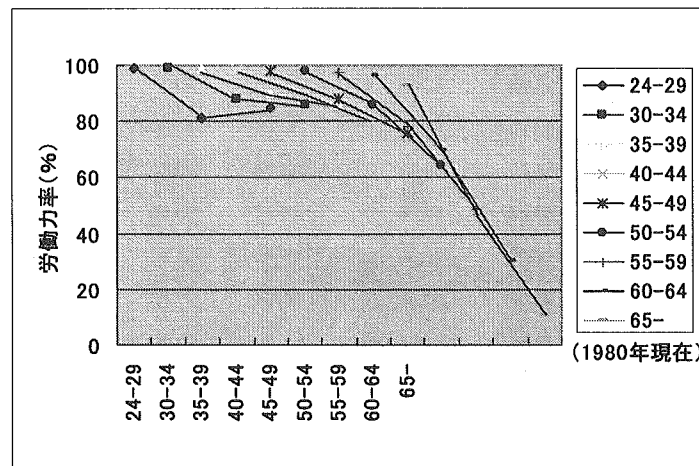


## 1980年登録女性医師の労働力率の変化



## 研究成果の刊行に関する一覧表

## 雑誌

| 発表者氏名                                | 論文タイトル   | 発表誌名                    | 巻号      | 頁        | 出版年          |
|--------------------------------------|--|-------------------------|---------|----------|--------------|
| Inoue K,<br>Matsumoto M              | Japan's new postgraduate medical training system | Clinical Teacher        | 1       | 39-41    | 2004         |
| Kobayashi Y                          | Japan's new postgraduate training system         | Clinical Teacher        | 1       | 107-108  | 2004         |
| Inoue K,<br>Matsumoto M,<br>Sawada T | Evaluation of a medical school for rural doctors | Journal of Rural Health | in pres | in press | 2006<br>(予定) |

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|----------------------------|--|--|------------------|-----------|
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Airmail

# Japan's new postgraduate medical training system

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Issues of poor pay and working conditions became a social problem and a likely contributor to medical accidents

Japan's Ministry of Health and Labour has been drastically overhauling its postgraduate medical training, laying a new emphasis on primary care. Introduced under a new law in 2000, the

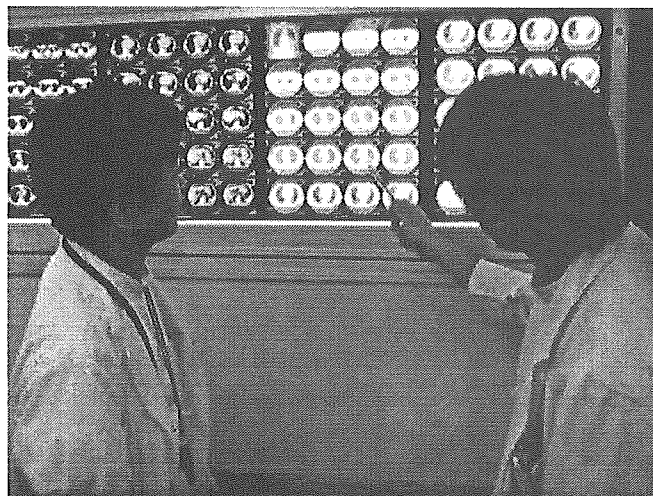
revamped system will be mandatory for all new doctors from April 2004. All doctors are to be trained to appreciate the primary care concept, and acquire basic capabilities in the field (see Table 1).

## MEDICAL TRAINING IN JAPAN BEFORE 2004

Since 1969, medical school graduates in Japan have been able to take a National Licence examination immediately after graduation, and then do clinical training in one of the 509 authorised teaching hospitals. Trainees usually train only in their own specialisation<sup>1</sup> and the quality and content of clinical training can be substantially different in each hospital.

### 1980 rotation system

To try and redress the narrowly specialised training, the Ministry of Health and Labour introduced a system in 1980 under which trainees could rotate their work in some areas related to their future specialty – a trainee who hoped to specialise in cardiology might also work in gastroenterology and pulmonology, for example.



