Identification of Inefficiencies in Healthcare Practices and Proposal for Improvement Thereof

October 18, 2022
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Overview

It is predicted that in the context of a progressively aging population and a decline in the working age population, healthcare costs in Japan will continue to increase. Thus, there is a great need to consider reforming the healthcare system as a whole to contribute to the appropriate management of social security benefits, in particular healthcare benefits. These discussions are currently being held. Meanwhile, there are calls to establish a more effective, more efficient healthcare provision structure by correcting inefficiencies in healthcare practices.

In this proposal, we aim to lay out the inefficiencies that have been identified regarding healthcare, and quantify the possible healthcare cost savings that can be anticipated by addressing these inefficiencies. Furthermore, as promoting innovation in the healthcare provision system and in healthcare technologies is extremely important for addressing these healthcare inefficiencies, we have laid out the impacts that investment in healthcare will have on the public.

In this proposal, in view of the balance between demand and supply in healthcare, we have defined situations in which the supply outstrips the demand as "waste," situations in which the supply is insufficient for the demand as " overburden," and situations in which waste and overburden are both present/unevenly distributed as "unevenness." In view of the above, in the investigation of quantifiable issues, wherever possible we referred to various types of public information such as government statistical data and conference materials, as well as expert opinions. In this way, we sought to indicate the extent to which each event or issue was considered problematic from the perspective of inefficiencies in healthcare costs and healthcare resources.

As a result of these investigations, we have identified the potential to reduce healthcare costs by a margin amounting to trillions of yen. It became clear that in

particular, establishing a primary care team structure and implementing value-based healthcare will contribute to eliminating waste, overburden, and unevenness, and that addressing waste could enable a healthcare cost reduction amounting to trillions of yen. Specifically, the correction of inefficiencies related to dispensing pharmacies such as avoiding overlapping prescriptions, etc. and abolishing incentives accompanying the spread of generic drugs could lead to reductions in hundreds of billions of yen. Moreover, the estimated possible savings resulting from items related to hospitalization such as excess hospital beds and long-term hospitalization are large, whereupon it is considered that the addressing of these items should be prioritized.

Correcting inefficiencies and reducing healthcare costs is considered an extremely important task in view of preventing increases in patients' medical expenses in the context of an aging society with a declining birthrate. Furthermore, waste and overburden at sites of healthcare could lower the quality of and access to healthcare, exerting undesirable effects on the health of the public as a whole. Concurrently, innovation should be positioned as a policy of utmost importance so that all people residing in Japan, the country with the world's longest lifespan, can continue to receive cutting-edge healthcare. In order to achieve a structure to provide sustainable, high-quality healthcare, it is essential to boldly move forward along the dual axes of reforming inefficiencies without exceptions, and promoting innovation.

1. Introduction

Due to such aspects as the decrease in the number of doctor visits as a result of the COVID-19 pandemic, FY2020 saw a 3.2% decrease in estimated healthcare costs compared to FY2019, falling to 42.2 trillion yen. However, as a result of increased healthcare costs related to COVID-19, healthcare costs in FY2021 soared to 44.2 trillion yen, a 4.6% increase from FY2020 and an all-time high. It is predicted that in the context of a progressively aging population and a decline in the working age population, healthcare costs in Japan will continue to increase. However, we estimate from our statistics that Japan is accumulating deficit-covering national bonds of 7 to 8 trillion yen each year, whereby it is highly unlikely that Japan's policy of continuing to rely on deficit-covering national bonds for benefits is sustainable. Thus, there is a great need to consider reforming the healthcare system as a whole to contribute to the appropriate management of social security benefits, in particular healthcare benefits. Discussions are currently being held with the goal of a triple fee reform of medical fees, nursing care fees, and disability welfare service fees in April 2024.

Considerations such as the above are being advanced regarding the state of healthcare finances as a whole, but there are calls to establish a more effective, more efficient healthcare provision structure by correcting inefficiencies in healthcare practices. For instance, it has been identified that the large number of hospitals and hospital beds stimulates demand and evokes an increase in healthcare costs. Moreover, "low-density healthcare" resulting from the low number of medical workers in comparison to the number of hospitals and hospital beds, the scattering of medical resources, and the insufficient assignment of personnel, as well as the lack of the division of roles and cooperation between healthcare institutions can be cited as factors behind the overburden on healthcare services arising during the COVID-19 pandemic. Factoring in aspects such as subsidies for economic measures, the state of affairs is accompanied by considerable expenditures. Another related aspect is that inefficiencies can also be seen in various tasks in existing healthcare, with the burden of such tasks falling on the efforts of self-sacrificing medical workers.

In July 2022, we established the "Health and Medical Policy Consortium" as an opportunity for various stakeholders in health care related fields to gather and discuss medium- to long-term reform of the overall healthcare system. This Consortium has established the issues that should be resolved from a public perspective, and is promoting the creation of a proposal for establishing an efficient, effective healthcare provision structure with a neutral, fair, and impartial stance.

Considerations are progressing with a particular focus on the three points of the establishment of a primary care team structure, the implementation of value-based healthcare, and a macro equilibrium of benefits and fiscal resources.

Figure 1: Points considered at Health and Medical Policy Consortium

Establishment of a primary care team structure to examine the health of the public throughout their lives through multidisciplinary regional collaboration

- The significance of primary care will be clarified from a medical perspective and a financial perspective, and specific measures for healthcare systems (registration system, payment system) appropriate for the current state of Japan will be considered based on the idea of value-based healthcare.

Implementation of value-based healthcare aimed at providing patient-focused healthcare

- The problems and solutions regarding the value of healthcare and digital infrastructure will be consolidated, and a structure for the continuous third-party evaluation of existing healthcare which leads to strengthening of the role of reevaluation of existing healthcare from a neutral perspective, which was discussed by the Medical Technology Evaluation Subcommittee of the Central Social Insurance Medical Council, will be considered.

Macro-balance of benefits and fiscal resources with public understanding

- Issues such as differences between the principles and actuality of public insurance premiums and taxes will be indicated, and the necessity of conducting integrated discussions and closely inspecting benefits in addition to realizing value-based healthcare will be proposed. Furthermore, a method for formulating a healthcare budget will be drawn up, and the feasibility of a method incorporating the value-based healthcare approach will be considered.

