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Measures for Increasing Inter-Korean Exchange and Cooperation on Healthcare and Medicine

Song Cheol-jong

KIHASA
Korea Institute for Health and Social Affairs

【Principal Researcher】
Song Cheol-Jong Associate Research Fellow, Korea Institute for Health and Social Affairs (KIHASA)

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Korea Institute for Health and Social Affairs
Building D, 370 Sicheong-daero, Sejong city 30147 KOREA
http://www.kihasa.re.kr
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I Introduction

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The purpose of this study is to identify policy measures necessary to promote inter-Korean exchange and cooperation on healthcare and medicine, with a view to the larger aim of establishing peace on the Korean Peninsula in the long run.[1] Even if peaceful unification of the two Koreas were to begin pursuant to a political agreement, social integration would proceed at a much slower pace, given the stark differences between the two. Achieving effective integration by minimizing foreseeable side effects and complications of union would be an even more serious, yet desired, task than political unification itself. Although inter-Korean relations have begun to show signs of thawing recently, it will take years, or even decades, for Koreans to overcome their institutional and ideological differences. It is therefore crucial to work toward reducing the gap between the two societies with a long-term view in sight.

First and foremost to social integration in the long run is the need to narrow the gap in terms of living standards and quality of life. Reducing the gap in living standards will involve much more than bringing one Korea's per-capita income on a par

1) This study is an excerpt and summary of Cho Seong-eun et al. (2018), *Healthcare and Medical Systems in South and North Koreas: Measures for Cooperation*. The tables and figures cited from the original are referenced as "Cho et al. (2018)."

with the other's; it will also require equivalence in the levels of welfare and health people of both societies enjoy. Health and welfare programs will profoundly influence North Koreans' living standards and incomes, employment prospects and working conditions, anticipation for increased exchange and cooperation with the South, support for true integration and the costs of social integration. Systematic and substantial research on the social security systems of both Koreas is therefore essential to the peace-building process. Of the broad array of research topics concerning health and welfare, this study focuses on measures to promote integration in healthcare and medicine.

Notwithstanding the transformation of North Korea into a market economy, healthcare and medical systems ought to remain as public as possible, as these systems function as public goods. To this end, South Korean policymakers need to find ways to promote health and medical aid and exchange for North Korea, while also determining the priorities and strategies regarding (re)construction of the healthcare security net in North Korea, which has severely atrophied over the years. Policymakers ought also to refer to existing research findings to predict likely future changes, and invest resources toward minimizing unwanted side effects and promoting peaceful social integration.

This study is intended to contribute in the following ways to the ultimate social integration of the two Koreas. First, this

study provides a rational plan for integrating the two healthcare systems, identifying the tasks involved step by step, and proposing measures of exchange and cooperation toward minimizing costs. Specifically, this study first examines the current North Korean healthcare system in detail. Second, it also reviews the potential risk factors that may emerge in the integration of the two health and medical systems, and explores solutions.

To achieve these research aims, this study first analyzes the existing literature, including international reports, on the state of healthcare in North Korea. It then analyzes (with approval from the Institutional Review Board (IRB)) the in-depth interviews held with North Koreans who have defected since 2010 and who earlier had worked in the medical field in North Korea.

This study is structured as follows. Chapter II surveys the current structure and state of the North Korean healthcare and medical system. Chapter III discusses the disparity in health between the two Koreas and the demand for health and medical care in North Korea. Chapter IV explores the issues and tasks for inter-Korean exchange and cooperation. Chapter V summarizes the findings and presents a conclusion.

II

Health and Medical System in North Korea

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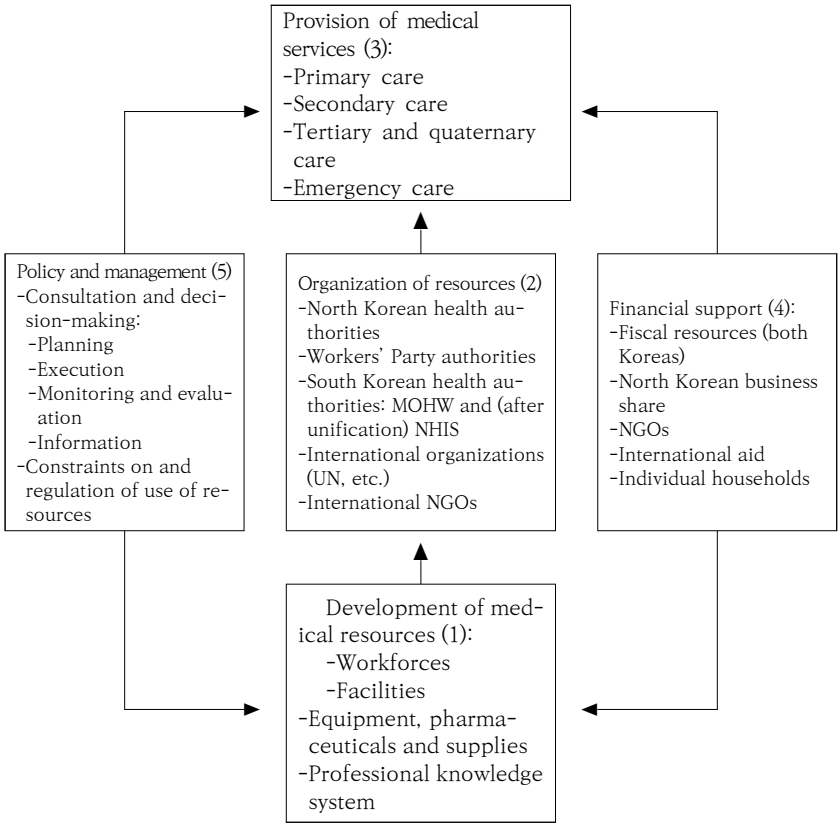
As is well known, North Korea has a socialist system of health and medical care, whose central pillars include free and universal care, preventive medicine, and a district doctor system. Free universal care, however, has stripped pharmaceuticals and medical services of their product value. Partial marketization has thus stalled investment in drugs, medical equipment and facilities (Shin et al., 2017, p. 2). With even medical practitioners denied rations during the Arduous March, informal forms of medical care began to proliferate, while partial marketization has also channeled significant portions of pharmaceuticals and medical devices into the informal market, steering them away from official channels of distribution. Although the Kim Jong-un regime has somewhat succeeded in stabilizing the overall economy, few significant changes have taken place in medicine and healthcare outside Pyongyang.

