

new

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(1) Data cleaning

```
rm(list = ls())
gc()
```

```
##          used (Mb) gc trigger (Mb) max used (Mb)
## Ncells 470196 25.2   1012987 54.1   660860 35.3
## Vcells 882506  6.8    8388608 64.0  1800812 13.8
```

```
set.seed(123)
##### (1) Data cleaning #####
## select variables
library(NHANES)
library(car)
```

```
## Loading required package: carData
```

```
library(naniar)
library(ggplot2)
df0 <- NHANES
df <- NHANES[NHANES$Age >= 18 & NHANES$Age < 60,]
# colSums(is.na(df)) / nrow(df)
df <- df[, which(colSums(is.na(df)) / nrow(df) < 0.3)]
# exclude duplication
df <- df[!duplicated(df),]
names(df)
```

```
## [1] "ID" "SurveyYr" "Gender" "Age"
## [5] "AgeDecade" "Race1" "Education" "MaritalStatus"
## [9] "HHIncome" "HHIncomeMid" "Poverty" "HomeRooms"
## [13] "HomeOwn" "Work" "Weight" "Height"
## [17] "BMI" "BMI_WHO" "Pulse" "BPSysAve"
## [21] "BPDiaAve" "BPSys1" "BPDia1" "BPSys2"
## [25] "BPDia2" "BPSys3" "BPDia3" "DirectChol"
## [29] "TotChol" "UrineVol1" "UrineFlow1" "Diabetes"
## [33] "HealthGen" "DaysPhysHlthBad" "DaysMentHlthBad" "LittleInterest"
## [37] "Depressed" "SleepHrsNight" "SleepTrouble" "PhysActive"
## [41] "Alcohol12PlusYr" "AlcoholYear" "Smoke100" "Smoke100n"
## [45] "Marijuana" "RegularMarij" "HardDrugs" "SexEver"
## [49] "SexAge" "SexNumPartnLife" "SexNumPartYear" "SameSex"
## [53] "SexOrientation"
```

```

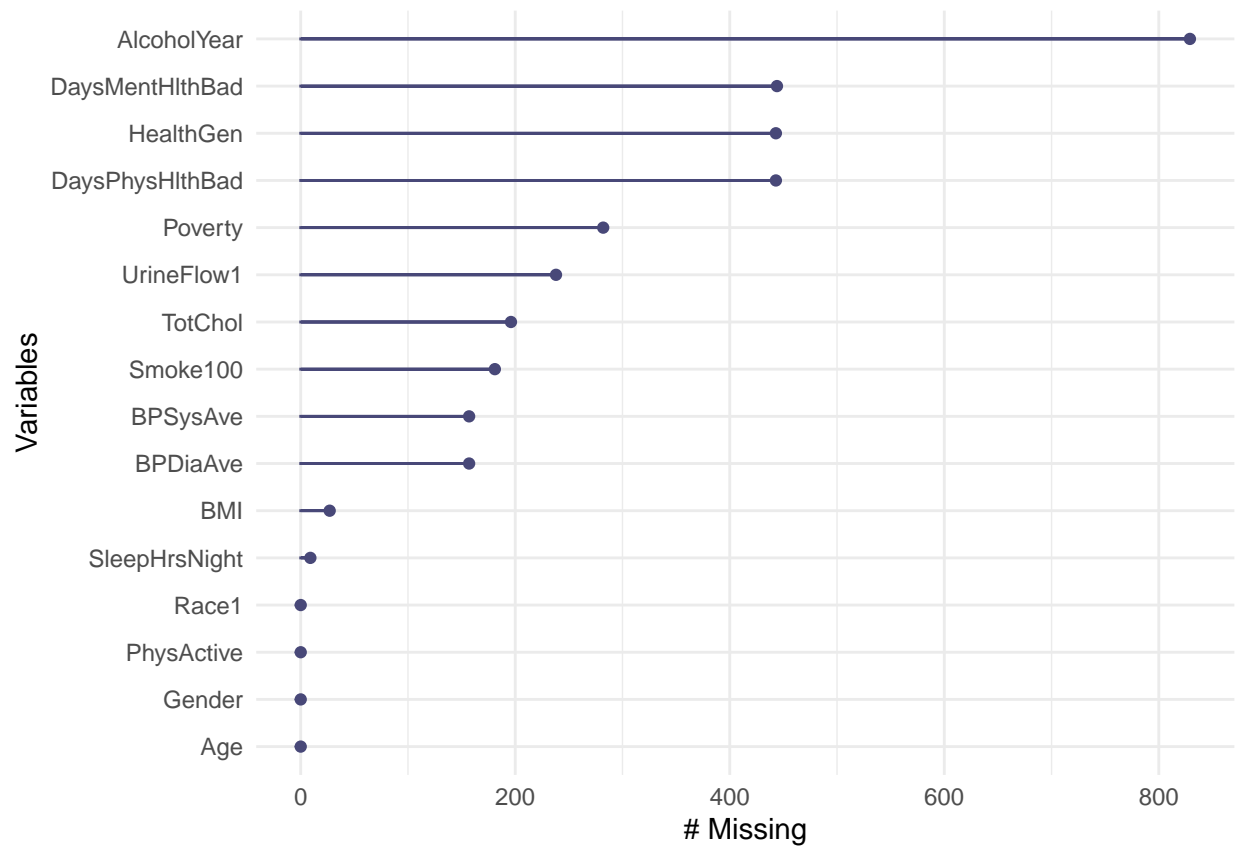
# df$BPSysAve
library(dplyr)

##
## Attaching package: 'dplyr'
## The following object is masked from 'package:car':
##
##      recode
## The following objects are masked from 'package:stats':
##
##      filter, lag
## The following objects are masked from 'package:base':
##
##      intersect, setdiff, setequal, union

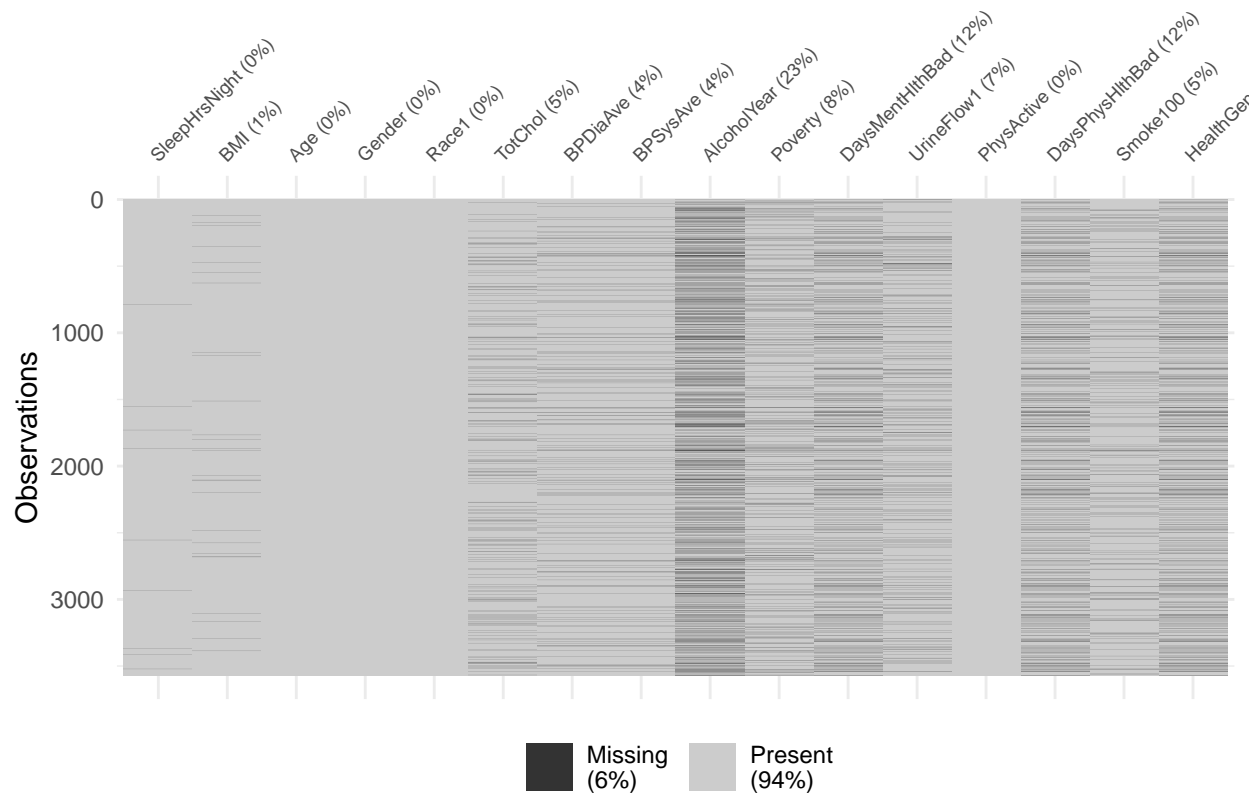
df2 <- df %>% select(
  SleepHrsNight,
  BMI,
  Age,
  Gender,
  Race1,
  TotChol,
  BPDiaAve,
  BPSysAve,
  AlcoholYear,
  Poverty,
  DaysMentHlthBad,
  UrineFlow1,
  PhysActive,
  DaysPhysHlthBad,
  Smoke100,
  HealthGen
)

gg_miss_var(df2)

```



```
vis_miss(df2) + theme(axis.text.x = element_text(size = 7))
```



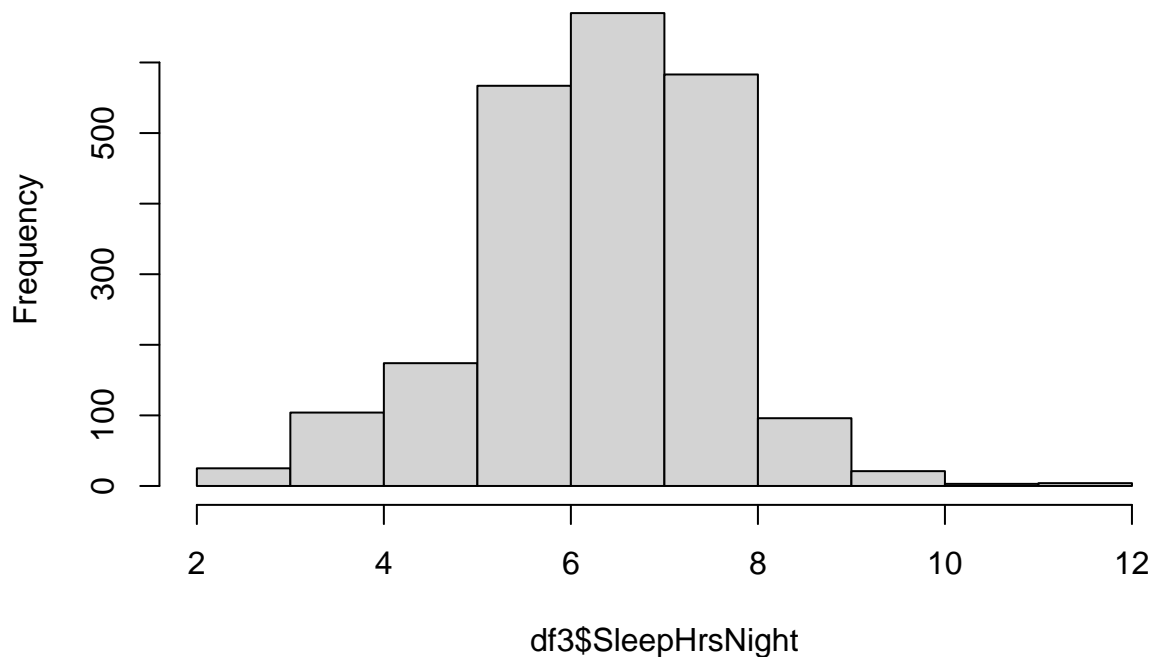
```
df3 <- na.omit(df2)
#df3$SleepHrsNight <- df3$SleepHrsNight * 60
#df3 <- df3[, -which(names(df3) %in% "SleepHrsNight")]
# cor(df3$BPSysAve, df3$BPDiaAve)
psych::describe(df3)
```

```
##          vars    n  mean   sd median trimmed  mad   min    max   range
## SleepHrsNight    1 2247   6.80  1.31   7.00    6.87   1.48   2.00  12.00   10.00
## BMI              2 2247  28.75  6.72  27.65   28.08   5.86  15.02  69.00   53.98
## Age              3 2247  39.12 11.40  39.00   39.08  14.83  20.00  59.00   39.00
## Gender*          4 2247   1.53  0.50   2.00   1.54   0.00   1.00   2.00    1.00
## Race1*           5 2247   3.43  1.16   4.00   3.56   0.00   1.00   5.00    4.00
## TotChol          6 2247   5.08  1.06   4.99   5.02   1.04   1.53  13.65   12.12
## BPDiaAve         7 2247  71.24 11.75  71.00   71.32  10.38   0.00 116.00  116.00
## BPSysAve         8 2247 117.60 14.57 116.00  116.61  13.34  78.00 226.00  148.00
## AlcoholYear      9 2247  70.43 94.41  24.00   50.67  35.58   0.00 364.00  364.00
## Poverty          10 2247   2.81  1.69   2.75   2.85   2.46   0.00   5.00    5.00
## DaysMentHlthBad  11 2247   4.45  8.00   0.00   2.38   0.00   0.00  30.00  30.00
## UrineFlow1       12 2247   1.08  0.97   0.81   0.91   0.60   0.00  10.14  10.14
## PhysActive*      13 2247   1.58  0.49   2.00   1.60   0.00   1.00   2.00    1.00
## DaysPhysHlthBad  14 2247   3.17  7.20   0.00   1.12   0.00   0.00  30.00  30.00
## Smoke100*        15 2247   1.46  0.50   1.00   1.45   0.00   1.00   2.00    1.00
## HealthGen*       16 2247   2.65  0.94   3.00   2.66   1.48   1.00   5.00    4.00
##
##          skew kurtosis    se
## SleepHrsNight -0.31    0.68 0.03
## BMI           1.27    2.92 0.14
```

```
## Age          0.02   -1.17  0.24
## Gender*     -0.13   -1.98  0.01
## Race1*      -1.10    0.04  0.02
## TotChol      0.91    3.31  0.02
## BPDiaAve    -0.38    3.10  0.25
## BPSysAve     1.14    3.95  0.31
## AlcoholYear  1.67    2.02  1.99
## Poverty      0.01   -1.48  0.04
## DaysMentHlthBad 2.18    3.82  0.17
## UrineFlow1   2.84   13.50  0.02
## PhysActive*  -0.33   -1.90  0.01
## DaysPhysHlthBad 2.79    6.98  0.15
## Smoke100*    0.16   -1.97  0.01
## HealthGen*   0.11   -0.36  0.02
```

```
# psych::pairs.panels(df3)
hist(df3$SleepHrsNight)
```

Histogram of df3\$SleepHrsNight



```
# colSums(is.na(df2)) / nrow(df2)
fit0 <-
  lm(SleepHrsNight ~ .,
     data = df3)
#data type
df3$Gender <- ifelse(df3$Gender == "male", 0, 1)
df3 <- df3 %>%
  mutate(
    Race1 = case_when(
```

```

    Race1 == 'Black' ~ 1,
    Race1 == 'Hispanic' ~ 2,
    Race1 == 'Mexican' ~ 3,
    Race1 == 'White' ~ 4,
    Race1 == 'Other' ~ 5,
    TRUE ~ NA_integer_ # Default value if none of the conditions are met
  )
)

library(psych)

##
## Attaching package: 'psych'

## The following objects are masked from 'package:ggplot2':
##
##   %+%, alpha

## The following object is masked from 'package:car':
##
##   logit

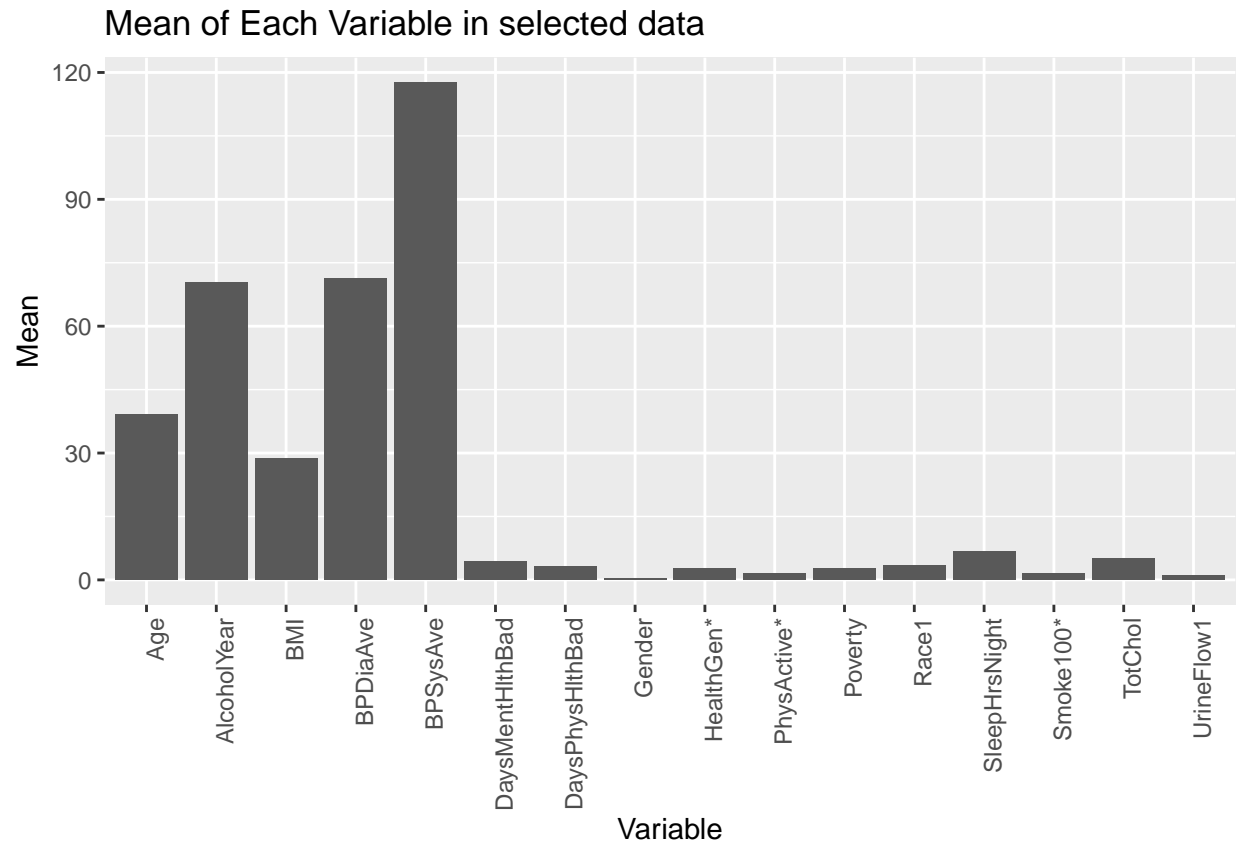
library(ggplot2)
library(reshape2)

# psych::describe
desc_stats <- psych::describe(df3)

# Transform the data format for easy visualization
# Use the measure.vars parameter to specify the columns to melt
desc_stats_long <- melt(desc_stats, measure.vars = colnames(desc_stats), variable.name = "Statistic", value.name = "Value")

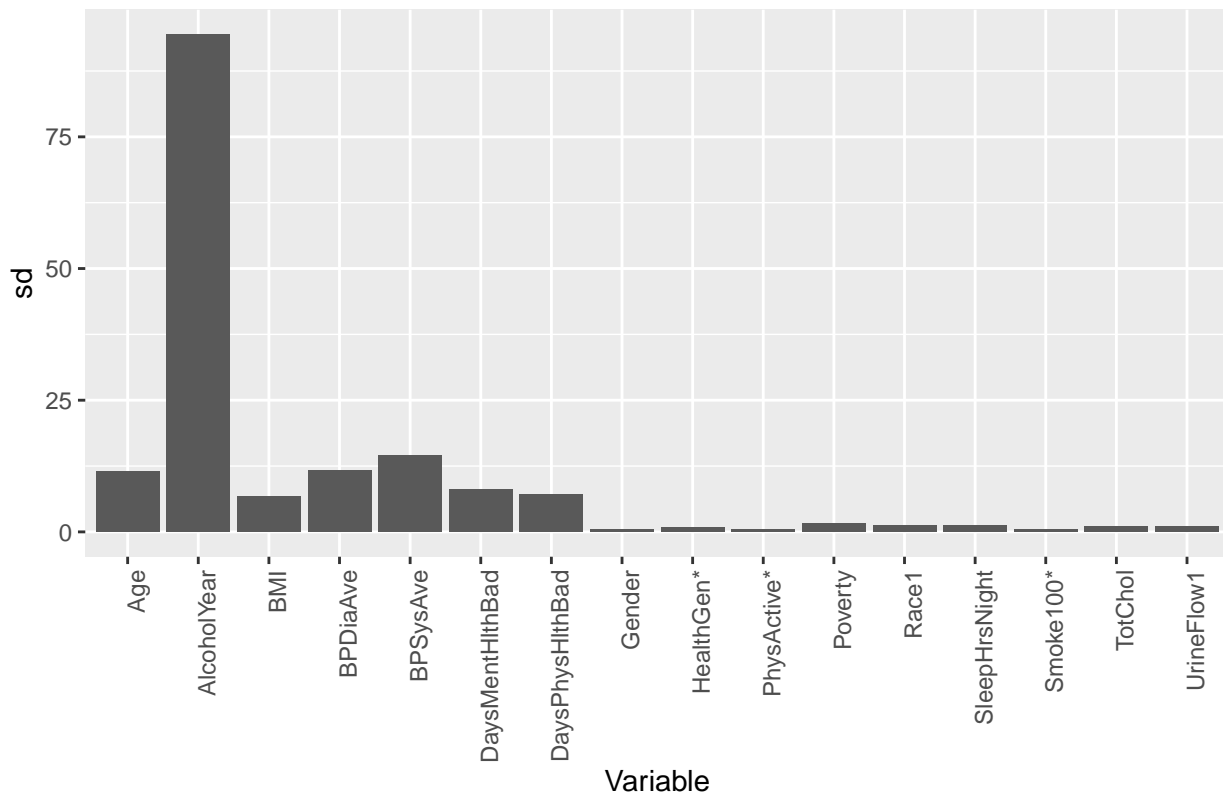
# Corrected ggplot2 visual code
ggplot(desc_stats_long[desc_stats_long$Statistic == "mean", ], aes(x = rownames(desc_stats), y = Value)) +
  geom_bar(stat = "identity") +
  theme(axis.text.x = element_text(angle = 90, hjust = 1)) +
  labs(x = "Variable", y = "Mean", title = "Mean of Each Variable in selected data")

```



```
ggplot(desc_stats_long[desc_stats_long$Statistic == "sd", ], aes(x = rownames(desc_stats), y = Value)) +
  geom_bar(stat = "identity") +
  theme(axis.text.x = element_text(angle = 90, hjust = 1)) +
  labs(x = "Variable", y = "sd", title = "sd of Each Variable in selected data")
```

sd of Each Variable in selected data



```
#Raw data normality analysis
# Assuming 'df3' is your dataframe from the NHANES dataset.
# Load necessary libraries
library(e1071)
library(ggplot2)
library(rlang)

# Function to perform normality analysis on a given column
perform_normality_analysis <- function(data, column_x, column_y) {
  # Check if the columns are numeric
  if(!is.numeric(data[[column_x]]) || !is.numeric(data[[column_y]])) {
    return(paste("One or both columns are not numeric. Skipping."))
  }

  # Shapiro-Wilk Test for Y column
  shapiro_test <- shapiro.test(data[[column_y]])

  # Skewness and Kurtosis for Y column
  skewness_value <- skewness(data[[column_y]])
  kurtosis_value <- kurtosis(data[[column_y]])

  # Q-Q Plot for Y column
  qqplot <- ggplot(data, aes_string(sample = column_y)) +
    stat_qq() +
    stat_qq_line() +
    ggtitle(paste("Q-Q Plot for", column_y))
}
```



```

# Histogram with Normal Distribution Fit for Y column
hist_plot <- ggplot(data, aes_string(x = column_y)) +
  geom_histogram(aes(y = ..density..), binwidth = 1, fill = "blue", alpha = 0.5) +
  geom_density(color = "red", size = 1) +
  theme_bw() +
  xlab(paste(column_y, "(Value)")) +
  ylab("Density") +
  ggtitle(paste("Histogram with Normal Distribution Fit for", column_y))

# Scatter Plot with Jittering and Alpha adjustment
scatter_plot <- ggplot(df3, aes_string(x = "SleepHrsNight", y = "BMI")) +
  geom_jitter(alpha = 0.5, width = 0.2) + # Add jittering and alpha adjustment
  geom_smooth(method = "lm", color = "red") +
  theme_bw() +
  ggtitle("Scatter Plot with Regression Line for SleepHrsNight vs BMI")

# Boxplot for Y column
boxplot <- ggplot(data, aes_string(y = column_y)) +
  geom_boxplot() +
  theme_bw() +
  ggtitle(paste("Boxplot for", column_y))

# Density Plot for Y column
density_plot <- ggplot(data, aes_string(x = column_y)) +
  geom_density(fill = "blue", alpha = 0.5) +
  theme_bw() +
  ggtitle(paste("Density Plot for", column_y))

# Output results
list(
  Column_Y = column_y,
  Shapiro_Test = shapiro_test,
  Skewness = skewness_value,
  Kurtosis = kurtosis_value,
  QQPlot = qqplot,
  Histogram = hist_plot,
  ScatterPlot = scatter_plot,
  Boxplot = boxplot,
  DensityPlot = density_plot
)
}

# Analyze BMI with SleepHrsNight as X-axis
bmi_sleep_analysis <- perform_normality_analysis(df3, "SleepHrsNight", "BMI")

## Warning: `aes_string()` was deprecated in ggplot2 3.0.0.
## i Please use tidy evaluation idioms with `aes()``.
## i See also `vignette("ggplot2-in-packages")` for more information.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use `linewidth` instead.