2. Purpose and Method

In this investigation, as an individual project of the Health and Medical Policy Consortium, we aim to lay out the inefficiencies that have been identified regarding healthcare, and quantify the possible healthcare cost savings that can be anticipated by addressing these inefficiencies. Furthermore, as promoting innovation in the healthcare provision system and in healthcare technologies is extremely important for addressing these healthcare inefficiencies, we have laid out the impacts that investment in healthcare will have on the public.

This study was carried out with the following approach. First, we attempted to define the main causes of the inefficiencies in healthcare. In defining the main causes of the inefficiencies, we avoided the use of specialized terminology so as to arrive at expressions and categories that are easily understandable for the public.

We referred to the Toyota production method[1], famous as a means for enhancing productivity, and also incorporated expert opinions.

After defining the main causes of the inefficiencies, we investigated government statistical data and various publicly available materials to arrive at a healthcare cost reduction amount. In addition to referring to available materials, we also conducted expert interviews to hear experts' opinions on the definitions and factor analysis of inefficiencies and on investment in healthcare-related industries, and incorporated the information from these interviews into the content of the proposal.

We zeroed in on the balance between demand and supply in healthcare. We defined situations in which the supply outstrips the demand as "waste," situations in which the supply is insufficient for the demand as "overburden," and situations in which waste and overburden are both present and unevenly distributed as "unevenness," and attempted to organize these. These definitions were defined by The Japan Research Institute with reference to expert opinions, but it must be noted that judging whether supply exceeds or falls short of demand is extremely difficult. One example is the issue that with regard to the attitudes of patients who wish to receive sufficient healthcare and medical workers who wish to provide sufficient healthcare, the judgment of whether the provision amount satisfies the needs is a difficult one.[1]

In this study, we followed the above-described definitions, and where possible we referred to various types of public information such as government statistical data and conference materials when investigating quantifiable issues. In this way, we sought to indicate the extent to which each event or issue was considered problematic from the perspective of inefficiencies in healthcare costs and healthcare resources. In particular, in specifying the contribution of implementing the establishment of a primary care team structure and the implementation of value-based healthcare, we considered not only the medical effects, but also the magnitude of the room for cost savings.

[1] OJT Solutions, "Toyota Basic Compendium of Work" (Chukei Publishing, 2015).

Figure 2: Definitions of factors of inefficiencies used in this study

3. Analysis and considerations regarding factors of each inefficiency

Based on divisions in government statistical data and the like, we organized the inefficiencies corresponding to each factor from the viewpoint of hospitalization, non-hospitalization, and dispensing pharmacies. The items we specified included: "excess beds" as an issue relating to hospitalization; "frequent examinations" as an issue relating to non-hospitalization; "inefficient prescriptions/treatment not connected to treatment outcomes," "excessive investment in advanced medical equipment," "uneven distribution of medical workers in medical departments and regions," and "inefficiencies of jobs in medical institutions" as issues relating to both hospitalization and non-hospitalization; and "overlapping prescriptions, polypharmacy, and leftover medicine" and "system reforms accompanying the spread of generic drugs" as issues relating to dispensing pharmacies (see Figure 3).

Upon considering the scale of the cost savings for each of these items, we discovered that, particularly concerning those items arising due to excess, that it was possible to save trillions of yen in terms of public healthcare costs. However, since the factors are linked to one another, one must take note that it is not appropriate to add them in a compounding fashion. On the other hand, it was found that in order to resolve overburden and/or unevenness, it will be necessary to temporarily engage in investment from monetary, human, and innovative angles.

3.1. Excess hospital beds

Hospitalized treatment costs accounted for the largest segment of public healthcare costs, at 38.1% of the total.[2] Hospitalized treatment costs and the

[2] Ministry of Health, Labour and Welfare, National Medical Care Expenditure (2019).

number of hospital beds for each prefecture show a strong mutual correlation[3,4], and the "physician demand incitation hypothesis," which states that excess hospital beds incite hospitalized treatment, has recently been cited as a cause of this. When compared with other OECD-member countries, the number of hospital beds per 1,000 people in Japan is second only to Korea, and is significantly higher than those countries in third place or lower.[5] Based on this situation, adjustment of the number of hospital beds has been promoted as a part of healthcare cost reduction policies for some time, but no large reductions in either the total number of hospital beds, or the number of hospital beds per 100,000 people of the population have been seen in recent years.[6] Thus, given Japan's high number of hospital beds, it is believed that there remains considerable room to establish an efficient healthcare provision structure and curtail the number of unneeded hospital beds.

Each prefecture formulates a healthcare plan every five years based on Japan's regional healthcare scheme. Healthcare planning seeks to correct the regionally uneven distribution of the number of hospital beds by calculating the standard number of hospital beds through a nationally uniform calculation formula, and using this formula when judging whether to install hospital beds. While the standard number of hospital beds is not positioned as a hospital bed reduction target for each prefecture, the standard number of hospital beds is an appropriate number of hospital beds with respect to the current healthcare demand, and it is anticipated that if each prefecture reduces its hospital beds to the standard number of hospital beds, hospitalized treatment costs will be reduced by up to 2.2 trillion yen (see Figure 4).

However, reducing hospital beds runs the risk of bringing about a decline in healthcare access and quality, and while this is the subject of numerous discussions, there is still no concrete consensus regarding this point. For this reason, the amount of reduction in hospitalized treatment costs in this paper merely indicates potential, and specific reduction measure proposals are introduced below.

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[3] Ministry of Health, Labour and Welfare, Analysis of Regional Differences in Healthcare Costs in FY2020 (June 2020).

[4] Ministry of Health, Labour and Welfare, 2020 Survey (Finalized Numbers) of Healthcare Facilities (Static and Dynamic) and Hospital Report (2020).

[5] OECD Health Statistics 2022, Health Care Resources (2022).