Our analysis of the North Korean healthcare system is based on the World Health Organization (WHO)'s instrument for analyzing health systems, which is suited to revealing the structural flows among interrelated variables. A health system, according to this analytical tool, consists of five factors, i.e., (1) development of medical resources, (2) organization of resources, (3) provision of medical services, (4) financial support, and (5) policy and management. The limited amount of available in-

formation on North Korea means that we can analyze only the first three of these factors. In this chapter, we will examine the structures of medical resources, organization and medical services in North Korea. Analysis of the fourth and fifth factors will be included as part of our discussion, in Chapter IV, on the mutually open and integrated system that may arise out of long-term exchange and cooperation between the two Koreas. The WHO's analytical framework will serve as the basis upon which we examine and analyze possible measures for inter-Korean exchange and cooperation in the future, particularly for rebuilding and integrating healthcare infrastructure.

[Figure 2-1] Factors of the Health and Medical System, and Flows



Source: WHO (1984), National health systems and their reorientation towards health for all, adapted, in Cho et al. (2018), to the North Korean situation and research findings.

The defining characteristics of the North Korean health system are "free universal care for all, appointment of doctors to each district, concurrent practice of Korean medicine and new (Western) medicine, emphasis on prevention, and participation of the general public in health projects, with much of those fi-

nanced by government budgets toward providing medical services via public medical institutions" (Lee et al., 2016, p. 176). It chiefly diverges from its South Korean counterpart with its universal care, preventive medicine, and doctor-area assignments. These three elements are so quintessential that they are enshrined in the country's Socialist Constitution. Article 56 of that Constitution states: "The State protects the people's lives and improves the working people's health by consolidating and developing the system of universal free medical service and improving the district doctor system and the system of preventive medicine."[2] Although the North Korean health system has all these important formative elements, the failure of the planned economy since the 1990s has accelerated the privatization of healthcare in the country. The equipment and facilities of public medical institutions remain outdated, while people have had to depend increasingly on the market for the supply of pharmaceuticals and other goods.

The Arduous March of the mid-1990s has left the North

2) Article 72 further states: "Citizens are entitled to free medical care, and all persons who are no longer able to work because of old age, illness or physical disability, and seniors and minors who have no means of support are all entitled to material assistance. This right is ensured by free medical care, an expanding network of hospitals, sanatoria and other medical institutions, State social insurance and other social security systems." This Article is significant in that it refers to "citizens," rather than "workers, office workers and their dependents," so as to protect the stated right of all persons, including farmers, small businessowners and housewives. It also emphasizes that free medical care is something that is independent of the State's generosity and is indeed a matter of right to which citizens are entitled.

Korean health system no longer capable of providing free care. The only remaining positive is the relatively large pool of medical practitioners. The North Korean government established numerous institutions for medical training in addition to colleges of medicine and thereby succeeded in developing a large medical workforce early on. In North Korea, it is estimated that there are approximately 32.9 health workers per 10,000 persons in North Korea, a figure that is slightly above South Korea's and significantly higher than the worldwide average of 14.2 health workers per 10,000.

〈Table 2-1〉 Medical Workforces: Koreas, Southeast Asia, and Worldwide

	South Korea	North Korea	Myanmar	Nepal	Bhutan	Southeast Asia	Low-income countries	World-wide
Doctors	20.2	32.9*	4.6	2.1*	0.2	5.6	2.1	14.2
Nurses and midwives	52.9	41.2*	8.0	4.6*	2.4	10.9	5.3	28.1
Pharmacists	12.1	6.0*	0.05*	0.1*	0.4	4.1	0.3	4.0

Source: Organisation for Economic Cooperation and Development (OECD) and WHO, *Health at a Glance: Asia/Pacific 2012,* quoted in Lee et al. (2017), p. 103 (Table 3-5).

With the aim of maintaining the medical workforce at a sufficiently large size, the North Korean government has allowed doctors to obtain their degrees not only from colleges of medicine, but also through communication courses. There are also specialized medical schools that produce intermediate-level health workers. Nurses can obtain their qualifications by simply

taking six-month courses available in their counties. Nurses can also take communication courses from medical colleges while working to become high-level health workers.

Nevertheless, the North Korean health system suffers from serious shortages of medical facilities, equipment, supplies and pharmaceuticals. These shortages "are seen as the most critical of all problems faced by the North Korean health system" (Lee et al., 2017, p. 104). Increasing the quantity of better-quality medical facilities, equipment and pharmaceuticals will be the top priority in organizing future inter-Korean cooperation on healthcare. The universal medical care system in North Korea, however, has ensured a relatively even distribution of medical facilities across the regions in the country. In general, each province has at least one university or general hospital, and each municipality (city, county or district) has one or two "people's hospitals." Each populous neighborhood (ri or dong) also has a "people's hospital" or clinic. A general clinic is provided for two or more less populous neighborhoods together. Each province also has institutions of specialized care, including in obstetrics, pediatrics, dentistry, tuberculosis treatment, psychiatry, clinical medicine, and communicable disease (CD) control. Municipalities also have sanatoriums to accommodate patients with CDs, such as tuberculosis.

