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You can use this free sample size calculator to determine the sample size of a given survey per the sample proportion, margin of error, and required confidence level.You can calculate the sample size in five simple steps:Choose the required confidence level from the dropdown menuInput the margin of errorInput the proportion of the total population (%)If required, specify the population sizeClick on the "Calculate" button to generate the results.The sample size of a survey is the total number of complete responses that were received during the survey process. It is referred to as a sample because it does not include the full target population; it represents a selection of that population. For example, many studies involve random sampling by which a selection of a target population is randomly asked to complete a survey.Some basic terms are of interest when calculating sample size. These are as follows:Confidence level: The level of confidence of a sample is expressed as a percentage and describes the extent to which you can be sure it is representative of the target population; that is, how frequently the true percentage of the population who would select a response lies within the confidence interval. For example, if you have a confidence level of 90%, if you were to conduct the survey 100 times, the survey would yield the exact same results 90 times out of those 100 times.Margin of Error: Margin of error is also measured in percentage terms. It indicates the extent to which the outputs of the sample population are reflective of the overall population. The lower the margin of error, the nearer the researcher is to having an accurate response at a given confidence level. To determine the margin of error, take a look at our margin of error calculator.Percentage of population selecting a given choice: The accuracy of the research outputs also varies according to the percentage of the sample that chooses a given response. If 98% of the population select "Yes" and 2% select "No," there is a low chance of error. However, if 35% of the population select "Yes" and 65% select "No", there is a higher chance an error will be made, regardless of the sample size. When selecting the sample size required for a given level of accuracy, researchers should use the worst-case percentage; i.e., 50%.Population Size: The population size is the total number of people in the target population. For example, if you were performing research that was based on the people living in the UK, the full population would be approximately 66 million. Likewise, if you were conducting research on an organization, the total size of the population would be the number of employees who work for that organization.Sample Size FormulaThe Sample Size Calculator uses the following formulas:1.n = z2 * p * (1 - p) / e22.n (with finite population correction) = [z2 * p * (1 - p) / e2] / [1 + (z2 * p * (1 - p) / (e2 * N))]Where:n is the sample size,z is the z-score associated with a level of confidence,p is the sample proportion, expressed as a decimal,e is the margin of error, expressed as a decimal,N is the population size.Example of a Sample Size Calculation: Let's say we want to calculate the proportion of patients who have been discharged from a given hospital who are happy with the level of care they received while hospitalized at a 90% confidence level of the proportion within 4%. What sample size would we require?The sample size (n) can be calculated using the following formula:n = z2 * p * (1 - p) / e2where z = 1.645 for a confidence level () of 90%, p = proportion (expressed as a decimal), e = margin of error.z = 1.645, p = 0.5, e = 0.04n = 1.6452 * 0.5 * (1 - 0.5) / 0.042n = 0.6765 / 0.0016 = 422.816n 423 patients.Desired Confidence LevelZ-Score70%1.0475%1.1580%1.2885%1.4490%1.64591%1.7092%1.7593%1.8194%1.8895%1.9696%2.0597%2.1798%2.3399%2.57699.5%2.80799.9%3.2999.99%3.89Reference: Daniel WW (1999). Biostatistics: A Foundation for Analysis in the Health Sciences. 7th edition. New York: John Wiley & Sons.You may also be interested in our Effect Size (Cohen's d) Calculator or Relative Risk Calculator Calculate the minimum sample size required to estimate a population parameter.Usually we have no control over the sample size of a data set. However, if we are able to set the sample size, as in cases where we are taking a survey, it is very helpful to know just how large it should be to provide the most information. Sampling can be very costly, in both time and product. Simple telephone surveys will cost approximately $30.00 each, for example, and some sampling requires the destruction of the product. Selecting a sample that is too large is expensive and time consuming. But selecting a sample that is too small can lead to inaccurate conclusions. We want to find the minimum sample size required to achieve the desired level of accuracy in the confidence