management Pilot Program.[36] Similar to its predecessors, this program was designed primarily for patients with hypertension and diabetes.[43] It combines patient management services from the former Community-Based Primary Care Pilot Project with remote monitoring services from the Chronic Disease Fee Pilot Project to offer comprehensive care. To enhance patient education and counseling, two approaches were implemented: employing care coordinators at clinics to provide education and counseling services to patients, and having physicians deliver these services directly without care coordinators.[43] Previous studies have reported the effectiveness of this program in managing hypertension and diabetes.[43,44] By 2024, the program had transitioned from a pilot initiative to a full-scale nationally-implemented program.

Regarding the function of first-contact care, home-based healthcare services can be considered part of primary care.[45-47] Therefore, efforts to strengthen primary care should also consider its role in home-based care. In Korea, existing home-based healthcare policies can be broadly categorized into two types: disease-centered and population-centered programs.

Disease-centered home healthcare programs currently target patients with conditions such as peritoneal dialysis, type 1 diabetes, home ventilation, heart disease, rehabilitation, tuberculosis, cancer, and severe pediatric illnesses.[48-55] Other home-based healthcare initiatives include the Primary Care Home Visit Fee Pilot Project, Long-Term Care Home-Based Healthcare Pilot Project, Disability Health Family Doctor Pilot Project, and Home Hospice and Palliative Care Pilot Project.[56-59] While various home healthcare programs are currently being implemented, they remain fragmented and lack sufficient coordination across services within regional frameworks, highlighting a significant limitation of the current system.

Despite previous policy efforts to strengthen primary care attributes, significant limitations persist. One major issue is that the payment models for primary care pilot projects still rely on the traditional fee-for-service system.[60] This approach does not align primary care compensation with performance, as reimbursement remains based on service volume rather than patient outcomes.

Although existing primary care initiatives have demonstrated clinically positive outcomes, their cost-effectiveness remains uncertain. Similar concerns have been observed internationally,[61] where future investment feasibility is questioned due to resource constraints. In other words, while the effectiveness of primary care is well-established,[62-64] its cost-effectiveness from a policymaker's perspective remains debatable.

Most policies related to primary care focus on the management and treatment of diabetes and hypertension. Furthermore, there is a lack of effective coordination among stakeholders involved in these initiatives,[65] resulting in a fragmented structure and indicating that these policies failed to establish an integrated framework during both the design and implementation phases.

In addition to the central government-led policies, various initiatives by other stakeholders also provide primary care. Notable examples include the Health and Social Welfare Cooperative (HSWC) and the NHIS's Region-Based, Patient-Centered Primary Care Pilot Project.[66] Both initiatives encompass a wide range of primary care functions, including multidisciplinary care, integration with community-based care, and home healthcare programs.[66,67]

The two aforementioned primary care innovation initiatives continue to transform primary care in Korea through distinct approaches. The HSWC operates on a group practice-based model, strengthening connections between home healthcare, caregiving, and community resources.[66] Notably, these cooperatives are member-funded, fostering active participation among resident.

In contrast, the NHIS Region-Based, Patient-Centered Primary Care Pilot Project is tailored to the diverse primary care clinic models, focusing on hospital integration and strengthened collaboration between hospitals and clinics. This model enables primary care development centers within hospitals to provide support aligned with the core functions of primary care, customized to the specific characteristics of different types of clinics.

Both initiatives have driven significant changes in Korea's primary care system through various operational models. However, these approaches have certain limitations. In the case of HSWC, the lack of a standardized service delivery model results in variations in the scope and nature of healthcare services provided across cooperatives and regions. Similarly, the Region-Based, Patient-Centered Primary Care Pilot Project is constrained by the limited number of participating regions and clinics, posing challenges for nationwide scalability and expansion.

Primary care functions that suit the Korean context

Primary care encompasses a wide range of functions, making its full implementation challenging. Therefore, policies aimed at strengthening primary care require not only short-term interventions but also long-term developmental strategies that progress in stages.[68] To define these developmental stages, assessing how the current policies in Korea address the various primary care functions is essential.

Coordination is a key function of primary care, and in the case of Korea's complex healthcare challenges, it requires long-term solutions. This is because the current healthcare system, characterized by high patient accessibility and autonomy, makes it difficult to restrict patients' choice of healthcare providers. Additionally, the lack of effective patient information-sharing system hinders the ability to coordinate care based on comprehensive data for individual patients.[69]

By considering continuity, comprehensiveness, and first-contact accessibility as one axis and addressing critical issues in Korea's healthcare system—such as coordination between medical institutions[70] and payment systems[60]—existing policies and gaps can be identified. **Fig. 2** illustrates that while each element has corresponding individual policies, there is a lack of integrated policies that comprehensively address these components.

