



Korean Healthcare Quality Report I –  
Developing National Healthcare Quality Report

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# 1

## Introduction

Section 1. Development Background

Section 2. Purpose and Uses

Section 3. Development Method





## Section 1. Development Background

### 1. 「Korean Healthcare Quality Report」: study rationale

#### A. The need for a fundamental reform of the current system, which generates high costs regardless of the quality of care

Korean healthcare consumers who flock to large-scale general hospitals located in metropolitan areas offer a snapshot of the nation's high-cost healthcare system. Stratifying the level of healthcare services to deliver the timeliest and appropriate care to consumers not only improves health outcomes but also prevents the generation of unnecessary costs throughout the system (Kang 2014, p.68). In the Korean healthcare system, consumers are free to choose their own healthcare providers. Unfortunately, the lack of sufficient information on providers, coupled with consumers' low level of trust in the primary healthcare system, tend to drive them in droves to large and popular hospitals as they conclude that doing so minimizes any potential risks (Kang, 2014, p. 68).

Furthermore, health insurance's main remuneration system of "fee-for-service" encourages providers to increase the volume of services they provide, rather than to focus on providing necessary and appropriate services for the patients based on their healthcare history. As a result, the Korean healthcare system presents a structural problem that inadvertently encourages steep competition among the providers to increase the number of services offered to patients.

Clearly, a fundamental shift is needed that will incentivize providers to become invested in patients' overall healthcare experience and cooperate

with one another toward providing efficient and patient-oriented care.

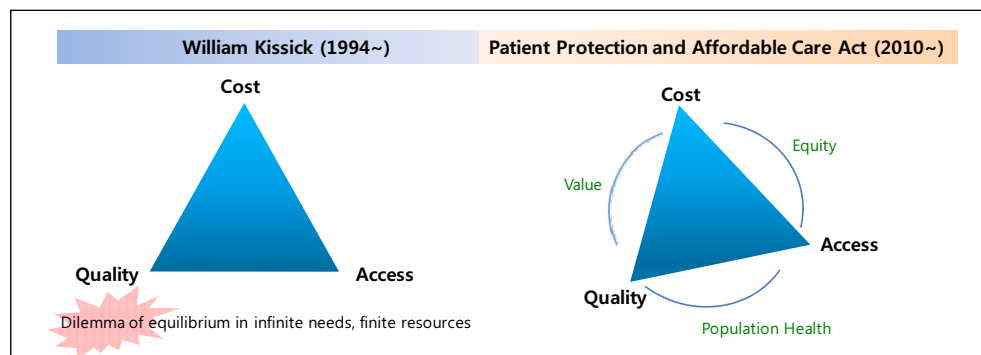
Unfortunately, such changes will inevitably accompany resistance from various parties of interest who are comfortably settled in the status quo. As such, changes must be proposed and implemented on the basis of scientific evidence. Assessing the quality of our healthcare system at a national level, and continuously monitoring and sharing with the public its progress, will serve as a catalyst for improvement in all areas of national affairs.

### B. The need to establish a mechanism for improving national healthcare quality based on the shift to a value-oriented system

The current policy of expanding healthcare coverage seeks to provide quality healthcare to all at an affordable price. Taking stock of these efforts on a regular basis is critically important to ensure sustainability of the National Health Insurance.

According to public health policy experts, the iron triangle of healthcare consists of cost, quality, and accessibility. Equilibrium is achieved when the three components strike a balance (FTC·DOJ 2004, p. 6). This means that improvement in one aspect of healthcare always affects the other two aspects (left image in Figure 1-1).

[Figure 1-1] The iron triangle of healthcare; changes in the concept



Source: Compiled by author based on Kissick(1994, p. 3 Figure 1) and The Fickle Finger (2012, p. 1).

This concept was first introduced in William Kissick's book, "medicine's dilemma of infinite needs versus finite resources" in 1994. The concept was generated from the dilemma of achieving equilibrium between the three vertices (Kissick 1994, p. 3, cited in FTC, DOJ 2004, p. 6). In the iron triangle, each vertex is connected to the others. In equilibrium, changes in any one of these dimensions can compromise one or both of the other dimensions (Kissick 1994, p. 3, cited in FTC:DOJ 2004, p. 6). In other words, an attempt to reduce the cost in the system will likely result in compromised quality or accessibility.

However, the triangle assumes no wasteful spending and optimal level of expenditure within a healthcare system. Considering that the current healthcare system generates a significant amount of wasteful spending, improving the quality of care while cutting costs is not so unfathomable. Recently, the direction of healthcare reform shifted to increasing the value. Such a shift comes from the public's desire to improve quality and reduce unnecessary spending in the system.

For instance, the PPACA (Patient Protection and Affordable Care Act) of 2010, commonly referred to as Obama Care, offers economic incentives for providers to voluntarily reduce wasteful spending and improve quality of care through pay for performance and risk sharing (The Fickle Finger 2012, p. 1).

Observation of current healthcare reform directions suggests that the three dimensions of the iron triangle are not fixed in place; rather, they are quite dynamic in nature (Right image in Figure 1-1). Flexible relationships are possible as is improving in quality and lowering cost (Value), improved health level for all (Population Health), and equalized access to quality care (Equity) (The Fickle Finger 2012, p. 1). Many countries are measuring and sharing the quality and outcomes of their healthcare systems in an effort to change the systems from being volume-based to value-based (Soderlund et al. 2012, p. 3).

Value increases when the unit cost for service provision decreases or when the quality of services or health outcomes increases (Soderlund et al. 2012, p. 4). Assessing quality and performance, and sharing the results with the public, will help build the institutional and operational infrastructure required to change our current healthcare system to a value-based system.

Porter and Teisberg (2006, p. 97) stated, “Competition in healthcare must be reformed to value-based competition on results. Doing so is the best and only way to facilitate continuous improvement in quality and efficiency.” They also went on to say, “Value based competition on results is a positive sum game, in which all participating parties in healthcare system can benefit.” By focusing on patients’ value, patients will experience better services and health outcomes, insurers will be able to reduce costs, and suppliers will be financially rewarded for improved care and health outcomes. Value-based healthcare is the basic framework of healthcare reform, which will prioritize patients’ values before accessibility, reduced costs, convenience, or customer service (Porter & Teisberg 2006, p. 97).

The shift to a value-based healthcare system is built on the premise that quality of care will be constantly monitored and shared. Establishing improvement goals, measuring progress, and sharing results will continuously educate healthcare system participants, which will facilitate the creation of necessary infrastructure, spread awareness regarding healthcare quality among the public, and promote effective cooperation between government agencies and relevant institutes to improve the system.

### **C. The need for the evidence for assessing and adjustment in healthcare quality improvement policy**

US healthcare reform suggests the potential of applying various policy tools to a healthcare supply system mainly funded by private investment.

Notwithstanding the differences in institutional environment between countries, previous reform cases that addressed the issues of wasteful spending, rampant medical malpractices, and disparities in care quality, offer beneficial pointers in terms of policy direction and tools with which to alleviate current problems and prevent future crises.

One of the important lessons we should take away from foreign cases is that all effective changes are based on measurable evidence to garner support from all stakeholders.

Since the National Health Promotion Plan in 2002, which was established based on the US's Healthy People 2010, Korea has implemented various public health policies. However, because policy evaluation mainly focused on whether targets have been achieved, it is difficult to inspect structure/process or to identify problems (Kang et al. 2013, p. 38)<sup>1)</sup>. In terms of the quality of care, in particular, there is no system in place at a national level that can evaluate performance in relation to processes and outcomes. Clearly, an evidence-producing mechanism is needed that will assess quality, identify problems, and facilitate discussions for effective alternatives.

Recent shifts in healthcare require quality assessment and evidence-based public health policies. Improving healthcare system requires continuous policy intervention, and because policy intervention can be costly, a policy evaluation mechanism is needed that will keep the cycle of quality improvement to continue on its own. In short, the 「Korean Healthcare Quality Report」 published through this study seeks to provide the momentum required to establish effective policies by tracking the policy outcomes through available evidence and by identifying the causes behind each success and failure.

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1) Changes in Korea's policy for healthcare quality improvement were based on the first year's research (Kang et al. 2013, pp. 37-39)

## **D. Improving the efficiency of quality care governance**

As the public interest in healthcare quality assessment and associated policy grows, strengthening the government's role and increasing inter-agency cooperation has become necessary.

In the 15th OECD Health Committee meeting held in June 2014, balancing the roles of central government and local government to improve public health services was discussed. According to the report, in the nations that participated in the OECD's Health Care Quality Review, central government (or an equivalent agency) assumes the leading role in quality care governance. Even the nations that had previously delegated the role to local governments are reported to be strengthening the central government's role in managing, monitoring, and improving the quality of local public healthcare (OECD 2014, p. 2). This is said to be attributable to the fact that central governments tend to be better equipped to analyze and compare performances than local governments, and that responsibilities in this area are growing (OECD 2014, p. 2).

"It is necessary to clearly define the roles and responsibilities of relevant governments and agencies at all levels in order to maximize a health system's capacity" (OECD 2014, p. 3). As the government's role in healthcare increases, return to a more centralized governance is required, and the central government needs to achieve a balanced governance so as to prevent inefficiency throughout the system.

One of the approaches used by central governments to mediate the overall system and share responsibilities is monitoring the quality of care at a national level and sharing the results with the public. For instance, Sweden has created a system that publishes healthcare quality indexes at a national level. Through more than 150 quality and efficiency indexes, performance of the healthcare system is being reported by county unit (OECD

2014, p. 11).

In Korea, interest in healthcare quality policy has been growing around academia and policy experts since 2000 when the Health Insurance Review and Assessment Service was founded to assess the appropriateness of care. Based on health insurance claims data, a database for developing and measuring quality indicator has been created. With the recent spread of the “value for money” concept in healthcare, all participants in the system, including service providers, insurers, and patients, have become interested in the quality of care. The quality improvement policies of the Ministry of Health and Welfare have had an effect on HIRA, as well as various relevant agencies under the umbrella of the Ministry, healthcare organizations, and relevant academic societies.

Under these circumstances, healthcare providers may be burdened with multiple data submissions, and quality improvement agencies may also experience duplicate responsibilities.

The Ministry of Health and Welfare must establish a balanced governance in order to improve the quality of the healthcare system, and clearly define the roles and responsibilities of the relevant agencies to prevent conflict and inefficiency. Additionally, a common barometer is needed with which to streamline performance while maintaining diversity, decentralization, and independence of the participants’ roles in the system.

## **2. Development rationale behind the 「Korean Healthcare Quality Report」**

Upon mapping the healthcare quality indicators commonly used in major countries worldwide, NECA presented the 「National Healthcare Quality Indicators」 in 2009 by incorporating the results of an expert Delphi survey and quality indicators of our nation’s particular interest. Reviewing other countries’ practices and suggesting indicators based on the findings is

meaningful in the sense that it is an attempt to expand the scope of quality measurement at a national level to include “patient safety,” “patient-based,” “efficiency,” and “timeliness,” in addition to “clinical effectiveness.” By outlining a base for indicators that can be measured nationally, it contributed to establishing the quality measures of the clinical domain in the current study.

As healthcare quality policy continues to expand and pay for performance and value-based healthcare spread globally, improving healthcare quality is an important task required to increase the system’s value for money in association with improvement of other elements. Improving healthcare quality through a system reform is an important policy task for Korea as well.

For this, the Korea Institute for Health and Social Affairs has been assessing quality improvement in our healthcare system since 2013, the findings of which are compiled in the 「Korean Healthcare Quality Report」. Upon comparing the healthcare quality assessment systems of major countries around the world, the first year’s report published in 2013 adopted the conceptual framework of the NHQR (US) as a basic framework for reform as it measures healthcare quality from various angles. The report also assessed the feasibility of applying specific measures of the framework in our nation. For the second year’s report in 2014, the first year’s set of indicators was modified to better identify the trends in quality improvement, and the results were compiled and published. The report was designed in ways that will allow modifications and updates of the measures to reflect the continuous changes in the healthcare environment and the public’s acceptance of the policy.

The ultimate aim of the current study is to track and monitor the performance of our healthcare system in terms of the quality of care experienced by individuals. The healthcare quality report published at a national



level allows opportunities for the stakeholders to communicate and cooperate toward improved care. Its contribution can also be found in the fact that individuals' performance ultimately translates into national performance. The current paper seeks to promote awareness in the Parliament and among policy makers of their responsibility for healthcare quality assessment and sharing its results with the public. Furthermore, it seeks to urge all stakeholders in the system to actively participate and cooperate in the process.

## Section 2. Purpose and Uses

### 1. Purpose of the KHQR

The goal of the Korean Healthcare Quality report is to measure the quality of our healthcare system and establish a mechanism for continuous improvement. In other words, “The report is not to assess the national health level, but to continuously monitor the healthcare system’s performance” (Institute Of Medicine 2010, p. 12).

The report will “...raise awareness for the importance of national healthcare quality, and help to ensure fair provision of services to all sub groups, disease types (preventative medicine, acute treatment, chronic disease management, etc.) and diseases (diabetes, cardiovascular diseases, etc.), and highlight the performance of our healthcare system in terms of providing safe, effective, timely, and patient-centered care” (Institute Of Medicine 2010, p. 13).

In the second year (2014), a written report was to be published based on the first year of research (Kang et al. 2013). The specific objectives of each year of research are as follows:

- First year: Design a national healthcare quality report
  - Identify domestic and international trends in national healthcare reports
  - Assess the feasibility of designing and completing the Korean healthcare quality report
  - Provide recommendations for a system that will produce annual reports

- Second year: Prepare the Korean Healthcare Quality Report
  - Determine the conceptual framework, indicator set, data sources, and analysis methods
  - Compile measurement results and determine methods of presentation
  - Analyze trends in quality improvement and disparities between subgroups

## 2. Utilization of the KHQR

The key purpose of the Korean Healthcare Quality Report is to provide support from a variety of perspectives and levels for designing policies with which to improve the quality of national healthcare. However, it also provides a base for asserting one's position and decision making among stakeholders. While it does not provide healthcare consumers with information on individual healthcare providers, it can raise the level of awareness regarding the importance of care quality and offer guidelines with which to understand the national average. We expect that the report will raise healthcare consumers' level of trust in the Health Insurance Review and Assessment Board and the Korea Institute for Healthcare Accreditation who provide information on individual provider performance. Potential uses of the report by the system stakeholders are described in <Table 1-1> below.

<Table 1-1> Potential uses of the Korean Healthcare Quality Report by system participants

Participants	Utilization
Policy experts (The Parliament, Ministry of Health and Welfare, etc.)	Confirm or identify the areas in need of policy development.
Relevant organizations and agencies (National Health Insurance Corporation, HIRA, etc.)	Confirm and identify the areas that require suppliers' support for improvement of health insurance and healthcare quality. Confirm and identify areas that need to be highlighted in terms of health insurance performance assessment.
Healthcare suppliers	Highly invested as they are directly involved in provision of healthcare. Hold suppliers accountable for providing quality care while also identifying areas of improvement as well as those that require improvement.
Support groups (Patient associations, etc.)	Demand development of new policies or reinforcement of existing policies based on the report results.
Academia, researchers	Develop new indicators and recalibrate the existing indicators based on the report results for continuous quality improvement.
The public, healthcare consumers	Provide opportunities to become aware of the important issues in healthcare quality. For this, however, the media's role would be important as consumers have limited access to the report.

Source: Relevant parts summarized from Kang et al. (2013, p. 69)

## Section 3. Development Method

### 1. Development process

Building on the first year's research results, an additional review was conducted that examined the conceptual frameworks and clinical domains of major countries. In addition, in order to reflect the needs and demand for our nation's healthcare system, we reviewed and incorporated the diseases and services defined in the National Health Promotion Plan, Quality Assessment of National Health Insurance Benefits, and local healthcare plans. In order to ensure that the report identifies the specific quality issues present in our nation's healthcare system and justify policy interventions, detailed measures were prepared for the domain of healthcare quality, and associated clinical indicators were included comprehensively.

The first year's research, which was based on the Agency for Healthcare Research and Quality (AHRQ) National Healthcare Quality Report (NHQR), reviewed the feasibility of adopting and measuring certain quality indicators in the Korean setting. These results were re-examined by an inter-agency working group discussion<sup>2)</sup> and expert interviews. Incorporating the group's views, the research team reviewed the current state of quality assessment and its necessity, and established a final set of measures. For this, the research team incorporated the measures suggested by the National Evidence-based Healthcare Collaborating Agency (NECA) (Jeong et al. 2009<sup>3)</sup>). For duplicate indicators, the working group was con-

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2) Expert consultants from the National Health Insurance, HIRA, KOIHA, NECA, Korea Centers for Disease Control and Prevention, and Korea Hospital Association participated and exchanged views on the results from the first year of study and reached a consensus on the measures.

3) In 2009, NECA mapped the healthcare quality measures adopted by major countries and incorporated an expert Delphi survey results to present the "National Healthcare Quality Indicators" (IhnSook Jeong et al. 2009, p. 5).

sulted again to select agencies and institutes known to produce data with relatively high reliability and stability. The research team organized and ran the working group to share perspectives and gather expertise required to develop specific measures for the healthcare quality report.

Additionally, the team held policy discussions to examine the progress of current indicator production and the feasibility of measuring and analyzing trends. The team also held a workshop with the AHRQ to examine the current status of the US quality indicators and to compare the level of improvement between the two countries. The workshop sought to gather perspectives regarding the direction of the Korean Healthcare Quality Report and the measures to be incorporated to ultimately bolster the report's domestic and international recognition and reliability.

The Korean Healthcare Quality Report is designed to allow continuous modification of assessment scope and measures to accommodate changes in the healthcare environment and policy demand. Published data were to be used short term. However, in order to establish new data sources and to encourage agencies and institutes to submit pertinent data toward producing meaningful indicators, we presented definitions and measurement methods of indicators even if no publishable data were yet available. If there were publishable sample data or survey data (National Health Insurance sample data, National Health and Nutrition Survey data, Korea Health Panel data), the research team measured the indicators and added these in the report. Through these steps, data sources required for the report were established.

## **2. Determining its conceptual framework**

An international comparison of quality domains and conceptual frameworks was performed. The most specific domains were selected with the

aim of establishing a quality improvement mechanism at a national level based on the following: “enhance the link between quality assessment and policy establishment” and “identify trends in healthcare quality improvement as well as specific problem areas.”

Additionally, in order to increase the positive effect of healthcare quality improvement on national health, components of the clinical domain, which measure the effectiveness of healthcare, were selected upon a comprehensive review of domains adopted by major nations around the world. Furthermore, diseases and services that require intensive management in terms of health effects and disease burden were selected, which was based on the individuals managed and assessed by the National Health Promotion Plan and Quality Assessment of National Health Insurance Benefits.

Conceptual framework for the Korean Healthcare Quality Report was determined through the processes described above with the research team presenting the initial plan, which was finalized upon incorporation of expertise from the working group and relevant experts. In order to maintain the continuity of the healthcare quality assessment, the initial domains selected were determined to be the key domains that would stay constant. However, domains may be added or specified in the future upon consultation with the working group in order to accommodate changes in the healthcare environment.

### **3. Selecting measures**

Indicator selection criteria are not only needed to determine the initial set of measures in the report, but also to update them in the future, if needed.

