

Trending: Methods to Analyze Safety & Health Performance Measures

Trend analysis is the practice of spotting patterns (both good or bad) in the information and data you collect. Simply monitoring and measuring the performance of your safety and health (S&H) processes in your safety management system (SMS) is not enough. It helps to know the numbers, but what learning what they mean and can tell you is where trend analysis comes in! Trends help you understand how your SMS has performed and predict where current SMS efforts will take you. The burning question is: *“How do I perform trend analysis?”*

This one pager describes methods you can use to analyze the S&H data at your organization and develop strategies to uphold performance of your SMS.



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WHO SHOULD PERFORM TREND ANALYSIS?

Designate responsible persons to analyze S&H performance data using the methods described in this one pager, or other appropriate methods. Assign this responsibility to someone familiar with data analysis and the use of software programs.

COMPARE REGULATORY COMPLIANCE AND HISTORICAL DATA

Compare your S&H data against regulatory requirements or other guidance (e.g., consensus standards, Service requirements) to see what is required and what you are accomplishing.

Example: You are required to identify corrective actions for all open risk assessment code (RAC) 2s within 60 days. Look at each RAC 2 for quarter 3 and assess if 100% of them had corrective action plans developed within a 60-day period. You have 21 RAC 2s without a corrective action plan. Compare the data to quarters 1 and 2 to see if it is a common occurrence. If so, identify it as a trend and investigate why it is happening.

Use historical data, when possible, to determine whether trends exist. Historical data is any past metric or measure regarding the performance measures you plan to trend. Historical data is dated as it focuses on things having already occurred, but it can give insight on current SMS performance. It is important to carefully choose your timeframes when making historical comparisons. Only through comparisons are you able to find out whether your SMS is making progress or regressing over time.

Example: You plan to measure your S&H training completion percentage for the first half of the calendar year. Measuring you are 80% complete as an organization does not tell you much. You need to know the percentage you were at in a past timeframe for comparison, such as the first half of the prior calendar year. Last year, S&H training completion was 96% complete this point, so you can conclude training completion dropped and you need to determine why. Compare the S&H training completion rate for the first half of the year against the data collected over the last five years to see if it is an ongoing trend needing investigated.

IDENTIFY OBVIOUS TRENDS

When you have historical data or compliance goals, it is often easy to spot trends. If your injury and illness rates increase four years in a row (Figure 1), you can reasonably say you have a trend of increasing injury and illness rates. We know high injury and illness rates are undesirable, and so we can say the continuation of this trend is not a good trend to have for the SMS.

Now, look further into your injuries and illness to see what is happening and why. *Is there a specific type of injury occurring most often?* Let's say you have an ongoing trend in sprain and strain injuries. Look for trends regarding where the injuries occur (e.g., in a certain work area, when performing a specific operation, during a particular time of day).

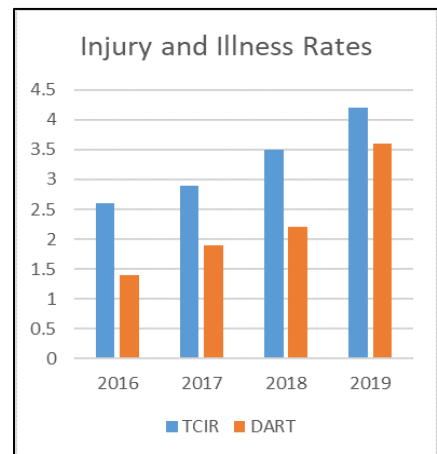


Figure 1 – Injury and Illness Rate Trend

IDENTIFY NOT-SO-OBVIOUS TRENDS

In other cases, you may look at your data and not be sure whether a trend exists. For example, the number of S&H inspection findings fluctuate over the course of a six-month timeframe (Figure 2). *How can you tell if it is trending up or down?*

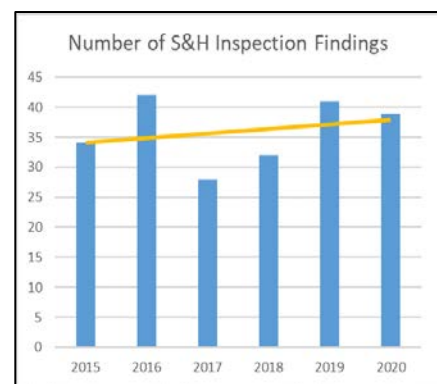


Figure 2 – S&H Inspection Finding Trend

USE THE AVERAGE

Averages help you understand how well you are performing. Find the average of your data set and use the average as a benchmark for future trends.

$$\text{Average} = \frac{(\text{Month 1} + \text{Month 2} + \text{Month 3})}{\text{Total Number of Months}} = \frac{(34 + 42 + 28)}{3} = 35$$

Compare future inspection finding numbers against the average to see if they fall above or below the benchmark (i.e., 35 inspection findings).

USE MICROSOFT EXCEL TO IDENTIFY TREND LINES

Apply trend lines when your data varies constantly. Look at the yellow trend line you can apply to your data in Microsoft Excel (Figure 2). Though the numbers fluctuate over time, the trend line shows a slight upward trend over the past 6 months, meaning the number of your inspection findings is increasing over time.

Add a trend line in Microsoft Excel™

1. Input your data and create a chart
2. Select the '+' button to open the Chart Elements options
3. Check the "Trend Line" box

MAKE IMPROVEMENTS

After you complete your trend analysis, use this information to investigate the causes of trends and create plans of action to make SMS improvements.

For additional information on the SMCX's services, please visit the SMCX-hosted website at: <https://www.smscx.org/>.