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＜Review＞

Economic background and issues of regional medical coordination policy in Japan

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Abstract

"Regional medical coordination" is a key concept in the consideration of future regional healthcare provider systems as well as an important and strongly promoted policy issue. However, there have been few studies in which such policy and related issues have been organized and analyzed on the basis of economic knowledge. This study outlines an approach based on basic economic concepts for interpreting "regional medical coordination" within the context of economics, the implications derived, and the points that society should consider while promoting desirable regional medical coordination.

In traditional medical care by self-contained healthcare institutions, each healthcare institution pursues economies of scale and scope. Therefore, the economic motive aiming at self-contained healthcare institutions exists. However, functional differentiation through regionally contained medical care may, under certain conditions, increase the capability to provide healthcare for the entire society without increasing production resources. Promoting such a policy has a certain economic rationality, given the severe labor shortages currently occurring in regional medical care. To build a favorable cooperative system, development of an infrastructure that facilitates network externalities and economies of consolidation is important. Securing opportunities for mutual understanding, a long-term cooperative relationship, and third-party facilitation have been suggested as measures for improving operational issues after building a cooperative system.

Regional medical coordination tends to be considered primarily from the perspective of provider logic. However, when evaluating the policy as a whole, we must balance provider issues against the policy's disadvantages and the resulting reduction in benefits to patients.

keywords: Regional medical coordination, healthcare provider system, functional differentiation, regionally contained health care, network externalization, prisoner's dilemma

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I. Background and progress of regional medical coordination policy

The direction of current healthcare system reform in Japan is specified in the June 2006 Healthcare Reform Bill. The rationale underpinning these reforms is set forth in the Outline of Healthcare System Reform (Iryo-seido kaikaku taiko in Japanese) approved by the government and ruling party's Council on Healthcare Reform in December 2005 [1]. One of the major pillars of this system reform outline is the "emphasis on prevention and ensuring peace of mind and trust in medical care" with "response to the issues of shortage of physicians" and "establishment of a system of regional medical coordination" proposed as supporting measures.

Coinciding with this outline, the Fifth Amendment to the Medical Service Law in 2006 serves the purpose of

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"Promoting the differentiation and coordination of medical functions through the review of medical planning systems" thus generating a requirement for a system of coordination for four illnesses/five operations within the regional medical plan. Furthermore, the "Outline of Integrated Social Security and Tax Reforms" approved by the Cabinet in February 2012 emphasizes collaboration and role division of hospital functions, increased cooperation between hospitals, and the enhancement of in-home medical care [2]." Given the aforementioned policies, we can state without exaggeration that regional medical coordination is the most important concept in future healthcare provider systems in Japan.

What types of factors contributed to the background for regional medical coordination becoming a key concept of healthcare provider system reform? Insufficient differentiation of medical functions has always been noted as a problem with Japan's healthcare provider systems. A review of recent history reveals problems such as insufficient functional differentiation of hospital beds, including mixing acute patients and long-term care patients; insufficient functional differentiation for outpatients in clinics and large, medium, and small hospitals; and issues with long waiting times and patient focus in large hospitals, all relating to the current status and issues in healthcare provider systems within the "Challenges and Perspectives of Healthcare Reform" issued in March 2001 by the Ministry of Health, Labour and Welfare's Central Office for Promotion of Reforms such as Healthcare for the Elderly [3]. Such recognition probably motivated the review of hospital bed classification in the Amendment to Medical Services Law of the same year. Furthermore, with society's growing sense of crisis in the decline of healthcare institutions, "A Vision for Ensuring Peace of Mind and Hope" was issued in June 2008, specifying that standalone healthcare institutions should not provide healthcare by a self-contained healthcare institution, but should promote regionally contained healthcare for the entire region with each healthcare institution leveraging its specialty [4].

Consequently, the following comprised the background factors of regional medical coordination: recognition of past problems arising from the lack of functional differentiation in healthcare institutions combined with numerous reports of shortage in healthcare manpower since 2006, the state of decline in regional healthcare, and the expectation of measures to integrally improve these issues from a supplier perspective.

