Shortage of health workforce in Greater Tokyo

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Objective

The population of Greater Tokyo was approximately 35 million in 2010 and is expected to remain the same in 2020. However, the population of the elderly population (aged 65 years and over) will increase by about 2 million and the proportion of them will rise from 21.0 % to 26.8%. Greater Tokyo is likely to remain the world's most densely populated area and demand for healthcare services for the elderly population will increase.
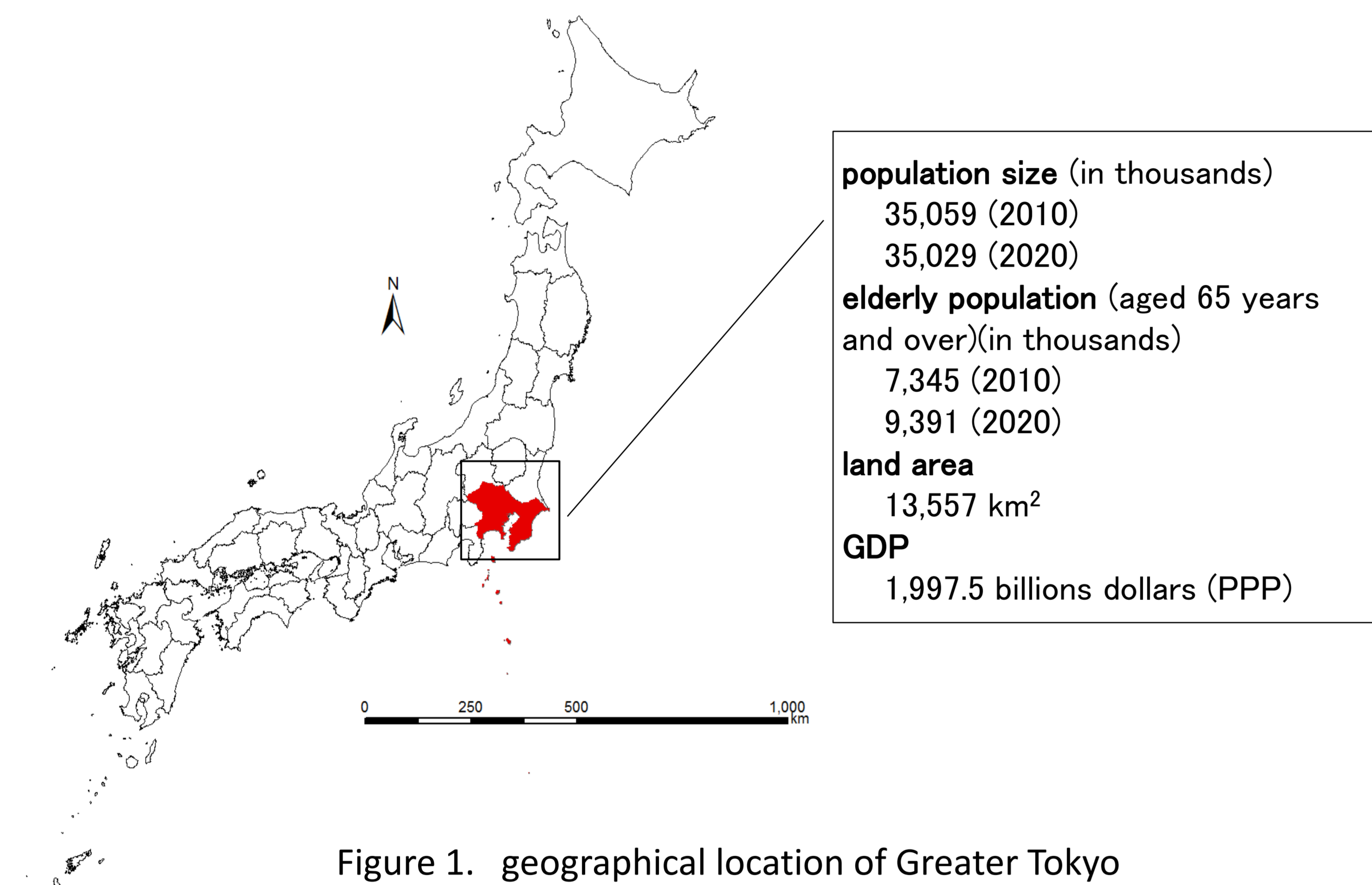

population size (in thousands)
35,059 (2010)
35,029 (2020)
elderly population (aged 65 years and over)(in thousands)
7,345 (2010)
9,391 (2020)
land area
13,557 km^2
GDP
1,997.5 billions dollars (PPP)

Figure 1. geographical location of Greater Tokyo

Methods

We used the data acquired from the official physician registry survey (Survey of Physicians, Dentists, and Pharmacists) in Japan. The number of physicians and information on sex, age, their specialty, and their working facilities were obtained from the registry data 1996–2010. We used the Bayesian theorem to estimate the numbers of physicians in all areas in Greater Tokyo. We calculated the numbers of physicians per 100,000 population and 100,000 elderly population, and the dispersion of physician in 2000, 2010, and 2020 using Gini coefficients.