〈Table 2-2〉 Medical Institutions in North Korea

Type		No. of workers	Departments	No. of beds	Key facilities
Quaternary	Joseon Red Cross General Hospitals	approx. 900	Similar to tertiary-level hospitals	+/- 1,000	Comprehensive equipment for basic diagnostics and treatment
Tertiary	Provincial/ university hospitals	approx. 200	All departments (including internal medicine and surgery)	800 to 1,200	
Secondary	People's hospitals (cities, counties, districts)	approx. 50	Internal medicine, surgery, pediatrics, ob./gyn., dermatology, ophthalmology, ENT, radiation, labs (blood tests), physiotherapy, tuberculosis, CD control, oral, Korean medicine, neurology, etc.	100 to 500	Ambulance, X-ray, ultrasound
Primary	People's hospitals (neighborhoods)	approx. 10	Internal medicine, surgery, ENT, pediatrics, ob./gyn., Korean medicine, oral, radiation (some)	5 to 20	X-ray for larger institutions
	General clinics	5 to 10	Internal medicine, surgery, pediatrics (limited), vaccination (limited)	5 or fewer	
	Neighborhood clinics	2 to 5	No specialized departments	2 or fewer	None

Source: Table 1, Medical Aid for Children (2012), pp. 41-42, adapted by Cho et al. (2018) in light of the findings of the qualitative survey on North Korean defectors who had formerly been medical practitioners and Shin et al. (2017).

The biggest problem facing the North Korean health system, to note again, is not the quantity of existing facilities, but the shortages of pharmaceuticals, equipment, supplies and other such material goods necessary to ensure the quality of the serv-

ices provided by those facilities (WHO, 2011). For instance, the maternal mortality rate in North Korea is quite high, due to hemorrhaging (30 percent), anemia (13 percent), infection (12 percent), difficult birth and preeclampsia (12 percent). This reflects the shortage of antibiotics and other basic pharmaceuticals and the generally outdated nature of the available equipment and facilities, which contribute to the inability to control hemorrhaging, infection, and other postpartum complications (Lee et al., 2017, p. 105). Article 32 of the Pharmaceuticals and Medical Supplies Management Act in North Korea explicitly requires increasing the percentages of pharmaceutical and supply containers being recycled. The prevalent practice of recycling, inevitable due to the shortage of goods, significantly threatens the safety of pharmaceuticals and medical supplies and raises the likelihood of infection (WHO, 2008). The trend of marketization sweeping across all of North Korean society has rendered official channels of rations ineffectual, forcing more and more North Koreans to resort to the market. This, in turn, translates into a widening gap in the availability of medical resources along class lines.

According to the testimonies of former North Korean doctors who have defected, the shortage of pharmaceuticals and medical supplies in hospitals leads individuals to purchase such things from *jangmadang* (marketplaces). Free care is now effectively provided for only a part of the population. It is impos-

sible to guarantee the quality of pharmaceuticals purchased from *jangmadang*, while individuals are also prone to overdosing on, or otherwise misusing, these substances. Doctors, too, are compelled to purchase these substances from wholesale distributors, resell them to patients, and/or operate their own "private" practices after official work hours to earn the extra income they need to survive in a medical system that is, in fact, privatized.

The marketization of healthcare has nonetheless failed to stem the growing shortages of pharmaceuticals and medical supplies. Although there are nearly a dozen pharmaceutical plants operated by the state in North Korea, including ones at Suncheon, Pyongyang, Hamheung, and Cheongjin, these plants together are capable of producing only 20 or so synthetic drugs and a couple types of antibiotics. The plants are frequently interrupted by power outages and the lack of access to steady supplies of quality materials. As a result, Chinese-made drugs and even pharmaceuticals brought in by international aid organizations flow into *jangmadang* for private transactions. Furthermore, county- and district-level hospitals that are most commonly visited by North Koreans lack basic equipment, including devices for ultrasound, electrocardiogram (ECG) and endoscopy. Most of these smaller hospitals have nothing more than blood testing devices and X-ray machines. Trapped in chronic shortages of medical goods, the health authorities in

North Korea encourage individuals to farm and gather medicinal herbs. Even local clinics and hospitals prescribe various herbal medicines. It is common for patients with a cold to be prescribed *samhwangsan* rather than aspirin. *Hwanggyeongpi* is a common prescription for patients with indigestion.

A systemic overhaul, involving the better regulation of private transactions on pharmaceuticals and production, is needed in light of the despairing shortages of medical supplies in North Korea. Policy measures are necessary to ensure supply of quality-assured (e.g., GMP-certified) medical supplies. Even more urgent, however, is the need to establish infrastructure to allow North Korean pharmaceutical plants to produce generic and essential drugs. Joint ventures, combining North Korean labor and South Korean capital, should be set up to expedite the production of necessary pharmaceuticals.

The health system in North Korea is holding onto its skeletal structure by the skin of its teeth. The official system of the state fails to work properly, leaving North Koreans at the mercy of the market and private transactions for the medical care they need. Restoring the official health system in North Korea toward providing widely accessible care for all, should be the first and foremost task in integrating the two Koreas' health systems in the future.

III

Disparity in Health and the Demand for Healthcare

III Disparity in Health and the Demand for Healthcare

The shortcomings of the health infrastructure and the declining quality of official healthcare in North Korea suggest that the vast majority of North Koreans suffer from poor health, particularly as the supply of food has not been stable since the Arduous March. The most common indicators of health used by international organizations, such as life expectancy, suggest that public health is in a poor state in North Korea.

We strive to improve the health infrastructure and the quality of public healthcare ultimately for the health of the general public. In this chapter, we compare the conditions of public health in South and North Korea using general indicators, and estimate and prioritize demand for different types of medical care in North Korea in light of these indicators.

The systemic deficiencies of the North Korean regime, coupled with years of sanctions from the international community, have left the North Korean population deprived of food and other essential goods for survival. The chronic shortages of medical supplies and basic infrastructure for health mean that most North Koreans face restrictions in accessing the care and treatment they need.

It is therefore unsurprising that North Koreans generally fare poorly compared to South Koreans in terms of health. Life ex-

pectancy in North Korea is nearly 12 years shorter than in the South, while mortality rates due to communicable and non-communicable diseases are almost 250 percent higher, maternal mortality rates 740 percent higher, neonatal mortality rates 670 percent higher, and infant mortality rates 510 percent higher. The alarmingly high incidence of tuberculosis in North Korea is also a cause of concern for international health organizations.

