m158-project1-sara-ian

R Markdown

```
NHANES %>%
  glimpse()
```

```
## Rows: 10,000
## Columns: 76
## $ ID                <int> 51624, 51624, 51624, 51625, 51630, 51638, 51646, 5164~
## $ SurveyYr          <fct> 2009_10, 2009_10, 2009_10, 2009_10, 2009_10, 2009_10,~
## $ Gender            <fct> male, male, male, male, female, male, male, female, f~
## $ Age               <int> 34, 34, 34, 4, 49, 9, 8, 45, 45, 45, 66, 58, 54, 10, ~
## $ AgeDecade         <fct>  30-39,  30-39,  30-39,  0-9,  40-49,  0-9,  0-9,  40~
## $ AgeMonths         <int> 409, 409, 409, 49, 596, 115, 101, 541, 541, 541, 795,~
## $ Race1             <fct> White, White, White, Other, White, White, White, Whit~
## $ Race3             <fct> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ Education         <fct> High School, High School, High School, NA, Some Colle~
## $ MaritalStatus     <fct> Married, Married, Married, NA, LivePartner, NA, NA, M~
## $ HHIncome          <fct> 25000-34999, 25000-34999, 25000-34999, 20000-24999, 3~
## $ HHIncomeMid       <int> 30000, 30000, 30000, 22500, 40000, 87500, 60000, 8750~
## $ Poverty           <dbl> 1.36, 1.36, 1.36, 1.07, 1.91, 1.84, 2.33, 5.00, 5.00,~
## $ HomeRooms         <int> 6, 6, 6, 9, 5, 6, 7, 6, 6, 6, 5, 10, 6, 10, 10, 4, 3,~
## $ HomeOwn           <fct> Own, Own, Own, Own, Rent, Rent, Own, Own, Own, Own, O~
## $ Work              <fct> NotWorking, NotWorking, NotWorking, NA, NotWorking, N~
## $ Weight            <dbl> 87.4, 87.4, 87.4, 17.0, 86.7, 29.8, 35.2, 75.7, 75.7,~
## $ Length            <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ HeadCirc          <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ Height            <dbl> 164.7, 164.7, 164.7, 105.4, 168.4, 133.1, 130.6, 166.~
## $ BMI               <dbl> 32.22, 32.22, 32.22, 15.30, 30.57, 16.82, 20.64, 27.2~
## $ BMICatUnder20yrs  <fct> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ BMI_WHO           <fct> 30.0_plus, 30.0_plus, 30.0_plus, 12.0_18.5, 30.0_plus~
## $ Pulse             <int> 70, 70, 70, NA, 86, 82, 72, 62, 62, 62, 60, 62, 76, 8~
## $ BPSysAve          <int> 113, 113, 113, NA, 112, 86, 107, 118, 118, 118, 111, ~
## $ BPDiaAve          <int> 85, 85, 85, NA, 75, 47, 37, 64, 64, 64, 63, 74, 85, 6~
## $ BPSys1            <int> 114, 114, 114, NA, 118, 84, 114, 106, 106, 106, 124, ~
## $ BPDia1            <int> 88, 88, 88, NA, 82, 50, 46, 62, 62, 62, 64, 76, 86, 6~
## $ BPSys2            <int> 114, 114, 114, NA, 108, 84, 108, 118, 118, 118, 108, ~
## $ BPDia2            <int> 88, 88, 88, NA, 74, 50, 36, 68, 68, 68, 62, 72, 88, 6~
## $ BPSys3            <int> 112, 112, 112, NA, 116, 88, 106, 118, 118, 118, 114, ~
## $ BPDia3            <int> 82, 82, 82, NA, 76, 44, 38, 60, 60, 60, 64, 76, 82, 7~
## $ Testosterone      <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ DirectChol        <dbl> 1.29, 1.29, 1.29, NA, 1.16, 1.34, 1.55, 2.12, 2.12, 2~
## $ TotChol           <dbl> 3.49, 3.49, 3.49, NA, 6.70, 4.86, 4.09, 5.82, 5.82, 5~
## $ UrineVol1         <int> 352, 352, 352, NA, 77, 123, 238, 106, 106, 106, 113, ~
## $ UrineFlow1        <dbl> NA, NA, NA, NA, 0.094, 1.538, 1.322, 1.116, 1.116, 1.~
```

```