## A. The initial indicator set

The initial indicator set for the report was determined on consultation of the working group. The research team selected measures based on “significance,” “scientific soundness,” and “feasibility,” which are the major selection criteria for the NHQR published by the AHRQ in the US. Here, “significance” refers to the measure’s health effects, policy implication, and corrigibility within the healthcare system. “Scientific soundness” concerns whether the measure accurately measures what it is purports to measure, whether the measure shows stability when applied across various groups and individuals, and whether the measure has sufficient grounds to be used as a quality indicator. Finally, “feasibility” concerns whether the indicator is currently in use, whether necessary data can be obtained in the system, and whether data required for subgroup analysis is available (IOM 2001, pp. 83–87).

To start, “scientific soundness” can be assured by applying the detailed measures of the NHQR domains with necessary modifications. The NHQR measures, which are based on the National Quality Forum (NQF)’s measures, are endorsed on consensus. The measures’ scientific soundness has been proven throughout the years of reporting since 2003. Additionally, most Korean agencies that develop and measure healthcare quality indicators, including HIRA and KOIHA, are also reviewing the quality indicators of the AHRQ or NQF. Such a selection method can eliminate the need to develop a whole new set of indicators.

However, a measure of significance and feasibility in the Korean context must be reviewed. For this, the diseases and service domains selected for the report as measures of clinical effectiveness were compared with those of the NHQR.

Based on the results of the comparison, the indicators, which are already



being measured in Korea but are absent from the NHQR, were added. However, among the NHQR indicators of the clinical domain, those deemed insignificant in the Korean context were excluded from the report.

Feasibility was also reviewed during the above processes. Based on the first year's research, which reviewed the feasibility of all NHQR indicators in Korea, the indicators that are already being measured in Korea were determined to be essential. Regarding the indicators not currently available in Korea, notwithstanding their importance assigned by National policies and strategies such as the National Health Promotion Plan, we adopted the NHQR indicators and presented their measurement methods in an effort to promote future production.

## B. Index selection criteria

Pertinent data published by the Ministry of Health and Welfare and affiliated agencies were collected and analyzed in order to produce the quality measures required for the report. Recalibrating the indicator selection criteria through continuous reporting and ensuring transparency of the selection process will be beneficial.

Davies et al. (2001) suggested the following indicator selection criteria:

〈Table 1-2〉 Quality measure assessment criteria by Davies et al.(2001)

Criteria	Detail
1. Face validity	An adequate quality indicator must have sound clinical or empirical rationale for its use. It should measure an important aspect of quality that is subject to provider or healthcare system control.
2. Precision	An adequate quality indicator should have relatively large variation among providers or areas that are not due to random variation or patient characteristics.
3. Minimum bias	The indicator should not be affected by systemic differences in the patient case-mix, including disease severity and comorbidity. In cases where such systematic differences exist, an adequate risk adjustment system should be possible using available data.

Criteria	Detail
4. Construct validity	The indicator should be related to other indicators or measures intended to measure the same or related aspects of the system.
5. Fosters real quality improvement	The indicator should be robust to possible provider manipulation of the system. In other words, the indicator should be insulated from perverse incentives for providers to improve their reported performance by avoiding difficult or complex cases, or by other responses that do not improve quality of care.
6. Application	The indicator should have been used in the past or have high potential for working well with other indicators.

Source: Davies et al. (2001, p. 3)

The Korean Healthcare Report's key purpose is to measure the health-care system's performance in terms of quality improvement. As such, the adequacy of quality measures regarding population subgroups needs to be continuously monitored. Although adoption of the NHQR's quality measures assures the reliability of the following components to a degree, continuous reviewing of selected measures is vital to ensure their contribution to quality improvement.

Campbell et al. (2002) suggested that the quality of performance measures increases along with increasing accessibility, feasibility, reliability, sensitivity to change, and predictive value (cited in Campbell et al. 2002, p. 359; Lester & Roland 2009, p. 380). Capacity concerns the adequacy of both evaluation and implementation. Feasibility refers to the potential of collecting and using reliable and valid data. Reliability concerns minimal error in measurement, and sensitivity to change pertains to how sensitively it detects changes in healthcare quality. Finally, predictive value concerns how accurately it predicts health outcomes. AHRQ also has criteria and principles for quality measures designed to ensure continuous management of the initial set of measures (IOM 2010, p. 63) (see Table 1-3).

〈Table 1-3〉 AHRQ's NHQR indicator selection criteria and principles

Category	Detail
Primary criteria	<ol style="list-style-type: none"> <li>1. Importance <ul style="list-style-type: none"> <li>• Health impact (clinical significance, prevalence)</li> <li>• Meaningfulness</li> <li>• Susceptibility to being influenced by the health system</li> </ul> </li> <li>2. Scientific soundness: use consensus-based endorsed measures</li> <li>3. Feasibility <ul style="list-style-type: none"> <li>• Capacity of data and measure for subgroup analysis</li> <li>• Cost or burden of measurement</li> <li>• Availability of required data for national and subgroup analysis</li> </ul> </li> <li>4. Usability: easy to interpret and understand (methodological simplicity)</li> <li>5. Type of measure <ul style="list-style-type: none"> <li>• Evidence-based healthcare process measures are favored over health outcome measures because most outcome measures were too distal to an identified intervention</li> </ul> </li> </ol>
Secondary criteria	<ul style="list-style-type: none"> <li>• Applicable to general population rather than unique to select population</li> <li>• Data available regularly/recently</li> <li>• Linkable to established indicator sets (such as Healthy People 2010 targets)</li> <li>• Data source that supports multivariate model</li> </ul>
Balancing principles	<ul style="list-style-type: none"> <li>• Balance across health conditions</li> <li>• Balance across sites of care</li> <li>• At least some state data and multivariate models</li> </ul>

Source: cited in AHRQ(2005); IOM(2010, p. 63)

The NHQR of the US, which was consulted for developing the measure set to include in the Korean Healthcare Quality Report, was developed in 2012, and it reflects the quality indicator selection criteria of the AHRQ.

It will be beneficial to establish criteria and principles for updating the measures in the future to better accommodate our nations' reality.

### C. Types of indicators

The IOM (2001), which designed the national healthcare quality report, classified the measures in domain of effectiveness of care to reflect the transforming healthcare needs across the lifespan: staying healthy, getting better, living with illness or disability, and coping with end of life (IOM 2001, pp. 94-97; AHRQ 2013, p. 35) (See Table 1-4).

〈Table 1-4〉 Healthcare effectiveness measures types

Group		Detail
Process measures	Prevention	<ul style="list-style-type: none"> <li>• Caring for healthy people is an essential component of healthcare.</li> <li>• Educating people on health and promoting healthy behaviors can prevent or delay incidents of diseases.</li> <li>• Early detection of health problems can increase treatment effectiveness and reduce costs.</li> </ul>
	Treatment	<ul style="list-style-type: none"> <li>• Adequate preventative healthcare does not eliminate the need for acute treatment.</li> <li>• Appropriate and timely treatment can minimize the impact of diseases and accelerate recovery</li> </ul>
	Management	<ul style="list-style-type: none"> <li>• Some diseases, including diabetes and late stage renal failure, are difficult to cure and require management over time.</li> <li>• Chronic disease management often includes promotion/maintenance of healthy lifestyle and regular check-in with healthcare providers.</li> <li>• Effective management of chronic diseases can mean the difference between normal/healthy living and frequent medical problems.</li> </ul>
Outcome measures		<ul style="list-style-type: none"> <li>• Various factors other than treatment can affect health outcomes, which include genetics, lifestyle, social, and physical environment.</li> <li>• Nevertheless, appropriate preventative services, timely treatment of acute diseases and judicious management of chronic diseases can reduce mortality and morbidity, and have a positive effect on quality of life.</li> </ul>

Source: AHRQ 2013, pp. 35-36.

Adopting the above, the Korean Healthcare Quality Report's effectiveness domain consists of prevention, treatment, management, and outcome measures. For other domains, types of measures were defined where applicable.

Outcome measures are sometimes considered standard measures. However, because outcomes measures, such as morbidity, are too distal to an intervention and are not insular to the effects of other non-healthcare factors, contributing the results to medical intervention alone has its limits (Lester & Roland 2009, p. 381). For this reason, process measures that are based on scientific evidence associated with effective outcomes may be

useful indicators that can promote healthcare quality improvement. Many healthcare systems adopt clinical quality measures, rather than outcome measures. However, both measures serve to promote improvement in healthcare quality at different levels; thus, an appropriate combination will be beneficial (Lester & Roland 2009, p. 381).

Process measures verify whether the steps proven to benefit patients are indeed accurately being performed. Outcome measures are the most relevant to patients, and they are considered the measures that suppliers wish to improve the most (NQF, 2014). However, due to the restrictions of realities, the policy mechanism that measures healthcare suppliers' performance to achieve healthcare improvement are based on process measures.

#### **D. Management of measures**

The Korean Healthcare Report will show our healthcare system's performance level in sequence and over time. Therefore, it is necessary to distinguish and manage the core measures in each domain in order to analyze their trends over time. Furthermore, according to the level of achievement, measures may be eliminated or added. The aforementioned indicator selection criteria and principles will be needed for this task. The report seeks to manage the indicators using some of criteria defined by the AHRQ.

The core measures, which are consistent on an annual basis, are used to analyze the trends over time. News measures are adopted when new additions are required to reflect the National Health Promotion Plan or policy changes. However, a measure can be eliminated when its performance achieves 95%, or a more suitable measure is identified. However, a retired measure can continue to be monitored and then added back if its performance falls below the goal performance.

- Core Measure
  - Compare changes occurring over time
  - Alternating measures, which are tracked annually but presented on an alternating basis: typically rotating across odd or even years of the report (breast cancer and colorectal cancer measures)
- New Measure
  - New measures are added to reflect the recently announced National Health Promotion Plan and associated policies
- Retired Measure
  - Measures for which performance has reached 95% are retired/measures that show a ceiling effect
  - Data will continue to be collected and these measures will be added back if their performance falls below 95%
  - When more suitable measures are identified
- Composite Measure
  - Various segmented measures are integrated into one

Source: AHRQ (2013, pp. 22-24)

The healthcare system consists of various and complex dimensions, which makes it difficult to neatly summarize its performance. To address this complexity, use of composite measures is on the rise (Smith et al. 2009, p. 14). For instance, diabetes composite scores can be calculated by integrating multiple process measures pertaining to diabetes management. Just as in the composite score of all chronic diseases across population groups, it can also be calculated between different diseases. Composite measures are often used to provide the overall picture of care quality as it integrates individual outcome measures into a single score or measure. However, carelessly designed composite measures can create room for misinterpretation, which can subsequently lead to a serious failure in healthcare policy planning and implementation (Smith et al. 2009, p. 15).

Composite measures can typically be produced using the three methods detailed below (Mcglynn 2009, p. 101).

① Opportunity score

Opportunity score counts all instances in which a patient is eligible for an indicator into the denominator, and counts all instances in which care is provided into the numerator. The tacit weight here is the size of the population group that different measures assess. A more typical treatment process will occupy the biggest share of the total score, and the patients who are subject to more measures will contribute more to the total score.

② Average of averages approach

Scores are calculated for each patient, and the scores are averaged. Here, each patient contributes equally to the total score.

③ All or nothing approach

The percentage of patients for whom all indicators triggered by that patient are met.

Source: McGlynn 2009, p. 101

Policy makers have supported the use of composite measures to improve understanding of the information contained in various measures. This is because composite measures summarize the meaning of individual measures pertaining to a particular disease or condition. The AHRQ applies composite measures on the appropriateness model and opportunity model. Under the appropriateness model, composite measures are calculated based on the total number of patients who received all required services through the “all or none” approach. For instance, the patients who received all four recommended services pertaining to diabetes management are counted, and those who did not are excluded. Under the opportunity model, the percentage of patients who received appropriate care are calculated and used as a composite measure (AHRQ 2013, pp. 26-27).

In the developing stage of the Korean Healthcare Quality Report, we place meaning in collecting and reviewing measures that have been already published in an effort to produce new measures. In this report, with the exception of presenting the incidence rates of the five major cancers with the opportunity score method, no other composite measures are used. As a sufficient base of measures and an agreement base are established, application of composite scores must be reconsidered.

## 4. Healthcare quality improvement performance analysis method

### A. Analysis data

For the selected detail measures, published data were collected. Measures unavailable in Korea but calculable using available published data, were calculated accordingly. Data used to calculate the measures were collected from the National Health Insurance Cohort Database provided by the National Health Insurance Service, Korean Health and Nutrition Survey data provided by the Korea Centers for Disease Control and Prevention, and Korea Health Panel data jointly provided by the Korea Institute for Health and Social Affairs and the Korea Health Insurance Service.

The purpose of the report is to track the improvement in national healthcare over time. Therefore, data sources must be easily accessible, reliable, and collectible on a regular and steady basis (Jeong et al. 2009, p. 18). For this reason, the healthcare quality report is largely based on measures made available through public reports and statistical data. Data sources for the quality report are detailed in Table 1-5 below.

〈Table 1-5〉 Data sources for the Korean Healthcare Quality Report

Sources	Available data
• National Survey	
Ministry of Health and Welfare	Children's Health Survey
Ministry of Health and Welfare	Mental Illness survey
Korea Institute for Health and Social Affairs (KIHASA)	National Birth/Delivery History and Family Health and Welfare Survey
KIHASA	Patient Survey
KIHASA, National Health Insurance Service (NHIS)	Korea Health Panel
Korea Centers for Disease Control and Prevention (KCDC)	National Health and Nutrition Survey (Oral Health Survey)
KCDC	Immunization Survey
KCDC	Community Health Survey
KCDC (Ministry of Education/Ministry of Welfare/KCDC)	Teenage Health Behavior Online Survey



Sources	Available data
<b>• Health Care Facilities and Clinical Data</b>	
NHIS	Long-term care facility quality assurance program
Health Insurance Review and Assessment Service (HIRA)	Long-term care hospital evaluation
HIRA	Preventative pre-op antibiotics prescription assessment
HIRA	Acute myocardial infarction assessment outcome
HIRA	Hemodialysis adequacy review outcome
HIRA	Medical care facility statistics
Korea Health Industry Development Institute (KHIDI)	Healthcare resource statistics
KHIDI	Hospital management analysis
<b>• Surveillance and Vital Statistics</b>	
KCDC	Hospital-acquired infections surveillance system: hospitals across nation
KCDC	Infectious diseases surveillance system: hospitals across nation
KCDC	National chronic diseases surveillance system
NHIS	National Health Screening Statistical Yearbook
NHIS, HIRA	National Health insurance Statistical Yearbook, disease statistics
Ministry of Health and Welfare, KCDC	Health and welfare statistics (national health statistics)
National Cancer Center	Current state of cancers through statistics
Central Emergency Healthcare Center	Emergency healthcare statistics
Statistics Bureau	Causes of death statistics
<b>• Other</b>	
KCDC, Korean network for organ sharing	Organ transplant statistics
KCDC, Korea Federation for HIV/Aids Prevention	AIDS related knowledge/attitude/faith survey
Korea Breast Cancer Academic Society	2012 Breast Cancers Encyclopedia
Korea Kidney Academic Society (2000; 2006)	End-stage Renal Disease Patient Survey (505 agencies)
Supreme Prosecutor's Office	Drug-related Crime Encyclopedia
Ministry of Health and Welfare, HIRA (2011)	OECD Health Care Quality Indicators Project
OECD	Health at a Glance 2011
Ministry of Health and Welfare	National Health Promotion Plan 2020

## B. Quality improvement performance analysis: trend analysis

Through trend analysis, quality improvement for each measure was assessed by its improvement direction and annual improvement rate. If the average annual rate of change was greater than 1% in the desirable direction, progress on a measure was deemed to be improving. Conversely, progress on a measure was deemed to be worsening if the average annual rate of change was greater than 1% in the undesirable direction. Additionally, a change of less than 1% was deemed not particularly meaningful (AHRQ 2013, p. 28).

For trend analysis, we used the method used by the NHQR, in which measures for which a minimum of four data points (years) were collected are examined for the average annual rate of change and statistical significance ( $p < 0.10$ ), and the following weighted log linear regression analysis is performed to estimate the average annual rate of change (AHRQ 2013, p. 29).

$$\ln(M) = \beta_0 + \beta_1 Y, \text{ weight: } w = (M^2/v)$$

$M$ : measure value of year  $Y$ ,

$Y$ : year,

$\beta_0$ : intercept,

$\beta_1$ : coefficient corresponding to year  $Y$

\* average annual rate of change(%) =  $100 \times (\exp(\beta_1) - 1)$

Even when the annual rate of change is greater than 1%, the change may not be important. As such, we conducted a weighted log-linear regression analysis that applies a weight ( $w$ ) on the variance ( $v$ ) of a measured value to take into account the measure type and size of standard deviation. Because standard error may vary significantly, the significance level was

set at  $\alpha = 0.10$  (AHRQ 2013, p. 29). When there is a minimum of four data points ( $M$ ), progress on a measure was determined as follows:

- Progress on the measure is deemed to be improving if the average annual rate of change is greater than 1% in the desirable direction, and  $p < 0.10$ .
- Progress on the measure is deemed to be worsening if the average annual rate of change is greater than 1% in the undesirable direction, and  $p < 0.10$ .
- Progress on the measure is deemed to have remained the same if the average annual rate of change is less than or equal to 1% in either the desirable or undesirable direction, or  $p > 0.10$ .

### **C. Trends in disparities in population subgroups**

When data is collected, disparities and trends in disparities in healthcare quality provided can be analyzed by looking at the measures across age, gender, income level, education level, and 16 provinces/cities. The NHQR considers a disparity between a group and a reference group to be meaningful if there is a minimum relative difference greater than 10%, with  $p < 0.05$  (AHRQ 2013, p. 29). Additionally, it has been tracking and monitoring the disparities in healthcare quality between vulnerable population groups (minority, low-income, the elderly, etc.) and reference groups. For this, a trend analysis is performed that tracks annual changes in absolute disparities or relative disparities between comparison groups and reference groups (AHRQ 2013, p. 29).

## **D. Benchmarks**

To the greatest extent possible, measure specific benchmarks or comparative values were also presented when reporting performance trends of all measures. Selecting standards of performance suggests achievable levels of improvement. For each individual measure, benchmarks corresponding to measures included in the Health Plan 2020 were selected. In cases where no benchmarks are available, benchmarks of high performing groups were averaged. For instance, if regional comparison was made possible, the average of the three highest performing regions was used. For international comparison, the average of the top three performing OECD nations was used. As the number of measurable indicators increases or the number of measures included in international comparison increases, more measures will become available for international comparison.

# 2

## Selecting Conceptual Framework and Measures for the KHQR

- Section 1. Conceptual Framework for Healthcare Quality Assessment at a System Level
- Section 2. Conceptual Frameworks and Measure Compositions of National Healthcare Quality Reports Around the World
- Section 3. Selecting a Conceptual Framework and Measures for the KHQR



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# 2

## Selecting Conceptual Framework << and Measures for the KHQR

### Section 1. Conceptual Framework for Healthcare Quality Assessment at a System Level

#### 1. Definition and domains of quality care in a healthcare system

Donabedian (1966) defined “quality” in terms of structure (the environment where care is provided, equipment that enables services), process (provision of quality care and degree of congruence), and outcomes (recovery, reclaiming of function, survival) (cited in Donabedian 1966, pp. 169–170; IOM 2001, p. 22). Donabedian’s three dimensions of quality care (1966) continues to be the dominant paradigm for assessing healthcare quality.

