

How do you calculate the Standard Error of the Mean in Excel?

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The Standard Error of the Mean (SEM) is a measure of the variation or uncertainty of the mean of a dataset. It is used to determine the accuracy and precision of the mean value. In Excel, the SEM can be calculated using the formula "`=STDEV(range)/SQRT(COUNT(range))`". This formula takes the standard deviation of the dataset and divides it by the square root of the number of data points. This provides an estimate of the uncertainty in the mean value. By calculating the SEM, one can better understand the reliability of the mean and make more informed decisions based on the data.

Calculate the Standard Error of the Mean in Excel

The standard error of the mean is a way to measure how spread out values are in a dataset. It is calculated as:

$$\text{Standard error} = s / \sqrt{n}$$

where:

s: sample standard deviation
n: sample size

You can calculate the standard error of the mean for any dataset in Excel by using the following formula:

`=STDEV(range of values) / SQRT(COUNT(range of values))`

The following example demonstrates how to use this formula.

Example: Standard Error in Excel

Suppose we have the following dataset:

	A	B	C	D	E	F	G
1	data						
2	3						
3	4						
4	4						
5	5						
6	7						
7	8						
8	12						
9	14						
10	14						
11	15						
12	17						
13	19						
14	22						
15	24						
16	24						
17	24						
18	25						
19	28						
20	28						
21	29						
22							
23							
24							
25							
26							
27							

The following screenshot shows how to calculate the standard error of the mean for this dataset:

	A	B	C	D	E	F	G
1	data		Standard Error	Formula			
2	3		2.0014	=STDEV(A2:A21)/(SQRT(COUNT(A2:A21)))			
3	4						
4	4						
5	5						
6	7						
7	8						
8	12						
9	14						
10	14						
11	15						
12	17						
13	19						
14	22						
15	24						
16	24						
17	24						
18	25						
19	28						
20	28						
21	29						
22							
23							
24							
25							

The standard error turns out to be 2.0014.

Note that the function =STDEV() calculates the sample mean, which is equivalent to the function =STDEV.S() in Excel.

Thus, we could have used the following formula to get the same results:

	A	B	C	D	E	F	G
1	data		Standard Error	Formula			
2	3		2.0014	=STDEV.S(A2:A21)/SQRT(COUNT(A2:A21))			
3	4						
4	4						
5	5						
6	7						
7	8						
8	12						
9	14						
10	14						
11	15						
12	17						
13	19						
14	22						
15	24						
16	24						
17	24						
18	25						
19	28						
20	28						
21	29						
22							
23							
24							
25							
26							
27							

Once again the standard error turns out to be 2.0014.

How to Interpret the Standard Error of the Mean

The standard error of the mean is simply a measure of how spread out values are around the mean. There are two things to keep in mind when interpreting the standard error of the mean:

1. The larger the standard error of the mean, the more

spread out values are around the mean in a dataset.

To illustrate this, consider if we change the last value in the previous dataset to a much larger number:

	A	B	C	D	E	F	G	H
1	data		Standard Error	Formula				
2	3		6.9783	=STDEV.S(A2:A21)/SQRT(COUNT(A2:A21))				
3	4							
4	4							
5	5							
6	7							
7	8							
8	12							
9	14							
10	14							
11	15							
12	17							
13	19							
14	22							
15	24							
16	24							
17	24							
18	25							
19	28							
20	28							
21	150							
22								
23								
24								
25								
26								
27								
28								
29								

Notice how the standard error jumps from 2.0014 to 6.9783. This is an indication that the values in this dataset are more spread out around the mean compared to the previous dataset.