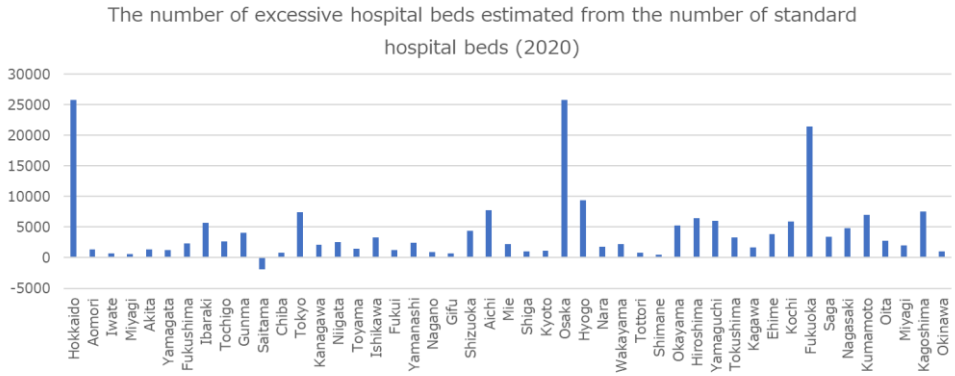
[6] Ministry of Health, Labour and Welfare, Survey of Healthcare Facilities and Hospital Report (2010, 2013, 2016, 2018, 2020).

Figure 3: Inefficiency items identified by this study, and cost reduction margin

Area	Factor	Inefficiency	Point*	Cost reduction margin	Details
Hospitalization	Waste, Overburden, Unevenness	Excess hospital beds	PC	**About 2.2 trillion yen**	In the case of reducing the number of hospital beds to the standard number of hospital beds calculated in the healthcare plans of each prefecture in 2018, there would be an estimated reduction of about 2.2 trillion yen in hospitalized treatment costs.
	Waste	Long-term hospitalization	VBHC PC	**About 2.6 trillion yen**	If the hospitalization rate in prefectures having a high social hospitalization rate in people aged 65 or over is reduced with a target of the lowest nationwide rate, the estimated reduction effect will be 2.6 trillion yen, even considering home nursing care costs.
Non-hospitalization (outpatient)	Waste	Frequent examinations	VBHC PC	**About 155.6 billion yen**	It is estimated that reducing those examinations which have the purpose of prescription attainment, one cause of frequent examinations, through the spread of and replacement with refill prescriptions could enable a 155.6 billion yen reduction.
Dispensing pharmacies	Waste	Overlapping prescription, polypharmacy, leftover medicine	VBHC	**About 573 billion yen**	The estimated effect of a medicine reduction effect if, among patients aged 65 or over, those taking five or more types of medicine eliminated one type of medicine is 573 billion yen.
	Waste	System reforms accompanying the spread of generic drugs	VBHC	**About 144 billion yen**	It is estimated that abolishing the monetary incentives of the current system would result in a reduction of about 140 billion yen.
Both hospitalization and non-hospitalization	Waste, Overburden	Inefficient treatment/prescriptions not connected to treatment outcomes	VBHC	-	It is necessary to clarify treatment results with clinical practices and prescription units, but no comprehensive studies have been conducted.
	Unevenness	Excessive investment in advanced medical equipment	PC	-	In terms of the current situation, by promoting the shared usage of expensive medical equipment unevenly distributed to some regions, in 2016 and 2020, the proportion of the number of shared CT scanners in clinics was about 18% and about 39%, respectively, and the proportion of the number of shared MRI scanners in clinics was about 8% and about 42%, respectively. In this way, unevenness (the uneven distribution of medical equipment) is being reduced.
	Unevenness	Uneven distribution of medical workers in medical departments and regions	PC	-	Uneven distribution between regions, departments, and private and public physicians is generating unevenness and overburden. It is necessary to take steps to correct uneven distribution by promoting medical fee systems and remuneration structures (incentives) and setting incentives and disincentives to maintain regional quotas and introduce insured physician quota systems, rather than simply controlling admission numbers for medical schools. The number of physicians by region was 403 in FY2016, and is estimated to reach 9,679 in 2024.
	Waste, Overburden, Unevenness	Inefficiencies of jobs in medical institutions	PC	-	Of an average of 240 minutes spent on five tasks that can be allocated to other occupations by the shifting of a physician's tasks, it is reported that about 47 minutes (under 20%) can be shifted. As an example of ICT introduction, it has been reported that movement within hospitals has been reduced by the utilization of social networks by nurses, whereby the time available to visit patients' bedsides increased by 60 minutes.

*Among the points being considered at the Health and Medical Policy Consortium, "PC" indicates "establishment of a primary care team structure," and "VBHC" indicates "implementation of value-based healthcare."

Figure 4: Healthcare cost reduction effect estimated from standard number of hospital beds (unit: number of hospital beds)



Reduction of inpatient medical expenses was calculated by following method

$$\text{Reduction of medical expenses} = Inpatient\ medical\ expenses(2020) \times \left(1 - \frac{the\ number\ of\ standard\ hospital\ beds}{the\ number\ of\ existing\ hospital\ beds}\right)$$
$$= 16{,}201{,}903{,}555{,}848yen \times \left(1 - \frac{1{,}300{,}943\ beds}{1{,}507{,}526\ beds}\right)$$
$$= 2{,}220{,}218{,}982{,}809yen$$

Data from : Ministry of Health, Labour and Welfare「 Analysis of Regional Differences in Medical Expenses for FY 2020 」,「 2020 Survey of Medical Facilities 」 and Medical Plan for Fiscal Year 2008 of each prefectural divisions

3.1.1. Correction of social hospitalizations

Having a patient capable of living at home or at a caregiving facility to be hospitalized over a long period, known as social hospitalization, leads to a decline in the quality of the patient's daily life and to excessive healthcare costs. In a report by the Takero Doi study group, noting a regional disparity in the rate of hospitalized treatment in which recovery in the chronic phase required a hospitalization of 15 days or more in patients of at least 65 years old, a measure was considered in which the hospitalized treatment rate for long-term hospitalization could be corrected through the implementation of nursing care.[7]

3.1.2. Correction of non-treatment hospitalization

Global Health Consulting defines hospitalization before/after treatment which requires hospitalization, conducted solely for the purpose of medication or meals, as non-treatment hospitalization. Not only will this bring about an increase in excess hospitalized treatment costs, but this also encourages the dispersion of medical workers and thereby bringing about a decline in the quality of treatment due to physicians being sparser. For this reason, non-treatment hospitalization has been identified as requiring correction.[8]

[7] Keio University Takero Doi Study Group, Policy Recommendations on the Sustainable Provision of Healthcare and Nursing Care (November 2015).

