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Standard Error Of The Proportion

The standard error of the proportion is defined as the spread of the sample proportion about the population proportion. More specifically, the standard error is the estimate of the standard deviation of a statistic. It has a similar nature with standard deviation, as both are the measures of dispersion. It is used to find the accuracy and efficiency of the sample.

Consider that p is the population proportion and P is the sample proportion. Hence, the formula for the standard error of proportion is defined as follows:

n with number of success x and total number of observations of n. The standard error of proportion is directly proportional with sample proportion. It implies that if the sample proportion increases, then the standard error also increases and if the sample proportion decreases, then the standard error also decreases. The standard error of proportion is inversely proportional with the total number of observations. It implies that if the number of

increases. A large amount of standard deviation and standard error indicates that the observations are widely spread. However, the main difference between the standard error and standard deviation is that standard deviation is based on population parameter, whereas

the standard error is based on the sample statistic. The precision of the proportion of a data set can be estimated by the sample proportion. Standard error of proportion also used to

How to find the standard error of a proportion?

For single proportion:

as both are the measures of dispersion. It is used to find the accuracy and efficiency of the sample.

Consider that p is the population proportion and \hat{P} is the sample proportion. Hence, the formula for the standard error of proportion is defined as follows:

 $SE = \sqrt{rac{\hat{p}\left(1-\hat{p}
ight)}{n}}$, where \hat{p} is defined as $\hat{p} = rac{x}{n}$ with number of success x and total number of observations of n. Example:

Consider a random sample of 250 people among which 180 persons agreed on smoking.

In this problem, the number of success is 180, that is, x = 180 and the number of total observation is 250, that is, n = 250. Hence, the sample proportion is obtained as follows:

= 0.72

Now, the standard error of the proportion is defined as follows:

 $SE = \sqrt{\frac{0.72 (1 - 0.72)}{250}}$ $= \sqrt{\frac{0.2016}{250}}$ = 0.028For difference between two population proportions:

of the population proportions P_1 and P_2 is defined as follows:

Example: Consider a random sample of 250 people among which 180 persons agreed on smoking and another random sample of 230 people among which 150 persons agreed on smoking.

For first problem,
$$x_1 = 180$$
, $n_1 = 250$.

Hence, the sample proportion for 1st sample is obtain 180

= 0.72

 $SE = \sqrt{\frac{0.72(1-0.72)}{250} + \frac{0.65(1-0.65)}{230}}$ = 0.042

 $\it n$ with number of success x and total number of observations of n. Example:

Open an Excel sheet. Enter x, n, 180, 250 in cell A1, B1, A2, and B2, respectively. f_x C1 B A n

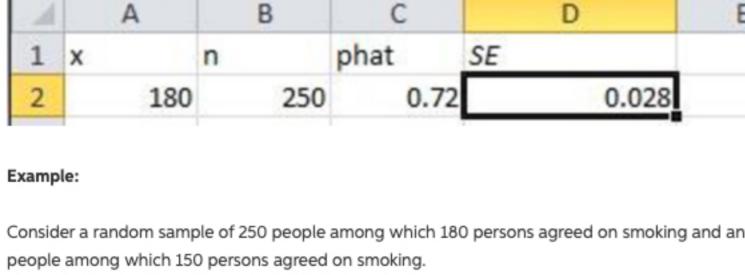
The steps to obtain the standard error using Excel are as follows:

C2 В D

n

180

D2



 f_x F9

250

n2

D

230

 $f_{x} = SQRT((((E2)*(1-E2))/(C2))+(((F2)*(1-F2))/(D2)))$

0.72

p2hat

p1hat

230

G

0.042

SE

In cell D1, type SE and type "=SQRT(((C2)*(1-C2))/B2)" in cell D2. Hence, the standard error of proportion is obtained.

 $f_{x} = SQRT(((C2)*(1-C2))/B2)$

x2 x1 n1 n2 180 150 250 230 In cell G1, type SE and type "=SQRT((((E2)*(1-E2))/(C2))+(((F2)*(1-F2))/(D2)))" in cell G2. Hence, the standard error of proportion is obtained.

n1

150

B

x2

180

x1

proportions are obtained.

