



The Attributes of Physicians Assigned to Rural Clinics Designated for Areas without Physicians in Japan

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In Japan, there are rural clinics designated for areas without physicians to ensure the availability of medical care for rural area residents. The purpose of this study was to clarify the attributes of physicians working in the rural clinics. Using the 2018 Ministry of Health, Labour and Welfare data in Japan, we compared the attributes and board certifications of physicians in rural clinics with those of physicians in other clinics. The age group with the highest percentage of physicians was the over 70 group (16%) and the early 30s group (15%) at rural clinics; however, the highest percentage of physicians at other clinics was the 70 over group (20%) and the early 60s group (16%). The number of physicians working in the internal medicine field at rural clinics was 550 (89%). There were 147 (27%) board-certified physicians in that field. Among them, the number of board certifications in internal medicine, surgery, and other than internal medicine or surgery were 79 (54%), 17 (12%), and 51 (35%), respectively. The proportion of board-certified surgery physicians within the internal medicine field in rural clinics was significantly higher than in other clinics (5%). In rural clinics, the age distribution of physicians was different from that in other clinics, and many of the physicians worked in the internal medicine field, but some of them seemed to have a mismatch between their board-certifications and their fields of practice. Further studies are necessary to clarify what the mismatches mean in rural practice.

Keywords: primary care; remote area; rural clinics; rural medicine

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Introduction

Physicians are generally concentrated in urban areas (Matsumoto et al. 2010a, b; Tanihara et al. 2011). Reducing the uneven distribution of physicians between urban and rural areas is an urgent issue (Strasser 2003). For sustainable rural medical care, it is important to secure physicians who work in medical institutions located in rural areas.

In each country, various efforts have been made to secure physicians in rural areas. For example, to prevent uneven distribution of physicians between urban and rural areas, programs such as employment placement, granting incentives such as scholarships have been implemented in about 70 countries (Frehywot et al. 2010). However, the

shortage of primary care physicians and a declining population in rural areas have influenced physicians' movement from rural to urban cities (McGrail and Humphreys 2015; McGrail et al. 2017), and measures to secure physicians in rural areas are currently being researched.

As for measures against an uneven distribution of physicians between urban and rural areas, several countries operate a physician dispatch system, with incentives such as scholarship lending for physicians in rural areas (Frehywot et al. 2010). This system is being implemented in Japan (Matsumoto et al. 2019; Yoshida et al. 2019). Although a high proportion of physicians are working in their designated areas, there are cases where the obligatory service is postponed, and the physicians are working in

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non-designated areas (Yoshida et al. 2019). There are also cases of withdrawal from the obligatory service (Matsumoto et al. 2017). Thus, it is difficult to secure physicians as planned in rural areas of Japan.

Regarding Japanese patients' behavior, although there is a free-access system that allows patients to receive treatment at the medical institution of their choice (Kaneko and Matsushima 2017), generally, the patient first visits a clinic (Fukui et al 2017), and clinics provide primary care to the patients. There are two types of clinics; private clinics and public clinics. The number of physicians is likely to be smaller in rural areas, and therefore, the percentage of public clinics is likely to increase. In addition, the municipality economically supports private clinics in rural areas, and such private clinics are considered to be semi-public clinics (Ministry of Health, Labour and Welfare 1979).

