A Mathematical Model for Estimating the Future Number of Dentists Practicing in Medical Facilities Expressed in the National Survey of Physicians, Dentists, and Pharmacists in Japan

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Abstract: A discrete-time mathematical model for describing the population of dentists working at medical facilities expressed in the National Survey of Physicians, Dentists, and Pharmacists in Japan (NSPDP) was developed based on the number of candidates passing the national dentist examination from 2001 to 2008 and the dynamics of the previous results of the NSPDP from 1984 to 2008. The number of dentists aged 24 to 29, which is shown in the NSPDP of the target year, was calculated based on the age-distribution of dentists newly entered in the government list, considering the effects of the number of candidates passing the national dentist examination over the previous 5 years. Ages from 25 to 84 years were divided by intervals of 5 years, excluding ages 24 and 85 or over, and parameter coefficients for the dynamics of each group were calculated from the change in the number of dentists in each group after 5 years. A mathematical model for estimating the future number of dentists practicing in medical facilities expressed in the NSPDP was constructed utilizing the above. Using the model, the future population dynamics of dentists were by simulated based on the numbers of candidates passing the national dentist examination, whereby the numbers were kept constant over time, i.e., 1,200, 2,400, and 2,700.


Key words: Dental therapy, Discrepancy in supply-and-demand, Number of dentists, Future prospects