



# **Sampling Versus Census: A Comparative Analysis**

## INTRODUCTION

*Have you ever wondered how pollsters can report survey results based upon part of a population as being representative of the entire population at large? How many people do you have to survey to consider the sample results representative of the views of an entire population? In other words, how do you know when a sample survey is an acceptable alternative to surveying an entire population? What are the advantages of conducting a sample survey versus a census survey?*

*Surveys are often conducted to gather opinions and feedback on a variety of topics. We survey employees to get their opinions on company-wide and regional issues. We survey our customers to find out information about our products and services. We survey our members to improve membership offerings and services. We survey citizens to find out what they think about certain political issues. Conducting sample surveys can be just as effective, in some cases, as surveying an entire population. Budget limitations, organizational constraints, and/or lack of resources are just a few of the key issues to consider when deciding whether to opt for a sample or a census survey.*

## Error & Accuracy

Sample surveys differ from census surveys in that they only utilize responses from a cross section of the entire population. Sampling strategies such as random sampling or stratified random sampling can be used to identify the sample frames (those who should participate). Two factors need to be considered when determining the sample frame – the desired level of confidence and the desired confidence interval.

The confidence level refers to the accuracy of the results or the amount of error in the survey results that is acceptable. Most researchers select either a 95 percent level of confidence (5 percent chance of error) or a 99 percent level of confidence (1 percent chance of error). This percentage refers to how confident we can be that the results did not occur by chance. The higher the desired confidence level, the larger the sample size must be.

Another term often reported is the confidence interval. The confidence interval determines the margin of error the researcher obtains or is willing to accept. Survey results may be reported with a confidence interval of +/- (plus or minus) some percent or amount. For example, survey results may indicate a 65 percent favorable rating + or – 3 percent. This means that the true score is somewhere between 62 percent and 68 percent. As with the confidence level, sample size is also directly related to the confidence interval. Larger sample sizes result in smaller confidence intervals - the smaller the confidence interval, the more accurate the results.

When determining the desired level of confidence or accuracy, a key consideration is how the data will be used. In the case of a political poll where the survey results will simply be used to obtain a general sense of which candidate is leading an election, a moderate level of confidence and a wider margin of error are acceptable. In this case, fewer persons need to be surveyed. In the case of a survey in which subsequent decisions based upon the results could affect a large number of persons or have legal or ethical implications, the required level of confidence is high, and required margin of error is narrow. In this case, relatively more persons need to be surveyed to effectively generalize the results to the entire population.

## Advantages and Disadvantages

To determine whether a sample survey or a census survey is most appropriate, review the following list of advantages and disadvantages. While many of these advantages and disadvantages focus on organizational surveys, many are also applicable to a wide variety of surveys.

### Advantages of Sample Surveys

#### Cost Reduction

In most cases, conducting a sample survey costs less than a census survey. If fewer people are surveyed, fewer surveys need to be produced, printed, shipped, administered, and analyzed. Further, fewer data reports are often required, thus the amount of time and expense required to analyze and distribute the results reports is reduced.

#### Generalizability of Results

If conducted properly, the results of a sample survey can still be generalized to the entire population, meaning that the sample results can be considered representative of the views of the entire target population. Sampling strategies should be firmly aligned with the overarching survey goals to ensure the utilization of a proper sample frame and sample size.

#### Timeliness

Sample surveys can typically be printed, distributed, administered, and analyzed more quickly than census surveys. As a result, a shorter turnaround time for results is often achieved.

## Identification of Strengths & Opportunities

As with census surveys, results from a properly conducted sample survey can also be used to identify strengths and opportunities and develop plans for meaningful change.

## Disadvantages of Sample Surveys

### Determining the Correct Sample Frame

Determining the correct sample frame (i.e., determining who should participate) can require extensive work. Laypersons may be left to engage in guesswork to determine the correct sample frame. This guesswork, if incorrect, will yield survey results that inaccurately reflect the sentiments of the population, and therefore compromise any conclusions drawn based upon the results.

Many factors should be considered when determining a suitable sample frame, such as the total population size, appropriate confidence level and confidence interval, anticipated participation level, anticipated standard deviation, and specific stratification needs. Individuals who are not confident in making these considerations are well advised to consult an experienced survey researcher or statistician.