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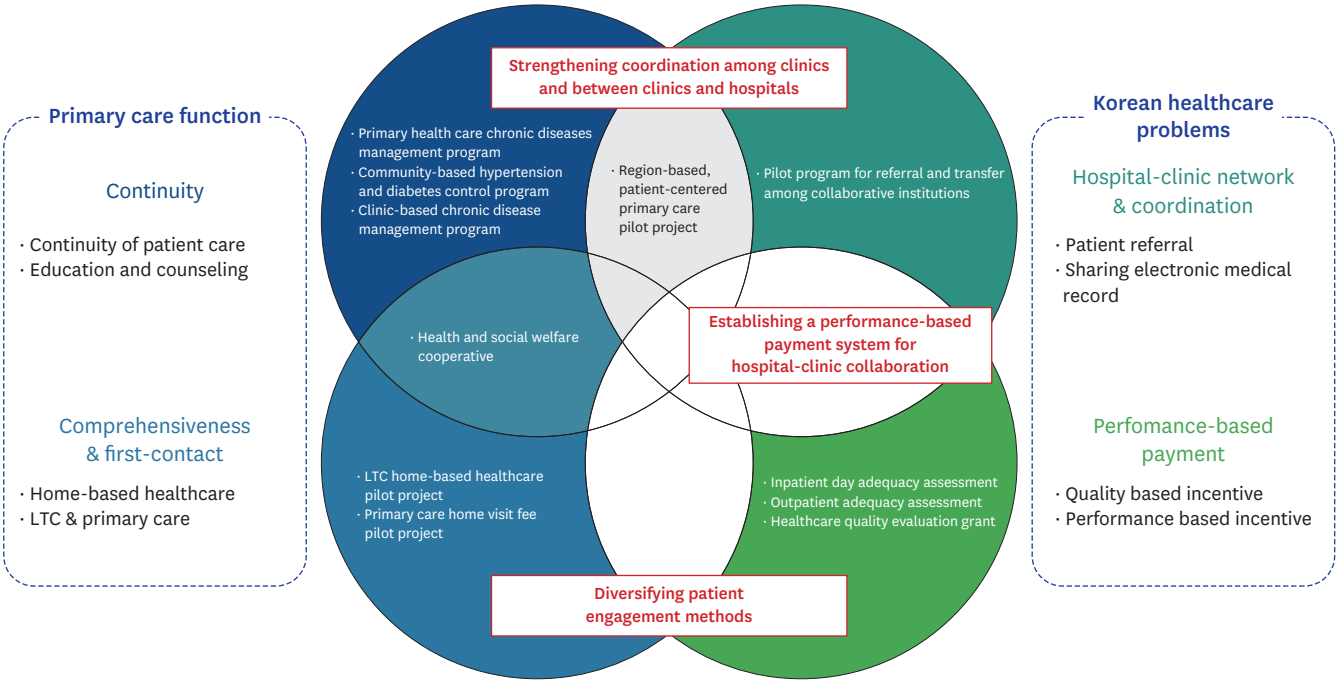

Fig. 2. Policy classification by primary care functions tailored to the context of Korea.
LTC = long-term care.

Currently, Korea's healthcare policies aim to strengthen primary care while addressing the inherent limitations of the national healthcare system through a variety of initiatives. Notably, to facilitate smoother patient referrals and transfers among healthcare institutions in a competitive environment, the country is implementing a pilot program for a referral and transfer system among collaborative institutions. This program establishes a vertical coordination network between tertiary hospitals, general hospitals, and smaller facilities using an electronic system. Managed by the HIRA, this initiative allows for electronic patient referrals and transfers, medical information sharing, and imaging data exchange, with participating institutions receiving additional compensation.

Additionally, policies offering performance-based financial incentives to healthcare institutions have been introduced. Examples include the Medical Quality Assessment Support Fund, established to address financial gaps following the elimination of certain non-reimbursed services, such as selective treatment fees, and policies evaluating the appropriateness of inpatient stays and outpatient services. The MOHW and HIRA are leading efforts to enhance inter-institutional networks and develop performance-based payment systems.

The previous model shows that policies addressing continuity, comprehensiveness, and first-contact accessibility are somewhat established. However, there is a notable absence of primary care policies that effectively address Korea's unique healthcare context. Bridging this policy gap should be a priority when developing realistic strategies to strengthen primary care.

To address the policy gap, the first priority should be to enhance coordination both among clinics and between clinics and hospitals. Once these connections are established, it will be necessary to define performance metrics and explore methods to integrate them into payment

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systems. Given the current environment where most clinics are operated independently by specialists, promoting referrals and transfers among clinics could be a practical approach to improving inter-clinic coordination. In primary care, key areas of focus include metabolic disorders, musculoskeletal conditions, and mental health issues. However, in Korea, very few clinics are equipped to comprehensively address these conditions. Thus, fostering an environment in which clinics can refer patients to one another would enable the provision of more holistic care.

Additionally, enhancing vertical coordination between primary care clinics and tertiary or general hospitals must be prioritized. Under Korea's current healthcare system, medical institutions receive payment per service provided, which incentivizes hospitals to retain patients rather than refer them to other institutions. This fee-for-service model allows patient autonomy in healthcare utilization, often overriding the guidance of medical professionals and reinforcing competition between healthcare providers, including primary care clinics and tertiary hospitals. To address these challenges, a vertical care coordination program could be developed to manage specific patient groups. This program would focus on patients who have recovered patients or completed acute care but require ongoing follow-up. Local primary care clinics could take responsibility for providing continuous care to these patients, while ensuring that medical information is shared with other institutions involved in their treatment.

To embed performance-based payment systems into primary care, it is crucial to first define performance indicators. For policymakers, demonstrating the cost-effectiveness of a system is essential to establish the rationale and momentum for its implementation, making the development of performance indicators a top priority. Performance indicators can be categorized into three main types: clinical outcome-based indicators, cost-based indicators, and utilization-based indicators. When designing performance metrics, one approach is to develop a comprehensive indicator set encompassing all three elements, similar to the United Kingdom's Quality and Outcomes Framework. Alternatively, a simplified approach focusing on a single component could be considered. However, it is essential to recognize that most clinics in Korea operate as private entities. Therefore, identifying performance measures that encourage the participation of private clinics while minimizing administrative and financial burdens on physicians is critical.

Finally, after establishing coordination mechanisms between healthcare institutions and implementing a performance-based payment system at the coordination level, it will be necessary to diversify patient engagement strategies by integrating home healthcare and long-term care. Additionally, these expanded engagement methods should be linked to performance-driven payment systems. Diversifying patient engagement strategies holds intrinsic value in strengthening primary care functions. However, expanding patient engagement alone does not necessarily improve patient outcomes. For instance, in the case of home healthcare, collaboration with social welfare services is critical to ensuring comprehensive care delivery. Therefore, incorporating performance-based metrics into diversified patient engagement strategies is essential to enhance the quality of primary care delivered through these various approaches.

Until now, primary care policies in Korea have been largely focused on medical services, while the long-term care system has been centered on care management, resulting in a bifurcated structure. However, as various primary care-related policies have evolved,

care management-related systems have also developed alongside them. Moving forward, an integrated approach that connects primary care with long-term care and caregiving services is essential. Strengthening the organic link between these systems will ensure a more cohesive and comprehensive healthcare framework. By prioritizing these steps, Korea can develop a more integrated and sustainable primary care system tailored to its unique healthcare environment.