As such, regional medical coordination is an important and strongly promoted policy issue; however, there have been few cases in which such policy and related issues have been organized and analyzed on the basis of economic knowledge. We believe that there is profound significance in understanding the academic background relating to the key concepts in building a regional health provider system as well as examining its validity and related considerations.

Based on the above recognition and fundamental economic concepts, this study outlines an approach to interpreting regional medical coordination within the context of economics, the implications derived, and the points that society should consider in order to promote desirable regional medical coordination.

This paper proceeds as follows. First, after defining "regional medical coordination" and noting specific situations, Section Ⅱ reviews previous research related to regional medical coordination from an economic perspective. Section Ⅲ examines self-contained healthcare institutions—Japan's traditional system of providing regional healthcare. Section Ⅳ examines each currently promoted economic background factor for regionally contained healthcare. Section Ⅴ describes important points for formulating better regional medical coordination from an economic perspective. Section Ⅵ discusses common problems in regional medical coordination and approaches to dealing with them. Section Ⅶ describes bottleneck problems that determine regional medical coordination policy success or failure. Section Ⅷ describes the tradeoffs in executing the policy. Finally, Section Ⅸ concludes the paper.

II. Definition and elements of regional medical coordination and previous research review

Although described as "regional medical coordination," the concrete implementation of the policy in the field and actual cases takes various forms. Then, how exactly should regional medical coordination be defined?

According to the Ministry of Health, Labour and Welfare, regional medical coordination is defined as "the promotion of functional differentiation and specialization of healthcare toward smooth coordination of all healthcare institutions within a region in accordance with the circumstances of regional healthcare institutions and the condition of regional healthcare, so that the residents receive appropriate and consistent healthcare within their region through the effective utilization of the available resources." [5] From this definition, we can see that "specialization and functional differentiation of regional healthcare institutions" as well as "smooth coordination" are the major pillars.

Actual examples of regional medical coordination implementation based on "specialization and functional differentiation" that demonstrate "smooth coordination" in the formulation of clinical networks through IT, the design of systems such as collaborating coordinators, the installation and use of open hospital beds, and the shared use of medical equipment can be observed. [6] As the definition suggests, this study discusses the central problem of regional medical coordination by focusing on functional differentiation and specialization and smooth

coordination.

Previous research has indicated the problem addressed in this study. Less research than expected discusses regional medical coordination from an economic perspective. The first noteworthy work is Yamamoto and Kondo [7], which empirically examines the extent to which functional differentiation of healthcare has actually progressed from the perspective of understanding the actual condition. Within the context of public hospital restructuring, Tanida and Hayashi [8] demonstrated that the selection and concentration of resources through functional differentiation does not necessarily equate to desirable results for society. Furthermore, Hayashi [9] constructed a logical model focusing on the healthcare functions of acute and recuperative care and analyzed circumstances wherein the differentiation of healthcare functions has proven effective from a societal standpoint. The study also examined fees for medical services, which influence differentiation. As a result, interesting implications were suggested, such as (1) maintaining the disparity between the fees for medical services at a certain level in order to properly facilitate functional differentiation and (2) the necessity for cooperation between healthcare institutions with emphasis on the public interest versus profit-oriented healthcare institutions to obtain the optimal social solution through functional differentiation of healthcare [9].

Each of the aforementioned examples of previous research focus on functional differentiation without sufficient consideration of issues related to smooth coordination that arise after functional differentiation. Although the regional healthcare provider system in Japan is undergoing a major transformation from healthcare by self-contained healthcare institutions to regionally contained healthcare, the economic factors behind each type of system have not been sufficiently examined.

Therefore, in addition to briefly organizing the economic background factors behind the regional medical system that has evolved to date as well as describing anew the roles of functional differentiation, Section Ⅲ addresses the economic understanding of smooth coordination issues.

Furthermore, classification of perceptions of functional differentiation in regional healthcare can occur on various levels such as clinics versus hospitals, clinical departments versus functionalities of healthcare institutions, and acute versus chronic illnesses. This study advances the theory and assumption that the conceptual model significantly bisects chronic and acute healthcare required in a region.