G2

180

1 x1

Example:

 $H_1: p_1 > p_2$

Test statistic:

B

n1

Hence, in this way the standard error of proportion can be obtained by Excel.

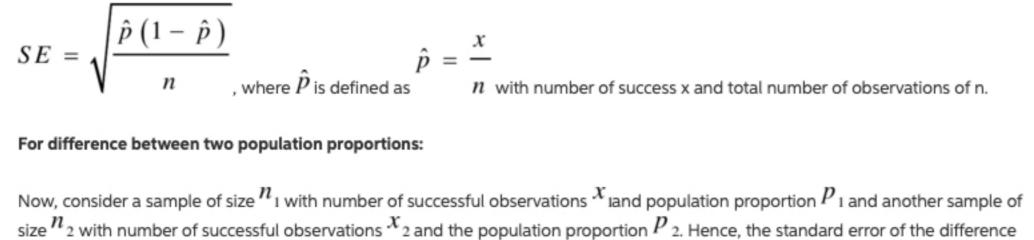
150

x2

What is standard error in hypothesis testing?

2

with standard deviation, as both are the measures of dispersion. For single proportion:



population proportion of patients suffering from heart attack or stroke under the ticagrelor drug. Null hypothesis: $H_0: p_1 = p_2$

See more Statistics and Probability topics

Decision rule based on the P-value approach:

If $P - value \le \alpha$, then reject the null hypothesis H_{0} .

If $P - value > \alpha$, then fail to reject the null hypothesis H_0 .

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Experts answer in as little as 30 minutes

01:00

A: See Answer Q: carried out for the case of women. 14. Before every flight, the pilot must verify that the total weight of the load is less than the maximum allowable load for the aircraft. The aircraft can carry 42 passengers, and ... A: See Answer Q: The Turbojot Beverage Company sells its X-Treme energy drink in "6 ounce ultra-reinforced carbon steel cans.

A: See Answer

want...

A: See Answer

sampled 1...

A: See Answer

A: See Answer

they normal? bimoda...

A: See Answer

A: See Answer

them in a

In reality, not every can contains exactly 6 fuld ounces of beverage. A TurboJo X-ecutive (who is so X-trem... A: See Answer Q: The role of a survey then by a bank in a modundred town are shown in the wie The way asked questions about the investments of tanks Angle one more on you we were in the tot, in the number of people in each set Comple... A: See Answer Q: The effectiveness of a blood pressure drug is being investigated. An experimenter finds that, on average, the reduction in systolic blood pressure is 67.6 mmHg (millimeters of mercury) for a sample of size 635 and a ...

Q: An particular model of smartphone was advertised to have a battery life of 15 hours. The manufacturer claims that the battery life for this model actually follows a Normal distribution with a mean of 14.87 hours and ... A: See Answer Q: The Spaaaarkling Toothpaste Company sells its product in 400 militer (ml) tubes. Due to a problem at the

Q: A goal of financial literacy for children is to learn how to manage money wisely. One question is How much

money do children have to manage? A recent study by Schnur Educational Research Associates randomly

Q: College tuition: A simple random sample of 35 colleges and universities in the United States has a mean tuition of \$17,500 with a standard deviation of \$10,100. Construct an 80% confidence interval for the mean tuiti...

f(x) using its values at the points [Xi-2, Xi-1, Xi, Xi+2, Xi+2]. Show all the steps in your calculation... A: See Answer Q: a service that repairs air conditioners sells maintenance agreements for \$80 a year. The average cost for repairing an air conditioner is \$450 and 2% of all consumers who purchase maintenance agreements have air con... A: See Answer

https://www.worldometers.info/coronavirus/ 2) create 3 histograms from this data discuss their meaning, are

Q: 5) suppose that a romp of otters is normally distributed with mean 7.34 and standard deviation 1.84. Calculate the maximum size of a romp of otters if the romp size is in the lowest 15%, correct to two decimal places...

