Applications of the Japanese Mortality Database to Mortality Studies

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This study aims to reveal the usefulness of the Japanese Mortality Database (JMD) to mortality studies, and its applicability and possibilities of use in demographic analyses. We show the estimated indicators for locations and variance in the death distribution using the life table functions as long time series, trends in the probability of dying by cause, and their applications to the analysis of the structure of cause of death by prefecture. Furthermore, we show an application of the exposure to risk by prefecture in the JMD for fertility indicators.

From the trends in the modal age at death, we observed a steady increase since 1950 along with an increase of the dx caused by the improvement of younger mortality. In the 1990s, it is notable that the increase of the dx tapered and only the modal age increased. Furthermore, an increase of the modal age has been weakened whereas an increase of dx has been strengthened since 2000, which is consistent with analysis using the linear difference model. We could recognize this as a new trend in Japanese female mortality that was not observed before.

We observed prefectural characteristics of mortality by cause with hierarchical cluster analysis using the probability of dying by cause, and then divided all prefectures into four groups. We observed that the first group revealed a geographical feature that included many prefectures in the Tohoku area, whereas the second group contained prefectures with big cities, such as Tokyo, Kyoto, and Osaka. The third group for both males and females was formed solely by Okinawa; the proportion of deaths by cause was affected by the peculiarity of the mortality pattern in Okinawa, which involved a different structure of cause of death by age.

Furthermore, we showed some possibilities of improving an estimation of the fertility rate by using the exposure to risk by prefecture in the JMD. We could show the applicability of the JMD on mortality studies as well as the possibility of applying it to demographic analyses.

The life table functions show the mortality situation by age in detail and include abundant information themselves. However, it is also important to modify them and develop new indicators to elucidate the characteristics of mortality in demographic analyses. For these kinds of analyses, it is necessary that the life tables are constructed by uniform methods and provided as common formats; this is accomplished by the JMD, which can appropriately be called an optimized database for mortality analysis. The analyses that we have shown in this study could not necessarily have been performed easily without the JMD. We believe that it will greatly contribute to the progress of demographic studies in Japan through the enhancement of analyses in demography.