R Project Milestone 3

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```
## `summarise()` has grouped output by 'county'. You can override using the
## `.groups` argument.
```

Visualization 1:

Table

```
library(kableExtra)
```

```
##
## Attaching package: 'kableExtra'

## The following object is masked from 'package:dplyr':
##
##     group_rows
```

```
table_col_order <- c("county", "summed_total_cost", "pop12_sqmi",
                     "med_age", "renter_ratio",
                     "relative_chronic_dis_mort", "med_age_CAT",
                     "summed_total_cost_CAT", "pop12_sqmi_CAT",
                     "renter_ratio_CAT","relative_chronic_dis_mort_CAT")
merged_data_for_table <- merged_data[, table_col_order]

 table<-merged_data_for_table%>%
  rowwise() %>%
  mutate(number_highs= sum(c_across(7:11) == "High priority", na.rm = TRUE),
         number_mediums= sum(c_across(7:11) == "Medium priority", na.rm = TRUE),
         temp_rank=(number_highs*2)+number_mediums
         )%>%
   ungroup()%>%
   arrange(desc(temp_rank))%>%
   select(-c(number_highs, number_mediums))%>%
   slice(1:15)
table
```

```
## # A tibble: 15 x 12
##    county    summed_total_cost pop12_sqmi med_age renter_ratio relative_chronic~
##    <chr>                 <dbl>      <dbl>   <dbl>        <dbl>             <dbl>
##  1 Amador           598970736.      63.3     48.2        0.253            0.102
##  2 Calaveras        131848234.      44.6     49.1        0.231            0.0875
##  3 Tuolumne         242129946       24.3     47.1        0.302            0.105
##  4 Inyo             169160700.       1.82    45.5        0.364            0.0737
##  5 Lake            1347450993.      49.1     45          0.342            0.102
##  6 Mariposa          17474756       12.6     49.2        0.321            0.0702
##  7 Nevada          6352716267.     103.      47.5        0.280            0.0984
##  8 Plumas            46955168        7.65    49.5        0.305            0.0750
##  9 Siskiyou        1558949981.       7.12    46.8        0.353            0.110
## 10 Tehama           610226591.      21.5     39.5        0.354            0.0896
## 11 Alpine                   0        1.54    46.4        0.282            0
## 12 Del Norte        615640530.      28.3     39          0.383            0.0776
## 13 El Dorado       4239088028.     102.      43.5        0.268            0.0776
## 14 Humboldt       17981394511.      38.1     37.3        0.450            0.0929
## 15 Modoc           1703663257        2.33    46          0.314            0.0687
```

```
## # ... with 6 more variables: med_age_CAT <fct>, summed_total_cost_CAT <fct>,
## #   pop12_sqmi_CAT <fct>, renter_ratio_CAT <chr>,
## #   relative_chronic_dis_mort_CAT <fct>, temp_rank <dbl>
```

```
# kable(table,
#        col.names = c("County","Chronic disease mortality burden",
#                      "Previous spending on projects",
#                      "Population density", "Median age of population",
#                      "% population that are renters"),
#        caption="Top 10 Counties ranked by need for oshpd projects.",
#        booktabs=TRUE,
#        align='lccccc')%>%
#   kable_styling(latex_options="scale_down")