Research activities needed to strengthen primary care in Korea

In addition to designing policies to enhance primary care, it is equally important to generate empirical evidence that validates the effectiveness of these policies and to evaluate their impact upon implementation. To achieve this, it is essential to actively conduct research using various datasets that reflect the Korean healthcare context. For instance, studies could examine the effects of strengthening primary care on patient outcomes and the efficiency of health insurance financing, comparing these to the current healthcare system in Korea. Given the broad scope of primary care, conducting in-depth research on specific issues will help accumulate evidence and contribute to the development of a more robust and comprehensive primary care system.

Korea has a variety of unique data sources, ranging from nationwide claims data derived from the single-payer national health insurance system to health-related sample datasets consistently generated by research and government institutions. To design primary care strategies tailored to Korea and enhance system efficiency, it is essential to leverage the distinct characteristics of each dataset and apply appropriate research methodologies. **Table 1** outlines the data-producing institutions, dataset descriptions, and potential applications.

Table 1. Available data for primary care and summary descriptions

Data producing agency	Name of data source	Strengths and limitations	Sample size	Key available variables	Application of primary care research
Korea Institute for Health and Social Affairs	Korea Health Panel Survey	• Strengths - A nationally representative panel dataset enabling diverse statistical analyses. - Includes information on out-of-pocket medical expenses, addressing the limitations of claims data. - Offers a wide range of healthcare utilization variables, allowing for multifaceted analyses related to medical use. • Limitations - Since the second phase of data collection began in 2019, there is a limitation in the availability of data for panel analysis using second-phase data.	5,000 to 7,000 households, 17,000 to 20,000 household members	• Household information: income, assets, housing type, healthcare-related expenditures • Private health insurance information: insurance type, coverage details, claims, and receipt status • Healthcare utilization information: chronic disease data, inpatient and outpatient care, medication use, usual source of care, emergency medical services, and unmet healthcare needs • Health behavior information: alcohol consumption, smoking, and physical activity	• Healthcare utilization and costs based on the presence of a usual source of care
	Medical service experience survey	• Strengths - Nationally representative due to sample design based on census data. - Surveys patient satisfaction, which is difficult to capture through administrative data. - Enables patient-centered statistical analyses, such as those on patient experiences and responsiveness. • Limitations - Data is limited to single-year snapshots, making time-series or panel analyses infeasible. - Integration with other data sources is challenging.	14,910 individuals	• Sociodemographic information of respondents: gender, age, education level, region, income • Experience by type of healthcare service (inpatient, outpatient, nursing care, health check-ups): satisfaction, waiting time, etc.	• Development of primary care performance evaluation using patient satisfaction with clinics

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Table 1. (Continued) Available data for primary care and summary descriptions

Data producing agency	Name of data source	Strengths and limitations	Sample size	Key available variables	Application of primary care research
	National survey of people with disabilities	• Strengths - Applied two-stage cluster sampling to the population of registered persons with disabilities under the Ministry of Health and Welfare. - Stratified sampling based on disability type and severity, enabling the extraction of registered individuals with disabilities. - Allows for analyses of life and health conditions based on disability type. • Limitations - Single-year data prevents time-series or panel analyses. - Integration with other data sources is challenging.	6,549 individuals based on 2017 data	• Household information: household type, income, and expenditures • Disability information: type of disability, onset timing and age, diagnosis • Health information: chronic conditions, treatment details • Daily life information: activities of daily living, use of assistive devices, additional costs due to disability • Education and social activity information: educational attainment, current education status, employment status, social and leisure activities, experiences of violence and discrimination	• Identifying the medical and care needs of vulnerable populations with disabilities • Establishing evidence for customized primary care systems by disability type
	National survey of older Koreans	• Strengths - Represents elderly individuals aged 65 and older residing in general households nationwide. - Provides more detailed insights into the health and lives of the elderly compared to other data sources. - Enables analysis of palliative care and life-sustaining treatment through data related to perceptions of death. • Limitations - Data is limited to single-year snapshots, making time-series or panel analyses infeasible. - Integration with other data sources is challenging.	10,078 individuals	• Household information: relationship to respondent, income, assets, liabilities • Health status: presence of chronic diseases, cognitive function, treatment status, health behaviors • Ability to perform daily activities: ADL, IADL, type of long-term care • Daily life aspects: social activities (religion, social gatherings, employment, etc.), time spent using electronic devices, thoughts about death	• Developing evidence for customized primary care systems based on the socioeconomic status of older adults
Korea Disease Control and Prevention Agency	National Health and Nutrition Examination Survey	• Strengths - A nationally representative sample dataset focused on health and nutrition at the national level. - Enables analysis of nationwide health status and health behaviors. - Offers more in-depth coverage of health promotion topics compared to other data sources. • Limitations - Single-year data is not suitable for comparative analyses between communities.	6,929 individuals	• Health information: diagnosed conditions identified through health examinations • Health-related information: health behaviors, healthcare utilization, mental health, vaccinations, and health check-ups • Nutrition information: nutrient intake status, dietary habits, etc.	• Defining the role of primary care through analysis of healthcare utilization and its association with health behaviors and lifestyles
	Community Health Survey	• Strengths - A nationally representative sample dataset with a focus on community health. - Stratified sample design based on community units, allowing for health information analysis at the regional level. - Enables health-related analyses at the community level, facilitating comparisons across regions. • Limitations - Single-year data prevents time-series or panel analyses. - Annual variations in survey items result in some variables being inconsistent across years.	231,752 individuals	• Health behavior information: smoking, alcohol consumption, physical activity, dietary habits • Health-related information: vaccination status, information on high fever, diabetes-related data, mental health details, oral health information • Healthcare utilization and quality of life: unmet healthcare needs and reasons, subjective health perception, EQ-5D index	• Comparative analysis of health behaviors, health status, and healthcare utilization across regional primary care environments

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Table 1. (Continued) Available data for primary care and summary descriptions