Comparative analysis of the states of health in the two Koreas, using the major indicators, and projections of health-related demands among North Koreans reveal non-communicable diseases (NCDs; cardiovascular, respiratory and musculoskeletal), pregnancy- and delivery-related complications, asphyxiation and trauma upon birth, neonatal sepsis and infections, mother and child diseases (including iron deficiency and anemia), and CDs (tuberculosis, dysentery, encephalitis, etc.) to be the major threats to health plaguing North Korea today. Psychiatric and behavioral disorders are also anticipated to emerge as major health issues in North Korea in the future, as post-unification political and social changes may inflict further suffering on North Koreans.

Infection control is a critical issue in the North, but the prevalence of NCDs is an equally worrying problem. The number of age-standardized disability-adjusted life years (DALYs) in North Korea was 8,636 person-years per 100,000 in 2016, significantly lower than 11,313 person-years per 100,000 in South

Korea. NCDs accounted for the vast majority of deaths (75.4 percent), followed by communicable, maternal and neonatal diseases and malnutrition (14.2 percent), and injuries (10.5 percent). In comparison, NCDs accounted for 80.5 percent of deaths in South Korea, followed by injuries (12.7 percent), and communicable, maternal and neonatal diseases and malnutrition (6.8 percent). The percentage of deaths attributed to communicable, maternal and neonatal diseases and malnutrition was more than twice as high in North Korea as in South Korea. These diseases were also the second-most leading cause of death, next to NCDs.

Improving the health of mothers and young children by enhancing the related services is another critical issue. The maternal death rate in North Korea has dropped over the years, from 128 per 100,000 newborn children in 2000 to 82 per 100,000 in 2015. Nevertheless, even in 2015, the maternal mortality rate was 740 percent higher than in South Korea (11 per 100,000 newborns). Neonatal, infant, and child mortality rates, which are also basic indicators of the quality of healthcare available in a society, have also been decreasing over the years in North Korea, but still remain significantly higher than in the South. The neonatal mortality rate, i.e., the percentages of newborns who die before the 28th day after their birth, amounted to 10 per 1,000 as of 2017, 6.7 times greater than South Korea's 1.5 per 1,000. The infant mortality rate, meaning

the percentage of infants who die in the first year after birth, was also 14.4 per 1,000 in North Korea as of 2017 – 5.1 times greater than South Korea's 2.8 per 1,000. The child mortality rate, referring to the percentage of children who die under the age of five, was 19 per 1,000 in North Korea, or 5.7 times greater than South Korea's.

As comparison of the use of medical services in the two Koreas suggests, the demand for medical care is poised to grow exponentially in North Korea once a proper health system is established there. As there are no official statistics on North Koreans' use of, and demand for, medical care, we may attempt, instead, to estimate the likely demand for medical care in North Korea in light of the use of medical care in South Korea by North Korean defectors.

Respiratory diseases were the conditions for which North Korean defectors sought care most frequently in South Korea. In 2015, 739.5 out of every 1,000 defectors sought outpatient care for respiratory conditions. The other conditions for which outpatient care was frequently sought included digestive disorders (529.6/1,000), urological and genital disorders (363.4/1,000), musculoskeletal disorders (351.7/1,000), certain infections and parasitic diseases (343.1/1,000), and dermatological and subcutaneous diseases (320.8/1,000).

Psychiatric and behavioral disorders were the category on which the disparity of demand between North Korean defectors

and South Koreans was most prominent. North Korean defectors sought outpatient care for these disorders 3.5 times more frequently than South Koreans. The other categories of diseases where the disparity of demand was also noteworthy included pregnancy, childbirth and postpartum care (three times), urological and genital care (2.1 times), neurological care (twice), unclassified diseases, signs and symptoms (1.7 times), and certain infectious and parasitic diseases (1.6 times). This pattern holds for much of the hospitalization care sought as well.

It is important to standardize available data by gender and age in order to compare the differences in medical care demands between South and North Koreans more properly, but the lack of available data prevents us from doing so. Caution is therefore needed in interpreting these estimates. Nevertheless, it is not too far-fetched to forecast that the demand for care for communicable, urological/genital, pregnancy/birth/postpartum, and maternal and neonatal diseases would likely be high among North Koreans in the future. Demand will also be significant for care for NCDs, including respiratory, psychiatric and behavioral disorders.

We may also compare North Korean defectors and South Koreans in terms of the average number of hospitalization days and outpatient visits per capita per year. North Korean defectors spent, on average, 4.7 days in hospitalization per capita in 2015, compared to South Koreans' 2.7 days. The former also

made 24.9 outpatient visits to hospitals, compared to the latter's 16.9 visits. The number of outpatient visits per capita per year indeed increased from 19.7 in 2005 to 24.9 in 2015 among North Korean defectors.

It will therefore be necessary to enhance the health system with special emphases on developing policy measures and support as well as sustainable services for NCDs, maternal and child diseases, and CDs. Investment planning from a mid- to long-term view is needed to reduce the disparity in health between the two Koreas. Our projections, based on various basic indicators of health, suggest that much of the demand for healthcare in North Korea remains unsatisfied, and that it is impossible for the North Korean government alone to satisfy that demand. Sustained support for humanitarian principles is needed from South Korea and the rest of the international community, along with efforts to facilitate reforms in North Korea.

Under strategic plans renewed every five years, the WHO has been working with Pyongyang since 2001, undertaking various programs to improve health for North Koreans. The WHO's Country Cooperation Strategy 2014-2019 marks the third installment, after the two previous strategies spanning 2004 to 2008, and 2009 to 2013, respectively. The top priority requiring the WHO's support, as identified in the strategy, is (1) prevention and control of NCDs. The other four priorities include

(2) addressing women and children's health to reduce vulnerability and promote disaster risk reduction, (3) prevention and control of CDs, (4) strengthening of health systems to improve service delivery, and (5) ensuring the WHO's continued presence to support sustainable development of national health.

