

Statistical Analysis of Household Size

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This paper discusses two kinds of household size distributions; one is based on the number of households by size and the other is based on the number of individuals living in household by size. The latter is called "propensity." It is shown that a moment of propensity is a function of a higher moment of household size distribution. An analysis of census data in Japan shows that the change in variance is usually greater than that of mean, with an exception of 1975–95 period when the mean reduced more rapidly than the variance.

A linear ratio of change model is proposed to obtain the distribution of household size according to a given average. This model is applied to the national average in the future and to prefectural averages in the 2015 census. A method to adjust an underestimation of variance is also proposed when a census table does not show all the household sizes but the last category summarize such as "ten persons and more." This method is applied to the post-war censuses of Japan and pre-war censuses of Japan, Korea, and Taiwan to evaluate the extent of underestimation of variances. It is shown that the average household size increased in the Japanese empire in 1920–40, and that the percentage of one-person household was lowest in Korea and highest in Taiwan.

keywords : household size, moments, propensity