

Current Situations and Issues in Respiratory Medicine in Japan

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Abstract

The essence of the current shortage of physicians in Japan is not just a shortage in the absolute number. It is also a shortage of physicians in particular fields of medicine, as well as an uneven geographic distribution of hospital-employed physicians. The Future Planning Committee of Japanese Respiratory Society conducted a survey to determine the actual status and issues pertaining to the practice of respiratory medicine in 2007–2008, as part of an effort to seek appropriate measures to increase the number of respiratory physicians. For this survey, 3,000 hospitals were randomly sampled from nationwide that had a department of internal medicine, then, 1,232 (41.1%) hospitals that returned the questionnaire were subjected to analysis.

The national average number of physicians per 10 beds was 0.83 for internists, 0.50 for respiratory physicians, and 0.21 for physicians specialized in respiratory diseases. Among all prefectures of Japan, there were 3.9-fold and 6.1-fold differences for internists and respiratory specialists, respectively. Even amongst large hospitals with 300 beds or more, the self-containment level, which indicates the extent to which the diagnosis and treatment of diseases can be completed within a particular hospital, was low for the treatment of acute respiratory failure, chemotherapy of lung cancer, and diagnosis and treatment of intractable diseases such as pulmonary circulatory disease in rural areas with a population of less than 50,000. This suggests a qualitative disparity in the practice of respiratory medicine among different areas of Japan. On the other hand, the survey also indicated that physicians not specialized in respiratory diseases have to deal with intractable respiratory diseases like acute respiratory failure or interstitial pneumonia in rural areas, suggesting possible disadvantages to patients in rural areas who are in need of respiratory medicine. In order to promote equality in medical practice in Japan, it is urgent to foster respiratory physicians and specialists and distribute them appropriately.

Key words Shortage of physicians, Respiratory specialists, Regional disparity, Equalization of healthcare

Introduction

In recent years, Japan has been facing a serious shortage of physicians. In essence, it is not just a shortage in absolute numbers of physicians; it is also a shortage of physicians in particular fields of medicine such as obstetrics, pediatrics, and emergency medicine, uneven geographic distribution of physicians, and a worsening work

environment for hospital-employed physicians. On the other hand, as the ageing of Japanese population progresses, the number of patients with pneumonia, respiratory failure, lung cancer, chronic obstructive pulmonary disease (COPD), or asthma continues to increase, enhancing the role of respiratory physicians in the practice of general internal medicine and further emphasizing the importance of respiratory medicine. And

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Table 1 Numbers of internists, respiratory physicians, and respiratory specialists per 10 departmental beds ($n_{I/10}$, $n_{R/10}$, and $n_{S/10}$, respectively) and the ratios of respiratory specialists to respiratory physicians and respiratory physicians to internists ($ratio_{S/R}$ and $ratio_{R/I}$) among 47 prefectures in Japan

