Forecast of Changes in the Number of Outpatients and Inpatients in Each Japanese Prefecture from 2005 to 2020

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Abstract

Visits to medical institutions increase with age. In the future Japan's overall population will decline, but its population of elderly persons aged 65 and older will increase through 2020. Accordingly, the number of outpatients and inpatients is anticipated to increase over the next 10 years. However, since the aging of the population will not progress uniformly across the country, future forecasts of the number of patients in each prefecture will be essential for discussing future health care. In view of that, the changes in the number of outpatients and inpatients from 2005 to 2020 were forecast based on each prefecture's estimated population in 2020 and consultation rate in 2008.

The areas where the number of patients is predicted to increase sharply over the next 10 years are large metropolitan areas such as the Kanto, Tokai, Kinki, and San-yo regions. On the other hand, although the number of inpatients is forecast to increase on a national basis, there are prefectures where the number of outpatients is predicted to decrease, such as in the Tohoku, San-in, Shikoku, and Kyushu regions.

Key words Outpatients, Inpatients, Japan, Prefecture, Health care management

Japan's population is on a declining trend, but the population aged 65 years and older will continue to increase through 2020 after which it is forecast to flatten out (**Fig. 1**).[1] On the other hand, the consultation rate (number of outpatients and inpatients per day per 100,000 people) drops to its lowest point at around 2,000 for 15–19 year-olds and then increases with age (**Fig. 2**).[2] For this reason, the number of outpatients and inpatients is anticipated to increase over the next 10 years with the ageing of society, regardless of the population decline. However, aging of the population will not progress uniformly throughout the nation, and so forecasts of the number of patients in each prefecture will be needed for thinking about the health care system of the future. Accordingly, changes in the number of patients were forecast based on each prefecture's estimated changes in population from 2005 to 2020 and the consultation rate in 2008.

Methods

Future population projections in five-year age groups for each prefecture were taken from data published by the National Institute of Population and Social Security Research.[1] Fundamental actual population numbers in five-year age groups were taken from the results of the 2005 Population Census.[3] The consultation rate (number of outpatients and inpatients per day per 100,000 people) by age group for each prefecture was shown only in 10-year age groups, and the rate for persons aged 75 and older was not shown.[2] Consequently, the consultation rates in five-year age groups were taken from national values in

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the 2008 Patient Survey.[2] The total consultation rates in 2005 and 2008 were 5,551 and 5,376 for outpatients and 1,145 and 1,090 for inpatients, respectively. The numbers for 2008 were therefore slightly lower but there was no major difference. Further, the consultation rate for children aged 0–4 was counted in two groups (aged 0 and 1–4), whereas the projected population was counted for the single age group 0–4.[1] For this reason, the value for the aged 1–4 group was substituted as the consultation rate for the aged 0–4 group. Note that the consultation rates in 2008 were 6,867 for the aged 0 group and 6,273 for the aged 1–4 group, and so there was no major difference.

The number of patients in 2020 was estimated as follows:

- Number of outpatients = (Projected population in each 5-year age group for 2020) × (Outpatient consultation rate in each 5-year age group for 2008) and totaled for all age groups
- Number of inpatients = (Projected population in each 5-year age group for 2020) × (Inpatient consultation rate in each 5-year age group for 2008) and totaled for all age groups