The previous Country Cooperation Strategy called for (1) strengthening of health systems (including local production of pharmaceuticals, vaccines, and medical supplies) toward improving services and developing policy and planning capabilities, (2) improvement of maternal and child health, (3) prevention and control of CDs (including tuberculosis, malaria, hepatitis-B, vaccinations, parasites, and new diseases), (4) prevention and control of NCDs (cancer, cardiovascular diseases, and smoking), and (5) management of environmental determinants of health (flooding, drought, water pollution, climate change, and public health and nutrition programs) (WHO, 2014). The latest strategy, by contrast, emphasizes the control of NCDs as a more pressing issue than that of CDs. Although CDs still present a significant risk to public health in North Korea, NCDs have begun to emerge as even more critical. The WHO also continues to emphasize the need to improve the health of mothers and children. Table 3-1 summarizes the WHO's latest strategy for North Korea.

〈Table 3-1〉 WHO's Country Cooperation Strategy 2014-2019

Priority rank	Strategy	Required actions
1	Prevention and control of NCDs	- Support implementation of national strategic plans for monitoring, integrated prevention and control of NCDs. - Support national authorities regulating tobacco consumption through sector-specific measures and the MPOWER Measure Package.
2	Addressing women and children's health to reduce vulnerability and promote disaster risk reduction	- Support efforts to improve pregnant women's health, obstetrics-gynecological care, and neonatal health, to reduce mortality rates, and achieve Millennium Development Goals 4 and 5. - Support efforts to improve integrated management of childhood infections (IMCIs) in primary care. - Provide technical support for development and implementation of national health strategies. - Reinforce cooperation and partnership with health clusters on health, nutrition and hygiene. - Include measures for managing all foreseeable emergency and disaster situations in the WHO-UN's Strategic Frameworks and national health strategies. - Support efforts to use WHO's investigative tools in documenting all measures taken to manage national health in emergency situations and disasters using local benchmarks.
3	Prevention and control of CDs	- Provide technical support to help develop capabilities for enhancing integrated infection control. - Provide technical and financial support necessary to maintain the high DTaP-IPV-Hib vaccination rate, and support introduction of new and high-priority vaccines identified by comprehensive multi-year plans (cMYP) on vaccinations. - Enhance capabilities of health systems for diagnosing and treating tuberculosis. - Provide additional support toward improving capabilities for reducing/eliminating malaria. - Support national efforts to prevent/control sexually transmitted diseases. - Support implementation of national strategies to prevent/control viral hepatitis. - Support implementation of International Health

Priority rank	Strategy	Required actions
		Regulations (IHR) 2005 to strengthen national preparations against public health issues of international import.
4	Strengthening of health systems to improve service delivery	- Ensure country's general mid-term strategic plans for health development and clarify policy and strategic visions for partners. - Enhance the roles of national regulatory agencies and nationally controlled labs in updating and reforming standard operating procedures. - Strengthen health management information systems for developing comprehensive, integrated and sustainable health systems. - Develop human resources for health, particularly midlevel managers and primary care practitioners. - Upgrade the quality standards for primary care. - Establish systems for research in Western and Korean medicine to facilitate evidence-based policy planning and decision-making.
5	Ensuring WHO presence to support sustainable national health development	- Improve (reinforce) health partnerships in regions and worldwide mediated by the WHO. - Improve (reinforce) mutual support for sustainable national health development.

Source: WHO (2016), WHO Country Cooperation Strategy: Democratic People's Republic of Korea 2014-2019, pp. 36-45.

IV

Medical Inter-Korean Exchange and Cooperation: Issues and Tasks

IV Medical Inter-Korean Exchange and Cooperation: Issues and Tasks

Integration and reconstruction are the two keywords that should guide inter-Korean exchange and cooperation on healthcare. Specifically, the two long-term goals are to (1) gradually integrate the two Koreas' health systems and (2) reconstruct North Korea's system so that it can function effectively. A survey of the existing literature reveals that, in the 2010s, the main focus was on transforming the North Korean health system in the mold of the South Korean one. More recently, however, researchers have begun to realize the importance of respecting the distinctiveness of the North Korean system and restoring it so that it can function properly as intended.

A key issue that stands in the way of integrating the two Koreas' health systems has to do with different views on the true state of the North Korean economy and the state-backed social security net there. Those who support integration of the two countries' systems as equal see North Korea's economic and social capabilities as able to withstand such integration to an extent. Others who advocate reproducing the South Korean system in the North, on the other hand, view the official North Korean economy as on the verge of collapse, and that the country is effectively running on a dual economy. The latter, in other words, hold that the official planned economy coexists

with an unofficial market economy in North Korea, and the threat of the latter supplanting the former continues to grow. The result is paralysis of the state-backed social security programs, including healthcare. The official system has thus collapsed. The approach to integration would therefore depend on the degree of strength we see in the North Korean economy and social security system.

The two approaches nonetheless need not be mutually exclusive. Long-term and sustained exchange and cooperation that allow the system of each country learn and adopt parts of the other may support their steady and peaceful harmonization. Conversely, integration of the two countries' systems may be necessary to allow substantial exchange of knowledge and systems to occur. Table 4-1 presents different approaches to integration and summarizes practical tasks involved in each.

One key issue concerning medical workforce integration, for example, raises the question of whether South Korea should view North Korean health workers as in need of licenses and whether South Korean authorities should handle that licensing. The alternative would involve both countries recognizing each other's health workforces as equally qualified and allowing for free exchange. As for the integration of North Korea's expertise in health and knowledge system, the question also arises whether South Korea should lead the (re)training of North Korean health workers. Questions of this sort, in other words, also in-

volve how we view the qualifications and professionalism of the North Korean healthcare workforce.