In 1990, the Institute of Medicine (IOM) defined quality of care as “the extent to which health services provided to individuals and patient populations improve desired health outcomes” (cited in IOM 1990, p. 21; IOM 2001, p. 22). The IOM also defined the four components of healthcare quality improvement to be safety, effectiveness, patient centeredness, and timeliness (IOM 2001, p. 41). According to the IOM’s definitions, safety refers to avoiding harming the patients with services provided, effectiveness refers to providing scientifically backed services to patients expected to benefit from such services, patient centeredness refers to care that is respectful and responsive to individuals’ wishes, needs, and preferences through a partnership between healthcare provider, patient, and family, while providing patient education and support to help the patient participate in the decision-making process. Timeliness refers to provision of

care without unnecessary delay. Additionally, equity was brought up to ensure that the four components of quality care are available to all and that the quality of care provided does not vary across different subgroups.

Leatherman and Sutherland (2005) defined the quality of care into six domains. The six domains are used as the basic framework of healthcare quality assessment in Canada. The Canadian framework, however, presents “capability” as an added domain as adequate resources are required to be able to provide appropriate healthcare services.

〈Table 2-1〉 Six dimensions of quality healthcare suggested by Leatherman and Sutherland(2005)

Category	Principle	Sample index
Effectiveness	Healthcare services must be based on science and research to the greatest extent possible.	<ul style="list-style-type: none"> <li>▶survival rate, mortality rate</li> <li>▶cancer diagnosis rate</li> <li>▶secondary prevention of heart failure</li> </ul>
Access & Timeliness	Healthcare services must be provided in a timely manner at a place conducive to rendering the services.	<ul style="list-style-type: none"> <li>▶wait times for elective surgeries and primary care</li> <li>▶cost barrier to accessing healthcare services</li> <li>▶timely referral to specialists</li> </ul>
Capacity	The healthcare system must have sufficient resources to ensure provision of adequate services.	<ul style="list-style-type: none"> <li>▶per person healthcare cost</li> <li>▶patient-to-doctor, patient-to-nurse ratios</li> <li>▶availability of beds in the ICU</li> </ul>
Safety	Patients must be protected from potential harm and unnecessary risks in the delivery of care.	<ul style="list-style-type: none"> <li>▶number of incidences in which patients were harmed due to inappropriate care</li> <li>▶medication errors</li> <li>▶hospital-acquired infections</li> </ul>
Patient-centeredness	Healthcare should: First, be based on a partnership between provider and patient. Second, be responsive to individual patient’s needs, values, and preferences, and must be based on empathy.	<ul style="list-style-type: none"> <li>▶patient report regarding experience with healthcare system</li> <li>▶patient understanding regarding disease state</li> <li>▶healthcare professional’s respect for patients</li> </ul>
Disparities	Healthcare should: First, be provided based on the need for care, independent of patient’s individual characteristics, such as age, gender, ethnicity, race,	<ul style="list-style-type: none"> <li>▶compare subgroups for surgical procedures rendered</li> <li>▶infant mortality rate by socioeconomic status</li> <li>▶disparity in immunization rate by</li> </ul>



Category	Principle	Sample index
	language, socioeconomic status, and geographical location. Second, be provided in ways that minimize disparities between various subgroups.	ethnicity and race

Source: Leatherman and Sutherland (2005, p. xxvi).

In the context of healthcare, quality is a multidimensional concept, which makes it difficult to have a single definition or assessment framework. This is apparent in the fact that assessment domains vary by country. However, international approaches by the WHO and OECD that are in progress today are contributing to reaching a consensus regarding what domains should be assessed for healthcare quality.

According to the WHO (2006, p. 9) all projects that have attempted to improve healthcare quality and outcomes thus far began with an understanding of what “quality” means. The WHO suggested the six domains—effectiveness, efficiency, equitability, accessibility, patient-centeredness, and safety—in assessing the overall quality of a healthcare system. Definitions of the six domains are presented in Table 2-2.

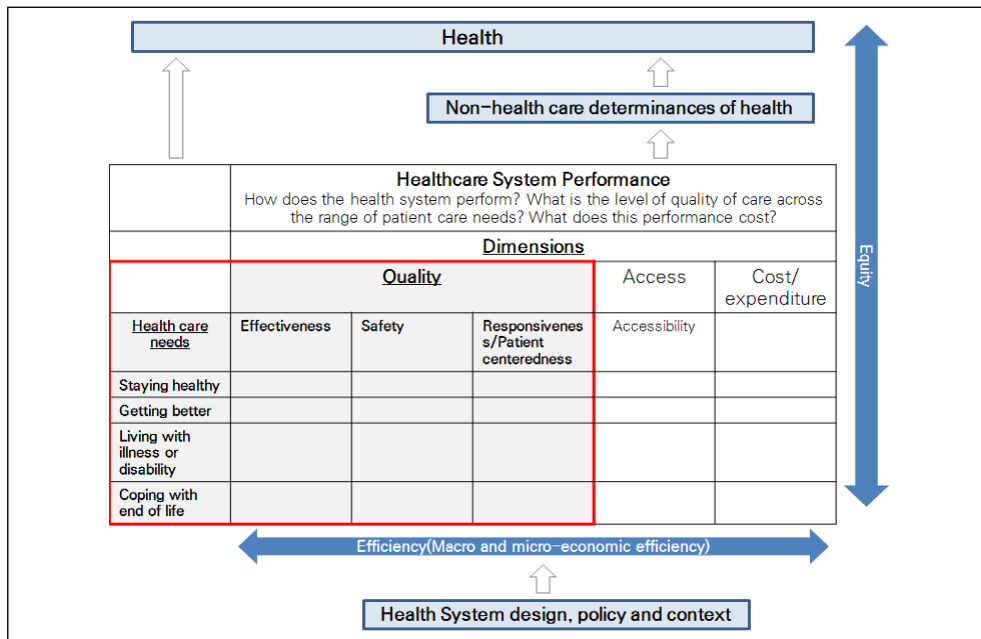
<Table 2-2> Six domains of healthcare quality in need of improvement from the WHO’s(2006) system point of view

Quality domain	Definition
Effectiveness	Provide scientifically proven healthcare based on patients’ needs to improve health outcomes of individuals and communities.
Efficiency	Provide healthcare that maximizes resources and minimizes wastes.
Accessibility	Provide healthcare that is timely and accessible in an environment conducive to quality care.
Capacity/patient-center edness	Provide healthcare that reflects individual consumers and environment conducive to quality care.
Equitability	Provide equal care to all regardless of individual characteristics gender, race, ethnicity, geographical location, and socioeconomic status.
Safety	Provide healthcare that minimizes risks and harm to those receiving care.

Source: WHO 2006, pp. 9-10.

The OECD also presents the quality domains selected through the Health Care Quality Indicator (HCQI) Project, which performed an international comparison of the quality assessment structures (Kelley & Hurst 2006, p. 15; cited in Kang et al. 2013, p. 89) (See Figure 2-1). Previously, quality domains were limited to indicators related to effectiveness as they render themselves easy for measurement in most countries. However, more indicators were gradually incorporated over the years and, in the 2013 Health at a Glance, patient-centeredness measures were published. Healthcare equity is also mentioned as an intersecting issue. Unlike in the WHO’s quality assessment framework, in the OECD’s framework, quality assessment domains (effectiveness, efficiency, responsiveness/patient-centeredness) are intersecting with changes in healthcare needs (maintenance of good health, improving symptoms, disease and disability management, lifetime management) (Kelley & Hurst 2006, p. 15) (Figure 2-1, Table 2-3).

[Figure 2-1] Conceptual framework and healthcare quality domains: OECD HCQI



Source: Kelley & Hurst (2006, p. 15); cited in Kang et al. (2013, p. 89)

<Table 2-3> OECD Health at a Glance healthcare quality assessment domains and detail measures

Quality care domains	Subdomains and measures	
Effectiveness	Avoidable hospital admissions	▶asthma admission rate, COPD admission rate, diabetes admission rate
	Prescribing in primary care	▶antibiotics prescription rate (per 1,000 capita DDD) ▶cephalosporin or quinolone family antibiotics prescription rate
	Acute treatment of chronic diseases	▶fatality rate: acute myocardial infarction, ischemic/hemorrhagic strokes
	Treatment of psychiatric diseases	▶readmission rate: schizophrenia, bipolar disorder ▶excess mortality due to psychiatric diseases: schizophrenia, bipolar disorder
	Cancer treatment	▶cervical cancers: screening rate, five major relative survival rates, mortality rate ▶breast cancers: screening rate, five major relative survival rates ▶colon cancers: five major relative survival rates
	Vaccination	▶childhood immunization: pertussis, measles, hepatitis B ▶influenza immunization rate among the elderly
Patient safety	▶obstetric trauma: equipment not used/equipment used ▶post-op complications: post-op sepsis/deep vein thrombosis, post-op sepsis, foreign objects left in patient during surgery	
Patient centeredness	▶percentage of patients who feel that their regular doctors spend enough time counselling during an appointment ▶percentage of patients who feel that their regular doctors provide comprehensible explanations during a consultation ▶percentage of patients who feel that their regular doctors provide opportunities for them to ask questions or show interest ▶percentage of patients who feel that their regular doctors involve them in treatment decisions	

Source: OECD (2014). Health at a Glance 2013, pp. 107-135.

## **Section 2. Conceptual Frameworks and Measure Compositions of National Healthcare Quality Reports Around the World**

To assess a healthcare system's quality and performance, we need to establish the level of assessment and conceptual framework that guides what specific indicators would be measured. In our first year analysis, we reviewed the feasibility of producing certain measures in Korea. The measures reviewed were selected based on the assessment framework of the NHQR(US), which presents the most comprehensive and detailed measurement domains. In the second-year analysis, we sought to strengthen the logical base for the quality assessment conceptual framework to be used in Korea by incorporating international trends and our nation's healthcare demand.

In countries such as the UK and Sweden, which have an NHS system funded and operated by the government, a system is rated by ultimate outcomes of improvement in national health and healthcare equity and the problem areas are identified. Conversely, in countries such as the US, which adopt a healthcare system relying mainly on private investment and less on government funding, the aim is to increase system efficiency. As such, improving quality while lowering cost is an important outcome measure of such a system. With this approach, the system governance promotes competition between private healthcare organizations by publishing data on quality. This promotes improvement in overall system efficiency while compensating for the limits in the government's right for intervention. In countries such as the US and the Netherlands, in particular, where patients are free to choose their healthcare providers, patient-centered care coordination is considered an important measure of system efficiency. In Korea where an increasing number of consumers

continue to flock over to large-scale general hospitals, this efficiency/care coordination issue needs to be addressed (Kang 2014, pp. 73-75).

We reviewed the conceptual frameworks of healthcare quality assessment worldwide with a focus on the countries that have been publishing national healthcare quality reports or those that assess healthcare quality with detailed outcome measures. In the first year’s review, Australia’s health outcome assessment framework was analyzed in connection. In the second year’s research, the conceptual framework of the Australian 「Healthcare quality and safety report」 replaced it, and the conceptual framework of Canada’s 「Healthcare Quality Report」 was added and used in the comparison.

## 1. UK

The UK has been publishing the 「NHS Outcomes Framework 2013/2014」 annually.

〈Table 2-4〉 Conceptual framework and quality measures: the UK’s NHS Outcomes Framework

Dimension	1	2	3	4	5
	Preventing people from dying prematurely	Enhancing quality of life for people with long-term conditions	Helping people to recover from episodes of ill health or following injury	Ensuring that people have a positive experience of care	Treating and caring for people in a safe environment; and protecting them from avoidable harm
Overarching measures	▶potential years of life lost (PYLL)	▶Health-related quality of life for people with long-term conditions	▶Emergency admissions for acute conditions that should not usually require hospital admission	▶patient experience of primary care -GP services/ out of hours services, NHS Dental services	▶patient safety incident reported ▶safety incidents involving severe harm/death

Dimension	1	2	3	4	5
	<p>Preventing people from dying prematurely</p>	<p>Enhancing quality of life for people with long-term conditions</p>	<p>Helping people to recover from episodes of ill health or following injury</p>	<p>Ensuring that people have a positive experience of care</p>	<p>Treating and caring for people in a safe environment; and protecting them from avoidable harm</p>
Improvement areas	<p>▶Life expectancy at 75</p> <p>▶Reducing premature mortality from major causes of deaths</p> <ul style="list-style-type: none"> <li>-under 75 mortality rate from cardiovascular diseases</li> <li>-under 75 mortality rate from respiratory diseases</li> <li>-under 75 mortality rate from liver diseases</li> <li>-under 75 mortality rate from cancer</li> <li>•one-and 5-year survival from all cancers</li> <li>•one-and 5-year survival from breast, lung, and colorectal</li> </ul>	<p>▶Ensuring people feel supported to manage their condition</p> <p>▶improving functional ability in people with long-term conditions</p> <p>▶Reducing time spent in hospital by people with long-term conditions</p> <ul style="list-style-type: none"> <li>-unplanned hospitalization for chronic ambulatory care sensitive conditions</li> <li>-unplanned hospitalization for asthma, diabetes, and liver diseases in under 19s</li> </ul>	<p>▶Emergency readmissions within 30days of discharge from hospital</p> <p>▶Improving outcomes from planned treatments</p> <ul style="list-style-type: none"> <li>-Total health gain as assessed by patients for elective procedure</li> <li>•Hip replacement</li> <li>•Knee replacement</li> <li>•Groin hernia</li> <li>•Varicose veins</li> <li>•Psychological therapies</li> </ul> <p>▶Preventing lower respiratory tract infections (LRTI) in children from becoming serious</p> <p>▶Improving recovery from injuries and trauma</p>	<p>▶patient experience of hospital care</p> <p>▶family and friends test</p> <p>▶improving people's experience of outpatient care</p> <p>▶improving hospitals' responsiveness to personal needs</p> <p>▶Improving people's experience of accident and emergency services</p> <p>▶Improving access to primary care services</p>	<p>▶hospital deaths attributable to problems in care</p> <p>▶reducing incidence of avoidable harm</p> <ul style="list-style-type: none"> <li>-incidence of hospital-related venous thromboembolism(VTE)</li> <li>-incidence of healthcare-associated infection (MRSA, C.difficile)</li> <li>-incidence of newly-acquired category 2, 3, and 4 pressure ulcers</li> <li>-incidence of medication errors causing serious harm</li> </ul>

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Dimension	1	2	3	4	5
	Preventing people from dying prematurely	Enhancing quality of life for people with long-term conditions	Helping people to recover from episodes of ill health or following injury	Ensuring that people have a positive experience of care	Treating and caring for people in a safe environment; and protecting them from avoidable harm
	<p>cancer</p> <ul style="list-style-type: none"> <li>▶Reducing premature death in people with serious mental illness</li> <li>▶Reducing deaths in babies and young children</li> <li>▶Reducing premature death in people with a learning disability</li> </ul>	<ul style="list-style-type: none"> <li>▶Enhancing quality of life for carers</li> <li>▶Enhancing quality of life for people with mental illness</li> <li>▶Enhancing quality of life for people with dementia</li> </ul>	<ul style="list-style-type: none"> <li>▶Improving recovery from stroke</li> <li>▶Improving recovery from fragility fractures</li> <li>▶Helping older people to recover their independence after illness or injury</li> <li>-Proportion of older people (65 and over) who were still at home 91 days after discharge from hospital into reablement/ rehabilitation service</li> <li>-Proportion offered rehabilitation following discharge from acute or community hospital</li> </ul>	<ul style="list-style-type: none"> <li>▶Improving women and their families' experience of maternity services</li> <li>▶Improving the experience of care for people at the end of their lives</li> <li>▶Improving experience of healthcare for people with mental illness</li> <li>▶Improving children and young people's experience of healthcare</li> <li>▶Improving people's experience of integrated care</li> </ul>	<ul style="list-style-type: none"> <li>▶Improving the safety of maternity services</li> <li>▶Delivering safe care to children in acute settings</li> </ul>

Source: Department of Health (2012, p. 14). The NHS Outcomes Framework 2013/2014.

Through these efforts, we were able to look at the UK's healthcare quality domains and major clinical measures included in the effectiveness domain (Department of Health 2012, p. 14). Of the five main domains of the NHS Outcomes Framework, "Preventing people from dying prematurely," "Enhancing quality of life for people with long-term conditions," and "Helping people to recover from episodes of ill health or following injury" comprised the effectiveness domain; "Ensuring that people have a positive experience of care" was included in accessibility and patient-centeredness domains, and "Treating and caring for people in a safe environment; and protecting them from avoidable harm" was included in the safety domain (Table 2-4). Additionally, clinical diseases and services measures included in the effectiveness domain consisted of cardiovascular diseases, respiratory diseases, liver diseases, cancers (breast, lung, colorectal cancers), psychiatric diseases, long-term care, and dementia. The UK's ultimate aim is to reduce disparities in health outcomes between subgroups through inter-region and inter-group analyses.

## 2. Sweden

Sweden has a well-established system for assessing and reporting national healthcare quality (OECD 2014, p. 11). The annually published national report, "Quality and Efficiency in Swedish Health Care" consists of national-level measures and inter-regional comparison measures (Swedish Association of Local Authorities and Regions, Swedish National Board of Health and Welfare 2010, p. 13) (Table 2-5). The national level measures include health level, patient experience, accessibility, and cost domains. Included in the health level measures are the outcome measures of expected longevity, subjective health status, and patient safety-related hospital-acquired infections. The outcome measures associated with the appro-



priateness and efficiency of healthcare include mortality rate and hospital admission rate. The domain of trust and patient experience measures the degree of patient-centeredness in the delivery of care and healthcare accessibility. The accessibility domain concerns timeliness and accessibility. Additionally, by measuring the healthcare costs, they measure the degree to which patients accept healthcare services, and evaluate efficiency of the healthcare system in connection with health outcomes. In the clinical domain where specific regional comparisons are made, pregnancy/delivery/neonatal, obstetrics, musculoskeletal, diabetes, cardiac diseases, strokes, renal diseases, cancers, psychiatric diseases, ICU patients, drug treatment, and others (HIV, end-of-life care, etc.) are included.