table
```

```
## # A tibble: 15 x 12
##    county    summed_total_cost pop12_sqmi med_age renter_ratio relative_chronic~
##    <chr>                 <dbl>      <dbl>   <dbl>        <dbl>             <dbl>
##  1 Amador           598970736.      63.3     48.2        0.253            0.102
##  2 Calaveras        131848234.      44.6     49.1        0.231            0.0875
##  3 Tuolumne         242129946       24.3     47.1        0.302            0.105
##  4 Inyo             169160700.       1.82    45.5        0.364            0.0737
##  5 Lake            1347450993.      49.1     45          0.342            0.102
##  6 Mariposa          17474756       12.6     49.2        0.321            0.0702
##  7 Nevada          6352716267.     103.      47.5        0.280            0.0984
##  8 Plumas            46955168        7.65    49.5        0.305            0.0750
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## 10 Tehama           610226591.      21.5     39.5        0.354            0.0896
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## 12 Del Norte        615640530.      28.3     39          0.383            0.0776
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## 14 Humboldt       17981394511.      38.1     37.3        0.450            0.0929
## 15 Modoc           1703663257        2.33    46          0.314            0.0687
## # ... with 6 more variables: med_age_CAT <fct>, summed_total_cost_CAT <fct>,
## #   pop12_sqmi_CAT <fct>, renter_ratio_CAT <chr>,
## #   relative_chronic_dis_mort_CAT <fct>, temp_rank <dbl>
```
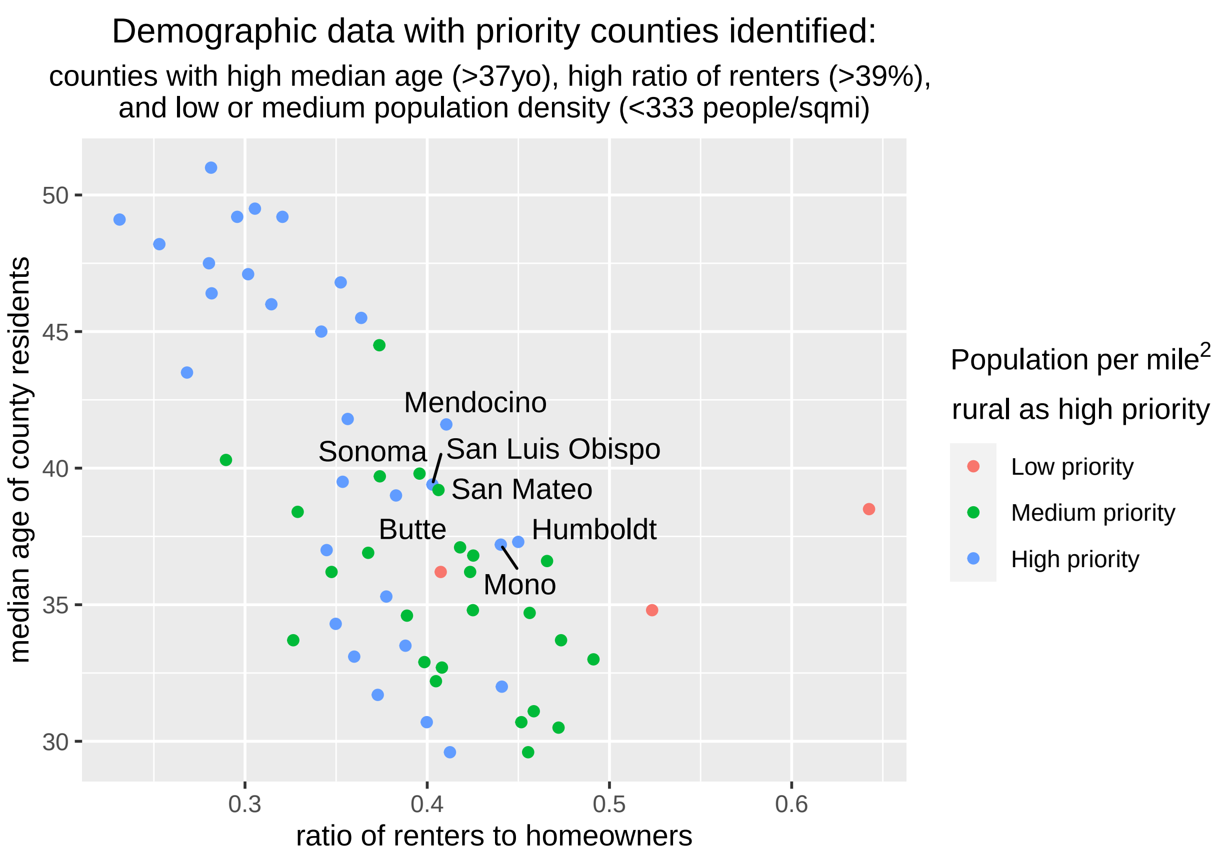

Visualization 2:

Using demographic data to rank counties

