

# Sampling from Small Populations

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Following is an extract from the webpage by Evan Morris

## What is a small population?

Many surveys deal with large populations, such as all adults in Canada, or all adults in Saskatchewan. The target populations of these surveys can contain hundreds of thousands or even millions of people. The sampling and statistical analysis methods presented in most textbooks assume that:

- the population is very large, and
- the size of the sample is small when compared to the size of the population.

When the target population is less than approximately 5000, or if the sample size is a significant proportion of the population size, such as 20% or more, then the standard sampling and statistical analysis techniques need to be changed.

## When might we encounter small populations in research?

Typical situations involving small populations include:

- Sampling residents of a small town or small city.
- Sampling employees in a firm.
- Sampling members of a trade or professional group.
- Sampling cows from a herd of cattle.
- Sampling hospitals from around the country.
- Sampling emissions from power plants in Canada.

In each of these cases the target population may vary from several dozen to several thousand.

## How do we select a sample size when sampling a small population?

When dealing with large populations, the sample size is determined using the normal approximation to the binomial distribution. This approximation is very accurate when the population is large, and the sample size is small. However, if you were to sample a population of 200 individuals, then for a given accuracy, you would require a far smaller sample than that calculated using the normal approximation to the binomial. To determine the sample size for small populations, we use the normal approximation to the hypergeometric distribution. The sample size formulas for large (binomial) and small (hypergeometric) populations are shown below.

For larger populations see the [Sample Size Calculator](#)<sup>1</sup>.

See also the Google search for these keywords: [sample size small populations](#)<sup>2</sup>

Follow the link below to download the spreadsheet. It was written for Microsoft Excel, but other spreadsheet applications, such as OpenOffice will work.

## Part "Attachment Data"

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1. [daisy:88 \(Sample Size Calculator\)](#)
  2. <http://www.google.com/search?q=sample+size+small+populations>

Mime-type: application/vnd.ms-excel, size: 14848 bytes

## Links

Sampling from Small Populations - Evan Morris

<http://uregina.ca/~morrisev/Sociology/Sampling%20from%20small%20populations.htm>

OpenOffice - an open source replacement for Microsoft Office

<http://www.openoffice.org>

Sample Size Calculator

[daisy:88](#)

## Fields

Name	Value
Name	Sampling from Small Populations
Description	An excel spreadsheet that assists in calculating sample sizes for small populations
MethodDomain	Statistics Analysis Surveys Interviews Data collection
MetaKeys	Quantitative Qualitative
Distribution	Freeware
OS	OS Independent
SoftwareDependencies	Microsoft Excel OpenOffice Spreadsheet
Authors	Evan Morris
Institution	University of Regina
Date	7/29/06
URL	<a href="http://uregina.ca/~morrisev/Sociology/Sampling%20from%20small%20population">http://uregina.ca/~morrisev/Sociology/Sampling%20from%20small%20population</a>
URLDoA	7/29/06