<Table 2-5> Conceptual framework and quality measures: Sweden’s healthcare quality and efficiency report

Measuring level	Domain	Detail domains and measure
National/ general measures	Health status	<ul style="list-style-type: none"> <li>▶life expectancy</li> <li>▶subjective health status</li> <li>▶subjective mental health status</li> <li>▶healthcare-related avoidable mortality</li> <li>▶avoidable mortality-related to healthcare coverage</li> <li>▶avoidable mortality-related to ischemic heart diseases</li> <li>▶avoidable hospitalization</li> <li>▶meticillin-resistance staph testing and tracking and monitoring</li> <li>▶hospital infection</li> <li>▶childhood vaccination (measles, mumps, rubella)</li> </ul>
	Confidence and patient experience	<ul style="list-style-type: none"> <li>▶healthcare accessibility</li> <li>▶confidence in health centers</li> <li>▶confidence in hospitals</li> <li>▶primary care provider’s respect and consideration for patient</li> <li>▶provision of adequate information (to patient) during primary care visit</li> <li>▶patient participation during primary care visit</li> </ul>
	Availability	<ul style="list-style-type: none"> <li>▶appointment with primary care doctor within 7 days</li> <li>▶patient perception regarding waiting time during a visit</li> <li>▶availability of primary care by phone</li> <li>▶availability of health consultation by phone</li> <li>▶specialist appointment not available within 90 days</li> <li>▶waiting time for treatment over 90 days</li> </ul>

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Measuring level	Domain		Detail domains and measure
	Costs		<ul style="list-style-type: none"> <li>▶adjusted guaranteed healthcare costs per capita</li> <li>▶per capita healthcare cost by type of care</li> <li>▶adjusted drug cost per capita</li> <li>▶cost per consumed DRG point</li> <li>▶cost per hospital DRG point</li> <li>▶cost per contact with the primary care system</li> </ul>
Regional/ regional comparison	Clinical domain	Pregnancy, childbirth, neonatal care	<ul style="list-style-type: none"> <li>▶tobacco use during pregnancy</li> <li>▶induced abortion prior to 10 completed weeks of pregnancy</li> <li>▶fetal mortality rate</li> <li>▶infant mortality rate</li> <li>▶percentage of neonates with Apgar score below 7</li> <li>▶percentage of third- and fourth-degree tears during vaginal delivery</li> <li>▶cesarean section</li> <li>▶cost per care event for childbirth</li> </ul>
		Gynecol ogical care	<ul style="list-style-type: none"> <li>▶adverse events after hysterectomy</li> <li>▶patient reported complications after hysterectomy</li> <li>▶patient reported complications after uterine prolapsed surgery</li> <li>▶cost per care event for hysterectomy</li> <li>▶over 90 days of waiting period for gynecological surgery</li> <li>▶over 90 days of waiting period to see a doctor</li> </ul>
		Musculo skeletal	<ul style="list-style-type: none"> <li>▶total knee arthroplasty implant survival rate</li> <li>▶total hip arthroplasty implant survival rate</li> <li>▶reoperation after total knee arthroplasty</li> <li>▶patient reported outcome of total hip arthroplasty</li> <li>▶adverse events after total knee arthroplasty, total hip arthroplasty</li> <li>▶waiting period for hip fracture surgery</li> <li>▶total hip arthroplasty for hip fracture</li> <li>▶drugs to prevent fracture due to osteoporosis</li> <li>▶knee arthroscopy for osteoarthritis or degenerative meniscus lesion</li> <li>▶biologic drugs for rheumatoid arthritis</li> <li>▶patient-reported effects after commencement of biologic drugs for rheumatoid arthritis</li> <li>▶patient-reported improvement after treatment of rheumatoid arthritis</li> <li>▶over 90 days of waiting period for orthopedic appointment or total knee arthroplasty</li> <li>▶over 90 days of waiting period for orthopedic appointment or total hip arthroplasty</li> <li>▶cost per inpatient care event for primary total knee arthroplasty</li> <li>▶cost per inpatient care event for primary total hip arthroplasty</li> </ul>
		Diabetes	<ul style="list-style-type: none"> <li>▶blood glucose level of patients with hypertension who received nutrition treatment</li> <li>▶systolic pressure</li> </ul>

Measuring level	Domain	Detail domains and measure
		<ul style="list-style-type: none"> <li>▶patients with diabetes in primary care who achieve the target LDL cholesterol level</li> <li>▶lipid-lowering drug therapy</li> <li>▶blood glucose level: children and teenagers with diabetes</li> <li>▶insulin pump for patients with type 1 diabetes</li> <li>▶prescription of metformin for patients with type 2 diabetes and patients with renal diseases</li> </ul>
	Cardiac care	<ul style="list-style-type: none"> <li>▶myocardial infarction: 28-day case fatality rate</li> <li>▶myocardial infarction: 28-day case fatality rate-hospitalized patients</li> <li>▶recurrence of infarction or death from ischemic heart disease</li> <li>▶reperfusion therapy for patients with ST-segment elevation myocardial infarction</li> <li>▶coronary angiography after non-ST-segment elevation myocardial infarction in patients with another risk factor</li> <li>▶Clopidogrel therapy for patients with non ST-segment elevation myocardial infarction</li> <li>▶lipid-lowering drug therapy after myocardial infarction</li> <li>▶readmission or death after hospitalization for heart failure</li> <li>▶waiting period for coronary bypass surgery</li> <li>▶over 90 days of waiting period for physician appointment regarding heart disease</li> <li>▶cost per inpatient care event for PCI (percutaneous coronary intervention) after myocardial infarction</li> </ul>
	Stroke care	<ul style="list-style-type: none"> <li>▶28-day and 90-day case fatality rate for first-ever stroke patients</li> <li>▶28-day and 90-day case fatality rate for first-ever stroke patients: hospitalized</li> <li>▶stroke patients treated at a special stroke unit</li> <li>▶anticoagulant therapy for stroke patients with atrial fibrillation</li> <li>▶recurrence of stroke</li> <li>▶patient's level of daily function three months after stroke</li> <li>▶patient satisfaction with stroke care at hospital</li> </ul>
	Renal care	<ul style="list-style-type: none"> <li>▶Five-year survival rate: renal replacement therapy</li> <li>▶target fulfilment for hemodialysis dose</li> <li>▶vascular access during dialysis (AV fistula/AV graft)</li> <li>▶kidney transplant</li> <li>▶cost per inpatient care event for kidney transplant</li> </ul>
	Cancer care	<ul style="list-style-type: none"> <li>▶colon cancer: relative 5-year survival rate</li> <li>▶rectal cancer: relative 5-year survival rate</li> <li>▶breast cancer: relative 5-year survival rate</li> <li>▶lung cancer: relative 1-2-5-year survival rates</li> <li>▶reoperation for rectal cancer</li> <li>▶prostate cancer: curative treatment of patients aged 70 and younger</li> <li>▶waiting time from receipt of referral until commencement of treatment: head and neck cancer patients</li> </ul>

Measuring level	Domain	Detail domains and measure
	Psychiatric care	<ul style="list-style-type: none"> <li>▶suicide rates</li> <li>▶treatment with soporifics or sedatives</li> <li>▶polypharmacy: elderly who consume three or more psychopharmacological drugs</li> <li>▶consumption of appropriate soporifics by the elderly</li> <li>▶avoidable inpatient medical care for people with psychiatric diagnosis</li> <li>▶readmission within 14 days and 28 days after treatment for schizophrenia</li> <li>▶readmission within 3-6 months after treatment for schizophrenia</li> <li>▶compliance with lithium therapy for bipolar disorder</li> <li>▶child and adolescent psychiatry: appointment within 30 days</li> <li>▶adult psychiatry: over 90 days of waiting period for an appointment</li> <li>▶recidivists during forensic psychiatric care</li> </ul>
	Surgical care	<ul style="list-style-type: none"> <li>▶reoperation for inguinal hernia</li> <li>▶inguinal hernia: percentage of day-case operations</li> <li>▶minimally invasive cholecystectomy</li> <li>▶complications after elective over 90 days of waiting period</li> <li>▶cost per DRG point for cholecystectomy</li> <li>▶waiting period for carotid endarterectomy</li> <li>▶amputation or death after infrainguinal bypass surgery</li> <li>▶cost per inpatient care event for infrainguinal bypass surgery</li> <li>▶patient oriented outcome of septoplasty</li> <li>▶cataract surgery: visual acuity of below 0.5</li> <li>▶over 90 days of waiting period for a typical surgery</li> <li>▶over 90 days of waiting period for infrainguinal bypass surgery</li> <li>▶over 90 days of waiting period for over 90 days of waiting period</li> <li>▶over 90 days of waiting period for cataract surgery</li> </ul>
	Intensive care	<ul style="list-style-type: none"> <li>▶risk-adjusted mortality after treatment at an ICU</li> <li>▶discharge from ICU at night time</li> <li>▶readmission to ICU within 72 hours of discharge</li> </ul>
	Drug therapy	<ul style="list-style-type: none"> <li>▶drug-drug interactions among the elderly</li> <li>▶polypharmacy: elderly who consume 10 or more drugs per day</li> <li>▶occurrence of antibiotics treatment</li> <li>▶Penicillin V treatment of children with respiratory diseases</li> <li>▶Quinolone therapy in treatment of women with urinary tract infection</li> <li>▶combination of drugs for asthma</li> <li>▶percentage of prescription angiotensin 2 receptor blockers (ARBs) in treatment of hypertension</li> </ul>
	Other care	<ul style="list-style-type: none"> <li>▶HIV control</li> <li>▶pain intensity at end of life</li> <li>▶prescription of opioids on as-needed basis at end of life</li> <li>▶immunomodulators for relapsing remitting MS</li> <li>▶immunomodulators for secondary progressive MS</li> </ul>

Source: Swedish Association of Local Authorities and Regions, Swedish National Board of Health and Welfare (2010). pp. 289-292, author compiled

### 3. The Netherlands

The Netherlands, like Sweden, has a well-established system for assessing the healthcare system’s performance at a national level, along with a well-established system for collecting and reporting detailed measures of quality. The biannual report published by the National Institute for Public Health and the Environment, the ‘Dutch Health Care Performance Report, DH CPR,’ measures quality, accessibility, costs, and efficiency to assess the performance of the healthcare system. Of these, the quality domain consists of four areas of effectiveness: patient safety, responsiveness, care coordination, and cooperation. The clinical sub-domain included in the effectiveness domain consists of the three areas of prevention, treatment, and long-term care, which subsequently consist of lifestyle modification for managing risk of chronic diseases, acute myocardial infarction, cerebral infarction, cerebral hemorrhage, cancers (breast, colorectal, cervical cancers), psychiatric treatment, childhood immunizations, obstetric services, and long-term care. The report measures healthcare quality and outcomes in connection with the level of expenditures in order to concurrently assess the healthcare system’s efficiency (See Table 2-6).

<Table 2-6> Conceptual framework and quality measures; the Dutch National Healthcare Performance Report

	Domain		Subdomain and measure
Quality	Effectiveness	Prevention	<ul style="list-style-type: none"> <li>▶ participation rate in screening tests: breast/cervical/heel prick test</li> <li>▶ vaccination rates</li> <li>▶ participation rate for the project ‘The Healthy School and Drugs’</li> <li>▶ lifestyle: smoking/alcohol use/obesity</li> <li>▶ coverage of preventive child healthcare</li> <li>▶ infant mortality</li> </ul>

Domain		Subdomain and measure
	Curative care	<ul style="list-style-type: none"> <li>▶percentage of GP practices according to formulary of the Dutch College of General Practitioners</li> <li>▶in hospital case fatality rates within 30 days for acute myocardial infarction, cerebral infarction, and cerebral hemorrhage</li> <li>▶experienced progress in physical functioning after surgery</li> <li>▶mortality rates for breast, colorectal, and cervical cancers</li> <li>▶number of hip fractures that are operated on within 48 hours</li> <li>▶avoidable hospital admission</li> <li>▶C-sections in low risk pregnant women</li> <li>▶drop-out rates in mental healthcare</li> </ul>
	Long-term care	<ul style="list-style-type: none"> <li>▶number of patients who experienced good physical care</li> <li>▶number of patients who experienced professional and safe care</li> <li>▶satisfaction of nurses and carers with quality of care</li> <li>▶preventable healthcare problems among clients in residential homes and nursing homes and home care patients (malnutrition/falls)</li> <li>▶number of rooms with multiple beds in nursing homes and residential homes</li> <li>▶number of nursing homes, residential homes, and facilities for psychogeriatric care where a doctor is on call 24/7</li> <li>▶demonstrated competence of staff in carrying out reserved or risky procedures</li> </ul>
	Patient safety	<ul style="list-style-type: none"> <li>▶percentage of chronically ill patients who experienced medical errors</li> <li>▶hospital standardized mortality rate</li> <li>▶percentage of patient contacts in primary care that resulted in unintended harm</li> <li>▶percentage of residents of nursing homes and residential homes that experienced an adverse drug event</li> <li>▶percentage of patients with hospital-acquired infection</li> <li>▶percentage of serious blood transfusion reactions per 100 blood products</li> <li>▶percentage of patients with hospital-acquired pressure sores</li> <li>▶percentage of patients with pressure sores acquired in nursing homes, residential homes, or in home care</li> <li>▶percentage of hospitals that performed less than the minimum number of Abdominal Aortic Aneurysm (AAA) or Office of Civil Right(OCR) operations</li> <li>▶percentage of pharmacotherapeutic consultation groups functioning at Level 3 or 4</li> </ul>
	Responsiveness	<ul style="list-style-type: none"> <li>▶experienced interpersonal connection with medical personnel</li> <li>▶experienced polite treatment</li> <li>▶receiving understandable information</li> <li>▶involvement in decision making regarding care</li> <li>▶extent to which healthcare providers take sufficient time for patients</li> <li>▶fulfillment of care wishes of clients in mental healthcare</li> </ul>

	Domain	Subdomain and measure
	Coordination and cooperation	<ul style="list-style-type: none"> <li>▶first experiences of care groups with bundled payment</li> <li>▶extent to which patients have to repeat themselves to different healthcare providers</li> <li>▶patient experiences with healthcare providers giving contradictory information</li> <li>▶percentage of chronically ill patients who experienced coordination problems with medical tests</li> <li>▶Supply of support and information at hospital discharge</li> <li>▶number of health care providers connected to the National Exchange Point of Electronic Health Records</li> <li>▶percentage of hospitals where information on medication prescribed in hospital and elsewhere is electronically accessible on hospital wards and elsewhere</li> </ul>
Accessibility	Financial approach/geographical approach/availability of personnel/freedom of choice	
Costs and efficiency	Medical costs/efficiency/financial state of providers and insurers	

Source: National Institute for Public Health and the Environment (2010, pp. 262-266), author compiled

#### 4. Canada

In response to the explosion in the amount of healthcare quality data that is being produced by central and local governments, academia, expert organizations, and patient organizations, the Canadian Health Services Research Foundation (CHSRF) (2010), funded by the Canadian government, has put together the national report “Quality of Healthcare in Canada: A Chartbook” and sought to provide a comprehensive picture of Canada’s national healthcare quality. Although the report is not being published on a regular basis, it is meaningful for understanding the components of healthcare quality assessment. The report emphasizes the importance of the availability of reliable data in improving the quality of care and presents a conceptual framework for quality assessment (Table 2-7). The six sub-domains comprising the healthcare quality domain include effectiveness, accessibility, capacity, safety, patient-centeredness, and equity. Effectiveness is subsequently comprised of health promotion, diseases, and adequacy. Adequacy measures in the effectiveness domain are also used as

efficiency measures in other countries. Included in diseases are cancers (lung, colorectal, breast, prostate cancers), vascular diseases, cardiac diseases, strokes, respiratory diseases, diabetes, and psychiatric diseases.

〈Table 2-7〉 Conceptual framework and healthcare quality measures; presented by CHSRF (2010)

Domain		Subdomains	Measures
Effectiveness	Prevention and health promotion	<ul style="list-style-type: none"> <li>• immunization</li> <li>• risk factor management</li> <li>• cancer screening</li> </ul>	<ul style="list-style-type: none"> <li>▶immunization rates</li> <li>▶cancer screening rates</li> </ul>
	Diseases	<ul style="list-style-type: none"> <li>• cancers: lung cancer, colorectal cancer, breast cancer, prostate cancer, cardiovascular diseases</li> <li>• strokes</li> <li>• respiratory diseases</li> <li>• diabetes</li> <li>• mental health and psychiatric diseases</li> </ul>	<ul style="list-style-type: none"> <li>▶mortality rate</li> <li>▶survival rate</li> <li>▶compliance rates for recommended procedures or services</li> </ul>
	Appropriateness	<ul style="list-style-type: none"> <li>• Adequate primary care</li> <li>• Appropriate hospital discharge</li> <li>• C-section rate</li> </ul>	<ul style="list-style-type: none"> <li>▶ambulatory care sensitive condition hospitalization rates</li> <li>▶readmission rates</li> <li>▶surgery rates</li> </ul>
Access		<ul style="list-style-type: none"> <li>• Wait times for primary care and emergency care</li> <li>• Wait times for secondary care and specialist appointment</li> <li>• Wait times for major procedures</li> </ul>	<ul style="list-style-type: none"> <li>▶percentage of patients on waiting lists</li> <li>▶percentage of patients whose needs are not met</li> <li>▶total knee arthroplasty, cataract surgery, radiation therapy, CABG, specific diagnostic tests</li> </ul>
Capacity		<ul style="list-style-type: none"> <li>• Expenditure</li> <li>• Personnel</li> <li>• Equipment</li> <li>• Information technology</li> <li>• Medications</li> </ul>	<ul style="list-style-type: none"> <li>▶per capita healthcare cost</li> <li>▶medical personnel per 1,000 populations</li> <li>▶CT/MRI per 1 million populations</li> <li>▶IT utilization rates</li> <li>▶per capita medication cost</li> </ul>
Safety		<ul style="list-style-type: none"> <li>• Adverse incidents in the delivery of care</li> <li>• Healthcare-related infection</li> <li>• Safety system and procedures</li> </ul>	<ul style="list-style-type: none"> <li>▶percentage of inappropriate care, patient reported errors</li> <li>▶MRSA per 1,000 patients</li> <li>▶safety alerts experience</li> </ul>
Patient-centeredness			<ul style="list-style-type: none"> <li>▶patient assessment of overall quality of care</li> <li>▶problems with healthcare coordination</li> <li>▶patient involvement in decision making regarding care</li> </ul>
Equity			<ul style="list-style-type: none"> <li>▶disparity in mortality across subgroups</li> <li>▶disparity in recommended procedures across subgroups</li> </ul>

Source: Leatherman and Sutherland (2010, p. 17)



## 5. Australia

Since 2013, the Australian Commission on Safety and Quality in Health Care has been publishing “VITAL SIGNS” annually to report on the nation’s healthcare quality and safety. The 2014 report, 「VITAL SIGNS 2014: The State of Safety and Quality in Australian Health Care」, is structured around the three essential questions that affect the national health outcome: “will my care be safe?” “will I get the right care?” and “will I be a partner in my care?” (Australian Commission on Safety and Quality in Health Care 2014, p.3) (see Table 2-8). The Commission promotes and leads improvement in the safety and quality of national healthcare. It is a legally appointed organization supported by the National Health Reform Act 2011 (NHR Act), which reports to the Parliament and the head of the Health Ministry.

The Australian Health Ministry accredited the Australian Safety and Quality Framework for Health Care in 2010. The conceptual framework lays out the vision for improved national healthcare quality and safety for all Australians as well as activities toward achieving the goal. The framework defines the three key principles for safe and quality healthcare as “consumer-centered,” “information based,” and “organized for safety.”

〈Table 2-8〉 Conceptual framework and quality measures: Australia’s healthcare safety and quality report

Domain		Subdomain	Major indicators
Will my care be safe?	Safety and quality standards (*all hospitals and outpatient facilities require accreditation in 10 domains of quality and	1.governance for safety and quality organizations	<ul style="list-style-type: none"> <li>▶ accreditation rates of hospitals/ outpatient facilities</li> <li>▶ grades of the accredited institutes</li> <li>▶ accreditation rates of general practitioners</li> <li>▶ participation in the hand hygiene campaign among public and private hospitals</li> <li>▶ percentage of hospitals submitting data</li> </ul>
		2.partnering with consumers	
		3.preventing and controlling healthcare associated infections	
		4.medication safety	
		5.patient identification and procedure matching	
		6.clinical handover	
		7.blood and blood products	
		8.preventing and managing	

Domain	Subdomain	Major indicators
safety.)	pressure injuries 9.recognizing and responding to clinical deterioration in acute healthcare 10.preventing falls and harm from falls	
Hand hygiene		<ul style="list-style-type: none"> <li>▶ percentage of healthcare providers participating in online education</li> <li>▶ number of reported cases of staph infections</li> </ul>
Medication safety		<ul style="list-style-type: none"> <li>▶ reduce medication errors by improving communication when patients move around in the health system</li> <li>▶ number of unintentional medication inconsistency cases</li> <li>▶ percentage of patients who experienced unintentional medication inconsistency</li> </ul>
Recognizing and responding to deteriorating clinical condition		<ul style="list-style-type: none"> <li>▶ number of hospitals participating in reform projects by adopting checklists for monitoring vital signs</li> <li>▶ incidence rate of associated heart failures</li> <li>▶ number of associated deaths prevented</li> </ul>
Seclusion and restraint		<ul style="list-style-type: none"> <li>▶ number of seclusion cases per 1,000 days</li> </ul>
Will I get the right care?	Healthcare Variation	<ul style="list-style-type: none"> <li>▶ geographical variation in major surgeries</li> <li>▶ hip fractures, total knee arthroplasty, knee arthroscopy, C-sections, hysterectomy without cancer diagnosis, cardiac catheterization, percutaneous coronary intervention, coronary artery bypass grafting</li> </ul>
	Cognitive Impairment	<ul style="list-style-type: none"> <li>▶ mortality rate due to acute (delirium)</li> </ul>
	Advance Care Planning	<ul style="list-style-type: none"> <li>▶ provision of national standards for advance care planning for end-of-life patients</li> </ul>

Domain	Subdomain	Major indicators
Will I be a partner in my care?	Decision Aids	▶ percentage of patients who reported to share the decision-making process with specialists
	Health Literacy	▶ percentage of patients who are unable to report with accuracy what medications they are on with accuracy
	Patient Stories and Feedback	▶ patient experience survey to be conducted
Case Studies	Stroke	▶ compliance rate for recommended procedures
	Palliative Care	▶ number of days in palliative care unit

Source: Australian Commission on Safety and Quality in Health Care (2014, pp. 5-66), author compiled

The Australian Health Ministry is ensuring that the framework provides a basis for designing strategies and plans for improved healthcare quality and safety, serves as a mechanism with which to increase the number of associated activities, and provides guidelines for investment and research while encouraging cooperation and agreement between parties involved (Australian Commission on Safety and Quality in Health Care 2014b, p.64).