In Japan, rural clinics have been established to provide primary care to people living in areas without physicians. The establishment of these clinics is included in the medical plans for securing physicians in rural areas of each prefecture (Ministry of Health, Labour and Welfare 2001, 2020a). The policy identifies areas with limited access to medical care and sets up rural clinics for the residents of those areas (Ministry of Health, Labour and Welfare 2001). In addition, to prevent shortages of physicians at rural clinics, rural medical centers sometimes dispatch physicians to rural clinics (Ministry of Health, Labour and Welfare 2001, 2020a). However, there is no steady system to dispatch physicians to rural clinics. In addition to physicians who are spontaneously working in rural clinics, based on the medical plan in each prefecture, physicians may be dispatched from rural medical-base hospitals to rural clinics (Ministry of Health, Labour and Welfare 2001). Some departments of the medical university may dispatch specialized physicians, or the prefecture offices may dispatch physicians to clinics in rural areas with a scholarship system by the systems of the Jichi Medical University or regional frame (Jichi Medical School 2002; Yoshida et al. 2019). Therefore, the attributes and the backgrounds of physicians at rural clinics are varied (Jichi Medical School 2002); however, there are few studies on this issue. We thought that studying the attributes of physicians in rural clinics would provide clues to their background. Studies thus far have focused on rural areas, but not specifically on rural clinics. There is a report stating that the factors of physicians working in rural areas include having a rural background, undergraduate exposure to rural practice, multispecialty-rotation in postgraduate training, and current administrative position (Matsumoto et al 2005). Another study found that primary care physicians are more likely to settle in rural areas (Woloschuk and Tarrant 2004; Inoue et al 2009).

One of the medical institutions providing primary care in rural areas is rural clinics. To take measures to secure physicians in rural areas, it is necessary to clarify the current situation of rural clinics. However, the attributes of

physicians working in rural clinics have not been clarified. The purpose of our study is to clarify the current attributes of physicians working in rural clinics.

Materials and Methods

Physicians working in clinics were classified into those working in rural clinics and those working in other clinics. We compared these attributes and the types of qualifications related to specialization (hereafter referred to as board certifications) of the physicians at each clinic. Next, we categorized the physicians working as an internist in rural clinics into the following three groups according to whether they had board certifications; board certifications of internal medicine, board certifications of other than internal medicine, and no board certifications. We then compared the attributes of these three groups.

Data collection

The Ministry of Health, Labour and Welfare conducts "The survey of Physicians, Dentists, Pharmacists" every 2 years as a national survey. In Japan, the Medical Practitioners Act requires all physicians to report the situation every 2 years. The response rate for this survey was reported to be 90% (Shimada and Kondo 2004). We requested official permission from the Ministry of Health, Labour and Welfare to analyze part of the 2018 survey for research purposes in accordance with the procedures set forth in the statistics law. The survey data includes the medical registration number, sex, year of physician registration, place of work, types of medical facilities in which they work, area of practice, board certification, and the name of the medical institution where the employee was employed. The data was anonymized so that individuals could not be identified. Further, when the number of physicians in the aggregate results was calculated to be less than 10, it was indicated as < 10 in the table. The total number of registered physicians in the provided data was 327,210. We selected physicians who provided the name of their medical institution of work ($n = 324,673$, 99.2%).

Classification of medical institutions

The medical institutions were categorized into clinics, hospital (including medical education institutions), and other medical facilities. Rural clinics are clinics established in areas with a population of $\geq 1,000$ people, where residents live within a radius of approximately 4 km from the central community and reaching major medical facilities would take > 30 minutes even with ordinary transportation (Ministry of Health, Labour and Welfare 2001). Since rural clinics were included as clinics in the medical institution classification of the survey data, we extracted the clinics from the text data of the medical institution name in the survey data using published rural clinic list from the text data (Ministry of Health, Labour and Welfare 2021). Non-rural clinics were classified as other clinics.

Classification of board certification and area of practice

With reference to past reports (Ministry of Health, Labour and Welfare 2020b), area of practice was classified into internal medicine (internal medicine, respiratory medicine, cardiology, gastroenterology, nephrology, neurology, diabetes medicine, metabolic medicine, hematology, allergy, rheumatology, infectious diseases, and psychosomatic medicine) and surgery (surgery, respiratory surgery, cardiovascular surgery, breast surgery, tracheoesophageal surgery, gastroenterological surgery, anal surgery, and pediatric surgery). Board certifications, corresponding to areas of practice, were classified into internal medicine and of surgery. Board certifications of internal medicine included certification of general internal medicine, pulmonology, cardiology, gastroenterology, nephrology, neurology, diabetology, endocrinology, hematology, allergology, rheumatology, infectious diseases medicine, and psychotherapist internal medicine. Board certifications of surgery included certification of surgery, pulmonary surgery, cardiovascular surgery, breast cancer, bronchoesophagology, gastroenterological surgery, coloproctology, and pediatric surgery.

