

## Trend analysis of sex ratios of births and fetal deaths in Japan, 1899-2003

Limin Yang<sup>1</sup> Naoko Sakamoto<sup>1</sup> Eiji Marui<sup>1</sup>

<sup>1</sup> Department of Public Health, Graduate School of Medicine, Juntendo University, Tokyo, Japan

**Objective:** To examine the secular trend in sex ratios of live birth and fetal death from 1899 to 2003 in Japan.

**Methods:** Annual male and female live births and fetal deaths data were obtained directly from the Vital Statistics in Japan. The ratio of male/female live births was defined as live birth sex ratio, and male/female ratio of fetal deaths was calculated as sex ratio of fetal death. Joinpoint regression analysis was used to detect long-term changes in the sex ratio over time.

**Results:** Between 1899 and 2003, the trend of sex ratio of births was marked by three significant shifts. The joinpoints occurred in 1910 and 1971. Beginning in 1911, the trend increased by 0.04 percent per year for nearly five decades. After 1971, the sex ratio of births began to decrease annually by -0.03 percent per year. Trend analysis for sex ratio in fetal deaths showed 3 significant joinpoints in 1955, 1964, and 1976. A significant increase was observed since 1964.

**Conclusion:** Our study confirmed a decrease in sex ratio for births and a significant increase in sex ratio for fetal deaths in the recent three decades. The increase in sex ratio of fetal death might be due to great improvements in obstetric care and an increasing availability of perinatal diagnosis since the 1970's. This increasing trend in sex ratio of fetal death may have influenced the decrease in sex ratio of births in Japan.