<Table 2-9> key principles of Australian healthcare safety and quality framework

Principles	What it means to patients and consumers	Action domain in the healthcare system
<p><b>Consumer Centered</b></p> <ul style="list-style-type: none"> <li>- providing care that is easy for patients to get when they need it</li> <li>- making sure that healthcare staff respect and respond to patient choices, needs, and values</li> <li>- forming partnerships between patients, families, carers and providers</li> </ul>	<ul style="list-style-type: none"> <li>• I can get high-quality care when I need it.</li> <li>• I have information I can understand.</li> <li>• It helps me to make decisions about my healthcare.</li> <li>• I can help to make my care safe.</li> </ul>	<ul style="list-style-type: none"> <li>▶ develop methods and models to help patients get health services when they need them</li> <li>▶ increase health literacy</li> <li>▶ partner with consumers, patients, families, and carers to share decision-making about their care</li> <li>▶ provide care that respects and is sensitive to different cultures</li> <li>▶ involve consumers, patients, and carers in planning for safety and quality</li> </ul>

Principles	What it means to patients and consumers	Action domain in the healthcare system
	<ul style="list-style-type: none"> <li>• My healthcare is well organized.</li> <li>• The doctors, nurses, and managers all work together.</li> <li>• I feel safe and cared for.</li> </ul>	<ul style="list-style-type: none"> <li>▶ improve continuity of care</li> <li>▶ minimize risk at handover</li> </ul>
	<ul style="list-style-type: none"> <li>• I know I receive appropriate care.</li> </ul>	<ul style="list-style-type: none"> <li>▶ promote healthcare rights</li> </ul>
	<ul style="list-style-type: none"> <li>• If something goes wrong, my healthcare team will look after me. I receive an apology and a full explanation of what happened.</li> </ul>	<ul style="list-style-type: none"> <li>▶ if something goes wrong, openly inform and support the patient</li> </ul>
<p><b>Driven by Information</b></p> <ul style="list-style-type: none"> <li>- using up-to-date knowledge and evidence to guide decisions about care</li> <li>- safety and quality data are collected, analyzed, and fed back for improvement</li> <li>- taking action to improve patients' experiences</li> </ul>	<ul style="list-style-type: none"> <li>• My care is based on the best knowledge and evidence.</li> </ul>	<ul style="list-style-type: none"> <li>▶ use agreed guidelines to reduce inappropriate variation in the delivery of care</li> <li>▶ collect and analyze safety and quality data to improve care</li> </ul>
	<ul style="list-style-type: none"> <li>• The outcome of my treatment and my experience are used to help improve care.</li> </ul>	<ul style="list-style-type: none"> <li>▶ learn from patients' and carers' experiences</li> <li>▶ encourage and apply research that will improve safety and quality</li> </ul>
<p><b>Organized for Safety</b></p> <ul style="list-style-type: none"> <li>- this means making safety a central feature of how healthcare facilities are run, how staff work, and how funding is organized</li> </ul>	<ul style="list-style-type: none"> <li>• I know that the healthcare team, managers, and governments all take my safety seriously.</li> </ul>	<ul style="list-style-type: none"> <li>▶ health staff take action for safety</li> <li>▶ health professionals take action for safety</li> <li>▶ managers and clinical leaders take action for safety</li> <li>▶ governments take action for safety</li> </ul>
	<ul style="list-style-type: none"> <li>• The health system is designed to provide safe, high quality care for me, my family, and my carers.</li> </ul>	<ul style="list-style-type: none"> <li>▶ ensure funding models are designed to support safety and quality</li> <li>▶ support, implement, and evaluate e-health</li> <li>▶ design and operate facilities, equipment, and work processes for safety</li> </ul>
	<ul style="list-style-type: none"> <li>• When something goes wrong, actions are taken to prevent it happening to someone else.</li> </ul>	<ul style="list-style-type: none"> <li>▶ take action to prevent or minimize harm from healthcare errors</li> </ul>

Source: Australian Commission on Safety and Quality in Health Care, accessed at October 22, 2014.

## 6. The United States

The US has the most laissez-faire healthcare system of all the countries we analyzed, and provision of healthcare services is mainly centered on private organizations. This type of system has traditionally been considered the least efficient due to the high potential for unnecessary expenditure from profit seeking, and a relatively low level of health outcome against high expenditure due to poor care coordination and segmented or duplicated services offered by competing providers.

In an effort to increase efficiency, the US has been highly interested in improving healthcare quality and outcome. On this note, it appears that the US has a well-established system for reporting healthcare quality assessment to facilitate effective policy intervention. The six domains presented by the IOM (2001a, p. 41) became the basis for creating the conceptual framework for the Korean Healthcare Quality Report.

### The 6 domains of quality care presented by 「Crossing the Quality Chasm」 (IOM, 2001a)

- **Safety:** avoiding injuries to patients from the care that is intended to help them
- **Effectiveness:** providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit
- **Patient-Centeredness:** providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions
- **Timeliness:** reducing waits and sometimes harmful delays for both those who receive and those who give care
- **Efficiency:** avoiding waste, including waste of equipment, supplies, ideas, and energy
- **Equitable:** providing care that does not vary in quality because of personal characteristics, such as gender, ethnicity, geographic location, and socioeconomic status

Source: Institute of Medicine (2001a, p.41); cited in Kang et al. (2013, p.73)

The Agency of Healthcare Research and Quality (AHRQ) publishes the National Healthcare Quality Report and the Disparities Report every year. The reports are each composed of the six quality domains: effectiveness, patient safety, timeliness, patient centeredness, accessibility, efficiency, care coordination, and system infrastructure. The report appears to provide the most value as a basis for policy intervention for quality improvement as it has the most detailed domains of all countries examined. Furthermore, the report deals with equity and value as intersecting issues. For equity, there is a separate report that examines disparities in healthcare quality between subgroups of different demographic characteristics. Regarding value, efforts are being made to continuously expand the measures in the report. Additionally, care coordination and system infrastructure are included as components of healthcare quality (effectiveness, patient safety, timeliness, patient-centeredness, accessibility, and efficiency), which improves system capacity (Figure 2-2).

[Figure 2-2] Conceptual framework of the NHQR

Crosscutting Dimensions	Components of Quality Care	Types of Care		
		Preventive Care	Acute Treatment	Chronic Condition Management
E Q U I T Y	V A L U E	Effectiveness		
		Safety		
		Timeliness		
		Patient/family-centeredness		
		Access		
		Efficiency		
	Care Coordination			
Health Systems infrastructure Capabilities				

Source: IOM (2010, p. 42); cited in Kang et al. (2013, p. 74).

The clinical subdomains included in the effectiveness domain include cancers, cardiovascular diseases, chronic renal diseases, diabetes, HIV/AIDS, maternal and child health, mental health, substance abuse, musculoskeletal diseases, respiratory diseases, lifestyle modification, preservation of function and rehabilitation, provision of support, and palliative care (See Table 2-10).

<Table 2-10> NHQR’s conceptual framework and assessment measures (AHRQ, US)

Domain	Subdomain	Measures	
Effectiveness	Cancers	Prevention	Breast cancer screening (every 2 years, 50-74 years)
		Treatment	Percentage of patients who received axillary node dissection or sentinel lymph node biopsy
			Percentage of patients who received radiation therapy (under 70 years of age)
		Outcomes	Percentage of patients with advanced stage breast cancer (per 100,000 populations, 40 years and older)
			Breast cancer mortality rate (per 100,000 populations)
Effectiveness	Cardiovascular diseases	Prevention	Checking cholesterol level
		Treatment	Percentage of patients who received ACE blockers or prescribed ARB for heart failure
			Outcomes
		Hospital admission rate for congestive heart failure	
	Chronic renal diseases	Management	Percentage of patients who commenced nephrology care before kidney failure
			AVF utilization rate
			Kidney transplant waiting list status
		Outcome	Survival rate of dialysis patients (standardized mortality rate)
	Diabetes	Management	Utilization rate of recommended diabetes treatment
		Outcomes	Hospital admission rate for short-term diabetes complications
			Percentage of late-stage renal disease patients
	HIV/AIDS	Prevention	HIV screening (excluding blood donation)
			Percentage of women who are tested for HIV as part of prenatal care
		Management	Percentage of patients who received recommended HIV treatment
		Outcome	Mortality rate of patients infected with HIV

Domain	Subdomain	Measures	
Maternal and child healthcare	Prevention	Childhood immunization rate (19-35 months) vaccine series immunization rate	
		Percentage of children who had a dental exam	
	Outcome	Percentage of obstetric trauma patients	
		Percentage of patients who visited ER for asthma	
		Percentage of teenagers with untreated decays	
	Adolescent health prevention	Percentage of teenagers who had a check up the previous year	
		Meningitis immunization rate among teenagers	
		Percentage of teenagers (female) who were tested for chlamydia	
	Mental health, drug abuse	Treatment	Depression treatment rate
			Treatment rate for drugs or alcohol abuse problem
			Percentage of patients who completed drug abuse treatment
		Outcome	Suicide mortality rate
Musculoskeletal diseases	Management	Percentage of patients visiting ER due to psychiatric illness or drug abuse	
		Osteoporosis screening for female elderly	
		Arthritis education for adults with arthritis	
Respiratory diseases	Prevention	Counselling about physical activity for adults with arthritis	
		Counselling about weight reduction for overweight and obese adults with arthritis	
	Treatment	Pneumonia immunization rate	
	Outcome	Percentage of patients who received recommended pneumonia treatment	
Effectiveness	Lifestyle	Percentage of patients who completed tuberculosis treatment	
		Management	Percentage of patients who take asthma prevention medication on a daily basis
		Prevention	Percentage of individuals who were recommended to quit smoking
			Percentage of obese adults who were recommended to lose weight
			Percentage of children who were recommended to lose weight
Percentage of obese adults who were recommended a diet change			
Outcome	Percentage of children who were recommended a diet change		
		Percentage of obese adults who do not exercise	



Domain	Subdomain	Measures	
	Functional status preservation and rehabilitation	Outcome	Improvement in mobility among home healthcare patients
			Nursing home residents needing more help with daily activity
		Focus on inpatient rehab facility patients	Mean locomotion score gain among inpatient rehabilitation facility patients
			Mean communication score gain among stroke inpatients in rehab facilities
	Support and palliative care		Percentage of patients who experienced relief in shortness of breath during home healthcare
			Percentage of nursing home residents with pressure sores
			Percentage of hospice patients who did not receive appropriate support for emotional and spiritual needs
			Survey results regarding provision of adequate information to hospice family caregivers when patients pass away
			Survey results regarding provision of care consistent with patients' end-of-life wishes
	Patient safety	Prevention (healthcare-related infections)	Percentage of patients who received appropriate care before a surgical procedure
Percentage of patients who were prescribed antibiotics in a timely manner			
Outcome (healthcare-related infections)		Percentage of post-op sepsis	
		Percentage of blood stream infections	
Outcome (complications)		Ambulatory visit due to adverse effects of medical care	
		Percentage of adverse events due to medical equipment malfunction (central venous catheter)	
		Percentage of post-op troubled breathing	
Outcome (prevention and premature mortality rate)		Mortality rate due to post-op complications	
	Mortality rate among inpatients with a main diagnosis of pneumonia		
Timeliness	Related to accessibility	Percentage of adults who did not receive care in a timely manner	
		Percentage of children who did not receive care in a timely manner	
	Related to wait times in ER	Percentage of patients who had to wait an hour or more during an ER visit	
	Timeliness of cardiac reperfusion for patients with myocardial infarction	Percentage of patients who received percutaneous coronary intervention within 90 minutes	
Percentage of patients who were administered anticoagulants within 30 minutes			

Domain	Subdomain	Measures
Patient-centeredness	Experience of adult patients	Percentage of adults who reported poor communication at the appointment
	Experience of adolescent patients	Percentage of adults who reported poor communication at the appointment
	Patient's hospital experience	Percentage of patients who reported poor communication with nurses/doctors
	Patient/carer involvement in decision making	Percentage of patients and carers who were not included in decision making regarding treatment
Care coordination	Management(handover)	Percentage of heart failure patients who completed discharge guidelines (patient experience)
	Information coordination(handover)	Transfer of patient information and percentage of doctors who are savvy with the process (adults, patient experience)
		Transfer of patient information and percentage of doctors who are savvy with the process (children, patient experience)
	Outcome(readmission to hospital)	Readmission rate due to congestive heart failure
	Management(supply of prescription information)	Percentage of adequate information exchange regarding prescription and treatment
	Structure(supply of prescription information)	Percentage of hospitals that exchange medication information electronically
	Outcome(avoidable ER visits)	Percentage of asthma patients with avoidable ER visit
Efficiency	Inappropriate medication use	Percentage of adults who received inappropriate prescriptions
	Avoidable hospital admission	Percentage of adults with avoidable hospital admission
		Total national costs associated with potentially avoidable hospitalizations
		Percentage of avoidable hospital admission among Medicare home patients
	Perforated appendixes	Percentage of hospitalized appendixes patients with perforated appendixes
	Potentially harmful preventive services with no benefit	Percentage of male elderly persons who received a PSA test or digital colonoscopy
	Trends in hospital efficiency	Average estimated relative hospital cost efficiency index average of relative indexes for hospital inefficiency
Regarding the top 25% and bottom 25%: hospital cost efficiency <ul style="list-style-type: none"> <li>- cost-per patient mix-adjusted admission</li> <li>- full-time equivalent employees per case mix-adjusted admission</li> <li>- average length of stay</li> <li>- operating margin</li> </ul>		

Domain	Subdomain	Measures
System infrastructure	Health information technology	Hospitals' utilization rate of electronic clinical documentation
		Home health and hospice facilities' utilization rates of electronic clinical documentation
	Workforce distribution	Geographical distribution of occupational therapists, physical therapists, speech therapists
		Geographical distribution of primary care, mental healthcare, and dental care professionals
		Characteristics of patients receiving federal healthcare support
Accessibility	Health insurance coverage	Health insurance coverage
	Uninsured patients	Percentage of uninsured patients
	Healthcare cost burden	Percentage of households whose health insurance contribution and auxiliary costs account for 10% or more of total household income
		Usual source of care
	Patient perceptions of need	Percentage of patients with a regular primary care provider
		Percentage of patients who did not receive appropriate and timely treatment when they needed medical/dental care or prescription medicines

Source: AHRQ (2012), NHQR 2011: author compiled.

## 7. Comparison of healthcare quality domains across major countries and international organizations

Common healthcare quality domains used in major countries around the world include “effectiveness,” “patient centeredness,” and “safety.” “Accessibility” is also reflected in healthcare’s effectiveness or included in a separate domain.

Efficiency was included in Sweden and the US as a separate domain, and care coordination was included as a separate domain in the Netherlands and the US. In the cases of the Netherlands and the US where competition

among providers is steep and consumers are free to select providers, reducing unnecessary expenditures is crucial for healthcare efficiency. For this reason, care coordination and cooperation among providers are included as major domains of healthcare quality. Additionally, Canada and the US have set aside system infrastructure and capability as separate domains required for quality improvement. In most countries, equity is included as a quality domain to reduce healthcare disparities and inequality.

〈Table 2-11〉 International comparison of quality assessment domains: international organizations and major countries

WHO	OECD	UK QOF	Sweden	Netherland	Canada	Australia	US NHQR
Effectiveness	Effectiveness	Effectiveness	Effectiveness	Effectiveness	Effectiveness (Appropriateness)	Effectiveness (Appropriateness)	Effectiveness of care
Access		Access	Access		Access		Access to Care Timeliness
Safety	Safety	Safety	Safety	Patient Safety	Safety	Safety	Patient Safety
Efficiency			Efficiency		(Appropriateness)		Efficiency
Acceptability / Patient-centeredness	Patient-centeredness	Patient-centeredness	Patient-centeredness	Responsiveness	Patient-centeredness	Patient Participation	Patient-centeredness
				Care coordination / Cooperation			Care Coordination
					Capacity		Health System Infrastructure
Equity	Equity	Equity	Regional Variation		Equity	Healthcare Variation	Disparity

## Section 3. Selecting a Conceptual Framework and Measures for the KHQR

### 1. Domain matrix and structural relations

Upon comparing the healthcare quality report frameworks of different countries and international organizations, it was found that “effectiveness,” “patient-centeredness,” “safety,” and “accessibility” were commonly included as healthcare quality assessment domains. As for healthcare system’s efficiency or system capacity improvement, a nation’s extent of interest in those areas determined the number and details of the subdomains. Distinguishing between accessibility and timeliness, care coordination, efficiency, system capacity, or infrastructure are the examples. Additionally, most countries address the issue of equity as an intersecting issue.