```

```
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```

```
# Display the results
print(bmi_sleep_analysis$Shapiro_Test)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  data[[column_y]]
## W = 0.92828, p-value < 2.2e-16
```

```
print(paste("Skewness:", bmi_sleep_analysis$Skewness))
```

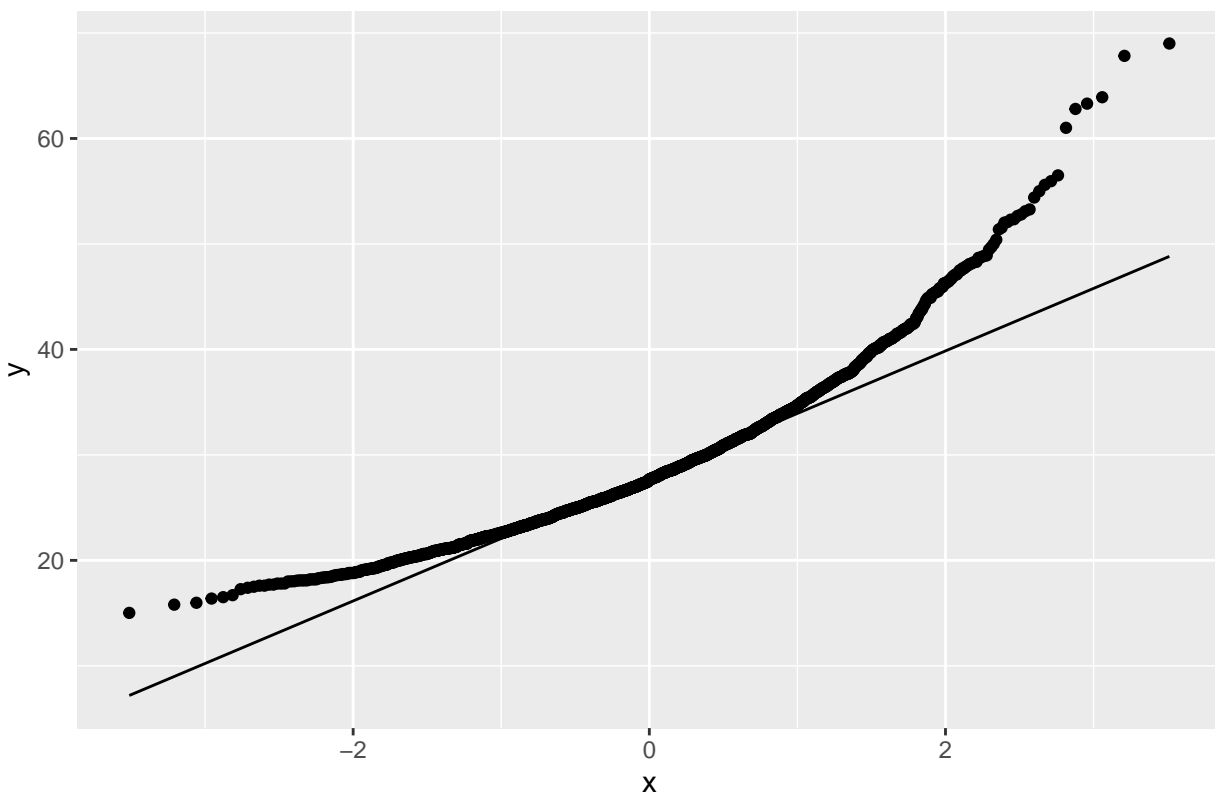
```
## [1] "Skewness: 1.26620366771869"
```

```
print(paste("Kurtosis:", bmi_sleep_analysis$Kurtosis))
```

```
## [1] "Kurtosis: 2.9210614116705"
```

```
print(bmi_sleep_analysis$QQPlot)
```

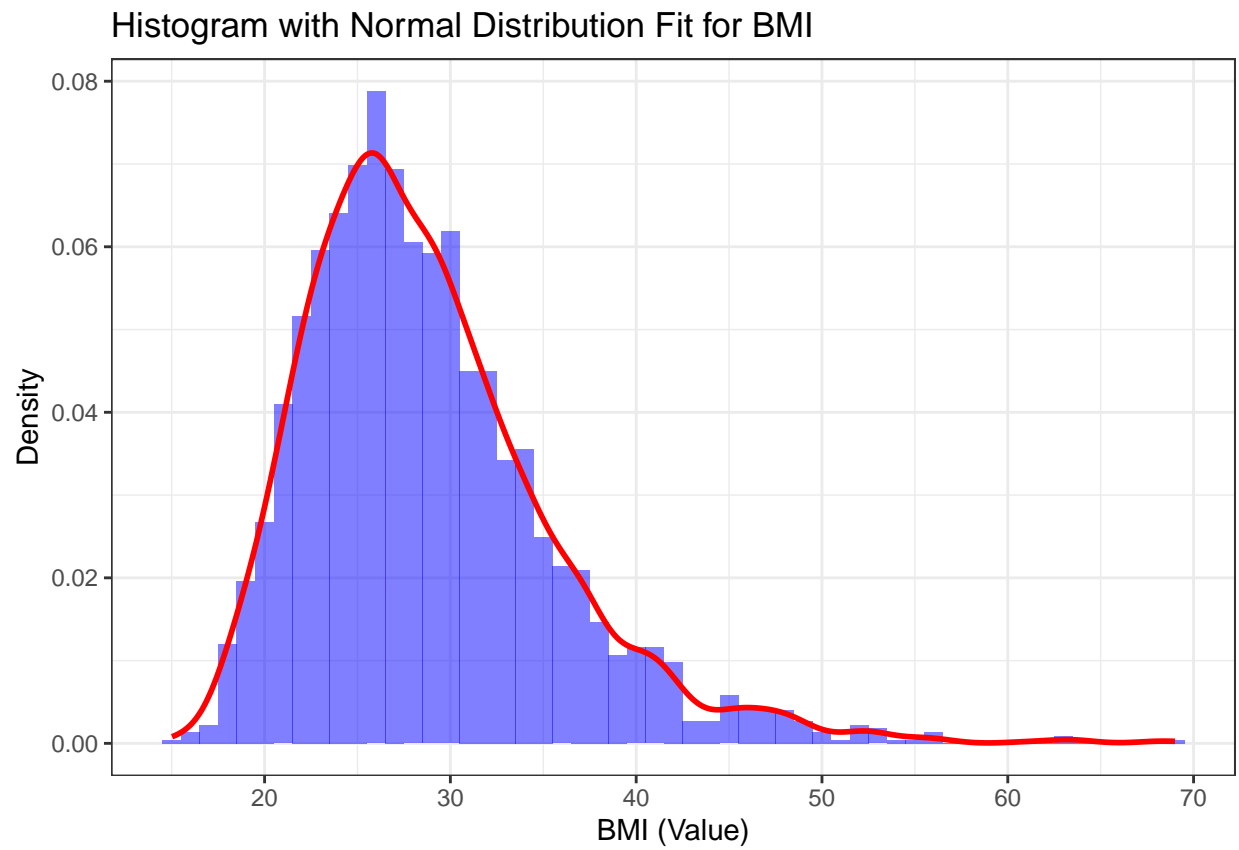
Q-Q Plot for BMI



```
print(bmi_sleep_analysis$Histogram)
```

```
## Warning: The dot-dot notation (`..density..`) was deprecated in ggplot2 3.4.0.
## i Please use `after_stat(density)` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
```

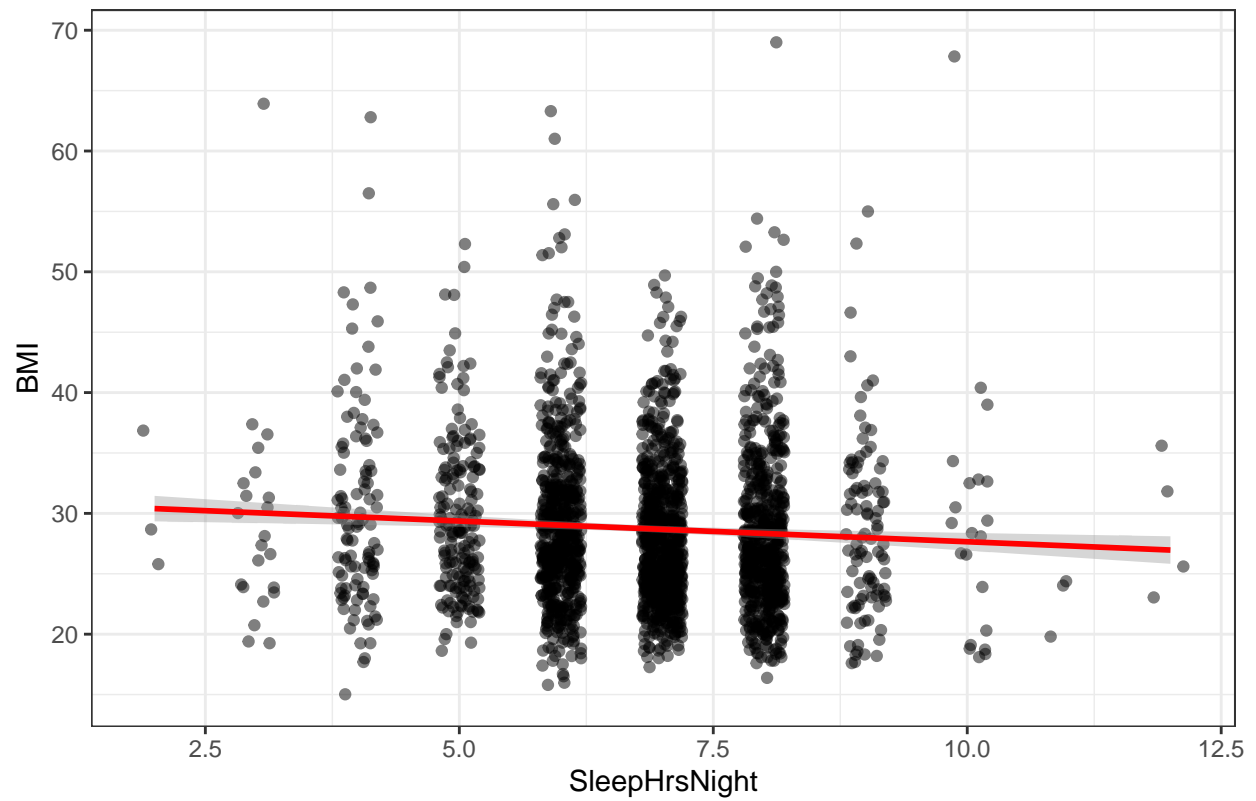
```
## generated.
```



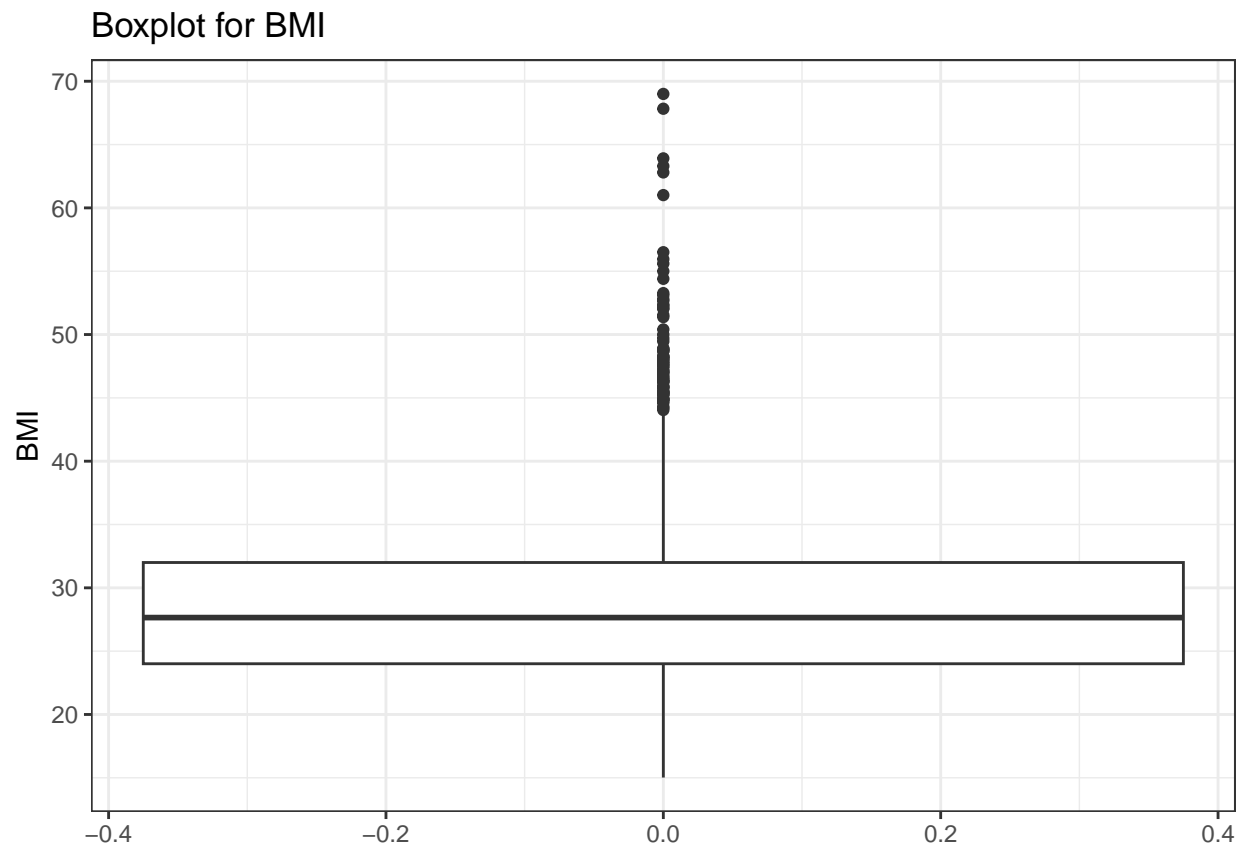
```
print(bmi_sleep_analysis$ScatterPlot)
```

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

Scatter Plot with Regression Line for SleepHrsNight vs BMI

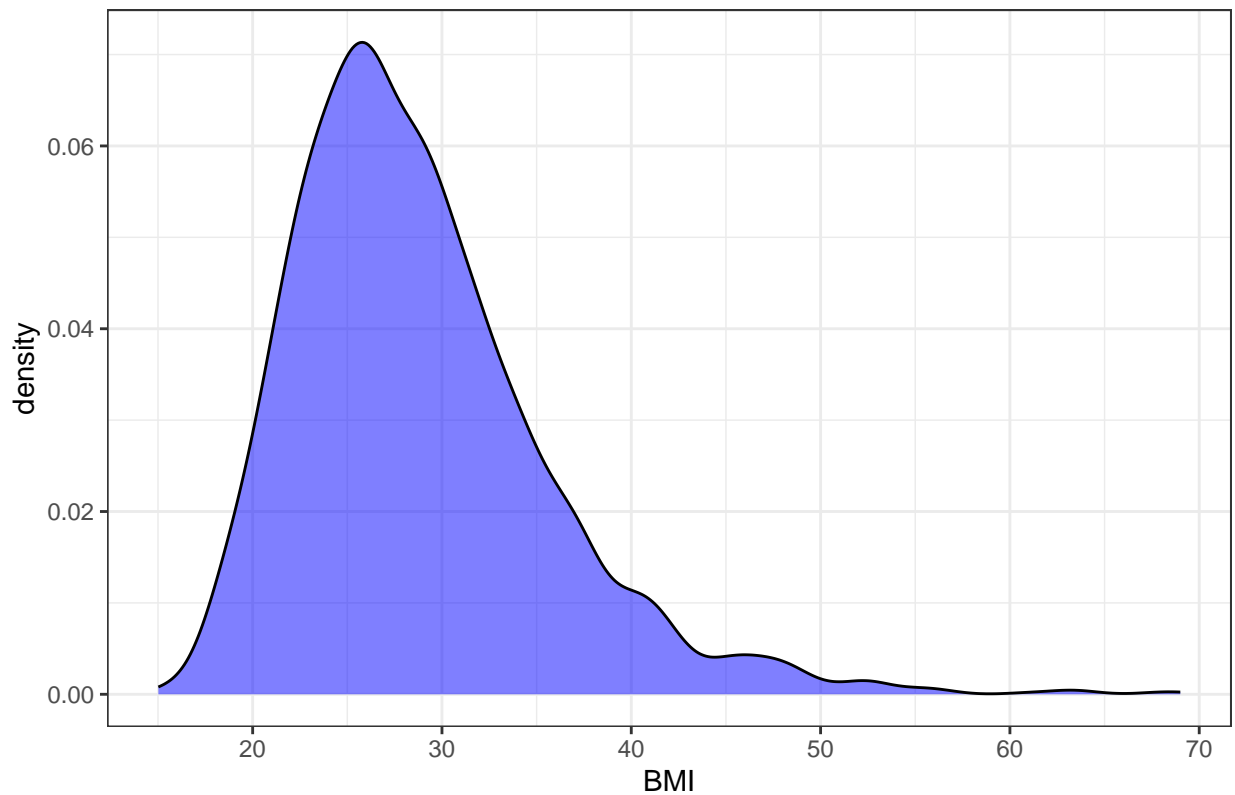


```
print(bmi_sleep_analysis$Boxplot)
```



```
print(bmi_sleep_analysis$DensityPlot)
```

Density Plot for BMI



```
#basic characteristics
# Assuming 'df3' is your dataframe.

# Load necessary library
library(dplyr)

# Function to get basic characteristics of a given column
get_basic_characteristics <- function(data, column) {
  # Ensure the column is numeric
  if(!is.numeric(data[[column]])) {
    return(data.frame(Variable = column, Mean = NA, Median = NA, SD = NA, Min = NA, Max = NA, Q1 = NA, Q3 = NA))
  }

  # Calculate basic characteristics
  characteristics <- data %>%
    summarise(
      Mean = mean(.data[[column]], na.rm = TRUE),
      Median = median(.data[[column]], na.rm = TRUE),
      SD = sd(.data[[column]], na.rm = TRUE),
      Min = min(.data[[column]], na.rm = TRUE),
      Max = max(.data[[column]], na.rm = TRUE),
      Q1 = quantile(.data[[column]], 0.25, na.rm = TRUE),
      Q3 = quantile(.data[[column]], 0.75, na.rm = TRUE)
    ) %>%
    mutate(Variable = column) %>%
    select(Variable, everything())
}
```

```

# Return the results
return(characteristics)
}

# List of columns to analyze
columns_to_analyze <- c("SleepHrsNight", "BMI", "DirectChol", "Age", "Gender", "Race1", "TotChol", "BPDiaAve", "BPSysAve", "AlcoholYear")

# Apply the function to each column and combine results
combined_characteristics <- lapply(columns_to_analyze, function(col) get_basic_characteristics(df3, col))
combined_characteristics <- do.call(bind_rows(), combined_characteristics)

# Display the combined basic characteristics
print(combined_characteristics)

```

```

## # A tibble: 21 x 8
##   Variable      Mean Median    SD   Min   Max    Q1    Q3
##   <chr>      <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1 SleepHrsNight 6.80    7    1.31    2    12     6     8
## 2 BMI          28.8   27.6  6.72  15.0   69    24.0   32
## 3 DirectChol    NA     NA    NA     NA    NA     NA     NA
## 4 Age          39.1   39   11.4   20    59    29    49
## 5 Gender        0.466    0   0.499    0     1     0     1
## 6 Race1         3.43    4   1.16    1     5     3     4
## 7 TotChol       5.08   4.99  1.06   1.53  13.6   4.33   5.70
## 8 BPDiaAve     71.2   71   11.8    0   116    64    78
## 9 BPSysAve    118.   116  14.6   78   226   108   125
## 10 AlcoholYear  70.4   24  94.4    0   364     4   104
## # i 11 more rows

```

(2) Baseline characteristics

```

Hmisc::describe(df3)

```

```

## df3
##
## 16 Variables      2247 Observations
## -----
## SleepHrsNight
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2247      0      11    0.939    6.795    1.411      4      5
##      .25      .50      .75      .90      .95
##      6      7      8      8      9
##
## lowest :  2  3  4  5  6, highest:  8  9 10 11 12
##
## Value      2      3      4      5      6      7      8      9      10      11      12
## Frequency      3     22    104    174    567    670    583    96     21      3      4
## Proportion 0.001 0.010 0.046 0.077 0.252 0.298 0.259 0.043 0.009 0.001 0.002
## -----
## BMI
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2247      0    1097      1    28.75    7.194    20.19    21.50

```

```

##      .25      .50      .75      .90      .95
##    24.01    27.65    32.00    37.33    41.08
##
## lowest : 15.02 15.80 15.98 16.38 16.51, highest: 62.80 63.30 63.91 67.83 69.00
## -----
## Age
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2247      0      40    0.999    39.12    13.16      21      23
##      .25      .50      .75      .90      .95
##      29      39      49      55      57
##
## lowest : 20 21 22 23 24, highest: 55 56 57 58 59
## -----
## Gender
##      n missing distinct      Info      Sum      Mean      Gmd
##    2247      0      2    0.747    1048    0.4664    0.498
##
## -----
## Race1
##      n missing distinct      Info      Mean      Gmd
##    2247      0      5    0.769    3.425    1.128
##
## lowest : 1 2 3 4 5, highest: 1 2 3 4 5
##
## Value      1      2      3      4      5
## Frequency   301   155   250  1370   171
## Proportion 0.134 0.069 0.111 0.610 0.076
## -----
## TotChol
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2247      0      211      1    5.076    1.157    3.570    3.850
##      .25      .50      .75      .90      .95
##    4.330    4.990    5.705    6.360    6.871
##
## lowest : 1.53 2.69 2.74 2.79 2.82, highest: 9.31 9.34 9.90 12.28 13.65
## -----
## BPDiaAve
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2247      0      84    0.999    71.24    12.75      53      57
##      .25      .50      .75      .90      .95
##      64      71      78      85      89
##
## lowest : 0 20 21 22 25, highest: 108 109 110 114 116
## -----
## BPSysAve
##      n missing distinct      Info      Mean      Gmd      .05      .10
##    2247      0      100    0.999    117.6    15.63      97     101
##      .25      .50      .75      .90      .95
##     108     116     125     135     142
##
## lowest : 78 83 84 85 86, highest: 184 191 202 209 226
## -----
## AlcoholYear
##      n missing distinct      Info      Mean      Gmd      .05      .10

```



```

##      2247      0      56      0.993      70.43      91.9      0      0
##      .25      .50      .75      .90      .95
##      4      24      104      208      288
##
## lowest :    0    1    2    3    4, highest: 260 300 312 360 364
## -----
## Poverty
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2247      0      398      0.988      2.813      1.934      0.330      0.656
##      .25      .50      .75      .90      .95
##      1.240      2.750      4.770      5.000      5.000
##
## lowest : 0.00 0.02 0.03 0.04 0.05, highest: 4.95 4.96 4.97 4.99 5.00
## -----
## DaysMentHlthBad
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2247      0      28      0.844      4.448      6.862      0      0
##      .25      .50      .75      .90      .95
##      0      0      5      15      30
##
## lowest :    0    1    2    3    4, highest: 25 26 27 29 30
## -----
## UrineFlow1
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2247      0      1373      1      1.076      0.9099      0.1953      0.2826
##      .25      .50      .75      .90      .95
##      0.4585      0.8080      1.3615      2.1988      2.8201
##
## lowest :    0.000    0.005    0.006    0.011    0.014, highest: 7.325 7.826 8.730 9.410 10.143
## -----
## PhysActive
##      n missing distinct
##      2247      0      2
##
## Value      No  Yes
## Frequency  943 1304
## Proportion 0.42 0.58
## -----
## DaysPhysHlthBad
##      n missing distinct      Info      Mean      Gmd      .05      .10
##      2247      0      24      0.706      3.169      5.329      0      0
##      .25      .50      .75      .90      .95
##      0      0      2      10      24
##
## lowest :    0    1    2    3    4, highest: 24 25 26 28 30
## -----
## Smoke100
##      n missing distinct
##      2247      0      2
##
## Value      No  Yes
## Frequency  1215 1032
## Proportion 0.541 0.459
## -----

```

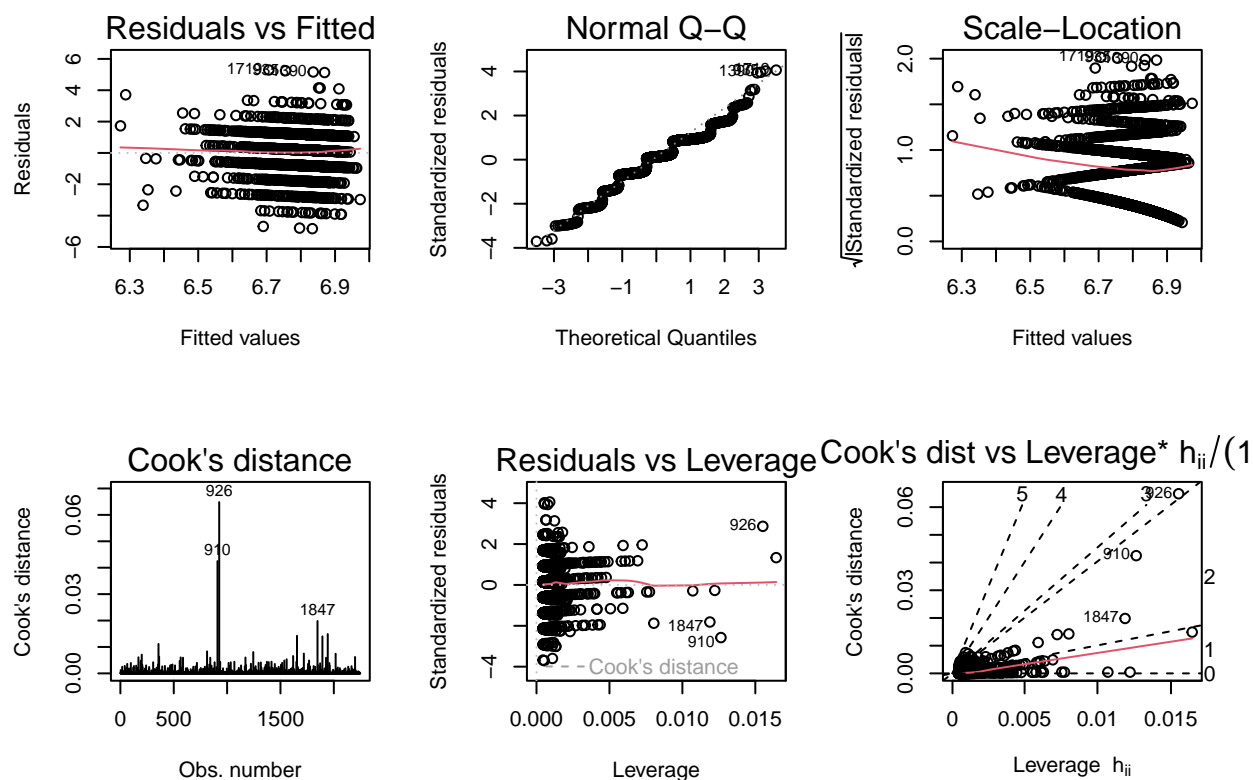
```
## HealthGen
##      n missing distinct
##    2247      0        5
##
## lowest : Excellent Vgood      Good      Fair      Poor
## highest: Excellent Vgood      Good      Fair      Poor
##
## Value      Excellent      Vgood      Good      Fair      Poor
## Frequency      252      725      885      335      50
## Proportion      0.112      0.323      0.394      0.149      0.022
## -----
```

(3) linear regression model

```
##simple linear regression##
model1 = lm(df3$SleepHrsNight ~ df3$BMI, data = df3)
summary(model1)

##
## Call:
## lm(formula = df3$SleepHrsNight ~ df3$BMI, data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -4.8336 -0.8129  0.1627  1.1392  5.2936
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  7.168497   0.120957  59.265  < 2e-16 ***
## df3$BMI      -0.012981   0.004097  -3.169  0.00155 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.304 on 2245 degrees of freedom
## Multiple R-squared:  0.004452,    Adjusted R-squared:  0.004009
## F-statistic: 10.04 on 1 and 2245 DF,  p-value: 0.001552

par(mfrow = c(2, 3)) #read more from ?plot.lm
plot(model1, which = 1)
plot(model1, which = 2)
plot(model1, which = 3)
plot(model1, which = 4)
plot(model1, which = 5)
plot(model1, which = 6)
```



