Data Tools with Instructions

QI Tracking Measures

Pareto Chart

A bar chart composed of a various factors that contribute to an overall effect arranged in order from largest to smallest contribution of effect

Driver Diagram

A diagram that displays identified “primary or secondary drivers” or contributors and relationship between them in relation to the overall aim of the project

Run Chart

A graph that depicts the current performance of a process and monitors whether interventions lead to improvement

Cause and Effect Diagram

A fishbone diagram that identifies contributors to certain effect or outcome and examines the relationship of cases to the effect and to each other

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Background

A Pareto chart is a bar chart composed of various factors that contribute to an overall effect arranged in the order from the largest to smallest contribution to the effect. It identifies and allows concentration of improvement on the “vital few” factors that have the largest contribution to the effect and “useful many” factors that have relatively smaller contribution to the effect.

The dataset for a Pareto chart can be create in table format with headings of contributing factors to an overall effect, magnitude of each factor, percentage of the total each factor represents, and cumulative percentage for each factor.

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Pareto Chart

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Instructions

The Pareto chart can be created manually or using a software including R with qcc package. The horizontal axis (X) is labeled with the factors contributing to the overall effect in order of largest to smallest. The left vertical axis (Y) is labeled with the unit of comparison from 0 to the total. The right vertical axis is labeled as cumulative percentage from 0% to 100%.

The magnitude of the effect is depicted using a bar chart using the unit on the left vertical axis. The cumulative percentage is demonstrated using a line graph from 0% to 100%. The “vital few” factors are identified by the factors that contribute to 80% of the cumulative percentage.

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Delay Type	Frequency (No.)	Percentage (%)	Cumulative Percentage (%)
A: Delay in securing transportation to or placement in planned discharge disposition	76	46.1	46.1
B: Delay in coordinating discharge planning with allied healthcare workers, patient, patient's family	33	20.0	66.1
C: Delay in receiving services or equipment for discharge	24	14.5	80.6
D: Delay in recognizing discharge needs	17	10.3	90.9
E: Delay in diagnostic tests or consultation service	10	6.1	97.0
F: Complication or exacerbation of comorbidities	5	3.0	100
Total	165	100	

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Pareto Chart

```
options(repos = list(CRAN="http://cran.rstudio.com/"))
install.packages("qcc")
```

```
##
## The downloaded binary packages are in
##  /var/folders/0_/nx97xfc94yl6ww2lv3yht_z00000gn/T//Rtmpa8Im4z/downloaded_packages
```

```
library("qcc")
```

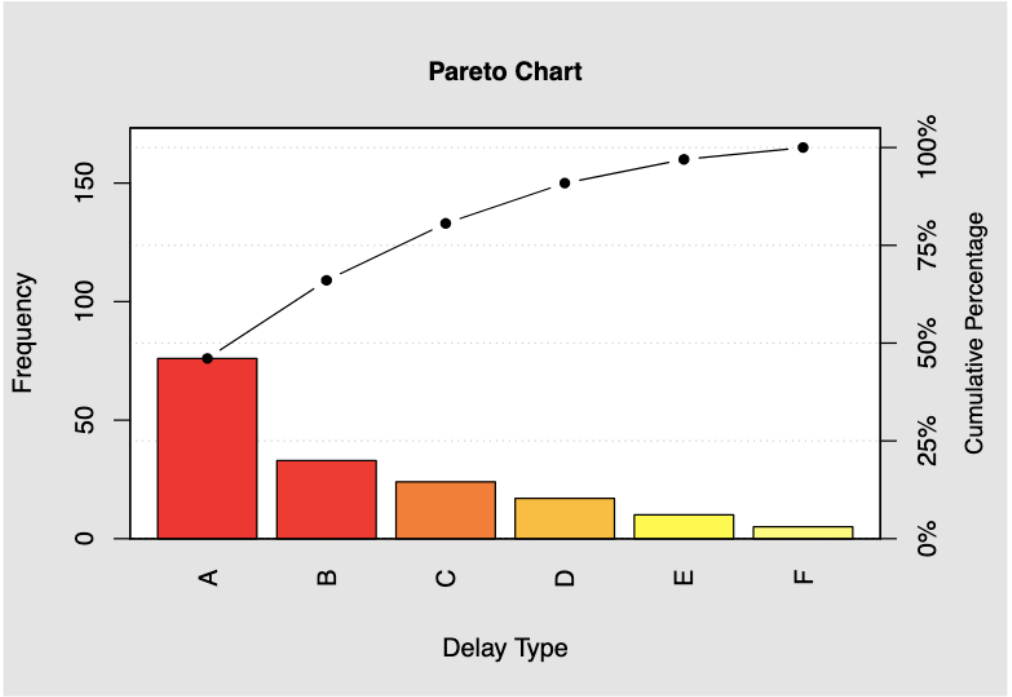
```
## Package 'qcc' version 2.7
```

```
## Type 'citation("qcc")' for citing this R package in publications.
```

```
df <- data.frame(delay.type=c('A', 'B', 'C', 'D', 'E', 'F'))
df$frequency = c(76, 33, 24, 17, 10, 5)
df
```

```
##   delay.type frequency
## 1          A        76
## 2          B        33
## 3          C        24
## 4          D        17
## 5          E        10
## 6          F         5
```

```
pareto.chart(df$frequency,
             main='Pareto Chart',
             xlab='Delay Type',
             col=heat.colors(length(df$frequency))
)
```




```
##
## Pareto chart analysis for df$frequency
##      Frequency  Cum.Freq. Percentage Cum.Percent.
##   A 76.000000  76.000000  46.060606    46.060606
##   B 33.000000 109.000000  20.000000    66.060606
##   C 24.000000 133.000000  14.545455    80.606061
##   D 17.000000 150.000000  10.303030    90.909091
##   E 10.000000 160.000000   6.060606    96.969697
##   F  5.000000 165.000000   3.030303   100.000000
```