Students at Jichi Medical School.



Students at Jichi Medical School.

**1985 'super rotation' system**

In 1985, the Ministry also introduced a 'super rotation' system, under which trainees could work in a variety of fields regardless of their intended specialty. For those who hoped to specialise in

primary care, however, there was no standard nationwide training programme of general practice and family medicine<sup>2</sup>, and most trainees still worked only in their chosen specialty or a few related areas<sup>3</sup>.

The failure to provide a mandatory postgraduate clinical training system caused the motivation of both trainees and teachers to deteriorate, while issues of poor pay and working conditions became a social

**Table 1. Postgraduate medical education in Japan, 1969–2004**

| Year                   | 1969–2003  | 2004–  |
|------------------------|--|--|
| System                 | Not obligatory, regulated by the Law for Medical for Medical Doctors         | Obligatory, regulated by the Revised Law for Medical Doctors                 |
| Content                | Clinical training for at least two years after obtaining a Physician Licence | Clinical training for at least two years after obtaining a Physician Licence |
| Training               | Monospecialty (46.5 per cent, 1995); some rotation training                  | Rotation training only   |
| 'Matching' scheme      | No   | Yes  |
| Doctor licence         | Necessary  | Necessary  |
| Training hospitals     | 509 (2002)   | 946 (2003)   |
| Total national subsidy | 4,300 million yen (2003)   | 17,100 million yen (2004 Budget)   |

problem and a likely contributor to medical accidents.

#### NEW CLINICAL TRAINING AFTER 2004

To solve these problems, a new postgraduate training system was developed<sup>4</sup>; it was intended to:

- Implement a mandatory 'super rotation' system.
- Make all trainees rotate work in all relevant specialties.
- Improve trainees' salaries and working conditions.
- Improve the quality and quantity of teaching staff.

The training period is to be two years:

- In the first twelve months, all trainees must rotate work in internal medicine (at least six months), surgery and emergency medicine (including anaesthesiology).
- In the second twelve months, trainees will rotate work in paediatrics, OB-GYN, psychiatry and 'community health', for one month each. They can also take optional specialties within the training period.
- Part-time jobs outside the training hospital, which some trainees have held

under the current system, will be forbidden but the trainees' salaries will be secured by law and financial support will be available for all teaching staff.

The 'community health' element is important, a one-month mandatory programme in which trainees are sent to primary care facilities such as community preventive health centres, community clinics (preferably in rural and remote areas) and social welfare facilities outside the teaching hospital. Under the supervision of teaching staff, they will experience the practice of community-oriented primary care which should encourage them to become much-needed primary care professionals.

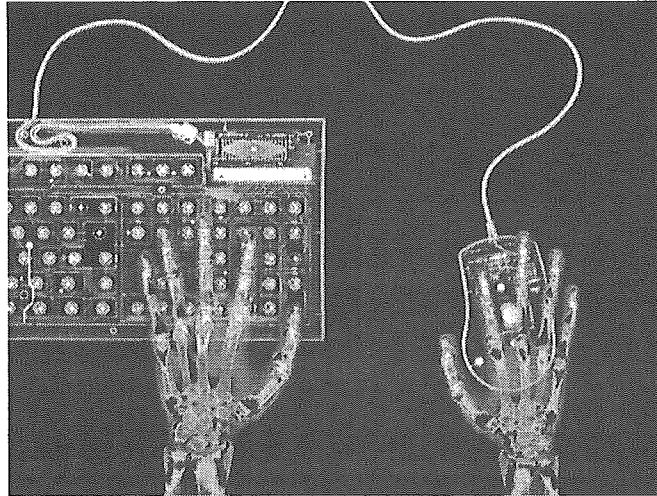
#### THE 'MATCHING' SCHEME

To prepare for the new system, a 'matching' scheme that mediates between trainees and teaching hospitals was introduced in 2003. Final-year medical students apply for places at several teaching hospitals: according to their preferences, available vacancies and interviews or examinations, a computer system determines who obtains a place, and where. This should help to streamline the conventional

application process which formerly took place on an individual-hospital basis, and prevent a concentration of graduates from the same medical school at their own university hospital. Graduates will now have more options, and this should be a strong incentive for training hospitals to improve the quality and quantity of their programmes and facilitate the expansion of primary care and generalisation in the Japanese medical education system as a whole.

