

# Estimation and interpretation of mortality and fertility in Okinawa for the period of 1920-1935

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In this paper, I address two objectives. The first is to estimate the number of deaths and births in Okinawa from 1920 through 1935, and the second is to interpret the estimated mortality and fertility in Okinawa during that period by comparing them with those of other prefectures in Japan and by identifying the stage at which Okinawa was in the demographic transition model.

Okinawa is known for the longevity and high fertility of its inhabitants. The life expectancy at birth for men is 77.6, which is shorter than whole Japan, whereas the life expectancy at birth for women was 86.01 in 2000, which is the longest in Japan. In addition, the total fertility rate was 1.72 in 2005, which is the highest in Japan. However, the vital statistics for the years before 1972, the year in which full control of Okinawa was assumed by Japan, are incomplete, and therefore, the mortality and fertility in Okinawa before 1972 were uncertain.

The following eight steps were implemented to estimate the number of deaths and births.

1. The accuracy of the vital statistics relative to infant mortality and delayed registrations between 1900 and 1941 was examined.
2. The error in the number of deaths by age due to their delayed registration was corrected.
3. The corrected number of deaths was evaluated for accuracy.
4. The  ${}_4q_1$ ,  ${}_5q_5$ , ...,  ${}_5q_{55}$  values were calculated from the corrected number of deaths by age using the Greville's method.
5. The  $q_0$  and  ${}_5q_{60}$ ,  ${}_5q_{65}$ , ...,  ${}_∞q_{85}$  values were calculated by relating the q-type mortality rate calculated above to a Coale-Demeny South model life table.
6. Abridged model life tables were constructed using the q-type mortality rate as previously calculated and estimated.
7. The number of deaths aged 0 and over 60 years was estimated on the basis of census data and the abridged model life table.
8. The number of births was estimated on the basis of census data and the estimated number of deaths at 0 years of age.

After the estimation of the number of deaths and births, the mortality and fertility of the inhabitants of Okinawa from 1920 through 1935 were examined. The results are as follows:

1. The schedule of mortality rates by the age of the inhabitants of Okinawa was high in the early and middle years of life and relatively low in old age when  $q_0$  and the life expectancy of Okinawans at 0, 15, and 65 years of age were compared with those from the other prefectures in Japan.
2. When the fertility rates in Okinawa obtained using Coale's fertility indices and those of other prefectures in Japan were compared, it was observed that the fertility in Okinawa was relatively high, which was attributed to the high marital fertility and low nuptiality. These structures of fertility were similar to those currently being reported.
3. The crude death rate, crude birth rate, and infant mortality rate in Okinawa fluctuated around 23%, 38%, and 160%, whereas these three indices for the whole of Japan decreased. Okinawa was, therefore, at the first stage of the demographic transition model between 1920 and 1935.