Code	Prefecture	$n^a)$	$n_{I/10}^{b)}$	$n_{R/10}^{c)}$	$n_{S/10}^{d)}$	$Ratio_{S/R}^{e)}$	$Ratio_{R/I}^{f)}$
0	Nationwide	1,232	0.83	0.50	0.21	0.43	0.14
1	Hokkaido	80	0.73	0.52	0.18	0.35	0.15
2	Aomori	28	0.51	0.33	0.14	0.42	0.13
3	Iwate	21	0.57	0.43	0.16	0.37	0.19
4	Miyagi	35	0.81	0.78	0.32	0.41	0.15
5	Akita	14	0.53	0.54	0.18	0.33	0.15
6	Yamagata	12	0.62	0.56	0.37	0.67	0.15
7	Fukushima	25	0.60	0.29	0.13	0.45	0.080
8	Ibaraki	24	0.89	0.34	0.12	0.36	0.063
9	Tochigi	13	0.58	0.51	0.30	0.60	0.17
10	Gumma	31	0.65	0.44	0.17	0.38	0.16
11	Saitama	52	1.18	0.49	0.17	0.35	0.094
12	Chiba	58	0.74	0.31	0.11	0.34	0.095
13	Tokyo	92	1.02	0.58	0.24	0.42	0.14
14	Kanagawa	47	0.95	0.51	0.22	0.43	0.13
15	Yamanashi	20	0.79	0.52	0.28	0.53	0.18
16	Nagano	8	0.47	0.50	0.17	0.33	0.24
17	Niigata	17	0.82	0.45	0.14	0.31	0.10
18	Toyama	9	0.80	0.36	0.31	0.86	0.11
19	Ishikawa	9	0.81	0.67	0.34	0.50	0.15
20	Fukui	27	0.92	0.45	0.21	0.47	0.12
21	Gifu	27	0.66	0.31	0.13	0.42	0.12
22	Shizuoka	22	1.34	0.71	0.23	0.32	0.17
23	Aichi	34	1.08	0.56	0.25	0.44	0.18
24	Mie	7	0.88	0.40	0.16	0.40	0.12
25	Shiga	19	0.81	0.40	0.19	0.47	0.10
26	Kyoto	25	1.09	0.50	0.22	0.45	0.12
27	Osaka	67	0.87	0.56	0.25	0.45	0.16
28	Hyogo	40	0.89	0.46	0.21	0.46	0.13
29	Nara	25	0.77	0.64	0.12	0.19	0.18
30	Wakayama	16	0.76	0.44	0.24	0.59	0.12
31	Tottori	6	0.85	0.61	0.27	0.44	0.14
32	Shimane	15	0.60	0.48	0.21	0.44	0.13
33	Okayama	26	0.78	0.45	0.22	0.49	0.17
34	Hiroshima	24	0.61	0.44	0.21	0.48	0.14
35	Yamaguchi	12	0.73	0.33	0.19	0.57	0.049
36	Tokushima	14	0.91	0.54	0.24	0.45	0.098
37	Kagawa	17	0.94	0.53	0.19	0.35	0.16
38	Ehime	17	1.15	0.60	0.37	0.62	0.13
39	Kochi	14	0.80	0.53	0.23	0.43	0.10
40	Fukuoka	50	0.85	0.45	0.21	0.46	0.16
41	Saga	5	0.82	0.66	0.094	0.14	0.15
42	Nagasaki	25	0.92	0.67	0.27	0.41	0.19
43	Kumamoto	29	0.82	0.69	0.30	0.44	0.24
44	Oita	33	0.72	0.36	0.18	0.50	0.11
45	Miyazaki	12	0.59	0.21	0.070	0.33	0.13
46	Kagoshima	19	0.89	0.63	0.43	0.69	0.12
47	Okinawa	10	0.72	0.81	0.13	0.15	0.18

a) Number of hospitals analyzed (n).b) Number of internists per 10 beds in the department of internal medicine ($n_{I/10}$).c) Number of respiratory physicians per 10 beds in the department of internal medicine ($n_{R/10}$).d) Number of respiratory specialists per 10 beds in the department of respiratory medicine ($n_{S/10}$).e) Ratio of respiratory specialists to respiratory physicians ($ratio_{S/R}$).f) Ratio of respiratory physicians to internists ($ratio_{R/I}$).