Q: Assignment I (you may we call or some equivokad) (1) Go to the page do muy dey de empnia

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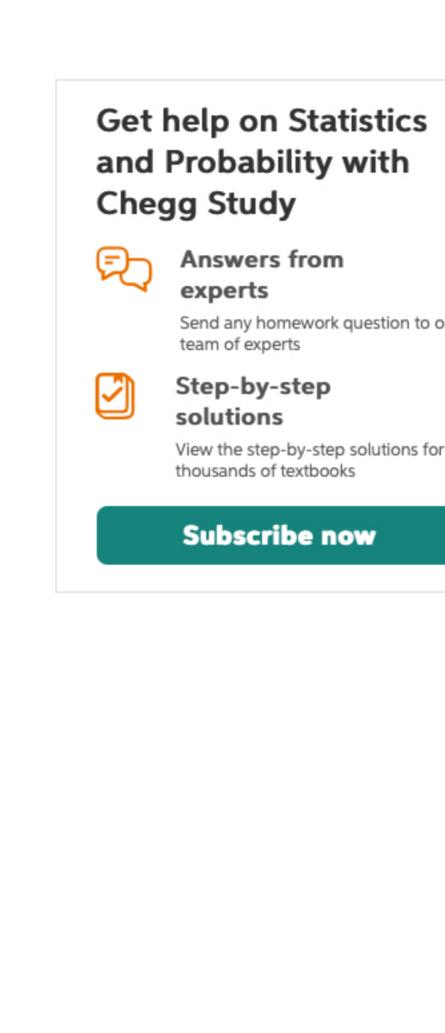
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Q

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observations increases, then the standard error decreases and if the number of observation decreases, then the standard error find the confidence interval (margin of error) in a hypothesis testing procedure. The standard error of the proportion is defined as the spread of the sample proportion about the population proportion. More specifically, the standard error is the estimate of the standard deviation of a statistic. It has a similar nature with standard deviation, Now, consider a sample of size n_1 with number of successful observations x_1 and population proportion p_1 and another sample of size n_2 with number of successful observations x_2 and the population proportion p_2 . Hence, the standard error of the difference

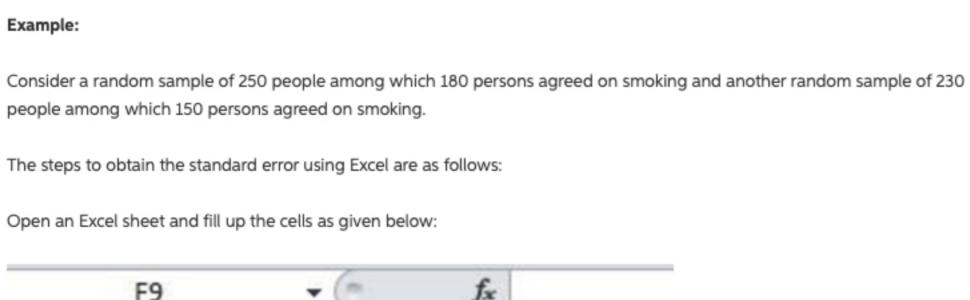
 $SE = \sqrt{\frac{\hat{p}_1 (1 - \hat{p}_1)}{n_1} + \frac{\hat{p}_2 (1 - \hat{p}_2)}{n_2}}$ Hence, the sample proportion for 1st sample is obtained as follows: For the second problem, $x_2 = 150$, $n_2 = 230$ Hence, the sample proportion for 2nd sample is obtained as follows: $\hat{p}_2 = \frac{150}{}$ = 0.65Now, the standard error of the difference of the proportions is defined as follows:

How do you calculate the standard error of proportion in Excel? The standard error of the proportion is defined as the spread of the sample proportion about the population proportion. More specifically, the standard error is the estimate of the standard deviation of a statistic. It has a similar nature with standard deviation, as both are the measures of dispersion. It is used to find the accuracy and efficiency of the sample. For single proportion: Consider that p is the population proportion and \bar{P} is the sample proportion. Hence, the formula for the standard error of proportion is defined as follows:

250 180 In cell C1, type phat and type "=A2/B2" in cell C2. Hence, the sample proportion is obtained. =A2/B2

phat

Consider a random sample of 250 people among which 180 persons agreed on smoking.



