

DATA608_HW3

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5/13/2022

```
data <- read.csv("https://raw.githubusercontent.com/charleyferrari/CUNY_DATA_608/master/module3/data/cl")
```

Question 1

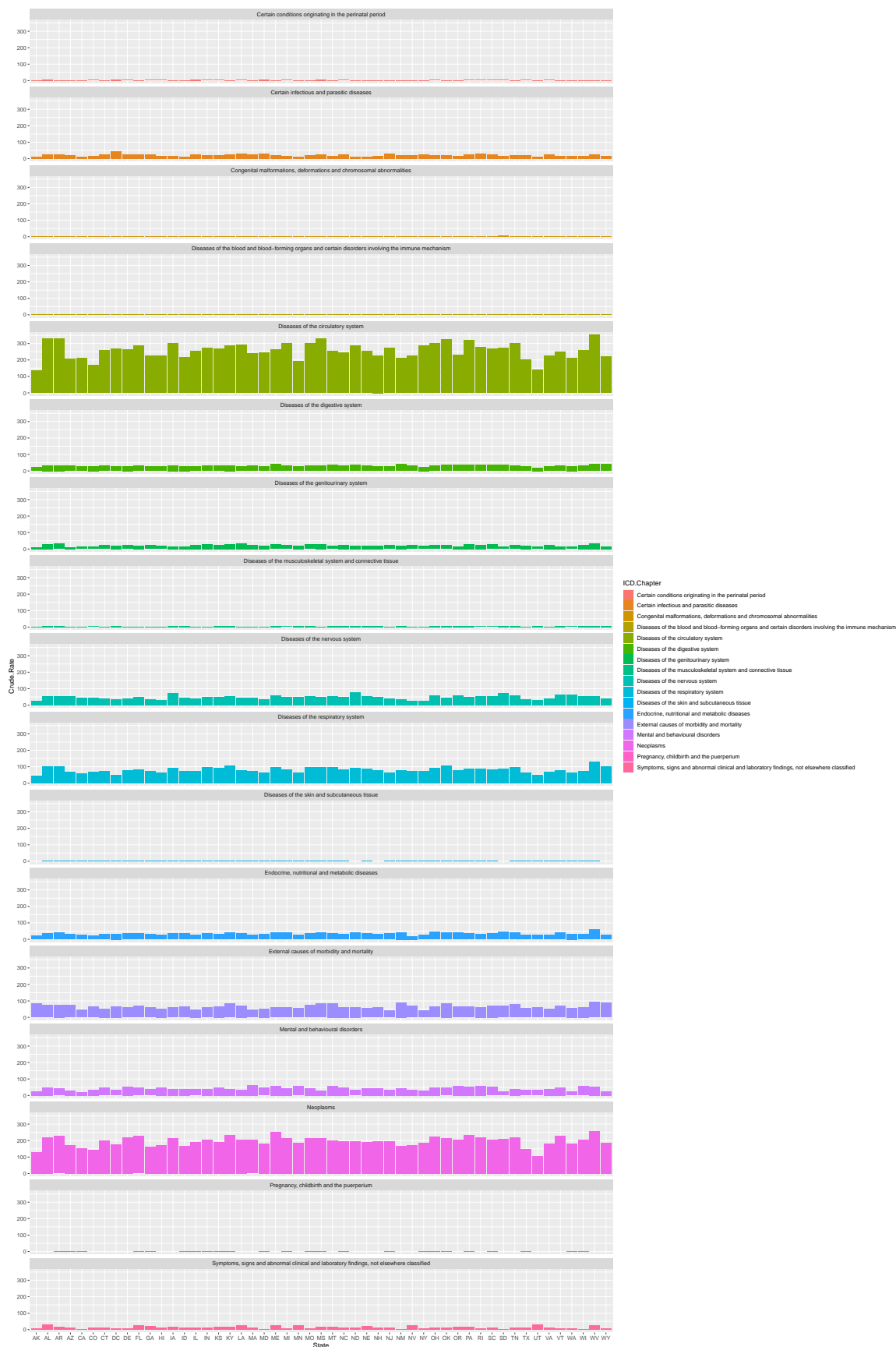
```
head(data)
```

```
##              ICD.Chapter State Year Deaths Population
## 1 Certain infectious and parasitic diseases    AL 1999    1092    4430141
## 2 Certain infectious and parasitic diseases    AL 2000    1188    4447100
## 3 Certain infectious and parasitic diseases    AL 2001    1211    4467634
## 4 Certain infectious and parasitic diseases    AL 2002    1215    4480089
## 5 Certain infectious and parasitic diseases    AL 2003    1350    4503491
## 6 Certain infectious and parasitic diseases    AL 2004    1251    4530729
##      Crude.Rate
## 1          24.6
## 2          26.7
## 3          27.1
## 4          27.1
## 5          30.0
## 6          27.6
```