Data producing agency	Name of data source	Strengths and limitations	Sample size	Key available variables	Application of primary care research
Statistics Korea	Cause-of-death statistics	· Strengths - Enables identification of nationwide death cases and causes based on submitted death certificates. - Allows for analyses that simultaneously consider causes of death and the sociodemographic characteristics of the deceased. - Actively facilitates data sharing and integration with various other data sources. · Limitations - Includes distributions of data not directly attributable as causes of death, such as frailty.	Population data	· Sociodemographic characteristics of the deceased: education, region, marital status, occupation, place of death · Cause of death: aggregated in tabular format according to the recommendations of the World Health Organization International Classification of Diseases	· Measuring premature mortality due to chronic diseases and their complications to highlight the need for strengthening primary care
National Health Insurance Service	National Health Insurance Service-Sample Cohort Data	· Strengths - Stratified sampling based on sex, age, region, health insurance enrollment type, and insurance premium quintile. - A cohort dataset representative of the entire population as of 2006, allowing for longitudinal analyses. - Provides integrated data on causes of death, health check-up records, and long-term care, enabling comprehensive analyses. · Limitations - Masking of sensitive disease and procedure codes prevents analysis of certain conditions and treatment details. - Conditions such as mental and behavioral disorders or breast cancer are masked, limiting analysis capabilities.	About 1,000,000 individuals	· Eligibility and premium information for health insurance beneficiaries: coverage type, premium decile, disability information · Birth and death information: birth details and causes of death · Medical service information: claim details (medical costs, days of hospitalization/outpatient care, primary and secondary diagnoses), treatment details (procedures, medical materials, prescriptions), diagnosis records, prescription details (medication information, dosage, ingredient codes) · Health check-up information: past medical history, family history, health behaviors, clinical metrics such as cholesterol and blood glucose levels · Healthcare institution information: type of institution, number of doctors, number of nurses, number of hospital beds · Long-term care information: classification of long-term care recipients, long-term care assessments, actions taken, claim details, and information about long-term care institutions	· Research on healthcare utilization patterns and the continuous monitoring of primary care outcomes
	Customized data based on national claims data	· Strengths - Enables integration of data related to health insurance enrollees with mortality statistics and health check-up records. - Researchers can customize analyses to suit their study topics using claims data, medical records, and examination data from the National Health Insurance Service. · Limitations - As administrative data primarily serves billing purposes, it lacks clinical information and measures of patient severity.	The number of study participants can be customize based on nationwide health insurance claims bigdata through their research design	· More specific variables than sample cohort data are provided	· Assessing the clinical effectiveness of primary care providers using operational definitions of specific diseases

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Table 1. (Continued) Available data for primary care and summary descriptions

Data producing agency	Name of data source	Strengths and limitations	Sample size	Key available variables	Application of primary care research
Health Insurance Review & Assessment Service	Health Insurance Review & Assessment Service-National Patients Sample data	• Strengths - Stratified systematic sampling on an annual basis by gender and age groups using patient-specific sample data. - Divided into datasets for inpatients, the elderly, and pediatric patients, enabling analyses tailored to specific patient characteristics. • Limitations - Single-year patient sample data makes time-series or panel analyses infeasible. - As administrative data is primarily for billing purposes, it lacks clinical details and measures of patient severity.	About 700,000 to 1,000,000 individuals	• Medical service information: claim details (medical costs, days of hospitalization/outpatient care, primary and secondary diagnoses), treatment details (procedures, medical materials, prescription information), diagnosis records • Outpatient prescription information: medication details, dosage, drug ingredient codes, Anatomical Therapeutic Chemical codes • Healthcare institution information: type and details of medical institutions	• Analyzing prescribing patterns of primary care providers for specific patient groups
	Customized data based on national claims data	• Strengths - Allows precise selection of study subjects by considering prescribed medications. - Researchers can customize analyses using health insurance claims data, medical records, and examination data tailored to their research topics. • Limitations - As administrative data is primarily for billing purposes, it lacks clinical details and measures of patient severity.	The number of study participants can be customize based on nationwide health insurance claims bigdata through their research design	• More specific variables than national patients sample data are provided	• Understanding prescription patterns in primary care institutions using operational definitions of specific diseases

ADL = Activities of Daily Living, IADL = Instrumental Activities of Daily Living, EQ-5D = European Quality of Life 5 Dimensions.

Korea's healthcare system revolves around the NHIS and the HIRA, which oversee insurance coverage and claims processing. The resulting claims data is consolidated into the health insurance database, providing a valuable resource for conducting various studies related to primary care. While NHIS and HIRA offer similarly structured customized datasets, it is important to recognize that their sample datasets differ due to distinct stratification and sampling methodologies. NHIS sample data is based on the eligibility information of health insurance subscribers, representing a nationwide sample of the Korean population. In contrast, HIRA sample data focuses on patient-based sampling. Given these differences, NHIS sample data is more suitable for studies on healthcare expenditure trends in primary care, whereas HIRA sample data is better suited for analyzing prescription patterns and patient outcomes.

However, the data provided by NHIS and HIRA is based on claims information, which means it lacks details on non-covered medical services and private health insurance utilization. To address this limitation, the Korea Health Panel Survey, offered by the Korea Institute for Health and Social Affairs, serves as a complementary resource. The Korea Health Panel Survey collects panel data on individual healthcare utilization, covering a broader range of topics beyond claims data, including private health insurance enrollment, the presence of a usual source of care, and out-of-pocket healthcare expenditures.

Data sources from Statistics Korea and the KDCA provide insights into regional health indicators and healthcare accessibility. For example, Statistics Korea's Cause of Death Statistics identifies causes of death based on death certificates and includes information on the deceased's region, gender, education level, and occupation. This allows for assessing premature mortality burden across various demographic and regional factors.

Currently, multiple datasets are being linked with the Cause of Death Statistics, enabling multidimensional studies. While this dataset can be used independently for research, integrating it with other linked data facilitates more comprehensive studies.

KDCA data sources applicable to primary care include the National Health and Nutrition Examination Survey and the Community Health Survey. Both datasets provide health indicators at the national and regional levels. In particular, the Community Health Survey is useful for analyzing healthcare accessibility trends at the community level. However, as the purpose of data collection and sampling methods differ between the two sources, researchers must carefully select the dataset that aligns with their specific unit of analysis to ensure appropriate and accurate study outcomes.

