Analyzing Healthcare Outcomes for VA Facilities

Avery Holloman

2024-08-18

```
library(readxl)
library(ggplot2)
library(gridExtra)
SpaceCeleb_VA_Outcomes <- read_excel("C:/Users/jacob/OneDrive/Desktop/R Studio Projects 2024/Dat
asets/SpaceCeleb_VA_Outcomes.xls")
```

```
## New names:
## • `Footnote` -> `Footnote...14`
## • `Footnote` -> `Footnote...35`
```

```
head.matrix(SpaceCeleb_VA_Outcomes)
```

```
## # A tibble: 6 × 81
##   `Patient Name`         `Hospital Visited` Address `City/Town` State `ZIP Code`
##   <chr>                  <chr>              <chr>   <chr>       <chr>      <dbl>
## 1 Elon Musketeer         BIRMINGHAM VA MED… 700 SO… BIRMINGHAM  AL         35233
## 2 Buzz Lightyear DiCapr… BIRMINGHAM VA MED… 700 SO… BIRMINGHAM  AL         35233
## 3 Stellar Swift          BIRMINGHAM VA MED… 700 SO… BIRMINGHAM  AL         35233
## 4 Martian McConaughey    BIRMINGHAM VA MED… 700 SO… BIRMINGHAM  AL         35233
## 5 Nebula Clooney         BIRMINGHAM VA MED… 700 SO… BIRMINGHAM  AL         35233
## 6 Orbit Winfrey          BIRMINGHAM VA MED… 700 SO… BIRMINGHAM  AL         35233
## # ℹ 75 more variables: `County/Parish` <chr>, `Telephone Number` <chr>,