Results

The total number of physicians is predicted to increase from 76,000 to 94,000 by 2020, equivalent to an increase in physicians per 100,000 population from 215.4 to 267.6. The numbers of healthcare workers of per population there (except Tokyo metropolitan city) will be the lowest among all areas in Japan. Although physicians per 100,000 elderly population increased from 1,012.6 in 2000 to 1,048.3 in 2010, we expect the per capita supply to decrease to 997.9 by 2020. Internists in clinics administer primary care in Japan. We expect internists in clinics per 100,000 elderly population will also decrease by 2020.

We depicted Lorentz curves and calculated Gini coefficients for all physicians per 100,000 population and per 100,000 elderly population, and found the inequity was almost stable. However, Gini coefficients for internists in clinics per 100,000 elderly population will rise from 0.3265 in 2000 to 0.3959 in 2020.
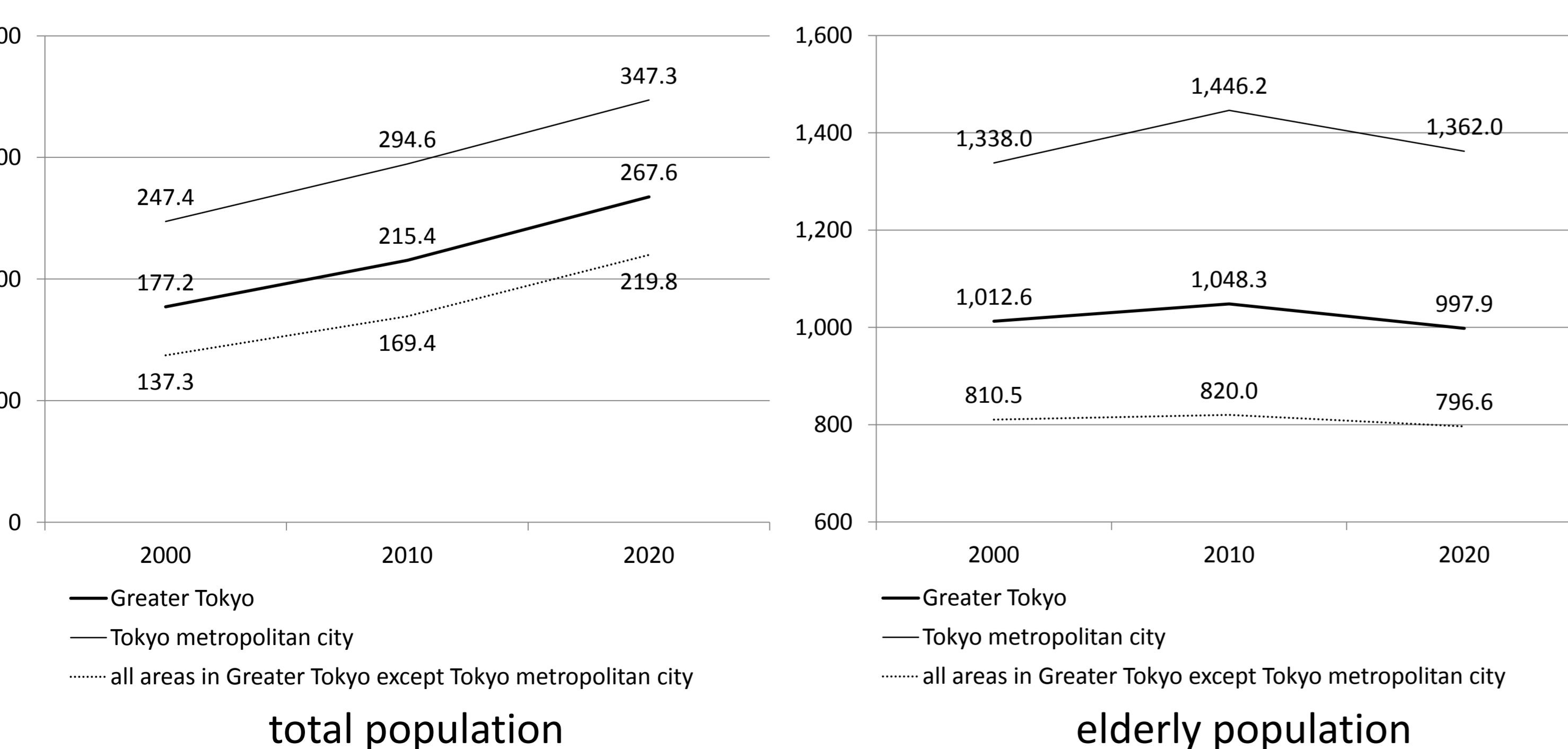