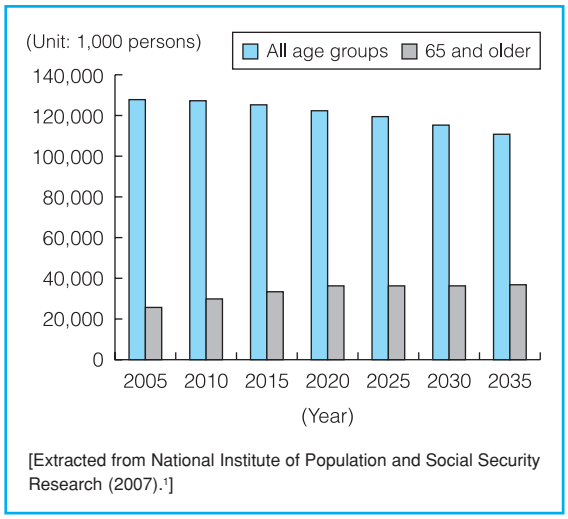


Fig. 1 Projected population for all age groups and persons aged 65 and older

Results

The 11 prefectures in which the number of outpatients is forecast to decrease from 2005 to 2020 are shown in **Fig. 3** and the 10 prefectures with a large change are shown in **Table 1**. The prefecture with the largest decrease is Akita (331 outpatients) followed in order by Yamagata (219), Shimane (181), Wakayama (148), Yamaguchi (116), Kochi (116), Kagoshima (109), Iwate (88), Nagasaki (36), Tokushima (12), and Niigata (6).

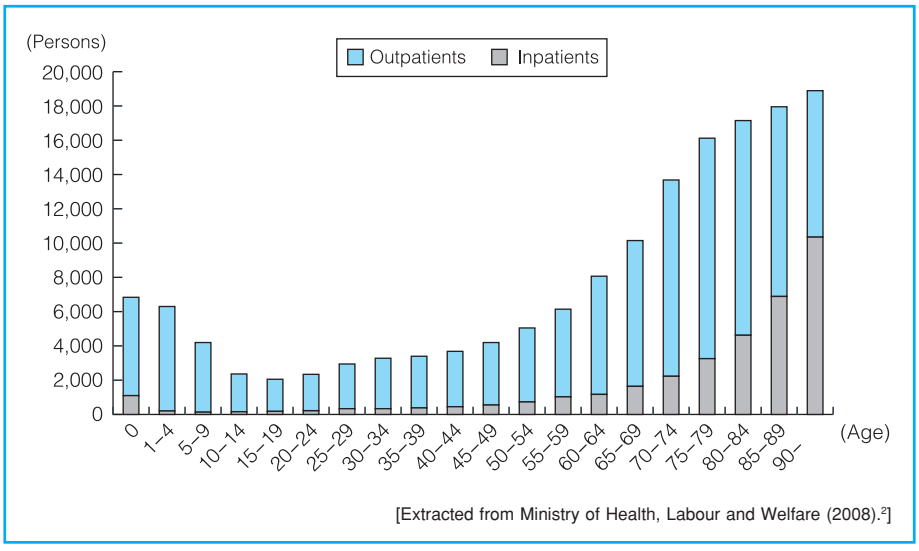
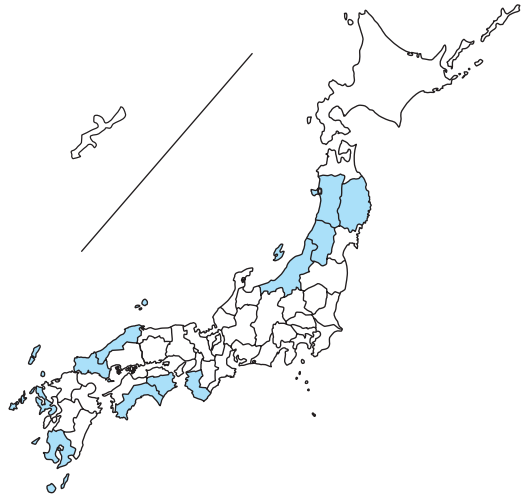


Fig. 2 Number of outpatients and inpatients per day per 100,000 people by age group (the consultation rate)



[Prepared from National Institute of Population and Social Security Research (2007)[1]/Ministry of Health, Labour and Welfare (2008).[2]]

Fig. 3 Prefectures with a decline in the number of outpatients per day from 2005 to 2020

Table 1 The anticipated increase in the number of patients per day from 2005 to 2020: top 10 and bottom 10 prefectures

(Persons)