The Ministry of Health, Labour and Welfare has defined the following board certifications as general areas since 2018; general internal medicine, surgery, pediatrics, obstetrics and gynecology, orthopedics, neurosurgery, ophthalmology, otorhinolaryngology, acute medicine, anesthesiology, dermatology, urology, plastic surgery, radiology, pathology, rehabilitation, psychiatry, laboratory medicine, and general practice (Koike et al. 2018). Prior to 2018, academic societies operated board certifications, and multiple board certification in the general area were allowed.

Statistical analysis

Data are expressed as ratios for categorical variables. Continuous variables are expressed as the median (interquartile range). Categorical and continuous variables were analyzed using the chi-square or Fisher's test and the Mann-Whitney U test or Kruskal-Wallis, respectively. Residual analysis was performed when the chi-square analysis revealed a significant difference. IBM SPSS version 25.0 (IBM, Tokyo, Japan) was used for all statistical analyses. The significance level was set to 5% for all analyses.

Ethical review

The study was approved by Jichi Medical University Bioethics Committee for Medical Research (No. 21-067).

Results

Attributes of physicians in the survey

Table 1 shows the attributes of all survey subjects. There were 253,603 men (78.1%), with a median age of 49 years. A total of 622 (0.2%) physicians worked in rural clinics and 103,182 (31.8%) worked in other clinics.

Comparison between physicians in rural and other clinics

We compared the attributes of physicians in rural clinics with those of physicians in other clinics (Table 2). The proportion of male physicians in rural clinics was significantly higher than that in other clinics (92.0% vs. 80.3%, $P < 0.001$). The median age of physicians working in rural clinics was significantly lower than that of physicians in other clinics (56 vs. 59 years, $P < 0.001$).

A higher proportion of physicians in rural clinics

Table 1. Attributes of all survey subjects.

	Overall, n = 324,673
Male, n (%)	253,603 (78.1)
Age, years old, median (interquartile range)	49 (37-61)
Full-time ^a , n (%)	278,677 (86.5)
Area of practice ^b , n (%)	
Internal medicine	115,777 (37.3)
Surgery	27,831 (9.0)
General practitioner	227 (0.1)
Others	166,861 (53.7)
Board certification, n (%)	198,698 (61.2)
Internal medicine ^c	68,804 (21.2)
Surgery	19,765 (6.1)
Other than internal medicine or surgery	110,129 (33.9)
Medical facility, n (%)	
Rural clinic	622 (0.2)
Other clinics	103,182 (31.8)
Hospitals (including medical education institutions)	211,864 (65.2)
Other facilities	9,005 (2.8)

^aNumber of valid answers: n = 322,202.

^bNumber of valid answers: n = 310,696.

^cIncludes holders of both board certification of internal medicine and surgery (n = 4,664).

Table 2. Attributes of physicians working in rural and other clinics.

	Rural clinics, n = 622	Other clinics, n = 103,182	P-value
Male, n (%)	572 (92.0)	82,870 (80.3)	< 0.001
Age, median (interquartile range)	56 (39-65)	59 (51-68)	< 0.001
Full-time ^a , n (%)	548 (88.4)	89,625 (88.0)	0.761
Area of practice ^b , n (%)			
Internal medicine	550 (88.7)	48,036 (46.8)	< 0.001
Surgery	16 (2.6)	3,854 (3.8)	
General practitioner	18 (2.9)	68 (0.1)	
Others	36 (5.8)	50,674 (49.4)	
Board certification, n (%)			
Internal medicine ^c	82 (13.2)	21,328 (20.7)	< 0.001
Surgery	24 (3.9)	3,020 (2.9)	
Other than internal medicine or surgery	67 (10.8)	40,108 (38.9)	
Number of board certification			
1	110 (63.6 ^d)	45,259 (70.2 ^d)	0.291
2	43 (24.9 ^d)	13,411 (20.8 ^d)	
3	15 (8.7 ^d)	4,405 (6.8 ^d)	
more than 3	< 10 (-)	1,381 (2.1 ^d)	

^aNumber of valid answers: rural clinics n = 620, other clinics n = 101,860.