## #   Condition <chr>, `Measure ID` <chr>, `Measure Name` <chr>, Score <chr>,
## #   Sample <chr>, Footnote...14 <chr>, `Start Date` <dttm>, `End Date` <dttm>,
## #   `Ambulatory Surgical Center` <dbl>,
## #   `Ambulatory Surgical Center Quality Reporting` <dbl>,
## #   `Acute Myocardial Infarction` <dbl>, Average <dbl>,
## #   `Coronary Artery Bypass Graft` <dbl>, …
```

```
# Rename the columns to shorter names for easier plotting
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Ambulatory Surgical Cente
r"] <- "ASC"
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Acute Myocardial Infarctio
n"] <- "AMI"
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Coronary Artery Bypass Gra
ft"] <- "CABG"
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Catheter-associated urinar
y tract infections"] <- "CAUTI"
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Clostridium difficile Infe
ction"] <- "CDI"
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Central line-associated bl
oodstream infections"] <- "CLABSI"
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Chronic Obstructive Pulmon
ary Disease"] <- "COPD"
colnames(SpaceCeleb_VA_Outcomes)[colnames(SpaceCeleb_VA_Outcomes) == "Days or Procedure Count"]
<- "Procedure Days"
```

```
# Create a function to plot three variables
plot_three_variables <- function(data, var1, var2, var3) {
  p1 <- ggplot(data, aes(x = .data[[var1]], y = as.numeric(Score))) +
    geom_point(color = "red") +
    geom_smooth(method = "lm", color = "blue") +
    ggtitle(paste(var1, "vs Score")) +
    theme_minimal() +
    scale_y_continuous(limits = c(0, 100), breaks = seq(0, 100, by = 10))

  p2 <- ggplot(data, aes(x = .data[[var2]], y = as.numeric(Score))) +
    geom_point(color = "green") +
    geom_smooth(method = "lm", color = "blue") +
    ggtitle(paste(var2, "vs Score")) +
    theme_minimal() +
    scale_y_continuous(limits = c(0, 100), breaks = seq(0, 100, by = 10))

  p3 <- ggplot(data, aes(x = .data[[var3]], y = as.numeric(Score))) +
    geom_point(color = "purple") +
    geom_smooth(method = "lm", color = "blue") +
    ggtitle(paste(var3, "vs Score")) +
    theme_minimal() +
    scale_y_continuous(limits = c(0, 100), breaks = seq(0, 100, by = 10))

  grid.arrange(p1, p2, p3, ncol = 3)
}

# Now re-run the plotting function with the updated names
plot_three_variables(SpaceCeleb_VA_Outcomes, "ASC", "AMI", "CABG")