## $ UrineVol2        <int> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ UrineFlow2       <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ Diabetes         <fct> No, No, No, No, No, No, No, No, No, No, No, No, No, N~
## $ DiabetesAge      <int> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ HealthGen        <fct> Good, Good, Good, NA, Good, NA, NA, Vgood, Vgood, Vgo~
## $ DaysPhysHlthBad  <int> 0, 0, 0, NA, 0, NA, NA, 0, 0, 0, 10, 0, 4, NA, NA, 0,~
## $ DaysMentHlthBad  <int> 15, 15, 15, NA, 10, NA, NA, 3, 3, 3, 0, 0, 0, NA, NA,~
## $ LittleInterest   <fct> Most, Most, Most, NA, Several, NA, NA, None, None, No~
## $ Depressed        <fct> Several, Several, Several, NA, Several, NA, NA, None,~
## $ nPregnancies     <int> NA, NA, NA, NA, 2, NA, NA, 1, 1, 1, NA, NA, NA, NA, N~
## $ nBabies          <int> NA, NA, NA, NA, 2, NA, NA, NA, NA, NA, NA, NA, NA, NA~
## $ Age1stBaby       <int> NA, NA, NA, NA, 27, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ SleepHrsNight    <int> 4, 4, 4, NA, 8, NA, NA, 8, 8, 8, 7, 5, 4, NA, 5, 7, N~
## $ SleepTrouble     <fct> Yes, Yes, Yes, NA, Yes, NA, NA, No, No, No, No, No, Y~
## $ PhysActive       <fct> No, No, No, NA, No, NA, NA, Yes, Yes, Yes, Yes, Yes, ~
## $ PhysActiveDays   <int> NA, NA, NA, NA, NA, NA, NA, 5, 5, 5, 7, 5, 1, NA, 2, ~
## $ TVHrsDay         <fct> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ CompHrsDay       <fct> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
## $ TVHrsDayChild    <int> NA, NA, NA, 4, NA, 5, 1, NA, NA, NA, NA, NA, NA, 4, N~
## $ CompHrsDayChild  <int> NA, NA, NA, 1, NA, 0, 6, NA, NA, NA, NA, NA, NA, 3, N~
## $ Alcohol12PlusYr  <fct> Yes, Yes, Yes, NA, Yes, NA, NA, Yes, Yes, Yes, Yes, Y~
## $ AlcoholDay       <int> NA, NA, NA, NA, 2, NA, NA, 3, 3, 3, 1, 2, 6, NA, NA, ~
## $ AlcoholYear      <int> 0, 0, 0, NA, 20, NA, NA, 52, 52, 52, 100, 104, 364, N~
## $ SmokeNow         <fct> No, No, No, NA, Yes, NA, NA, NA, NA, NA, No, NA, NA, ~
## $ Smoke100         <fct> Yes, Yes, Yes, NA, Yes, NA, NA, No, No, No, Yes, No, ~
## $ Smoke100n        <fct> Smoker, Smoker, Smoker, NA, Smoker, NA, NA, Non-Smoke~
## $ SmokeAge         <int> 18, 18, 18, NA, 38, NA, NA, NA, NA, NA, 13, NA, NA, N~
## $ Marijuana        <fct> Yes, Yes, Yes, NA, Yes, NA, NA, Yes, Yes, Yes, NA, Ye~
## $ AgeFirstMarij    <int> 17, 17, 17, NA, 18, NA, NA, 13, 13, 13, NA, 19, 15, N~
## $ RegularMarij     <fct> No, No, No, NA, No, NA, NA, No, No, No, NA, Yes, Yes,~
## $ AgeRegMarij      <int> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, 20, 15, N~
## $ HardDrugs        <fct> Yes, Yes, Yes, NA, Yes, NA, NA, No, No, No, No, Yes, ~
## $ SexEver          <fct> Yes, Yes, Yes, NA, Yes, NA, NA, Yes, Yes, Yes, Yes, Y~
## $ SexAge           <int> 16, 16, 16, NA, 12, NA, NA, 13, 13, 13, 17, 22, 12, N~
## $ SexNumPartnLife  <int> 8, 8, 8, NA, 10, NA, NA, 20, 20, 20, 15, 7, 100, NA, ~
## $ SexNumPartYear   <int> 1, 1, 1, NA, 1, NA, NA, 0, 0, 0, NA, 1, 1, NA, NA, 1,~
## $ SameSex          <fct> No, No, No, NA, Yes, NA, NA, Yes, Yes, Yes, No, No, N~
## $ SexOrientation   <fct> Heterosexual, Heterosexual, Heterosexual, NA, Heteros~
## $ PregnantNow      <fct> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N~
```