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# Japan's new postgraduate training system

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**E**ditor - In April 2004, a new postgraduate training system was introduced in Japan, requiring new doctors to undergo training for two years in specialties relevant to primary care.<sup>1</sup> Although this system is intended to facilitate the expansion of primary care, there is concern that it might lead to a shortage of doctors in some specialties. Under the new system, few doctors will be trained in specialties other than the designated ones, at least for the next two years. The new system will also lead to increased workloads for teaching staff in the designated specialties.

In the 1970s, to deal with a shortage of doctors and their uneven distribution across the country, the number of medical schools in Japan almost doubled. While this expansion eased the overall shortage of practitioners to some degree, the problem of geographical distribution remains.<sup>2</sup> When postgraduate training in primary care was limited,<sup>3</sup> the majority of doctors, trained at university or teaching hospitals, were reluctant to take on the care of patients outside their own specialties: a necessity in rural practice. In 2003, the media repeatedly publicised the fact that some community hospitals in rural areas were making

false claims to be employing doctors who in fact were not working there. These false claims were made to ensure that the hospitals continued to receive reimbursements: such hospitals would otherwise have received reduced payments, or would have had to cut the number of beds available. It is still enormously difficult to recruit full-time doctors to posts in rural areas.

So where have all the trained doctors gone over the past 20 years? Currently, the nationwide ratio is 2.0 doctors per 1,000 population (60% working in hospitals and 35% in clinics), with the ratio estimated to exceed 2.5

by 2025 – even raising concerns about a future surplus.<sup>4</sup> The ageing of Japanese society and advances in medical technologies has increased the demand for doctors. Also, the relatively high ratios of hospital beds to population in Japan, with more than 1.6 million beds for 127 million people (although the doctor/bed ratio is relatively small), together with decreased lengths of stay in hospital caused by payment reforms, requires a large physician workforce in hospitals. And increasing numbers of women are undertaking medical training (a

third of those currently in training are female), but the productivity of female doctors has been reported to be only 80–90% of that of male physicians.<sup>4</sup>

Policy regarding the training of doctors is a difficult task which needs constant monitoring and evaluation.<sup>5</sup>

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## **Evaluation of a medical school for rural doctors**

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## **Abstract**

**Context.** Jichi Medical School (JMS) is the first and only medical school in Japan that was founded exclusively to graduate/prepare rural doctors.

**Purpose.** To evaluate the long-term effect of Jichi Medical School (JMS) on the nationwide distribution of doctors.

**Methods.** Data from the Japanese population census of 1995 and from the Japanese physician census of 1994 were combined for use in this study. We extracted the JMS graduates from the physician census and compared the distribution of JMS graduates to that of non-JMS graduates. JMS graduates have an obligation to work in rural areas for nine years after graduation. Therefore, we divided them into those doctors who were either 'under rural duty' or 'after rural duty.'

**Findings.** JMS graduates were more likely than non-JMS physicians to practice in rural municipalities. There were 7.1, 2.6, 3.0, and 5.3 times more JMS graduates practicing under rural duty and 4.6, 1.6, 1.9, and 2.8 times more JMS graduates practicing after rural duty than non-JMS graduates present in 'small population,' 'remote,' 'mountain,' and 'medically underserved' municipalities, respectively. The JMS graduates accounted for only 0.7 percent of all the physicians in Japan. However, they accounted for 4.2, 1.5, 1.8, and 3.0 percent of the physicians in 'small population,' 'remote,' 'mountain,' and 'medically underserved' municipalities, respectively

**Conclusions.** The goal of JMS to produce rural doctors has made an impact on doctor distribution nationwide. JMS has developed a successful approach to ameliorating the shortage of rural physicians in Japan..