Even when using the same dataset, employing different methodologies can lead to results with distinct implications. In other words, while leveraging diverse datasets is crucial, applying appropriate research methodologies tailored to the study topic is equally important to draw accurate conclusions. The datasets described in **Table 1** are primarily suitable for epidemiological studies. For instance, NHIS sample data or customized datasets can be used to design retrospective cohort studies. Additionally, propensity score matching can be employed to conduct case-control studies. However, when utilizing these methodologies, it is important to focus on causal inference rather than merely association detection. This requires careful selection of variables during the research model design phase. Alternatively, advanced methodologies such as doubly robust estimation, which combines propensity score matching with outcome regression, or target trial emulation can be applied to enhance causal validity.

With the rapid advancement of computing technologies and the emergence of big data analytics, artificial intelligence (AI) is driving significant progress across various fields, including healthcare. Korea, where nearly all citizens are enrolled in the national health insurance system, offers an ideal environment for leveraging AI. The country's extensive healthcare big data includes demographic characteristics, medical treatments, and disease records. By utilizing health insurance big data and AI algorithms, predictive models for disease occurrence and chronic disease complications can be developed to classify patients into risk groups. This approach enables the implementation of personalized care strategies and alternative payment models.

Furthermore, studying the impact of strengthening primary care on healthcare utilization patterns and the resulting economic implications can provide valuable policy insights. In the context of Korea's healthcare system, enhancing care coordination functions within primary care can drive more efficient resource allocation, ensuring the sustainability of the national health insurance system. By assessing the effects of primary care policy interventions and evaluating existing policies, evidence can be gathered to guide future healthcare reforms. Such efforts will enable data-driven modifications to the healthcare system, optimizing the impact of primary care enhancement initiatives.

Since the development of primary care must consider the sociocultural characteristics of a society, it is essential to conduct qualitative research alongside quantitative studies. Qualitative studies offer the advantage of examining phenomena from multiple perspectives and providing in-depth insights into specific issues.[71] Using this approach, focus group interviews can be conducted with various groups to design tailored systems for vulnerable populations or explore strategies to improve patient satisfaction. Given that stakeholders

in primary care span multiple sectors—such as central and local governments, healthcare, caregiving, and health promotion—the Delphi method can be employed to identify consensus among experts and stakeholders, contributing to the advancement of the system. Moreover, by integrating quantitative and qualitative approaches through mixed-methods research, the limitations of each methodology can be addressed, enabling the development of comprehensive plans to strengthen primary care in a holistic manner.

The future direction for primary care in Korea

In summary, Korea's primary care system faces challenges due to its reliance on private healthcare providers, low reimbursement rates, the fee-for-service payment model, and the absence of a well-structured healthcare delivery system. As a result, comprehensive and coordinated primary care centered on patients is not adequately provided. A significant issue is the shortage of specialized physicians who can offer comprehensive, patient-centered consultations and care. Moreover, the healthcare system has historically been structured around tertiary hospitals, resulting in insufficient central government support for primary care. Additionally, demographic challenges such as the transition to a super-aged society and a declining working-age population further exacerbate the situation. Rapid economic development, particularly in metropolitan areas, has led to instability in regional healthcare systems, with communities struggling to efficiently allocate and utilize available resources.

Addressing these challenges requires a thorough assessment of the limitations within Korea's current primary care system and determine the functions of primary care that are suitable for the country's unique context. Based on these functions and experiences from various primary care innovation initiatives currently underway, refined policies must be developed to strengthen primary care.

In addition to strategies focused on enhancing primary care functions tailored to Korea's needs, it is also essential to establish mid- to long-term development plans that take a forward-looking perspective to ensure the sustainability of primary care. This requires refining short- to mid-term policies while solidifying coordination systems between clinics and hospitals. The need to share medical information in a patient-centered manner is central to this effort. Integrating patient information into a centralized system would enable coordinated care and facilitate polypharmacy management. However, the method of information sharing and the entity responsible for managing it will require broader societal consensus. Given the sensitivity of personal medical data, discussions regarding the scope of information sharing, data storage protocols, and governance structures must be guided by thorough legal review and patient-centered considerations.

If societal consensus on information sharing can be established, along with the necessary foundational infrastructure, it will become possible to utilize individual medical records within a fee-for-performance system. Under such conditions, a fee-for-performance system that reduces the administrative burden on healthcare providers could be developed, either through direct data input by patients or providers, or through automated data transmission systems. This system could serve not only as an effective payment mechanism, but also play a crucial role in strengthening coordination within primary healthcare.

Aligning the coordination systems between healthcare institutions under a unified incentive framework, particularly an economic one, is essential. In other words, the current competitive relationships between medical institutions must transition toward a model

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of mutual cooperation. This can be achieved by reinforcing the horizontal coordination among clinics and vertical coordination between clinics and hospitals. However, to unify the coordination system under economic incentives, transitioning from the traditional fee-for-service model to a performance-linked payment system is necessary.

The above-mentioned elements represent long-term structural improvements for strengthening primary care. From a long-term perspective, along with systemic growth, the development of healthcare resources, particularly human resources, must be supported to effectively enhance primary care in Korea. The process of cultivating primary care professionals varies by country, reflecting different healthcare environments and socio-cultural contexts.[72-74] Similarly, Korea must develop primary care workforce tailored to its specific needs by comprehensively considering the training environment and medical residency curricula.

A practical workforce policy essential for Korea is the establishment of a training environment that enables primary care institutions to provide comprehensive and continuous medical services to patients. Compared to other countries, consultation time in Korea is relatively limited, making it challenging to deliver fully patient-centered care. Currently, healthcare professionals do not engage in comprehensive consultations in patient-centered manners, covering aspects such as health behaviors, genetic factors, and medication adherence. Moreover, physicians are not yet accustomed to this approach to patient care. Strengthening the foundation for primary care in Korea requires a long-term strategy, starting with fundamental workforce development. By taking this structured approach, Korea can lay the groundwork for a more robust and sustainable primary care system.

Beyond institutional development, it is essential to leverage various data sources that reflect the state of primary care in Korea to build evidence and assess policy outcomes. This requires conducting a wide range of studies, including effectiveness analyses comparing outcomes before and after policy interventions, prospective research designs, and long-term follow-up studies to establish causal relationships. Research is also needed to identify non-medical factors that hinder the first-contact function of primary care and to explore strategies to address social determinants of health that impact healthcare access. Furthermore, with the rapid advancement of digital health technologies, studies on how to integrate telemedicine and digital health tools into primary care and measure its impact should also be prioritized.