[8] Global Health Consulting Japan Fiscal System Subcommittee, Materials 1-2 (October 2021).

3.1.3. Introduction of comprehensive payment for each hospitalization

In 2003, Japan introduced DPC/PDPS (a set cost fee calculation system per day based on categorization into diagnosis groups), achieving a certain level of effectiveness with regard to the streamlining of hospitalized treatment during the acute phase. On the other hand, problems remain. For example, the hospitalization period in DPC hospitals still varies, and there is not a compelling incentive for an early discharge since payment is calculated per day. Japan is considering the switch to a comprehensive payment for each hospitalization, i.e., from PDPS to PPS. This is actually incorporated into some treatments in the form of "basic for short stay, etc." It is believed that the appropriate operation of PPS would reduce incentives to perform excessive treatments while securing the quality of healthcare, and be highly effective in terms of healthcare finances.

While the streamlining of hospitalized treatment is being discussed from a variety of perspectives as described above, considering impacts on the quality of and access to healthcare, there are barriers to adopting a concrete policy. Vital to the discussions is how to maximize the utilization of healthcare resources for hospitalized treatment and correct the inefficiencies without compromising the quality of and access to healthcare. Moving forward, it will likely be necessary to discuss how to define clear excesses.

3.2. Frequent examinations

"Frequent examinations" refer to the receiving of excessive examinations at the same medical institution for the same illness. The recipients of outpatient examinations through medical assistance have been seen as problematic for some time. Welfare recipients receiving medical assistance have all fees covered by public expenses, making frequent examinations prone to occurring. The Ministry of Health, Labour and Welfare provided guidance on appropriate examinations as a measure to address frequent examinations for welfare recipients, and there have been significant results, with the proportion of such examinations in 2019 falling to below half of the 2011 figure.[9] However, at the current time, no measures have been taken for frequent examinations by non-welfare recipients.

When considering the excess of outpatient examinations more broadly, we consider examinations merely for the purpose of receiving a drug prescription, being frequent examinations in a broad sense, to be an example. In a survey by the

[9] Ministry of Health, Labour and Welfare, 7th Meeting of the Study Group on Medical Assistance, Document 1 (July 2022).

Ministry of Health, Labour and Welfare on behaviors regarding receiving care, of 88.7% who responded that the purpose of receiving an outpatient examination was "To receive an examination, treatment, or a test," 42.4% (37.6% of the total) responded that their purpose was "To receive a regular examination or drug prescription."[10] Medical fee reforms in FY2022 introduced refill prescriptions, but in a survey one month after the introduction, it was found that only 5% of physicians had experience issuing these.[11] It has been reported that the issuing of refill prescriptions results in reexamination costs and prescription issuance costs being reduced by about 155.6 billion yen,[12] making the spread of refill prescriptions an urgent matter.

3.3. Overlapping prescription, polypharmacy, leftover medicine

Physicians grasp the medicines already being taken by patients by self-reporting from those patients. "Overlapping prescription," in which the same medicine is prescribed by multiple healthcare institutions, and "polypharmacy," in which the dosing of multiple medicines can lead to due to adverse drug events or dosing errors, can easily occur due to insufficient confirmation by the physician or insufficient reporting by the patient. With an increase in prescriptions for medicines that patients should not take come health problems for the patients taking these medicines, and "leftover medicine" occurs for patients who do not take their medicine, resulting in a detriment in terms of healthcare finances.

In 2017 at the Central Social Insurance Medical Council, the Ministry of Health, Labour and Welfare proposed efforts to reduce polypharmacy and overlapping prescriptions, and to eliminate leftover medicine.[13] Revisions were made to premiums for prevention of overlapping prescriptions and interactions, which evaluate cases of reducing the medicine of hospitalized or outpatient patients taking multiple types of medication, and to outpatient dosing assistance fees, which evaluate inquiries regarding prescriptions at pharmacies. In 2016, the year of these revisions, there were actually an increased number of calculations for premiums for

[10] Ministry of Health, Labour and Welfare, Summary of 2020 Survey of Care Receipt Practices (Approximate Numbers) (September 2020).

[11] m3.com, Refill Prescriptions Issued by Only 5% of Physicians [Survey One Month After Revision] (May 2022).

[12] Ayumi Maeda, Atsuyuki Kanno, "Predicting Economic Effects of Introducing Refill Prescribing System," Japanese Journal of Social Pharmacy, 39, 35-39 (2020).

[13] Ministry of Health, Labour and Welfare, Central Social Insurance Medical Council, General Meeting (367th) (November 2017).

prevention of overlapping prescriptions and interactions and outpatient dosing assistance fees.

On the other hand, it is difficult to say that the problems of overlapping prescription, polypharmacy, and leftover medicine have been corrected. In a survey by the Ministry of Health, Labour and Welfare conducted in 2017 concerning patients' experiences of leftover medicine, it was found that of patients having medicine, which is prescribed through regular examinations, about 40% had experienced an event of leftover medicine within the past year. As for the situation regarding polypharmacy, there is a tendency for the proportion of patients taking a large number of types of medicine to increase with the age of the patients, with about 1 in 4 patients aged 75 or older who receive outpatient prescriptions being prescribed 7 or more types of medicine.[14] Focusing on these elderly patients, it is estimated that the effect value of healthcare cost optimization if patients aged 65 or over taking five or more medicines eliminated one type of medicine would be 573 billion yen per year.[15] However, it should be noted that since this estimation also targeted polypharmacy not involving side effects, only targeted the elderly, and did not consider patients who needed to reduce their medicine not by one type, but by multiple types, the actual effect value of healthcare cost optimization may differ from this.

These problems should be firmly corrected since they harm patients' health and have a large impact on healthcare economics. While the rate of side effects in patients taking 7 or more types of medicine is high, the healthcare cost optimization plan is inconsistent with this in that it allows patients to take up to 15 types of medicine. Furthermore, resolution of overlapping prescription cannot currently be completely resolved by the human intervention of physicians and pharmacists. It is expected that new standards relating to polypharmacy will be adopted, and the introduction of digital prescriptions will improve the current situation, in which prescriptions can increase contrary to medical professionals' intentions.