**Keywords;** Jichi Medical School, education, rural health, doctor distribution, recruitment

## Introduction

The lack of physicians in rural areas remains a worldwide issue and has been a serious problem in Japan.<sup>1</sup> To improve the supply of rural physicians, the Japanese government has experimented with many strategies. The Strategy to Promote Rural Health and Medical Service has been in place since 1956, and includes the establishment of rural hospitals, clinics and health centers, transportation for patients, telemedicine services, financial aid for medical undergraduates who intend to practice in rural areas, mediation of physicians to rural practices and so on.<sup>2</sup> However, these measures did not contribute significantly to redressing the inequities between urban and rural areas.<sup>2,3</sup>

To solve this problem, Jichi Medical School (JMS) was established in 1972. Among the 80 medical schools in Japan, JMS is the only one that is dedicated exclusively to producing doctors for rural areas.<sup>4</sup> To encourage its graduates to practice in rural areas, JMS has a unique system that applies to all of its students. JMS has guaranteed it will recruit 2 or 3 high-school graduates per year from each of the 47 prefectures of Japan. Therefore, the student to :population ratio is higher in prefectures with a lower population. As a result, JMS has tended to recruit more high-school students from the less populated prefectures of Japan.<sup>4</sup> All students are funded by their home prefectural governments, so that they pay no tuition or school fees for their six years at the JMS. The six-year undergraduate program at JMS is tailored for future rural practice. In 2003 there were lectures focusing on rural primary care: 10 credit hours in the first year, 15 in the third, 5 in the fifth, and 14 in the last year. Most of these lecture hours are given by experienced rural practitioners. In the fifth year, students spend two weeks in a rural practice in their home prefectures. In the sixth year they also can complete an elective rural internship for four weeks. In addition, the 'JMS prefecturers' union' (define this term more clearly) of each prefecture invites JMS students to experience rural practice through summer internship programs.

All JMS graduates are required to take two years of postgraduate training at a general hospital in their home prefecture. Although mono-specialty training dominates Japanese postgraduate education, JMS graduates must complete rotations in internal medicine, surgery, and pediatrics. After the training, they have an obligation to work for seven years in the public clinics or hospitals in rural areas in their home prefecture. In Japan a rural area generally means a place that is remote and less populated. However, there is no clear definition of the term 'rural area.' So the areas to which JMS graduates are sent are determined by each prefectural office, taking a demand-supply balance of the prefecture into account. After completing the nine years, the JMS graduates can choose to remain in rural practice or transfer to an urban one. However, each prefecture office has a responsibility to all rural obligated JMS graduates to check the obligation fulfillment status of all JMS graduates from the prefecture. Students who breach the obligation must pay all their medical school expenses at one time.<sup>4</sup>

This study evaluated the success of JMS in producing physicians in rural areas, and its impact on

the nationwide distribution of doctors.

## Methods

Japan has three levels of government: municipal, prefectural, and national. Municipalities (cities, towns and villages) are the basic geographic units of administration. In 1994, there were 47 prefectures and 3,255 municipalities in Japan. The data of the Japanese nationwide population census of 1995 and the physician census of 1994, were combined according to the relevant municipal code numbers.<sup>5,6</sup> Under a legal obligation, both of the censuses must cover all of their subject populations. Since four municipalities merged into two in 1994 and 1995, we readjusted the numbers of physicians according to the 1995 boundaries.

In general, a rural community in Japan is located in the mountains, has a small population and is distant from large cities. In this study, therefore, each municipality in Japan was categorized as rural or non-rural community according to one of the following four criteria:

1. the size of population = 20,000 or less
2. remoteness from the prefecture capital = 50 km or more
3. altitude of the community = 500m or more above sea level
4. the number of doctors per 100,000 residents = 50 or fewer.