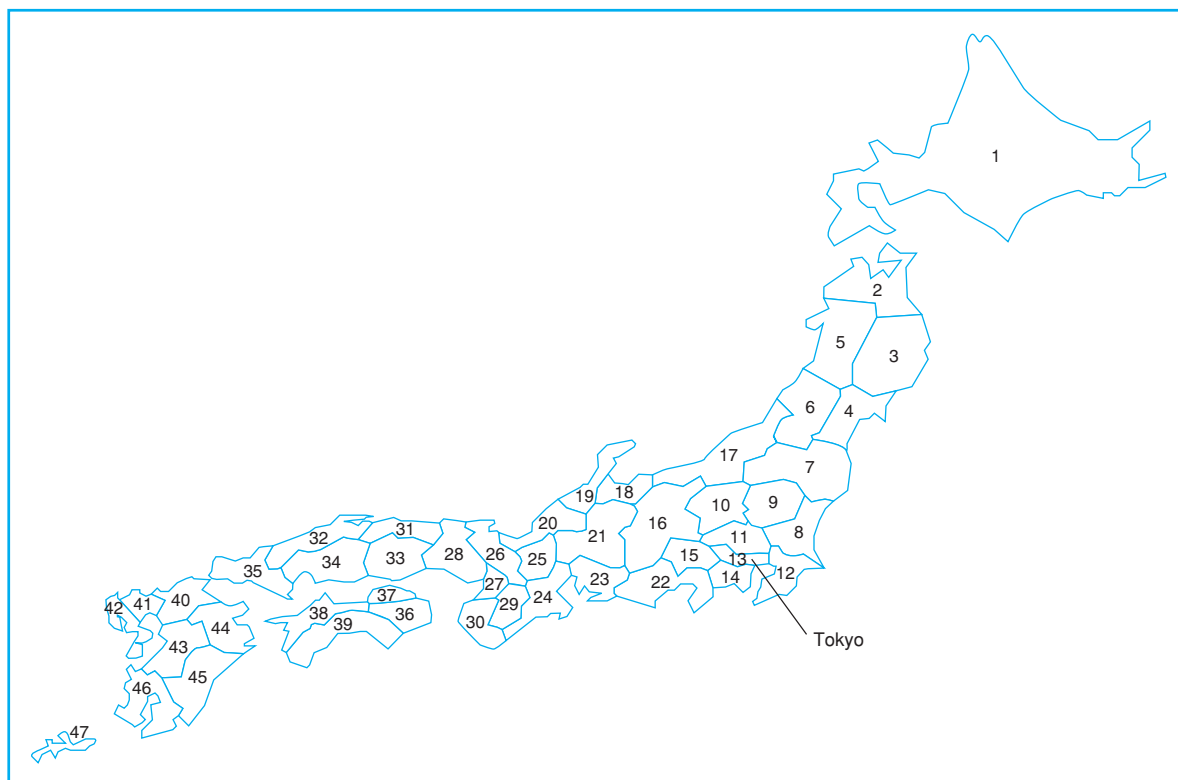


Fig. 1 A map of Japan, showing the locations of its 47 prefectures
The numbers shown correspond with the prefecture code in Table 1.

of course, there remains the significant issue that the number of physicians engaged in respiratory medicine in the front-line of medical practice is not enough.¹

The Future Planning Committee of Japanese Respiratory Society conducted a survey on the actual status and issues pertaining to the practice of respiratory medicine in 2007–2008, as part of an effort to seek appropriate measures to increase the number of respiratory physicians in Japan.

Methods

The purposes of the survey were to determine (1) the location of hospitals, number of physicians in relation to the hospital scale, and the actual status of clinical practice, and (2) to what extent the diagnosis and treatment of diseases can be completed in a particular hospital (the self-containment level).

Of the approximately 9,000 hospitals in Japan, there are 5,620 hospitals with a department of

internal medicine, after excluding dedicated sanatorium types and medical school affiliated hospitals. Questionnaires were sent to the 3,000 hospitals that were randomly sampled from these 5,620 hospitals. Medical school affiliated hospitals were excluded from the sampling because, although they generally have a greater number of physicians than other hospitals, some are working for the purpose of education and research rather than clinical practice.