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

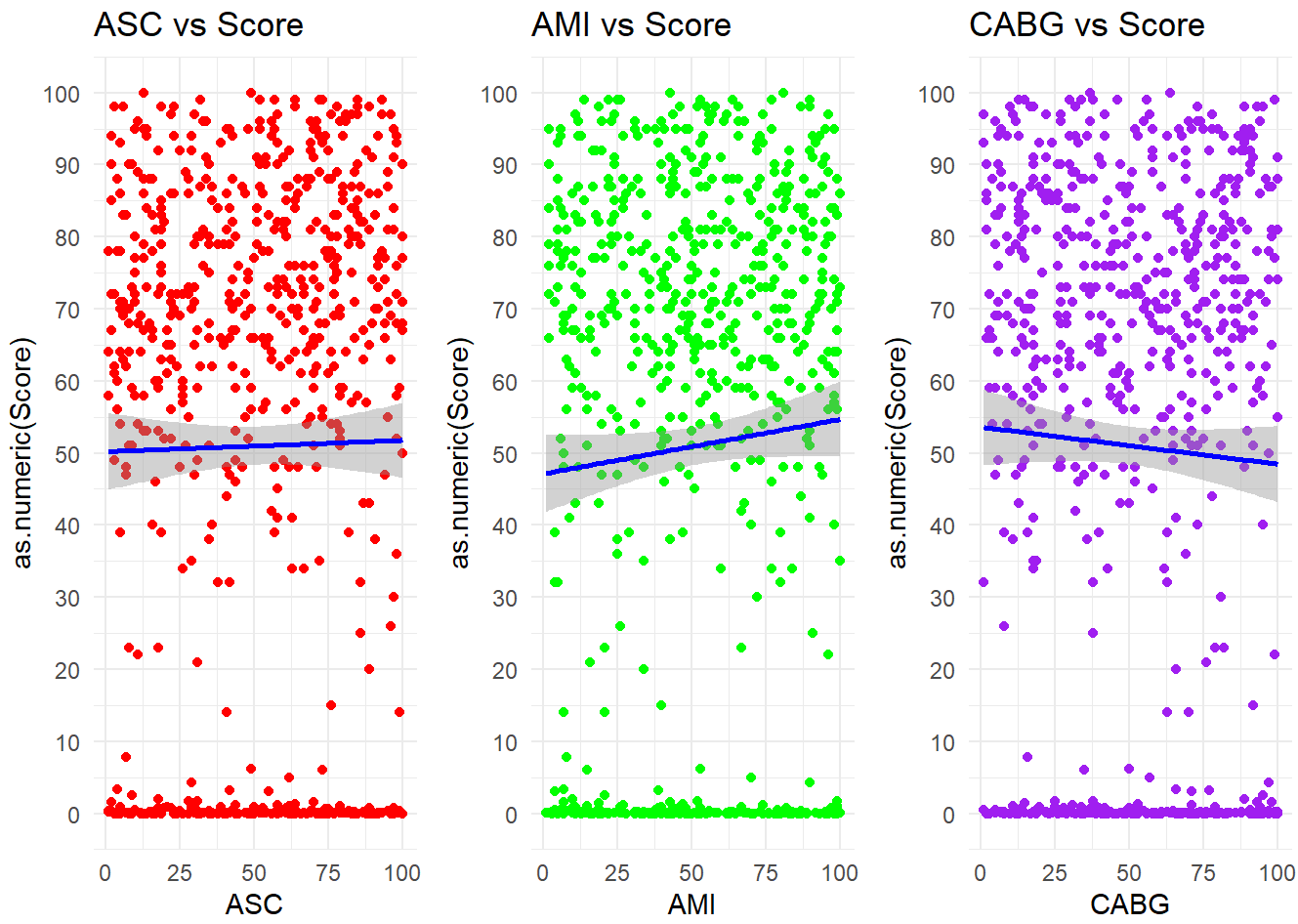
```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```




```
plot_three_variables(SpaceCeleb_VA_Outcomes, "CAUTI", "CDI", "CLABSI")
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

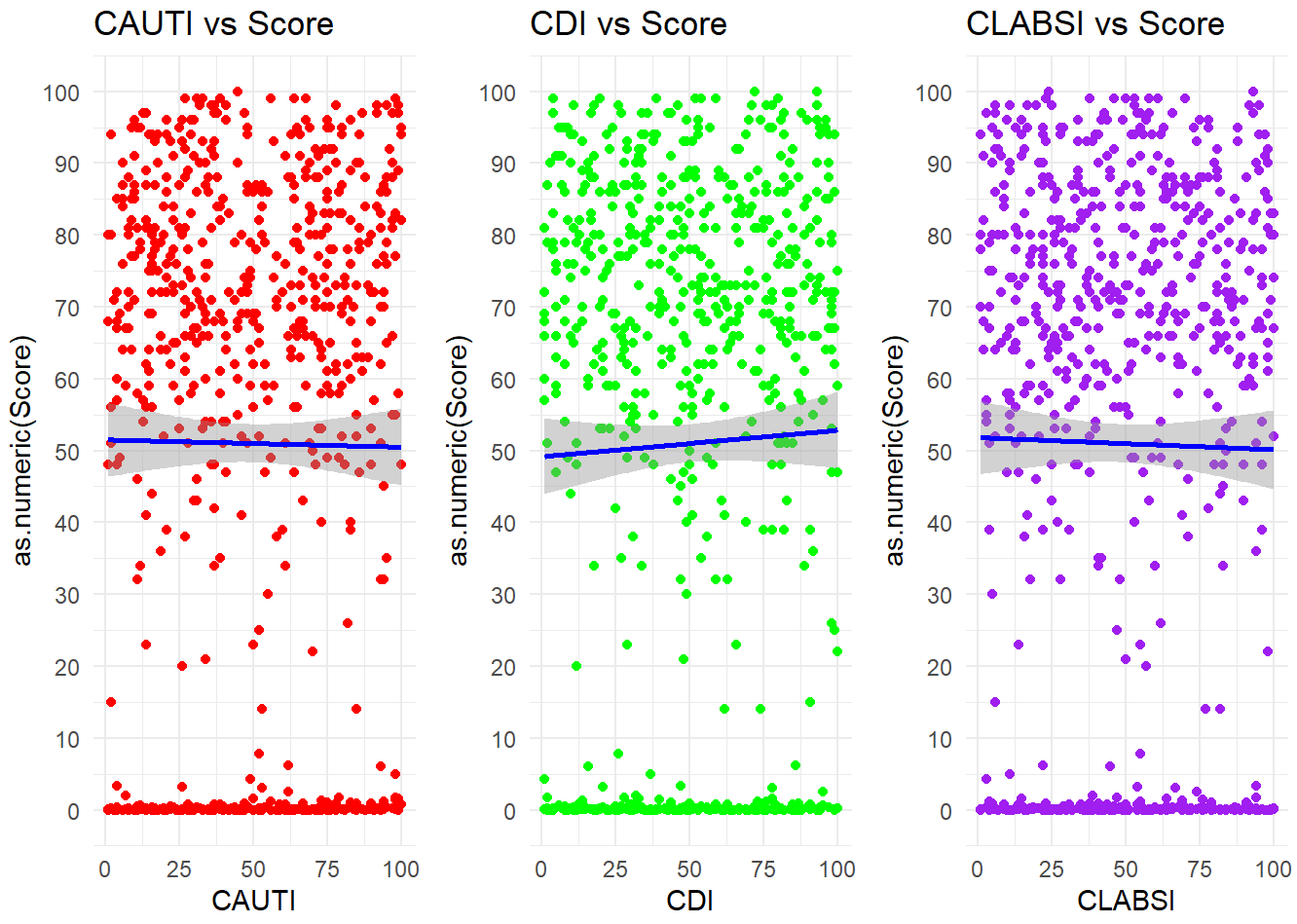
```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```




```
plot_three_variables(SpaceCeleb_VA_Outcomes, "Complications", "COPD", "Procedure Days")
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

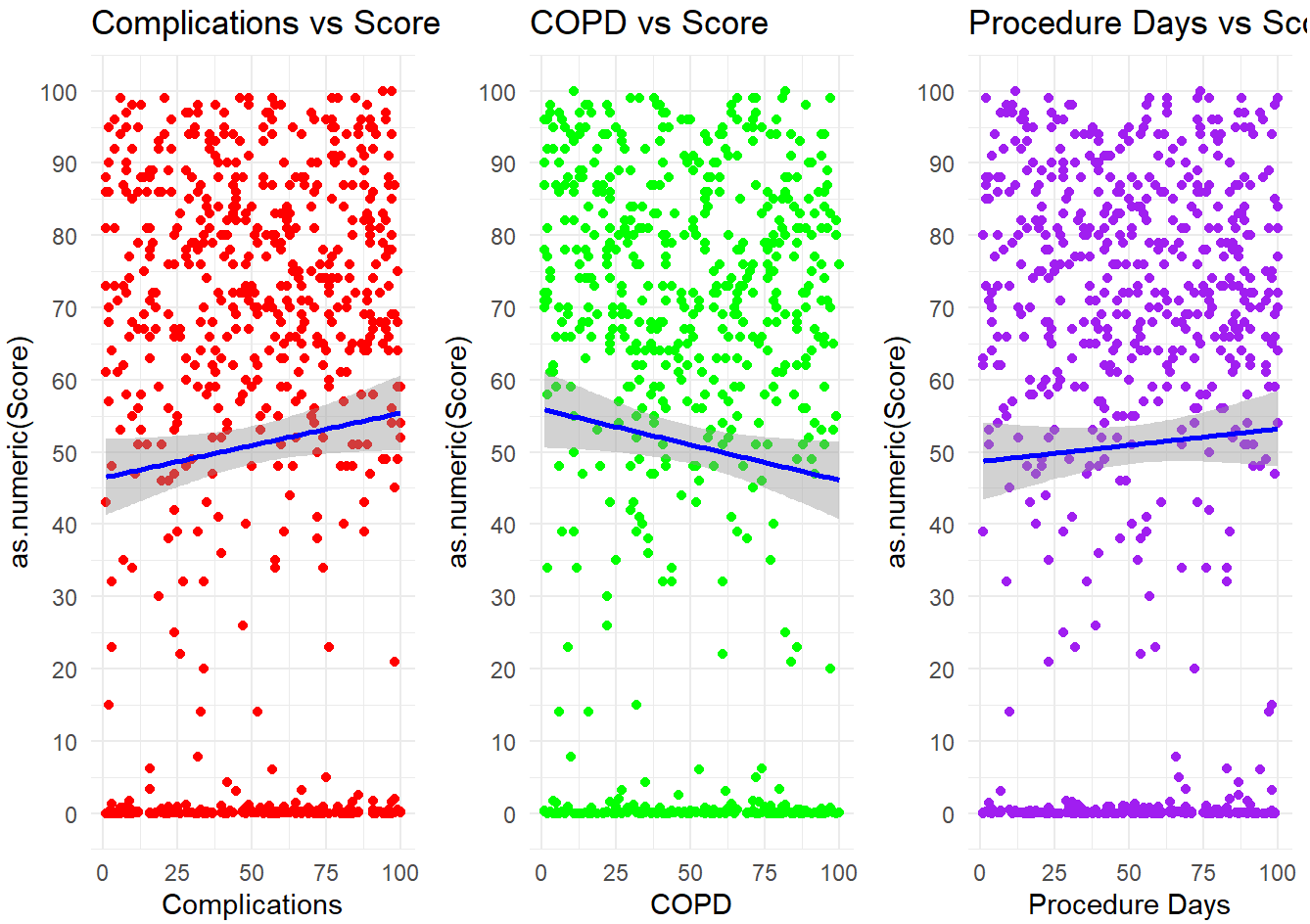
```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
## Warning in FUN(X[[i]], ...): NAs introduced by coercion
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: Removed 85 rows containing non-finite outside the scale range
## (`stat_smooth()`).
```

```
## Warning: Removed 85 rows containing missing values or values outside the scale range
## (`geom_point()`).
```


Complications vs Score
COPD vs Score
Procedure Days vs Sc
as.numeric(Score)
Complications
COPD
Procedure Days
0
10
20
30
40
50
60
70
80
90
100
0
25
50
75
100