total population

elderly population

- Greater Tokyo
- Tokyo metropolitan city
- all areas in Greater Tokyo except Tokyo metropolitan city

Figure 2. estimated numbers of physicians per 100,000 population in 2000, 2010 and 2020
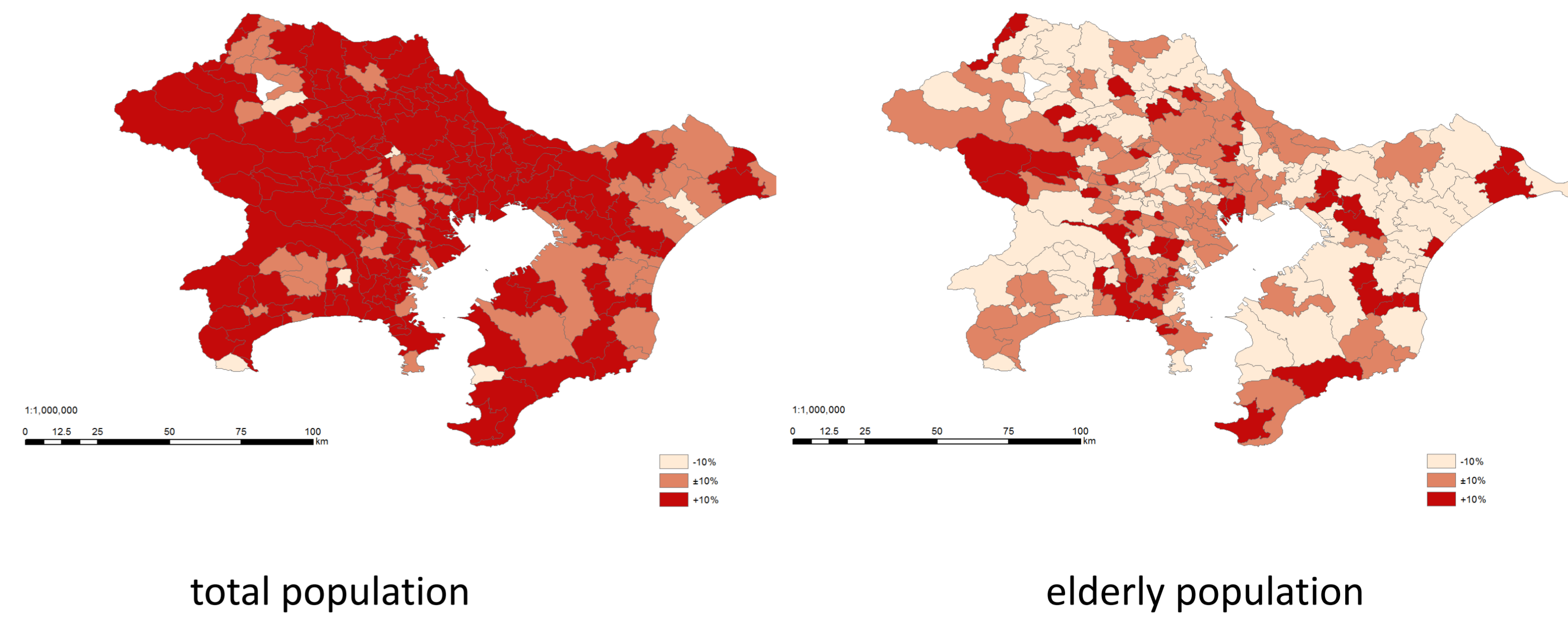

total population

elderly population

Figure 3. changes in the percentage of the numbers of physicians per 100,000 population between 2010 and 2020