In addition to research focused on domestic circumstances, efforts must be made to assess Korea's primary care system in comparison to international standards. By utilizing data from international organizations such as the World Health Organization or OECD, comparisons can be drawn with countries that share similar social and environmental contexts to assess Korea's primary care performance on a global scale. These future studies will enable the development of a more evidence-based primary care system while offering objective insights into how Korea's system compares to those of other nations.

CONCLUSION

Korea's healthcare system is undergoing significant transformations within the broader context of healthcare reform. Amid discussions on comprehensive system restructuring, greater emphasis should be placed on strengthening primary care. However, it is crucial

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to avoid uncritically adopting primary care models from other countries with different sociocultural contexts. Instead, efforts must focus on understanding the distinctive characteristics of Korea's healthcare environment and developing evidence-based strategies tailored to the nation's specific needs. This approach is essential to establish a robust primary care system and foster long-term sustainability.

To achieve this, collaboration across various professional fields is essential. Given the multifaceted nature of primary care, active research across diverse academic disciplines is necessary to consolidate knowledge and develop comprehensive solutions. In particular, it is crucial to integrate multidisciplinary research findings to design a holistic and well-rounded primary care system.

Korea is currently facing a range of pressing healthcare challenges, including rapid demographic changes, rising healthcare costs, and issues related to the training environment for medical residents. To address these issues, the government aims to implement various healthcare reforms. Amid these efforts, the reinforcement of primary care must be prioritized.

Historically, Korea's healthcare policies have been hospital-centered, highlighting the need for a paradigm shift in the overall healthcare culture. To achieve this, the government should establish mid- to long-term strategic directions for primary care reform and prioritize policies tailored to Korea's unique circumstances. By focusing on these priorities, the government can develop practical and feasible strategies to effectively strengthen primary care.

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REFERENCES

1. GBD 2021 Diseases and Injuries Collaborators. Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet* 2024;403(10440):2133-61. PUBMED | CROSSREF
2. Jung YS, Kim YE, Ock M, Yoon SJ. Measuring the burden of disease in Korea using disability-adjusted life years (2008–2020). *J Korean Med Sci* 2024;39(7):e67. PUBMED | CROSSREF
3. Kim CN, Jung YS, Kim YE, Ock M, Yoon SJ. Korean national burden of disease: the importance of diabetes management. *Diabetes Metab J* 2024;48(4):518-30. PUBMED | CROSSREF
4. Institute for Health Metrics and Evaluation. GBD compare. https://vizhub.healthdata.org/gbd-compare/. Updated 2024. Accessed December 6, 2024.
5. Kim KW, Kim OS. Super aging in South Korea unstoppable but mitigatable: a sub-national scale population projection for best policy planning. *Spat Demogr* 2020;8(2):155-73. PUBMED | CROSSREF
6. Kontis V, Bennett JE, Mathers CD, Li G, Foreman K, Ezzati M. Future life expectancy in 35 industrialised countries: projections with a Bayesian model ensemble. *Lancet* 2017;389(10076):1323-35. PUBMED | CROSSREF
7. World Health Organization (WHO). *Republic of Korea Health System Review*. Manila, Philippines: WHO Regional Office for the Western Pacific; 2015.
8. Park EC. Strategies for improving healthcare delivery system in Korea. *HIRA Res* 2021;1(1):9-15. CROSSREF
9. Lee JY, Jo MW, Yoo WS, Kim HJ, Eun SJ. Evidence of a broken healthcare delivery system in Korea: unnecessary hospital outpatient utilization among patients with a single chronic disease without complications. *J Korean Med Sci* 2014;29(12):1590-6. PUBMED | CROSSREF