3.4. System reforms accompanying the spread of generic drugs

The Ministry of Health, Labour and Welfare formulated the "Roadmap for Promoting the Further Use of Generic Drugs" in April 2013, and advanced efforts with the goal of achieving a generic drug usage rate of 80% in September 2020.

[14] Ministry of Health, Labour and Welfare, 2021 Statistics by Social Medical Practice (June 2021).

[15] Japan Health Insurance Association, Fukuoka Branch, "Survey Report on Polypharmacy and Inappropriate Prescriptions" (July 2019).

The share in September 2021 was 79.0%, a 39.1 point increase over 10 years prior, but was still short of the goal. In June 2021, the goal was changed, whereby it was newly set to a goal of 80% or higher in all prefectures by the end of FY2023, while achieving reliability in terms of the quality and stable supply of generic drugs.[16]

According to the Ministry of Finance, regarding the premium for the generic drug dispensing structure, the increment resulting from optimization due to a new goal to be met by the end of FY2023 is 20 billion yen, and it is estimated that under the current system, there will be a premium of about 120 billion yen per year.[17] Regarding the monetary incentives related to the spread of generic drugs, while generic drugs are recognized as logical when the degree of spreading is low, it is considered that the adverse effects have become more prominent in the current state, where generic drugs have become more widespread. Estimations indicate that abolishing the monetary incentives would enable a reduction of about 140 billion yen. Healthcare cost-controlling effects by using generic drugs should be maximized by abolishing the monetary incentives while ensuring reliability in terms of the quality and stable supply of generic drugs.[18]

3.5. Inefficient treatment/prescriptions not connected to treatment outcomes

From an economic viewpoint, the Japanese government is promoting self-medication by, e.g., general medicines (medicines that have become OTCs),[19] and with regard to the review of the scope of insurance benefits for existing medicines, considerations are underway regarding whether to adopt: (1) a method of removing medicines that have become OTCs, etc. from the scope of insurance benefits; or (2) a method allowing medicines to remain subject to insurance, and reducing the scope of insurance benefits in accordance with, e.g., effectiveness of the drug and cost of the drug borne by the patient, and removal from medicines eligible for insurance benefits. [3]

With regard to (1), in a study group on the review of public health insurance benefit coverage conducted by the Association for Health Economics Research and Social Insurance and Welfare and the Institute for Health Economics and Policy

[16] Ministry of Health, Labour and Welfare, Promotion of Use of Generic Drugs, Reference Material 1: Targets and Trends in Usage Percentage of Generic Drugs (September 2022).

[17] Ministry of Finance, Documents Submitted by Financial System Sub-Council (November 2021).

[18] Japan Research Institute, Inc., Shift of Generic Drug Promotion Policy: Shift Incentives from Healthcare Providers to Patients, and Targets from Volume to Healthcare Cost Curtailment (2021).

[19] Cabinet Office, Regulatory Reform Implementation Plan, Cabinet Office (July 2020).

(IHEP)[20] and the 31st Meeting of the Council on Economic and Fiscal Policy's Committee on the Promotion of Integrated Reform,[21] new selected treatments were proposed, aiming for the coverage of high-value healthcare and the transition of low-value healthcare to selected treatment and exclusion from insurance coverage. Here, it was proposed that healthcare having low effectiveness with respect to cost and lacking evidence be removed from eligibility from insurance benefits while maintaining recognition in order to secure it as a healthcare option, and that, concurrently, as a benefit for improving health, health improvement activities recognized by evidence be made eligible for benefits. Furthermore, the healthcare cost reduction effect due to switching to OTC was considered by an expert panel at the Ministry of Health, Labour and Welfare concerning the promote of self-medication,[22,23] and a healthcare cost reduction effect of 233 billion yen in existing domains and 88 billion yen in new domains, adding up to a total of 321 billion yen, was predicted. In Japan, a mechanism in which healthcare can be selected by means of value felt by the patient has already been incorporated into the dental field. It is also considered that it may be appropriate to consider changing patients' expense rate based on the value or additional effectiveness of the medicine or medical technology.

On the other hand, when considering this issue, discussing whether similar OTC drugs should be eligible for public healthcare insurance benefits is not an essential topic. Essentially, a discussion should be conducted regarding the prescription of medicines that are available as OTCs (wanting to have them prescribed). It is important to design a system that values high-value healthcare and eliminates low-value healthcare, while considering how effective intervention can be (what kind of value can be provided and whether healthcare costs can be reduced) over time and from multiple perspectives, including whether room can be provided to incorporate new value that will emerge in the future.

With regard to clinical practices, a proposal for the establishment of new selective medical treatments cited anti-inflammatory analgesics and the like as

[20] Association for Health Economics Research and Social Insurance and Welfare and Institute for Health Economics and Policy, Report on Study Group on Review of Public Health Insurance Benefit Coverage (March 2019).

[21] 31st Meeting of the Council on Economic and Fiscal Policy's Committee on the Promotion of Integrated Reform (March 2020).

[22] Japan Self-Medication Industry, Report on Promotion of Self-Medication to Support New Normal (November 2020).

[23] Ministry of Health, Labour and Welfare, 1st Expert Panel on Promotion of Self-Medication (February 2021).

examples for which there is insufficient evidence.[24] As selective treatments, while they are similar to rehabilitation where the frequency and number of days are limited, they were chosen as treatments without limits to the frequency or number of days. In this way, it is believed that of the healthcare that is currently provided, limiting the treatment with insufficient evidence and the inefficient treatment would contribute to a healthcare cost reduction. Yet differentiating between inefficient clinical practices and effective clinical practices is extremely difficult. For each clinical practice, it is necessary to clarify treatment results by means of data, but currently no comprehensive studies have been conducted. Currently, a medical fee system based on structure and process-based piecework payment is central, but in the future, it may become necessary to review and switch to a medical fee system based on outcome by accumulating data regarding medical details, frequency, and treatment results. Consequently, there are growing expectations for the construction of a system designed for data collection and utilization.

