Regression Analysis

Regression Analysis in Practice

Nicoleta Serban, Ph.D.
Professor
Stewart School of Industrial and Systems Engineering

Emergency Department Healthcare Costs: Exploratory Data Analysis

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About This Lesson

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Exploratory Data Analysis: Response Variable

```
## Read the data using read.csv() R command
dataAdult = read.csv("DataADULT.csv", header=TRUE)
attach(dataAdult)

## Rescale outcome/response variable
EDCost.pmpm = EDCost/PMPM

## Rescale utilization
dataAdult$PO = PO/PMPM
dataAdult$HO = HO/PMPM

## Histogram of the response variable
par(mfrow=c(2,1))
hist(EDCost.pmpm, breaks=300, xlab="Emergency Department Cost", main="")
hist(log(EDCost.pmpm), breaks=300, xlab="Log-Emergency Department Cost", main="")
```

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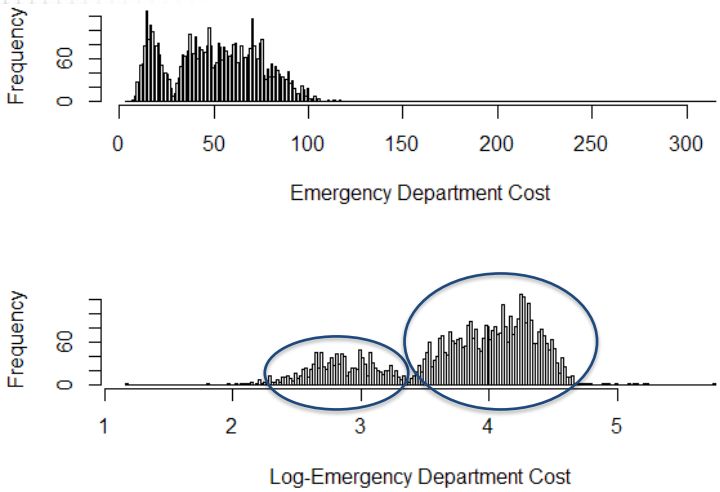
Exploratory Data Analysis: Response Variable



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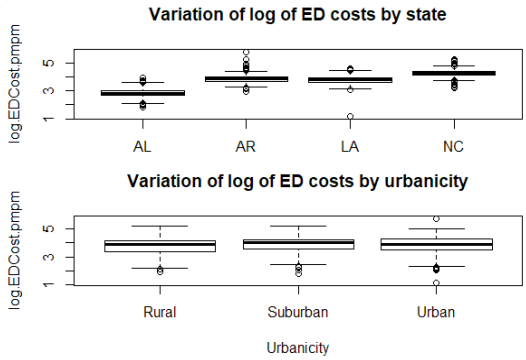
Exploratory Data Analysis: Response vs Qualitative Predictors

```
log.EDCost.pmpm = log(EDCost.pmpm)
## Response variable vs categorical predicating variables
par(mfrow=c(2,1))
boxplot(log.EDCost.pmpm ~ State, main = "Variation of log of ED costs by state")
boxplot(log.EDCost.pmpm ~ Urbanicity, main = "Variation of log of ED costs by urbanicity")
```

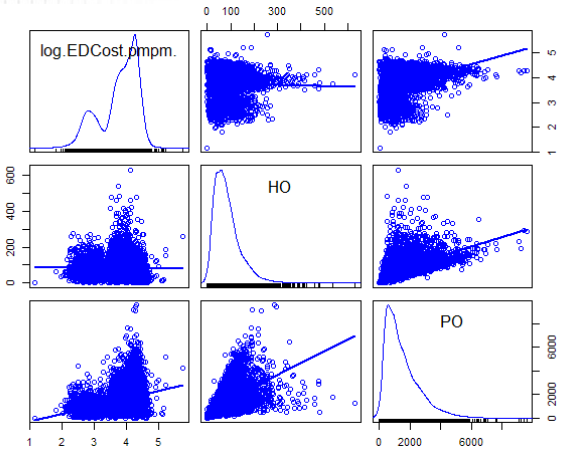


Exploratory Data Analysis: Response vs Qualitative Predictors

```
## Scatterplot matrix plots
library(car)

## Response vs Utilization
scatterplotMatrix(~ log(EDCost.pmpm) + HO + PO, smooth=FALSE)

## Response vs Population Characteristics
scatterplotMatrix(~ log(EDCost.pmpm) + WhitePop + BlackPop + OtherPop + HealthyPop +
    ChronicPop + ComplexPop, smooth=FALSE)

## Response vs Socioeconomic and Environmental Characteristics
scatterplotMatrix(~ log(EDCost.pmpm) + Unemployment + Income + Poverty + Education +
    Accessibility + Availability + ProvDensity, smooth=FALSE)

## Response vs County Health Rankings
scatterplotMatrix(~ log(EDCost.pmpm) + RankingsPCP + RankingsFood + RankingsHousing +
    RankingsExercise + RankingsSocial, smooth=FALSE)
```

Response vs Quantitative Predictors

ED Cost vs. Utilization Measures: *Number of Claims for HO and PO*



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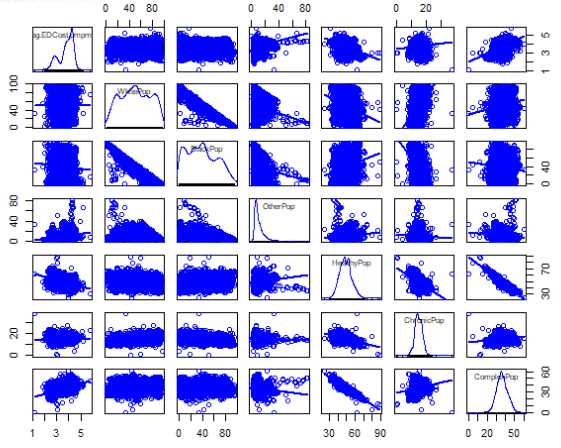
Response vs Quantitative Predictors

ED Cost vs. Population Characteristics: *WhitePop, BlackPop, OtherPop, HealthyPop, ChronicPop, ComplexPop*



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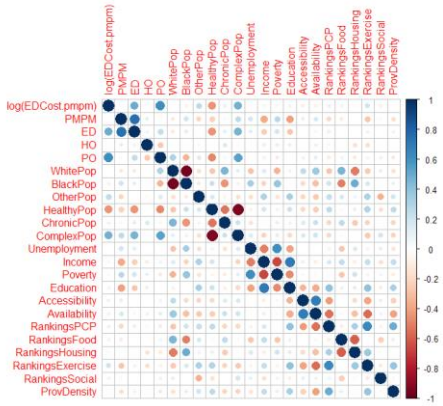
Response vs. Predicting Variables: Correlation Matrix Plot

```
## Correlation matrix plot
library(corrplot)
corr = cor(cbind(log(EDCost.pmpm), dataAdult[,-c(1, 2, 3, 18)]))
corrplot(corr)
```



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Summary

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