Questionnaires were recovered from 1,251 hospitals (41.7%), and eventually 1,232 hospitals (41.1%) were analyzed ($n=1,251$). With regard to the hospital size (number of beds), 28.7% were large-sized hospitals (300 or more beds), 42.4% were middle-sized (100 or more and fewer than 300 beds), and 28.9% were small-sized (fewer than 100 beds). In terms of the location, 22.6% were located in metropolitan areas (population 500,000 or greater), 22.6% in urban areas (population 200,000 or more and fewer than 500,000), 32.3% in provincial areas (population 50,000 or

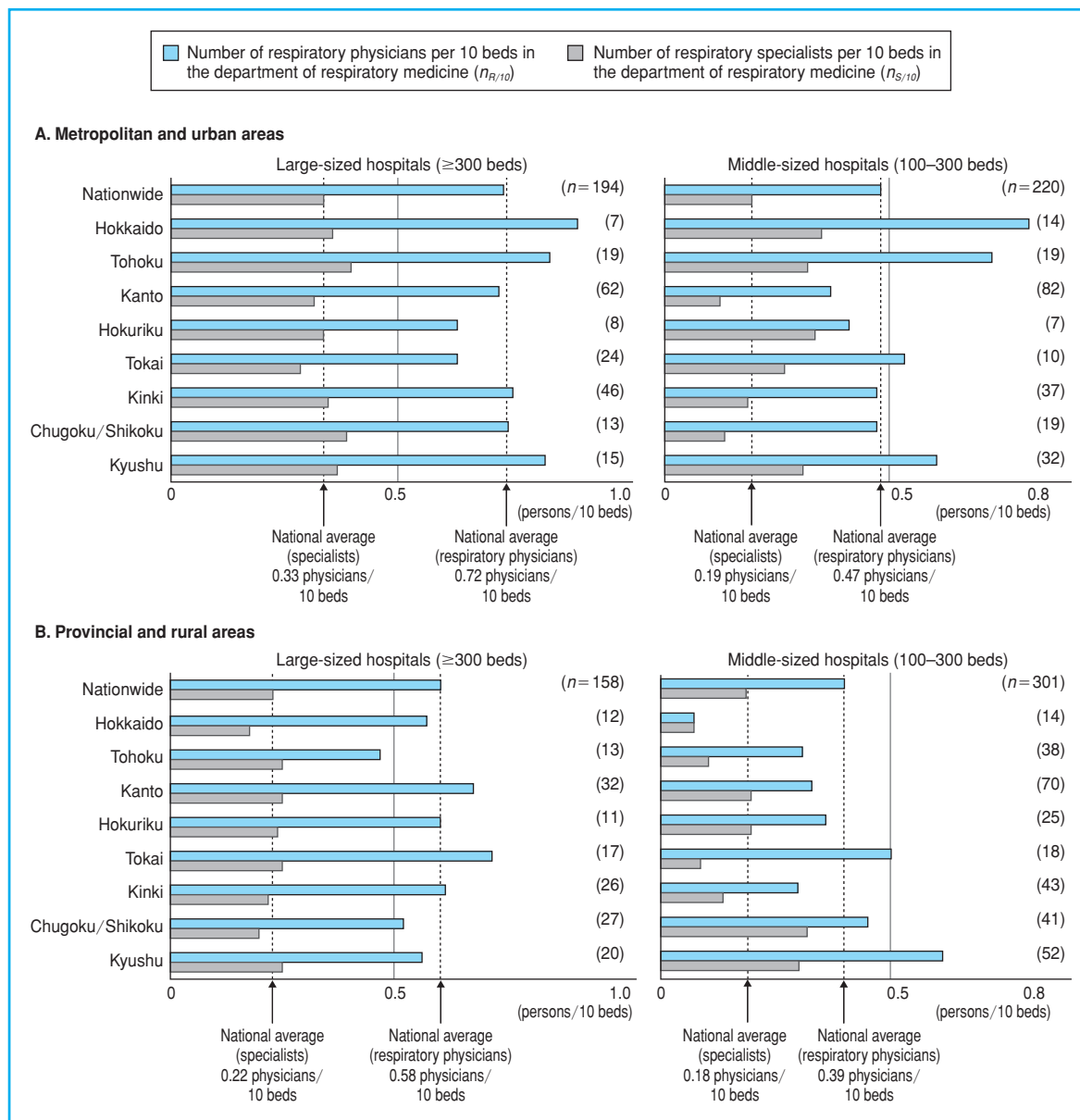


Fig. 2 Numbers of respiratory physicians and specialists: Comparison among eight branch areas of Japanese Respiratory Society