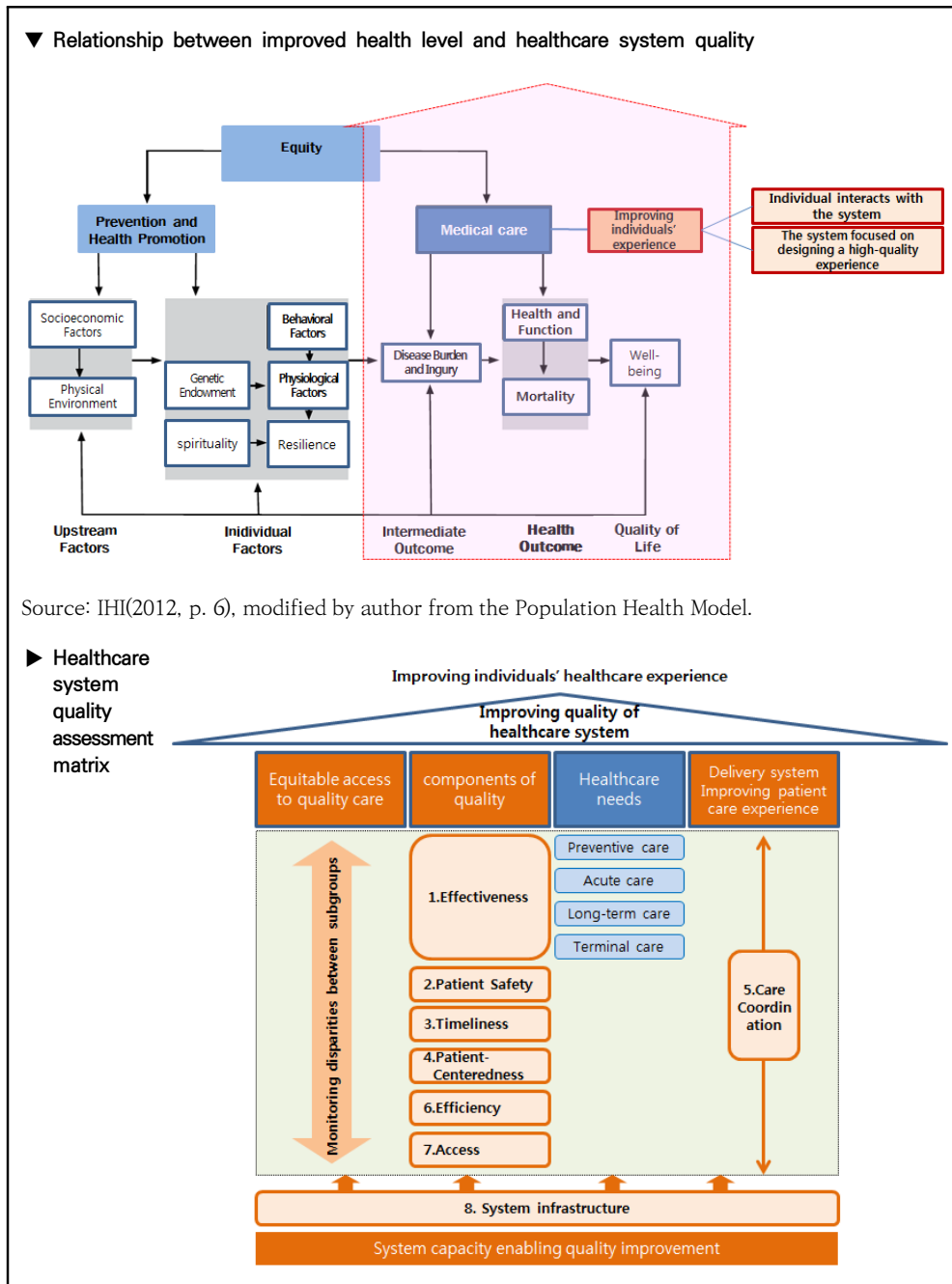
For the Korean Healthcare Quality Report, we wanted to select quality domains that would reflect the following aims: “reconsidering the link between quality assessment and policy” and “identifying trends in healthcare quality improvement and specific problem areas.” This led us to select the NHQR’s framework as it contains all the domains commonly identified during the international framework comparison and the most detailed and specific sub-domains. The framework for the KHQR was designed in an effort to increase the effects of healthcare quality improvement on national health as well as to enhance our healthcare system’s capacity to continue to promote improvement in quality of care.

The conceptual framework focuses on improving individual patients’ healthcare experiences in ultimately promoting improvement in health of the overall population. The Institute for Healthcare Improvement (IHI) has stated, “For measuring the experience of care, two perspectives are con-

sidered: first, the perspective of the individual as he or she interacts with the health care system, and second, the perspective of the health care system focused on designing a high-quality experience for patients as defined by the IOM's six aims for improvement” and suggested that the former is attained by surveying the patients for their healthcare experience and, the latter, by measuring the domains of healthcare quality (IHI 2012, p. 5).

The domains for quality assessment include effectiveness, patient safety, timeliness, patient-centeredness, care coordination, efficiency, accessibility, and system infrastructure. All domains are interconnected, rather than exclusive of others, but not all the connections are equal. Care coordination contributes to increasing the performances of other domains via medical data sharing and care cooperation between providers. Healthcare system infrastructure concerns increase the amount of resources and capacity required to enable all other domains to reach their full capacity (See Figure 2-12). Additionally, trends in equity will also be assessed through variance analysis in order to reduce disparities in healthcare quality domains between subgroups.

[Figure 2-3] Structural relationship and healthcare quality assessment matrix for a national healthcare quality report



〈Table 2-12〉 Healthcare quality components established for the KHQR

Components	Measure details
Effectiveness	Provide science and knowledge-based care to patients who are expected to benefit from it - Prevention, treatment, and outcome review by disease and subgroups
Safety	Deliver care that minimizes risks and harm to patients - Monitor safety within hospitals
Timely	Provide care that minimizes unnecessary delay and wait times that can be harmful for both patients and providers - Review patient perception regarding timely and appropriate provision of time-sensitive care
Patient-Centeredness	Provide care that respects patients' preferences, needs, and values; care that guarantees clinical decisions based on patients' values - Monitor patient-provider communication, patient satisfaction level with patient-provider partnership
Care Coordination	Healthcare system's performance in coordinating care between various providers and services - Monitor readmission rate and the measures pertaining to patient transition within the system
Efficiency	Healthcare system's performance in improving quality of care while keeping costs in check - Monitor the measures that promote waste reduction and provision of quality services
Access	Provide care to all in need regardless of financial status - Monitor the measures pertaining to drop outs in treatment due to financial difficulties
System infrastructure	Create a healthcare environment that promotes appropriate and timely distribution of resources and technology across geography - Monitor structural quality measures, such as healthcare workforce supply, electronic data system
Equitable	Provide equitable care that does not vary based on patients' personal characteristics - Monitor disparity in healthcare accessibility across subgroups based on demographic characteristics, such as geographical locations, socioeconomic status, and so forth.

Source: WHO (2006, pp. 9-10); AHRQ (2013, p. 23); author compiled.

Patients who experience quality care are expected to have good health outcomes, and this will ultimately contribute to improved health for the overall population (IHI 2012, p. 6). Certainly, factors other than healthcare factors also affect a population's health level (upper level factors, personal



factors, etc.). This report seeks to strengthen the structural tie between these factors in policy intervention with which to lead the quality improvement of our healthcare system.

## **2. Selecting clinical measures of healthcare effectiveness**

The major countries we examined had selected the clinical domains with a focus on major causes of deaths and diseases with high burden. For the diseases and services to be included in the KHQR, the subjects of the Quality Assessment of National Health Insurance Benefits and the third Health Plan 2020<sup>4)</sup> were reviewed while focusing on the major chronic diseases to be managed through the healthcare system. High burden diseases among the elderly as well as major diseases defined by the community healthcare plan were added.

HIRA has been assessing the quality of care of the national health insurance benefits regarding relevant care facilities in order to reduce the disparities between facilities and to increase the quality of care provided to a certain level (Kim 2013, p.48). In Korea where a single-payer system prevails, the Quality Assessment of National Health Insurance Benefits can be the basis for determining the priorities of national strategies for improving the adequacy of healthcare services rendered in the clinical domain (Table 2-13).

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4) In accordance with the National Health Promotion Act, the central government has established the Health Plan 2020. The initial HP2020 went into effect in 2002; the second, in 2005; and, the third, in 2010. A mid-to-long-term plan needs to be established with a focus on prevention of chronic diseases, as chronic diseases have become the major causes of deaths in Korea and the need for pertinent health policies and projects have grown over the years (Choi 2010, p.37)

〈Table 2-13〉 Current Quality Assessment of National Health Insurance Benefits (as of 2013)

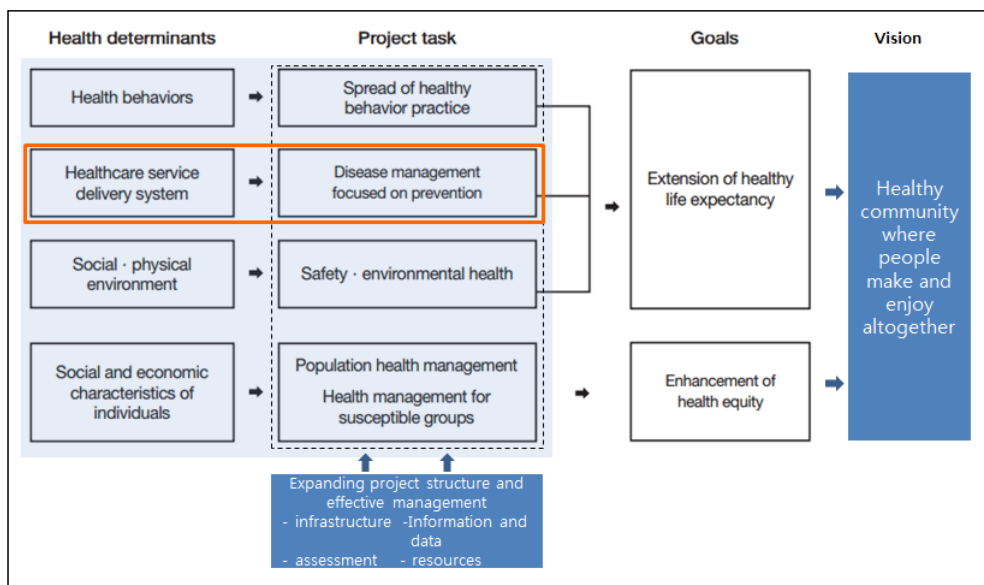
Domains		Adequacy assessment items		Notes (preliminary assessment*)
		Continuous assessment(19)	New assessment(10)	
Hospital admission	Cardiac-cerebro diseases (acute)	- acute myocardial infarction, coronary artery bypass, acute stroke	<ul style="list-style-type: none"> <li>ischemic heart diseases</li> <li>percutaneous coronary intervention</li> </ul>	
	Cancers	- colon cancer, breast cancer	- lung cancer	- gastric cancer, liver cancer
	Major surgery	<ul style="list-style-type: none"> <li>antibiotics for surgical prophylaxis (11 surgeries)</li> <li>C-section</li> <li>procedure volume (5 surgeries)</li> </ul>		
Out-patient care	Chronic diseases	- hypertension, diabetes	- asthma	- COPD
	Appropriate prescribing	<ul style="list-style-type: none"> <li>rate of injections prescription</li> <li>rate of antibiotics prescription</li> <li>number of medicines</li> <li>daily medication cost</li> <li>rate of duplicate prescription for anti-inflammatory to relief osteoarthritis pain and fever</li> <li>antibiotics prescribed to infants and small children for ear infections</li> </ul>		
DRG payment			<ul style="list-style-type: none"> <li>Seven disease groups DRG payment (hospital-clinic level)</li> <li>lens surgeries, tonsils and adenoid surgeries, hernia surgeries, pancreatectomy, rectal surgeries, uterus and miscellaneous uterine surgeries, C-sections</li> </ul>	<ul style="list-style-type: none"> <li>Seven disease groups DRG payment (general hospital and tertiary hospital)</li> <li>new DRG payment</li> </ul>
Institute level		<ul style="list-style-type: none"> <li>long-term care facility</li> <li>Medicaid psychiatry unit</li> <li>hemodialysis</li> </ul>		- general quality measures (tertiary hospital)

\*Note: A preliminary assessment is a test assessment performed to verify validity, efficacy, and feasibility of assessment measures and assessment standards

Source: Kim (2013, p. 51)

Furthermore, in order to achieve of the goals of “increasing healthy life expectancy” and “achieving health equity,” the Health Plan 2020 has selected 31 tasks across six domains (healthy lifestyle, chronic diseases management, infectious diseases management, safe environment, population health care, system management), and included a healthcare service delivery system as a determinant of health (Figure 2-4).

[Figure 2-4] Framework of Health Plan 2020



Source: Kim & Lee (2013, p.208); Ministry of Health and Welfare (2011, p. 10); author modified.

In terms of chronic disease management focusing on prevention; chronic disease management include cancers, health checkup, arthritis, cerebrocardiac diseases, obesity, mental health, and oral health; infectious diseases include immunization, emergency prevention system, hospital acquired infection, tuberculosis management, and AIDS as important subjects of management. Additionally, the Health Plan 2020 incorporates mothers and pregnant women, infants and children, elderly persons, workers/military, school health, multicultural families, health visits for under-

served families, and those with disabilities to be managed separately in special categories (Choi 2010, pp.37-43).

Because it has representative measures for each major task, relevant measures and their target goals were linked and included in the quality domains (Table 2-14).

<Table 2-14> Summary of Health Plan 2020's major quality measures by domains

Domains		Major measures	Measure trend		2020 target
			2008	2009	
1	Smoking cessation	Male adult smoking rate	47.7%	46.9%	29.0%
2	Drinking cessation	Adult high-risk drinking rate	male 28.3% female 8.5%	male 24.6% female 7.3%	male 18.0% female 5.0%
3	Physical activity	Percentage of adults engaging in regular moderate-intensity physical activity (excluding walking)	14.5%	13.4%	20.0%
4	Nutrition	Percentage of adults on a healthy diet (percentage of population that meets the requirements for a minimum of 2 of the 4 measures: fat, sodium, fruit/vegetables)	28.9%	-	35.0%
5	Cancer management	National cancer screening participation rate	50.7%	53.3%	80.0%
6	Health check up	National health check up participation rate	65.3%	65.8%	80.0%
7	Cerebrocardiac diseases	Hypertension prevalence rate (30 yrs and older)	26.9%	30.3%	23.0%
8	Obesity	Obesity prevalence rate	male 35.3% female 25.2%	male 35.8% female 26.0%	male ≤35.0% female ≤25.0%
9	Mental health	Reduction in suicide mortality (per 100,000 population)	26 ppl	31 ppl	18 ppl
10	Oral health	Children and teenagers: dental caries rate (permanent teeth)	61.1% ('06)	60.5% ('10)	45.0%
11	Immunizations	Infants/small children: required immunization rate	59.5%	-	95.0%
12	Tuberculosis	Incidence rate of smear positive tuberculosis (per 100,000 population)	22.7 ppl	23.2 ppl	10 ppl
13	Injury prevention	Traffic accident mortality rate (per 100,000 population)	16.1 ppl('06)	-	7 ppl

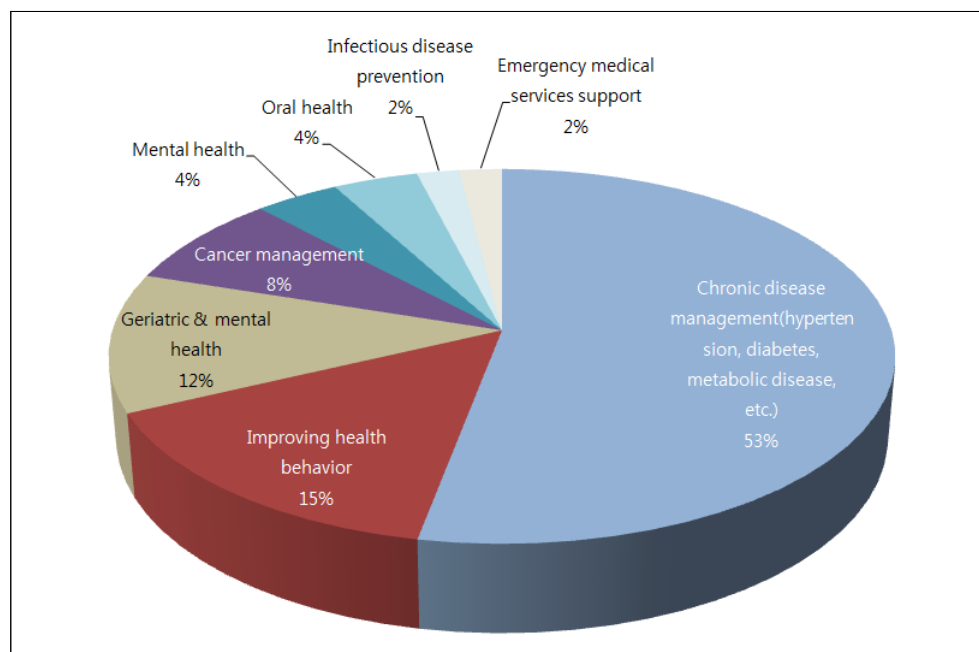
	Domains	Major measures	Measure trend		2020 target
			2008	2009	
14	Maternal health	Maternal mortality rate (per 100,000 births)	12 ppl	-	9 ppl
15	Infant/small children health	Infant mortality rate (per 1,000 births)	3.4 ppl	-	2.8 ppl
16	Elderly health	Geriatric functional assessment -activities of daily living (ADL) disability rate	11.4%	-	11.4%

Source: Ministry of Health and Welfare (2011, p. 15)

In terms of disease burden on the elderly, the study by Lee and Kwon (2008, p. 10) identified that hypertension accounted for the most (per 1,000 elderly population) (35%), followed by arthritis (25%), cancers (21%), diabetes (8%), and chronic bronchitis (5%), with the top three (hypertension, arthritis, cancers) accounting for 80% of the disease burden among the elderly.

According to Section 3 of the Community Health Act, the heads of the district offices (mayors, local governors, district heads, etc.) are responsible for establishing the community health plans to submit to Seoul’s city mayor, metropolitan city mayors, or governors, who will subsequently run it through the city/province councils to submit to the Ministry of Health and Welfare. Upon examining the 26 high-performing areas selected by the Fifth Community Health Plan (2011-2014), chronic disease management (diabetes, hypertension, metabolic diseases, etc.) appeared most frequently in their plans, followed by improving health behavior, geriatric health, mental health, cancer management, oral health, and infectious disease prevention.

[Figure 2-5] Focus task frequency distribution: 26 high performing local governments selected by the Community Healthcare Plan



Source: author compiled based on the Ministry of Health and Welfare's (2011a) focus task by local government

Diseases and services included in the healthcare effectiveness domains for many international organizations and major countries are displayed in <Table 2-15>. The diseases and services included in the effectiveness domain vary slightly by country depending on the major causes of deaths in the country as well as points of national interest.

Most countries we examined included cancers, psychiatric diseases, cardiovascular diseases, as well as improvement in acute treatment and management of chronic diseases, long-term care, and palliative care (end-of-life treatment). The US and the Netherlands organized health behaviors for disease risk management or lifestyle modifications into a separate prevention domain.

<Table 2-15> International comparison of effectiveness domain: diseases and services measured by international organizations and major countries

OECD	UK	Sweden	Netherlands	Canada	Australia	US
immunizations	immunizations		Prevention immunizations health behavior	Prevention/ promote health		lifestyle modification
AMI	cardiovascular diseases	cardiac diseases	Treatment AMI	Treatment cardiac diseases vascular diseases	health variation: major surgeries	cardiovascular diseases
asthma	respiratory diseases			respiratory diseases		respiratory diseases
COPD						
diabetes		diabetes		diabetes		diabetes
strokes		strokes	cerebral infarction	strokes	strokes	
	liver diseases					
		renal diseases				chronic renal diseases
cancers breast cancers cervical cancers colon cancers	cancers breast cancers lung cancers colon cancers	cancers breast cancers lung cancers colon cancers rectal cancers prostate cancers	cancers breast cancers lung cancers colon cancers	cancers breast cancers lung cancers colon cancers		cancers breast cancers colon cancers
psychiatric diseases	psychiatric diseases	psychiatric diseases	psychiatric diseases	psychiatric diseases	psychiatric diseases	psychiatric diseases/substance abuse
	dementia				intellectual disability	
		musculoskeletal	hip joint		hip surgery variation	musculoskeletal diseases
		delivery/obstetrics	child delivery			maternal and child health
drug therapy		drug therapy				
		HIV	HIV			HIV/AIDS
	long-term care		long-term care			functional status preservation and rehabilitation
		palliative care	palliative care		palliative care (advance care plan)	support and palliative care
				appropriateness		

Note: cancer screening is included in the cancers domain.

