

[BOX] Sampling Method and Margin of Error

Ideally, public opinion surveys should cover all households in the country to get a true representation of public opinion. However, for various reasons, including cost and time, this is not feasible. Therefore, the usual practice is to conduct a sampling survey, by using an appropriate sampling method to select survey subjects, and to use its results to infer the overall picture.

Two keys to conducting a sampling survey are the sampling method and the margin of error. With regard to the sampling method, it is best to select respondents who are without bias to the extent possible so that the survey results are as close to true public opinion (the results that would be obtained from a survey covering all households in Japan) as possible. As for the margin of errors in the survey results, it is best to know the degree of discrepancy, if any, between the survey results and true public opinion (in other words, how much allowance for errors should be taken into account when survey results are interpreted).

■ Sampling Method

This survey uses the stratified two-stage random-sampling method, which allows for the random selection of prospective respondents without bias stemming from region-specific characteristics or from characteristics due to city size.

Steps of the stratified two-stage random-sampling method

Assign an appropriate proportion of the survey areas to different regions	Divide Japan into 9 regions (Hokkaido, Tohoku, Kanto, Hokuriku, Chubu, Kinki, Chugoku, Shikoku, and Kyushu) and assign the 400 survey areas to each region in proportion to its share of the number of ordinary households.	<Example> Hokkaido (survey areas: 27)
Assign an appropriate proportion of the survey areas based on the size of the municipalities	Classify municipalities in each region into the following six groups based on their size: (1) large cities (13 cities nationwide), (2) cities with 40,000 households or more, (3) cities with 20,000–39,999 households, (4) cities with 10,000–19,999 households, (5) cities with less than 10,000 households, and (6) rural districts (towns and villages). Then, assign the number of survey areas to each group in proportion to its share of the number of households.	↓ large city (8) cities with 40,000 or more (8) cities with 20,000–39,999 (2) cities with 10,000–19,999 (2) cities with less than 10,000 (1) rural districts (6)
Select survey areas	Determine survey areas by randomly choosing them from the municipalities of each group, according to the number assigned to each group.	↓ Randomly choose 8 survey areas from the large city.
Select households to be surveyed	Randomly choose 15 households in each survey area, based on the residents' register.	↓ Randomly choose 15 households in each of the 8 survey areas.

■ **Margin of Error**

The total number of households surveyed was 6,000. Because the response rate is approximately 70% every year, the survey receives responses from approximately 4,200 households. The accuracy of the survey is based on “the law of large numbers.” For example, the more a die is thrown, the more the probability of rolling a “1” approaches one sixth. Applying this to the survey, the greater the number of samples (households covered by the survey), the closer the results of the survey to the true public opinion.

How much is the margin of error in the results of a survey covering 4,200 households? For example, when the percentage of households having opinion A is 60.5% this year whereas last year it was 60.0% in a survey covering the same number of households, can we conclude that the number of households having opinion A increased this year compared with last year?

The table below provides a quick view of the margin of error based on the number of households covered in and results of the survey. It shows that because the above result has a margin of error of slightly more than $\pm 2\%$, we cannot necessarily conclude that the number of households having opinion A increased compared with last year.

Margin of Error (Reliability = 95%)

Results (%) \ No. of Households	1% (99%)	5% (95%)	10% (90%)	20% (80%)	30% (70%)	40% (60%)	50%
500	1.3	2.8	3.8	5.1	5.8	6.2	6.3
1,000	0.9	1.9	2.7	3.6	4.1	4.5	4.5
2,000	0.6	1.4	1.9	2.5	2.9	3.1	3.2
3,000	0.5	1.1	1.5	2.1	2.4	2.5	2.6
4,000	0.4	1.0	1.3	1.8	2.0	2.2	2.2

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