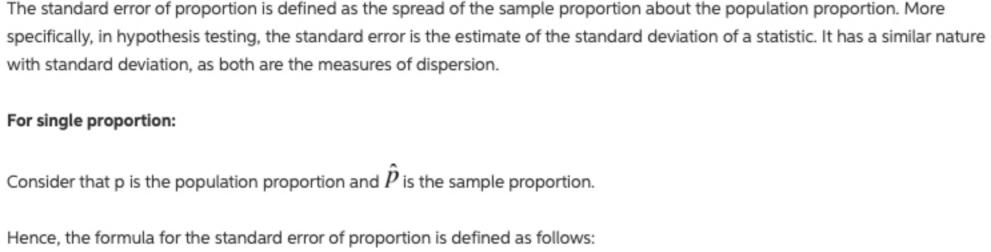
B D E F C A p2hat p1hat 0.72 0.65

D

n2

250

In cell E1, type p1hat and type "=A2/C2" in cell E2. Similarly, in cell F1, type p2hat and type "=B2/D2" in cell E2. Hence, the sample



of the population proportions P_1 and P_2 is defined as follows: $SE = \sqrt{\frac{\hat{p}_{1}(1-\hat{p}_{1})}{n_{1}} + \frac{\hat{p}_{2}(1-\hat{p}_{2})}{n_{2}}}$

Consider a study that from a sample of 6,676 patients under clopidogrel drug, 668 patients suffered heart attack or stroke. In other

wants to check whether the proportion of patients under ticagrelor drug, who suffer heart attack or stroke, is significantly less than

hand, from another sample of 6,732 patients under ticagrelor drug, 569 patients suffered heart attack or stroke. The investigator

Let p_1 be the population proportion of patients suffering from heart attack or stroke under the clopidogrel drug and p_2 be the

the proportion of patients under drug clopidogrel suffering from heart attack or stroke.

proportion of patients under the ticagrelor drug suffering heart attack or stroke.

The test statistic for testing the difference between two proportions is as follows:

That is, there is no significant difference between the proportion of patients suffering from heart attack or stroke under the clopidogrel drug and the proportion of patients suffering from heart attack or stroke under the ticagrelor drug. Alternate hypothesis:

That is, the proportion of patients under the clopidogrel drug suffering heart attack or stroke is significantly greater than the

Consider the level of significance is $\alpha = 0.01$. Now, the test statistic is obtained as 3.11 with the P-value of 0.001.

Conclusion based on the P-value approach: The P-value is 0.001 and α value is 0.01. Here, the P-value is less than the α value. $_{\text{That is,}} 0.001 (= P - \text{value}) < 0.01 (= \alpha)$ By the rejection rule, reject the null hypothesis. Thus, there is enough evidence to conclude that the proportion of patients under ticagrelor drug suffering from heart attack or stroke is significantly less than the proportion of patients under the clopidogrel drug suffering from heart attack or stroke. Videos related to **Statistics and Probability**

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Q: Brawdy Plastics, Inc., produces plastic seat belt retainers for General Motors at the Brawdy Plastics plant in Buffalo, New York. After final assembly and painting, the parts are placed on a conveyor belt that moves ...

Q: In 1900, there were about 20 million Englishmen and 37 were less than 170 cm tallSuppose we took a random sample of 50 of those mean and calculated the proportion of the sample that was less than 170 cm tall. We

Q: Preparing for Section 6.2 Introduction Objective 1 Objective 2 Objective 3 Objective 2: Compute Probabilities of

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Counting

Q: 1.In a particular game, a six-sided fair die is tossed. If the number of spots showing is six, you win \$6; if the number of spots showing is five, you win \$3; if the number of spots showing is four, you win \$2; and i...

A: See Answer Q: 1. A company determines that 15% of the microchips that they produce are defective. If you were to purchase three of those microchips, what is the probability that EXACTLY one of them is defective? A: See Answer

Q: 5. Use the Gauss-Elimination method to solve the following system of linear algebraic equations. Show all the intermediate calculations up to six decimal places for forward and backward substitution. (20 points) 3x1 ...

Q: If you have limp carrots that look a bit dried up, then you are can make them become firm and crisp by putting

Q: In the following problem, check that it is appropriate to use the normal approximation to the binomial. Then use the normal distribution to estimate the requested probabilities. It is estimated that 3.7% of the gener...

manufacturing plant, the Individual tubes in a particular shipment have a mean amount of only 355 ml, a

Q: 4. Derive a fourth order accurate centered finite difference approximation for second derivative of a function,

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