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Quota Sampling

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Quota sampling is a type of survey sampling in which interviewers are directed to gather information from a specified number of members of the population belonging to certain subgroups. The subgroups are sometimes called *strata* or *cells.* In contrast to stratified random sampling, in which interviewers are given specific instructions by the survey planners concerning which individuals to interview, interviewers in quota sampling are given some latitude in selecting the population members to interview. Quota sampling, therefore, is similar to convenience sampling in that the survey designers and planners do not strictly control the selection of the sample. Some control, however, is maintained in the distribution of some sample characteristics.

Suppose an insurance company wants to gather information on a sample of its policyholders. The company's database of clients contains records on the sex, age, and number of policies of all its policyholders. Interviews are to be conducted by telephone. The interviewers are directed to interview 75 individuals in each of 12 strata. The strata are defined by three factors: sex, age, and number of policies. Specifically, the strata are formed by grouping policyholders by sex (female or male), age group (18–35, 36–65, and over 65 years old), and number of policies (one policy or more than one policy). These instructions will produce a quota sample because the interviewers may call as many customers as needed in order to quickly find people to complete the required interviews. In a stratified random sample, in contrast, the study planners would random select 75 individuals and instruct interviewers to gather data from the selected individuals.

Quota samples can be implemented in contexts other than telephone or in-person interviewing. Suppose a researcher wants to know the amount of herbicide per acre applied to agricultural land planted with corn and soybeans in the state of Iowa. The researcher picks 20 counties from around the state. He or she directs data gatherers to collect information on herbicide application for five farms growing corn and five others growing soybeans in the selected counties. If the data gatherers are allowed to choose the most convenient farms or the first farms that will participate, then it is a quota sample. The cells are defined by county and crop. If the researcher randomly selects the farms that the interviewers should visit, then it is not a quota sample.

Quota sampling is an example of *nonprobability sampling. Convenience sampling* is another nonprobability sampling scheme. The goal of a survey is to gather data in order to describe the characteristics of a population. A population consists of units, or elements, such as individuals, plots of land, hospitals, or invoices of purchases or sales for a company. A survey collects information on a sample, or subset, of the population. In nonprobability sampling designs, it is not possible to compute the probabilities of selection for the samples overall and, usually, for individuals. The probabilities are unknown, because typically data gatherers are allowed some freedom in selecting convenient units for data collection.

Estimates of population characteristics based on nonprobability samples can be affected by *selection bias.* Since the interviewers choose respondents that they want to interview, there is a potential for selection bias. If the respondents in the survey are systematically different on the variables being measured from the general population, then estimates of characteristics will be different on average from what they would have been with a controlled probability-sampling **[p. 813 ↓]** scheme. In *probability sampling*, the survey planner or researcher controls which units are in the sample and selects the sample using known probabilities of selection. The probabilities of selection can be used to produce estimates of population characteristics without the problem of selection bias. Examples of probability sampling include simple random sampling, stratified random sampling, and cluster sampling.

Probability sampling is the standard methodology for large-scale surveys intended to support scientific studies and decision making for government policy. Theory supporting the use of probability sampling was developed beginning in the 1930s and has come to be appreciated widely. Quota sampling, on the other hand, is quite common in marketing surveys and less formal studies. Nonprobability sampling certainly can produce useful information for some purposes. One attempt to adjust for the fact that probabilities of selection are unknown is to use *weights*, usually called *survey weights*, in analysis. These weights are computed so that the sum of the weights for sampled individuals in a particular stratum sum to a number proportional to the actual number of people known to exist in the population in the stratum or cell. The cells for which quotas are set are often chosen due to the fact that the proportions of the population in the cells are known. Although this adjustment can help make the sample more representative of

the population in analysis, it cannot overcome the fact that there could be a remaining bias due to noncontrolled random selection of the sample.

As an example of weighting or weight adjustment, suppose a bank conducts a quota sample of its account holders by selecting 100 individuals from each of four categories. The four categories are females holding single accounts, males holding single accounts, females holding multiple accounts, and males holding multiple accounts. If the hypothetical proportions of all account holders in these four categories are as given in Table 1, then the sample that contains 25% of the respondents in each category is slightly out of balance relative to the population counts.

Percentage in the Population		Number of Accounts	
Sex of Account Holder	One Account	More Than One	Total
Female	21%	27%	48%
Male	24%	28%	52%
Total	45%	55%	100%

Weights		Number of Accounts
Sex of account holder	One account	More than one
Female	25/21 = 1.19	25/27 = 0.93
Male	25/24 = 1.04	25/28 = 0.89

Weights can be computed as the fraction of the sample in a category divided by the fraction of the population in the same category. The weights in this example are given in Table 2. The bank is interested in the amount of credit card debt held by its account holders. Since the credit cards might not be issued through the bank, the bank cannot simply compute the amount of debt; it must ask members of the sample for the information. A direct average of the amount of debt among the members of the sample might not represent the population very well, because the proportions by category are not exactly equal to those in the population. Instead, a weighted average using weights given in Table 2 might be better.

Of course, the selection bias produced by the quota sample might still lead to a systematic overestimate or underestimate of credit card debt.

The method of *focus groups* is another method of collecting information that can be seen as being similar in spirit to quota sampling. In focus groups, researchers meet with representatives of a population, ask questions, and hold discussions on topics of interest. Researchers conducting focus group studies and interviews with key informants about a population hope to gain insight into issues, concerns, and terminology relevant to the population's perception of an issue. Quota **[p. 814 ↓]** sampling, instead of bringing a group together for an in-depth discussion, gathers data using a survey from a sample of individuals. A substantial research project might use several methods of gathering data, including focus groups, a pilot survey or a preliminary quota survey, and then a large-scale probability sample survey.

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See also

Further Reading

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