It should be noted, however, that even sampling experts may inadvertently overlook organizational or employee-relations issues that impact sampling effectiveness. For example, a well-calculated organizational sampling strategy may require 10 out of 50 employees from one plant or work group to complete a survey. If, however, this group is experiencing severe absenteeism or morale problems that are unbeknownst to the sampling expert, actual participation rates may be lower than anticipated, which could prevent the desired confidence level and confidence interval from being attained. These types of issues are difficult to incorporate into a sampling strategy.

### Difficulty Interpreting Sub-Group Results & Formulating Sub-Group Action Plans

Be aware that identifying sample frames without stratified sampling techniques (without considering the characteristics of particular subgroups) is inappropriate when survey results need to be interpreted at the sub-group level. In other words, it is certainly possible to obtain results that can be generalized to the entire population, but still obtain sub-group level results that are suspect (are not necessarily representative of the particular sub-group). This occurs when, the number of actual survey respondents within particular sub-group(s) (such as a sub-group of workers over 65 or a sub-group within a particular geographic location) is too low, but the actual number of respondents overall (i.e., across the entire population) is acceptable.

Unless proper stratification strategies are implemented, sub-group results may not be representative of the views held by sub-group members of that sub-group. If sub-group results are not representative, developing and implementing effective action-planning strategies will be challenging at best. The bottom line is that if results need to be interpreted for smaller sub-groups within a population, then a census survey or a stratified sample is required.

## Possibility of Creating Feelings of Exclusion

While employees may intuitively understand the sampling process, some may feel left out or have ill feelings toward management due to being excluded from the sample frame. This may be particularly likely when unequal treatment or inclusion has been perceived as an issue in the past. In these cases, inviting all employees to participate is best from a humanistic and employee morale perspective.

## More Inclination to Discount Results & Less Inclination to Take Action

When survey results are favorable there tends to be a general feeling that the sampling strategy was effective. However, when survey results are unfavorable there is a general tendency to “discount” the results and claim that the results were based on a poor sample. Leaders may argue that the results are less favorable because the sample only selected those persons with more negative attitudes. While great lengths may have been taken to ensure a representative sample, some leaders may still question the selection process and therefore be resistant to taking action.

## Creates Reasonable Expectation for Follow-up

One area most organizations struggle with after conducting a survey is creating action plans and following through with effective action. When an entire population is surveyed, the expectation that action needs to be taken is more widespread among leaders, managers and particular sub-groups than when a sample survey is utilized. This consensus enhances cooperation during the action-planning and follow-up processes.

## Advantages of Census Surveys

### Everyone Has an Opportunity to Participate

One of the greatest advantages of a census survey is that all employees have the same opportunity to participate. Some employees may still choose not to participate, but at least the opportunity to do so is presented. No one person or group can feel slighted or left out.

### Accuracy Concerns are Reduced

Sample surveys, when conducted properly, are certainly capable of yielding representative results, however, census surveys tend to enhance feelings of security surrounding the accuracy of the results.

### Easier to Administer

Administration of sample surveys is more complicated. A census survey is easier to administer, because it includes all persons. The volume of surveys that need to be distributed may increase with a census survey, but figuring out who receives a survey is clear – everyone.

## Obtains Better Demographic Data

A great advantage to conducting census surveys is the ability to collect better demographic data across the population. Demographic items such as age, tenure, location, function, ethnicity, education and intent to leave can be used to create subsets of the population. Demographic data can be used to enhance the depth of clarity surrounding critical organizational issues. For example, demographic data can help determine if all employees are unsatisfied with a particular issue or just one demographic group (e.g., longer tenured employees). It may be important to know that employees who have been with the organization for five to 10 years are the ones most intent upon leaving. After all, employees comprising this demographic group may represent the most knowledgeable employees. If they intend to leave, then they will take their knowledge, skills and talent with them. Demographic data not only builds better insight, it also enables more effective action once the survey results are delivered.

## All Work Groups Receive Results

Results from a census survey can be used to “drill down” into the organizational structure and highlight departmental results. Because all employees participate, there is a greater chance of obtaining responses that are representative of all sub-groups within the organizational structure. Managers at all levels of an organization can then review their results, compare these to the results of the overall company, and establish action plans. Armed with this knowledge, managers at all levels of the organization can then be held accountable for implementing actions that deliver effective change.