```
par(mfrow = c(1, 1)) # reset

dummy_b = 1 * (df3$Race1 == "Black")
dummy_h = 1 * (df3$Race1 == "Hispanic")
dummy_m = 1 * (df3$Race1 == "Mexican")
dummy_w = 1 * (df3$Race1 == "White")
dummy_o = 1 * (df3$Race1 == "Other")

age_quant = quantile(df3$Age)
df3$AgeC = 0
df3$AgeC[df3$Age > age_quant[2] & df3$Age <= age_quant[3]] = 1
df3$AgeC[df3$Age > age_quant[3] & df3$Age <= age_quant[4]] = 2
df3$AgeC[df3$Age > age_quant[4]] = 3

### multiple linear regression###
# model_1 add demographic
m_1 = lm(BMI ~ SleepHrsNight + Age + Gender + factor(Race1), df3)
summary(m_1)
```

```
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + factor(Race1),
##     data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
```

```

## -14.194 -4.552 -1.204 3.181 40.301
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  30.83046   0.95742  32.202 < 2e-16 ***
## SleepHrsNight -0.27310   0.10779  -2.534 0.011356 *
## Age          0.04657   0.01241   3.754 0.000179 ***
## Gender       0.15322   0.28184   0.544 0.586739
## factor(Race1)2 -2.17537   0.65505  -3.321 0.000912 ***
## factor(Race1)3 -1.17186   0.57024  -2.055 0.039991 *
## factor(Race1)4 -2.53995   0.42385  -5.993 2.40e-09 ***
## factor(Race1)5 -3.79120   0.63552  -5.966 2.83e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.618 on 2239 degrees of freedom
## Multiple R-squared:  0.03235,    Adjusted R-squared:  0.02933
## F-statistic: 10.69 on 7 and 2239 DF,  p-value: 2.617e-13
## model_2 add known risk factors
m_2 = lm(
  BMI ~ SleepHrsNight + Age + Gender + Race1 + TotChol + BPDiaAve + BPSysAve + AlcoholYear + Smoke100 +
  DaysPhysHlthBad + PhysActive,
  df3
)
summary(m_2)

##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + TotChol +
##      BPDiaAve + BPSysAve + AlcoholYear + Smoke100 + DaysPhysHlthBad +
##      PhysActive, data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -14.663  -4.238  -0.859   3.172  37.902
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  21.345325   1.564968  13.639 < 2e-16 ***
## SleepHrsNight -0.195278   0.105023  -1.859 0.063105 .
## Age          0.008611   0.013111   0.657 0.511388
## Gender       0.412838   0.284075   1.453 0.146289
## Race1       -0.609481   0.119116  -5.117 3.37e-07 ***
## TotChol      0.060618   0.135190   0.448 0.653912
## BPDiaAve     0.058753   0.013744   4.275 1.99e-05 ***
## BPSysAve     0.060987   0.011475   5.315 1.18e-07 ***
## AlcoholYear  -0.009292   0.001488  -6.243 5.14e-10 ***
## Smoke100Yes  -0.556721   0.281266  -1.979 0.047900 *
## DaysPhysHlthBad 0.071694   0.019304   3.714 0.000209 ***
## PhysActiveYes -1.193772   0.285877  -4.176 3.08e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.391 on 2235 degrees of freedom

```

```
## Multiple R-squared:  0.09913,    Adjusted R-squared:  0.0947
## F-statistic: 22.36 on 11 and 2235 DF,  p-value: < 2.2e-16
```

```
#LINE
```

```
#influential observations
```

```
#multicollinearity
```

```
vif(m_1)
```

```
##              GVIF Df GVIF^(1/(2*Df))
## SleepHrsNight 1.017530  1      1.008727
## Age           1.025201  1      1.012522
## Gender        1.014147  1      1.007049
## factor(Race1) 1.038987  4      1.004792
```

```
vif(m_2)
```

```
##      SleepHrsNight      Age      Gender      Race1      TotChol
##      1.035713      1.227842      1.104720      1.044481      1.121877
##      BPDiaAve      BPSysAve      AlcoholYear      Smoke100 DaysPhysHlthBad
##      1.434880      1.535950      1.085843      1.080676      1.062228
##      PhysActive
##      1.094846
```

```
## model_3 add additional risk factors
```

```
m_3 = lm(
  BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + TotChol + BPDiaAve + BPSysAve + AlcoholYear +
  DaysPhysHlthBad + HealthGen + PhysActive,
  df3
)
summary(m_3)
```

```
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty +
##      TotChol + BPDiaAve + BPSysAve + AlcoholYear + Smoke100 +
##      UrineFlow1 + DaysMentHlthBad + DaysPhysHlthBad + HealthGen +
##      PhysActive, data = df3)
##
```

```
## Residuals:
##      Min      1Q  Median      3Q      Max
## -16.595  -4.058  -0.669   3.272  36.072
##
```

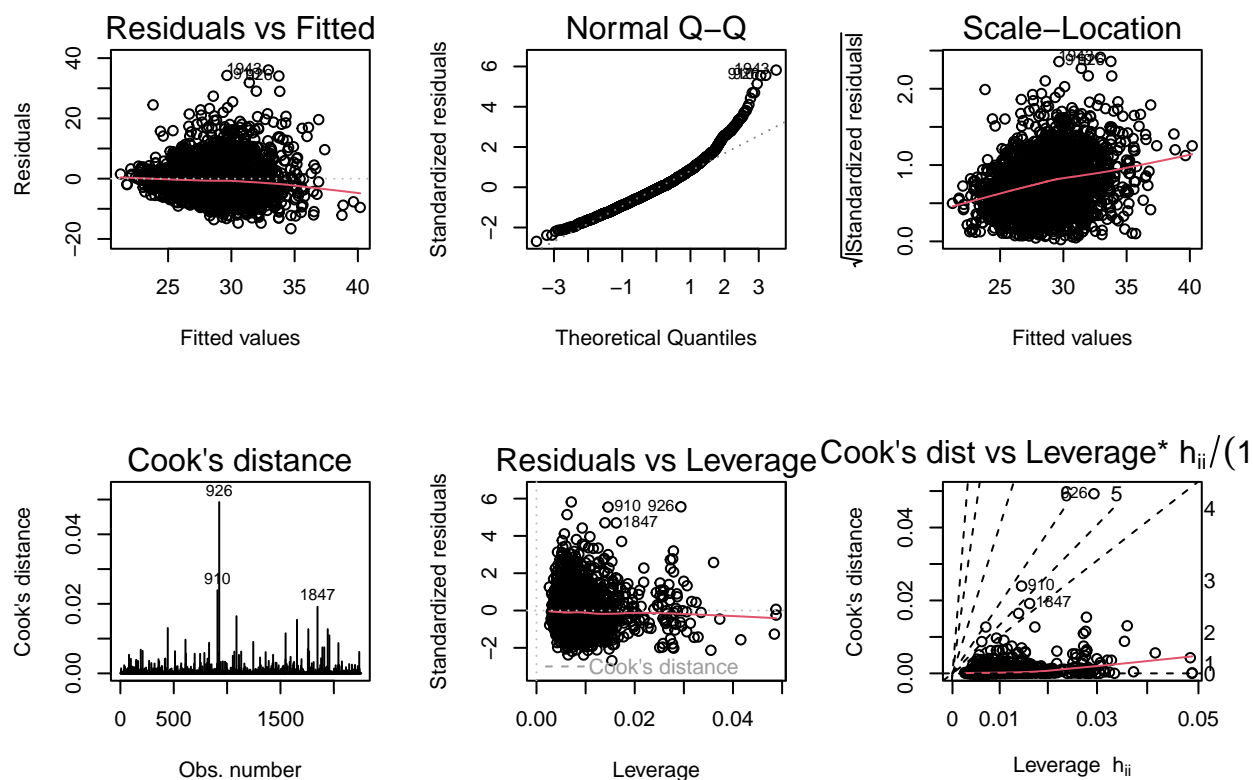
```
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  18.864211   1.572842  11.994 < 2e-16 ***
## SleepHrsNight -0.114991   0.103673  -1.109  0.26748
## Age           0.006283   0.013306   0.472  0.63682
## Gender        0.462007   0.279148   1.655  0.09805 .
## Race1        -0.489946   0.118576  -4.132  3.73e-05 ***
## Poverty       0.075062   0.088009   0.853  0.39381
## TotChol       0.010016   0.131806   0.076  0.93943
## BPDiaAve      0.062052   0.013404   4.629  3.88e-06 ***
```

```
## BPSysAve      0.048739    0.011246    4.334 1.53e-05 ***
## AlcoholYear   -0.007813    0.001469   -5.320 1.14e-07 ***
## Smoke100Yes   -0.859729    0.280020   -3.070 0.00216 **
## UrineFlow1    -0.091612    0.138427   -0.662 0.50816
## DaysMentHlthBad -0.034930    0.017452   -2.001 0.04546 *
## DaysPhysHlthBad 0.020052    0.020347    0.985 0.32450
## HealthGenVgood 1.968141    0.457489    4.302 1.77e-05 ***
## HealthGenGood  3.664152    0.454975    8.054 1.30e-15 ***
## HealthGenFair  5.229406    0.554851    9.425 < 2e-16 ***
## HealthGenPoor  8.128338    1.045166    7.777 1.13e-14 ***
## PhysActiveYes  -0.747015    0.286383   -2.608 0.00916 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.22 on 2228 degrees of freedom
## Multiple R-squared:  0.1494, Adjusted R-squared:  0.1425
## F-statistic: 21.74 on 18 and 2228 DF,  p-value: < 2.2e-16
```

```
vif(m_3)
```

```
##              GVIF Df GVIF^(1/(2*Df))
## SleepHrsNight 1.065532 1      1.032246
## Age           1.335211 1      1.155513
## Gender        1.126212 1      1.061231
## Race1         1.092732 1      1.045338
## Poverty       1.290246 1      1.135890
## TotChol       1.125879 1      1.061074
## BPDiaAve      1.440912 1      1.200380
## BPSysAve      1.557504 1      1.248000
## AlcoholYear   1.116165 1      1.056487
## Smoke100      1.130850 1      1.063414
## UrineFlow1    1.042860 1      1.021205
## DaysMentHlthBad 1.132451 1      1.064167
## DaysPhysHlthBad 1.245939 1      1.116216
## HealthGen     1.428819 4      1.045616
## PhysActive    1.159992 1      1.077029
```

```
par(mfrow = c(2, 3)) #read more from ?plot.lm
plot(m_3, which = 1)
plot(m_3, which = 2)
plot(m_3, which = 3)
plot(m_3, which = 4)
plot(m_3, which = 5)
plot(m_3, which = 6)
```



```
par(mfrow = c(1, 1)) # reset

# model_4 add additional risk factors
m_full = lm(
  BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + TotChol + BPDiaAve + BPSysAve + AlcoholYear +
    DaysPhysHlthBad + HealthGen + PhysActive + SleepHrsNight * Age + SleepHrsNight *
    Gender,
  df3
)
summary(m_full)
```

```
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty +
##     TotChol + BPDiaAve + BPSysAve + AlcoholYear + Smoke100 +
##     UrineFlow1 + DaysMentHlthBad + DaysPhysHlthBad + HealthGen +
##     PhysActive + SleepHrsNight * Age + SleepHrsNight * Gender,
##     data = df3)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -16.764  -4.057  -0.642   3.245  36.491
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    21.498108   2.900449   7.412 1.76e-13 ***
```

```
## SleepHrsNight      -0.500058    0.368580   -1.357    0.17501
## Age                -0.104332    0.060904   -1.713    0.08684 .
## Gender              3.847769    1.400785    2.747    0.00607 **
## Race1              -0.488068    0.118385   -4.123    3.88e-05 ***
## Poverty             0.074412    0.088021    0.845    0.39799
## TotChol            -0.003453    0.131675   -0.026    0.97908
## BPDiaAve           0.062234    0.013382    4.651    3.50e-06 ***
## BPSysAve           0.049402    0.011230    4.399    1.14e-05 ***
## AlcoholYear        -0.007872    0.001467   -5.366    8.87e-08 ***
## Smoke100Yes        -0.862278    0.279596   -3.084    0.00207 **
## UrineFlow1         -0.087512    0.138264   -0.633    0.52684
## DaysMentHlthBad    -0.034557    0.017432   -1.982    0.04756 *
## DaysPhysHlthBad     0.020582    0.020320    1.013    0.31121
## HealthGenVgood      1.970712    0.456778    4.314    1.67e-05 ***
## HealthGenGood       3.642205    0.454274    8.018    1.72e-15 ***
## HealthGenFair       5.230583    0.554558    9.432    < 2e-16 ***
## HealthGenPoor       8.156997    1.043723    7.815    8.39e-15 ***
## PhysActiveYes       -0.762638    0.286844   -2.659    0.00790 **
## SleepHrsNight:Age    0.016297    0.008736    1.865    0.06226 .
## SleepHrsNight:Gender -0.498190    0.201735   -2.470    0.01360 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.21 on 2226 degrees of freedom
## Multiple R-squared:  0.153, Adjusted R-squared:  0.1454
## F-statistic: 20.1 on 20 and 2226 DF, p-value: < 2.2e-16
```

```
vif(m_full)
```

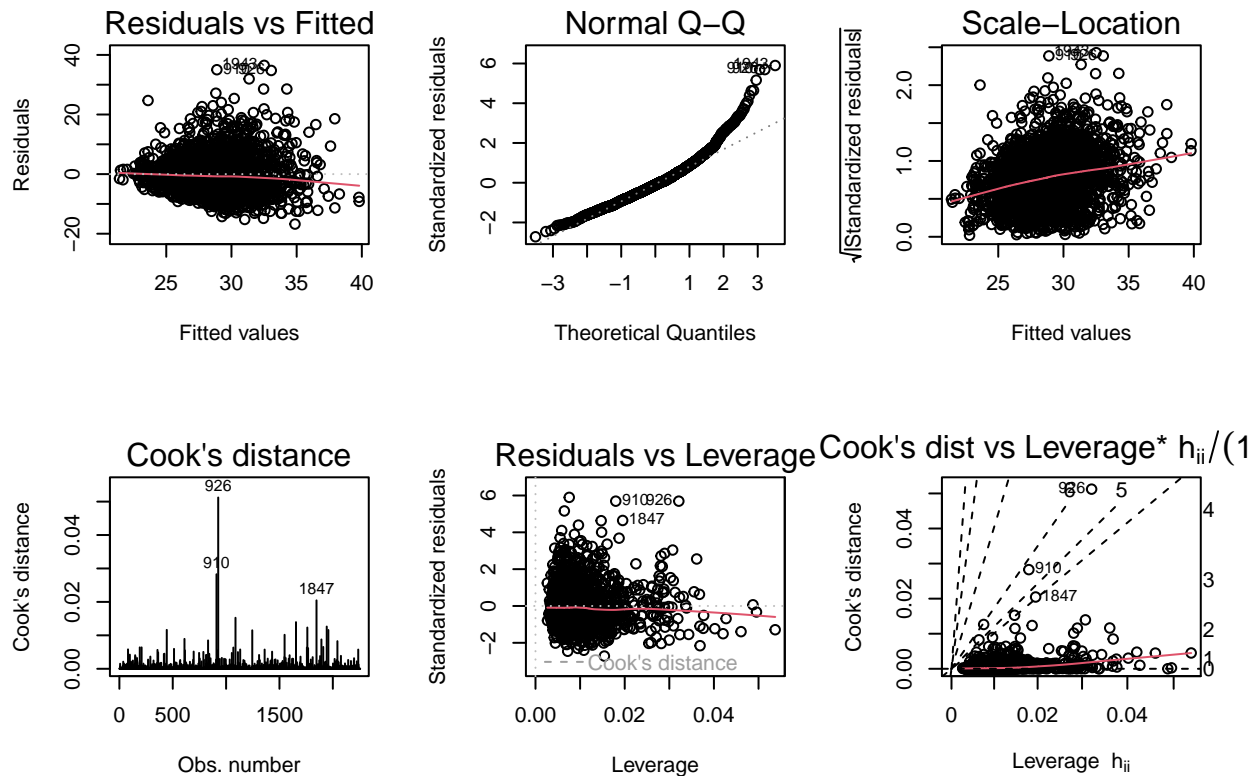
```
## there are higher-order terms (interactions) in this model
## consider setting type = 'predictor'; see ?vif
```

```
##              GVIF Df GVIF^(1/(2*Df))
## SleepHrsNight    13.512753  1      3.675970
## Age              28.066271  1      5.297761
## Gender            28.453824  1      5.334213
## Race1             1.092851  1      1.045395
## Poverty           1.294913  1      1.137942
## TotChol           1.127398  1      1.061790
## BPDiaAve          1.440942  1      1.200392
## BPSysAve          1.558228  1      1.248290
## AlcoholYear       1.117233  1      1.056993
## Smoke100          1.131190  1      1.063574
## UrineFlow1        1.043878  1      1.021703
## DaysMentHlthBad   1.133562  1      1.064689
## DaysPhysHlthBad   1.246696  1      1.116555
## HealthGen          1.438380  4      1.046488
## PhysActive         1.167611  1      1.080560
## SleepHrsNight:Age  37.226127  1      6.101322
## SleepHrsNight:Gender 30.003860  1      5.477578
```

```
par(mfrow = c(2, 3)) #read more from ?plot.lm
plot(m_full, which = 1)
plot(m_full, which = 2)
plot(m_full, which = 3)
plot(m_full, which = 4)
```



```
plot(m_full, which = 5)
plot(m_full, which = 6)
```



```
par(mfrow = c(1, 1)) # reset
```

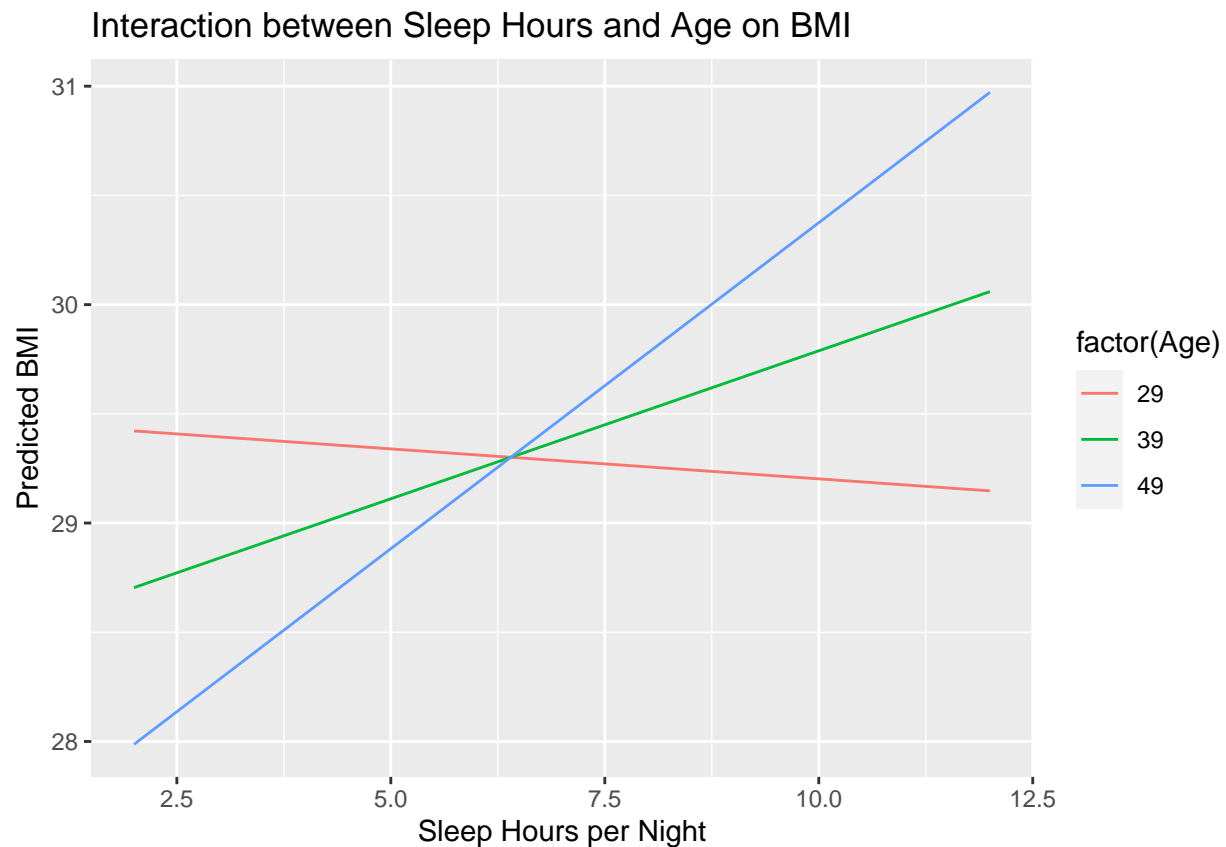
```
getMode <- function(v) {
  univq <- unique(v)
  univq[which.max(tabulate(match(v, univq)))]
}
```

```
new_data <- expand.grid(SleepHrsNight = seq(min(df3$SleepHrsNight), max(df3$SleepHrsNight), length.out = 100),
  Age = quantile(df3$Age, probs = c(0.25, 0.5, 0.75)),
  Gender = median(df3$Gender, na.rm = TRUE),
  Race1 = median(df3$Race1, na.rm = TRUE),
  Poverty = median(df3$Poverty, na.rm = TRUE),
  TotChol = median(df3$TotChol, na.rm = TRUE),
  BPDiaAve = median(df3$BPDiaAve, na.rm = TRUE),
  BPSysAve = median(df3$BPSysAve, na.rm = TRUE),
  AlcoholYear = median(df3$AlcoholYear, na.rm = TRUE),
  Smoke100 = getMode(df3$Smoke100),
  UrineFlow1 = median(df3$UrineFlow1, na.rm = TRUE),
  DaysMentHlthBad = median(df3$DaysMentHlthBad, na.rm = TRUE),
  DaysPhysHlthBad = median(df3$DaysPhysHlthBad, na.rm = TRUE),
  HealthGen = getMode(df3$HealthGen),
  PhysActive = getMode(df3$PhysActive)
)
```

```

# predict
new_data$predicted_BMI <- predict(m_full, newdata = new_data)
# interaction
library(ggplot2)
ggplot(new_data, aes(x = SleepHrsNight, y = predicted_BMI, group = factor(Age))) +
  geom_line(aes(color = factor(Age))) +
  labs(title = "Interaction between Sleep Hours and Age on BMI",
       x = "Sleep Hours per Night",
       y = "Predicted BMI")

```



(4) Diagnosis: 10-fold CV

```

library(caret)

## Loading required package: lattice
splitIndex <-
  createDataPartition(df3$SleepHrsNight, p = 0.7, list = FALSE)
trainData <- df3[splitIndex, ]
testData <- df3[-splitIndex, ]
predictions <- predict(m_full, newdata = testData)
mse <- mean((testData$SleepHrsNight - predictions) ^ 2)
control <-
  trainControl(method = "cv", number = 10) # 10-fold cross-validation

```

```

cv_model <-
  train(
    SleepHrsNight ~ .,
    data = df3,
    method = "lm",
    trControl = control
  )
cv_model

## Linear Regression
##
## 2247 samples
## 16 predictor
##
## No pre-processing
## Resampling: Cross-Validated (10 fold)
## Summary of sample sizes: 2023, 2022, 2022, 2021, 2023, 2023, ...
## Resampling results:
##
##   RMSE      Rsquared   MAE
## 1.275969  0.04783007  0.991811
##
## Tuning parameter 'intercept' was held constant at a value of TRUE
(cv_results <- cv_model$results)

##   intercept      RMSE  Rsquared      MAE   RMSESD RsquaredSD   MAESD
## 1      TRUE 1.275969 0.04783007 0.991811 0.08216468 0.01871131 0.04949381

```

(4) Diagnosis: Normality Assumption

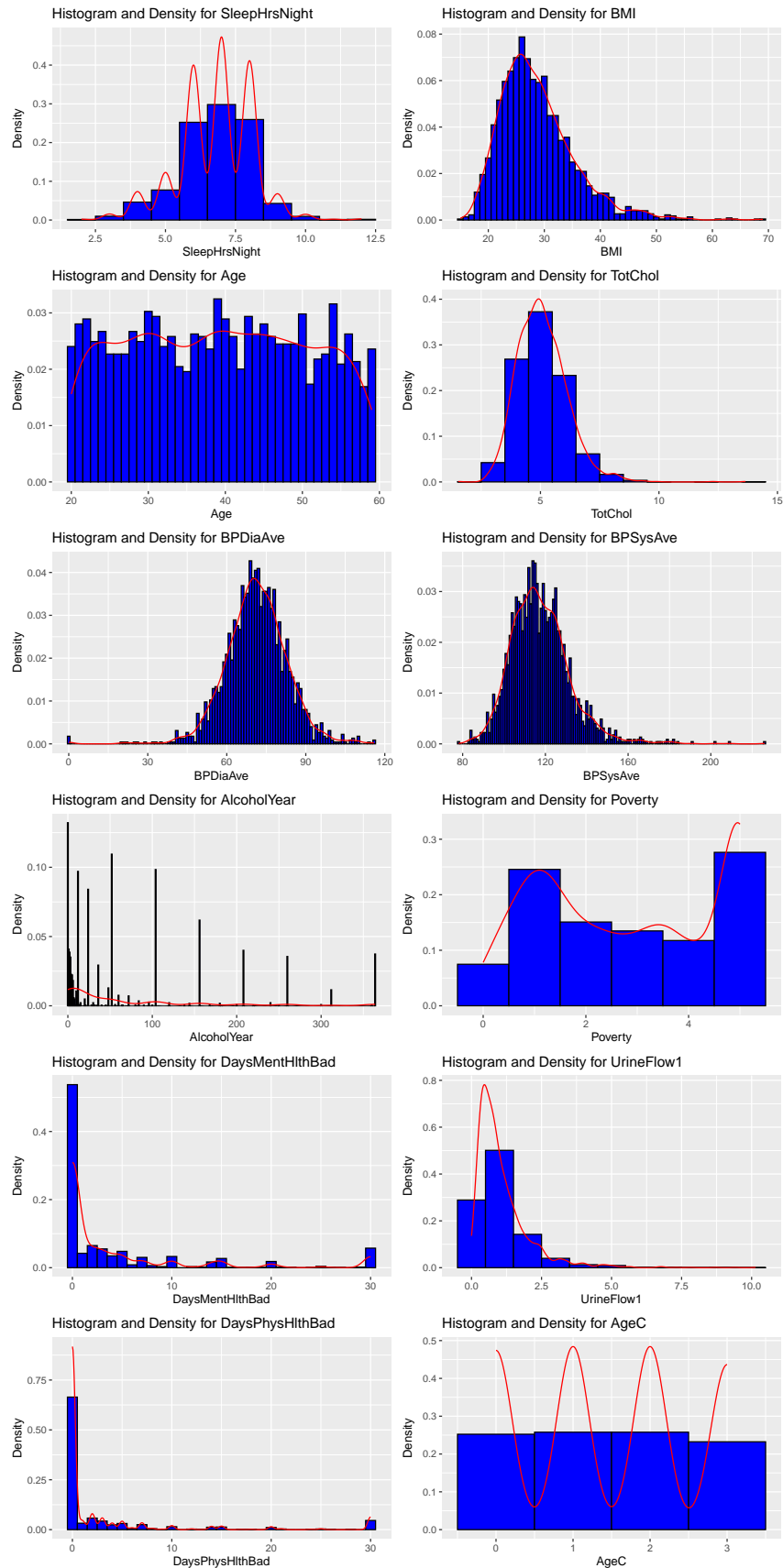
```

library(ggplot2)
library(patchwork)
# Initializes an empty patchwork object
plot_list <- list()