```
## renter ratio median = 39%
## median age median = 37.05
## population density 1st quantile (low cutoff) = 25.887
## population density 3rd quantile (high cutoff) = 333.485
ggplot(data = merged_data, aes(x = renter_ratio, y = med_age)) +
geom_point(data = merged_data, aes(x = renter_ratio, y = med_age,
                                    color = pop12_sqmi_CAT)) +
geom_text_repel(aes(label=ifelse((med_age > 37 & renter_ratio > 0.39
    & (pop12_sqmi_CAT=="High priority"| pop12_sqmi_CAT=="Medium priority")),
    county, "")))+
  labs(title = "Demographic data with priority counties identified:",
subtitle = "counties with high median age (>37yo), high ratio of renters (>39%),
and low or medium population density (<333 people/sqmi)",
       x = "ratio of renters to homeowners",
       y = "median age of county residents",
       color =
         bquote(atop(Population~per~mile^{"2"}, "rural as high priority")))+
  theme(plot.title=element_text(hjust=0.5),
        plot.subtitle=element_text(hjust=0.5))
```



In plot (afterline 284): We are plotting population per square mile based upon higher renter to owner ratio and higher median age. We are focused on those counties with a higher ranking based upon our table of "merged_data".

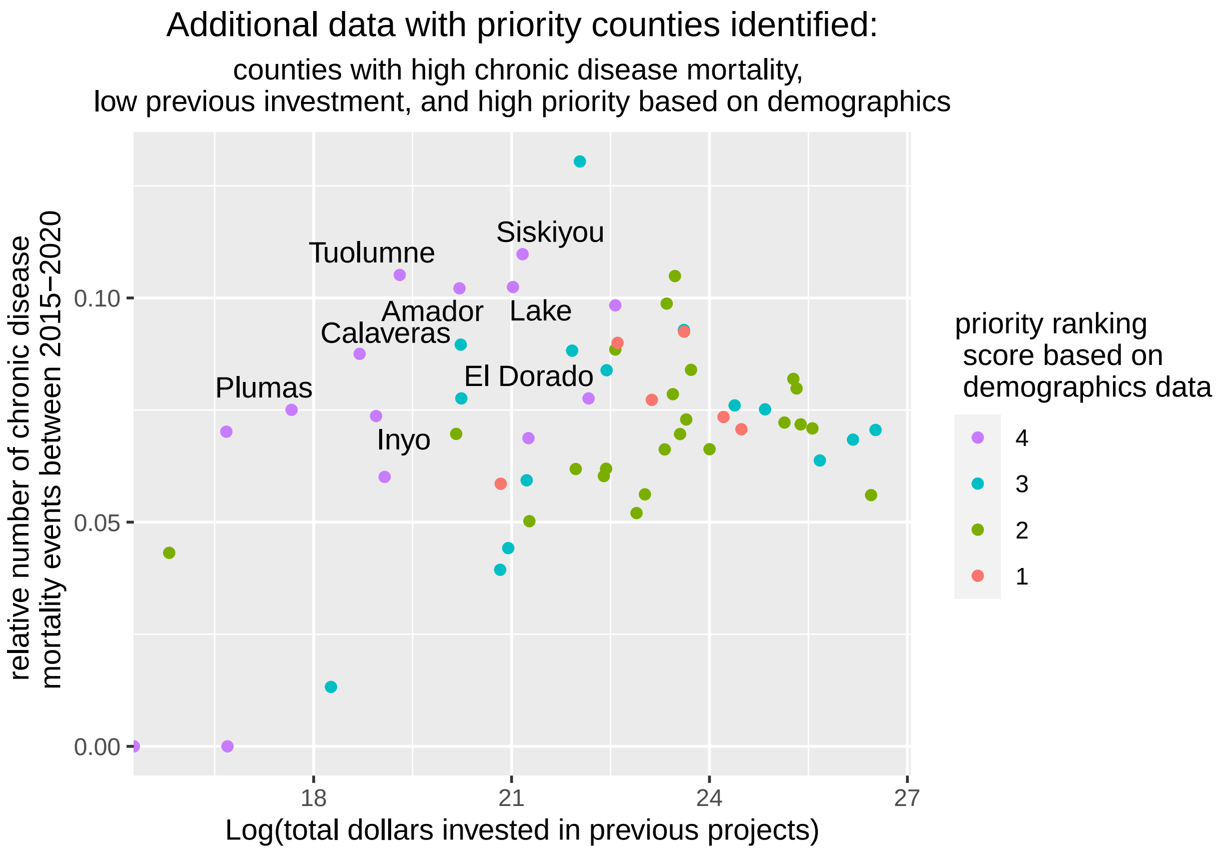
Visualization 3:

Using mortality and investment data to rank counties

```
## make data set with continuous data and ranking factor for the demographic
## data in the first figure
second_fig_data_temp<-merged_data%>%
  select(c("county", "pop12_sqmi_CAT", "med_age_CAT", "renter_ratio_CAT"))%>%
 rowwise() %>%
 mutate(number_highs= sum(c_across(2:4) == "High priority", na.rm = TRUE),
        number_mediums= sum(c_across(2:4) == "Medium priority", na.rm = TRUE),
        demo_rank=(number_highs*2)+number_mediums
        )%>%
  ungroup()%>%
  select(c("county", "demo_rank"))

second_fig_data_final<-full_join(second_fig_data_temp, merged_data, by="county")
summary(second_fig_data_final$relative_chronic_dis_mort)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.00000 0.06187 0.07255 0.07213 0.08664 0.13044
```

```
## make the figure
## relative chronic disease mortality median = 0.07213
## log(relative chronic disease mortality median) = log(0.07213) = -2.629285
## summed total cost median = 5961782208
## log(summed total cost median) = log(5961782208) = 22.50864
ggplot(data = second_fig_data_final,
       aes(y = relative_chronic_dis_mort, x = log(summed_total_cost))) +
geom_point(data = second_fig_data_final,
           aes(y = relative_chronic_dis_mort, x = log(summed_total_cost),
                                    color = as.factor(demo_rank))) +
guides(color = guide_legend(reverse=TRUE))+
 geom_text_repel(aes(label=ifelse(
   (relative_chronic_dis_mort >= 0.07213 & summed_total_cost<=5961782208
    & demo_rank >3), county, "")), max.overlaps = Inf)+
labs(title = "Additional data with priority counties identified:",
 subtitle = "counties with high chronic disease mortality,
low previous investment, and high priority based on demographics",
        x = "Log(total dollars invested in previous projects)",
        y =
"relative number of chronic disease \n mortality events between 2015-2020",
        color = "priority ranking \n score based on \n demographics data") +
   theme(plot.title=element_text(hjust=0.5),
         plot.subtitle=element_text(hjust=0.5))
```



Based upon our plot 333: We merged the data from the prior plot and compared the total dollars invested in prior projects to mortality events associated with chronic diseases in a 5 year span (from 2015-2020) and by comapring these 5 variables we identified the counties that required greater funding.