interval.Calculating the Sample Size for a Population MeanThe margin of error [latex]E[/latex] for a confidence interval for a population mean is[latex]\displaystyle{E=\frac{z \times \sigma}{\sqrt{n}}}[/latex]where [latex]z[/latex] is the [latex]z[/latex]-score so that the area under the standard normal distribution in between [latex]-z[/latex] and [latex]z[/latex] is the confidence level [latex]C[/latex].Rearranging this formula for [latex]n[/latex] we get a formula for the sample size [latex]n[/latex]:[latex]\displaystyle{n=\left(\frac{z \times \sigma}{E}\right)^2}[/latex]In order to use this formula, we need values for [latex]z[/latex], [latex]E[/latex] and [latex]\sigma[/latex]:The value for [latex]z[/latex] is determined by the confidence level of the interval, calculated the same way we calculate the [latex]z[/latex]-score for a confidence interval.The value for the margin of error [latex]E[/latex] is set as the predetermined acceptable error, or tolerance, for the difference between the sample mean [latex]\overline{x}[/latex] and the population mean [latex]\mu[/latex]. 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The table below shows the appropriate sample size at different levels of confidence and different margins of error, assuming [latex]p=0.5[/latex]. Looking at each row, we can see that for the same margin of error, a higher level of confidence requires a larger sample size. Similarly, looking at each column, we can see that for the same confidence level, a smaller margin of error requires a larger sample size.Required Sample Size (90%)Required Sample Size (95%)Margin of Error169124012%75210673%2713845%689610%Suppose a mobile phone company wants to determine the current percentage of customers aged 50+ who use text messaging on their cell phones. How many customers aged 50+ should the company survey in order to be 90% confident with a margin of error of 3%?.Solution:To find the sample size, we need to find the [latex]z[/latex]-score for the 90% confidence interval. This means that we need to find the [latex]z[/latex]-score so that the entire area to the left of [latex]z[/latex] is [latex]\displaystyle{0.90+\frac{1-0.90}{2}=0.95}[/latex].Functionnorm.s.invAnswerField 10.951.6448So [latex]z=1.6.448....[/latex]. From the question [latex]E=0.03[/latex]. Because no estimate of the population proportion is given, [latex]p=0.5[/latex].[latex]\begin{eqnarray*}\&=&p\times(1-p)\times\left(\frac{z }{E}\right)^2\\&=&0.5\times(1-0.5)\times\left(\frac{1.6448...}{0.03}\right)^2\\&=&751.539... \\&\Rightarrow&752\mbox{ customers age 50+}\\\\\end{eqnarray*}[/latex]752 customers aged 50+ must be surveyed to achieve the desired accuracy. Remember to round the value for the sample size UP to the next integer. This ensures that the sample size is large enough. Do not forget to include appropriate units with the sample size.Suppose an internet marketing company wants to determine the percentage of customers who click on ads on their smartphones. How many customers should the company survey in order to be 94% confident that the estimated proportion is within 5% of the population proportion of customers who click on ads on their smartphones? Click to see SolutionFunctionnorm.s.invAnswerField 10.971.8807[latex]\begin{eqnarray*} n & = & p \times (1-p) \times \left(\frac{z}{E}\right)^2 \\ & = & 0.5 \times (1-0.5) \times \left(\frac{1.8807...}{0.05}\right)^2 \\ & = & 353.738... \\& \Rightarrow & 354 \mbox{ customers}\end{eqnarray*}[/latex]Watch this video: Sample Size for Confidence Intervals by ExcelIsFun [7:54] Concept ReviewIn order to construct a confidence interval, a sample is taken from the population under study. But collecting sample information is time consuming and expensive. The minimum sample size required to achieve the desired level of accuracy is determined before collecting the sample data.Sample size for population means: [latex]\displaystyle{n=\left(\frac{z \times \sigma}{E}\right)^2}[/latex]Sample size for population proportions: [latex]\displaystyle{n=p \times (1-p) \times \left(\frac{z}{E}\right)^2}[/latex]After calculating the value of [latex]n[/latex] from the formula, round the value of [latex]n[/latex] up to the next integer. Attribution7.2The Central Limit Theorem for Sums in Introductory Statistics by OpenStaxis licensed under aCreative Commons Attribution 4.0 International License.8.4Calculating the Sample Size n: Continuous and Binary Random Variables in Introductory Business Statistics by OpenStaxis licensed under aCreative Commons Attribution 4.0 International License. Calculate the minimum sample size required to estimate a population parameter.Usually we have no control over the sample size of a data set. However, if we are able to set the sample size, as in cases where we are taking a survey, it is very helpful to know just how large it should be to provide the most information. Sampling can be very costly, in both time and product. Simple telephone surveys will cost approximately $30.00 each, for example, and some sampling requires the destruction of the product. Selecting a sample that is too large is expensive and time consuming. But selecting a sample that is too small can lead to inaccurate conclusions. 