# Draw a histogram for each numeric variable (except Race1 and Gender) and add it to the list
for (var in names(df3)) {
  if (is.numeric(df3[[var]]) && !(var %in% c("Race1", "Gender"))) {
    p <- ggplot(df3, aes(x = .data[[var]])) +
      geom_histogram(
        aes(y = after_stat(density)),
        binwidth = 1,
        fill = "blue",
        color = "black"
      ) +
      geom_density(col = "red") +
      ggtitle(paste("Histogram and Density for", var)) +
      xlab(var) +
      ylab("Density")
    plot_list[[length(plot_list) + 1]] <- p
  }
}

```

```
}  
  
# Use patchwork to put all the charts together  
combined_plot <- wrap_plots(plot_list, ncol = 2)  
print(combined_plot)
```



```

df3 <- data.frame(df3)
library(dplyr)
# Shapiro-Wilk normality test is performed for each numerical variable in df3
results <- sapply(df3, function(x) {
  if (is.numeric(x)) {
    shapiro_test <- shapiro.test(x)
    return(c(shapiro_test$statistic, shapiro_test$p.value))
  } else {
    return(c(NA, NA))
  }
})
# Convert the result to a data box and name the column
results_df <- as.data.frame(t(results))
names(results_df) <- c("W", "p.value")
# Add a variable name as a new column
results_df$Variable <- rownames(results_df)
# Rearrange the order of columns
results_df <- results_df[, c("Variable", "W", "p.value")]
# Calculate the corrected P-value (for example, using Bonferroni correction)
results_df$p.adjusted <-
  p.adjust(results_df$p.value, method = "bonferroni")
print(results_df)

```

```

##           Variable      W      p.value  p.adjusted
## SleepHrsNight SleepHrsNight 0.9338622 1.778905e-30 2.490467e-29
## BMI           BMI          0.9282826 1.612730e-31 2.257822e-30
## Age           Age          0.9560746 1.722452e-25 2.411432e-24
## Gender        Gender       0.6349727 2.212481e-56 3.097473e-55
## Race1         Race1        0.7417356 1.804321e-50 2.526049e-49
## TotChol       TotChol      0.9644072 4.128738e-23 5.780233e-22
## BPDiaAve      BPDiaAve     0.9724617 2.239823e-20 3.135753e-19
## BPSysAve      BPSysAve     0.9467229 8.775437e-28 1.228561e-26
## AlcoholYear   AlcoholYear  0.7431971 2.241076e-50 3.137506e-49
## Poverty       Poverty      0.8945201 9.727860e-37 1.361900e-35
## DaysMentHlthBad DaysMentHlthBad 0.6093542 1.400760e-57 1.961064e-56
## UrineFlow1    UrineFlow1   0.7578721 2.095427e-49 2.933597e-48
## PhysActive     PhysActive    NA          NA          NA
## DaysPhysHlthBad DaysPhysHlthBad 0.4970302 3.684373e-62 5.158122e-61
## Smoke100       Smoke100     NA          NA          NA
## HealthGen      HealthGen     NA          NA          NA
## AgeC           AgeC         0.8597608 7.335056e-41 1.026908e-39

```

Standardized residuals, Studentized residuals

```

# Regular residuals
residual_1 <- m_full$residuals

# Standardized residuals
residual_2 <- rstandard(m_full)

# Studentized residuals
residual_3 <- rstudent(m_full)

```

```

# Externally studentized residuals
# Note: Externally studentized residuals are the same as studentized residuals in most cases
residual_4 <- rstudent(m_full)

# Creating a data frame to summarize these residuals
residual_summary <- data.frame(
  Residuals = c("Regular", "Standardized", "Studentized", "Externally Studentized"),
  Mean = c(mean(residual_1), mean(residual_2), mean(residual_3), mean(residual_4)),
  SD = c(sd(residual_1), sd(residual_2), sd(residual_3), sd(residual_4)),
  Min = c(min(residual_1), min(residual_2), min(residual_3), min(residual_4)),
  Max = c(max(residual_1), max(residual_2), max(residual_3), max(residual_4))
)

# Display the summary
print(residual_summary)

```

| | Residuals | Mean | SD | Min | Max |
|------|------------------------|---------------|----------|------------|-----------|
| ## 1 | Regular | -1.005375e-16 | 6.182265 | -16.764148 | 36.491300 |
| ## 2 | Standardized | -1.169070e-05 | 1.000896 | -2.720637 | 5.898602 |
| ## 3 | Studentized | 2.295298e-04 | 1.001991 | -2.724559 | 5.943913 |
| ## 4 | Externally Studentized | 2.295298e-04 | 1.001991 | -2.724559 | 5.943913 |

```

# Load necessary library
library(ggplot2)

# Assuming m_full is your linear model
# m_full <- lm(SleepMinNight ~ ., data = df3)

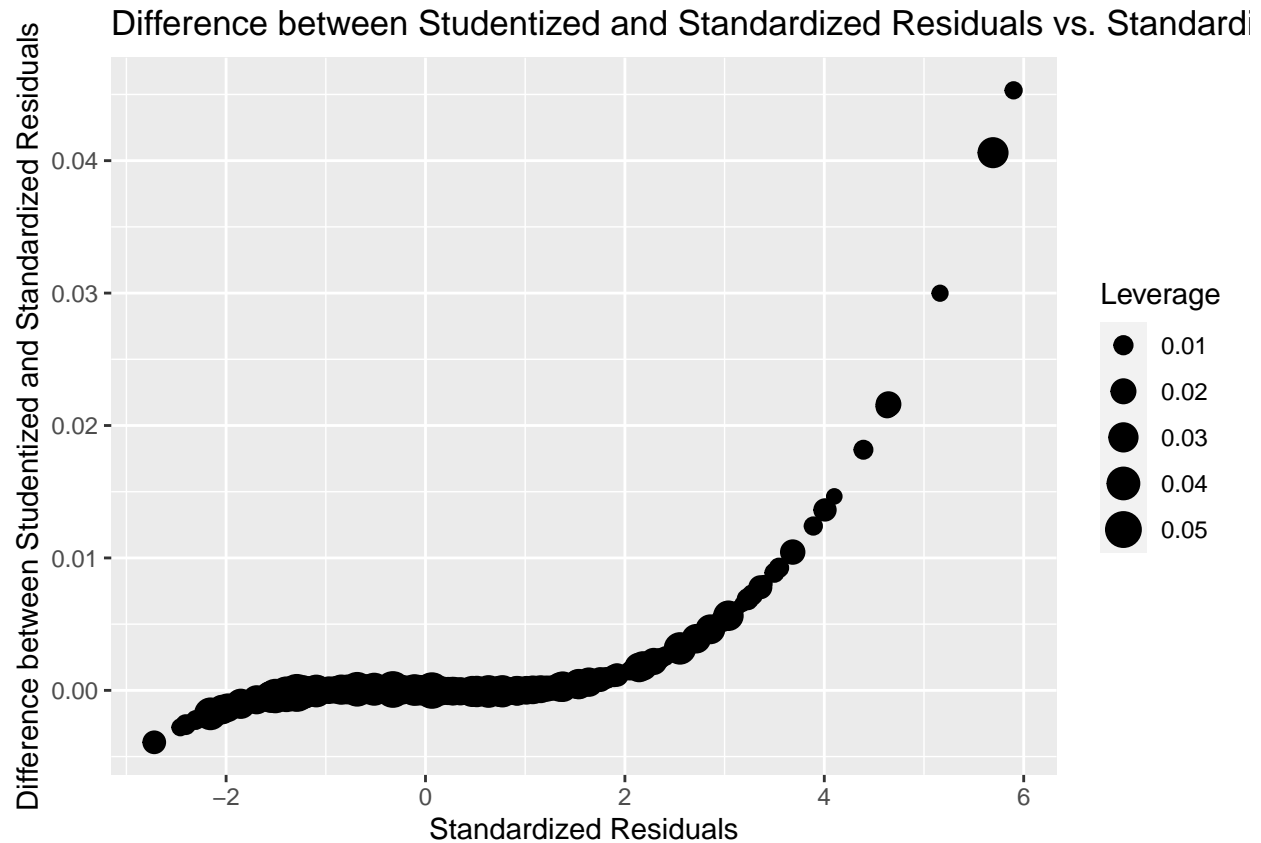
# Calculate standardized and studentized residuals
residual_2 <- rstandard(m_full)
residual_3 <- rstudent(m_full)

# Calculate leverage values
leverage_values <- hatvalues(m_full)

# Create a data frame for plotting
plot_data <- data.frame(
  Standardized_Residuals = residual_2,
  Difference = residual_3 - residual_2,
  Leverage = leverage_values
)

# Create the plot
ggplot(plot_data, aes(x = Standardized_Residuals, y = Difference)) +
  geom_point(aes(size = Leverage)) +
  ggtitle("Difference between Studentized and Standardized Residuals vs. Standardized Residuals") +
  xlab("Standardized Residuals") +
  ylab("Difference between Studentized and Standardized Residuals")

```



```
# Display the plot
print(ggplot)
```

```
## function (data = NULL, mapping = aes(), ..., environment = parent.frame())
## {
##   UseMethod("ggplot")
## }
## <bytecode: 0x3c93708>
## <environment: namespace:ggplot2>
```

```
# Load necessary library
library(ggplot2)
```

```
# Assuming m_full is your linear model
# m_full <- lm(SleepMinNight ~ ., data = df3)
```

```
# Calculate studentized and externally studentized residuals
```

```
residual_3 <- rstudent(m_full)
```

```
residual_4 <- rstudent(m_full) # Externally studentized residuals are typically the same as studentized
```

```
# Regular residuals
```

```
residual_1 <- m_full$residuals
```

```
# Create a data frame for plotting
```

```
plot_data <- data.frame(
  Studentized_Residuals = residual_3,
  Difference = residual_4 - residual_3,
```

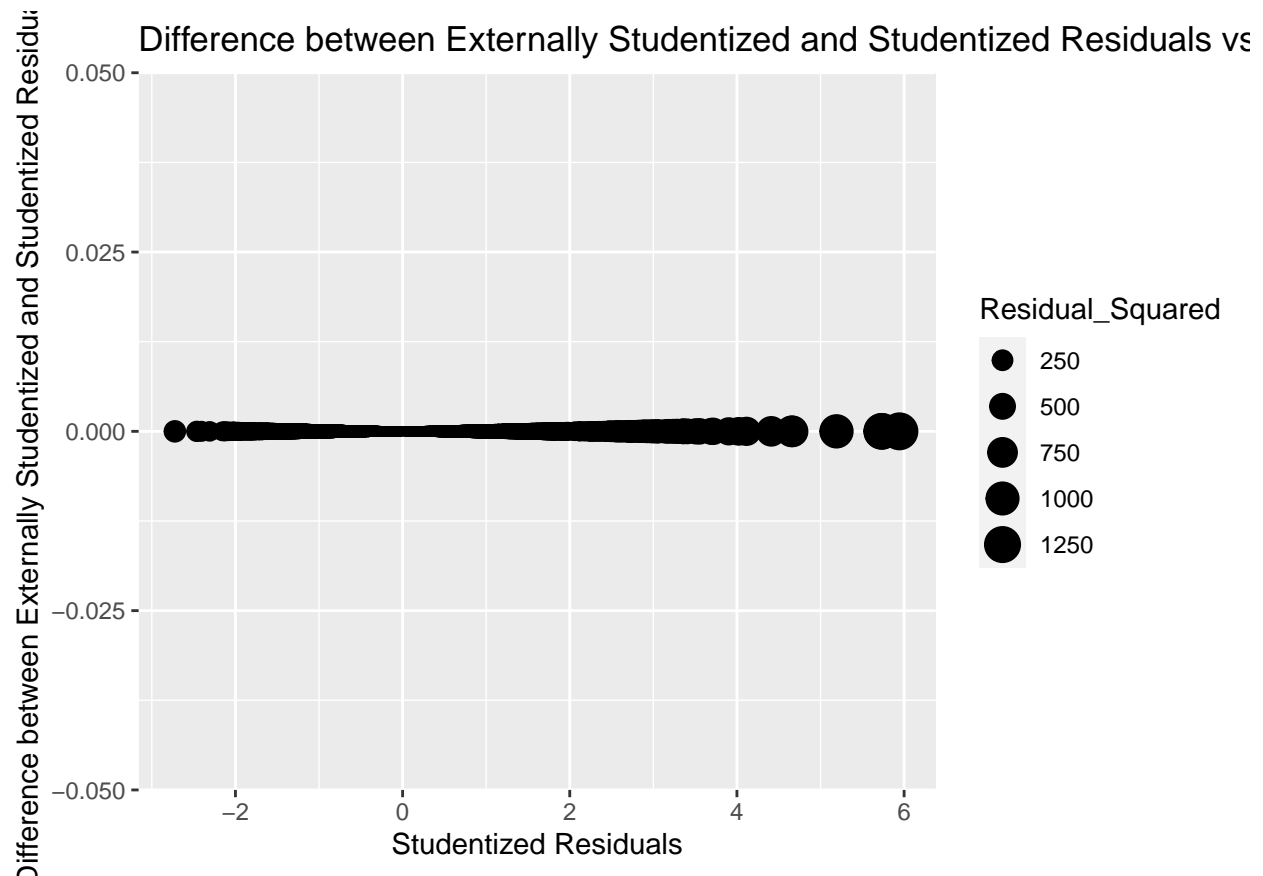


```

Residual_Squared = residual_1^2
)

# Create the plot
ggplot(plot_data, aes(x = Studentized_Residuals, y = Difference)) +
  geom_point(aes(size = Residual_Squared)) +
  ggtitle("Difference between Externally Studentized and Studentized Residuals vs. Studentized Residuals") +
  xlab("Studentized Residuals") +
  ylab("Difference between Externally Studentized and Studentized Residuals")

```



```

# Display the plot
print(ggplot)

```

```

## function (data = NULL, mapping = aes(), ..., environment = parent.frame())
## {
##   UseMethod("ggplot")
## }
## <bytecode: 0x3c93708>
## <environment: namespace:ggplot2>

```

```

# Load necessary library
library(ggplot2)

# Assuming m_full is your linear model
# m_full <- lm(SleepMinNight ~ ., data = df3)

# Calculate regular residuals

```

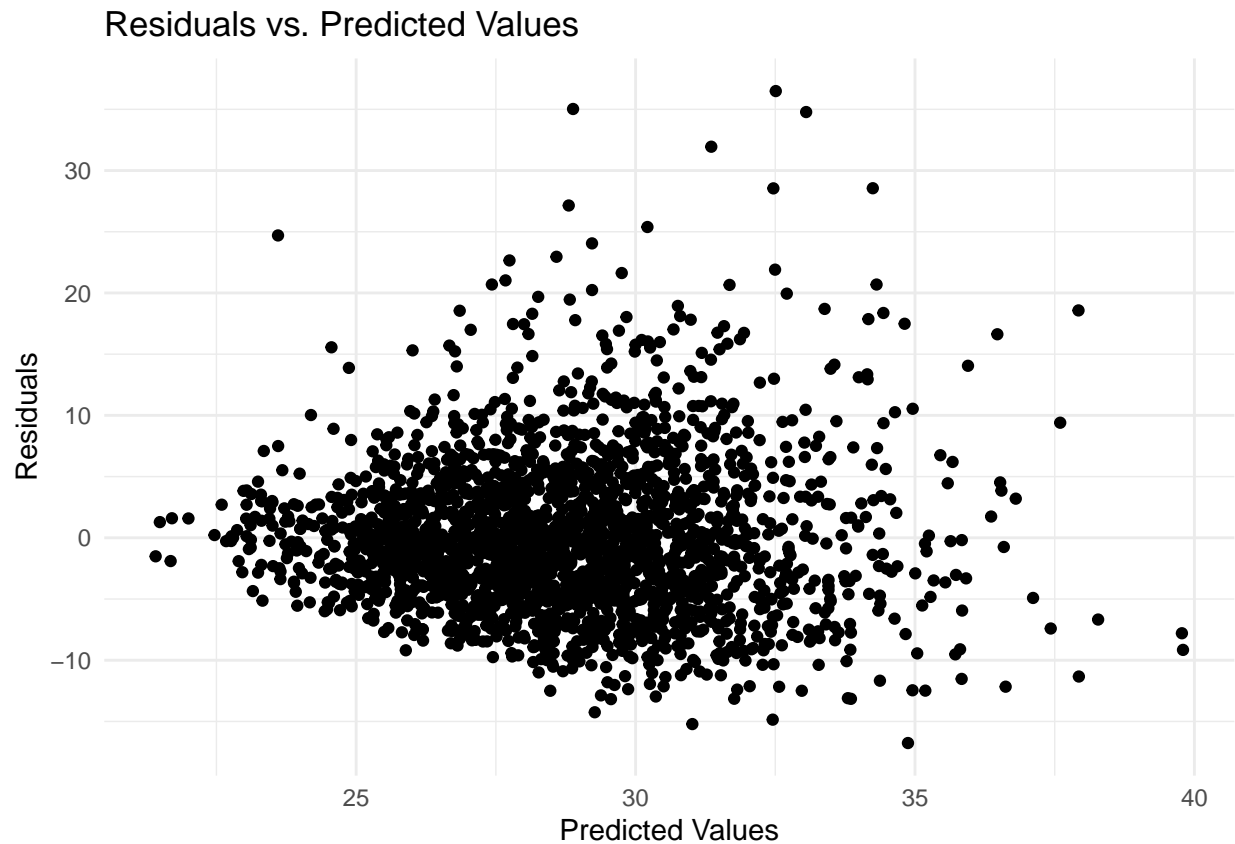
```

residual_1 <- m_full$residuals

# Get predicted values from the model
predicted_values <- predict(m_full)

# Create the plot
ggplot() +
  geom_point(aes(x = predicted_values, y = residual_1)) +
  ggtitle("Residuals vs. Predicted Values") +
  xlab("Predicted Values") +
  ylab("Residuals") +
  theme_minimal()

```



```

# Display the plot
print(ggplot)

## function (data = NULL, mapping = aes(), ..., environment = parent.frame())
## {
##   UseMethod("ggplot")
## }
## <bytecode: 0x3c93708>
## <environment: namespace:ggplot2>

# Load necessary library
library(ggplot2)

# Assuming m_full is your linear model

```

```

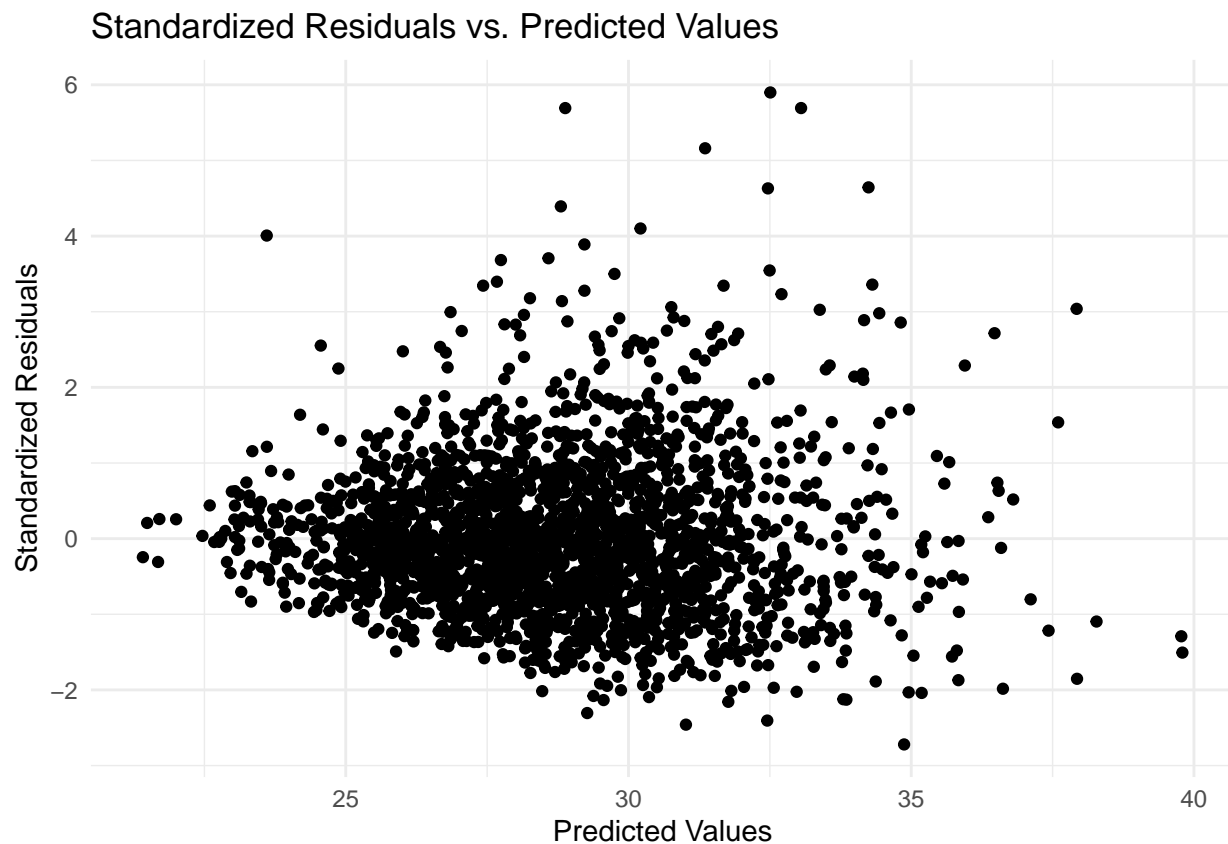
# m_full <- lm(SleepMinNight ~ ., data = df3)

# Calculate different types of residuals
residual_2 <- rstandard(m_full)
residual_3 <- rstudent(m_full)
residual_4 <- rstudent(m_full) # Externally studentized residuals

# Get predicted values from the model
predicted_values <- predict(m_full)

# Plot for Standardized Residuals
ggplot() +
  geom_point(aes(x = predicted_values, y = residual_2)) +
  ggtitle("Standardized Residuals vs. Predicted Values") +
  xlab("Predicted Values") +
  ylab("Standardized Residuals") +
  theme_minimal()

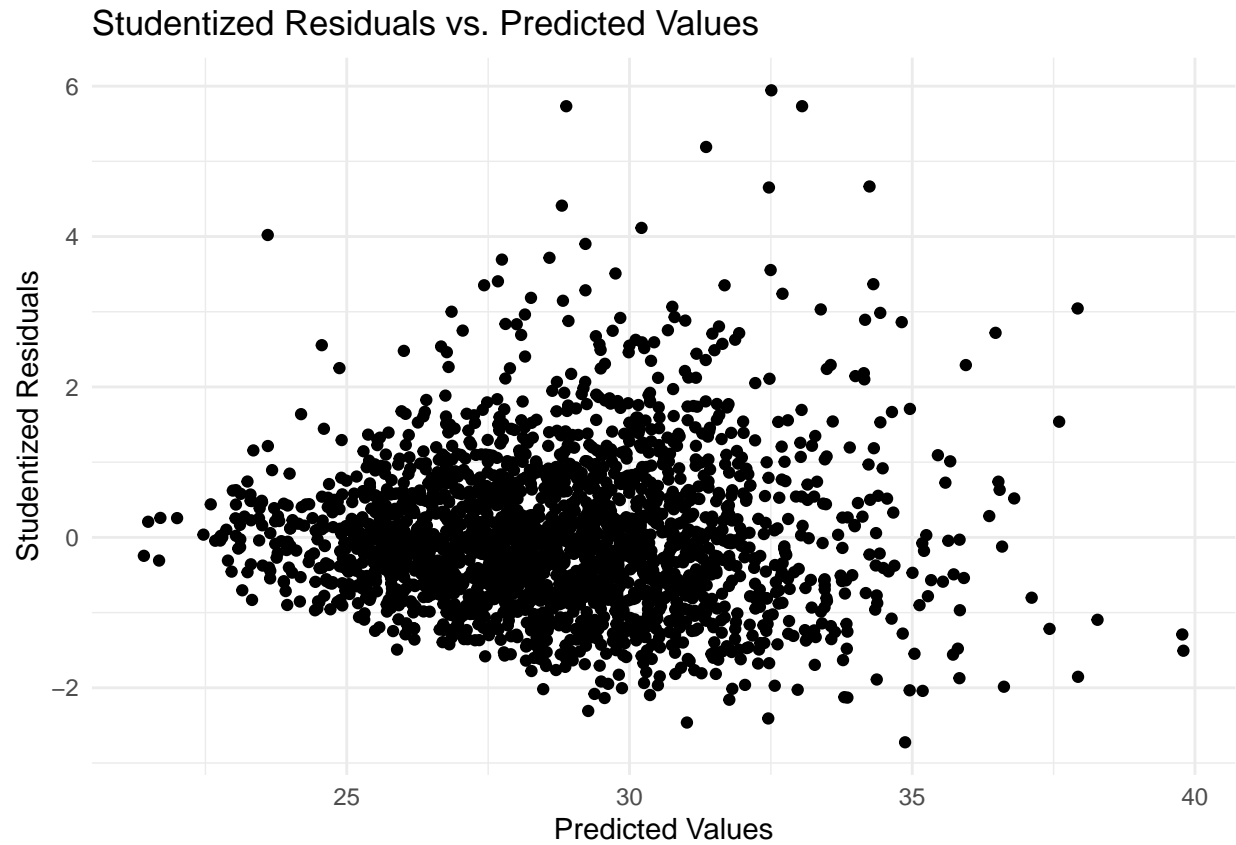
```



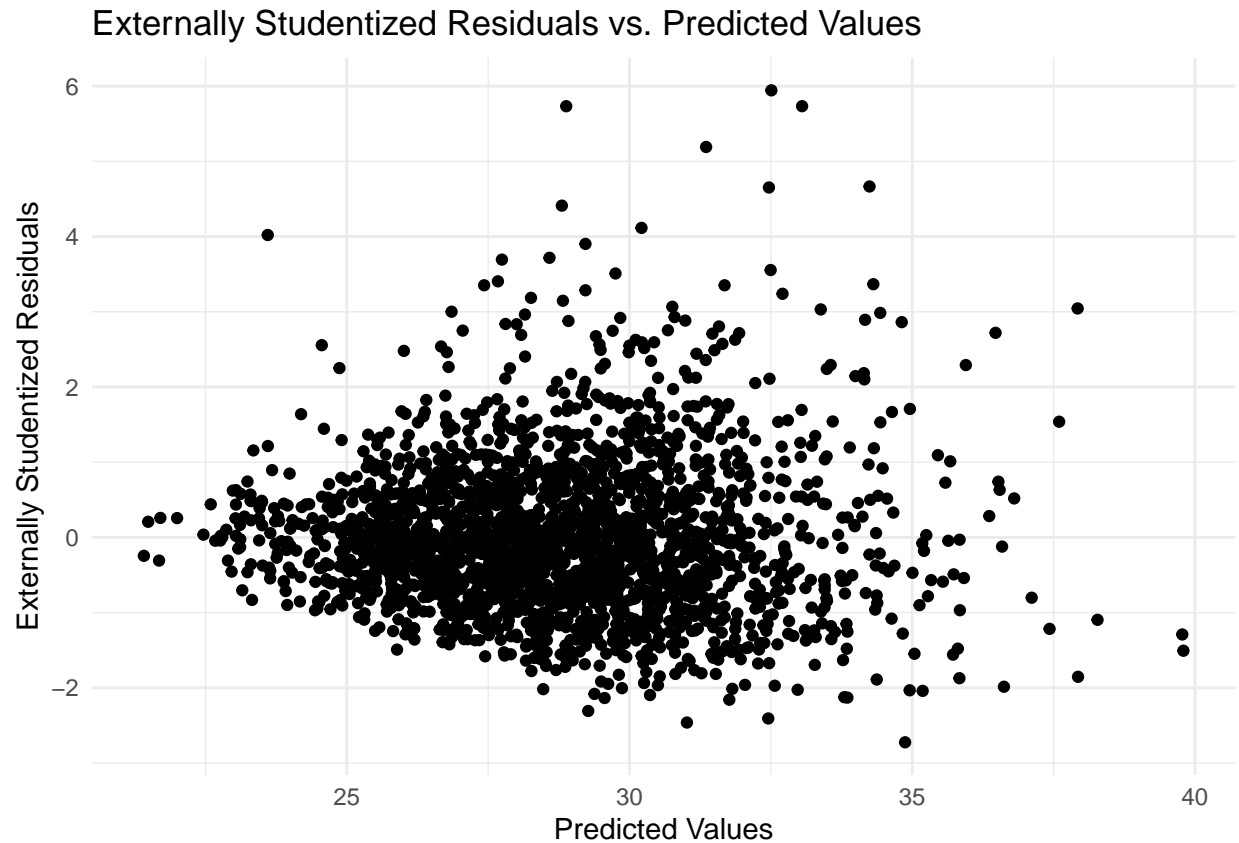
```

