

Why Standard Deviation Is an Important Statistic

By Deborah J. Rumsey, PhD from Statistics For Dummies, 2nd Edition

The standard deviation is a commonly used statistic, but it doesn't often get the attention it deserves. Although the mean and median are out there in common sight in the everyday media, you rarely see them accompanied by any measure of how diverse that data set was, and so you are getting only part of the story. In fact, you could be missing the most interesting part of the story.

Without standard deviation, you can't get a handle on whether the data are close to the average (as are the diameters of car parts that come off of a conveyor belt when everything is operating correctly) or whether the data are spread out over a wide range (as are house prices and income levels in the U.S.).

For example, if you are told that the average starting salary for someone working at Company Statistix is \$70,000, you may think, "Wow! That's great." But if the standard deviation for starting salaries at Company Statistix is \$20,000, that's a lot of variation in terms of how much money you can make, so the average starting salary of \$70,000 isn't as informative in the end, is it?

On the other hand, if the standard deviation was only \$5,000, you would have a much better idea of what to expect for a starting salary at that company. Which is more appealing? That's a decision each person has to make; however, it'll be a much more informed decision once you realize standard deviation matters.

Without the standard deviation, you can't compare two data sets effectively. Suppose two sets of data have the same average; does that mean that the data sets must be exactly the same? Not at all. For example, the data sets 199, 200, 201 and 0, 200, 400 both have the same average (200) yet they have very different standard deviations. The first data set has a very small standard deviation ($s=1$) compared to the second data set ($s=200$).