III. Economic background of healthcare by self-contained healthcare institutions

In healthcare by self-contained healthcare institutions, one healthcare institution has comprehensive healthcare capability and provides comprehensive and complete healthcare services to patients (Figure 1). This system contains multiple healthcare institutions with similar treatment functions in the region with no major differences, particularly in the types of patients treated. Because these circumstances present no clear differences in treatment functions or patients among healthcare institutions, each institution must differentiate itself by specializing in patients within a limited area of medical practice. It is well known that numbers of high-cost advanced medical equipment such as CT and MRI in proportion to the population are extremely high in Japan when compared internationally; this phenomenon is probably motivated by competitive differentiation.

Although the introduction of advanced medical equipment and new, extended, and renovated hospital wards is a readily understood means of differentiation, it also incurs significant investment costs. If fixed costs are a large portion of investment costs, each healthcare institution can reduce unit costs by increasing the amount of services by exploiting the capital. This background factor of “economies of scale” underpins the principle of lower costs.

In the conventional fee-for services payment system (“dekidaka barai” in Japanese), each healthcare fees are unitary regulated, the total medical practice revenue is fundamentally determined by multiplying the per unit fee for medical service by the amount of service provided. In this revenue structure, the reduction of per unit costs equates to increased profit. It is considered that the fee-for services insurance payment system coupled with the economic motivation of pursuing economies of scale by increasing the amount of services provided have influenced healthcare institution management, especially in Japan where the costs of investments in the facilities and the equipment of healthcare institutions are not explicitly classified and evaluated in the fees for medical services.

Reasons other than large fixed costs explain “economies of scale”. Service production scale expansion brings about volume purchasing of raw materials necessary for supply. If the purchaser has more significant negotiating power over the seller, costs decrease even further through deals with more favorable terms such as discounts.

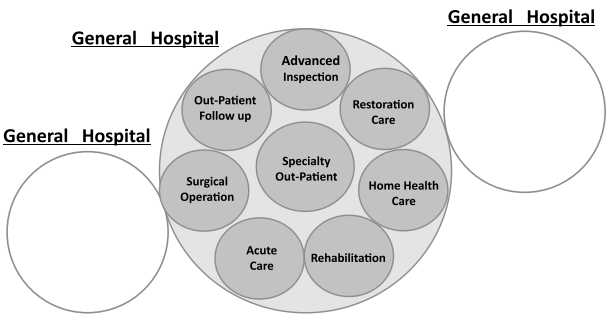

Figure 1 Healthcare System by Self-contained Institutions

It is considered that economies of scale accompanied by improved purchasing power has occurred when regional healthcare institutions' treatment functions and their patients were not sufficiently differentiated because one regional institution expanded to offer more comprehensive treatment for acute and chronic illnesses.

Similarly, achieving economies of scope is another important motivation for self-contained healthcare institutions. We usually explain economies of scope as follows. Two goods and services, Y_1 and Y_2, are produced simultaneously at a total cost of $C(Y_1, Y_2)$. The cost of producing these goods and services separately as individual units is $C(Y_1, 0)$ and $C(0, Y_2)$. Economies of scope is defined when the cost of combined production is lower than the cost of producing each unit individually, that is, when $C(Y_1, Y_2) < C(Y_1, 0) + C(0, Y_2)$.

Although certain facilities and equipment in healthcare institutions have been designed for use in a specific department, multiple departments and medical treatment functions can share most equipment, such as the aforementioned CT and MRI devices.

We can differentiate a healthcare institution with a single department acquiring each piece of equipment separately with one with multiple departments acquiring the equipment centrally for shared use to provide healthcare services. When evaluated as a healthcare system for an entire region, the second example, given the same quality of care, is more effective with lower investment and management operational costs. Of course, for a single institution to provide comprehensive self-contained healthcare services for patients, it must have departments and functions for medical services bridging acute and chronic care. Therefore, self-contained, healthcare institutions have enjoyed the benefits of economies of scope.

In addition to each institutions' aforementioned economic factors, we note three factors for regional healthcare by self-contained healthcare institutions: factors for consistently increasing population, popularization of medical insurance, and payment system for medical services based on fee-for services. Increasing population and the popularization of the insurance system affect the increased healthcare demand. A fee-for services payment system that guarantees increasing profits merely by accommodating the corresponding increase in demand probably supported the underlying motivation for self-contained healthcare institutions by independently meeting many patients' healthcare needs.