more and fewer than 200,000), and 22.5% in rural areas (fewer than 50,000 population). The numbers of beds per hospital were 224.8 on average; 97.6 for the department of internal medicine and 22.7 for the department of respiratory medicine. The mean numbers of physicians per hospital were 8.1 for full-time internists, 1.1 for full-time respiratory physicians, and 0.5 for respiratory specialists.

Results

Number of physicians by prefecture

Table 1 shows the number of hospitals subjected to analysis (n), the numbers of internists, respiratory physicians, and respiratory specialists per 10 departmental beds ($n_{I/10}$, $n_{R/10}$, and $n_{S/10}$, respectively), the ratio of respiratory specialists to respiratory physicians ($ratio_{S/R}$), and the ratio

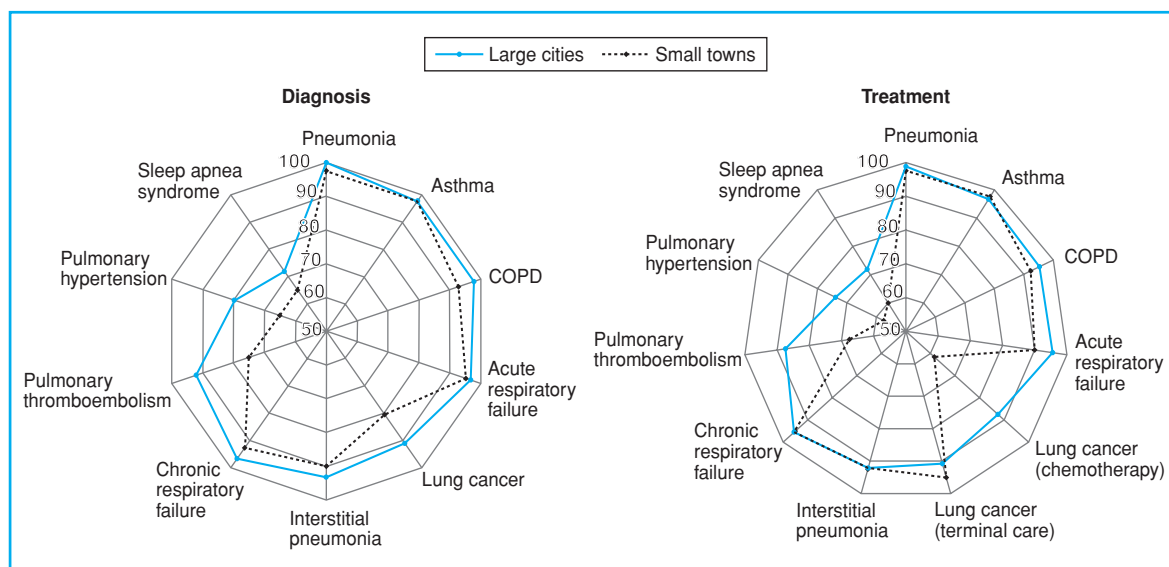


Fig. 3 The self-containment level for diagnosis and treatment among large-sized hospitals (300 or more beds): Large cities vs. small towns

of respiratory physicians to internists ($ratio_{R/I}$), among 47 prefectures in Japan (see Fig. 1 for the location map). The national averages per 10 departmental beds were: 0.83 for internists ($n_{I/10}$), 0.50 for respiratory physicians ($n_{R/10}$), and 0.21 for respiratory specialists ($n_{S/10}$). There were considerable deviations in the results among prefectures. The greatest differences was a 2.9-fold difference for the number of internists ($n_{I/10}$) between Shizuoka and Nagano, a 3.9-fold difference in the number of respiratory physicians ($n_{R/10}$) between Okinawa and Miyazaki, and a 6.1-fold difference in the number of respiratory specialists ($n_{S/10}$) between Kagoshima and Miyazaki. As for the national averages for the ratios, the respiratory specialists to respiratory physicians ($ratio_{S/R}$) and the respiratory physicians to internists ($ratio_{R/I}$) were 0.43 and 0.14, respectively.