After loading the data I filtered the data for the year 2010 only and plotted the death rate by state and split it by mortality type.

```
filter_data <- data %>%
  filter(Year == 2010)

ggplot(filter_data, aes(fill = ICD.Chapter, x = State, y = Crude.Rate)) +
  geom_bar(position='dodge', stat='identity') +
  facet_wrap(~ ICD.Chapter, nrow = 20)
```



There is so much information in the bar charts above that it is difficult to clearly see the mortality rates by state. However, it is clear to see which Cause of Death (column ICD.Chapter) has a higher overall rate. If we take a sum of all deaths grouped by type then take a subset of that data with the top 5 causes it is a little clearer to view the rate by state.

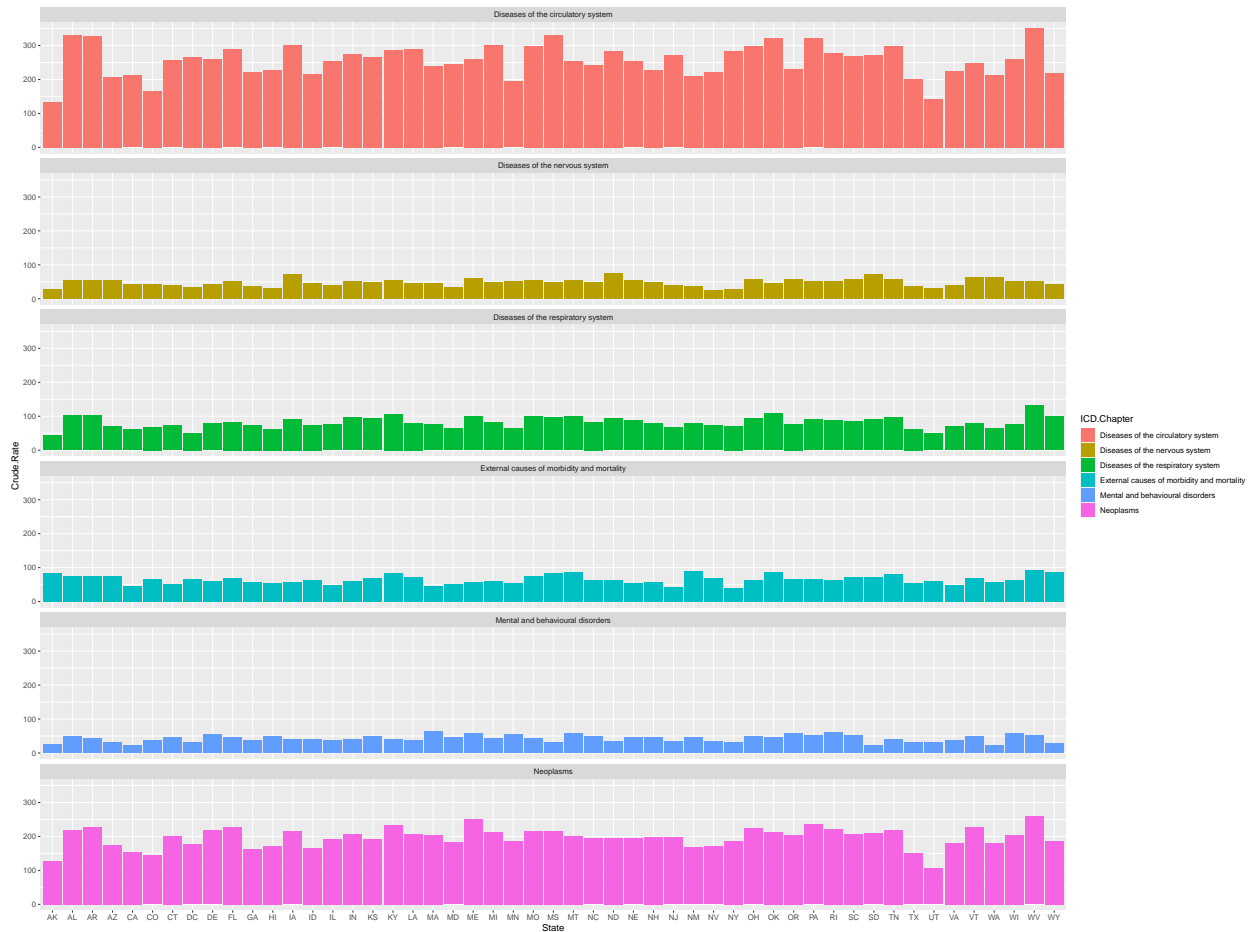
```
filter_data %>%
  group_by(ICD.Chapter) %>%
  summarise(sum = sum(Deaths)) %>%
  arrange(desc(sum))
```

```
## # A tibble: 17 x 2
##   ICD.Chapter      sum
##   <chr>          <int>
## 1 Diseases of the circulatory system 784454
## 2 Neoplasms 589660
## 3 Diseases of the respiratory system 237433
## 4 External causes of morbidity and mortality 183301
## 5 Diseases of the nervous system 141106
## 6 Mental and behavioural disorders 120821
## 7 Endocrine, nutritional and metabolic diseases 98891
## 8 Diseases of the digestive system 91314
## 9 Certain infectious and parasitic diseases 67583
## 10 Diseases of the genitourinary system 65676
## 11 Symptoms, signs and abnormal clinical and laboratory findings, not el~ 38360
## 12 Diseases of the musculoskeletal system and connective tissue 13323
## 13 Certain conditions originating in the perinatal period 12128
## 14 Diseases of the blood and blood-forming organs and certain disorders ~ 9774
## 15 Congenital malformations, deformations and chromosomal abnormalities 9673
## 16 Diseases of the skin and subcutaneous tissue 3971
## 17 Pregnancy, childbirth and the puerperium 718
```