Each category can overlap with another. We extracted JMS graduates from the 1994 physician census and classified them as 'under duty' or 'after duty' based on the status of their nine-year rural obligation. Because there are very few graduates of foreign medical schools in Japan, non-JMS physicians constituted virtually all of the graduates of the other 79 medical schools in Japan. By comparing the distribution of JMS graduates and non-JMS graduates in 1994, we evaluated the cumulative effect of JMS graduates on physicians' distribution in the entire nation since 1978 when JMS produced its first graduates.

To check the accuracy of the physician census data, the compliance rate of JMS graduates was examined. JMS reported that 1,748 graduates registered in National Doctor Registry between 1978 and 1994.<sup>7</sup> In the physician census for the same period, we found 1,661 JMS graduates. Subtracting the 24 graduates who were outside of Japan, 96 percent of the JMS graduate physicians were confirmed on the physician census data. (Be sure that all paragraph indents are a full 5 spaces)

Because this study deals with the whole municipalities and almost all the physicians in Japan, we did not conduct any statistical tests.

## Results

Table 1 shows the characteristics of the four types of rural municipalities. The less populated and remote municipalities geographically occupy more than half of the country, but their populations comprise less than twenty percent of the national population. The physician/population ratios of all

four types of rural municipalities were smaller than that of the nation as a whole. The number (percent) of physicians in one, two, three and four of the four rural definitions were 38,132 (16.5%), 7,537 (3.3%), 1,316 (0.6%), and 59 (0.03%). Table 2 shows the distribution of each physician group in the four types of rural municipalities. There were 7.1, 2.6, 3.0, and 5.3 times more JMS graduates under rural duty and 4.6, 1.6, 1.9, and 2.8 times more JMS graduates after rural duty than non-JMS graduates in 'small population,' 'remote,' 'mountain,' and 'medically underserved' municipalities, respectively. Of those physicians who were in at least one of the four categories, 2.7 times more were 'under duty' JMS graduates and 2.0 times more were 'after duty' JMS graduates. JMS graduates accounted for only 0.7 percent of all the physicians in Japan. However, they accounted for 4.2, 1.5, 1.8, and 3.0 percent of the physicians in 'small population,' 'remote,' 'mountain,' and 'medically underserved' municipalities, respectively. Only 2 (since you use numerals for all the other percent statistics, I would here also) percent of JMS graduates did not observe the rural practice obligation. The graduates were distributed throughout Japan, from Rishirito Island (Hokkaido) in the north, to Haterumato Island (Okinawa) in the south.

As for specialties that physicians have chosen, 67.7 percent of JMS graduates specialized in one of the subject areas that are conventionally considered as 'primary care' subjects in Japan including internal medicine, surgery, and OB-GYN, while non-JMS graduates having chosen 'primary care' subjects were 52.4 percent. Traditionally, in Japan there is no primary care specialty, such as 'family medicine' or 'general practice,' as in other countries.

## **Discussion**

JMS graduates are working in rural areas to a much greater percent than are graduates from other medical schools. When JMS was established, the general population and policy makers expressed two serious concerns about its plan to produce rural doctors.<sup>8</sup> The first was that JMS graduates would breach the contract with JMS and refuse to enter rural practices. By paying all the education fees, JMS graduates can dissolve the contract to work in rural areas. Contrary to the expectations, and as this study shows, the majority of JMS graduates have observed the contract. The second and graver concern was whether or not JMS graduates would remain in the rural areas after completing their contractual obligation. In this study, however, JMS graduates who had completed their obligatory work proved more likely to remain in rural communities than are other medical school graduates.

There are some limitations in this study. We employed as many criteria as possible to distinguish rural from non-rural, and analyze physicians' distribution. Though our definitions represent the concept of 'rurality' well, it is possible that rural municipalities, as defined by one of the four definitions, are not actually rural places, or example, lightly populated areas near a city. Matsumoto et al. used other definitions of rural municipalities by citing the size of a populated area's elderly

population, economic power, and the rate of population decrease.<sup>9</sup> Lack of a clear quantitative definition of a rural place makes it difficult for Japanese researchers to conduct rural health research whose results are to be compared with each other.