IV. Economic background of regionally contained healthcare

Regionally contained healthcare is based on functional differentiation of healthcare institutions and smooth coordination, in contrast to healthcare through self-contained healthcare institutions (Figure 2).

The theoretical background for the measurement of functional differentiation resides in classical economic concepts: Adam Smith's advantage of division of labor and Ricardo's comparative advantage. Using the concept of comparative advantage, Ricardo [10] demonstrated the enhancement of both productivity in society as a whole and societal welfare through each country's utilization of its comparative advantage by specializing in the production of goods of comparative advantage and cooperatively facilitating products through trade. Although Ricardo used the framework of trade to demonstrate the benefits of functional differentiation through comparative advantage, the implications can be broadly applied to other aspects of society. Here, we broadly segment regional healthcare service functionality into acute and chronic healthcare and explain the advantages of functional differentiation on the basis of comparative advantage.

Consider two healthcare institutions (Hospital α and

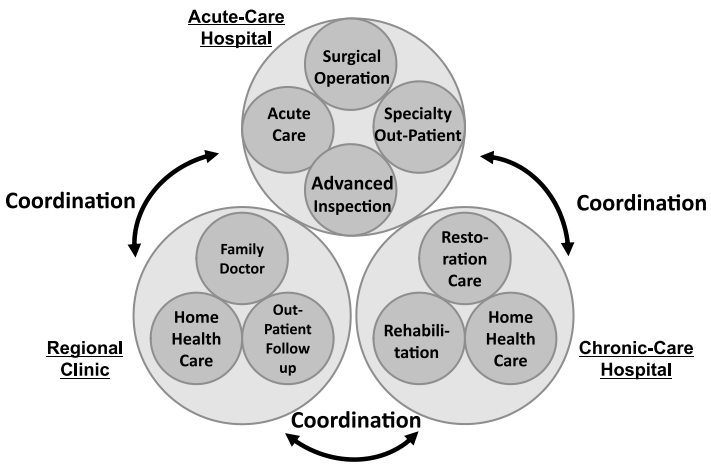

Figure 2 Regionally Contained Healthcare System

Hospital γ) in a region where healthcare institution functions are insufficiently differentiated. When a set number of healthcare personnel work for a set number of hours in Hospital α, Unit A provides acute healthcare services, and Unit B provides chronic healthcare services. On the other hand, when the same number of personnel work for the same number of hours in Hospital γ, Unit A' provides acute healthcare services, and Unit B' provides chronic healthcare services.

If A > A', Hospital α has an absolute advantage over Hospital γ in providing acute healthcare services. If A/B > A'/B', Hospital α has a comparative advantage over Hospital γ in providing acute healthcare services (in comparison to chronic healthcare services).

Because 10 > 9 and 5 > 3 in Table 1, Hospital α also has an absolute advantage over Hospital γ in providing acute and chronic healthcare services. From a comparative advantage perspective, Hospital γ has a comparative advantage in providing acute healthcare services because (9/3) > (10/5). That is, Hospital γ can produce three units of acute healthcare service by sacrificing one unit of chronic healthcare service, whereas Hospital α can produce only two units of acute healthcare service by sacrificing one unit of chronic healthcare service. Hospital α has an absolute advantage over Hospital γ with regard to either healthcare service (As A > A' and B > B'). In this case, we examine whether it would be advantageous for Hospital α to form a collaborative relationship with Hospital γ.

This time, Table 1 displays the number of units of both acute and chronic healthcare services that each healthcare staff member can provide in Hospital α and Hospital γ when working a set number of hours.

Assume that Hospital α and Hospital γ each have 200 personnel, 100 of which provide acute healthcare services, while the remaining 100 provide chronic healthcare services. Table 2 displays the acute and chronic healthcare services produced by each hospital under this assumption.

Let us further assume that each hospital differentiates functionally by the service for which it has a competitive advantage (its specialty). For example, Hospital α increases the number of personnel who provide the service for which it has a competitive advantage (chronic healthcare services) by 180, and Hospital γ increases the number of personnel providing such service (acute healthcare services) by 200. Table 3 displays the acute and chronic healthcare services produced by each hospital under this assumption.