2005–2020	Outpatients		Inpatients	
Top	Tokyo	10,186	Tokyo	5,048
	Kanagawa	7,437	Kanagawa	3,786
	Saitama	5,573	Osaka	3,252
	Aichi	5,091	Saitama	2,947
	Chiba	4,884	Aichi	2,707
	Osaka	4,096	Chiba	2,591
	Hyogo	2,547	Hyogo	2,021
	Fukuoka	2,246	Hokkaido	1,960
	Hokkaido	1,593	Fukuoka	1,676
	Shizuoka	1,588	Shizuoka	1,342
Bottom	Tokushima	−12	Akita	281
	Nagasaki	−36	Yamagata	280
	Iwate	−88	Yamanashi	261
	Kagoshima	−109	Wakayama	252
	Kochi	−116	Saga	229
	Yamaguchi	−116	Fukui	221
	Wakayama	−148	Tokushima	213
	Shimane	−181	Kochi	193
	Yamagata	−219	Shimane	166
	Akita	−331	Tottori	156

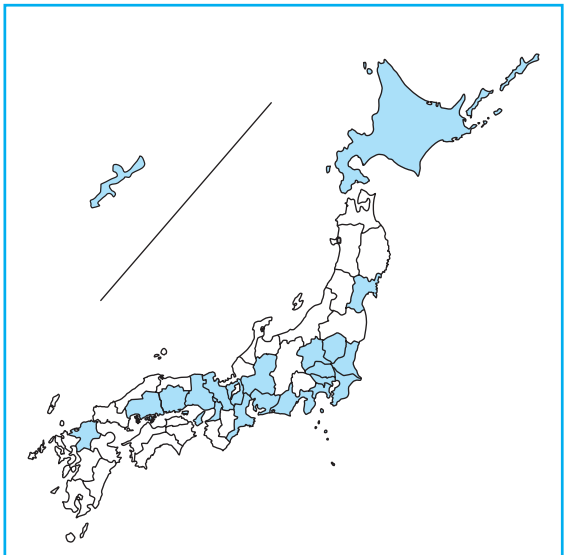
[Prepared from National Institute of Population and Social Security Research (2007)[1]/Ministry of Health, Labour and Welfare (2008).[2]]

In 2020 the number of inpatients per day will increase compared to 2005 in all prefectures (**Table 1**). However, the number of inpatients per day will increase by 1,000 or more in only 10 prefectures: Tokyo (5,048), Kanagawa (3,786), Osaka (3,252), Saitama (2,947), Aichi (2,707), Chiba (2,591), Hyogo (2,021), Hokkaido (1,960), Fukuoka (1,676), and Shizuoka (1,342).

Similarly, the prefectures in which the number of outpatients and inpatients per day is forecast to increase by 1,000 or more from 2005 to 2020 are shown in **Fig. 4**. There are 21 prefectures in this group and, excluding Hokkaido and Okinawa, they tend to be concentrated in the large metropolitan areas of the Kanto, Tokai, Kinki, and San-yo regions.

Discussion

Nowadays, the shortage of doctors is becoming a social problem. It is seen as the breakdown of community health care, but the places where the increase in demand for health care over the next 10 years will be pronounced are mainly large metropolitan areas such as the Kanto, Tokai,



[Prepared from National Institute of Population and Social Security Research (2007)[1]/Ministry of Health, Labour and Welfare (2008).[2]]

Fig. 4 Prefectures in which the number of outpatients and inpatients per day will increase by 1,000 or more from 2005 to 2020

Kinki, and San-yo regions (**Fig. 4**). A conceivable contributor is that demand for health care will increase as the generation that moved from the countryside to the cities ages. Of course, it is possible that consultation behavior at medical institutions could change, such as with an increase in out-of-pocket medical expenses. Nonetheless, it is clear that the elderly population in large metropolitan areas will increase, as will the population with diseases.

At present, the planned stationing of doctors is being discussed as a solution to the shortage of doctors. However, the stationing of doctors will be required not only in remote places far from major cities. As this investigation makes clear, it is highly like that in 10 years a shortage of doctors in major metropolitan areas will become a social problem. It is conceivable that there will be large numbers of cases in which the shortage of doctors will make it difficult to be seen by a doctor even in bedroom communities several dozens of kilometers away from major cities.

Doctors are a limited resource. There should be no regional difference in the health care resources which the people can receive the benefit of. For that reason, the demand for doctors in communities should be quantified and there will likely be a need to store up basic data when drawing blueprints for a health care provision system.

References

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