Varibales we're using: Age (quantitative) Income (numerical discrete?) Testosterone (quantitative) Physactivedays (numerical discrete) Pulse (quantitative)

Gender (categorical) SleepTrouble (categorical) Depressed (categorical) Education (categorical) Work (categorical)

```
OurData <- NHANES %>% select(Age, HHIncome, Testosterone, PhysActiveDays,
                             Pulse, Gender, SleepTrouble, Depressed,
                             Education, Work)
names(OurData)
```

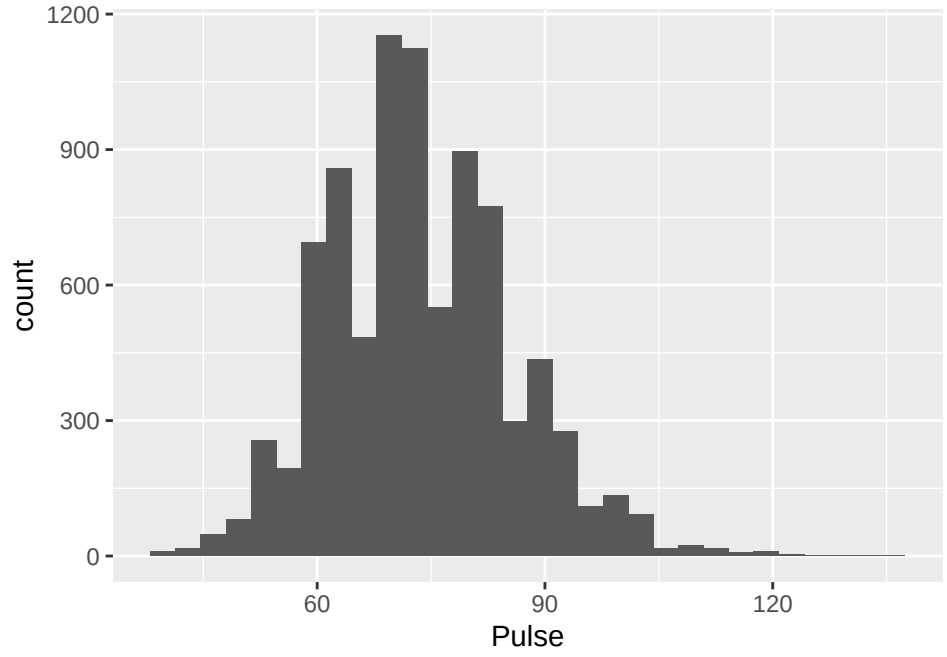
```
##  [1] "Age"            "HHIncome"       "Testosterone"   "PhysActiveDays"
##  [5] "Pulse"          "Gender"         "SleepTrouble"   "Depressed"
##  [9] "Education"      "Work"
```

```
dim(OurData)
```

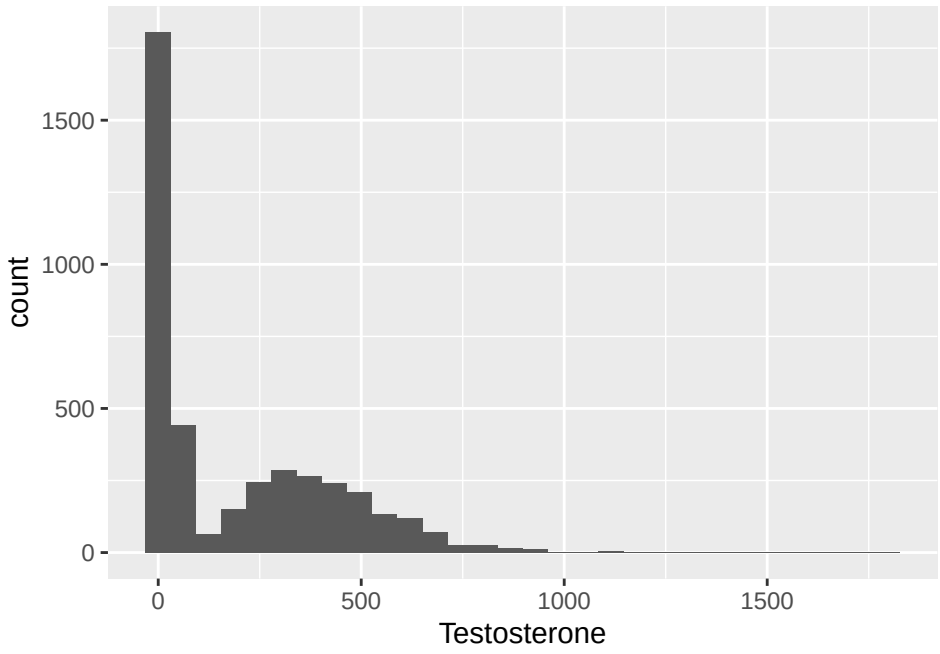
```
## [1] 10000    10
```

```
skim(OurData)
```