Regional comparison of the numbers of respiratory physicians and specialists per 10 departmental beds ($n_{R/10}$ and $n_{S/10}$) by hospital size, in metropolitan and urban areas (population 200,000 or more) (based on the branch areas of Japanese Respiratory Society) (Fig. 2A)

Among large-sized hospitals ($n = 194$), the number of respiratory physicians per 10 departmental

beds ($n_{R/10}$) was 0.724 on average, ranging from 0.880 (Hokkaido Area) to 0.621 (Tokai Area) and 0.623 (Hokuriku Area), in terms of the branch areas of Japanese Respiratory Society. The number of respiratory specialists per 10 beds ($n_{S/10}$) was 0.329 on average (range: 0.385 of Tohoku Area to 0.278 of Tokai Area). Among middle-sized hospitals ($n = 220$), the number of respiratory physicians ($n_{R/10}$) was 0.473 on average (range: 0.790 of Hokkaido Area to 0.360 of Kanto Area), and the number for respiratory specialists ($n_{S/10}$) was 0.194 (range: 0.339 of Hokkaido Area to 0.118 of Kanto Area).

Regional comparison of the numbers of respiratory physicians and specialists per 10 departmental beds ($n_{R/10}$ and $n_{S/10}$) by hospital size, in provincial and rural areas (population less than 200,000) (based on the branch areas of Japanese Respiratory Society) (Fig. 2B)

Among large-sized hospitals ($n = 158$), the number of respiratory physicians per 10 departmental beds ($n_{R/10}$) was 0.579 on average (range: 0.693 of Tokai Area to 0.447 of Tohoku Area). The number of respiratory specialists ($n_{S/10}$) was 0.223 on average (range: 0.235–0.240 of Tohoku, Kanto, Kyushu, and Tokai Areas, to 0.173 of Hokkaido Area). Among middle-sized hospitals ($n = 301$),

the number of respiratory physicians ($n_{R/10}$) was 0.390 on average (range: 0.597 of Kyushu Area to 0.068 of Hokkaido Area). The number of respiratory specialists ($n_{S/10}$) was 0.181 (range: 0.308 of Chugoku/Shikoku Area to 0.068 of Hokkaido Area).

Self-containment level

When the self-containment levels for various respiratory diseases were examined among large-sized hospitals in relation to the location of the hospital, the survey found that the difference between metropolitan areas and rural areas was within 5% for the diagnosis and treatment of pneumonia, asthma, COPD, interstitial pneumonia, and chronic respiratory failure. On the other hand, the self-containment level was distinctly lower in rural areas for the treatment of acute respiratory failure, the diagnosis and treatment (chemotherapy) of lung cancer, and the diagnosis and treatment of pulmonary thromboembolism, pulmonary hypertension, and sleep apnea syndrome. However, the self-containment level for the terminal care of lung cancer was higher in rural areas (Fig. 3).

Personnel exchanges with university medical department offices

Analysis of the responses from 1,186 medical facilities as to the presence/absence of personnel exchanges with university medical department offices (called “ikyoku” in Japan) in relation to the size and location of the hospital revealed that the percentage of large-sized hospitals with such exchanges was highest in rural areas (82.9%), followed by metropolitan areas (82.4%), urban areas (80.4%), and provincial areas (77.4%), showing certain personnel exchanges existed in most hospitals. Among middle-sized hospitals, the percentage of such personnel exchanges was highest in rural areas (67.5%) and lowest in metropolitan areas (43.2%). Among small-sized hospitals, the percentage of the exchanges was highest (59.0%) in metropolitan areas, followed by rural areas (50.9%).