3.6. Excessive investment in advanced medical equipment

The number of CT and MRI units per capita in Japan leads the world by far, and is about 3 times the average OECD value. Not only is the number of pieces of advanced medical equipment excessive; but the root of the problem is also that there is an uneven distribution of advanced medical equipment. The number of tests per CT/MRI unit in Japan is at the lowest level among the OECD, and as a result, the operation rate per unit is low, which factors into pressure on the management of medical institutions and hospitals.[25]

In order to resolve unevenness such as the uneven distribution of medical equipment, starting in FY2020, shared usage has been promoted in line with an outpatient medical plan created by each prefecture. The proportion of shared usage of multi-slice CT scanners that are 64-slice or higher in medical institutions was about 18% in 2016, 39% in 2020, and the proportion of shared usage of MRI scanners of 3.0 teslas or higher in medical institutions was about 8% in 2016 and about 42% in 2020. Thus, it can be deemed that the proportion of shared usage has been in an increasing trend in recent years.[26]

Thus, by resolving uneven distribution brought about by excessive

[24] 3rd Meeting of Council for Regulatory Reform's Working Group on Healthcare and Nursing Care, Document 1 (December 2019).

[25] Ministry of Health, Labour and Welfare, Study Group on Demand for Medical Workers, 28th Meeting of Subcommittee on Demand for Doctors (February 2019).

[26] Ministry of Health, Labour and Welfare, 9th Study Group on 8th Healthcare Plan (June 2022).

investment in advanced medical equipment, the management of medical institutions is expected to improve. Moreover, the operation of CT and MRI scanners can be standardized and contribute to sustained, high-quality healthcare.

3.7. Uneven distribution of medical workers in medical departments and regions

The number of physicians in statistics regarding physicians, dentists, and pharmacists at the end of FY2020 was 339,627, an all-time high which marks an increase of over 100% in the past 40 years. However, despite the increase in the number of physicians, the issue of physicians being unevenly distributed to certain regions or medical departments remains unresolved.

The prefecture having the highest number of physicians per 100,000 people is Tokushima Prefecture, with 338.4, while the lowest is Saitama Prefecture, with 177.8. In this way, the number of physicians per capita varies greatly depending on the region. Furthermore, while the number of physicians as a whole is in an increasing trend, the number of internists who handle primary care and the number of gynecologists are essentially static (however, for example, it is surmised that a significant number of patients from Saitama are receiving healthcare in locations around Tokyo, so it must be noted that access to healthcare cannot be unconditionally evaluated by the number of physicians alone).

This kind of uneven distribution in regions and medical departments leads to unevenness and overburden. It is likely that individual physicians tend to concentrate in urban areas due to their preferences for research and the study of medical technology, as well as anxiety regarding responsibility for regional healthcare. Further, in the management aspect of medical institutions, market principles based on official prices do not apply; at the foundation of this issue is the fact that the price of healthcare in regions lacking physicians cannot be adequately increased. It can be deemed that unevenness by region occurs due to such factors. Training physicians based on regional quotas can be cited as another current measure. The number of physicians based on regional quotas was 403 in FY2016 and is estimated to reach 9,679 in FY2024.[27] It will likely be necessary moving forward to coordinate medical school admission numbers while maintaining regional quotas.

[27] Ministry of Health, Labor, and Welfare, Workshop on Formulation of Healthcare Plan (February 2018).

3.8. Inefficiencies of jobs in medical institutions

In terms of the actual work hours each week of physicians, 41.8% work over 60 hours. Compared to an average of 14% for other types of work, physicians accounted for the highest percentage. Furthermore, according to a questionnaire survey conducted by the Ministry of Health, Labour and Welfare "keeping records, writing reports, and performing documentation" in addition to examinations was the main reason for physicians' overtime, at 55.6%. There are thus inefficient parts remaining in the work of physicians and medical workers, and these inefficiencies are thought to be causing overburden in the working status of physicians.

The current policy involves the streamlining of work in medical institutions by shifting tasks and introducing ICT. In a survey by the Ministry of Health, Labour and Welfare, it was reported that 8 to 33% of the five tasks that can be allocated to other occupations among physicians' tasks (explanations to patients, measuring of basic vital data such as blood pressure, medical records, medical administration, replenishment and shipping of hospital articles, patient transportation) can be shared.[28] There are also examples in which physicians' work burden has been decreased by introducing ICT. For instance, while this is an example of the task streamlining of nurses, when nurses contacted one another utilizing social media platforms within teams divided by hospital ward, the movement distance for each nurse was reduced by 2.5 km, whereby the time available to visit patients' bedsides increased by 60 minutes.[29]

On the other hand, some experts have voiced the opinion that there is a limit to the reduction of physicians' work burdens by shifting tasks such as miscellaneous duties. It was remarked that shifting tasks would likely not be realized without bold reforms, such as greatly rethinking the tasks of physicians and providing comprehensive instructions to nurses so that nurses could provide prescriptions at their judgment.

3.9. Limits of analysis regarding this study

This study clarifies the waste, overburden, and unevenness in healthcare and illuminates the room to reduce inefficiencies, but appropriate healthcare will vary based on the situation involving regionality, patient backgrounds, and

[28] Ministry of Health, Labour and Welfare, Survey on Working Conditions and Working Inclinations of Doctors (April 2016).

[29] Health and Global Policy Institute, Issues and Future Prospects Concerning Workplace Reform for Medical Workers (2022).

healthcare providers. In view of these points, it is necessary to minutely analyze data that is more micro, such as the microdata of patients' receipt data, in order to clarify the waste, overburden, and unevenness of healthcare; however, this study was performed based on government statistical data, NDB open data, and existing investigations, and is thereby limited to making approximations.

4. Importance of investing in healthcare

As stated above, it is important to correct the inefficiencies of Japan's healthcare provision structure and aim to reduce healthcare costs, but excessive healthcare cost reduction policies run the risk of causing overburden and unevenness at sites of healthcare and in medical industries, impacting the quality of and access to healthcare, and ultimately lowering the health index of the public and resulting in economic impact.

For this reason, it is believed that the amount of reduction resulting from the correction of inefficiencies should be reallocated into investment in order to introduce innovations that enhance the efficiency of medical institutions, medical technologies, and the like. Specifically, patient-centered healthcare should be aimed for, and improvements should be sought while promoting the regional healthcare scheme, ICT utilization, and the appropriate usage of medical technologies in order to achieve a comprehensive healthcare provision structure.

4.1. Aspect of social effects brought about by healthcare maintaining health

Currently, regulation of the overall budget and measures for reducing the unit cost of medical technologies are being continued as healthcare cost reduction measures, but as indicated in the following figure, these result in a multifaceted effect on sites of healthcare and healthcare-related industries. In view of economic growth and the guarantee of safety, it is predicted that there would be significant concerns.