^bNumber of valid answers: rural clinics n = 620, other clinics n = 102,632.

^cIncludes holders of both board certification of internal medicine and surgery (rural clinics < 10, other clinics n = 715).

^dPercentage of physicians with board certification.

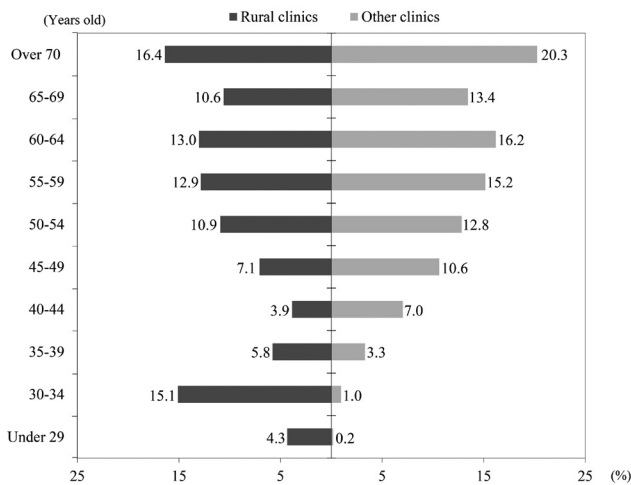


Fig. 1. Proportion of physicians in each age group to the total number of physicians for the rural and other clinics.

(88.7%) provided internal medicine service compared to other clinics (46.8%) (Table 2). A lower proportion of rural clinics (5.8%) provided an area of practice other than internal medicine and surgery compared to other clinics (49.4%) (Table 2). The proportion of physicians with a board certification in rural clinics (27.8%) was significantly lower than that in other clinics (62.5%) (Table 2). The proportion of physicians with a board certification in internal medicine in rural clinics (13.2%) was lower than that in other clinics (20.7%) (Table 2). The proportion of physicians with a

board certification in an area other than internal medicine and surgery in rural clinics (10.8%) was lower than that in other clinics (38.9%) (Table 2). In both clinics, the percentage of physicians with one type of board certification was the highest (Table 2).

Fig. 1 shows the ratio of physicians by age group of 5 years. The majority of physicians in rural clinics were in their early 30s or were over 70, and the minority were in their early 40s. At other clinics, the majority of physicians in rural clinics were in their early 60s or were over 70, and the minority were under 29. In the comparison of the ratio of people by age group between the two clinics, the age groups under 29, 30-34, and 35-39 years old had a significantly higher proportion of physicians working in rural clinics. Additionally, the age groups 40-44, 45-49, 60-64, 65-69, and over 70 years old worked in rural clinics with a significantly lower proportion than the other clinics. No significant difference was observed in the 50-54 and 55-59 years old groups between the clinics.

Table 3 shows the top 10 physicians for each board certification in each clinic. Among rural clinic physicians, the highest percentages of board certifications were (in descending order) general internal medicine, gastroenterology, gastroenterological endoscopy, surgery, and anesthesiology. At other clinics, the most common board certifications were general internal medicine, ophthalmology, and orthopedic surgery in descending order. In both clinics, the most common combination of qualifications among physicians with multiple certifications was gastroenterology and

Table 3. Number of board-certified physicians in each clinic.