Discussion

One of the reasons for the shortage of physicians in Japan is an uneven distribution of hospital-employed physicians. According to the report of the Japanese Ministry of Health, Labour and

Welfare, in 2007 there was a maximum 2.1-fold difference in the number of hospital-employed physicians per 100,000 population among prefectures.² On the other hand, this survey revealed a maximum 2.9-fold difference in the number of internists, 3.9-fold in respiratory physicians, and 6.1-fold in respiratory specialists among prefectures. Such disparity brings up the importance of quality equalization in respiratory medicine that transcends the borders of prefectures. Analysis of personnel exchange levels between university medical department offices and various community hospitals suggests that medical practice in rural areas is barely maintained by the personnel support from university medical department offices. This indicates that whether physicians in residency choose a university hospital or a community hospital as the site of training exerts a great influence on the status of medical practice for a region.

Geographical comparisons of the numbers of respiratory physicians and specialists per 10 departmental beds ($n_{R/10}$ and $n_{S/10}$) by hospital size revealed that, in Hokkaido and Tohoku Areas, the numbers of each type of physicians exceeded national averages in both large- and medium-sized hospitals in metropolitan and urban areas. However, for large- and middle-sized hospitals in provincial and rural areas of Hokkaido and Tohoku Areas, these figures were lower than the national averages. In particular, shortages of respiratory physicians and specialists were prominent in Hokkaido Area. These findings suggest that, in Hokkaido and Tohoku Areas, physicians are concentrated at large-sized hospitals and in urban areas, creating a depopulation of physicians among middle-sized hospitals and in rural areas. In contrast, distributions of respiratory physicians and specialists for middle-sized hospitals in provincial and rural areas showed higher densities in the western part and lower densities in the eastern part of Japan.

Among large-sized hospitals, the self-containment level was lower in rural areas than in large cities for the treatment of acute respiratory failure, chemotherapy for lung cancer, and diagnosis and treatment of intractable diseases such as pulmonary circulatory disorders, even though there was no marked difference for pneumonia, asthma, COPD, and terminal care of lung cancer. This suggests that the level of respiratory medicine is unevenly distributed in terms of the

quality. On the other hand, the difference in the self-containment level between large cities and small towns remained within 10% for intractable diseases like acute respiratory failure and interstitial pneumonia. This suggests that physicians who are not specialized in respiratory medicine have to entirely deal with respiratory diseases in regions where respiratory physicians are scarce. Middle-sized hospitals also show similar disparity. Furthermore, among small-sized hospitals, the self-containment level was even lower in large cities and small towns. In small towns where small-sized hospitals are predominant, there is the possible delay in the diagnosis and treatment before a patient arrives at a specialized hospital. Thus, patients in small towns may be at disadvantage in the field of respiratory medicine.

According to the report on the number of specialists by Subspecialty Society of Japanese Board of Medical Specialties, there were 14,657

gastrointestinal disease specialists and 10,354 circulatory disease specialists (as of March 2008).³ On the other hand, the number of respiratory specialists was distinctly fewer, at 3,580.

The need for respiratory medicine in Japanese society is increasing, and people are asking to improve regional disparity and equalize the quality of medical practice. Therefore, it is urgent to foster more respiratory physicians and specialists in the nation to respond to those voices, including appropriate distribution of manpower.

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Supplementary note

A survey covering 168 community hospitals in Japan was conducted in 2004 to clarify the actual situation of respiratory physicians. It revealed that, in the department of respiratory medicine, the ratio of the number of full-time respiratory physicians to the number of departmental beds and that of respiratory specialists

were 79% and 68%, respectively. In the department of gastrointestinal medicine, the ratio for full-time physicians was 61%, and 55% for the specialists. These differences clearly indicated the shortage of respiratory physicians.¹