

Why Sampling?

- ❑ To save cost, time and energy in conducting a research study
- ❑ It is undeniable to most statistical experts that both small and large samples can be highly accurate if the sampling plan is sound.
- ❑ An important part of the plan is to use a correct sampling frame.

How to select optimum samples?

1. Determine an optimum sample size.
2. Select an appropriate sampling technique.

How to Determine a Sample Size

Basic understanding

1. Determining sample size involves both managerial and financial considerations.
2. There is no direct relationship between the size of the population and the size of the sample needed to estimate a certain population parameter.
3. Generally the sample size will not be more than 10% of the population.
4. Typically the larger the sample size, the less the sampling error.
5. The costs of larger samples tend to increase on a linear basis: not so for sampling error.

Methods for Determining a Sample Size

There are 6 methods for determining a sample size, namely:

1. Blind guessing
2. Affordability method
3. Rules of thumb
4. Ready-made sample size tables
5. Online sample size calculator
6. Statistical methods

1. Blind guessing & 2. Affordability method

There is no need to mention the first method because it is purely a kind of guessing. Therefore, it should not be used.

As for the second method, normally time and budget are 2 main factors that the researcher takes into consideration. If possible, it should not be used either because it is difficult to justify the trustworthiness of the findings.

3. Common Rules of Thumb

Rules of thumb for selecting samples (Gay and Diehl 1992: 146)

1. Samples should be as large as possible. In general, the larger the sample, the more representative it is likely to be, and the more generalizable the results of the study are likely to be.
2. Minimum, acceptable sample sizes depending on the type of research, for example:
 - Descriptive research --- *10% of the population*
 - Correlational research ---- *30 subjects*
 - Causal-comparative research ---- *30 subjects per group*
 - Experimental research ---- *15-30 subjects per group*
3. Even large samples can lead to erroneous conclusions if they are not well selected.

4. Ready-made sample size tables

There are a few well-known ready-made optimal sample sizes.

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140
15	14	230	144
20	19	240	148
25	24	250	152
30	28	260	155
35	32	270	159
40	36	280	162
45	40	290	165
50	44	300	169
55	48	320	175
60	52	340	181
65	56	360	186
70	59	380	191
75	63	400	196
80	66	420	201

This is a part of the table constructed by Krejcie & Morgan (1970).

This is a part of the table produced by Yamane (1967)

Table 1. Sample Size for $\pm 3\%$, $\pm 5\%$, $\pm 7\%$, and $\pm 10\%$ Precision Levels where Confidence Level Is 95% and $P=.5$.

Size of Population	Sample Size (n) for Precision (e) of:			
	$\pm 3\%$	$\pm 5\%$	$\pm 7\%$	$\pm 10\%$
500	a	222	145	83
600	a	240	152	86
700	a	255	158	88
800	a	267	163	89
900	a	277	166	90
1,000	a	286	169	91
2,000	714	333	185	95
3,000	811	353	191	97
4,000	870	364	194	98
5,000	909	370	196	98
6,000	938	375	197	98

This is also a part of the table produced by Yamane (1967)

Table 2. Sample Size for $\pm 5\%$, $\pm 7\%$ and $\pm 10\%$ Precision Levels where Confidence Level Is 95% and $P=.5$.

Size of Population	Sample Size (n) for Precision (e) of:		
	$\pm 5\%$	$\pm 7\%$	$\pm 10\%$
100	81	67	51
125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76