# Plot for Studentized Residuals
ggplot() +
  geom_point(aes(x = predicted_values, y = residual_3)) +
  ggtitle("Studentized Residuals vs. Predicted Values") +
  xlab("Predicted Values") +
  ylab("Studentized Residuals") +
  theme_minimal()

```



```
# Plot for Externally Studentized Residuals  
ggplot() +  
  geom_point(aes(x = predicted_values, y = residual_4)) +  
  ggtitle("Externally Studentized Residuals vs. Predicted Values") +  
  xlab("Predicted Values") +  
  ylab("Externally Studentized Residuals") +  
  theme_minimal()
```



(5) Model Selection

```
step(m_full)
```

```
## Start:  AIC=8227.65
## BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + TotChol +
##       BPDiaAve + BPSysAve + AlcoholYear + Smoke100 + UrineFlow1 +
##       DaysMentHlthBad + DaysPhysHlthBad + HealthGen + PhysActive +
##       SleepHrsNight * Age + SleepHrsNight * Gender
##
##           Df Sum of Sq  RSS   AIC
## - TotChol      1      0.0 85843 8225.7
## - UrineFlow1    1     15.4 85858 8226.1
## - Poverty       1     27.6 85871 8226.4
## - DaysPhysHlthBad 1     39.6 85883 8226.7
## <none>                  85843 8227.7
## - SleepHrsNight:Age  1    134.2 85977 8229.2
## - DaysMentHlthBad    1    151.6 85995 8229.6
## - SleepHrsNight:Gender 1    235.2 86078 8231.8
## - PhysActive         1    272.6 86116 8232.8
## - Smoke100           1    366.8 86210 8235.2
## - Race1              1    655.5 86498 8242.7
## - BPSysAve           1    746.3 86589 8245.1
## - BPDiaAve           1    834.1 86677 8247.4
```

```

## - AlcoholYear          1    1110.5 86954 8254.5
## - HealthGen            4    4944.8 90788 8345.5
##
## Step: AIC=8225.65
## BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + BPDiaAve +
##       BPSysAve + AlcoholYear + Smoke100 + UrineFlow1 + DaysMentHlthBad +
##       DaysPhysHlthBad + HealthGen + PhysActive + SleepHrsNight:Age +
##       SleepHrsNight:Gender
##
##              Df Sum of Sq  RSS    AIC
## - UrineFlow1    1      15.5 85858 8224.1
## - Poverty        1      27.7 85871 8224.4
## - DaysPhysHlthBad 1      39.6 85883 8224.7
## <none>                                85843 8225.7
## - SleepHrsNight:Age 1     134.2 85977 8227.2
## - DaysMentHlthBad   1     151.5 85995 8227.6
## - SleepHrsNight:Gender 1    235.2 86078 8229.8
## - PhysActive        1     272.6 86116 8230.8
## - Smoke100          1     367.0 86210 8233.2
## - Race1             1     657.2 86500 8240.8
## - BPSysAve          1     746.5 86590 8243.1
## - BPDiaAve          1     841.8 86685 8245.6
## - AlcoholYear       1    1113.5 86957 8252.6
## - HealthGen         4    4948.2 90791 8343.6
##
## Step: AIC=8224.06
## BMI ~ SleepHrsNight + Age + Gender + Race1 + Poverty + BPDiaAve +
##       BPSysAve + AlcoholYear + Smoke100 + DaysMentHlthBad + DaysPhysHlthBad +
##       HealthGen + PhysActive + SleepHrsNight:Age + SleepHrsNight:Gender
##
##              Df Sum of Sq  RSS    AIC
## - Poverty        1      25.0 85883 8222.7
## - DaysPhysHlthBad 1      39.6 85898 8223.1
## <none>                                85858 8224.1
## - SleepHrsNight:Age 1     137.0 85996 8225.6
## - DaysMentHlthBad   1     153.8 86012 8226.1
## - SleepHrsNight:Gender 1    234.0 86092 8228.2
## - PhysActive        1     280.2 86139 8229.4
## - Smoke100          1     368.8 86227 8231.7
## - Race1             1     681.7 86540 8239.8
## - BPSysAve          1     743.9 86602 8241.4
## - BPDiaAve          1     843.0 86701 8244.0
## - AlcoholYear       1    1134.1 86993 8251.5
## - HealthGen         4    4962.7 90821 8342.3
##
## Step: AIC=8222.71
## BMI ~ SleepHrsNight + Age + Gender + Race1 + BPDiaAve + BPSysAve +
##       AlcoholYear + Smoke100 + DaysMentHlthBad + DaysPhysHlthBad +
##       HealthGen + PhysActive + SleepHrsNight:Age + SleepHrsNight:Gender
##
##              Df Sum of Sq  RSS    AIC
## - DaysPhysHlthBad   1      38.8 85922 8221.7
## <none>                                85883 8222.7
## - SleepHrsNight:Age 1     142.8 86026 8224.4

```

```

## - DaysMentHlthBad      1      159.0 86042 8224.9
## - SleepHrsNight:Gender 1      229.1 86113 8226.7
## - PhysActive           1      262.8 86146 8227.6
## - Smoke100             1      411.9 86295 8231.5
## - Race1                1      659.8 86543 8237.9
## - BPSysAve             1      732.1 86616 8239.8
## - BPDiaAve             1      850.4 86734 8242.9
## - AlcoholYear          1     1110.7 86994 8249.6
## - HealthGen            4     5020.1 90904 8342.4
##
## Step: AIC=8221.72
## BMI ~ SleepHrsNight + Age + Gender + Race1 + BPDiaAve + BPSysAve +
##       AlcoholYear + Smoke100 + DaysMentHlthBad + HealthGen + PhysActive +
##       SleepHrsNight:Age + SleepHrsNight:Gender
##
##               Df Sum of Sq  RSS    AIC
## <none>                        85922 8221.7
## - DaysMentHlthBad      1      137.3 86060 8223.3
## - SleepHrsNight:Age    1      139.2 86061 8223.4
## - SleepHrsNight:Gender 1      230.5 86153 8225.7
## - PhysActive           1      276.0 86198 8226.9
## - Smoke100             1      401.5 86324 8230.2
## - Race1                1      658.7 86581 8236.9
## - BPSysAve             1      738.0 86660 8238.9
## - BPDiaAve             1      833.2 86755 8241.4
## - AlcoholYear          1     1126.8 87049 8249.0
## - HealthGen            4     5578.5 91501 8355.1
##
## Call:
## lm(formula = BMI ~ SleepHrsNight + Age + Gender + Race1 + BPDiaAve +
##       BPSysAve + AlcoholYear + Smoke100 + DaysMentHlthBad + HealthGen +
##       PhysActive + SleepHrsNight:Age + SleepHrsNight:Gender, data = df3)
##
## Coefficients:
##           (Intercept)      SleepHrsNight           Age
##           21.681859          -0.515830         -0.102502
##           Gender              Race1          BPDiaAve
##           3.824307          -0.482813          0.061771
##           BPSysAve      AlcoholYear      Smoke100Yes
##           0.049041          -0.007851         -0.888609
##           DaysMentHlthBad  HealthGenVgood  HealthGenGood
##           -0.032375          1.953213          3.630407
##           HealthGenFair    HealthGenPoor  PhysActiveYes
##           5.233284          8.345291         -0.757817
##           SleepHrsNight:Age SleepHrsNight:Gender
##           0.016559          -0.492786

```

```
library(olsrr)
```

```

##
## Attaching package: 'olsrr'
##
## The following object is masked from 'package:datasets':
##
##     rivers

```

```
ols_step_forward_p(m_full, penter = 0.1, details = F)
```

```
##
##                               Selection Summary
## -----
##      Variable                Adj.
## Step      Entered      R-Square  R-Square      C(p)      AIC      RMSE
## -----
##   1  HealthGen           0.0851    0.0834    161.4477    14747.6355    6.4310
##   2  BPDiaAve            0.1087    0.1067    101.4337    14690.9219    6.3490
##   3  AlcoholYear         0.1232    0.1208     65.3495    14656.0890    6.2985
##   4  Race1               0.1327    0.1300     42.2855    14633.5149    6.2656
##   5  BPSysAve            0.1395    0.1365     26.3217    14617.7354    6.2422
##   6  Smoke100            0.1429    0.1395     19.3686    14610.8213    6.2313
##   7  PhysActive          0.1457    0.1418     14.2291    14605.6875    6.2228
##   8  DaysMentHlthBad     0.1467    0.1425     13.4727    14604.9273    6.2203
##   9  Gender              0.1478    0.1432     12.5457    14603.9924    6.2177
##  10  SleepHrsNight:Gender 0.1503    0.1453      8.1002    14599.5162    6.2101
##  11  Poverty              0.1507    0.1454      8.9990    14600.4079    6.2100
##  12  TotChol              0.1507    0.1450     10.9712    14602.3799    6.2113
##  13  UrineFlow1          0.1509    0.1448     12.5565    14603.9624    6.2121
##  14  DaysPhysHlthBad     0.1513    0.1448     13.5233    14604.9217    6.2121
##  15  Age                  0.1513    0.1445     15.3130    14606.7098    6.2132
##  16  SleepHrsNight       0.1516    0.1444     16.4798    14607.8703    6.2134
##  17  SleepHrsNight:Age   0.1530    0.1454     15.0000    14606.3604    6.2100
## -----
```

```
ols_step_forward_p(m_full, penter = 0.05, details = F)
```

```
##
##                               Selection Summary
## -----
##      Variable                Adj.
## Step      Entered      R-Square  R-Square      C(p)      AIC      RMSE
## -----
##   1  HealthGen           0.0851    0.0834    161.4477    14747.6355    6.4310
##   2  BPDiaAve            0.1087    0.1067    101.4337    14690.9219    6.3490
##   3  AlcoholYear         0.1232    0.1208     65.3495    14656.0890    6.2985
##   4  Race1               0.1327    0.1300     42.2855    14633.5149    6.2656
##   5  BPSysAve            0.1395    0.1365     26.3217    14617.7354    6.2422
##   6  Smoke100            0.1429    0.1395     19.3686    14610.8213    6.2313
##   7  PhysActive          0.1457    0.1418     14.2291    14605.6875    6.2228
## -----
```

```
ols_mallows_cp(model = m_3, fullmodel = m_full) # Mallows' Cp
```

```
## [1] 20.43401
```

```
#general hypothesis test
```

```
# Load the required libraries
```

```
library(dplyr)
```

```
library(car)
```

```
library(emmeans)
```

```
# Assuming your dataframe is df3
```



```

# Categorizing Age
df3 <- df3 %>%
  mutate(
    Age_Category = case_when(
      Age >= 18 & Age < 30 ~ "18-29",
      Age >= 30 & Age < 40 ~ "30-39",
      Age >= 40 & Age < 50 ~ "40-49",
      Age >= 50 & Age < 60 ~ "50-59",
      TRUE ~ NA_character_ # For cases not in the 18 to 60 age range
    ),
    Gender = as.factor(Gender), # Ensure Gender is a factor type
    Race1 = as.factor(Race1)    # Ensure Race1 is a factor type
  )

# Update the model using categorical variables
m_full_updated <- lm(SleepHrsNight ~ Age_Category + Gender + Race1, data = df3)

# Overall hypothesis test
anova_results_updated <- Anova(m_full_updated, type="III")

```

```

## Warning in printHypothesis(L, rhs, names(b)): one or more coefficients in the hypothesis include
## arithmetic operators in their names;
## the printed representation of the hypothesis will be omitted

```

```
summary(anova_results_updated)
```

```

##      Sum Sq      Df      F value    Pr(>F)
## Min.   : 17.33  Min.   :  1.0  Min.   :  3.866  Min.   :0.0000000
## 1st Qu.: 19.51  1st Qu.:  1.0  1st Qu.:  5.077  1st Qu.:0.0001630
## Median : 36.88  Median :  3.0  Median :  7.890  Median :0.0007829
## Mean   :2468.70  Mean   : 449.4  Mean   :1268.683  Mean   :0.0026434
## 3rd Qu.:3765.17  3rd Qu.:  4.0  3rd Qu.:1271.497  3rd Qu.:0.0032633
## Max.   :8504.59  Max.   :2238.0  Max.   :5055.085  Max.   :0.0090077
##                                     NA's   :1      NA's   :1

```

```
# Post-hoc comparisons using emmeans
```

```
emmeans_results_updated <- emmeans(m_full_updated, specs = pairwise ~ Age_Category + Gender + Race1)
summary(emmeans_results_updated)
```

```

## $emmeans
## Age_Category Gender Race1 emmean    SE    df lower.CL upper.CL
## 18-29         0      1      6.55 0.0921 2238     6.37     6.73
## 30-39         0      1      6.44 0.0929 2238     6.26     6.62
## 40-49         0      1      6.32 0.0933 2238     6.13     6.50
## 50-59         0      1      6.33 0.0938 2238     6.15     6.51
## 18-29         1      1      6.73 0.0912 2238     6.55     6.90
## 30-39         1      1      6.62 0.0918 2238     6.44     6.80
## 40-49         1      1      6.49 0.0930 2238     6.31     6.68
## 50-59         1      1      6.51 0.0947 2238     6.32     6.69
## 18-29         0      2      6.75 0.1157 2238     6.52     6.98
## 30-39         0      2      6.64 0.1172 2238     6.41     6.87
## 40-49         0      2      6.52 0.1173 2238     6.29     6.75
## 50-59         0      2      6.53 0.1196 2238     6.30     6.77
## 18-29         1      2      6.93 0.1163 2238     6.70     7.16
## 30-39         1      2      6.82 0.1177 2238     6.59     7.05

```