A comparison of Tables 2 and 3 reveals an increase in the total number of services produced in the entire region through functional differentiation based on current capability.

The concept of "comparative advantage" is not limited to international divisions of labor, but applies broadly to general divisions of labor intra-domestically, inter-institutionally, and thus among healthcare personnel. Policy implications of functional differentiation in regional healthcare lie in the enhancement of the entire region's service provider capabilities through each healthcare institution apportioning roles and specializing in its area of expertise on the basis of comparative advantage without having to increase production capability. This strategy has significant implications in light of the recent extreme difficulties in securing adequate regional manpower, beginning with physicians and nurses. Similar to the aforementioned Hayashi's [9] discussion on conditions for achieving functional differentiation of healthcare regionally, we must remember that functional differentiation according to comparative advantage does not operate unconditionally.

One effect that can be expected within institutions that accompanies the development of functional differentiation within each healthcare institution is the "experience curve effect". The experience curve effect generally refers to the ability of individuals and organizations to handle issues more efficiently as their experience increases [11]. In addition to generating improved outcomes, designated healthcare institutions can amass more cases and achieve higher treatment efficiencies if patients suffering from the same illness, heretofore dispersed among all healthcare institutions, now gather in a specific healthcare institution

Table 1 Comparative Advantage & Absolute Advantage

	Hospital α	Hospital γ
Acute Care Services	10	5
Chronic Care Services	9	3

Table 2 Total Amount of Services under "NOT" Differentiated by Comparative Advantage

	Hospital α	Hospital γ
Acute Care Services	1000 (＝10×100人)	500 (＝5×100人)
Chronic Care Services	900 (＝9×100人)	300 (＝3×100人)
Total Amount	1900	800

Table 3 Total Amount of Services under Differentiated by Comparative Advantage

	Hospital α	Hospital γ
Acute Care Services	200 (＝10×20人)	900 (＝5×180人)
Chronic Care Services	1800 (＝9×200人)	0 (＝3×0人)
Total Amount	2000	900

with functional differentiation.

V. Important economic factors in promoting regional medical coordination

Functional differentiation of each regional healthcare institution alone is insufficient to achieve regionally contained healthcare because regional contained health system requires the simultaneous operation of smooth connections among the functionally differentiated institutions. This section describes the economic factors that encourage smooth coordination.

We can safely state that building a system for regional medical coordination requires the formation of a network that interconnects healthcare institutions previously operating as individual units in a region. Within such a network, increasing subscribers in turn expands network connections and information sharing, thus generating positive externalities in the form of increased utility for existing subscribers [12]. Economic externalities are certain economic decisions and activities that influence the decisions and activities of other economic entities [13]. A positive externality exists if the influence is a net gain. As an example of regional medical coordination, the larger the network of healthcare institutions with relationships that cooperatively facilitate referrals, and the more the exchange referrals increase, the greater the increase in subscriber (healthcare institutions and patients) benefits and in the value of the network itself. Although new institutional subscribers consider only the subscribing cost and the benefits of using referrals from other institutions when subscribing, the further benefit of subscription is the increase in potential referrals to existing network users. Researchers acknowledge that the network subscription behavior always tends to be less than the socially desirable level when such a positive externality exists [14].

Actual examples of construction of systems for regional medical coordination include exclusive networks consisting of only advanced institutions in a region or entities having existing relationships. However, to widely enjoy the aforementioned external benefits and enhance benefits for the entire region, the policy must encourage broad network participation by lowering entry barriers and widely publicizing the formation of networks in regional healthcare for the referral and exchange referral of patients as well as for information sharing.

Building a network requires an awareness of the "economies of consolidation". Economies of consolidation differ from those of scope and denote a phenomenon wherein the sharing and trading of information reduces costs more than the individual collection of information, even with weak technological relationships [15]. Such cases involve sharing customer information across industries such as insurance, securities, and banking. For regional medical coordination, sharing information among healthcare institutions becomes even more important, and thus, each institution must make sufficient preparatory adjustments to create common ground on various levels such as information systems, paths to regional coordination, and sharing of patient information forms.