## Less Inclination to Discount Results & More Inclination to Take Action

While it is a fact that a well-designed sample survey can provide accurate results, most managers tend to believe their results more readily and be more inclined to take action when all employees have an opportunity to respond. Belief in the results and inclination to take action go hand in hand.

## Disadvantages of Census Surveys

### Higher Cost & More Time

Census surveys, generally, cost more to administer than sample surveys. Printing, distribution, and data collection costs all increase with a census survey due to the increased volume of materials and labor required.

Larger volumes of data require more time for data entry, data cleaning/verification, data analysis, and report production. Data coding and report dissemination may also become more complicated. The bottom line is that the more data there is, the more complicated a survey process becomes.

### Longer Administration Time

Including the entire population of interest in a survey process tends to require additional administration time. After all, coordinating schedules with a few persons or groups is much easier than coordinating schedules across an entire organization. Production schedules, delivery deadlines, vacation and holiday schedules, and travel schedules make it more difficult to gather feedback.

## **Increases Expectations**

Expectations for action planning and improvements increase when all employees participate. In return for their input, employees now want you to take action. Employees expect to see the link between what they said in the survey and the changes implemented by the organization. It's not good enough to say something will improve; they want to see proof. Note that increased expectations are also considered an advantage of census surveys, because this increase tends to foster enhanced cooperation and support for action planning.

## **Requires More Training and Support**

Not all managers are survey experts. Many managers are used to looking at numbers, spreadsheets, and facts and figures. But reviewing the statistical results from a survey and making sense of the percentages, mean scores, rankings, or statistical significance values requires a different skill set. When survey results are dispersed to all managers across an organization, more assistance, training and guidance are needed to improve understanding and interpretation of the results. When managers are held accountable for creating and implementing action plans, more assistance is also needed to sustain managerial involvement and motivation. Increased training and assistance may increase overall survey costs.

## **The Decision**

Sample and census surveys both provide value, and when implemented properly, produce valid results. Four primary factors are important to keep in mind when determining which strategy is most suitable:

### **1. Desired Outcomes**

What is the survey vision and goal? What do you intend to do with the results? How are action plans going to be implemented? Who will be held accountable for results? Knowing the end result will help you determine the appropriate path to take. If the outcome is organization-wide action planning and accountability at the work group level, then a census survey is required. If the outcome is the collection of high-level results with action planning at the highest levels of the organization, then a sample survey will provide adequate data.

### **2. Purpose**

What are the issues you want to address? Are you losing key talent and in need of understanding why people are leaving? Are you losing your customers to competitors? Do you just feel like it is a good time to solicit feedback from your employees? While this goes hand in hand with the survey vision and goal, it is important to understand the driving reason or reasons for collecting the data in the first place. Understanding these key drivers will help you select the appropriate strategy for gathering feedback.

### **3. Budget**

What is your budget? Budgetary constraints often dictate which survey process to implement. You may feel the value of conducting a census survey is greater, but not have sufficient funds to devote to a large-scale survey. Instead of eliminating the survey altogether, it is more advantageous to conduct a sample survey instead.

### **4. Perceptions**

How will your employees perceive the survey process? Will employees feel left out if not included in the sample? Do employees value surveys and look forward to providing input? Have your employees been surveyed to death without seeing beneficial improvements? Perception is reality so no matter how you rationalize the survey process, it's what matters most to your employees that counts.

## **Conclusion**

Generally speaking, the value of a survey is determined by comparing the costs of conducting the survey to the benefits gained from understanding employee opinions, desires, and requirements. What is the value of improving employee engagement in your organization? How much do disengaged employees cost your organization? How much do you currently devote to recruiting new talent because your key talent is walking out the door? What impact does turnover have on productivity, customer satisfaction and organizational morale?

The long-term benefit of surveying your employees on a regular basis is difficult to measure. It is safe to say, however, that the cost of not engaging your employees far outweighs the cost of conducting an ongoing survey process. The decision to conduct a sample versus a census survey is less important than the decision of whether to conduct a survey at all.

## About the Author

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