10. Lee HJ, Jang SI, Park EC. The effect of increasing the coinsurance rate on outpatient utilization of healthcare services in South Korea. *BMC Health Serv Res* 2017;17(1):152. PUBMED | CROSSREF
11. Song YJ. The South Korean health care system. *Japan Med Assoc J* 2009;52(3):206-9.
12. Jeong HS. Korea's National Health Insurance--lessons from the past three decades. *Health Aff (Millwood)* 2011;30(1):136-44. PUBMED | CROSSREF
13. Kim YE, Pyo J, Lee H, Jeong H, Park YK, Seo JW, et al. Relevance index regional variation by each disease and its essential medical field: a retrospective data analysis from 2016–2020 in Korea. *J Korean Med Sci* 2023;38(16):e130. PUBMED | CROSSREF
14. Jung YS, Kim YE, Ock M, Yoon SJ. Trends in healthy life expectancy (HALE) and disparities by income and region in Korea (2008–2020): analysis of a nationwide claims database. *J Korean Med Sci* 2024;39(6):e46. PUBMED
15. Kim CN, Jung YS, Kim YE, Ock M, Jin DL, Yoon SJ. Trends of gaps between health-adjusted life expectancy and life expectancy at the regional level in Korea using a group-based multi-trajectory modeling approach (2008–2019). *J Korean Med Sci* 2024;39(17):e145. PUBMED | CROSSREF
16. Chi Y. *A Policy Package to Bring Essential Healthcare Back From the Brink of Collapse*. Sejong, Korea: Ministry of Health and Welfare; 2024.
17. Chi Y. *The Government to Start Social Discussion on Healthcare Reform in Earnest*. Sejong, Korea: Ministry of Health and Welfare; 2024.
18. The Lancet Regional Health-Western Pacific. Junior doctor strikes in South Korea: more doctors are needed? *Lancet Reg Health West Pac* 2024;44:101056. PUBMED | CROSSREF
19. Park H. Junior doctors' strike in South Korea: systemic barriers undermine medical practice. *BMJ* 2024;385:q752. PUBMED | CROSSREF
20. Seth MJ. South Korea's economic development, 1948–1996. In: *Oxford Research Encyclopedia of Asian History*. Oxford, United Kingdom: Oxford University Press; 2017.
21. Kim KS, Lee YJ. Developments and general features of national health insurance in Korea. *Soc Work Public Health* 2010;25(2):142-57. PUBMED | CROSSREF
22. Kwon S. Thirty years of national health insurance in South Korea: lessons for achieving universal health care coverage. *Health Policy Plan* 2009;24(1):63-71. PUBMED | CROSSREF
23. Organisation for Economic Co-operation and Development (OECD) Library. Health at a glance 2023: OECD indicators. 2023. https://www.oecd.org/en/publications/2023/11/health-at-a-glance-2023_e04f8239.html. Updated 2023. Accessed December 18, 2024.
24. Kim H, Cheng SH. Assessing quality of primary diabetes care in South Korea and Taiwan using avoidable hospitalizations. *Health Policy* 2018;122(11):1222-31. PUBMED | CROSSREF
25. Kim SJ, Hwang JY, Seon JY. The effect of healthcare environment on quality improvement in primary care: panel analysis using 2008–2017 OECD health statistics data. *J Health Inform Stat* 2020;45(3):302-10. CROSSREF
26. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005;83(3):457-502. PUBMED | CROSSREF
27. Winpenny E, Miani C, Pitchforth E, Ball S, Nolte E, King S, et al. Outpatient services and primary care: scoping review, substudies and international comparisons. In: *Health Services and Delivery Research*. Southampton, United Kingdom: NIHR Journals Library; 2016. PUBMED | CROSSREF
28. HIRA Bigdata Open Portal. Current status of human resources. https://opendata.hira.or.kr/op/opc/olapHumanResourceStatInfoTab1.do. Updated 2024. Accessed December 25, 2024.
29. Lee JY, Eun SJ, Kim HJ, Jo MW. Finding the primary care providers in the specialist-dominant primary care setting of Korea: a cluster analysis. *PLoS One* 2016;11(8):e0161937. PUBMED | CROSSREF
30. Yun JM, Choi S, Cho Y, Park SM, Kim Y. Definition and status of functional primary clinic in Korea. *Korean J Fam Pract* 2021;11(1):3-9. CROSSREF
31. Kim HJ, Shin JY, Yang YJ, Cho B, Yun JM. Analysis of the comprehensiveness of primary care clinics in Korea. *Korean J Fam Med* 2021;42(1):47-52. PUBMED | CROSSREF
32. HIRA Bigdata Open Portal. Statistics of current health insurance care. https://opendata.hira.or.kr/op/opc/olapHthInsRvStatInfoTab20.do?docNo=03-036. Updated 2022. Accessed December 25, 2024.
33. Seo EW, Chung SH. A review of healthcare provider payment system in Korea. *Health Policy Manag* 2023;33:379-88.
34. Gosden T, Forland F, Kristiansen IS, Sutton M, Leese B, Giuffrida A, et al. Capitation, salary, fee-for-service and mixed systems of payment: effects on the behaviour of primary care physicians. *Cochrane Database Syst Rev* 2000;2000(3):CD002215. PUBMED | CROSSREF

35. Choi Y, Kweon S, Baek M. Inequalities in primary care provision in Gwangju Metropolitan City, South Korea. *Eur J Public Health* 2024;34(Suppl 3):ckae144.953. CROSSREF
36. Lee JR. Review the change of chronic disease care in Korea. *J Korean Diabetes* 2022;23(4):251-7. CROSSREF
37. Seo SY, Kim HJ, Oh HK, Lee SK. Propulsion status of a community-based hypertension and diabetes control program. *Public Health Wkly Rep* 2021;14(21):1414-21.
38. Korea Disease Control and Prevention Agency. *Community-based Hypertension and Diabetes Control Program Standard Manual*. Cheongju, Korea: Korea Disease Control and Prevention Agency; 2024.
39. Ministry of Health and Welfare (KR). *Enforcement Decree of the National Health Insurance Act, Presidential Decree No. 22099; Mar 26*, 2010. Sejong, Korea: Korea Legislation Research Institute; 2010.
40. Kim HS, Yoo BN, Lee EW. Evaluation of the national chronic diseases management policy: performance and future directions. *Public Health Aff* 2018;2(1):105-20. CROSSREF
41. Cho JJ, Kwon YJ, Jung SH. Community based health care service design on chronic disease for enhancing primary care and the status of community based primary care project. *Korean J Fam Pract* 2015;5:173-8.
42. Ha R, Kim D, Choi J, Jung-Choi K. A national pilot program for chronic diseases and health inequalities in South Korea. *BMC Public Health* 2021;21(1):1142. PUBMED | CROSSREF
43. Song E, Kim YE, Ji S. Impact of a primary health care chronic diseases management pilot program. *Korean J Med* 2021;96(1):7-12. CROSSREF
44. Lee EW, Kim HS, Yoo BN, Lee EJ, Park JH. Effect of a primary care-based chronic disease management program for hypertension patients in South Korea. *Iran J Public Health* 2022;51(3):624-33. PUBMED | CROSSREF
45. Ritchie CS, Leff B. Population health and tailored medical care in the home: the roles of home-based primary care and home-based palliative care. *J Pain Symptom Manage* 2018;55(3):1041-6. PUBMED | CROSSREF
46. Zimbroff RM, Ornstein KA, Sheehan OC. Home-based primary care: a systematic review of the literature, 2010-2020. *J Am Geriatr Soc* 2021;69(10):2963-72. PUBMED | CROSSREF
47. Kim CO, Jang SN. Home-based primary care for homebound older adults: literature review. *Ann Geriatr Med Res* 2018;22(2):62-72. PUBMED | CROSSREF
48. Health Insurance Review & Assessment Service (KR). Notice: guidelines for the "Pilot Project for Home Care of Peritoneal Dialysis Patients". https://www.hira.or.kr/bbsDummy.do?pgmid=HIRAA020002000100&brdScnBltNo=4&brdBltNo=7641. Updated 2019. Accessed December 24, 2024.
49. Health Insurance Review & Assessment Service (KR). Guidelines for home care pilot project for cancer patients. https://www.hira.or.kr/bbs/157/2022/10/BZ202210318044205.pdf. Updated 2021. Accessed December 24, 2024.
50. Health Insurance Review & Assessment Service (KR). Notice: guidelines for revision of the "Type 1 Diabetes Patient Home Care Pilot Project". https://www.hira.or.kr/bbsDummy.do?pgmid=HIRAA020002000100&brdScnBltNo=4&brdBltNo=10743&pageIndex=1&pageIndex2=1. Updated 2024. Accessed December 24, 2024.
51. Health Insurance Review & Assessment Service (KR). Guidelines for home care pilot project for rehabilitation patients. https://www.hira.or.kr/bbs/157/2023/12/BZ202312049364563.pdf. Updated 2024. Accessed December 23, 2024.
52. Health Insurance Review & Assessment Service (KR). Notice: guidelines for revision of the "Severely Ill Pediatric Home Care Pilot Project". https://www.hira.or.kr/bbsDummy.do?pgmid=HIRAA020002000100&brdScnBltNo=4&brdBltNo=10147&pageIndex=1&pageIndex2=1. Updated 2024. Accessed December 24, 2024.
53. Health Insurance Review & Assessment Service (KR). Notice: guidelines for revision of the "Home Medical Care Pilot Project for Patients with Home-use Ventilators". https://www.hira.or.kr/bbsDummy.do?pgmid=HIRAA020002000100&brdScnBltNo=4&brdBltNo=10049&pageIndex=1&pageIndex2=1. Updated 2022. Accessed December 25, 2024.
54. Health Insurance Review & Assessment Service (KR). Notice: guidelines for revision of the "Pilot Project for Home Medical Care for Heart Disease Patients". https://www.hira.or.kr/bbsDummy.do?pgmid=HIRAA020002000100&brdScnBltNo=4&brdBltNo=10051. Updated 2022. Accessed December 25, 2024.
55. Health Insurance Review & Assessment Service (KR). Notice: announcement of revision of guidelines for "Pilot Project for Home Medical Care for Tuberculosis Patients". https://www.hira.or.kr/bbsDummy.do?pgmid=HIRAA020002000100&brdScnBltNo=4&brdBltNo=9550&pageIndex=1. Updated 2022. Accessed December 25, 2024.