Figure 5: Effects brought about by implementing excessive healthcare cost reduction policies

Impact on sites of healthcare

- When resources for medical care are insufficient, the capacity of healthcare institutions is lowered, and appropriate healthcare can no longer be received.
- The introduction of new medical technologies is delayed, drugs and devices are subject to lag and/or loss, and there is an inability to keep up with costs generated in stable supply, resulting in a lack of healthcare options.

Impact on healthcare-related industries

- Along with the reduction of funding for R&D, there will be a drop in the ability to create innovation through R&D.
- It will not be possible to maintain the employment of medical workers and medical industry personnel, leading to facilitation of a rupturing (lack of succession) in personnel and technologies, and an outflow to other industries.

Drop in quality of healthcare

- A drop in the relative quality of healthcare, such as healthcare available in other countries not being expanded to Japan, will take place.
- Due to a lack of evidence in Japan, there will be an impact on physician prescriptions and the selection decisions of patients.

Deterioration of access to healthcare

- The public will not be able to receive appropriate healthcare at the appropriate time due to abstaining from examinations because of, e.g., an increased patient burden and an excessive burden on medical institutions.

Drop in health index of public (damage to universal health coverage)

- The impact will be a worsening of morbidity, mortality, average life expectancy, and healthy life expectancy.

Economic impact

- Due to a decrease in the working age population in all industries, there will be less tax revenue for Japan as a whole.
- The tax revenue from the medical industry will decrease.

In the Healthy Life Expectancy Extension Plan formulated in May 2019, the Ministry of Health, Labour and Welfare set 2040 as a goal for the achievement of a healthy life expectancy of at least 75 years.[30] The medical industry supports the creation of new treatment options and the saving of people who could not be treated up to now, the individual optimization of healthcare and enhancement of treatment results past the conventional, enabling quicker and more inexpensive access to treatment, and enabling prompt social rehabilitation by early completion of treatment, thereby contributing to the extension of the healthy life expectancy.

[30] Ministry of Health, Labour and Welfare, Summary of the Headquarters for Social Security and Work Reform Looking Ahead to 2040 (May 2019).

Appropriately evaluating medical innovations with the premise of appropriate usage and promptly incorporating such innovations into public healthcare insurance also contributes to the further promotion of health and the maintenance of a sustainable and robust public healthcare insurance structure.

4.2. Economic ripple effects of investment in healthcare

Healthcare should be evaluated as an investment from society in society and an investment by the public in the public in that it not only brings stability and peace of mind to the public and provides support during times of decreased earnings and recession, but it also contributes to revitalization of society as a whole now and in the future.[31]

The productivity effect, GDP ripple effect, and employment effect in healthcare are significant compared to other service industries. Masaharu Udo, former member of the House of Councillors, utilized an input-output table to estimate the ripple effects of investing a certain amount in fields (industries) such as healthcare and welfare.[32] The result indicated that investing 1 trillion yen in healthcare had national ripple effects in healthcare including 2.4657 trillion yen in terms of a productivity effect, 1.3615 trillion yen in terms of a GDP effect, and an employment effect of 262,893 people being hired. With respect to the ripple effects in public works, the productivity effect is 0.95 times and the GDP effect is 1.04 times, being nearly equivalent; and the employment effect is 1.51 times, meaning investment in healthcare can be seen as having enormous ripple effects.

4.3. Contribution to other biotechnology-related industries

Markets in which biotechnology-related industries have output are not limited to the health and medical fields, but exist across a broad range such as the primary production field, which includes sustainable primary production systems, large-scale construction utilizing timber, and smart forestry; and the bioproduction field, which includes high-function biomaterials, bioplastics, and bioproduction systems. In Bio-Strategy 2020, Japan promotes a plan for expansion to a total value of 92 trillion yen by 2030, necessitating R&D into bio-related technologies, as well as the utilization of the assets and distribution channels of existing industries and

[31] Japan Public Affairs Association, "Passing on National Healthcare System to Next Generation" (April 2021).

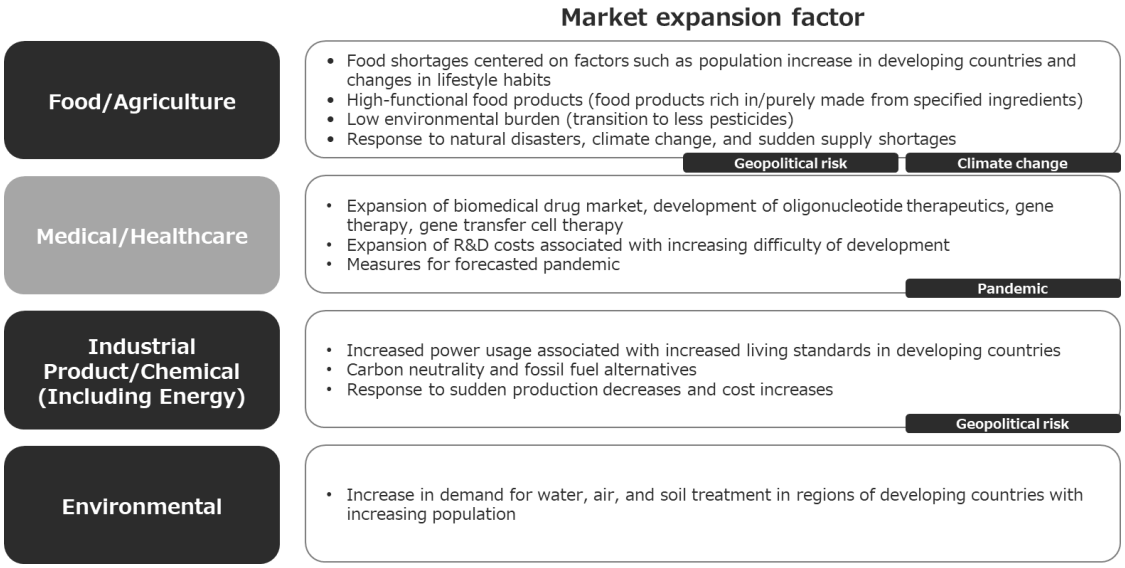
[32] Institute for Local Government Issues, "Former Member of House of Councillors Masaharu Udo - Medical and Welfare Expansion is a Force for Employment and Economic Development: A Look at the National and Local Governments" (March 2021).

the construction of an ecosystem.

