Pareto Analysis – Instruction

(Also known as: Pareto principle, 80/20 rule)

Why would I use this tool?

This tool is used to categorize and group data so that a team can quickly identify which causes have the most impact on a problem. This is also referred to as "the vital few versus the useful many" and follows the "80/20 rule," which says that 80 percent of the "effects" in a system are caused by 20 percent of the causes. In instances where there seem to be many causes, it is crucial to be able to invest efforts in those that will have the greatest positive impact. Correct usage of this tool is predicated on collection of data to support the Pareto analysis.

Quality Improvement Steps

How do I use this tool?

1) Identify an effect (cause or problem), something consistently observed in your system that is not desired
2) Decide what categories will be used to group items, based on local process experts, hunches, observations, etc.
3) Decide what measurements are important and relevant to this issue (frequency, time, cost or quantity), where they are best collected or assembled, and who will be accountable
4) Decide the time frame for collection of measurements. It is advisable to have at least 50 data points, so keep this in mind when determining the time period
5) Collect or assemble data using a Defect Check Sheet
6) When measurement period is complete, re-order the data onto the Pareto Analysis tool and total the observed occurrences for each category
7) Re-order the categories from most to least prevalent

8) Create a histogram depicting the most prevalent on the left to the least prevalent on the right. The histogram scale should display the range from 0 to the highest prevalence of occurrence on the left, and a scale of 0%–100% on the right
9) Calculate the percent representation of each item of the total
10) From most prevalent to least prevalent, add the percentage of each item (i.e., most prevalent: 23% + next most prevalent: 21% = 44%, + next most prevalent: 19% = 63%)
11) At each bar representing an item, put a dot at the appropriate % point, and then join the dots from right to left. The line should progress from the % of the most prevalent to 100%

How do I analyze a Pareto Chart?

Once the causes have been organized, the key questions for the QI Team to consider are:

- Is there a clear Pareto effect, with "vital few" causes indicated?
- Is there a need to drill down further on any of these causes?

What do I need to use this tool?

Materials

Electronic method

- Computer
- Excel Pareto Template (website tool available) or Excel software

Manual Method

- Calculator
- Graph paper
- Pencil
- Ruler
- Check sheet with raw data

Timing

Familiarity with the electronic template or basic Excel software will determine timing. It should only take a few minutes to create a Pareto Chart if the raw data is available and calculations are complete

Setup

- If you are using the Pareto Template, follow the instructions on the template and fill in each section
- If you are using Excel, you will need basic working knowledge of how to create charts

What tips and tricks will be useful in facilitating the use of this tool?

- Use the Fishbone/Cause and Effects diagram prior to the Pareto, to inform you of the categories to collect data on
- To uncover a true Pareto effect, collect as much data as possible. The more data points collected and analyzed, the clearer the effect
- Always use observable, measurable data, rather than opinion. Often, what is perceived as the chief cause actually isn't; it may be that it gets the largest reaction from staff and/or is the "loudest" or most visible
- It's sometimes helpful to record team members' predictions prior to the observation and discuss them afterwards; if observations are the same as predictions, it is positive affirmation. If different, this may be an area for exploration

Pareto Analysis and Chart – Tool

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Place available data in the spaces below, from highest frequency to least frequency.

Defect or Defect Cause (from highest frequency to least frequency)	Frequency (# of each event)	% Frequency (# of each event ÷ by total # of events)	Cumulative Frequency (addition of % frequency)

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