〈Table 4-1〉 Key Issues in the Inter-Korean Integration of Health Systems

Topic	Category	Issue	Description
Systems	Continuation or discontinuation	Should each system be allowed to retain its original elements, or the other system's better parts be reproduced?	Different views of North Korea's economic situation and current status of its social security system
	Institutions	National health system (NHS) or national health insurance (NHI)?	Conflicting views on what the integrated system should look like
	Medical benefits	Should these be extended to North Koreans before official unification?	Different views on the necessity of medical benefits and their applicability before unification
Resource development	Human resources	Should North Korean health workers be issued new licenses, and if so, by South Korea? Or should qualifications be mutually recognized and allowed for exchange?	Different views on the qualification and professionalism of North Korean healthcare workforce
	Expertise and knowledge	Should the North Korean healthcare workforce be re-trained, and if so, by South Korea? Or should existing knowledge be mutually recognized and allowed for exchange?	Different views on the expertise of North Korean healthcare workforce

Source: Cho et al. (2018).

The North Korean health system must be restored promptly. This is not to say that it should be returned to its past state. Rather, it means that the system needs reform at a fundamental level. The North Korean state should decide whether to maintain its socialist healthcare or, as the former states of the Eastern Bloc and Vietnam have done, to transform the system

by introducing a public health insurance and free market elements. True reconstruction, in other words, entails fundamental changes.

North Korea is suspected to have introduced free universal care not as a matter of protecting the people's basic rights to health and life, but with the goal in mind of ensuring that the people meet the production goals of the planned economy (Lee, 2016). Now that Pyongyang is eager to transform North Korea into a "normal" country, agreeing to summits with South Korean and American leaders and possible negotiations over renouncement of its nuclear ambitions, it should begin rebuilding its public healthcare system so that the state can effectively protect ordinary people's lives and quality of life. Not just CDs and malnutrition, but also NCDs and population aging present daunting challenges to North Korea's healthcare system (Yu, 2015). Introducing a quality and sustainable healthcare system is essential to the protection of North Koreans' rights and health, and also to national development and normalcy.

Insofar as reconstruction of the existing system is the goal, it is natural for the North Korean state to lead and handle that process before Korean unification. We should thus explore measures that the North Korean state should take in order to restore stability and effectiveness to its health system. Although unification and integration ought to be the aim in the long run, it is far more important and realistic to identify the tasks that

policymakers in both Koreas should undertake in the present conditions rather than in the vague hopes for a unification that has not yet arrived. It is critical for North Korea to rebuild its health system so that it becomes more stable and sustainable than in the past. South Korea should provide support and partnership to that end, but North Korea should ultimately lead the process and be the state primarily accountable.

In the Panmunjom Declaration of 2018, the South Korean government promised to be "the most trustworthy" supporter and helper for North Korea. In order for this declaration to bear fruit in healthcare, it is important for the two Korean governments to enter treaties and lay down more specific terms of cooperation on healthcare. No international or nongovernmental organization can do this task on behalf of the two Korean governments. Seoul should begin to explore ways to provide the substantial help that Pyongyang needs, without overstepping the boundaries set by still effective international sanctions. Even more important than the specific terms of support, however, is deciding with what attitude we should approach the task. South Korean policymakers ought to avoid acting like a rich donor about to provide official aid for a less developed country. Instead, they should strive to maximize their involvement in all stages of planning for the reconstruction of the health system in North Korea.

South Korea should provide the technical, financial and hard-

ware support to assist North Korea's efforts. Both the public and private sectors should play their unique roles in this process. South Korea, furthermore, may have a part to play in inducing international community aid and investment. Most importantly, South Korea should not confine itself to providing hardware only, but explore all possible ways to support the fundamental reform and reconstruction of the North Korean health system.

If that health system is to function properly, reconstruction of medical institutions and their functions should be first and foremost. Of particular importance in this regard are institutions that provide primary and secondary care. Medical institutions at all levels, except for a few major ones in Pyongyang, seem to have stopped functioning in North Korea today. Reconstruction of the nearly 9,000 medical institutions in the country (WHO, 2016) will require astronomical investments of time, money and effort, not the least because such reconstruction should involve modernization. Strategic and long-term plans for reconstruction are thus needed. As Pyongyang will not be able to establish such plans on its own, Seoul may step up and actively help Pyongyang devise the best possible plans.

The most efficient route of choice at the present would be for both Koreas to focus first on the expansion, reconstruction and modernization of secondary-level medical institutions. These generally refer to "people's hospitals" serving cities,

counties and districts, of which there are some 200 across North Korea. Because they are relatively evenly distributed throughout the country, these secondary care institutions can serve as bases or hubs for medical care. Restoring their functionality is crucial to providing effective medical care for all North Koreans. Modernizing and restoring these local hospitals is important not only in providing essential medical services, but also in strengthening the capabilities and functions of the other elements and strengths of the North Korean health system, including district doctors, neighborhood and general clinics, and neighborhood people's hospitals. The secondary care institutions at the levels of city, county and district should also be given a more expansive scope of functions so that they can serve as equivalents to public health clinics in South Korea. The new functions should include local health projects and activities for promoting public health. As the North Korean health system places significant emphasis on prevention, it already has the research and practical background capable of supporting the development of a comprehensive range of prevention activities.

The major issues regarding projected costs for the development and reconstruction of health infrastructure in North Korea have to do with estimating demand and likely costs. Demand projections necessarily reflect estimates of population sizes, prevalence and incidence rates, numbers of available

beds, and other such factors. It is based upon these estimates that one may proceed to estimate the number of additional beds needed. However, given the dearth of official data on North Korea, much of our projections are bound to depend on our own assumptions.

Estimating costs, on the other hand, requires us to determine, first and foremost, the proper scale of the project we are to undertake. We need information on the available area of land, the total floor area of complete buildings, the costs of construction/medical equipment/computers, and so forth, in order to estimate the likely cost and verify our estimates. There is, however, the question of which type of hospitals in North Korea should serve as the reference point. The cost of constructing a hospital generally includes costs for (1) land purchase and development, (2) construction and works, (3) related expenses (design and inspections, surveys and geological inspections, various impact assessments, etc.) and (4) other investments (in medical facilities, equipment, supplies and wearables, computer systems, etc.). Each type of cost depends on the prices of the resources (human and material) to be acquired. We therefore need more refined analysis of how much it would cost to reconstruct the health infrastructure in a particular society like North Korea. At present, it is impossible to estimate operating expenses, given the lack of information on wages, material costs, and telecommunication and infrastructure expenses.