VI. Economic interpretation and response to issues arising in applied coordination

Besides creating the system structure that coordinates and facilitates the participation of multiple regional healthcare institutions, we must consider a number of issues in operating and maintaining the collaborative relationship.

For example, those who have implemented regional medical coordination have wondered, "Will other healthcare institutions actually obey the rules instituted within our region with regard to patient referrals, exchange referrals, and systems for admitting patients who have been released? Perhaps our institution alone will end up bearing the burden…." Others have stated that "We received a request from a central hospital that is also a coordinating institution to admit a released patient into our long-term care ward. Although we have beds available to receive this patient, the last time we took in a patient about whom we were informed that he posed 'no problems', the truth was very different and caused us consternation. Will it be all right this time?" If cases such as these fester, mutual distrust increases and may eventually destroy a promising collaborative system. Such a situation may be depicted as a prisoner's dilemma, where each entity's attempt to maximize its greatest temporary personal benefit in an environment lacking sufficient mutual understanding causes the inability to obtain the maximum results for all.

Now, assume that two hospitals exist within a region: Hospital α is responsible for acute healthcare and Hospital γ is responsible for chronic healthcare. When Hospital α refers a released patient to Hospital γ, assume that there are two options: the circumstances are always accurately related, and the accurate information is inconsistently provided. Conversely, assume that Hospital γ has two options for receiving the patient referred from Hospital α: always provide information on available hospital beds and receive patients on the basis of this information, and voluntarily perform such service in an inconsistent manner. Under such conditions, which options will Hospital γ and Hospital α choose each? Table 4 uses a numerical value to represent the gain for each option exercisable by Hospital γ and Hospital α. For example, if Hospital α does not consistently provide accurate patient information, it will incur no particular loss if Hospital γ accepts the patient; however, Hospital γ incurs a loss from the volume of work created in adjusting to the admission of a patient on the

basis of inaccurate information. That is, the gain for Hospital α is 0 and that for Hospital γ is -15, where the integers in Area C represent each hospital's gain. Conversely, if Hospital γ has doubts regarding the information supplied and refuses admittance of patients despite Hospital α providing accurate patient information, Hospital α incurs a loss as it cannot ensure a destination for discharged patients and must expend considerable effort in resolving the problem; on the other hand, Hospital γ incurs no particular loss (Area B). When considering the entire region's gain from the complementary gains of both Hospital α and Hospital γ, Area D (gains of Hospital α at -2 and Hospital γ at -2) is the most advantageous with Hospital α providing accurate patient information despite the extra effort with the recipient and Hospital γ readily accepting patients on the basis of accurate information sharing. Conversely, Area A represents Hospital α providing inaccurate information and Hospital γ refusing to admit patients, which is the least advantageous result for the entire region.

Given these circumstances for gain, what kind of options will both parties exercise when making rational decisions? Following the thinking of acute care Hospital α, saving themselves the cost of providing accurate information (gain of -10) incurs lesser loss than that by providing accurate information (gain of -15) if chronic care Hospital γ decides not to voluntarily accept patients. Even if chronic care Hospital γ decides to accept patients, saving themselves the work of providing accurate information (gain of 0) incurs lesser loss compared to the option of providing accurate information (gain of -2). Therefore, the result will be Hospital α exercising the option of saving the work of providing accurate information regardless of Hospital γ's decision.

Following the similar thinking of chronic care Hospital γ also results in the decision to not voluntarily accept patients, regardless of Hospital α's decision. This result determined by both parties' choices is the least desirable gain for society represented by Area A (-10, -10).

