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Mortality Projection Model Consistent with the Recent Japanese Mortality Situation

— Developing the Age-shifting Model —

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In the Japanese official population projection, the cohort component method is used. To make an assumption for the survivorship ratio in the projection, use of the mortality projection model to obtain future life tables is necessary.

Japanese life expectancy has increased rapidly over time and is still increasing with top class values in the world. This unique trend is one of the factors that makes it difficult to project future mortality situations for Japan.

In this paper, first we observed the recent trends in Japanese mortality, and explored some aspects to improve mortality projection model for Japan. From the review, we found that the recent mortality improvement in Japan is recognized as age-shifting of mortality curve, therefore it would be preferable to develop a mortality model that has an age-shifting structure.

Next, we reviewed the Lee-Carter model and its application to Japan, since the age-shifting model is based on the Lee-Carter model. Then we discussed the structure of the age-shifting model, which is a Lee-Carter model that has age-shifting structure applying the amount of shift in the shifting logistic model by Bongaarts.

Finally, we compared the age-shifting model with the Lee-Carter model. According to the comparison of the age-shifting model and the Lee-Carter model, we presented that the age-shifting model had better performance in explaining the actual values, and was more consistent with the recent mortality pattern which is characterized as a delay in timing of death.