Rank	Rural clinics, n = 173 Board certification	n (%)	Rank	Other clinics, n = 64,456 Board certification	n (%)
1	General internal medicine	46 (26.6)	1	General internal medicine	8,235 (12.8)
2	Gastroenterology	27 (15.6)	2	Ophthalmology	6,585 (10.8)
2	Gastroenterological endoscopy	27 (15.6)	3	Orthopedic surgery	6,275 (9.7)
4	Surgery	24 (13.9)	4	Gastroenterology	6,237 (9.7)
4	Anesthesiology	24 (13.9)	5	Pediatric medicine	5,447 (8.5)
6	Cardiology	13 (7.5)	6	Gastroenterological endoscopy	5,310 (8.2)
7	Acute medicine	12 (6.9)	7	Obstetrics and Gynecology	4,841 (7.5)
8	Pediatric medicine	< 10 (-)	8	Otolaryngology	4,627 (7.2)
9	Neurosurgery	< 10 (-)	9	Cardiology	4,312 (6.7)
10	Orthopedic surgery	< 10 (-)	10	Dermatology	3,747 (5.8)
10	Kampo medicine	< 10 (-)			

Common combination when physicians have multiple qualifications (Top 5)

1	Gastroenterology and gastroenterological endoscopy	18 (10.4)	1	Gastroenterology and gastroenterological endoscopy	3,914 (6.1)
2	General internal medicine and gastroenterology	12 (6.9)	2	General internal medicine and gastroenterology	1,893 (2.9)
3	General internal medicine and gastroenterological endoscopy	10 (5.8)	3	General internal medicine and cardiology	1,629 (2.5)
4	General internal medicine and cardiology	< 10	4	Gastroenterology and hepatology	1,490 (2.3)
4	Surgery and anesthesiology	< 10	5	Orthopedic surgery and rheumatology	1,170 (1.8)
4	Surgery and gastroenterological surgery	< 10			
5	Gastroenterology and hepatology	< 10			
5	Gastroenterology and diabetology	< 10			
5	Acute medicine and anesthesiology	< 10			

Table 4. Attributes of physicians in internal medicine services in each clinic.

	Rural clinics, n = 550	Other clinics, n = 48,036	P-value
Male, n (%)	509 (92.5)	39,277 (85.3)	< 0.001
Age, median (interquartile range)	56.5 (41-66)	60.0 (52-69)	< 0.001
Full-time ^a , n (%)	486 (88.7)	40,191 (88.3)	0.807
Board certification, n (%)	147 (26.7)	23,388 (48.7)	< 0.001
Internal medicine ^b	79 (53.7 ^c)	17,982 (76.9 ^c)	< 0.001
Surgery	17 (11.6 ^c)	1,171 (5.0 ^c)	
Other than internal medicine or surgery	51 (34.7 ^c)	4,235 (18.1 ^c)	

^aNumber of valid answers: rural clinics n = 548, other clinics n = 45,491.

^bIncludes holders of both board certifications of internal medicine and surgery.

^cPercentage of physicians with board certification.

gastroenterological endoscopy.

Comparison of physicians working in internal medicine services between the clinics

We focused on the internal medicine services, which about 90% of the physicians in rural clinics were working in. We compared the attributes of the physicians between rural and other clinics (Table 4). The proportion of men in

rural clinics was significantly higher than that in other clinics (92.5% vs. 85.3%, $P < 0.001$). Physicians in rural clinics were younger than those in other clinics (56.5 years old vs. 60.0 years old, $P < 0.001$). The percentage of board-certified physicians in rural clinics was significantly lower than that in other clinics (26.7% vs. 48.7%, $P < 0.001$), the proportion of board certification of internal medicine was significantly lower in rural clinics ($n = 79$, 53.7%) than in

other clinics (n = 17,982, 76.9%), and the proportion of board certification of surgery working in internal medicine services was significantly higher in rural clinics than in other clinics (11.6% vs. 5.0%). In addition, the ratio of board certification of non-internal medicine (sum of board certification of surgery and other board certification) was significantly higher at rural clinics (n = 68, 46.3%) than at other clinics (n = 5,406, 23.1%).

Attributes of physicians working in internal medicine services at rural clinics

Table 5 shows the results of a comparison of physicians working in internal medicine of rural clinics, according to board certifications. The percentage of men and full-time physicians were higher among board certification of non-internal medicine than other two groups. Most physicians in their 20s and early 30s did not have board certification. Among physicians in their early 40s, a high proportion were board certification of internal medicine. Physicians in their early 60s included high percentages of board certification of internal medicine and other board certification. The ratio of board certification of other than

internal medicine was high among physicians in their late 60s. Anesthesiologists had the highest percentage of physicians with board certification of other than internal medicine, followed by surgery.