This example is the setting for the two-player non-cooperative game in game theory. Given these circumstances, why can the collaborating hospitals not choose the options (Area D) most beneficial to society: provide accurate information and accept patients? Although a detailed explanation exceeds the scope of this study, let us consider three important factors in choosing the most beneficial options. First, these settings do not provide an opportunity for negotiation and mutual understanding. Naturally, achieving the whole and harmonious distribution of maximum benefits through both parties' adequate mutual understanding and negotiation equates to obtaining the gains in Area D. Second, the setting is depicted as a one-time deal only and does not take into account repeat two-party decision-making in the context of an enduring relationship. If the mutual relationship is a one-time deal, the decision-making process has a strong incentive to maximize temporary personal gain. However, these factors differ when the relationship is long term and permanent. Such a relationship sours through maximization of short-term self-interest by outwitting your partner, and rather than settling for a medium- to long-term decrease in gain, parties probably have greater incentive to cooperate and maximize medium- to long-term gain even by sacrificing a certain amount of short-term gain. Third, the placement of a third party with neutrality and authority in a monitoring capacity for the benefit of the two-player parties. Such measures prevent the aforementioned circumstances and typify the government's expected function in a system of regional medical cooperation.

The prisoner's dilemma example suggests the following three tactics for achieving successful coordination of regional healthcare institutions: 1) ensure opportunities for smooth communication and mutual understanding; 2) increase the permanence of the collaborative relationship; and 3) interpose a neutral authority.

Table 4 Pay-off Matrix under Prisoner's Dilemma

		Acute Care : Hospital α	
		Inconsistent	**Accurate & Consistent**
Chronic Care : Hospital γ	**Not Admitted**	-10 **A** -10	-15 **B** 0
	Admitted	0 **C** -15	-2 **D** -2

VII. The bottleneck problem in regional medical coordination

The bottleneck problem is derived from the metaphor that the amount of water outflow from a bottle is limited by the thinness of the neck (bottleneck) regardless of how much water the bottle contains, and refers to the most pressing factors and problems that influence overall results. Here we consider the bottleneck problem in systems for regional medical coordination from the perspectives of both supply and demand.

The bottleneck problem on the supply side, more than anything else, entails the absolute shortage of treatment facilities and functions accompanied by the difficulty of securing adequate manpower such as physicians and nurses. One reason for promoting regionally contained medical coordination is to enhance supply within a region without having to obtain new production resources

externally through functional differentiation even with set conditions. This issue is significant in promoting the regional medical coordination policy in circumstances where many regional healthcare institutions currently have extreme difficulty in securing physicians and nurses, with no particular prospects for improvement.

Unfortunately, coordination is not practical with an absolute shortage of manpower and healthcare institutions required to cover a region's minimum healthcare functions. The difficulty in coordination is especially obvious when distinguishing between acute and chronic care in the absolute shortage condition in chronic care facilities that receive patients released from acute care, such as long-term care facilities, nursing facilities, and home care systems. From this perspective, a system of regional medical coordination that promotes functional differentiation and role apportionment must ensure that it is an effective policy in regions with minimum healthcare functionality.

The bottleneck problem on the demand side lies in the current and future healthcare needs within a region. Japan continues to age as a nation. Although the need for chronic healthcare is expected to increase, regions exhibit wide disparities in age composition and population. Therefore, they differ greatly in the required content and amount of future healthcare. Although building a system for regional healthcare promotes a unified national policy, such as the "five illnesses/five departments" rule required in regional medical plans, the national system should provide sufficient consideration of the disparities among regions' current and future needs. The purpose of planning regional medical coordination is to establish a system that effectively and adequately provides the required healthcare services for the region's residents. Policy makers must remember that accurately understanding regional healthcare needs and supplying a system that reflects those needs when promoting such a policy ensure that the building of a coordination system does not become an object unto itself.

VIII. Tradeoffs between patient convenience and functional differentiation in healthcare institutions

From the perspective of patients and users, functional differentiation among healthcare institutions may cause the following issues: 1) patients previously receiving complete checkups at a single neighborhood healthcare institution are now required to receive examinations at multiple healthcare institutions because of coordination; 2) patients who even though still receiving a complete checkup at a single healthcare institution must receive it at a distant healthcare institution because of functional differentiation of the institution where they had formerly received examinations.

These issues reduce patient accessibility convenience. Naturally, regional residents benefit from efficient healthcare delivery and increased capacity to provide services through functional differentiation and coordination. That being said, we must acknowledge that the restructuring and consolidation of regional healthcare institutions under the functional differentiation umbrella are overwhelmingly advanced in accordance with healthcare providers' circumstances and logic. I stress the importance of 1) considering the level of patient convenience reduction caused by the regional medical coordination policy, and 2) evaluating the policy from the perspectives of both society and the appropriateness of coordination-related restructuring and consolidation.