```
top_deaths <- filter_data%>%
  filter(ICD.Chapter %in% c("Diseases of the circulatory system", "Neoplasms", "Diseases of the respiratory system"))
head(top_deaths)
```

```
##   ICD.Chapter State Year Deaths Population Crude.Rate
## 1   Neoplasms   AL 2010  10429    4779736    218.2
## 2   Neoplasms   AK 2010    910     710231    128.1
## 3   Neoplasms   AZ 2010  11129    6392017    174.1
## 4   Neoplasms   AR 2010   6616    2915918    226.9
## 5   Neoplasms   CA 2010  57820   37253956    155.2
## 6   Neoplasms   CO 2010   7220    5029196    143.6
```

```
ggplot(top_deaths, aes(fill = ICD.Chapter, x = State, y = Crude.Rate)) +
  geom_bar(position='dodge', stat='identity') +
  facet_wrap(~ ICD.Chapter, nrow = 10)
```



Question 2

Here is a responsive Shiny app for 2010 mortality rates that can be filtered by cause of death.

```
ui <- fluidPage(

  headerPanel("2010 Cause of Death by State"),

  sidebarPanel(
    selectInput('cause', 'Cause of Death', unique(filter_data$ICD.Chapter))
  ),

  mainPanel(plotlyOutput("plot1"))
)

server <- function(input, output){

  output$plot1 <- renderPlotly({

    filterdf <- filter_data %>%
      filter(ICD.Chapter == input$cause)

    plot_ly(filterdf, x = ~State, y = ~Crude.Rate, type = 'bar') %>%
```

```
    layout(xaxis = list(title="State", tickangle = -45),  
           yaxis = list(title = "Death Rate"))  
  })  
}  
shinyApp(ui, server)
```