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In other words, [latex]E[/latex] is set to the maximum allowable width of the confidence interval.An estimate for the population proportion is provided, we use [latex]p=0.5[/latex].The value of [latex]n[/latex] determined from the formula is the minimum sample size required to achieve the desired level of confidence. The sample size [latex]n[/latex] is a count, and so is an integer. It would be unusual for the value of [latex]n[/latex] generated by the formula to be an integer. Because [latex]n[/latex] is the minimum sample size required, we must round the output from the formula up to the next integer. If we round the value of [latex]n[/latex] down, the sample size will be below the minimum required sample size.After we have found the sample size [latex]n[/latex] and collected the data for the sample, we use the appropriate confidence interval formula and the sample proportion from the actual sample.By using [latex]0.5[/latex] as an estimate for [latex]p[/latex] in the sample size formula we will get the largest required sample size for the confidence level and margin of error we selected. This is true because of all combinations of two fractions (the values of [latex]p[/latex] and [latex]1-p[/latex]) that add to one, the largest multiple is when each is 0.5. Without any other information concerning the population parameter [latex]p[/latex], this is the common practice. This may result in oversampling, but certainly not under sampling.There is an interesting trade-off between the level of confidence and the sample size that shows up here when considering the cost of sampling. The table below shows the appropriate sample size at different levels of confidence and different margins of error, assuming [latex]p=0.5[/latex]. Looking at each row, we can see that for the same margin of error, a higher level of confidence requires a larger sample size. Similarly, looking at each column, we can see that for the same confidence level, a smaller margin of error requires a larger sample size.Required Sample Size (90%)Required Sample Size (95%)Margin of Error169124012%75210673%2713845%689610%Suppose a mobile phone company wants to determine the current percentage of customers aged 50+ who use text messaging on their cell phones. How many customers aged 50+ should the company survey in order to be 90% confident with a margin of error of 3%?.Solution:To find the sample size, we need to find the [latex]z[/latex]-score for the 90% confidence interval. This means that we need to find the [latex]z[/latex]-score so that the entire area to the left of [latex]z[/latex] is [latex]\displaystyle{0.90+\frac{1-0.90}{2}=0.95}[/latex].Functionnorm.s.invAnswerField 10.951.6448So [latex]z=1.6.448....[/latex]. From the question [latex]E=0.03[/latex]. Because no estimate of the population proportion is given, [latex]p=0.5[/latex].[latex]\begin{eqnarray*}\&=&p\times(1-p)\times\left(\frac{z }{E}\right)^2\\&=&0.5\times(1-0.5)\times\left(\frac{1.6448...}{0.03}\right)^2\\&=&751.539... \\&\Rightarrow&752\mbox{ customers age 50+}\\\\\end{eqnarray*}[/latex]752 customers aged 50+ must be surveyed to achieve the desired accuracy. Remember to round the value for the sample size UP to the next integer. This ensures that the sample size is large enough. Do not forget to include appropriate units with the sample size.Suppose an internet marketing company wants to determine the percentage of customers who click on ads on their smartphones. How many customers should the company survey in order to be 94% confident that the estimated proportion is within 5% of the population proportion of customers who click on ads on their smartphones? Click to see SolutionFunctionnorm.s.invAnswerField 10.971.8807[latex]\begin{eqnarray*} n & = & p \times (1-p) \times \left(\frac{z}{E}\right)^2 \\ & = & 0.5 \times (1-0.5) \times \left(\frac{1.8807...}{0.05}\right)^2 \\ & = & 353.738... \\& \Rightarrow & 354 \mbox{ customers}\end{eqnarray*}[/latex]Watch this video: Sample Size for Confidence Intervals by ExcelIsFun [7:54] Concept ReviewIn order to construct a confidence interval, a sample is taken from the population under study. But collecting sample information is time consuming and expensive. The minimum sample size required to achieve the desired level of accuracy is determined before collecting the sample data.Sample size for population means: [latex]\displaystyle{n=\left(\frac{z \times \sigma}{E}\right)^2}[/latex]Sample size for population proportions: [latex]\displaystyle{n=p \times (1-p) \times \left(\frac{z}{E}\right)^2}[/latex]After calculating the value of [latex]n[/latex] from the formula, round the value of [latex]n[/latex] up to the next integer. Attribution7.2The Central Limit Theorem for Sums in Introductory Statistics by OpenStaxis licensed under aCreative Commons Attribution 4.0 International License.8.4Calculating the Sample Size n: Continuous and Binary Random Variables in Introductory Business Statistics by OpenStaxis licensed under aCreative Commons Attribution 4.0 International License. Aleksandra Zajc, MDAleksandra (Ola) Zajc, MD, is a medical doctor with a passion for lifestyle medicine. She wants to never stop learning while sharing what she already knows as a health educator and prophylaxis popularizer. She mainly concentrates on how human lifestyle impacts their health and disease. After hours, she likes weightlifting, foreign affairs podcasts, learning Korean, and dogs (with a special affection for her own pup Zoja). See full profileCheck our editorial policyAdena BennAdena Benn is a Guyanese teacher with a degree in computer science who is always reading and learning. She loves problem-solving, everything tech, and working with teenagers. She has a passion for education and is especially interested in how children learn and the teaching methods that best suit their learning styles. She grew up on a farm in Pomeroon, Guyana, where she worked alongside her parents and siblings. As such, she is just as comfortable growing plants as teaching in the classroom. In her early life, she also gained expertise as a seamstress, which she learned from her mother. By grade 9, she had already acquired her dressmaker's certificate. Today she uses her skills to design many items for her family. In her free time, Adena loves to read, take long walks, write childrens stories and poetry, travel, or spend time with her family. See full profileCheck our editorial policy7 people find this calculator helpfulIf you want to solve some confidence interval problems, you're in the right place. Our 95% confidence interval calculator will help you calculate this confidence interval and provide you with the essential knowledge! Read on to learn:What is the 95% confidence interval formula;What is the interpretation of the 95% confidence interval (or any chosen one, to be honest); andWhat is the p-value for the 95 percent confidence interval?To calculate a 95% confidence interval, we first need to calculate the standard error. We can use the formula:SE=nSE=\frac{}{\sqrt{n}}SE=nwhere:SESESE - the standard error; - the standard deviation; andnnn - number of measurements (the size of the sample).Now let's estimate the margin of error.ME=SEZ(0.95)ME = SE Z(0.95)ME=SEZ(0.95)MEMEME - margin of error;Z(0.95)Z(0.95)Z(0.95) - z-score for 95% confidence level; you'll find this value in the statistical tables.The only thing left is to count the lower and upper bounds of our confidence interval. To do this, we will add and subtract the margin of error to the mean (average) - .upperbound=+ME\text{upper}\ \text{bound} = + MEupperbound=+MElowerbound=ME\text{lower}\ \text{bound} = - MElowerbound=MEHow should you understand the results? Let's imagine George wants to calculate the mean height of his family members. Some relatives live very far, and George cannot measure them all. But he managed to get 30 measurements, and the average height of those measurements was 172 cm (5 ft 7 in). He found out, that the 95% confidence interval range is 161-183 cm (5 ft 3 in - 6 ft). Based on those measurements, he can be 95% sure that any family member's height falls between 162-183 cm.To use our tool:Look at the calculator panel on the left side of the screen.First, fill in the sample mean (average) - x.Now, fill in the standard deviation (s).Input the sample size (n).As it is the 95 percent confidence interval calculator, the confidence interval value is already there. But remember - you might change it any time.The Z-score row will change accordingly to your chosen confidence interval.Enjoy the results! You might now see the margin of error, the 95% confidence interval bounds, but also a chart displaying the data.FAQsTo count the 95% confidence interval:First, calculate the standard error (SE) and the margin of error (ME).SE = /nME = SE Z(0.95)where is the standard deviation, n - sample size, Z(0.95) - z-score for 95% confidence interval.Then determine the confidence interval range, using ME and - the calculated average (mean).upper bound = + MElower bound = - METhe uncorrected p-value at 95% confidence interval is 0.05.I know the desired value of:Did we solve your problem today?Check out 28 similar inference, regression, and statistical tests calculators

**How to calculate sample size with 95 confidence interval. What is the minimum sample size needed for a 95 confidence interval. What sample size is needed for a 95 confidence interval. Sample confidence interval. 95 procent betrouwbaarheidsinterval. Determining the sample size with 95 confidence level. How to find the sample size needed for a confidence interval.**