IX. Summary and conclusions

Last, let us review the main points of this study. It first discussed the traditional concept of regional healthcare providers and introduced changing concepts of regional healthcare, from the original "self-contained healthcare institutions" to the new concept of "regionally contained healthcare," with the nature of each provider and the factors inherent in each policy. In healthcare via self-contained healthcare institutions, each medical facility pursues economies of scale and scope on the basis of societal and systemic contexts of consistent increase in healthcare demand, fee-for services payment system, and functional differentiation, resulting in the internal economic motive of healthcare via self-contained healthcare institutions.

In contrast, restructuring toward more effective regional healthcare has become a societal demand in the societal and systemic context of future population reduction and aging, absolute difficulties in securing physicians and nurses, and stringency in funding healthcare costs. Researchers consider the introduction of a regional healthcare coordination policy connecting functional differentiation among healthcare institutions and institution coordination an appropriate response to this demand.

The regionally contained healthcare framework supports healthcare needed within a region through functional differentiation and coordination. As classical differentiation models adapted to acute and chronic regional healthcare services suggest, functional differentiation may, under certain conditions, increase the capability to provide for the entire society without introducing additional production resources. Promoting such a policy has a certain economic rationality in light of the current severe labor shortages in regional medical care.

Furthermore, society requires a good system of regional coordination without relying completely on functional differentiation. This goal demands infrastructure development that enables smooth information sharing and more widespread participation, producing the benefits of network externalities and consolidation economies.

We described circumstances similar to a prisoner's dilemma in the referral of patients as an operational problem in a coordination system. Furthermore, we suggested that guaranteeing opportunities for mutual understanding, guaranteeing long-term coordination, and neutral third-party authority facilitation may be effective measures for improving such situations.

Although creating a system of regional medical cooperation is a policy project uniformly promoted by the government, a fundamental definition of its success or failure must consider the bottleneck problem. Supply side factors include the absolute shortage of healthcare resources required to cover a region's minimum healthcare functions. Demand side factors include a competent understanding of current and future healthcare needs. Support for regions experiencing absolute shortages of healthcare resources is an indispensable prerequisite in promoting the regional medical coordination policy. A coordination system should be built in accordance with regional circumstances revealed by sufficient research and understanding of regional healthcare needs.

Finally, we stress that the regional medical coordination policy primarily from the logic and perspective of providers, and an overall evaluation of the policy should include sufficient evaluation of the inconvenience the policy causes to patients.

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地域医療連携政策の経済学的背景と課題

抄録

「地域医療連携」は今後の地域医療の提供体制を考える上でのキーワードであり重要な政策課題として現在強力に推進されている．しかしこれまでその政策と関連課題について経済学の知見にもとづき整理，検討した例はきわめて少ない．本稿では「地域医療連携」が経済学の文脈のなかでどのように解釈され，いかなる意味をもつのか，また社会にとってより望ましい地域医療連携を図っていくために留意すべき点は何かという点について，経済学の基本的な概念をベースとして概説した．

従来の「医療機関完結型」医療では，個々の医療機関が「規模の経済性」,「範囲の経済性」を追及するなか，結果として「医療機関完結型」医療を志向する経済的動機が内在していた．一方,「地域完結型」医療における機能分化は，一定の条件のもと追加的生産資源の投入なしに社会全体の提供能力を向上させる可能性があり，現在の地域医療における深刻な人材不足等を考慮すれば，この政策の推進には経済学的にも一定の合理性がある．また良好な連携体制の構築には,「ネットワークの外部性」,「連結の経済性」を享受できるような基盤整備が重要である．連携体制構築後の運営面での課題を改善する方策としては「意思疎通の機会の確保」,「連携関係の永続性確保」,「第三者の介在」が示唆された．

地域医療連携政策は主として提供側の論理で考えられている側面が強く，政策全体の評価としては，この政策でもたらされる患者側の不利益や便益低下についても十分配慮すべきである．

キーワード：地域医療連携，医療提供体制，機能分化，地域完結型医療，ネットワーク外部性，囚人のジレンマ

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