Discussion

We observed that one of the attributes of the physicians working in the designated rural clinics was that the proportion of those were under the age of 29 or in their early 30s was high. National and international reports have also shown that the age of physicians is an important factor associated with rural settlement. For example, being a primary care physician in the United States in their 30s is a factor for migration from rural areas to other areas (Vanasse et al. 2007). Australian general practitioners reported that being under the age of 40 was a factor for rural-to-urban migration (McGrail and Humphreys 2015). In Japan, it is reported that a physician's older age was positively related to continuing in rural practice (Matsumoto et al. 2005). Our result suggested that physicians in their late 30s in rural clinics migrated from rural clinics to other medical institutions. Some Japanese scholarship programs require stu-

Table 5. Comparison of board-certified physicians in internal medicine services in rural clinics.

	Board certification of internal medicine, n = 79	Board certification of other than internal medicine, n = 68	None of board certifications, n = 403	P-value
Male, n (%)	77 (97.5)	67 (98.5)	365 (90.6)	0.014
Full-time ^a , n (%)	65 (82.3)	64 (95.5)	357 (88.8)	0.042
Age, n (%)				
Under 29	0 (0)	0 (0)	24 (6.0)	< 0.001
30-34	< 10 (-)	< 10 (-)	70 (3.1)	
35-39	< 10 (-)	< 10 (-)	24 (6.0)	
40-44	< 10 (-)	< 10 (-)	10 (2.5)	
45-49	< 10 (-)	< 10 (-)	28 (6.9)	
50-54	11 (13.9)	< 10 (-)	40 (9.9)	
55-59	11 (13.9)	< 10 (-)	55 (13.6)	
60-64	19 (24.1)	15 (22.1)	41 (10.2)	
65-69	< 10 (-)	12 (17.6)	38 (9.4)	
Over 70	10 (12.7)	11 (16.2)	73 (18.1)	
The three commonest areas of board certification ^b , (n)				
Rank 1	General internal medicine (43)	Anesthesiology (21)	-	
2	Gastroenterology (25)	Surgery (14)	-	
3	Cardiology (13)	Gastroentero- logicalendoscopy (< 10)	-	
		Acute medicine (< 10)	-	
		Neurosurgery (< 10)	-	

Board certification of internal medicine includes holders of both board certifications of internal medicine and surgery. Board certification of other than internal medicine includes board-certified physicians with surgery or other board certification.

^aNumber of valid answers: board certification of internal medicine n = 79, board certification of other than internal medicine n = 67, none of board certifications n = 402.

^bMultiple answers. Of board certification of internal medicine, n = 18 were also gastroenterological endoscopists.

dents to work short-term in rural medical care after graduation (Matsumoto et al. 2021). And dispatch of physicians to rural areas for these scholarship participants is sometimes included in the prefectural medical care plan (Matsumoto et al. 2021; Ministry of Health, Labour and Welfare 2023). The high proportion of physicians in their 20s to early 30s in this study can be attributed to the inclusion of this physicians with these programs. Another attribute of the age distribution was a decrease in the proportion of physicians in their 40s in rural clinics, but the percentage of physicians in their 50s did not differ between rural and other clinics. The low proportion of physicians in their 40s in rural clinics may be related to the high chance of physicians in Japan to move from rural to urban area after acquiring a board certification (Koike et al. 2018). Another factor for the results may be that physicians in their 40s working in rural areas were reported to be dissatisfied with the fewer opportunities for their children's higher school education compared with children in urban areas (Matsumoto et al. 2004). However, physicians under 40 with younger children in rural areas were more satisfied with their children's primary and secondary schooling (Matsumoto et al. 2004). Children's education is a major reason for rural physician migration (Forti et al. 1995). Physician family composition was suggested to contribute to clinic work in the rural area. A possible reason for the increase in the proportion of physicians in their 50s working in rural clinics is that physicians of rural origin tend to work in rural areas (Matsumoto et al. 2008). Physicians' experience with working in a rural area was a factor that predicted their continuing to work in the rural area in the following 20 years (Inoue et al. 2009). A physician who worked in a rural area in his 20s and early 30s may choose to return to a rural clinic in his older years.