Projects for developing or rebuilding hospitals in North Korea can be undertaken either by commissioning South Korean construction companies with the entire process or through collaboration with local businesses in the North. In South Korea, construction accounts for 75.2 percent of the total cost of building a new hospital on average. Construction could take up less than that in the North.

The Kim Jong-un regime appears to have increased investment in the development of a pharmaceutical supply system (Shin et al., 2016). Stable production of medical equipment, goods and supplies, and devices is so important that it should be pursued simultaneously alongside the reconstruction of medical facilities, with active aid from the international community and South Korea where possible. Particularly in demand are drugs and nutritional supplements for mothers and newborns as well as antibiotics, which are commonly administered at municipal people's hospitals. Intravenous solutions and kits, syringes and other such medical supplies are also in demand, as are materials for dental procedures and traditional medicines. The demand for these goods can be high beyond measure. Private resources from South Korea and further support from the international community are needed to help North Korea develop new facilities to manufacture these goods. Such plants may also be established via economic cooperation involving investment and business models.

A skilled, qualified and sufficient medical workforce is perhaps the most pivotal factor for the success of any given health system. It is impossible to guarantee the effectiveness of a health system without ensuring the quality of the workforce working in it. It is therefore critical to train and develop medical personnel to work at municipal people's hospitals. Ideally, North Korean authorities would plan and design the training curriculum, and medical schools and faculties in the country would train medical practitioners to work at lower-level institutions. South Korea may then effectively confine its role to developing learning content and training North Korean faculty members.

It is important to make active use of the learning content already available from numerous institutions that train and educate medical personnel in South Korea. Abundance of experience, knowhow, and learning content can be found at organizations like the Korea Human Resources Development Institute for Health and Welfare, a public agency tasked with enhancing the capabilities of Korean health workers and medical practitioners; the Korea Foundation for International Healthcare, providing programs for enhancing the capabilities of medical practitioners in developing countries; and the JW Lee Center for Global Medicine at Seoul National University. One of the most important roles that South Korea can play is in developing and distributing textbooks to primary- and secondary-care

medical institutions in North Korea from which to train local medical personnel. This task would require a good understanding of medicine as practiced in North Korea as well as proofreading and editing from North Korean medical practitioners working at higher levels of care. Active exchange between researchers from the two Koreas is also needed.

Wide-ranging and accurate pathological and vital statistics are essential to inform medical practitioners' decision-making and also steer national health policy toward a more evidence-based approach. It is critical to prompt North Korea to develop a system that collects, sorts and processes such statistical information in a well-organized manner. South Korea's organizations and experts specializing in health information and statistics may be enlisted to help the North Korean health ministry set up a similar organization. North Korea has seen two censuses so far, and presumably has an organization in charge of handling such surveys. South Korea's expertise on nutrition and health surveys may be added to that organization. Surveys should be conducted regularly to support systemic monitoring. As this is a key concern of both North Korean authorities and the WHO, a proposition to this end will likely be heard.

With South Korea sharing its expertise on organizing and conducting large-scale health surveys, North Korea could easily have smaller-scale health surveys done. South Korea's National Health and Nutrition Survey can be applied, with almost all its

content and methodology intact, to North Korea, but a more summary form is recommended. South Korea should discuss the matter with North Korea's Central Bureau of Statistics to design a questionnaire, sample, and support survey execution as suited to North Korean conditions.

Also crucial are exchange and cooperation on the planning and implementation of health policy measures in North Korea. Timely and appropriate policy and institutional and legal interventions are necessary to ensure the development and operation of a more efficient and stable health system, and thereby effectively reduce the illness burden on North Koreans. Medical institutions in South Korea focus almost exclusively on providing treatment and care. North Korea's health system, on the other hand, is much more oriented to preventive and holistic medicine. It is essential for the health system and institutions in North Korea to provide a comprehensive range of medical services, including preventive and holistic ones that promote health. South Korea may have a part to play in emphasizing the importance of preventing chronic and lifestyle diseases, given the increasingly rapid pace of population aging in North Korea, providing technical support so that North Korea can design its remote medical system with a greater focus on combating chronic and lifestyle diseases.

Governments of developed countries worldwide have been attempting reforms of varying scale to enhance the sustain-

ability of their health systems. North Korea, too, will need to recognize that the recovery of its health system will take far more than reconstructing facilities and retraining its workforce. The task requires a fundamental reform of the system, without which the sustainability of North Korea's healthcare cannot be ensured.

Little discussion has been held on how South Korea may intervene in the governance of healthcare in North Korea. Assuming that the governments of the two Koreas attain to the highest possible level of mutual trust, South Korea may be able to make more radical propositions that cater more effectively to North Korea's pressing needs regarding the rejuvenation of its health system. Governance necessarily entails planning, administration, regulation and legislative actions necessary for the operation of the health system. These are matters in North Korea's exclusive purview, and it is unrealistic for South Korea to intervene therein. Nevertheless, with progress made in inter-Korean relations, Seoul will have much to offer for the successful reform of health governance in the North.

South Korea has many roles to play on the side to enable enhancement of the capabilities of the North Korean authorities for planning and managing a more evidence-based and sustainable health system. The most pivotal of these roles is providing sufficient information and knowledge to inform decision-making. South Korea may play this role via two routes,

first by participating in healthcare governance as an advisor, and second by developing and suggesting various alternative models of healthcare in light of North Korean conditions.

All this is to say that South Korea's roles in exchange and cooperation with the North on health should go over and beyond the mold of the past, which simply involved building hospitals and training a few select medical practitioners. It is critical to develop and execute more long-term roadmaps on the systematic reform of North Korea's health system. Pyongyang needs Seoul's help on an unprecedented scale to achieve this task.