The results of this study showed 33 percent of JMS graduates under duty did not work in any of the types of rural areas we defined. We suppose this result occurred because graduates who were in their first two years after graduation and in residency training were concentrating at teaching hospitals in large cities. The annual intake of students at JMS has been 100, and this number has not changed since its foundation. Thus, these 'junior trainee' doctors comprise 22 percent of JMS graduates under duty, which corresponds to the ratio of the first two years to the nine years' obligation. In addition, most prefectures allow 'senior training' in which graduates under rural duty who finished junior training take an additional one-year training at general hospitals or universities in non-rural areas. In the same way, they are estimated to comprise about 10 percent of JMS graduates under duty.

Another limitation is that the data of this study is ten years old because it is the only current data available. In the past ten years, the basic structure of JMS system did not change at all and continued to produce about one hundred rural doctors every year. However, JMS is a relatively young medical school, and therefore the cumulative effect of JMS graduates on the distribution of doctors in the country must be greater. A follow-up study to evaluate JMS's long-term effect on the nation's distribution of doctors should be conducted.

There are several programs that are designed to persuade students and physicians to work in rural areas. Most of these programs claim to have contributed to recruiting physicians in rural areas. However, these programs were only parts of a medical school's larger educational agenda or elements of a postgraduate GP training program. Examples are undergraduate short-term rural internship programs,<sup>10</sup> rural practice experience in postgraduate training,<sup>11-14</sup> and loan-forgiveness programs for medical students.<sup>15</sup> There is a program at a medical school that recruits small numbers of rural students and encourages them to enter rural family practice.<sup>16,17</sup> This program had remarkable success in having a high percentage of its graduates return to rural communities, and showed a clear correlation between the rural background of students and their future rural practice, an aspect we did not evaluate in this study.<sup>16,17</sup> However, the contributions of most of these programs to rural health care seem to be rather local and small scale, compared to those of the JMS program.

The National Health Service Corps (NHSC) is one of the largest scholarship programs in the United States. In the NHSC program, medical students are recruited through a system of scholarship; for each year of scholarship support, they are obliged to spend one year working in rural or medically-underserved urban areas after residency training. Although this program has succeeded in increasing health care manpower in medically-underserved areas, the recruitment rate of the

program's doctors in rural areas seems to be lower than that of the JMS system.<sup>15</sup>

The undergraduate education at JMS is unique in that it incorporates lectures and internship programs that focus on rural medicine. This observation is particularly true when we consider that most other medical schools in Japan have no such teaching element in their curriculums. However, because of strict standardization and control of undergraduate curriculum of each medical school by the Ministry of Education until 2001, the total amount of education tailored to rural practice is not enough. After 2001, the Ministry of Education relaxed its regulation on medical education; each medical school can now design and focus most of its entire curriculum at its own discretion. Thus JMS is now planning to expand the component of rural medicine available in its undergraduate education.<sup>18</sup>

Other than the educational factors mentioned above, additional factors may also affect the retention of JMS graduates in rural areas. The literature points out that a lack of familiarity with rural life and worry about the extensive clinical capability required for rural practice were major reasons that prevented non-rural Japanese doctors from entering rural practice.<sup>19</sup> However, during the obligation period, JMS graduates can develop suitable clinical capability for rural practice as well as familiarity with the rural life style. This adaptation may affect the career choice of JMS graduates who have finished their rural obligation. The network of JMS graduates in each prefecture is also a nonnegligible factor. Every prefecture has a 'JMS prefecturer union' in which graduates under or after obligation exchange information and support each other. The union gives JMS graduates a mutual locum service and career support. Isolation of a doctor in a rural area is one of the greatest deterrents to a rural medical practice.<sup>20,21</sup> Therefore the union system can help to retain JMS graduates in rural areas.