For the KHQR, diseases managed by the Health Plan 2020 and HIRA, high burden diseases for the elderly, and high-frequency diseases identified by the Fifth Community Health Plan's 26 high-performing areas were included. Furthermore, the diseases and services (palliative care) that garner attention and interest in other major countries were also included even if they are not recognized by the above (Table 2-16).

The US, which has the most detailed quality domains, also includes all the diseases and services selected for the Korean report.

〈Table 2-16〉 International comparison of clinical and services domains for healthcare effectiveness assessment

Domain	High frequency diseases in major countries	US NHQR	Quality Assessment of National Health Insurance Benefits (HIRA)	Health Plan 2020			Lee & Kwon (2008) High burden diseases for the elderly	Diseases managed by the community healthcare plans of 26 high-performing areas	KHQR clinical domain
				Spreading of healthy lifestyle	Chronic degenerative diseases /disease risk management	Infectious disease management			
Clinical domain	cancers	cancers	colon cancers, breast cancers, lung cancers, gastric cancers, liver cancers		cancers		cancers	cancers	cancers
	cardiovascular	cardiovascular	AMI, coronary artery bypass, ischemic heart diseases, hypertension		hypertension, cardiac diseases		hypertension	hypertension	cardiovascular diseases
	strokes		acute strokes		cerebrovascular diseases				cerebrovascular diseases
	respiratory diseases	respiratory diseases	asthma, COPD				chronic bronchitis		respiratory diseases



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Domain	High frequency diseases in major countries	US NHQR	Quality Assessment of National Health Insurance Benefits (HIRA)	Health Plan 2020			Lee & Kwon (2008) High burden diseases for the elderly	Diseases managed by the community healthcare plans of 26 high-performing areas	KHQR clinical domain
				Spreading of healthy lifestyle	Chronic degenerative diseases /disease risk management	Infectious disease management			
		chronic renal diseases	hemodialysis						chronic renal diseases
	diabetes	diabetes	diabetes		diabetes		diabetes	diabetes	diabetes
		HIV&AIDS				AIDS /tuberculosis		prevention of infectious diseases	infectious diseases
	immunizations	maternal and child health			oral health	immunization		maternal and child health oral health	maternal and child health
	mental health	mental health and substance abuse	Medicaid psychiatric care		mental health			mental health	mental health
	musculoskeletal	musculoskeletal			arthritis		arthritis		musculoskeletal diseases
Services domain	prevention/health behaviors	lifestyle modification (smoking, nutrition, obesity, physical activity)		smoking, nutrition, alcohol use, physical activity	obesity			health behavior improvement	lifestyle modification
	long-term care	Functional status preservation and rehabilitation (rehab facilities)	long-term care centers		geriatric care			geriatric health	subacute care and long-term care
	palliative care	support/palliative care (hospice)							palliative care

### 3. Components of the Korean Healthcare Quality Report

The KHQR to be published will include the components displayed in the table below to continuously track and monitor the Korean healthcare system's quality and performance.

<Table 2-17> Components of healthcare quality improvement tracked by the KHQR

	Clinical domain		Measure types				Equity
			Prevention	Treatment	Management	Outcome	
1. Effectiveness of Care	Diseases	cancers	Analyze national trends by domain and type, and compare them against international trends				(subgroup disparity) If applicable, present level of disparity between subgroups by characteristics
		cardiovascular diseases					
		strokes					
		respiratory diseases					
		chronic renal diseases					
		diabetes					
		HIV/AIDS					
		maternal and child health					
		mental health					
	musculoskeletal diseases						
	Services	lifestyle modification					
subacute care and long-term care							
palliative care							
2. Patient Safety							
3. Timeliness							
4. Patient Centeredness							
5. Care Coordination							
6. Efficiency							
7. Access to Care							
8. System Infrastructure							

#### **4. Selecting the detail measures by quality domains**

The US measures that are not appropriate for the current state of Korean healthcare were excluded.

The measures that are meaningful, yet unavailable in Korea, were marked “not measured” but their details were presented.

Where similar measures were published, or similar measures can be calculated using available data sources, we modified the corresponding measures to include them in the report.

In 2009, the NECA suggested the “National Healthcare Quality Indicators” by incorporating the results of a clinical expert Delphi survey and indicators of national interest (Jeong et al. 2009, p. 5). If candidate indicators from the NECA research were calculable, they were included in the initial indicator set. The final set of indicators are displayed in the following table.

〈Table 2-18〉 Effectiveness measures

Do mai n	Type	US NHQR measures	Korean measures	Note
Bre ast can cer	Preven- tion	Breast cancer screening rate (50-74 yrs)	Breast cancer screening recommendation compliance rate (40-74 yrs)	modif ied
	Treat- ment	Percentage of I-IIb stage auxiliary lymph node resections or sentinel lymph node biopsy breast cancer		n.m.
		Percentage of patients who received radiation therapy after a lumpectomy breast cancer (younger than 70 yrs)		n.m.
	Outcome	Percentage of patients with advanced breast cancer	Advanced breast cancer incidence rate	modified
			Five-year relative survival rate	added NECA
		Breast cancer mortality rate (per 100,000 population)	Breast cancer mortality rate (per 100,000 female population)	similar
Col on can cer	Preven- tion	Colon cancer screening rate	Colon cancer screening recommendation compliance rate (50-74 yrs)	similar
	Treat- ment	Percentage of patients who had a colectomy, including a minimum of 12 lymph nodes		n.m.
	Outcome	Percentage of patients with advanced colon cancer (% per 100,000 population, 50 yrs and older)	Advanced colon cancer incidence rate (per 100,000 population, 50 yrs and older)	modif ied
			Five-year relative survival rate	added NECA
		Colon cancer mortality rate (per 100,000 population)	Colon cancer mortality rate (per 100,000 population)	similar
	Gas tric can cer	Preven- tion		Gastric cancer screening recommendation compliance rate
Outcome			Advanced gastric cancer incidence rate	added
			Five-year relative survival rate	added NECA
			Gastric cancer mortality rate (per 100,000 population)	added
liver can cer	Preven- tion		Liver cancer screening recommendation compliance rate	added
	Outcome		Advance liver cancer incidence rate	added

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Domain	Type	US NHQR measures	Korean measures	Note
			Five-year relative survival rate	added NECA
			Liver cancer mortality rate (per 100,000 population)	added
Cervical cancers	Prevention	cervical cancer screening rate	Cervical cancer screening recommendation compliance rate (30-74 yrs)	modified
	Outcome		Advanced cervical cancer incidence rate	added
				Five-year relative survival rate
			Cervical cancer mortality rate (per 100,000 female population)	added
Cancers summary	Prevention		Five major cancers screening recommendation compliance rate	added NECA
	Outcomes		Advanced five major cancers incidence rate	
				All cancers five-year relative survival rates
			All cancers mortality rates	
Cardiovascular diseases	Prevention	Percentage of adults who had their cholesterol level measured within the past 5 yrs	Primary health check-up compliance rate	modified
		Percentage of adults who had their blood pressure measured within the past 2 yrs (18-64 yrs)		
	Management	Percentage of patients being managed for hypertension (% , 18 yrs and older)	Percentage of patients being managed for hypertension (% , 18 yrs and older)	modified
	Treatment	Percentage of patients who were prescribed ACE receptor blocker or ARB for heart failure	Percentage of patients on thrombolytic agent for acute myocardial infarction (%)	modified
	Outcome	Hospital admission rate for congestive heart failure (per 100,000 population, 18 yrs and older)	Hospital admission rate for congestive heart failure (per 100,000 population, 15 yrs and older)	modified
Hospital mortality rate for acute myocardial infarction		Thirty-day hospital mortality rate in patients with acute myocardial infarction (18 yrs and older)	modified	
Strokes	Outcome		Thirty-day hospital mortality rate in hemorrhagic stroke patients who died in the hospital of initial admission (hospital admission level)	added

Domain	Type	US NHQR measures	Korean measures	Note
			Thirty-day hospital mortality rate in ischemic stroke patients who died in the hospital of initial admission (hospital admission level)	added NECA
Respiratory diseases	Prevention	Influenza immunization rate (within the previous year, 65 years and older, geographical deviation)	Influenza immunization rate in elderly 65 years and older (%)	
		pneumococcal vaccine immunization rate(lifetime immunization rate, 65 yrs and older)	pneumococcal vaccine immunization rate (lifetime immunization rate, 65 yrs and older)	similar
	Treatment	Percentage of hospitalized patients who received recommended treatment for pneumonia		n.m. (TBA)
	Outcome	Percentage of pneumonia patients who completed effective curative treatment within a year of treatment	Percentage of patients who completed tuberculosis treatment within 6 months	n.m. NECA
	Management	Percentage of patients who take asthma prevention medication on an (almost) daily basis	Percentage of asthma patients who regularly take asthma medication (2005)	similar
		Percentage of patients who received (written asthma management plan) from healthcare provider		excluded
Chronic Renal diseases	Management	Percentage of ESRD patients who received specialized treatment before dialysis(18 yrs and older)		n.m.
		Percentage of arterial fistulas during the initial outpatient dialysis	Arterial fistula stenosis monitoring (%)	replaced
		percentage of patients on kidney transplant waiting list (%)	Patients waiting for kidney transplant (%)	replaced
	Outcome	Dialysis patients mortality rate (%)	dialysis patients mortality rate (% per 100,000 population)	replaced
Diabetes	Management	Diabetes management recommendations compliance rate (% , 40 yrs and older)	diabetes literacy test compliance rate	replaced
	Outcome	Hospital admission rate for short term complications (% , per 100,000 population, 18 yrs and older)	Hospital admission rate for short term complications(cases per 100,000 population)	replaced

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Domain	Type	US NHQR measures	Korean measures	Note
		Percentage of patients with hemoglobin A1c and blood pressure management (40 yrs and older)		n.m.
		Hospital admission rate for unmanageable diabetes (% per 100,000 population)	Hospital admission rate for unmanageable diabetes (% per 100,000 population)	replaced
		Diabetes related ESRD incidence rate (per 1 million population)		n.m.
HIV & AIDS	Prevention	Percentage of population who have had an HIV test (excluding blood donation, 15-44 yrs)		n.m.
	Management	Percentage of patients who were recommended HIV treatment		n.m.
		Percentage of women who had an HIV test as part of prenatal care (15-44 yrs)		n.m.
	Outcome	Number of new AIDS patients (per 100,000 population), 13 yrs and older	Number of new AIDS patients (per 100,000 populations), 15 yrs and older	modified
HIV mortality rate (per 100,000 populations)		HIV patients mortality rate (ppl, per 100,000 population)	similar	
Maternal and child health	Prevention	Prenatal screening rate (by region)		n.m.
		Small children (19-35 months) vaccine series (4:3:1:3:3:1:4) immunization rate	Infant and small children (19-35 months) vaccine series (4:3:1:3:3:1:4) immunization rate (%)	similar
			Percentage of small children (19-35 months) who completed all recommended vaccines (%)	added
		Percentage of children who had a vision test (within the previous year, 3-6 yrs)	Percentage of children who had a vision test (4-60 months) (%)	modified
		Percentage of children visiting healthcare facility for disease prevention (within the previous year, 10-17 yrs)		excluded
		Percentage of children who received a minimum of 1 dose of meningococcal vaccine (13-15 yrs)		n.m.
		Percentage of children who had a dental visit (within the previous year, 2-17 yrs)	Percentage of children who had a dental check up (within the previous year, 2-17 yrs) (%)	similar

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Do main	Type	US NHQR measures	Korean measures	Note	
		Percentage of teenagers (female) who were screened for Chlamydia		n.m.	
			Incident rates of diseases that could have been prevented through vaccination (per 100,000 population)	added NECA	
	Outcome	Percentage of children visiting ER due to asthma (2-19 yrs, per 10,000 population)	Percentage of children visiting ER due to asthma (1-19 yrs, per 10,000 population)		modif ied
		Percentage of teenagers with untreated dental caries (13-17 yrs)	Percentage of children with dental caries; permanent teeth (13-17 yrs) (%)		
			Percentage of infants who died within the first year of life (per 1,000 live births)		added NECA
			Percentage of infants who died within 4 weeks from birth (per 1,000 live births)		added NECA
Me ntal health, substance abuse	treat- ment	Depression treatment rate (% , 18 yrs and older)	Depression treatment rate (% , 18 yrs and older)	modif ied	
			Depression treatment rate (% , 12-17 yrs)	added	
		Percentage of treatment due to drugs and alcohol abuse	Percentage of treatment due to drug abuse (%)	modif ied	
			Percentage of counselling due to alcohol abuse (% , 18 yrs and older)	modif ied	
		Percentage of patients who completed substance abuse treatment (12 yrs and older)		n.m.	
	outcome	Suicide rate (per 100,000 population)	Suicide rate (ppl, per 100,000 population)	modif ied	
		Percentage of patients who visited ER due to neuropsychiatric problems (% , per 100,000 population)	Percentage of patients who visited ER due to neuropsychiatric problems (% , per 100,000 population)	repla ced	
	Mu scu los kel etal dis eas es	Preven- tion	Percentage of female elderly who were screened for osteoporosis	Percentage of adults who had a life transitional period primary health check up (%): bone density test included in national health insurance corporation's life transitional period health check up items(female 66 yrs and older)	repla ced
manage ment		Percentage of arthritis patients who received arthritis education		n.m.	



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Domain	Type	US NHQR measures	Korean measures	Note
		Percentage of arthritis patients who have been Advised by healthcare providers to engage in regular physical activity		n.m.
		Percentage of overweight arthritis patients who have been advised by healthcare providers to lose weight		n.m.
Life style modification	prevention	Percentage of current smoking adults who have been advised by healthcare providers to quit smoking	Percentage of current smoking adults who have been advised by healthcare providers to quit smoking	similar
		Percentage of obese adults who have been told by healthcare providers they were overweight (20 yrs and older )		n.m.
		Percentage of children and teenagers who have been told by healthcare providers they were obese (2-19 yrs)		n.m.
		Percentage of obese adults who have been advised by healthcare providers to increase the amount of physical activity		n.m.
		Percentage of children who have been advised by healthcare providers to exercise within the past 2 years (2-17 yrs)		n.m.
		Percentage of obese adults who have been advised by healthcare providers to decrease consumption of high fat, high cholesterol food items		n.m.
		Percentage of children who have been advised by healthcare providers about healthy eating (2-17 yrs)	Percentage of children who received nutrition education and counselling (6-17 yrs) /"have you received nutrition education at healthcare center, district office, town office, welfare facility, school, and clinic during the last year?" (elementary school students and older)	modified
		outcome	Percentage of obese adults who do not engage in moderate or intense physical activity (a minimum of 30 mins per session, three times per week)	Percentage of obese adults (BMI 25 and over) who engage in moderate-to-intense physical activity (weight applied if within the previous week, a minimum of 10 mins daily, three times weekly or more)

Domain	Type	US NHQR measures	Korean measures	Note
Subacute care/long-term care	outcome	Percentage of home healthcare patients with improved mobility		n.m.
		Increase in percentage of nursing home residents who require help with ADL		n.m.
	inpatient rehabilitation facility patients	Trends in FMI scores among inpatient rehabilitation facility patients at admission and discharge (size of gains)		n.m.
		Mean locomotion score of stroke patients in inpatient rehabilitation facility		n.m.
		Mean communication score of stroke patients in inpatient rehabilitation facility		n.m.
Palliative care	Palliative care outcome	Percentage of patients who experienced relief for troubled breathing during home healthcare episode		n.m.
		Percentage of care facility residents (long/short term) with pressure sores		n.m.
	emotional support management	Percentage of hospice patients who did not receive appropriate emotional and spiritual support for sadness and anxiety (18 yrs and older)		n.m.
	communication management	Sufficiency of information provided to carers of end-of-life hospice patients 18 yrs and older		n.m.
	quality palliative care management	Percentage of hospice patients 18 yrs and older who did not receive treatment congruent with end-of-life wishes		n.m.
	outcome		Satisfaction level with hospice palliative care	

\*n.m.: not measured

<Table 2-19> Patient safety measures

Domain	Type	US NHQR measures	Korean measures	Note	
Health care infection	Prevention	Percentage of appropriate medical care to surgery patients		n.m.	
		Percentage of surgery patients who were administered preventive antibiotics in a timely manner: prophylactic antibiotics initiated within one hour before surgical incision (%)	Prophylactic antibiotics initiated within one hour before surgical incision (%)	similar	
		Prophylactic antibiotics terminated within 24 hours following surgery		n.m.	
	Outcome	Percentage of postoperative sepsis following elective surgery (per 1,000 discharges)	Incidence rate of post operative sepsis (per 100 discharges)		replaced
		Percentage of patients (adults) with catheter-associated urinary tract infections following operation	Urinary tract infection among ICU patients (%)		replaced
		Percentage of inpatients with central line-associated blood stream infections (minimum of 2 days of hospital stay, per 1,000 discharges)	ICU patients with central line blood stream infections (%)		replaced
		(Geographical disparity) C-line-associated blood stream infections standardization rate			n.m.
		Percentage of C-line blood stream infection in NICU (per 1,000 central line days)			n.m.
			ICU patients with pneumonia associated with ventilators (Ventilator-associated PNEU rate) (%)		added
	Adverse events	(outcome)	Percentage of adverse events associated with central venous catheter placement (allergic reaction to catheter, perforation, pneumothorax, air embolism, hematoma, misplacement, bleeding, etc.)		n.m.
Percentage of obstetric trauma with third- or fourth-degree tear 3 (per 1,000 vaginal deliveries)			Percentage of obstetric trauma with third- or fourth-degree tear 3 (per 1,000 vaginal deliveries)	replaced	
Distribution of HAC following hospital admission, national total HAC rate (per 1,000 hospital admissions)				n.m.	

Domain	Type	US NHQR measures	Korean measures	Note
Patient safety culture		Hospital staff survey outcome; patient safety culture (by individual item, % positive response)		n.m.
		Hospital staff survey outcome; patient safety culture (by individual item, % positive response): regional average score (% positive response)		n.m.