To this end, both South and North Korean officials should seek to enter a new treaty for organizing cooperation on healthcare. Insofar as the Panmunjom Declaration elucidated the overarching aims of inter-Korean cooperation, we now need specific, firm and immediately effective treaties to achieve those aims. Because North Korea is not recognized worldwide as a "normal" state and its presence continues to raise international tensions, the establishment of peace on the Korean Peninsula would most pivotally depend on South Korea helping the North grow into a functioning and recognized member of the international community. Seoul should convince Pyongyang that it is committed to promoting and helping internal reforms in North Korea.

Future inter-Korean agreements on health and medicine should contain specific terms and conditions for a closer part-

nership between the two countries over and beyond humanitarian aid. The true recovery of the North Korean health system will start from the reform of governance and software. This view should be affirmed in future inter-Korean agreements. Even prior to and in the absence of such official agreements, however, exchange and cooperation should continue between the two Koreas for humanitarian reasons.

V

Conclusion

V Conclusion

This study departs from the existing literature in that it explores micro-level health and medical issues that are likely to manifest, given the latest situation in North Korea, in the process of inter-Korean social integration. Our survey of the literature and interviews with former North Korean medical practitioners who have defected affirm that the three pillars of North Korean healthcare, i.e., free universal care, preventive medicine and district doctors, remain intact formally. Nevertheless, the failure of the planned economy since the 1990s has quickly privatized healthcare, leaving the key promises of the official healthcare system in name only. State hospitals and facilities are outdated, while the shortage of pharmaceuticals and other medical supplies persevere, leading North Koreans to resort increasingly to market supplies. Even Chinese-made medicines and drugs brought in for humanitarian aid by international organizations end up in *jangmadang* for sale and purchase. This situation means that control and production of pharmaceuticals in North Korea is the first and foremost concern. North Korean authorities should start expanding the infrastructure for manufacturing pharmaceuticals, particularly essential generic drugs. North Korean labor and South Korean capital may be combined to launch pharmaceutical consortiums in North

Korea.

Our analysis of the major indicators of health, high-priority health issues and likely demand for health resources in North Korea reveals NCDs (such as cardiovascular, respiratory and musculoskeletal diseases), premature birth-related complications, asphyxiation and trauma upon birth, neonatal sepsis and infections, mother and child diseases (including anemia due to iron deficiency), and CDs (tuberculosis, dysentery, encephalitis, etc.) to be the major health issue in North Korea. A comparative analysis of the use patterns of medical resources by South and North Koreans suggests that North Koreans' demand for healthcare, currently suppressed by the poverty of health infrastructure in North Korea, will emerge with explosive power once the country's health system is up and running again. It is therefore necessary to find measures to reinforce North Korea's health system, particularly its capabilities and services for dealing with NCDs, mother and child diseases, and CDs.

This study also revisits the two different views on the long-term ideals for the two Koreas' health systems, i.e., either merging them into one or rebuilding North Korea's unique health system. The goal is to identify practical tasks implied by these views for present-day inter-Korean exchange and cooperation on healthcare. The different approaches belie different understandings of North Korea's current economic situation and state-run social security programs. Key issues in the integration of the two

Koreas' medical workforces are whether North Korean medical workers need to be re-licensed, and, if so, whether South Korea should be handling the re-licensing. These issues involve different views on the qualifications of North Korean health workers, as do issues concerning integration of the medical knowledge systems.

This study proposes a strategy for rebuilding the near-collapse North Korean health system toward ensuring stable availability of medical resources for North Koreans. The strategy involves rebuilding the facilities, enhancing the capabilities of health workers, reinforcing the health information system, strengthening the health policymaking capability, and supporting health governance and financing. All these measures require the governments of the two Koreas to enter an official treaty on health. Future inter-Korean agreements on health and medicine should contain specific terms and conditions for a closer partnership between the two countries over and beyond humanitarian aid.

Our ultimate goal should be social integration and not just increasing exchange and cooperation. In other words, our aim is not just solidifying a peaceful period, but making peace ever-lasting. Research and effort for post-unification institutional integration is therefore indispensable in peacetime. Now that the Korean Peninsula is filling up with new hopes for gradual and strategic unification, we are at a juncture where we need to

consider how to pace the process of integration—whether radically or incrementally. New forms of exchange and cooperation on health are in order in this day and age of new peace. We need to start envisioning strategies for the long-term inter-Korean integration of health systems based on the principles of mutual respect and pragmatism.

The policy implications of this study can be summarized as follows.

First, the German case of reforming the post-unification health system in the mold of the West German model, amid the sweeping tides of radical unification and integration, is not a helpful model to which we may refer. Instead, we ought to envision an integration that respects and maximizes the respective strengths of the two systems based on accumulated exchange and cooperation.

Second, we ought to be wary of peacetime exchange and cooperation on health that does not benefit the cause of inter-Korean integration of health systems. Once again, our ultimate objective is integration and not mere exchange or cooperation. Our eyes are on enduring peace beyond the solidification of peace. Research exchange and cooperation in peacetime should serve post-unification social integration. With social integration in our minds as the long-term goal, we need to start investing, proactively, in rebuilding the health system in North Korea.

Third, we should look to and adapt the pre-unification health treaty in Germany to devise a similar treaty for Korea. South and North Korea need to enter a variety of treaties, but a treaty on health and medicine is a top priority. Once such an inter-Korean treaty on healthcare is signed and effectuated, it would pave the institutional grounds upon which unification and integration could be accelerated in the future.

Fourth, Korean integration will and should be a long-term process. This means we need phase-by-phase plans for the development of health systems and resources. For example, we may devise plans for the rebuilding, institutional formation, and post-unification stages (Jeong et al., 2014, pp. 242-243) and plan for exchange and cooperation accordingly.

Integration on healthcare should be treated not as an independent subject, but as part of overall efforts to develop an organic structure of social security and insurances. The directions of medical integration should be determined on the basis of in-depth debates on what kind of social and welfare systems post-unification Korea should have. Serious debate and trial projects envisioning post-unification Korea during the exchange and cooperation process will determine the institutional makeup of the final integrated health system. We expect this study to contribute to the emergence of unification-aware perspectives that support policy development in light of the whole Korean Peninsula rather than South Korea only.

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