56. Ministry of Health and Welfare (KR). Guidelines for the pilot project for the fee of primary care visits. https://www.mohw.go.kr/boardDownload.es?bid=0003&list_no=1478692&seq=2. Updated 2022. Accessed December 25, 2024.
57. Ministry of Health and Welfare (KR). Announcement of guidelines for pilot project of long-term care home medical center. https://www.mohw.go.kr/board.es?mid=a10501010000&bid=0003&list_no=1479696&act=view. Updated 2024. Accessed December 25, 2024.
58. Ministry of Health and Welfare (KR). Guide of hospice and palliative care project in 2024. https://www.mohw.go.kr/board.es?mid=a10107010000&bid=0043&act=view&list_no=1480476&tag=&cg_code=&list_depth=1. Updated 2024. Accessed December 25, 2024.
59. Ministry of Health and Welfare (KR). Project overview. https://www.nrc.go.kr/chmcpd/html/content.do?depth=pi&menu_cd=02_04_01. Updated 2024. Accessed December 25, 2024.
60. Lee H. Changes in the mixed fee-based payment system in primary care: cases and implications. *Korean J Fam Pract* 2023;13(1):2-7. CROSSREF
61. Achelrod D, Welte T, Schreyögg J, Stargardt T. Costs and outcomes of the German disease management programme (DMP) for chronic obstructive pulmonary disease (COPD)-a large population-based cohort study. *Health Policy* 2016;120(9):1029-39. PUBMED | CROSSREF
62. Hur R, Kim KH, Jin DL, Yoon SJ. Impact of comprehensive primary care in patients with complex chronic diseases: nationwide cohort database analysis in Korea. *J Korean Med Sci* 2024;39(18):e158. PUBMED | CROSSREF
63. Cho YG. Supply of primary care physicians: a key strategy to reduce population mortality. *Korean J Fam Med* 2024;45(2):59-60. PUBMED | CROSSREF
64. Koh H, Kwon S, Cho B. Association of primary care physician supply with population mortality in South Korea: a pooled cross-sectional analysis. *Korean J Fam Med* 2024;45(2):105-15. PUBMED | CROSSREF
65. Kang HC, Yun G, Lee J, Ko J, Kim SK, Moon S, et al. *Korea Health Care System Performance (The Year 7): Achievements and Challenges of Innovation in Primary Care Chronic Disease Management*. Sejong, Korea: Korea Institute for Health and Social Affairs; 2023.
66. Leem JH, Lee S, Lim MK, Ahn E, Kim Y. Evaluation of value-based, community-centered primary care: a case study of Anseong health welfare social cooperative. *Korean J Fam Pract* 2024;14(2):66-74. CROSSREF
67. Mun H, Cho K, Lee S, Choi Y, Oh SJ, Kim YS, et al. Patient-centered integrated model of home health care services in South Korea (PICS-K). *Int J Integr Care* 2023;23(2):6. PUBMED | CROSSREF
68. Al Khashan H, Abogazalah F, Alomary S, Nahhas M, Alwadey A, Al-Khudhair B, et al. Primary health care reform in Saudi Arabia: progress, challenges and prospects. *East Mediterr Health J* 2021;27(10):1016-26. PUBMED | CROSSREF
69. Lee SI, Park H, Kim JW, Hwang H, Cho EY, Kim Y, et al. Physicians' perceptions and use of a health information exchange: a pilot program in South Korea. *Telemed J E Health* 2012;18(8):604-12. PUBMED | CROSSREF
70. Jeon B, Kwon S. Health and long-term care systems for older people in the republic of Korea: policy challenges and lessons. *Health Syst Reform* 2017;3(3):214-23. PUBMED | CROSSREF
71. Pyo J, Lee W, Choi EY, Jang SG, Ock M. Qualitative research in healthcare: necessity and characteristics. *J Prev Med Public Health* 2023;56(1):12-20. PUBMED | CROSSREF
72. Kato T, Ikegami N. How specialists become primary care physicians in Japan. *Health (Irvine Calif)* 2019;11(3):322-31. CROSSREF
73. Crisp N. A global perspective on the education and training of primary care and public health professionals. *London J Prim Care (Abingdon)* 2012;4(2):116-9. PUBMED | CROSSREF
74. Li X, Krumholz HM, Yip W, Cheng KK, De Maeseneer J, Meng Q, et al. Quality of primary health care in China: challenges and recommendations. *Lancet* 2020;395(10239):1802-12. PUBMED | CROSSREF