\*n.m.: not measured

〈Table 2-20〉 Timeliness measures

Domain	US NHQR measures	Korean measures	Note
Timeliness of treatment	Percentage of adult patients who did not receive timely treatment for injuries and diseases during the previous 12 months (18 yrs and older)		n.m.
	Percentage of children patients who did not receive timely treatment for injuries and diseases during the previous 12 months		n.m.
Emergency care accessibility	Percentage of patients who had to wait an hour or more during ER visits (level of urgency: immediate/emergent, urgent)	Percentage of patients who had to wait 50 mins or more during ER visits	replaced
Cardiac reperfusion for acute myocardial infarction patients	Percentage of patients who received PCI within 90 minutes of hospital arrival (%)	Percentage of myocardial infarction patients who received percutaneous coronary intervention within Ninety minutes of hospital arrival (%; for 2009, 2008: within 120 mins)	similar
	Percentage of myocardial infarction patients who received fibrinolytic medication within 30 mins (%)	Percentage of myocardial infarction patients who were administered thrombolytic agents within 30 mins (for 2009, 2008: within 60 mins)	similar
		Central value; from the point of initial chest pain to the point of arrival at hospital arrival	added
Strokes patients		Central value (min); from the point of initial stroke symptoms to the point of arrival at ER	added
		Percentage of considering intravenous thrombolytic agent (t-PA)	added

\*n.m.: not measured

<Table 2-21> Patient centeredness measures

Domain	US NHQR measures	Korean measures	Note
Patient experience of appointment (adult)	(Clinic) percentage of patients who experienced poor communication with healthcare provider during examination (overall measures)	Percentage of patients who responded “not so much” to the question, “Did your healthcare provider listen to you carefully, provided sufficient and understandable information while being punctual and respectful?”	replaced
Patient experience of appointment (children)	(Clinic) percentage of patients who experienced poor communication with healthcare provider during examination within the previous 12 months (overall measures)		n.m.
	Regional disparity: percentage of parents who experienced poor communication with healthcare providers		n.m.
Patient experience of appointment (hospital)	Percentage of patients (adults) who experienced poor communication with doctors or nurses		n.m.
Patients’ and carers’ involvement in decision making process	Percentage of patients with regular healthcare providers who reported that they are not asked by the providers for an input in treatment decisions		

\*n.m.: not measured

<Table 2-22> Care coordination measures

Domain	US NHQR measures	Korean measures	Note
Transitions of care	Percentage of heart failure patients who were provided with complete discharge information		n.m.
	Percentage of providers exchanging and learning patient information (adults)		n.m.
	Percentage of providers exchanging and learning patient information (children)		n.m.
		Hospital transfer rate upon referral (%)	added
Hospital readmission	Hospital readmission rate due to congestive heart failure (by region)	Patients readmitted due to recurrence or complications (%)	replaced

Domain	US NHQR measures	Korean measures	Note
Exchange of prescription information	Percentage of patients with a usual source of care who reported that healthcare providers continuously check details of treatment and prescription received from other providers		n.m.
	Percentage of hospitals that exchange medication information electronically		n.m.
Preventable ER visits	Percentage of asthma patients with preventable ER visits (per 100,000 population)	Percentage patients visiting ER due to asthma (per 100,000 population)	replaced
(Children with healthcare needs) management	Percentage of children in need of special healthcare who receive effective coordination of care (17 yrs and younger)		n.m.
	Percentage of children not residing in hospitals/clinics or care facilities who are in need of special healthcare		n.m.

\*n.m.: not measured

<Table 2-23> Efficiency measures

Domain	US NHQR measures	Korean measures	Note
Inappropriate use of medication	Percentage of elderly patients who were prescribed inappropriate medications (a minimum of 1 out of 11 prohibit medications for elderly)	Unnecessary medications (duplicates/total)	added
		Unnecessary medications (65 yrs and older)	replaced
	Percentage of adults who were prescribed inappropriate medications (a minimum of 1 out of 33 inappropriate medications)	Elderly patients prescribed cautionary medications (65 yrs and older) (%)	replaced
Preventable hospital admission	Percentage of adults with preventable hospital admission per 100,000 population	Adults with preventable hospital admission per 100,000 population (%)	modified
		Adults admitted for asthma (per 100,000 population) (%)	modified
		Adults admitted for chronic closed lung diseases (per 100,000 population) (%)	modified
		Adults admitted for diabetes (per 100,000 population) (%)	modified
	Total national costs associated with preventable Hospital admissions		n.m.
	Skilled nursing facilities patients with potentially avoidable hospitalizations within 30 days of who were readmitted within 30 days of start of care		n.m.

Domain	US NHQR measures	Korean measures	Note
	Medicare home health patients with potentially avoidable hospitalizations within 30 days of start of care		n.m.
Preventable ER visits	Percentage of adults with preventable ER visits (per 100,000 population)	Adults with preventable hospital admission (per 100,000 population) (%)	replaced
	Percentage of ER visits due to psychiatric diseases or substance abuse (per 100,000 population)	Patients visiting ER for addiction symptoms (per 100,000 population) (%)	replaced
	Percentage of ER visits due to periodontal diseases (per 100,000 population)	ER visits due to periodontal diseases (per 100,000 population) (%)	replaced
perforated appendixes	Percentage of appendicitis patients who were admitted due to perforated appendix (per 1,000 appendicitis)	Appendicitis patients who were admitted due to perforated appendix (per 1,000 appendicitis patients) (%)	replaced
Potentially harmful preventive services with no benefit	Percentage of elderly males who had PSA test or digital colonoscopy (75 yrs and older)		excluded
Trends in hospital efficiency	Average estimated relative hospital cost efficiency index for mix-adjusted admissions		n.m.
		Average length of stay	added

\*n.m.: not measured

<Table 2-24> Access to healthcare measures

Domain	US NHQR measures	Korean measures	Note
Healthcare coverage population	Percentage of population with health insurance coverage (65 yrs and younger)	Population with healthcare coverage (%)	excluded
	Percentage of uninsured population (65 yrs and younger)		excluded
Healthcare coverage rate		Health insurance coverage (%)	added
		Non-payment out-of-pocket expenses (%)	added
		Health insurance coverage for 4 major diseases (%)	added
		Public funding in national healthcare costs (%)	added

Domain	US NHQR measures	Korean measures	Note
Healthcare burden	Percentage of households with health insurance premium and healthcare associated costs accounting for 10% or more of total household Income (65 yrs or younger)	Households with a total healthcare cost (direct cost) accounting for 10% or more of total household income (%)	replaced
		Household members with a total healthcare cost (direct cost) accounting for 10% or more of total household income (total) (%)	replaced
		Household members with a total healthcare cost (direct cost) accounting for 10% or more of total household income (younger than 65 yrs) (%)	replaced
		Household members with a total healthcare cost (direct cost) accounting for 10% or more of total household income (65 yrs and older) (%)	replaced
		Out-of pocket medical expenses (against total national healthcare cost) (%)	added
Percentage of patients with usual source of care	Percentage of patients with specific source of on going care	Households with usual source of care (%)	replaced
	Percentage of patients with a regular primary care provider (total population)		excluded
Patient perception of need	Percentage of patients who did not receive timely Medical care, dental treatment, prescription when they needed it (include children and adults)	Patients who could not visit a clinic when they wanted to during the previous year (%)	replaced

〈Table 2-25〉 System infrastructure measures

Domain	US NHQR measures	Korean measures	Note
Medical technology related	Percentage of hospitals with electronic health records (based on 3,131 healthcare organizations)	Healthcare centers adopting PACS, OCS, EMR (%)	replaced
		Healthcare centers adopting EMR (%)	replaced
		Healthcare centers (hospital level or higher) adopting PACS (%)	replaced
		Healthcare centers (hospital level or higher) adopting OCS (%)	replaced
	Percentage of home health and hospice agencies with electronic health records		excluded



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Domain	US NHQR measures	Korean measures	Note
Distribution of healthcare personnel	Physicians (family practitioners, infectious disease clinicians, pediatricians, obstetricians) regional distribution	Number of family practitioners per 100,000 population	replaced
		Family practitioners in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
		Number of physicians per 100,000 population	replaced
		Physicians in the region (per 100,000 population) CV (based on 16 cities and provinces)	replaced
		Number of pediatricians per 100,000 population	replaced
		Pediatricians in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
		Number of obstetricians per 100,000 population	replaced
		Obstetricians in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
	Distribution of primary care physicians, psychiatrists, and dentists in regions with a healthcare supply shortage	Number of psychiatrists per 100,000 population	replaced
		Psychiatrists in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
		Number of dentists per 100,000 population	replaced
		Dentists in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
	Percentage of (trauma center) utilization	Number of surgeons per 100,000 population	replaced
		Surgeons in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
Number of orthopedic doctors per 100,000 population		replaced	
Orthopedic doctors in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)		replaced	

Domain	US NHQR measures	Korean measures	Note
		Number of neurosurgeons per 100,000 population	replaced
		Neurosurgeons in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
		Number of thoracic doctors per 100,000 population	replaced
		Thoracic doctors in the region (per 100,000 population) CV (based on 16 cities and provinces) (%)	replaced
Healthcare safety net	Characteristics of (HSHC) patients (by gender, age, insurance type)		excluded
	Percentage of HSHC patients with controlled hypertension or diabetes	Patients with controlled hypertension from underserved households (qualifying for personalized health visit and management project) (%)	replaced
		Patients with controlled diabetes from underserved households (qualifying for personalized health visit and management project) (%)	replaced
Facility distribution		Female population of child-bearing age residing in underserved regions (%)	added
		Population residing in underserved regions with emergency care shortage (%)	added
		Distribution of delivery rooms (per 100,000 population)	added

# 3

## Future Recommendations for the KHQR

Section 1. Future Recommendations for the National  
Healthcare Quality Report



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# 3

## Future Recommendations << for the KHQR

### Section 1. Future Recommendations for the National Healthcare Quality Report

#### 1. Cultivate data sources and expand measures for a more balanced assessment

Currently, a great number of indicators are distributed across the domain of effectiveness. Efforts are needed to develop data sources and expand the number of measures to achieve a more balanced framework of assessment.

Based on a conservative interpretation, we identified that 46% of the NHQR measures (published by the AHRQ, US) were measurable in Korea. Conversely, a 50% measurability was identified for the indicators in the domain of effectiveness, which appears to be due to the trends in healthcare improvement in Korea led by clinical effectiveness.

Measurable indicators or available data sources for musculoskeletal diseases, long-term care, and palliative care can be found even in the clinical domain. Considering the increasing trends in chronic degenerative diseases and geriatric healthcare costs, policy interest and indicator development to track and monitor progress in healthcare quality appears to be critical.

In the US framework as well, the effectiveness domain occupies a significant portion. This is because the system presents a great number of diseases and services with a wider scope, increasing the number of measures. Continuous evaluation and updating will be needed to ensure

that the measures are accurately representing the quality of care across the corresponding domains and areas.

In this report, measures selected based on the NHQR (of the AHRQ), which are difficult to measure in Korea, were replaced with similar measures that can be calculated based on available data. Additionally, measures suggested in previous studies and expert consultation were added to corresponding domains. However, measures are still lacking in the domains of “long-term care” and “palliative care,” as well as other domains of “patient safety,” “patient-centeredness,” and “care coordination.”

<Table 3-1> Status of applicable measures in Korea

Dimension		Number of measures		
		AHRQ NHQR(A)	Korea (B)	B/A
1. Effectiveness of Care	Cancer	5	3	60.0%
	Cardiovascular Diseases	6	5	83.3%
	Chronic Kidney Diseases	4	3	75.0%
	Diabetes	5	3	60.0%
	Musculoskeletal Diseases	4	1	25.0%
	Respiratory Diseases	6	3	50.0%
	Maternal and Child Health	9	4	44.4%
	Mental Health and Substance Abuse	5	4	80.0%
	Lifestyle Modification	7	3	42.9%
	Functional Status Preservation and Rehabilitation Supportive and Palliative Care	5	0	0.0%
	Supportive and Palliative Care	5	1	20.0%
	<b>Sub Total</b>	<b>61</b>	<b>30</b>	<b>49.2%</b>
2. Patient Safety		9	4	44.4%
3. Timeliness		4	4	100.0%
4. Patient Centeredness		3	1	33.3%
5. Care Coordination		10	4	40.0%
6. Efficiency		13	3	23.1%
7. Health System Infrastructure (modified for Korea NHQR)		7	2	28.6%
8. Access to Health Care		6	4	66.7%
<b>Total</b>		<b>113*</b>	<b>52**</b>	<b>46.0%</b>

Intervention and investment are needed to intentionally measure the quality of care across underserved domains. This is particularly salient as a recent celebrity hospital death has garnered our country’s attention toward patient safety.<sup>5)</sup> Policy interest and investment for expanding the basis of quality assessment pertaining to patient safety are needed. As well as the

existing studies that identified patient safety issues, the fact that we still lack a patient safety reporting system or a system for preventing recurrence of such accidents (Lee 2011; 2012; 2013) should accelerate the efforts for developing relevant quality measures (Kang et al. 2013, p.473).

Poor scores in care coordination can mean inadequate care transition, inappropriate adjustment of medications, and ineffective communication between primary care doctors and specialists at a hospital level. This can lead to healthcare errors, accidents, and preventable hospital admission, and unnecessary/duplicate testing and procedures that incur waste (IOM 2010, p. 49). Therefore, intentional efforts for quality assessment in care coordination will contribute to improving these issues. Patient centeredness is also a key element of quality improvement, which requires development of further indicators. Patient centeredness is founded on a partnership between providers and patients in making healthcare decisions, and refers to providers' effort to respect patients and their values and preferences. Patient centeredness and care coordination are essential tasks to reduce inefficiency and improve quality of care in our healthcare delivery system. As such, policy intervention and investment are needed to develop further indicators and data sources. Healthcare infrastructure is also an area where more assessment efforts are required to increase system capacity and increase the quality of care.

Data types also need to be diversified. Thus far, most quality measures have been based on providers' payment submission. However, for domains that are assessed with patient experience of healthcare, such as care coordination and patient centeredness, more patient surveys need to be developed. Patient experiences can vary depending on the type of facilities.

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5) SBS TV show, "That's what I want to know" aired on December 29, 2014; it covered the unexpected hospital death of a popular singer Haechurl Shin. The episode brought to the fore the issue of patient safety as well as exclusion of patients in medical decision making.

For instance, the experiences and perspectives of patients and carers in long-term care facilities, patients and carers using palliative care, and patients discharged from acute treatment centers may differ. As such, differentiating survey data by facility and service type will enable a more detailed identification of problem areas and issues. We expect that more diverse data sources and measures will naturally develop in the future as the report increases the level of understanding regarding each quality domain.

## **2. Evaluating performance improvement and polishing the methodology for subgroup comparison**

Because the KHQR seeks to provide a comprehensive picture of the overall quality of our healthcare system, the level of analysis is not as detailed as some others. As such, rather than providing specific cause analyses, it will suggest the importance of a more detailed cause analysis by providing explorative information.

Nevertheless, continuous efforts for honing the methodology are still needed. First, as previously discussed, data sources required to complete the report must be expanded and the scientific rationale behind selected measures must be strengthened. The KHQR is the first of its kind in Korea. As such, priority is placed on collecting as many pertinent indicators as possible to complete the big picture. By adopting the measures used by the AHRQ's NHQR, we could skip the step of verifying their scientific rationale and, by incorporating the indicators that are being published in Korea, we can assume the reliability of those measures.

However, in order for the quality report to have a meaningful effect on healthcare quality improvement, the measures must accurately reflect the quality of each corresponding domain. For this, the agency working groups must actively cooperate and exchange views with each other to ensure that



the measures are being accurately measured in ways they are intended in order to improve or update the measures as needed.

Additionally, the methodology used to present the outcomes need to be improved and reinforced. Continuous efforts are required to ensure a more systematic presentation of the outcomes and use of diagrams and tables to help identify quality issues and prioritize the areas that need attention.

### **3. Establishing a national level governance for healthcare quality**

The Korean Healthcare Quality Report will serve as a milestone in national healthcare quality management; through that, the mediating role of the central government will be emphasized. The role and responsibility of the central government to intervene in the system to improve care coordination and eliminate duplicate services across relevant agencies to improve quality and efficiency will be emphasized. For this, a national level governance that oversees quality management must be established.

Currently, various agencies are participating in the quality assessment project across various domains. However, due to the lack of a coordinating system between agencies, the domains tend to overlap or be absent altogether (Table 3-2). Thus far, quality assessment has been adopted in a scattered manner by individual departments based on their immediate agenda. The lack of a road map to quality improvement at a national level, compounded by the lack of a mechanism to prevent and mediate for duplicate projects, have incurred inefficiency. Additionally, opportunities to incorporate the multidimensional attribute of healthcare quality have been relatively scarce as the focus on its effectiveness has been strengthened.

The need to establish a national level governance that will integrate and manage quality improvement efforts and design strategies and implement related policies will continue to grow. The KHQR will increase the need for

such governance as well as provide an opportunity to establish one by allowing pertinent agencies to participate in the development of the report.

In order for quality improvement at an individual level to translate into improvement in quality and efficiency at a national level, a “strategy for improved national healthcare quality” is needed, in which all parties of interest participate (Kang et al. 2013, p.487). The national healthcare improvement strategy that would be updated and revised on a regular basis will serve as a milestone to determine policy priorities, and it will offer the measurement direction for the report as well. As a result, the Healthcare Quality Report will gain comprehensiveness annually by presenting our healthcare system’s performance and any changes in improvement strategies to the Parliament, government, and the people.

The Affordable Care Act (ACA), widely referred to as Obama Care, mandates that the head of the Health Department establishes the National Quality Strategy (NQS) to improve healthcare coverage, patient health outcomes, and the national health level (AHRQ 2013, p.23, cited in Kang et al. 2013, p.474). The NQS is repeatedly established through a process of transparent discussion and agreement between public and private parties of interest, and the first NQS was published on March 18, 2011 (cited in AHRQ 2013, p. 23; Kang et al. 2013, p.474).

〈Table 3-2〉 Healthcare quality component<sup>1)</sup> management scope by government agency

Category		Healthcare quality components		
		Effectiveness <sup>2)</sup>	Safety	Responsiveness/ patient centeredness
Ministry of Health and Welfare	Emergency care clinic assessment	○	○	
	Regional public hospitals operation assessment	○	○	○
Korea Centers for Disease Control and Prevention	Scientific research for disease prevention and management	○	○	
Korea Institute for Health and Social Affairs	National Healthcare Survey <sup>3)</sup>	○		
	Patient survey	○		
	Korea Health panel	○		○
KOIHA	<ul style="list-style-type: none"> <li>• Healthcare institute accreditation assessment</li> <li>• Dental clinic accreditation assessment</li> <li>• Oriental medicine center accreditation assessment</li> <li>• Accreditation by the Ministry of Welfare<sup>4)</sup></li> </ul>	○	○	○
HIRA	Quality Assessment of National Health Insurance Benefits and pay-for-performance program	○	○	
	Specialized hospital assessment	○		
	Health insurance review	○		
National Health Insurance Services	Assessment of institutes specializing in health check ups	○	○	
	Long-term care facility assessment	○	○	○
Korea Occupational Safety and Health Agency	Specialized health check-up centers assessment	○	○	
National Cancer Center	Cancer diagnostic centers quality assessment project	○	○	
	Cancer centers assessment	○	○	○
NECA	Public interest clinical research rationale assessment	○	○	
KAMS	Clinical treatment guidelines	○	○	○
Korea Hospital Association	Hospital accreditation program	○	○	

Notes 1) Quality components presented in the table are based on the conceptual framework of the OECD Healthcare Quality Indicator Project.

2) Of the quality components, adequacy is included in effectiveness, and continuity and capacity are included in patient centeredness.

3) The national healthcare survey pertains to the adequacy of healthcare resource management and distribution, and it is connected to healthcare effectiveness (The Commonwealth Fund's International Working Group on Quality Indicators, 2004).

4) Includes research hospitals of the Welfare Ministry and healthcare facilities specializing in palliative care.

Source: Kang et al. (2013, p.59)

Furthermore, the Healthcare Research and Quality Act mandates that the US Department of Health and Human Services submit the National Healthcare Quality Report and the National Healthcare Disparities Report to Congress; it also mandates that the AHRQ, a government-funded research institute, write the reports.

The US Department of Health and Human Services runs the interagency working group to implement quality improvement strategies, and the National Quality Forum, a non-profit organization, standardizes the measures used as a basis for quality assessment. Establishing national healthcare quality improvement strategies, operating the interagency working group, and compiling the National Healthcare Quality Report are all interrelated and they all affect the system's performance (IOM 2010, pp.23-26; Kang et al. 2013, p.475).

Fourteen years after the National Healthcare Insurance Act mandated the adequacy assessment, it is time that Korea assess and report on the quality of its healthcare system, implement quality improvement projects, establish a mechanism for quality improvement that enables continuous assessment and adjustment, and secure structural stability for coordinating care throughout the system.

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### 〈Chapter 3. Future recommendations for the KHQR〉

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