The development of innovative medical technologies is expected to contribute to fundamental technologies in the healthcare industry and in other industries. For instance, genome modification technologies, which involve modifying genes, not only play a part in basic research for drug discovery, but they also broadly contribute to the development of biotechnology-related industries, including the agricultural and livestock industries, material production, and biofuels. The creation of technologies, products, and services which stimulate such technical innovations should not be seen as costs, but as investments in the foundation of the next society.

Furthermore, in the context of having experienced the COVID-19 pandemic and the heightening of geopolitical risks in recent years, investments in biotechnology-related technologies are being seen as "crisis management investments," as the importance of strengthening R&D and conducting personnel training which contribute to the minimization of various risks is gaining recognition. Through investments in these areas, it will be necessary to envision business opportunities in response to major changes in the market environment.

Figure 6: Factors in market expansion of biotechnology-related industries



5. Summary

In this proposal, we have defined the inefficiencies of Japan's healthcare provision structure, and specified the room for healthcare cost savings, which reaches over 2 trillion yen. Furthermore, we believe that promoting innovation in the healthcare provision system and in healthcare technologies is extremely important for addressing these healthcare inefficiencies. Investment in healthcare achieves significant, multifaceted ripple effects. Thus, we believe that not only reinvestment from the amount saved, but also growth investment based on demand optimization should be pursued. This will transform the healthcare industry from a cost industry to a major Japanese growth industry, making innovative healthcare available to a larger number of citizens and enabling Japan to make more international contributions as a developed nation boasting R&D capabilities. To this end, the three points below are given as items which should be carried out to make this a reality.

5.1. Strengthening of position of healthcare industry as national growth industry

In "Action Plan of the Growth Strategy" in June 2021, it is stated that "Life science is a key strategic area along with digital and green, and is also an important area for security," positioning the healthcare industry as a national growth industry.[33]

On the other hand, it has become normalized for the healthcare-related budget to be limited due to reductions in drug costs as the result of various rules. For example, the premium to promote the development of new drugs and eliminate off-label use is a system that maintains drug prices for new drugs during their patent periods. However, the application requirements for this system became stricter with 2018 revisions, and while some reviews were conducted in 2020 revisions, currently over half of patented products are subject to price drops. The aspect of reducing medicine costs, which account for about 20% of public healthcare costs, and adjusting healthcare costs in total will hinder the motivation of the entire healthcare-related industry, including the pharmaceutical industry directly impacted by this, to invest in research and development. In order to resolve this situation, it is necessary to newly recognize that the healthcare-related industry, including the pharmaceutical industry, is contributing to the extension of healthy life expectancy, the enhanced maintenance of the public's socioeconomic lifestyles, and the country's economic growth by creating innovation (for instance, innovative

[33] Cabinet Office, Action Plan of the Growth Strategy (June 18, 2021).

medicines and vaccines).

Furthermore, investment in the healthcare industry, which contributes to protection from preventable diseases, is also a necessity. We believe there should be strengthened investment in developing technologies to detect changes in individual health status and early signs of disease, and to promote the improvement of lifestyle habits (healthy diet, exercise, and abstaining from smoking and alcohol), as well as in the development of an environment for the establishment of industry and in educational activities to promote continuous efforts and education for the public.

5.2. Investment in digital areas of healthcare

In order to correct the inefficiencies in healthcare, a healthcare information ICT infrastructure which appropriately evaluates the state of healthcare based on data and evidence must be further strengthened.

In current data health reforms, linkage with big data focuses on prevention measures related to disease and nursing care, the development of new treatment methods, and the achievement of innovation in drug discovery and the like, and the problem can be identified that the measurement and evaluation of the value of healthcare is not currently an object. On the other hand, at a study group on standard healthcare information systems held by the Next-Generation Healthcare ICT Infrastructure Council, it was written that an aim was to "realize evaluations of the state of healthcare and utilization of real-world data in clinical research, etc." It is considered that in the planning and schemes of data health reforms, the measurement and evaluation of the value of healthcare should be considered as a crucial aspect of overall schemes from the perspective of patients and society receiving optimal healthcare in the context of limited resources.

In particular, it would be necessary for big data, pathological specimens, and medical chart data to be associated with individuals, and there are circumstances in which this may not possible due to the Act on the Protection of Personal Information in its current form. It is necessary to consider a system which eases the requirements for companies able to perform such association and expands such companies and prevents discrimination in the setting of penalties and the calculation of insurance premiums. Furthermore, in order to enhance effectiveness, it is also necessary to strengthen insurer functions and secure personnel able to analyze data sets.

5.3. Necessity of growth investment and gaining of understanding of burdens commensurate with benefits

In order to truly achieve the necessary healthcare, measures to increase expenditures, including increasing the burden on the public, should be considered. To this end, it is necessary, together with the Cabinet, the Ministry of Finance, the Ministry of Health, Labour and Welfare, the Ministry of Economy, Trade and Industry, think tanks and media, to communicate to the public the necessity of growth investment in healthcare, and to promote understanding regarding burdens commensurate with benefits.

In the current situation, aiming for a balance between benefits and burdens and considering burdens commensurate with benefits in order to secure the sustainability of the system could lead to a risk of declining support and audience ratings. For this reason, politicians and mass media who directly address these points are rare. Another issue is that policy-related points made by politicians, the media, and bureaucrats are specialized, individual content relating to decreasing expenditure, whereby it is difficult to gain understanding from the public.

On the other hand, we are in a situation in which discussions are occurring concerning the balance between benefits and burdens going beyond decreases in expenditure, and the necessity of gaining political and public support continues to increase. The setting of a system resistant to drops in expenditure and gaining of public understanding regarding this system are a necessity. To this end, it is necessary to communicate, in particular to the younger generation who are currently paying more than they are receiving, the importance of healthcare's contribution to watching over our health and of sustainable access to healthcare going into the future.

* This proposal was created as a part of activities of the Health and Medical Policy Consortium, and was supported by the Pharmaceutical Research and Manufacturers of America (PhRMA).