The rate of board certification acquisition was low in rural clinics. Rural clinics typically provide primary care and are likely the first point of contact for people living in rural areas. Physicians in rural clinics are required to care for patients with a wide range of medical and surgical diseases (Kaneko et al. 2017). It was thought that holding their board certification had little relevance to routine medical care in rural clinics. Additionally, training at specialized facilities is required to maintain board certification. The low rate of board certification acquisition in rural clinics may be linked to difficulty in maintaining board certification due to long-term work in a rural clinic. In addition, since rural clinics were set up according to prefectural medical plans, unlike in urban areas, there was no possibility of competition with other medical institutions, and there was no need to differentiate physicians based on their board certification. This was also considered to be a contributing factor to the low percentage of board-certified physicians. Many physicians in rural clinics acquired board certifications in areas close to their primary care field, such as internal medicine and gastroenterology. Reports from Japan (Matsumoto et al. 2005; Inoue et al. 2009) and overseas (Woloschuk and Tarrant 2004) have said that primary care

physicians tend to work in rural areas, and our results suggested that there was a similar tendency for physicians in rural clinics. The proportion of physicians with board certification in surgery or anesthesiology in rural clinics was in the top five. The proportion of physicians with multiple board qualifications was also low in rural clinics. It was reported that physicians who underwent postgraduate clinical training in general internal medicine, general surgery, pediatrics, anesthesiology, and gastroenterology tended to continue their career in a rural area (Matsumoto et al. 2005). Our findings support this report.

Furthermore, although about 90% of all physicians in rural clinics were working in the services of internal medicine, some of the physicians had board certification of surgery. We observed that medical care was provided regardless of their own board certification in rural clinics. A high percentage of physicians in their 50s were board certifications of internal medicine, and a high percentage of physicians with board certification other than internal medicine were aged over 65. The retirement age for physicians in most health institutions is 60-65 (Cyranoski 2000). A presumption is that board-certified physicians of internal medicine worked in rural clinics before retirement age, and that board-certified physicians of non-internal medicine reentered rural clinics after retiring from other medical institutions. The aging and security of physicians in rural areas is a notable problem in many countries (Skinner et al. 2019). For instance, there are hospitals elected to require a neurologic and ophthalmologic examination of all applicants for reappointment to the medical staff who are aged 70 years or older (Cooney and Balcezak 2020). On the other hand, older physicians are said to be better at making initial diagnoses than younger physicians (Eva 2002). It will be important to utilize the abilities of these physicians in rural areas according to the medical conditions required in the area. When recruiting physicians in rural clinics, it may be necessary to understand the careers and characteristics of physicians before proposing work styles. It was suggested that in Japan's rural clinics, in addition to the shortage of physicians, the mismatch between the physician's board certifications and area of practice and the aging of physicians are intricately intertwined. Measures to secure physicians are important, but it is important to examine the effect of the mismatches on rural medicine in the future work.

There were several limitations of this study. First, it was unclear why they worked at rural clinics. Second, the length of service in rural clinics was unknown. Third, the other clinics group may have included clinics located in rural areas but not supported for areas without physicians as a rural clinic. Additionally, no research has been conducted on the attributes of physicians at clinics in rural areas outside of Japan, and because the policies for securing physicians are different, making a comparison is not possible.

Rural clinics designated for areas without physicians in Japan had a high proportion of physicians in their early

30s and 70s and a low proportion of those in their early 40s. The age distribution of physicians in rural clinics was different from that in other clinics. In rural clinics, many of the physician worked in the area of internal medicine, but some of them had a mismatch between their board-certifications and their area of practice. Further studies are necessary to clarify what the mismatches mean in rural practice.

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Conflict of Interest

The authors declare no conflict of interest.

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