Gini coefficient
2000   0.452631
2010   0.438765
2020   0.439716

total population

Gini coefficient
2000   0.466027
2010   0.481017
2020   0.486015
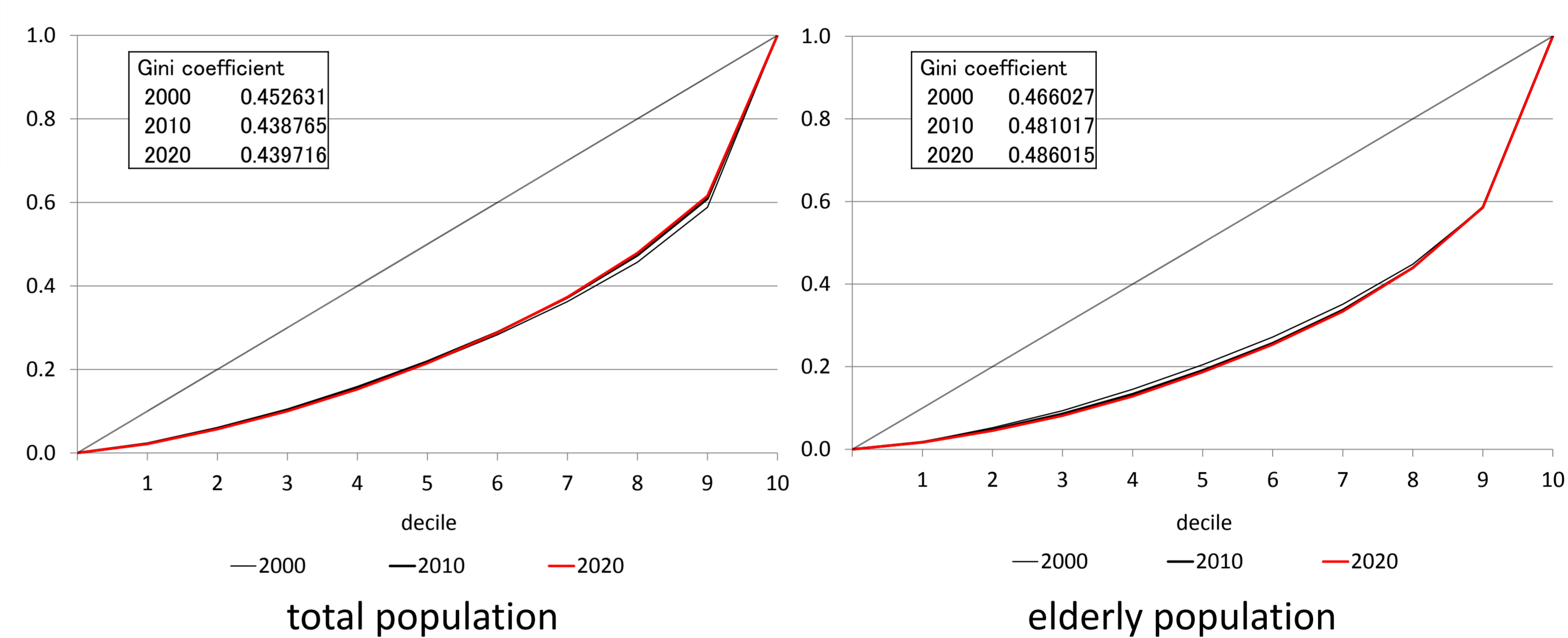
elderly population

— 2000 — 2010 — 2020

Figure 4. Lorentz curves of distribution of the numbers of physicians per 100,000 population in 2000, 2010 and 2020

Conclusion

Although the supply of physicians per capita in Greater Tokyo will increase, the number of physicians per 100,000 population is well below the average for Japan. Furthermore, physicians per 100,000 elderly population and the equity of primary care distribution will decrease. These results imply access to healthcare services will become more difficult and may present a substantial problem for health care provision. We also showed the different trends in physicians per 100,000 population and elderly population. Because elderly population people demand more health care services than younger people, it is necessary to employ better indicators to evaluate health workforce distribution.

The government estimates that by 2030, 27.9% of the population will be elderly population. Unless steps are taken to ensure an adequate supply of physicians, access to and equity in healthcare services will worsen. Existing policies have encouraged physicians to practice in rural and remote areas. However, changes in the age structure and the distribution of urban populations indicate that more physicians are needed in urban areas that will appear throughout the world by the middle of this century. We suggest the existing physician distribution policy should change to provide for urban areas as well as for rural and remote areas. In addition, policy makers or stakeholders there need to consider luring healthcare workers to the area in addition to preventing them there from quitting a profession and training new workers.

We proposed a new indicator "physicians per 100,000 per elderly population (aged 65 years and over)" to compare the level of physician supply among areas. This can provide more appropriate information on health workforce distribution and contribute to evaluate the distribution in aging society.

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