```

## 40-49      1      2      6.69 0.1183 2238      6.46      6.93
## 50-59      1      2      6.71 0.1216 2238      6.47      6.95
## 18-29      0      3      6.97 0.0953 2238      6.78      7.15
## 30-39      0      3      6.86 0.0959 2238      6.67      7.05
## 40-49      0      3      6.73 0.0960 2238      6.55      6.92
## 50-59      0      3      6.75 0.1009 2238      6.55      6.95
## 18-29      1      3      7.14 0.0995 2238      6.95      7.34
## 30-39      1      3      7.04 0.1001 2238      6.84      7.23
## 40-49      1      3      6.91 0.1008 2238      6.71      7.11
## 50-59      1      3      6.92 0.1065 2238      6.72      7.13
## 18-29      0      4      6.91 0.0667 2238      6.78      7.04
## 30-39      0      4      6.80 0.0651 2238      6.67      6.93
## 40-49      0      4      6.68 0.0636 2238      6.55      6.80
## 50-59      0      4      6.69 0.0643 2238      6.56      6.82
## 18-29      1      4      7.09 0.0667 2238      6.96      7.22
## 30-39      1      4      6.98 0.0648 2238      6.85      7.11
## 40-49      1      4      6.85 0.0644 2238      6.73      6.98
## 50-59      1      4      6.87 0.0667 2238      6.74      7.00
## 18-29      0      5      6.84 0.1107 2238      6.62      7.06
## 30-39      0      5      6.73 0.1110 2238      6.52      6.95
## 40-49      0      5      6.61 0.1134 2238      6.39      6.83
## 50-59      0      5      6.62 0.1156 2238      6.40      6.85
## 18-29      1      5      7.02 0.1125 2238      6.80      7.24
## 30-39      1      5      6.91 0.1128 2238      6.69      7.13
## 40-49      1      5      6.79 0.1156 2238      6.56      7.01
## 50-59      1      5      6.80 0.1188 2238      6.57      7.03
##
## Confidence level used: 0.95
##
## $contrasts
## contrast estimate SE df t.ratio
## (18-29 Gender0 Race11) - (30-39 Gender0 Race11) 0.107323 0.0767 2238 1.399
## (18-29 Gender0 Race11) - (40-49 Gender0 Race11) 0.232162 0.0769 2238 3.018
## (18-29 Gender0 Race11) - (50-59 Gender0 Race11) 0.218216 0.0794 2238 2.747
## (18-29 Gender0 Race11) - (18-29 Gender1 Race11) -0.176950 0.0551 2238 -3.209
## (18-29 Gender0 Race11) - (30-39 Gender1 Race11) -0.069627 0.0944 2238 -0.738
## (18-29 Gender0 Race11) - (40-49 Gender1 Race11) 0.055212 0.0952 2238 0.580
## (18-29 Gender0 Race11) - (50-59 Gender1 Race11) 0.041266 0.0984 2238 0.419
## (18-29 Gender0 Race11) - (18-29 Gender0 Race12) -0.201636 0.1283 2238 -1.571
## (18-29 Gender0 Race11) - (30-39 Gender0 Race12) -0.094313 0.1502 2238 -0.628
## (18-29 Gender0 Race11) - (40-49 Gender0 Race12) 0.030526 0.1501 2238 0.203
## (18-29 Gender0 Race11) - (50-59 Gender0 Race12) 0.016580 0.1529 2238 0.108
## (18-29 Gender0 Race11) - (18-29 Gender1 Race12) -0.378586 0.1407 2238 -2.690
## (18-29 Gender0 Race11) - (30-39 Gender1 Race12) -0.271263 0.1609 2238 -1.686
## (18-29 Gender0 Race11) - (40-49 Gender1 Race12) -0.146424 0.1612 2238 -0.909
## (18-29 Gender0 Race11) - (50-59 Gender1 Race12) -0.160370 0.1645 2238 -0.975
## (18-29 Gender0 Race11) - (18-29 Gender0 Race13) -0.416992 0.1115 2238 -3.739
## (18-29 Gender0 Race11) - (30-39 Gender0 Race13) -0.309669 0.1353 2238 -2.288
## (18-29 Gender0 Race11) - (40-49 Gender0 Race13) -0.184830 0.1351 2238 -1.368
## (18-29 Gender0 Race11) - (50-59 Gender0 Race13) -0.198776 0.1397 2238 -1.423
## (18-29 Gender0 Race11) - (18-29 Gender1 Race13) -0.593942 0.1283 2238 -4.628
## (18-29 Gender0 Race11) - (30-39 Gender1 Race13) -0.486619 0.1494 2238 -3.257
## (18-29 Gender0 Race11) - (40-49 Gender1 Race13) -0.361780 0.1497 2238 -2.417
## (18-29 Gender0 Race11) - (50-59 Gender1 Race13) -0.375726 0.1546 2238 -2.431

```

| | | | | | | | |
|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (18-29 Gender0 Race11) | - | (18-29 Gender0 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (18-29 Gender0 Race11) | - | (30-39 Gender0 Race14) | -0.253204 | 0.1112 | 2238 | -2.277 |
| ## | (18-29 Gender0 Race11) | - | (40-49 Gender0 Race14) | -0.128364 | 0.1101 | 2238 | -1.166 |
| ## | (18-29 Gender0 Race11) | - | (50-59 Gender0 Race14) | -0.142311 | 0.1118 | 2238 | -1.273 |
| ## | (18-29 Gender0 Race11) | - | (18-29 Gender1 Race14) | -0.537476 | 0.1002 | 2238 | -5.365 |
| ## | (18-29 Gender0 Race11) | - | (30-39 Gender1 Race14) | -0.430154 | 0.1247 | 2238 | -3.450 |
| ## | (18-29 Gender0 Race11) | - | (40-49 Gender1 Race14) | -0.305314 | 0.1242 | 2238 | -2.458 |
| ## | (18-29 Gender0 Race11) | - | (50-59 Gender1 Race14) | -0.319261 | 0.1266 | 2238 | -2.522 |
| ## | (18-29 Gender0 Race11) | - | (18-29 Gender0 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (18-29 Gender0 Race11) | - | (30-39 Gender0 Race15) | -0.186190 | 0.1460 | 2238 | -1.275 |
| ## | (18-29 Gender0 Race11) | - | (40-49 Gender0 Race15) | -0.061351 | 0.1476 | 2238 | -0.416 |
| ## | (18-29 Gender0 Race11) | - | (50-59 Gender0 Race15) | -0.075297 | 0.1503 | 2238 | -0.501 |
| ## | (18-29 Gender0 Race11) | - | (18-29 Gender1 Race15) | -0.470463 | 0.1382 | 2238 | -3.403 |
| ## | (18-29 Gender0 Race11) | - | (30-39 Gender1 Race15) | -0.363140 | 0.1578 | 2238 | -2.301 |
| ## | (18-29 Gender0 Race11) | - | (40-49 Gender1 Race15) | -0.238301 | 0.1597 | 2238 | -1.492 |
| ## | (18-29 Gender0 Race11) | - | (50-59 Gender1 Race15) | -0.252247 | 0.1629 | 2238 | -1.548 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender0 Race11) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender0 Race11) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender1 Race11) | -0.284273 | 0.0946 | 2238 | -3.006 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender1 Race11) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender1 Race11) | -0.052111 | 0.0948 | 2238 | -0.549 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender1 Race11) | -0.066057 | 0.0979 | 2238 | -0.675 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender0 Race12) | -0.308959 | 0.1488 | 2238 | -2.076 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender0 Race12) | -0.201636 | 0.1283 | 2238 | -1.571 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender0 Race12) | -0.076797 | 0.1491 | 2238 | -0.515 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender0 Race12) | -0.090743 | 0.1518 | 2238 | -0.598 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender1 Race12) | -0.485909 | 0.1597 | 2238 | -3.043 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender1 Race12) | -0.378586 | 0.1407 | 2238 | -2.690 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender1 Race12) | -0.253747 | 0.1603 | 2238 | -1.583 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender1 Race12) | -0.267693 | 0.1635 | 2238 | -1.637 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender0 Race13) | -0.524315 | 0.1354 | 2238 | -3.873 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender0 Race13) | -0.416992 | 0.1115 | 2238 | -3.739 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender0 Race13) | -0.292153 | 0.1348 | 2238 | -2.167 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender0 Race13) | -0.306099 | 0.1393 | 2238 | -2.197 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender1 Race13) | -0.701264 | 0.1496 | 2238 | -4.687 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender1 Race13) | -0.593942 | 0.1283 | 2238 | -4.628 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender1 Race13) | -0.469102 | 0.1495 | 2238 | -3.138 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender1 Race13) | -0.483049 | 0.1543 | 2238 | -3.131 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender0 Race14) | -0.467849 | 0.1144 | 2238 | -4.089 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender0 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender0 Race14) | -0.235687 | 0.1113 | 2238 | -2.117 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender0 Race14) | -0.249634 | 0.1129 | 2238 | -2.211 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender1 Race14) | -0.644799 | 0.1277 | 2238 | -5.050 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender1 Race14) | -0.537476 | 0.1002 | 2238 | -5.365 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender1 Race14) | -0.412637 | 0.1254 | 2238 | -3.292 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender1 Race14) | -0.426584 | 0.1277 | 2238 | -3.342 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender0 Race15) | -0.400836 | 0.1464 | 2238 | -2.738 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender0 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender0 Race15) | -0.168674 | 0.1475 | 2238 | -1.144 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender0 Race15) | -0.182620 | 0.1501 | 2238 | -1.216 |
| ## | (30-39 Gender0 Race11) | - | (18-29 Gender1 Race15) | -0.577786 | 0.1584 | 2238 | -3.649 |
| ## | (30-39 Gender0 Race11) | - | (30-39 Gender1 Race15) | -0.470463 | 0.1382 | 2238 | -3.403 |
| ## | (30-39 Gender0 Race11) | - | (40-49 Gender1 Race15) | -0.345624 | 0.1597 | 2238 | -2.164 |
| ## | (30-39 Gender0 Race11) | - | (50-59 Gender1 Race15) | -0.359570 | 0.1628 | 2238 | -2.208 |

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|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender0 Race11) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender1 Race11) | -0.409112 | 0.0941 | 2238 | -4.350 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender1 Race11) | -0.301789 | 0.0935 | 2238 | -3.229 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender1 Race11) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender1 Race11) | -0.190896 | 0.0971 | 2238 | -1.967 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender0 Race12) | -0.433798 | 0.1491 | 2238 | -2.909 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender0 Race12) | -0.326475 | 0.1495 | 2238 | -2.183 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender0 Race12) | -0.201636 | 0.1283 | 2238 | -1.571 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender0 Race12) | -0.215582 | 0.1519 | 2238 | -1.419 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender1 Race12) | -0.610748 | 0.1596 | 2238 | -3.826 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender1 Race12) | -0.503425 | 0.1599 | 2238 | -3.148 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender1 Race12) | -0.378586 | 0.1407 | 2238 | -2.690 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender1 Race12) | -0.392532 | 0.1633 | 2238 | -2.404 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender0 Race13) | -0.649154 | 0.1358 | 2238 | -4.780 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender0 Race13) | -0.541831 | 0.1354 | 2238 | -4.000 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender0 Race13) | -0.416992 | 0.1115 | 2238 | -3.739 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender0 Race13) | -0.430938 | 0.1395 | 2238 | -3.089 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender1 Race13) | -0.826104 | 0.1496 | 2238 | -5.524 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender1 Race13) | -0.718781 | 0.1492 | 2238 | -4.819 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender1 Race13) | -0.593942 | 0.1283 | 2238 | -4.628 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender1 Race13) | -0.607888 | 0.1540 | 2238 | -3.947 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender0 Race14) | -0.592688 | 0.1157 | 2238 | -5.121 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender0 Race14) | -0.485366 | 0.1138 | 2238 | -4.266 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender0 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender0 Race14) | -0.374473 | 0.1140 | 2238 | -3.285 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender1 Race14) | -0.769638 | 0.1284 | 2238 | -5.995 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender1 Race14) | -0.662315 | 0.1265 | 2238 | -5.234 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender1 Race14) | -0.537476 | 0.1002 | 2238 | -5.365 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender1 Race14) | -0.551423 | 0.1281 | 2238 | -4.305 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender0 Race15) | -0.525675 | 0.1450 | 2238 | -3.625 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender0 Race15) | -0.418352 | 0.1445 | 2238 | -2.895 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender0 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender0 Race15) | -0.307459 | 0.1485 | 2238 | -2.070 |
| ## | (40-49 Gender0 Race11) | - | (18-29 Gender1 Race15) | -0.702625 | 0.1566 | 2238 | -4.485 |
| ## | (40-49 Gender0 Race11) | - | (30-39 Gender1 Race15) | -0.595302 | 0.1561 | 2238 | -3.814 |
| ## | (40-49 Gender0 Race11) | - | (40-49 Gender1 Race15) | -0.470463 | 0.1382 | 2238 | -3.403 |
| ## | (40-49 Gender0 Race11) | - | (50-59 Gender1 Race15) | -0.484409 | 0.1610 | 2238 | -3.010 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender1 Race11) | -0.395166 | 0.0950 | 2238 | -4.161 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender1 Race11) | -0.287843 | 0.0943 | 2238 | -3.054 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender1 Race11) | -0.163004 | 0.0948 | 2238 | -1.720 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender1 Race11) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender0 Race12) | -0.419852 | 0.1489 | 2238 | -2.819 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender0 Race12) | -0.312529 | 0.1492 | 2238 | -2.094 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender0 Race12) | -0.187690 | 0.1489 | 2238 | -1.261 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender0 Race12) | -0.201636 | 0.1283 | 2238 | -1.571 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender1 Race12) | -0.596801 | 0.1587 | 2238 | -3.760 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender1 Race12) | -0.489479 | 0.1589 | 2238 | -3.080 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender1 Race12) | -0.364640 | 0.1590 | 2238 | -2.293 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender1 Race12) | -0.378586 | 0.1407 | 2238 | -2.690 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender0 Race13) | -0.635207 | 0.1341 | 2238 | -4.738 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender0 Race13) | -0.527885 | 0.1336 | 2238 | -3.951 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender0 Race13) | -0.403046 | 0.1331 | 2238 | -3.027 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender0 Race13) | -0.416992 | 0.1115 | 2238 | -3.739 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender1 Race13) | -0.812157 | 0.1472 | 2238 | -5.516 |

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|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender1 Race13) | -0.704835 | 0.1467 | 2238 | -4.803 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender1 Race13) | -0.579995 | 0.1468 | 2238 | -3.952 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender1 Race13) | -0.593942 | 0.1283 | 2238 | -4.628 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender0 Race14) | -0.578742 | 0.1175 | 2238 | -4.926 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender0 Race14) | -0.471419 | 0.1154 | 2238 | -4.084 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender0 Race14) | -0.346580 | 0.1141 | 2238 | -3.038 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender0 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender1 Race14) | -0.755692 | 0.1291 | 2238 | -5.854 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender1 Race14) | -0.648369 | 0.1272 | 2238 | -5.098 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender1 Race14) | -0.523530 | 0.1264 | 2238 | -4.141 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender1 Race14) | -0.537476 | 0.1002 | 2238 | -5.365 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender0 Race15) | -0.511729 | 0.1449 | 2238 | -3.531 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender0 Race15) | -0.404406 | 0.1443 | 2238 | -2.802 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender0 Race15) | -0.279566 | 0.1457 | 2238 | -1.919 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender0 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (50-59 Gender0 Race11) | - | (18-29 Gender1 Race15) | -0.688678 | 0.1559 | 2238 | -4.418 |
| ## | (50-59 Gender0 Race11) | - | (30-39 Gender1 Race15) | -0.581356 | 0.1552 | 2238 | -3.745 |
| ## | (50-59 Gender0 Race11) | - | (40-49 Gender1 Race15) | -0.456516 | 0.1569 | 2238 | -2.909 |
| ## | (50-59 Gender0 Race11) | - | (50-59 Gender1 Race15) | -0.470463 | 0.1382 | 2238 | -3.403 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender1 Race11) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender1 Race11) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender1 Race11) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender0 Race12) | -0.024686 | 0.1386 | 2238 | -0.178 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender0 Race12) | 0.082637 | 0.1591 | 2238 | 0.519 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender0 Race12) | 0.207476 | 0.1586 | 2238 | 1.308 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender0 Race12) | 0.193530 | 0.1606 | 2238 | 1.205 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender1 Race12) | -0.201636 | 0.1283 | 2238 | -1.571 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender1 Race12) | -0.094313 | 0.1502 | 2238 | -0.628 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender1 Race12) | 0.030526 | 0.1501 | 2238 | 0.203 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender1 Race12) | 0.016580 | 0.1529 | 2238 | 0.108 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender0 Race13) | -0.240042 | 0.1203 | 2238 | -1.995 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender0 Race13) | -0.132719 | 0.1427 | 2238 | -0.930 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender0 Race13) | -0.007880 | 0.1421 | 2238 | -0.055 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender0 Race13) | -0.021826 | 0.1457 | 2238 | -0.150 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender1 Race13) | -0.416992 | 0.1115 | 2238 | -3.739 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender1 Race13) | -0.309669 | 0.1353 | 2238 | -2.288 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender1 Race13) | -0.184830 | 0.1351 | 2238 | -1.368 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender1 Race13) | -0.198776 | 0.1397 | 2238 | -1.423 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender0 Race14) | -0.183577 | 0.0986 | 2238 | -1.861 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender0 Race14) | -0.076254 | 0.1236 | 2238 | -0.617 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender0 Race14) | 0.048585 | 0.1220 | 2238 | 0.398 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender0 Race14) | 0.034639 | 0.1227 | 2238 | 0.282 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender1 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender1 Race14) | -0.253204 | 0.1112 | 2238 | -2.277 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender1 Race14) | -0.128364 | 0.1101 | 2238 | -1.166 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender1 Race14) | -0.142311 | 0.1118 | 2238 | -1.273 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender0 Race15) | -0.116563 | 0.1340 | 2238 | -0.870 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender0 Race15) | -0.009240 | 0.1542 | 2238 | -0.060 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender0 Race15) | 0.115599 | 0.1553 | 2238 | 0.744 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender0 Race15) | 0.101653 | 0.1572 | 2238 | 0.647 |
| ## | (18-29 Gender1 Race11) | - | (18-29 Gender1 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (18-29 Gender1 Race11) | - | (30-39 Gender1 Race15) | -0.186190 | 0.1460 | 2238 | -1.275 |
| ## | (18-29 Gender1 Race11) | - | (40-49 Gender1 Race15) | -0.061351 | 0.1476 | 2238 | -0.416 |
| ## | (18-29 Gender1 Race11) | - | (50-59 Gender1 Race15) | -0.075297 | 0.1503 | 2238 | -0.501 |

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|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender1 Race11) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender1 Race11) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender0 Race12) | -0.132009 | 0.1577 | 2238 | -0.837 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender0 Race12) | -0.024686 | 0.1386 | 2238 | -0.178 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender0 Race12) | 0.100153 | 0.1576 | 2238 | 0.636 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender0 Race12) | 0.086207 | 0.1595 | 2238 | 0.540 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender1 Race12) | -0.308959 | 0.1488 | 2238 | -2.076 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender1 Race12) | -0.201636 | 0.1283 | 2238 | -1.571 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender1 Race12) | -0.076797 | 0.1491 | 2238 | -0.515 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender1 Race12) | -0.090743 | 0.1518 | 2238 | -0.598 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender0 Race13) | -0.347365 | 0.1427 | 2238 | -2.435 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender0 Race13) | -0.240042 | 0.1203 | 2238 | -1.995 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender0 Race13) | -0.115203 | 0.1417 | 2238 | -0.813 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender0 Race13) | -0.129149 | 0.1453 | 2238 | -0.889 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender1 Race13) | -0.524315 | 0.1354 | 2238 | -3.873 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender1 Race13) | -0.416992 | 0.1115 | 2238 | -3.739 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender1 Race13) | -0.292153 | 0.1348 | 2238 | -2.167 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender1 Race13) | -0.306099 | 0.1393 | 2238 | -2.197 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender0 Race14) | -0.290899 | 0.1263 | 2238 | -2.303 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender0 Race14) | -0.183577 | 0.0986 | 2238 | -1.861 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender0 Race14) | -0.058737 | 0.1231 | 2238 | -0.477 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender0 Race14) | -0.072684 | 0.1236 | 2238 | -0.588 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender1 Race14) | -0.467849 | 0.1144 | 2238 | -4.089 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender1 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender1 Race14) | -0.235687 | 0.1113 | 2238 | -2.117 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender1 Race14) | -0.249634 | 0.1129 | 2238 | -2.211 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender0 Race15) | -0.223886 | 0.1545 | 2238 | -1.449 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender0 Race15) | -0.116563 | 0.1340 | 2238 | -0.870 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender0 Race15) | 0.008276 | 0.1552 | 2238 | 0.053 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender0 Race15) | -0.005670 | 0.1570 | 2238 | -0.036 |
| ## | (30-39 Gender1 Race11) | - | (18-29 Gender1 Race15) | -0.400836 | 0.1464 | 2238 | -2.738 |
| ## | (30-39 Gender1 Race11) | - | (30-39 Gender1 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (30-39 Gender1 Race11) | - | (40-49 Gender1 Race15) | -0.168674 | 0.1475 | 2238 | -1.144 |
| ## | (30-39 Gender1 Race11) | - | (50-59 Gender1 Race15) | -0.182620 | 0.1501 | 2238 | -1.216 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender1 Race11) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender0 Race12) | -0.256848 | 0.1584 | 2238 | -1.621 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender0 Race12) | -0.149525 | 0.1588 | 2238 | -0.941 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender0 Race12) | -0.024686 | 0.1386 | 2238 | -0.178 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender0 Race12) | -0.038632 | 0.1600 | 2238 | -0.241 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender1 Race12) | -0.433798 | 0.1491 | 2238 | -2.909 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender1 Race12) | -0.326475 | 0.1495 | 2238 | -2.183 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender1 Race12) | -0.201636 | 0.1283 | 2238 | -1.571 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender1 Race12) | -0.215582 | 0.1519 | 2238 | -1.419 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender0 Race13) | -0.472204 | 0.1435 | 2238 | -3.290 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender0 Race13) | -0.364881 | 0.1432 | 2238 | -2.547 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender0 Race13) | -0.240042 | 0.1203 | 2238 | -1.995 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender0 Race13) | -0.253988 | 0.1459 | 2238 | -1.741 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender1 Race13) | -0.649154 | 0.1358 | 2238 | -4.780 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender1 Race13) | -0.541831 | 0.1354 | 2238 | -4.000 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender1 Race13) | -0.416992 | 0.1115 | 2238 | -3.739 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender1 Race13) | -0.430938 | 0.1395 | 2238 | -3.089 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender0 Race14) | -0.415739 | 0.1280 | 2238 | -3.247 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender0 Race14) | -0.308416 | 0.1263 | 2238 | -2.441 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender0 Race14) | -0.183577 | 0.0986 | 2238 | -1.861 |

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| ## | (40-49 Gender1 Race11) | - | (50-59 Gender0 Race14) | -0.197523 | 0.1251 | 2238 | -1.579 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender1 Race14) | -0.592688 | 0.1157 | 2238 | -5.121 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender1 Race14) | -0.485366 | 0.1138 | 2238 | -4.266 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender1 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender1 Race14) | -0.374473 | 0.1140 | 2238 | -3.285 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender0 Race15) | -0.348725 | 0.1536 | 2238 | -2.270 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender0 Race15) | -0.241402 | 0.1532 | 2238 | -1.576 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender0 Race15) | -0.116563 | 0.1340 | 2238 | -0.870 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender0 Race15) | -0.130509 | 0.1559 | 2238 | -0.837 |