The results of this study cannot apply to other countries without considering the system of rural practice in Japan. The relocation of doctors in Japan is generally easy because there are no legal limitations for doctors in choosing places to work for to open private practice. Thus, in rural areas, the turnover of doctors is considered to be much higher than in urban or suburban areas.<sup>2</sup> Lobbying of rural politicians was active, and political pressure by rural people upon central government to secure health care was fierce. This background led policy makers to believe in the need to attach a service obligation to any program to train rural doctors. This was the major reason for the JMS' foundation in 1972. However, rural practice differs from country to country. In some countries a JMS-style nine year 'rural duty' might not be accepted at all from the perspective of the individual's right and freedom to choose a place in which to live and work.

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Table 1. Characteristics of municipalities

|   | Rural municipalities |                   |                   |                 |                        |                     |  |
|---|----------------------|-------------------|-------------------|-----------------|------------------------|---------------------|--|
|   | All municipalities   | Small population* | Remote**          | Mountain†       | Medically underserved‡ | Any rural category§ |  |
| Number of municipalities                      | 3255                 | 2249 ( 69.1 )     | 1186 ( 36.4 )     | 309 ( 9.5 )     | 873 ( 26.8 )           | 2539 ( 78.0 )       |  |
| Area(square km)                               | 371473               | 245720 ( 66.1 )   | 191262 ( 51.5 )   | 43681 ( 11.8 )  | 83195 ( 22.4 )         | 296488 ( 79.8 )     |  |
| Population(persons)                           | 125568504            | 18312284 ( 14.6 ) | 21156399 ( 16.8 ) | 3232872 ( 2.6 ) | 7932732 ( 6.3 )        | 35318580 ( 28.1 )   |  |
| Population density (persons/km <sup>2</sup> ) | 338                  | 75 ( 22.0 )       | 111 ( 32.7 )      | 74 ( 21.9 )     | 95 ( 28.2 )            | 119 ( 35.2 )        |  |
| Physicians(persons)                           | 230519               | 17959 ( 7.8 )     | 32164 ( 14.0 )    | 4566 ( 2.0 )    | 2701 ( 1.2 )           | 47044 ( 20.4 )      |  |
| Physician/population ratio                    | 184                  | 98 ( 53.4 )       | 152 ( 82.8 )      | 141 ( 76.9 )    | 34 ( 18.5 )            | 133 ( 72.6 )        |  |

Parentheses are percentages to all municipalities.

\*: the size of population = 20,000 or less. \*\*: remoteness from the prefecture capital = 50 km or more. †: altitude of the community = 500 meters or more above sea level. ‡: the number of doctors per 100,000 residents = 50 or fewer. §: At least one of the

Table 2. Distribution of the JMS graduates and non-JMS graduates in rural municipalities

| Classification of physicians                                | Rural municipalities |           |                |                       |                     |            |     |       |
|---|----------------------|-----------|----------------|-----------------------|---------------------|------------|-----|-------|
|   | Small population     | Remote    | Mountain       | Medically underserved | Any rural category* |            |     |       |
| N   | %                    | Ratio**   | N              | %                     | Ratio               | N          | %   | Ratio |
| JMS graduates who paid school fees and dissolved rural duty | 26                   |           |                |                       |                     |            |     |       |
| JMS graduates under rural duty                              | 876                  | 468 53.4  | 7.1 321 36.6   | 2.6 287 32.8          | 3.0 55 6.3          | 589 67.2   | 2.7 |       |
| JMS graduates after rural duty                              | 759                  | 262 34.5  | 4.6 170 22.4   | 1.6 158 20.8          | 1.9 25 3.3          | 376 49.5   | 2.0 |       |
| Non-JMS graduates   | 228858               | 17225 7.5 | 1.0 32118 14.0 | 1.0 24860 10.9        | 1.0 2693 1.2        | 57867 25.3 | 1.0 |       |

\*At least one of the four categories.

\*\*Each ratio was calculated by treating non-JMS graduates as 1.0.