| ## | (40-49 Gender1 Race11) | - | (18-29 Gender1 Race15) | -0.525675 | 0.1450 | 2238 | -3.625 |
| ## | (40-49 Gender1 Race11) | - | (30-39 Gender1 Race15) | -0.418352 | 0.1445 | 2238 | -2.895 |
| ## | (40-49 Gender1 Race11) | - | (40-49 Gender1 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (40-49 Gender1 Race11) | - | (50-59 Gender1 Race15) | -0.307459 | 0.1485 | 2238 | -2.070 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender0 Race12) | -0.242902 | 0.1589 | 2238 | -1.529 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender0 Race12) | -0.135579 | 0.1592 | 2238 | -0.851 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender0 Race12) | -0.010740 | 0.1585 | 2238 | -0.068 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender0 Race12) | -0.024686 | 0.1386 | 2238 | -0.178 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender1 Race12) | -0.419852 | 0.1489 | 2238 | -2.819 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender1 Race12) | -0.312529 | 0.1492 | 2238 | -2.094 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender1 Race12) | -0.187690 | 0.1489 | 2238 | -1.261 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender1 Race12) | -0.201636 | 0.1283 | 2238 | -1.571 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender0 Race13) | -0.458257 | 0.1426 | 2238 | -3.213 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender0 Race13) | -0.350935 | 0.1423 | 2238 | -2.467 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender0 Race13) | -0.226096 | 0.1414 | 2238 | -1.599 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender0 Race13) | -0.240042 | 0.1203 | 2238 | -1.995 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender1 Race13) | -0.635207 | 0.1341 | 2238 | -4.738 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender1 Race13) | -0.527885 | 0.1336 | 2238 | -3.951 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender1 Race13) | -0.403046 | 0.1331 | 2238 | -3.027 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender1 Race13) | -0.416992 | 0.1115 | 2238 | -3.739 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender0 Race14) | -0.401792 | 0.1304 | 2238 | -3.080 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender0 Race14) | -0.294469 | 0.1287 | 2238 | -2.288 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender0 Race14) | -0.169630 | 0.1270 | 2238 | -1.336 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender0 Race14) | -0.183577 | 0.0986 | 2238 | -1.861 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender1 Race14) | -0.578742 | 0.1175 | 2238 | -4.926 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender1 Race14) | -0.471419 | 0.1154 | 2238 | -4.084 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender1 Race14) | -0.346580 | 0.1141 | 2238 | -3.038 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender1 Race14) | -0.360527 | 0.0827 | 2238 | -4.358 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender0 Race15) | -0.334779 | 0.1543 | 2238 | -2.170 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender0 Race15) | -0.227456 | 0.1537 | 2238 | -1.479 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender0 Race15) | -0.102617 | 0.1546 | 2238 | -0.664 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender0 Race15) | -0.116563 | 0.1340 | 2238 | -0.870 |
| ## | (50-59 Gender1 Race11) | - | (18-29 Gender1 Race15) | -0.511729 | 0.1449 | 2238 | -3.531 |
| ## | (50-59 Gender1 Race11) | - | (30-39 Gender1 Race15) | -0.404406 | 0.1443 | 2238 | -2.802 |
| ## | (50-59 Gender1 Race11) | - | (40-49 Gender1 Race15) | -0.279566 | 0.1457 | 2238 | -1.919 |
| ## | (50-59 Gender1 Race11) | - | (50-59 Gender1 Race15) | -0.293513 | 0.1245 | 2238 | -2.358 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender0 Race12) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender0 Race12) | - | (40-49 Gender0 Race12) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender0 Race12) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender0 Race12) | - | (18-29 Gender1 Race12) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender1 Race12) | -0.069627 | 0.0944 | 2238 | -0.738 |
| ## | (18-29 Gender0 Race12) | - | (40-49 Gender1 Race12) | 0.055212 | 0.0952 | 2238 | 0.580 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender1 Race12) | 0.041266 | 0.0984 | 2238 | 0.419 |
| ## | (18-29 Gender0 Race12) | - | (18-29 Gender0 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender0 Race13) | -0.108033 | 0.1526 | 2238 | -0.708 |

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| ## | (18-29 Gender0 Race12) | - | (40-49 Gender0 Race13) | 0.016806 | 0.1527 | 2238 | 0.110 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender0 Race13) | 0.002860 | 0.1553 | 2238 | 0.018 |
| ## | (18-29 Gender0 Race12) | - | (18-29 Gender1 Race13) | -0.392306 | 0.1462 | 2238 | -2.684 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender1 Race13) | -0.284983 | 0.1644 | 2238 | -1.734 |
| ## | (18-29 Gender0 Race12) | - | (40-49 Gender1 Race13) | -0.160144 | 0.1648 | 2238 | -0.972 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender1 Race13) | -0.174090 | 0.1679 | 2238 | -1.037 |
| ## | (18-29 Gender0 Race12) | - | (18-29 Gender0 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender0 Race14) | -0.051568 | 0.1322 | 2238 | -0.390 |
| ## | (18-29 Gender0 Race12) | - | (40-49 Gender0 Race14) | 0.073271 | 0.1315 | 2238 | 0.557 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender0 Race14) | 0.059325 | 0.1312 | 2238 | 0.452 |
| ## | (18-29 Gender0 Race12) | - | (18-29 Gender1 Race14) | -0.335840 | 0.1226 | 2238 | -2.738 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender1 Race14) | -0.228518 | 0.1426 | 2238 | -1.602 |
| ## | (18-29 Gender0 Race12) | - | (40-49 Gender1 Race14) | -0.103679 | 0.1424 | 2238 | -0.728 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender1 Race14) | -0.117625 | 0.1429 | 2238 | -0.823 |
| ## | (18-29 Gender0 Race12) | - | (18-29 Gender0 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender0 Race15) | 0.015446 | 0.1623 | 2238 | 0.095 |
| ## | (18-29 Gender0 Race12) | - | (40-49 Gender0 Race15) | 0.140285 | 0.1639 | 2238 | 0.856 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender0 Race15) | 0.126339 | 0.1650 | 2238 | 0.766 |
| ## | (18-29 Gender0 Race12) | - | (18-29 Gender1 Race15) | -0.268827 | 0.1550 | 2238 | -1.734 |
| ## | (18-29 Gender0 Race12) | - | (30-39 Gender1 Race15) | -0.161504 | 0.1721 | 2238 | -0.938 |
| ## | (18-29 Gender0 Race12) | - | (40-49 Gender1 Race15) | -0.036665 | 0.1741 | 2238 | -0.211 |
| ## | (18-29 Gender0 Race12) | - | (50-59 Gender1 Race15) | -0.050611 | 0.1757 | 2238 | -0.288 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender0 Race12) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender0 Race12) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender0 Race12) | - | (18-29 Gender1 Race12) | -0.284273 | 0.0946 | 2238 | -3.006 |
| ## | (30-39 Gender0 Race12) | - | (30-39 Gender1 Race12) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender1 Race12) | -0.052111 | 0.0948 | 2238 | -0.549 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender1 Race12) | -0.066057 | 0.0979 | 2238 | -0.675 |
| ## | (30-39 Gender0 Race12) | - | (18-29 Gender0 Race13) | -0.322679 | 0.1541 | 2238 | -2.095 |
| ## | (30-39 Gender0 Race12) | - | (30-39 Gender0 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender0 Race13) | -0.090517 | 0.1531 | 2238 | -0.591 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender0 Race13) | -0.104463 | 0.1556 | 2238 | -0.671 |
| ## | (30-39 Gender0 Race12) | - | (18-29 Gender1 Race13) | -0.499629 | 0.1658 | 2238 | -3.014 |
| ## | (30-39 Gender0 Race12) | - | (30-39 Gender1 Race13) | -0.392306 | 0.1462 | 2238 | -2.684 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender1 Race13) | -0.267467 | 0.1652 | 2238 | -1.619 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender1 Race13) | -0.281413 | 0.1682 | 2238 | -1.673 |
| ## | (30-39 Gender0 Race12) | - | (18-29 Gender0 Race14) | -0.266213 | 0.1364 | 2238 | -1.952 |
| ## | (30-39 Gender0 Race12) | - | (30-39 Gender0 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender0 Race14) | -0.034051 | 0.1333 | 2238 | -0.255 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender0 Race14) | -0.047998 | 0.1329 | 2238 | -0.361 |
| ## | (30-39 Gender0 Race12) | - | (18-29 Gender1 Race14) | -0.443163 | 0.1467 | 2238 | -3.021 |
| ## | (30-39 Gender0 Race12) | - | (30-39 Gender1 Race14) | -0.335840 | 0.1226 | 2238 | -2.738 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender1 Race14) | -0.211001 | 0.1442 | 2238 | -1.463 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender1 Race14) | -0.224948 | 0.1446 | 2238 | -1.556 |
| ## | (30-39 Gender0 Race12) | - | (18-29 Gender0 Race15) | -0.199200 | 0.1639 | 2238 | -1.215 |
| ## | (30-39 Gender0 Race12) | - | (30-39 Gender0 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender0 Race15) | 0.032962 | 0.1645 | 2238 | 0.200 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender0 Race15) | 0.019016 | 0.1654 | 2238 | 0.115 |
| ## | (30-39 Gender0 Race12) | - | (18-29 Gender1 Race15) | -0.376150 | 0.1738 | 2238 | -2.164 |
| ## | (30-39 Gender0 Race12) | - | (30-39 Gender1 Race15) | -0.268827 | 0.1550 | 2238 | -1.734 |
| ## | (30-39 Gender0 Race12) | - | (40-49 Gender1 Race15) | -0.143988 | 0.1746 | 2238 | -0.825 |
| ## | (30-39 Gender0 Race12) | - | (50-59 Gender1 Race15) | -0.157934 | 0.1762 | 2238 | -0.896 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender0 Race12) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender0 Race12) | - | (18-29 Gender1 Race12) | -0.409112 | 0.0941 | 2238 | -4.350 |

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| ## | (40-49 Gender0 Race12) | - | (30-39 Gender1 Race12) | -0.301789 | 0.0935 | 2238 | -3.229 |
| ## | (40-49 Gender0 Race12) | - | (40-49 Gender1 Race12) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender1 Race12) | -0.190896 | 0.0971 | 2238 | -1.967 |
| ## | (40-49 Gender0 Race12) | - | (18-29 Gender0 Race13) | -0.447518 | 0.1542 | 2238 | -2.902 |
| ## | (40-49 Gender0 Race12) | - | (30-39 Gender0 Race13) | -0.340195 | 0.1532 | 2238 | -2.221 |
| ## | (40-49 Gender0 Race12) | - | (40-49 Gender0 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender0 Race13) | -0.229302 | 0.1555 | 2238 | -1.474 |
| ## | (40-49 Gender0 Race12) | - | (18-29 Gender1 Race13) | -0.624468 | 0.1655 | 2238 | -3.773 |
| ## | (40-49 Gender0 Race12) | - | (30-39 Gender1 Race13) | -0.517145 | 0.1645 | 2238 | -3.143 |
| ## | (40-49 Gender0 Race12) | - | (40-49 Gender1 Race13) | -0.392306 | 0.1462 | 2238 | -2.684 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender1 Race13) | -0.406252 | 0.1678 | 2238 | -2.421 |
| ## | (40-49 Gender0 Race12) | - | (18-29 Gender0 Race14) | -0.391053 | 0.1373 | 2238 | -2.849 |
| ## | (40-49 Gender0 Race12) | - | (30-39 Gender0 Race14) | -0.283730 | 0.1348 | 2238 | -2.104 |
| ## | (40-49 Gender0 Race12) | - | (40-49 Gender0 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender0 Race14) | -0.172837 | 0.1335 | 2238 | -1.294 |
| ## | (40-49 Gender0 Race12) | - | (18-29 Gender1 Race14) | -0.568002 | 0.1470 | 2238 | -3.863 |
| ## | (40-49 Gender0 Race12) | - | (30-39 Gender1 Race14) | -0.460680 | 0.1447 | 2238 | -3.183 |
| ## | (40-49 Gender0 Race12) | - | (40-49 Gender1 Race14) | -0.335840 | 0.1226 | 2238 | -2.738 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender1 Race14) | -0.349787 | 0.1447 | 2238 | -2.417 |
| ## | (40-49 Gender0 Race12) | - | (18-29 Gender0 Race15) | -0.324039 | 0.1624 | 2238 | -1.995 |
| ## | (40-49 Gender0 Race12) | - | (30-39 Gender0 Race15) | -0.216716 | 0.1613 | 2238 | -1.343 |
| ## | (40-49 Gender0 Race12) | - | (40-49 Gender0 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender0 Race15) | -0.105823 | 0.1638 | 2238 | -0.646 |
| ## | (40-49 Gender0 Race12) | - | (18-29 Gender1 Race15) | -0.500989 | 0.1720 | 2238 | -2.912 |
| ## | (40-49 Gender0 Race12) | - | (30-39 Gender1 Race15) | -0.393666 | 0.1709 | 2238 | -2.303 |
| ## | (40-49 Gender0 Race12) | - | (40-49 Gender1 Race15) | -0.268827 | 0.1550 | 2238 | -1.734 |
| ## | (40-49 Gender0 Race12) | - | (50-59 Gender1 Race15) | -0.282773 | 0.1742 | 2238 | -1.623 |
| ## | (50-59 Gender0 Race12) | - | (18-29 Gender1 Race12) | -0.395166 | 0.0950 | 2238 | -4.161 |
| ## | (50-59 Gender0 Race12) | - | (30-39 Gender1 Race12) | -0.287843 | 0.0943 | 2238 | -3.054 |
| ## | (50-59 Gender0 Race12) | - | (40-49 Gender1 Race12) | -0.163004 | 0.0948 | 2238 | -1.720 |
| ## | (50-59 Gender0 Race12) | - | (50-59 Gender1 Race12) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (50-59 Gender0 Race12) | - | (18-29 Gender0 Race13) | -0.433571 | 0.1542 | 2238 | -2.812 |
| ## | (50-59 Gender0 Race12) | - | (30-39 Gender0 Race13) | -0.326249 | 0.1531 | 2238 | -2.131 |
| ## | (50-59 Gender0 Race12) | - | (40-49 Gender0 Race13) | -0.201409 | 0.1529 | 2238 | -1.317 |
| ## | (50-59 Gender0 Race12) | - | (50-59 Gender0 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (50-59 Gender0 Race12) | - | (18-29 Gender1 Race13) | -0.610521 | 0.1648 | 2238 | -3.704 |
| ## | (50-59 Gender0 Race12) | - | (30-39 Gender1 Race13) | -0.503199 | 0.1638 | 2238 | -3.073 |
| ## | (50-59 Gender0 Race12) | - | (40-49 Gender1 Race13) | -0.378359 | 0.1640 | 2238 | -2.307 |
| ## | (50-59 Gender0 Race12) | - | (50-59 Gender1 Race13) | -0.392306 | 0.1462 | 2238 | -2.684 |
| ## | (50-59 Gender0 Race12) | - | (18-29 Gender0 Race14) | -0.377106 | 0.1404 | 2238 | -2.686 |
| ## | (50-59 Gender0 Race12) | - | (30-39 Gender0 Race14) | -0.269783 | 0.1379 | 2238 | -1.956 |
| ## | (50-59 Gender0 Race12) | - | (40-49 Gender0 Race14) | -0.144944 | 0.1370 | 2238 | -1.058 |
| ## | (50-59 Gender0 Race12) | - | (50-59 Gender0 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (50-59 Gender0 Race12) | - | (18-29 Gender1 Race14) | -0.554056 | 0.1492 | 2238 | -3.713 |
| ## | (50-59 Gender0 Race12) | - | (30-39 Gender1 Race14) | -0.446733 | 0.1469 | 2238 | -3.042 |
| ## | (50-59 Gender0 Race12) | - | (40-49 Gender1 Race14) | -0.321894 | 0.1465 | 2238 | -2.198 |
| ## | (50-59 Gender0 Race12) | - | (50-59 Gender1 Race14) | -0.335840 | 0.1226 | 2238 | -2.738 |
| ## | (50-59 Gender0 Race12) | - | (18-29 Gender0 Race15) | -0.310093 | 0.1638 | 2238 | -1.893 |
| ## | (50-59 Gender0 Race12) | - | (30-39 Gender0 Race15) | -0.202770 | 0.1626 | 2238 | -1.247 |
| ## | (50-59 Gender0 Race12) | - | (40-49 Gender0 Race15) | -0.077931 | 0.1641 | 2238 | -0.475 |
| ## | (50-59 Gender0 Race12) | - | (50-59 Gender0 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (50-59 Gender0 Race12) | - | (18-29 Gender1 Race15) | -0.487042 | 0.1727 | 2238 | -2.821 |
| ## | (50-59 Gender0 Race12) | - | (30-39 Gender1 Race15) | -0.379720 | 0.1715 | 2238 | -2.214 |
| ## | (50-59 Gender0 Race12) | - | (40-49 Gender1 Race15) | -0.254881 | 0.1732 | 2238 | -1.471 |

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|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (50-59 Gender0 Race12) | - | (50-59 Gender1 Race15) | -0.268827 | 0.1550 | 2238 | -1.734 |
| ## | (18-29 Gender1 Race12) | - | (30-39 Gender1 Race12) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender1 Race12) | - | (40-49 Gender1 Race12) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender1 Race12) | - | (50-59 Gender1 Race12) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender1 Race12) | - | (18-29 Gender0 Race13) | -0.038406 | 0.1413 | 2238 | -0.272 |
| ## | (18-29 Gender1 Race12) | - | (30-39 Gender0 Race13) | 0.068917 | 0.1602 | 2238 | 0.430 |
| ## | (18-29 Gender1 Race12) | - | (40-49 Gender0 Race13) | 0.193756 | 0.1599 | 2238 | 1.212 |
| ## | (18-29 Gender1 Race12) | - | (50-59 Gender0 Race13) | 0.179810 | 0.1617 | 2238 | 1.112 |
| ## | (18-29 Gender1 Race12) | - | (18-29 Gender1 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (18-29 Gender1 Race12) | - | (30-39 Gender1 Race13) | -0.108033 | 0.1526 | 2238 | -0.708 |
| ## | (18-29 Gender1 Race12) | - | (40-49 Gender1 Race13) | 0.016806 | 0.1527 | 2238 | 0.110 |
| ## | (18-29 Gender1 Race12) | - | (50-59 Gender1 Race13) | 0.002860 | 0.1553 | 2238 | 0.018 |
| ## | (18-29 Gender1 Race12) | - | (18-29 Gender0 Race14) | 0.018059 | 0.1238 | 2238 | 0.146 |
| ## | (18-29 Gender1 Race12) | - | (30-39 Gender0 Race14) | 0.125382 | 0.1438 | 2238 | 0.872 |
| ## | (18-29 Gender1 Race12) | - | (40-49 Gender0 Race14) | 0.250221 | 0.1427 | 2238 | 1.753 |
| ## | (18-29 Gender1 Race12) | - | (50-59 Gender0 Race14) | 0.236275 | 0.1416 | 2238 | 1.668 |
| ## | (18-29 Gender1 Race12) | - | (18-29 Gender1 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (18-29 Gender1 Race12) | - | (30-39 Gender1 Race14) | -0.051568 | 0.1322 | 2238 | -0.390 |
| ## | (18-29 Gender1 Race12) | - | (40-49 Gender1 Race14) | 0.073271 | 0.1315 | 2238 | 0.557 |
| ## | (18-29 Gender1 Race12) | - | (50-59 Gender1 Race14) | 0.059325 | 0.1312 | 2238 | 0.452 |
| ## | (18-29 Gender1 Race12) | - | (18-29 Gender0 Race15) | 0.085073 | 0.1532 | 2238 | 0.555 |
| ## | (18-29 Gender1 Race12) | - | (30-39 Gender0 Race15) | 0.192396 | 0.1706 | 2238 | 1.128 |
| ## | (18-29 Gender1 Race12) | - | (40-49 Gender0 Race15) | 0.317235 | 0.1718 | 2238 | 1.846 |
| ## | (18-29 Gender1 Race12) | - | (50-59 Gender0 Race15) | 0.303289 | 0.1722 | 2238 | 1.761 |
| ## | (18-29 Gender1 Race12) | - | (18-29 Gender1 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (18-29 Gender1 Race12) | - | (30-39 Gender1 Race15) | 0.015446 | 0.1623 | 2238 | 0.095 |
| ## | (18-29 Gender1 Race12) | - | (40-49 Gender1 Race15) | 0.140285 | 0.1639 | 2238 | 0.856 |
| ## | (18-29 Gender1 Race12) | - | (50-59 Gender1 Race15) | 0.126339 | 0.1650 | 2238 | 0.766 |
| ## | (30-39 Gender1 Race12) | - | (40-49 Gender1 Race12) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender1 Race12) | - | (50-59 Gender1 Race12) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender1 Race12) | - | (18-29 Gender0 Race13) | -0.145729 | 0.1614 | 2238 | -0.903 |
| ## | (30-39 Gender1 Race12) | - | (30-39 Gender0 Race13) | -0.038406 | 0.1413 | 2238 | -0.272 |
| ## | (30-39 Gender1 Race12) | - | (40-49 Gender0 Race13) | 0.086433 | 0.1602 | 2238 | 0.540 |
| ## | (30-39 Gender1 Race12) | - | (50-59 Gender0 Race13) | 0.072487 | 0.1619 | 2238 | 0.448 |
| ## | (30-39 Gender1 Race12) | - | (18-29 Gender1 Race13) | -0.322679 | 0.1541 | 2238 | -2.095 |
| ## | (30-39 Gender1 Race12) | - | (30-39 Gender1 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (30-39 Gender1 Race12) | - | (40-49 Gender1 Race13) | -0.090517 | 0.1531 | 2238 | -0.591 |
| ## | (30-39 Gender1 Race12) | - | (50-59 Gender1 Race13) | -0.104463 | 0.1556 | 2238 | -0.671 |
| ## | (30-39 Gender1 Race12) | - | (18-29 Gender0 Race14) | -0.089264 | 0.1475 | 2238 | -0.605 |
| ## | (30-39 Gender1 Race12) | - | (30-39 Gender0 Race14) | 0.018059 | 0.1238 | 2238 | 0.146 |
| ## | (30-39 Gender1 Race12) | - | (40-49 Gender0 Race14) | 0.142898 | 0.1443 | 2238 | 0.990 |
| ## | (30-39 Gender1 Race12) | - | (50-59 Gender0 Race14) | 0.128952 | 0.1432 | 2238 | 0.901 |
| ## | (30-39 Gender1 Race12) | - | (18-29 Gender1 Race14) | -0.266213 | 0.1364 | 2238 | -1.952 |
| ## | (30-39 Gender1 Race12) | - | (30-39 Gender1 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (30-39 Gender1 Race12) | - | (40-49 Gender1 Race14) | -0.034051 | 0.1333 | 2238 | -0.255 |
| ## | (30-39 Gender1 Race12) | - | (50-59 Gender1 Race14) | -0.047998 | 0.1329 | 2238 | -0.361 |
| ## | (30-39 Gender1 Race12) | - | (18-29 Gender0 Race15) | -0.022250 | 0.1721 | 2238 | -0.129 |
| ## | (30-39 Gender1 Race12) | - | (30-39 Gender0 Race15) | 0.085073 | 0.1532 | 2238 | 0.555 |
| ## | (30-39 Gender1 Race12) | - | (40-49 Gender0 Race15) | 0.209912 | 0.1723 | 2238 | 1.218 |
| ## | (30-39 Gender1 Race12) | - | (50-59 Gender0 Race15) | 0.195966 | 0.1726 | 2238 | 1.135 |
| ## | (30-39 Gender1 Race12) | - | (18-29 Gender1 Race15) | -0.199200 | 0.1639 | 2238 | -1.215 |
| ## | (30-39 Gender1 Race12) | - | (30-39 Gender1 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (30-39 Gender1 Race12) | - | (40-49 Gender1 Race15) | 0.032962 | 0.1645 | 2238 | 0.200 |
| ## | (30-39 Gender1 Race12) | - | (50-59 Gender1 Race15) | 0.019016 | 0.1654 | 2238 | 0.115 |

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| ## | (40-49 Gender1 Race12) | - | (50-59 Gender1 Race12) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender1 Race12) | - | (18-29 Gender0 Race13) | -0.270568 | 0.1620 | 2238 | -1.671 |
| ## | (40-49 Gender1 Race12) | - | (30-39 Gender0 Race13) | -0.163245 | 0.1611 | 2238 | -1.013 |
| ## | (40-49 Gender1 Race12) | - | (40-49 Gender0 Race13) | -0.038406 | 0.1413 | 2238 | -0.272 |
| ## | (40-49 Gender1 Race12) | - | (50-59 Gender0 Race13) | -0.052352 | 0.1622 | 2238 | -0.323 |
| ## | (40-49 Gender1 Race12) | - | (18-29 Gender1 Race13) | -0.447518 | 0.1542 | 2238 | -2.902 |
| ## | (40-49 Gender1 Race12) | - | (30-39 Gender1 Race13) | -0.340195 | 0.1532 | 2238 | -2.221 |
| ## | (40-49 Gender1 Race12) | - | (40-49 Gender1 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (40-49 Gender1 Race12) | - | (50-59 Gender1 Race13) | -0.229302 | 0.1555 | 2238 | -1.474 |
| ## | (40-49 Gender1 Race12) | - | (18-29 Gender0 Race14) | -0.214103 | 0.1488 | 2238 | -1.439 |
| ## | (40-49 Gender1 Race12) | - | (30-39 Gender0 Race14) | -0.106780 | 0.1466 | 2238 | -0.728 |
| ## | (40-49 Gender1 Race12) | - | (40-49 Gender0 Race14) | 0.018059 | 0.1238 | 2238 | 0.146 |
| ## | (40-49 Gender1 Race12) | - | (50-59 Gender0 Race14) | 0.004113 | 0.1442 | 2238 | 0.029 |
| ## | (40-49 Gender1 Race12) | - | (18-29 Gender1 Race14) | -0.391053 | 0.1373 | 2238 | -2.849 |
| ## | (40-49 Gender1 Race12) | - | (30-39 Gender1 Race14) | -0.283730 | 0.1348 | 2238 | -2.104 |
| ## | (40-49 Gender1 Race12) | - | (40-49 Gender1 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (40-49 Gender1 Race12) | - | (50-59 Gender1 Race14) | -0.172837 | 0.1335 | 2238 | -1.294 |
| ## | (40-49 Gender1 Race12) | - | (18-29 Gender0 Race15) | -0.147089 | 0.1711 | 2238 | -0.860 |
| ## | (40-49 Gender1 Race12) | - | (30-39 Gender0 Race15) | -0.039766 | 0.1701 | 2238 | -0.234 |
| ## | (40-49 Gender1 Race12) | - | (40-49 Gender0 Race15) | 0.085073 | 0.1532 | 2238 | 0.555 |
| ## | (40-49 Gender1 Race12) | - | (50-59 Gender0 Race15) | 0.071127 | 0.1714 | 2238 | 0.415 |
| ## | (40-49 Gender1 Race12) | - | (18-29 Gender1 Race15) | -0.324039 | 0.1624 | 2238 | -1.995 |
| ## | (40-49 Gender1 Race12) | - | (30-39 Gender1 Race15) | -0.216716 | 0.1613 | 2238 | -1.343 |
| ## | (40-49 Gender1 Race12) | - | (40-49 Gender1 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (40-49 Gender1 Race12) | - | (50-59 Gender1 Race15) | -0.105823 | 0.1638 | 2238 | -0.646 |
| ## | (50-59 Gender1 Race12) | - | (18-29 Gender0 Race13) | -0.256622 | 0.1626 | 2238 | -1.578 |
| ## | (50-59 Gender1 Race12) | - | (30-39 Gender0 Race13) | -0.149299 | 0.1617 | 2238 | -0.924 |
| ## | (50-59 Gender1 Race12) | - | (40-49 Gender0 Race13) | -0.024460 | 0.1611 | 2238 | -0.152 |
| ## | (50-59 Gender1 Race12) | - | (50-59 Gender0 Race13) | -0.038406 | 0.1413 | 2238 | -0.272 |
| ## | (50-59 Gender1 Race12) | - | (18-29 Gender1 Race13) | -0.433571 | 0.1542 | 2238 | -2.812 |
| ## | (50-59 Gender1 Race12) | - | (30-39 Gender1 Race13) | -0.326249 | 0.1531 | 2238 | -2.131 |
| ## | (50-59 Gender1 Race12) | - | (40-49 Gender1 Race13) | -0.201409 | 0.1529 | 2238 | -1.317 |
| ## | (50-59 Gender1 Race12) | - | (50-59 Gender1 Race13) | -0.215356 | 0.1328 | 2238 | -1.622 |
| ## | (50-59 Gender1 Race12) | - | (18-29 Gender0 Race14) | -0.200156 | 0.1524 | 2238 | -1.313 |
| ## | (50-59 Gender1 Race12) | - | (30-39 Gender0 Race14) | -0.092833 | 0.1502 | 2238 | -0.618 |
| ## | (50-59 Gender1 Race12) | - | (40-49 Gender0 Race14) | 0.032006 | 0.1490 | 2238 | 0.215 |
| ## | (50-59 Gender1 Race12) | - | (50-59 Gender0 Race14) | 0.018059 | 0.1238 | 2238 | 0.146 |
| ## | (50-59 Gender1 Race12) | - | (18-29 Gender1 Race14) | -0.377106 | 0.1404 | 2238 | -2.686 |
| ## | (50-59 Gender1 Race12) | - | (30-39 Gender1 Race14) | -0.269783 | 0.1379 | 2238 | -1.956 |
| ## | (50-59 Gender1 Race12) | - | (40-49 Gender1 Race14) | -0.144944 | 0.1370 | 2238 | -1.058 |
| ## | (50-59 Gender1 Race12) | - | (50-59 Gender1 Race14) | -0.158891 | 0.1102 | 2238 | -1.442 |
| ## | (50-59 Gender1 Race12) | - | (18-29 Gender0 Race15) | -0.133143 | 0.1730 | 2238 | -0.770 |
| ## | (50-59 Gender1 Race12) | - | (30-39 Gender0 Race15) | -0.025820 | 0.1719 | 2238 | -0.150 |
| ## | (50-59 Gender1 Race12) | - | (40-49 Gender0 Race15) | 0.099019 | 0.1729 | 2238 | 0.573 |
| ## | (50-59 Gender1 Race12) | - | (50-59 Gender0 Race15) | 0.085073 | 0.1532 | 2238 | 0.555 |
| ## | (50-59 Gender1 Race12) | - | (18-29 Gender1 Race15) | -0.310093 | 0.1638 | 2238 | -1.893 |
| ## | (50-59 Gender1 Race12) | - | (30-39 Gender1 Race15) | -0.202770 | 0.1626 | 2238 | -1.247 |
| ## | (50-59 Gender1 Race12) | - | (40-49 Gender1 Race15) | -0.077931 | 0.1641 | 2238 | -0.475 |
| ## | (50-59 Gender1 Race12) | - | (50-59 Gender1 Race15) | -0.091877 | 0.1439 | 2238 | -0.638 |
| ## | (18-29 Gender0 Race13) | - | (30-39 Gender0 Race13) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender0 Race13) | - | (40-49 Gender0 Race13) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender0 Race13) | - | (50-59 Gender0 Race13) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender0 Race13) | - | (18-29 Gender1 Race13) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (18-29 Gender0 Race13) | - | (30-39 Gender1 Race13) | -0.069627 | 0.0944 | 2238 | -0.738 |

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| ## | (18-29 Gender0 Race13) | - | (40-49 Gender1 Race13) | 0.055212 | 0.0952 | 2238 | 0.580 |
| ## | (18-29 Gender0 Race13) | - | (50-59 Gender1 Race13) | 0.041266 | 0.0984 | 2238 | 0.419 |
| ## | (18-29 Gender0 Race13) | - | (18-29 Gender0 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |
| ## | (18-29 Gender0 Race13) | - | (30-39 Gender0 Race14) | 0.163788 | 0.1167 | 2238 | 1.403 |
| ## | (18-29 Gender0 Race13) | - | (40-49 Gender0 Race14) | 0.288627 | 0.1160 | 2238 | 2.487 |
| ## | (18-29 Gender0 Race13) | - | (50-59 Gender0 Race14) | 0.274681 | 0.1139 | 2238 | 2.411 |
| ## | (18-29 Gender0 Race13) | - | (18-29 Gender1 Race14) | -0.120485 | 0.1015 | 2238 | -1.187 |
| ## | (18-29 Gender0 Race13) | - | (30-39 Gender1 Race14) | -0.013162 | 0.1257 | 2238 | -0.105 |
| ## | (18-29 Gender0 Race13) | - | (40-49 Gender1 Race14) | 0.111677 | 0.1256 | 2238 | 0.889 |
| ## | (18-29 Gender0 Race13) | - | (50-59 Gender1 Race14) | 0.097731 | 0.1246 | 2238 | 0.785 |
| ## | (18-29 Gender0 Race13) | - | (18-29 Gender0 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (18-29 Gender0 Race13) | - | (30-39 Gender0 Race15) | 0.230802 | 0.1498 | 2238 | 1.541 |
| ## | (18-29 Gender0 Race13) | - | (40-49 Gender0 Race15) | 0.355641 | 0.1516 | 2238 | 2.346 |
| ## | (18-29 Gender0 Race13) | - | (50-59 Gender0 Race15) | 0.341695 | 0.1514 | 2238 | 2.257 |
| ## | (18-29 Gender0 Race13) | - | (18-29 Gender1 Race15) | -0.053471 | 0.1386 | 2238 | -0.386 |
| ## | (18-29 Gender0 Race13) | - | (30-39 Gender1 Race15) | 0.053852 | 0.1582 | 2238 | 0.340 |
| ## | (18-29 Gender0 Race13) | - | (40-49 Gender1 Race15) | 0.178691 | 0.1604 | 2238 | 1.114 |
| ## | (18-29 Gender0 Race13) | - | (50-59 Gender1 Race15) | 0.164745 | 0.1609 | 2238 | 1.024 |
| ## | (30-39 Gender0 Race13) | - | (40-49 Gender0 Race13) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender0 Race13) | - | (50-59 Gender0 Race13) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender0 Race13) | - | (18-29 Gender1 Race13) | -0.284273 | 0.0946 | 2238 | -3.006 |
| ## | (30-39 Gender0 Race13) | - | (30-39 Gender1 Race13) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (30-39 Gender0 Race13) | - | (40-49 Gender1 Race13) | -0.052111 | 0.0948 | 2238 | -0.549 |
| ## | (30-39 Gender0 Race13) | - | (50-59 Gender1 Race13) | -0.066057 | 0.0979 | 2238 | -0.675 |
| ## | (30-39 Gender0 Race13) | - | (18-29 Gender0 Race14) | -0.050858 | 0.1197 | 2238 | -0.425 |
| ## | (30-39 Gender0 Race13) | - | (30-39 Gender0 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |
| ## | (30-39 Gender0 Race13) | - | (40-49 Gender0 Race14) | 0.181304 | 0.1172 | 2238 | 1.547 |
| ## | (30-39 Gender0 Race13) | - | (50-59 Gender0 Race14) | 0.167358 | 0.1150 | 2238 | 1.456 |
| ## | (30-39 Gender0 Race13) | - | (18-29 Gender1 Race14) | -0.227807 | 0.1287 | 2238 | -1.771 |
| ## | (30-39 Gender0 Race13) | - | (30-39 Gender1 Race14) | -0.120485 | 0.1015 | 2238 | -1.187 |
| ## | (30-39 Gender0 Race13) | - | (40-49 Gender1 Race14) | 0.004354 | 0.1267 | 2238 | 0.034 |
| ## | (30-39 Gender0 Race13) | - | (50-59 Gender1 Race14) | -0.009592 | 0.1256 | 2238 | -0.076 |
| ## | (30-39 Gender0 Race13) | - | (18-29 Gender0 Race15) | 0.016156 | 0.1501 | 2238 | 0.108 |
| ## | (30-39 Gender0 Race13) | - | (30-39 Gender0 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (30-39 Gender0 Race13) | - | (40-49 Gender0 Race15) | 0.248318 | 0.1515 | 2238 | 1.639 |
| ## | (30-39 Gender0 Race13) | - | (50-59 Gender0 Race15) | 0.234372 | 0.1512 | 2238 | 1.550 |
| ## | (30-39 Gender0 Race13) | - | (18-29 Gender1 Race15) | -0.160794 | 0.1587 | 2238 | -1.013 |
| ## | (30-39 Gender0 Race13) | - | (30-39 Gender1 Race15) | -0.053471 | 0.1386 | 2238 | -0.386 |
| ## | (30-39 Gender0 Race13) | - | (40-49 Gender1 Race15) | 0.071368 | 0.1603 | 2238 | 0.445 |
| ## | (30-39 Gender0 Race13) | - | (50-59 Gender1 Race15) | 0.057422 | 0.1608 | 2238 | 0.357 |
| ## | (40-49 Gender0 Race13) | - | (50-59 Gender0 Race13) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender0 Race13) | - | (18-29 Gender1 Race13) | -0.409112 | 0.0941 | 2238 | -4.350 |
| ## | (40-49 Gender0 Race13) | - | (30-39 Gender1 Race13) | -0.301789 | 0.0935 | 2238 | -3.229 |
| ## | (40-49 Gender0 Race13) | - | (40-49 Gender1 Race13) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (40-49 Gender0 Race13) | - | (50-59 Gender1 Race13) | -0.190896 | 0.0971 | 2238 | -1.967 |
| ## | (40-49 Gender0 Race13) | - | (18-29 Gender0 Race14) | -0.175697 | 0.1207 | 2238 | -1.456 |
| ## | (40-49 Gender0 Race13) | - | (30-39 Gender0 Race14) | -0.068374 | 0.1188 | 2238 | -0.575 |
| ## | (40-49 Gender0 Race13) | - | (40-49 Gender0 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |
| ## | (40-49 Gender0 Race13) | - | (50-59 Gender0 Race14) | 0.042519 | 0.1157 | 2238 | 0.368 |
| ## | (40-49 Gender0 Race13) | - | (18-29 Gender1 Race14) | -0.352647 | 0.1290 | 2238 | -2.733 |
| ## | (40-49 Gender0 Race13) | - | (30-39 Gender1 Race14) | -0.245324 | 0.1272 | 2238 | -1.928 |
| ## | (40-49 Gender0 Race13) | - | (40-49 Gender1 Race14) | -0.120485 | 0.1015 | 2238 | -1.187 |
| ## | (40-49 Gender0 Race13) | - | (50-59 Gender1 Race14) | -0.134431 | 0.1257 | 2238 | -1.069 |
| ## | (40-49 Gender0 Race13) | - | (18-29 Gender0 Race15) | -0.108683 | 0.1485 | 2238 | -0.732 |

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|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (40-49 Gender0 Race13) | - | (30-39 Gender0 Race15) | -0.001360 | 0.1480 | 2238 | -0.009 |
| ## | (40-49 Gender0 Race13) | - | (40-49 Gender0 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (40-49 Gender0 Race13) | - | (50-59 Gender0 Race15) | 0.109533 | 0.1494 | 2238 | 0.733 |
| ## | (40-49 Gender0 Race13) | - | (18-29 Gender1 Race15) | -0.285633 | 0.1567 | 2238 | -1.823 |
| ## | (40-49 Gender0 Race13) | - | (30-39 Gender1 Race15) | -0.178310 | 0.1562 | 2238 | -1.142 |
| ## | (40-49 Gender0 Race13) | - | (40-49 Gender1 Race15) | -0.053471 | 0.1386 | 2238 | -0.386 |
| ## | (40-49 Gender0 Race13) | - | (50-59 Gender1 Race15) | -0.067417 | 0.1586 | 2238 | -0.425 |
| ## | (50-59 Gender0 Race13) | - | (18-29 Gender1 Race13) | -0.395166 | 0.0950 | 2238 | -4.161 |
| ## | (50-59 Gender0 Race13) | - | (30-39 Gender1 Race13) | -0.287843 | 0.0943 | 2238 | -3.054 |
| ## | (50-59 Gender0 Race13) | - | (40-49 Gender1 Race13) | -0.163004 | 0.0948 | 2238 | -1.720 |
| ## | (50-59 Gender0 Race13) | - | (50-59 Gender1 Race13) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (50-59 Gender0 Race13) | - | (18-29 Gender0 Race14) | -0.161750 | 0.1258 | 2238 | -1.286 |
| ## | (50-59 Gender0 Race13) | - | (30-39 Gender0 Race14) | -0.054428 | 0.1239 | 2238 | -0.439 |
| ## | (50-59 Gender0 Race13) | - | (40-49 Gender0 Race14) | 0.070412 | 0.1230 | 2238 | 0.572 |
| ## | (50-59 Gender0 Race13) | - | (50-59 Gender0 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |
| ## | (50-59 Gender0 Race13) | - | (18-29 Gender1 Race14) | -0.338700 | 0.1330 | 2238 | -2.546 |
| ## | (50-59 Gender0 Race13) | - | (30-39 Gender1 Race14) | -0.231378 | 0.1312 | 2238 | -1.764 |
| ## | (50-59 Gender0 Race13) | - | (40-49 Gender1 Race14) | -0.106538 | 0.1308 | 2238 | -0.814 |
| ## | (50-59 Gender0 Race13) | - | (50-59 Gender1 Race14) | -0.120485 | 0.1015 | 2238 | -1.187 |
| ## | (50-59 Gender0 Race13) | - | (18-29 Gender0 Race15) | -0.094737 | 0.1513 | 2238 | -0.626 |
| ## | (50-59 Gender0 Race13) | - | (30-39 Gender0 Race15) | 0.012586 | 0.1507 | 2238 | 0.084 |
| ## | (50-59 Gender0 Race13) | - | (40-49 Gender0 Race15) | 0.137425 | 0.1523 | 2238 | 0.902 |
| ## | (50-59 Gender0 Race13) | - | (50-59 Gender0 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (50-59 Gender0 Race13) | - | (18-29 Gender1 Race15) | -0.271687 | 0.1587 | 2238 | -1.712 |
| ## | (50-59 Gender0 Race13) | - | (30-39 Gender1 Race15) | -0.164364 | 0.1581 | 2238 | -1.040 |
| ## | (50-59 Gender0 Race13) | - | (40-49 Gender1 Race15) | -0.039525 | 0.1600 | 2238 | -0.247 |
| ## | (50-59 Gender0 Race13) | - | (50-59 Gender1 Race15) | -0.053471 | 0.1386 | 2238 | -0.386 |
| ## | (18-29 Gender1 Race13) | - | (30-39 Gender1 Race13) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender1 Race13) | - | (40-49 Gender1 Race13) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender1 Race13) | - | (50-59 Gender1 Race13) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender1 Race13) | - | (18-29 Gender0 Race14) | 0.233415 | 0.1094 | 2238 | 2.133 |
| ## | (18-29 Gender1 Race13) | - | (30-39 Gender0 Race14) | 0.340738 | 0.1324 | 2238 | 2.574 |
| ## | (18-29 Gender1 Race13) | - | (40-49 Gender0 Race14) | 0.465577 | 0.1313 | 2238 | 3.546 |
| ## | (18-29 Gender1 Race13) | - | (50-59 Gender0 Race14) | 0.451631 | 0.1286 | 2238 | 3.513 |
| ## | (18-29 Gender1 Race13) | - | (18-29 Gender1 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |
| ## | (18-29 Gender1 Race13) | - | (30-39 Gender1 Race14) | 0.163788 | 0.1167 | 2238 | 1.403 |
| ## | (18-29 Gender1 Race13) | - | (40-49 Gender1 Race14) | 0.288627 | 0.1160 | 2238 | 2.487 |
| ## | (18-29 Gender1 Race13) | - | (50-59 Gender1 Race14) | 0.274681 | 0.1139 | 2238 | 2.411 |
| ## | (18-29 Gender1 Race13) | - | (18-29 Gender0 Race15) | 0.300429 | 0.1416 | 2238 | 2.122 |
| ## | (18-29 Gender1 Race13) | - | (30-39 Gender0 Race15) | 0.407752 | 0.1609 | 2238 | 2.534 |
| ## | (18-29 Gender1 Race13) | - | (40-49 Gender0 Race15) | 0.532591 | 0.1623 | 2238 | 3.282 |
| ## | (18-29 Gender1 Race13) | - | (50-59 Gender0 Race15) | 0.518644 | 0.1614 | 2238 | 3.213 |
| ## | (18-29 Gender1 Race13) | - | (18-29 Gender1 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (18-29 Gender1 Race13) | - | (30-39 Gender1 Race15) | 0.230802 | 0.1498 | 2238 | 1.541 |
| ## | (18-29 Gender1 Race13) | - | (40-49 Gender1 Race15) | 0.355641 | 0.1516 | 2238 | 2.346 |
| ## | (18-29 Gender1 Race13) | - | (50-59 Gender1 Race15) | 0.341695 | 0.1514 | 2238 | 2.257 |
| ## | (30-39 Gender1 Race13) | - | (40-49 Gender1 Race13) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender1 Race13) | - | (50-59 Gender1 Race13) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender1 Race13) | - | (18-29 Gender0 Race14) | 0.126092 | 0.1349 | 2238 | 0.935 |
| ## | (30-39 Gender1 Race13) | - | (30-39 Gender0 Race14) | 0.233415 | 0.1094 | 2238 | 2.133 |
| ## | (30-39 Gender1 Race13) | - | (40-49 Gender0 Race14) | 0.358254 | 0.1322 | 2238 | 2.710 |
| ## | (30-39 Gender1 Race13) | - | (50-59 Gender0 Race14) | 0.344308 | 0.1294 | 2238 | 2.660 |
| ## | (30-39 Gender1 Race13) | - | (18-29 Gender1 Race14) | -0.050858 | 0.1197 | 2238 | -0.425 |
| ## | (30-39 Gender1 Race13) | - | (30-39 Gender1 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |

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|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (30-39 Gender1 Race13) | - | (40-49 Gender1 Race14) | 0.181304 | 0.1172 | 2238 | 1.547 |
| ## | (30-39 Gender1 Race13) | - | (50-59 Gender1 Race14) | 0.167358 | 0.1150 | 2238 | 1.456 |
| ## | (30-39 Gender1 Race13) | - | (18-29 Gender0 Race15) | 0.193106 | 0.1612 | 2238 | 1.198 |
| ## | (30-39 Gender1 Race13) | - | (30-39 Gender0 Race15) | 0.300429 | 0.1416 | 2238 | 2.122 |
| ## | (30-39 Gender1 Race13) | - | (40-49 Gender0 Race15) | 0.425268 | 0.1621 | 2238 | 2.624 |
| ## | (30-39 Gender1 Race13) | - | (50-59 Gender0 Race15) | 0.411322 | 0.1612 | 2238 | 2.552 |
| ## | (30-39 Gender1 Race13) | - | (18-29 Gender1 Race15) | 0.016156 | 0.1501 | 2238 | 0.108 |
| ## | (30-39 Gender1 Race13) | - | (30-39 Gender1 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (30-39 Gender1 Race13) | - | (40-49 Gender1 Race15) | 0.248318 | 0.1515 | 2238 | 1.639 |
| ## | (30-39 Gender1 Race13) | - | (50-59 Gender1 Race15) | 0.234372 | 0.1512 | 2238 | 1.550 |
| ## | (40-49 Gender1 Race13) | - | (50-59 Gender1 Race13) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender1 Race13) | - | (18-29 Gender0 Race14) | 0.001253 | 0.1362 | 2238 | 0.009 |
| ## | (40-49 Gender1 Race13) | - | (30-39 Gender0 Race14) | 0.108576 | 0.1346 | 2238 | 0.806 |
| ## | (40-49 Gender1 Race13) | - | (40-49 Gender0 Race14) | 0.233415 | 0.1094 | 2238 | 2.133 |
| ## | (40-49 Gender1 Race13) | - | (50-59 Gender0 Race14) | 0.219469 | 0.1305 | 2238 | 1.681 |
| ## | (40-49 Gender1 Race13) | - | (18-29 Gender1 Race14) | -0.175697 | 0.1207 | 2238 | -1.456 |
| ## | (40-49 Gender1 Race13) | - | (30-39 Gender1 Race14) | -0.068374 | 0.1188 | 2238 | -0.575 |
| ## | (40-49 Gender1 Race13) | - | (40-49 Gender1 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |
| ## | (40-49 Gender1 Race13) | - | (50-59 Gender1 Race14) | 0.042519 | 0.1157 | 2238 | 0.368 |
| ## | (40-49 Gender1 Race13) | - | (18-29 Gender0 Race15) | 0.068267 | 0.1600 | 2238 | 0.427 |
| ## | (40-49 Gender1 Race13) | - | (30-39 Gender0 Race15) | 0.175590 | 0.1596 | 2238 | 1.100 |
| ## | (40-49 Gender1 Race13) | - | (40-49 Gender0 Race15) | 0.300429 | 0.1416 | 2238 | 2.122 |
| ## | (40-49 Gender1 Race13) | - | (50-59 Gender0 Race15) | 0.286482 | 0.1598 | 2238 | 1.793 |
| ## | (40-49 Gender1 Race13) | - | (18-29 Gender1 Race15) | -0.108683 | 0.1485 | 2238 | -0.732 |
| ## | (40-49 Gender1 Race13) | - | (30-39 Gender1 Race15) | -0.001360 | 0.1480 | 2238 | -0.009 |
| ## | (40-49 Gender1 Race13) | - | (40-49 Gender1 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (40-49 Gender1 Race13) | - | (50-59 Gender1 Race15) | 0.109533 | 0.1494 | 2238 | 0.733 |
| ## | (50-59 Gender1 Race13) | - | (18-29 Gender0 Race14) | 0.015199 | 0.1416 | 2238 | 0.107 |
| ## | (50-59 Gender1 Race13) | - | (30-39 Gender0 Race14) | 0.122522 | 0.1400 | 2238 | 0.875 |
| ## | (50-59 Gender1 Race13) | - | (40-49 Gender0 Race14) | 0.247361 | 0.1387 | 2238 | 1.784 |
| ## | (50-59 Gender1 Race13) | - | (50-59 Gender0 Race14) | 0.233415 | 0.1094 | 2238 | 2.133 |
| ## | (50-59 Gender1 Race13) | - | (18-29 Gender1 Race14) | -0.161750 | 0.1258 | 2238 | -1.286 |
| ## | (50-59 Gender1 Race13) | - | (30-39 Gender1 Race14) | -0.054428 | 0.1239 | 2238 | -0.439 |
| ## | (50-59 Gender1 Race13) | - | (40-49 Gender1 Race14) | 0.070412 | 0.1230 | 2238 | 0.572 |
| ## | (50-59 Gender1 Race13) | - | (50-59 Gender1 Race14) | 0.056465 | 0.0900 | 2238 | 0.628 |
| ## | (50-59 Gender1 Race13) | - | (18-29 Gender0 Race15) | 0.082213 | 0.1633 | 2238 | 0.503 |
| ## | (50-59 Gender1 Race13) | - | (30-39 Gender0 Race15) | 0.189536 | 0.1629 | 2238 | 1.164 |
| ## | (50-59 Gender1 Race13) | - | (40-49 Gender0 Race15) | 0.314375 | 0.1640 | 2238 | 1.917 |
| ## | (50-59 Gender1 Race13) | - | (50-59 Gender0 Race15) | 0.300429 | 0.1416 | 2238 | 2.122 |
| ## | (50-59 Gender1 Race13) | - | (18-29 Gender1 Race15) | -0.094737 | 0.1513 | 2238 | -0.626 |
| ## | (50-59 Gender1 Race13) | - | (30-39 Gender1 Race15) | 0.012586 | 0.1507 | 2238 | 0.084 |
| ## | (50-59 Gender1 Race13) | - | (40-49 Gender1 Race15) | 0.137425 | 0.1523 | 2238 | 0.902 |
| ## | (50-59 Gender1 Race13) | - | (50-59 Gender1 Race15) | 0.123479 | 0.1288 | 2238 | 0.958 |
| ## | (18-29 Gender0 Race14) | - | (30-39 Gender0 Race14) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender0 Race14) | - | (40-49 Gender0 Race14) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender0 Race14) | - | (50-59 Gender0 Race14) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender0 Race14) | - | (18-29 Gender1 Race14) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (18-29 Gender0 Race14) | - | (30-39 Gender1 Race14) | -0.069627 | 0.0944 | 2238 | -0.738 |
| ## | (18-29 Gender0 Race14) | - | (40-49 Gender1 Race14) | 0.055212 | 0.0952 | 2238 | 0.580 |
| ## | (18-29 Gender0 Race14) | - | (50-59 Gender1 Race14) | 0.041266 | 0.0984 | 2238 | 0.419 |
| ## | (18-29 Gender0 Race14) | - | (18-29 Gender0 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (18-29 Gender0 Race14) | - | (30-39 Gender0 Race15) | 0.174337 | 0.1318 | 2238 | 1.323 |
| ## | (18-29 Gender0 Race14) | - | (40-49 Gender0 Race15) | 0.299176 | 0.1346 | 2238 | 2.223 |
| ## | (18-29 Gender0 Race14) | - | (50-59 Gender0 Race15) | 0.285229 | 0.1376 | 2238 | 2.073 |

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|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (18-29 Gender0 Race14) | - | (18-29 Gender1 Race15) | -0.109936 | 0.1210 | 2238 | -0.908 |
| ## | (18-29 Gender0 Race14) | - | (30-39 Gender1 Race15) | -0.002613 | 0.1443 | 2238 | -0.018 |
| ## | (18-29 Gender0 Race14) | - | (40-49 Gender1 Race15) | 0.122226 | 0.1473 | 2238 | 0.830 |
| ## | (18-29 Gender0 Race14) | - | (50-59 Gender1 Race15) | 0.108280 | 0.1508 | 2238 | 0.718 |
| ## | (30-39 Gender0 Race14) | - | (40-49 Gender0 Race14) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender0 Race14) | - | (50-59 Gender0 Race14) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender0 Race14) | - | (18-29 Gender1 Race14) | -0.284273 | 0.0946 | 2238 | -3.006 |
| ## | (30-39 Gender0 Race14) | - | (30-39 Gender1 Race14) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (30-39 Gender0 Race14) | - | (40-49 Gender1 Race14) | -0.052111 | 0.0948 | 2238 | -0.549 |
| ## | (30-39 Gender0 Race14) | - | (50-59 Gender1 Race14) | -0.066057 | 0.0979 | 2238 | -0.675 |
| ## | (30-39 Gender0 Race14) | - | (18-29 Gender0 Race15) | -0.040309 | 0.1295 | 2238 | -0.311 |
| ## | (30-39 Gender0 Race14) | - | (30-39 Gender0 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (30-39 Gender0 Race14) | - | (40-49 Gender0 Race15) | 0.191853 | 0.1331 | 2238 | 1.441 |
| ## | (30-39 Gender0 Race14) | - | (50-59 Gender0 Race15) | 0.177906 | 0.1361 | 2238 | 1.307 |
| ## | (30-39 Gender0 Race14) | - | (18-29 Gender1 Race15) | -0.217259 | 0.1423 | 2238 | -1.527 |
| ## | (30-39 Gender0 Race14) | - | (30-39 Gender1 Race15) | -0.109936 | 0.1210 | 2238 | -0.908 |
| ## | (30-39 Gender0 Race14) | - | (40-49 Gender1 Race15) | 0.014903 | 0.1460 | 2238 | 0.102 |
| ## | (30-39 Gender0 Race14) | - | (50-59 Gender1 Race15) | 0.000957 | 0.1495 | 2238 | 0.006 |
| ## | (40-49 Gender0 Race14) | - | (50-59 Gender0 Race14) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender0 Race14) | - | (18-29 Gender1 Race14) | -0.409112 | 0.0941 | 2238 | -4.350 |
| ## | (40-49 Gender0 Race14) | - | (30-39 Gender1 Race14) | -0.301789 | 0.0935 | 2238 | -3.229 |
| ## | (40-49 Gender0 Race14) | - | (40-49 Gender1 Race14) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (40-49 Gender0 Race14) | - | (50-59 Gender1 Race14) | -0.190896 | 0.0971 | 2238 | -1.967 |
| ## | (40-49 Gender0 Race14) | - | (18-29 Gender0 Race15) | -0.165148 | 0.1268 | 2238 | -1.302 |
| ## | (40-49 Gender0 Race14) | - | (30-39 Gender0 Race15) | -0.057825 | 0.1276 | 2238 | -0.453 |
| ## | (40-49 Gender0 Race14) | - | (40-49 Gender0 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (40-49 Gender0 Race14) | - | (50-59 Gender0 Race15) | 0.053067 | 0.1333 | 2238 | 0.398 |
| ## | (40-49 Gender0 Race14) | - | (18-29 Gender1 Race15) | -0.342098 | 0.1394 | 2238 | -2.454 |
| ## | (40-49 Gender0 Race14) | - | (30-39 Gender1 Race15) | -0.234775 | 0.1401 | 2238 | -1.676 |
| ## | (40-49 Gender0 Race14) | - | (40-49 Gender1 Race15) | -0.109936 | 0.1210 | 2238 | -0.908 |
| ## | (40-49 Gender0 Race14) | - | (50-59 Gender1 Race15) | -0.123883 | 0.1465 | 2238 | -0.846 |
| ## | (50-59 Gender0 Race14) | - | (18-29 Gender1 Race14) | -0.395166 | 0.0950 | 2238 | -4.161 |
| ## | (50-59 Gender0 Race14) | - | (30-39 Gender1 Race14) | -0.287843 | 0.0943 | 2238 | -3.054 |
| ## | (50-59 Gender0 Race14) | - | (40-49 Gender1 Race14) | -0.163004 | 0.0948 | 2238 | -1.720 |
| ## | (50-59 Gender0 Race14) | - | (50-59 Gender1 Race14) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (50-59 Gender0 Race14) | - | (18-29 Gender0 Race15) | -0.151202 | 0.1267 | 2238 | -1.193 |
| ## | (50-59 Gender0 Race14) | - | (30-39 Gender0 Race15) | -0.043879 | 0.1274 | 2238 | -0.344 |
| ## | (50-59 Gender0 Race14) | - | (40-49 Gender0 Race15) | 0.080960 | 0.1301 | 2238 | 0.622 |
| ## | (50-59 Gender0 Race14) | - | (50-59 Gender0 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (50-59 Gender0 Race14) | - | (18-29 Gender1 Race15) | -0.328152 | 0.1385 | 2238 | -2.369 |
| ## | (50-59 Gender0 Race14) | - | (30-39 Gender1 Race15) | -0.220829 | 0.1391 | 2238 | -1.588 |
| ## | (50-59 Gender0 Race14) | - | (40-49 Gender1 Race15) | -0.095990 | 0.1420 | 2238 | -0.676 |
| ## | (50-59 Gender0 Race14) | - | (50-59 Gender1 Race15) | -0.109936 | 0.1210 | 2238 | -0.908 |
| ## | (18-29 Gender1 Race14) | - | (30-39 Gender1 Race14) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender1 Race14) | - | (40-49 Gender1 Race14) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender1 Race14) | - | (50-59 Gender1 Race14) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender1 Race14) | - | (18-29 Gender0 Race15) | 0.243964 | 0.1175 | 2238 | 2.077 |
| ## | (18-29 Gender1 Race14) | - | (30-39 Gender0 Race15) | 0.351286 | 0.1414 | 2238 | 2.484 |
| ## | (18-29 Gender1 Race14) | - | (40-49 Gender0 Race15) | 0.476125 | 0.1436 | 2238 | 3.316 |
| ## | (18-29 Gender1 Race14) | - | (50-59 Gender0 Race15) | 0.462179 | 0.1457 | 2238 | 3.173 |
| ## | (18-29 Gender1 Race14) | - | (18-29 Gender1 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (18-29 Gender1 Race14) | - | (30-39 Gender1 Race15) | 0.174337 | 0.1318 | 2238 | 1.323 |
| ## | (18-29 Gender1 Race14) | - | (40-49 Gender1 Race15) | 0.299176 | 0.1346 | 2238 | 2.223 |
| ## | (18-29 Gender1 Race14) | - | (50-59 Gender1 Race15) | 0.285229 | 0.1376 | 2238 | 2.073 |

| | | | | | | | |
|----|------------------------|---|------------------------|-----------|--------|------|--------|
| ## | (30-39 Gender1 Race14) | - | (40-49 Gender1 Race14) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender1 Race14) | - | (50-59 Gender1 Race14) | 0.110893 | 0.0787 | 2238 | 1.409 |
| ## | (30-39 Gender1 Race14) | - | (18-29 Gender0 Race15) | 0.136641 | 0.1392 | 2238 | 0.982 |
| ## | (30-39 Gender1 Race14) | - | (30-39 Gender0 Race15) | 0.243964 | 0.1175 | 2238 | 2.077 |
| ## | (30-39 Gender1 Race14) | - | (40-49 Gender0 Race15) | 0.368803 | 0.1422 | 2238 | 2.594 |
| ## | (30-39 Gender1 Race14) | - | (50-59 Gender0 Race15) | 0.354856 | 0.1442 | 2238 | 2.461 |
| ## | (30-39 Gender1 Race14) | - | (18-29 Gender1 Race15) | -0.040309 | 0.1295 | 2238 | -0.311 |
| ## | (30-39 Gender1 Race14) | - | (30-39 Gender1 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (30-39 Gender1 Race14) | - | (40-49 Gender1 Race15) | 0.191853 | 0.1331 | 2238 | 1.441 |
| ## | (30-39 Gender1 Race14) | - | (50-59 Gender1 Race15) | 0.177906 | 0.1361 | 2238 | 1.307 |
| ## | (40-49 Gender1 Race14) | - | (50-59 Gender1 Race14) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender1 Race14) | - | (18-29 Gender0 Race15) | 0.011802 | 0.1372 | 2238 | 0.086 |
| ## | (40-49 Gender1 Race14) | - | (30-39 Gender0 Race15) | 0.119124 | 0.1380 | 2238 | 0.863 |
| ## | (40-49 Gender1 Race14) | - | (40-49 Gender0 Race15) | 0.243964 | 0.1175 | 2238 | 2.077 |
| ## | (40-49 Gender1 Race14) | - | (50-59 Gender0 Race15) | 0.230017 | 0.1420 | 2238 | 1.620 |
| ## | (40-49 Gender1 Race14) | - | (18-29 Gender1 Race15) | -0.165148 | 0.1268 | 2238 | -1.302 |
| ## | (40-49 Gender1 Race14) | - | (30-39 Gender1 Race15) | -0.057825 | 0.1276 | 2238 | -0.453 |
| ## | (40-49 Gender1 Race14) | - | (40-49 Gender1 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (40-49 Gender1 Race14) | - | (50-59 Gender1 Race15) | 0.053067 | 0.1333 | 2238 | 0.398 |
| ## | (50-59 Gender1 Race14) | - | (18-29 Gender0 Race15) | 0.025748 | 0.1378 | 2238 | 0.187 |
| ## | (50-59 Gender1 Race14) | - | (30-39 Gender0 Race15) | 0.133071 | 0.1386 | 2238 | 0.960 |
| ## | (50-59 Gender1 Race14) | - | (40-49 Gender0 Race15) | 0.257910 | 0.1405 | 2238 | 1.835 |
| ## | (50-59 Gender1 Race14) | - | (50-59 Gender0 Race15) | 0.243964 | 0.1175 | 2238 | 2.077 |
| ## | (50-59 Gender1 Race14) | - | (18-29 Gender1 Race15) | -0.151202 | 0.1267 | 2238 | -1.193 |
| ## | (50-59 Gender1 Race14) | - | (30-39 Gender1 Race15) | -0.043879 | 0.1274 | 2238 | -0.344 |
| ## | (50-59 Gender1 Race14) | - | (40-49 Gender1 Race15) | 0.080960 | 0.1301 | 2238 | 0.622 |
| ## | (50-59 Gender1 Race14) | - | (50-59 Gender1 Race15) | 0.067014 | 0.1057 | 2238 | 0.634 |
| ## | (18-29 Gender0 Race15) | - | (30-39 Gender0 Race15) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender0 Race15) | - | (40-49 Gender0 Race15) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender0 Race15) | - | (50-59 Gender0 Race15) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (18-29 Gender0 Race15) | - | (18-29 Gender1 Race15) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (18-29 Gender0 Race15) | - | (30-39 Gender1 Race15) | -0.069627 | 0.0944 | 2238 | -0.738 |
| ## | (18-29 Gender0 Race15) | - | (40-49 Gender1 Race15) | 0.055212 | 0.0952 | 2238 | 0.580 |
| ## | (18-29 Gender0 Race15) | - | (50-59 Gender1 Race15) | 0.041266 | 0.0984 | 2238 | 0.419 |
| ## | (30-39 Gender0 Race15) | - | (40-49 Gender0 Race15) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender0 Race15) | - | (50-59 Gender0 Race15) | 0.110893 | 0.0787 | 2238 | 1.409 |
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| ## | (30-39 Gender0 Race15) | - | (30-39 Gender1 Race15) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (30-39 Gender0 Race15) | - | (40-49 Gender1 Race15) | -0.052111 | 0.0948 | 2238 | -0.549 |
| ## | (30-39 Gender0 Race15) | - | (50-59 Gender1 Race15) | -0.066057 | 0.0979 | 2238 | -0.675 |
| ## | (40-49 Gender0 Race15) | - | (50-59 Gender0 Race15) | -0.013946 | 0.0785 | 2238 | -0.178 |
| ## | (40-49 Gender0 Race15) | - | (18-29 Gender1 Race15) | -0.409112 | 0.0941 | 2238 | -4.350 |
| ## | (40-49 Gender0 Race15) | - | (30-39 Gender1 Race15) | -0.301789 | 0.0935 | 2238 | -3.229 |
| ## | (40-49 Gender0 Race15) | - | (40-49 Gender1 Race15) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (40-49 Gender0 Race15) | - | (50-59 Gender1 Race15) | -0.190896 | 0.0971 | 2238 | -1.967 |
| ## | (50-59 Gender0 Race15) | - | (18-29 Gender1 Race15) | -0.395166 | 0.0950 | 2238 | -4.161 |
| ## | (50-59 Gender0 Race15) | - | (30-39 Gender1 Race15) | -0.287843 | 0.0943 | 2238 | -3.054 |
| ## | (50-59 Gender0 Race15) | - | (40-49 Gender1 Race15) | -0.163004 | 0.0948 | 2238 | -1.720 |
| ## | (50-59 Gender0 Race15) | - | (50-59 Gender1 Race15) | -0.176950 | 0.0551 | 2238 | -3.209 |
| ## | (18-29 Gender1 Race15) | - | (30-39 Gender1 Race15) | 0.107323 | 0.0767 | 2238 | 1.399 |
| ## | (18-29 Gender1 Race15) | - | (40-49 Gender1 Race15) | 0.232162 | 0.0769 | 2238 | 3.018 |
| ## | (18-29 Gender1 Race15) | - | (50-59 Gender1 Race15) | 0.218216 | 0.0794 | 2238 | 2.747 |
| ## | (30-39 Gender1 Race15) | - | (40-49 Gender1 Race15) | 0.124839 | 0.0763 | 2238 | 1.636 |
| ## | (30-39 Gender1 Race15) | - | (50-59 Gender1 Race15) | 0.110893 | 0.0787 | 2238 | 1.409 |


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## (40-49 Gender1 Race15) - (50-59 Gender1 Race15) -0.013946 0.0785 2238 -0.178
## p.value
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## 0.7310
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##
## P value adjustment: tukey method for comparing a family of 40 estimates

```