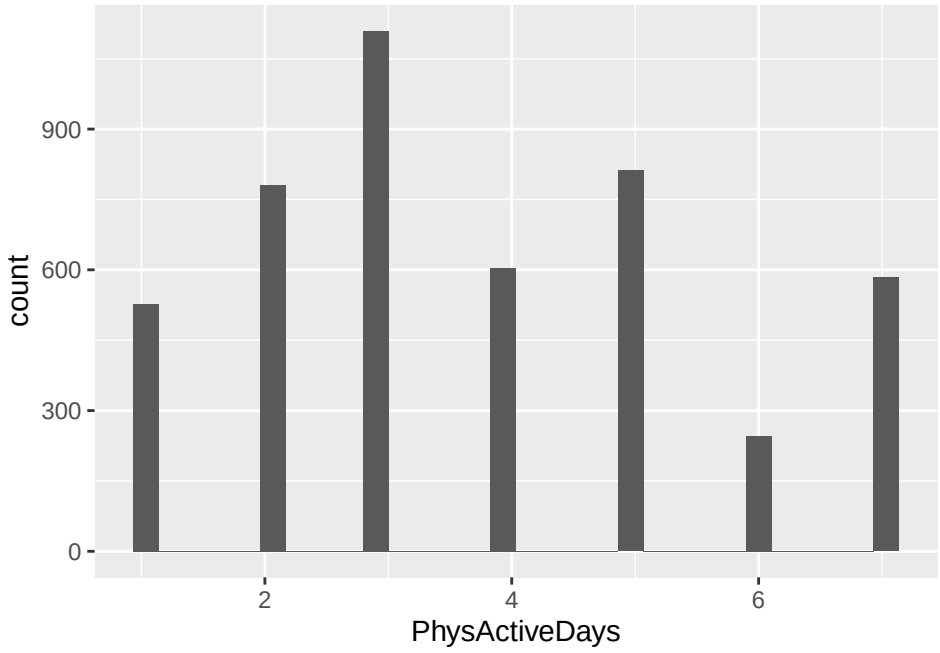
```
OurData %>%
  ggplot(aes(x = Pulse)) + # which column are the residuals?
  geom_histogram()  # nothing to do here, but remember this function for later!
```



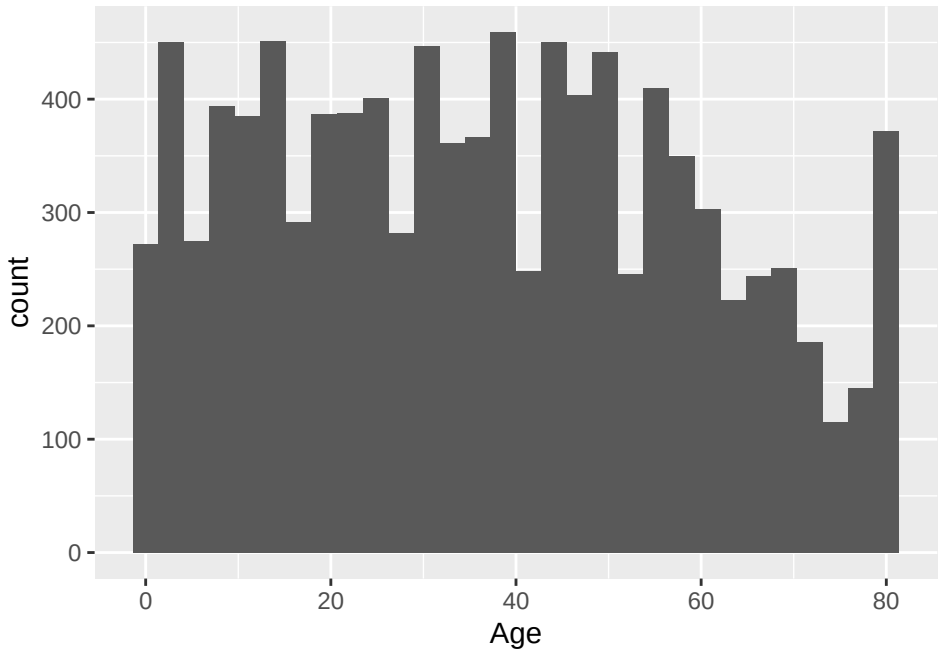

```
OurData %>%
  ggplot(aes(x = Testosterone)) + # which column are the residuals?
  geom_histogram()  # nothing to do here, but remember this function for later!
```




```
OurData %>%
  ggplot(aes(x = PhysActiveDays)) + # which column are the residuals?
  geom_histogram()  # nothing to do here, but remember this function for later!
```

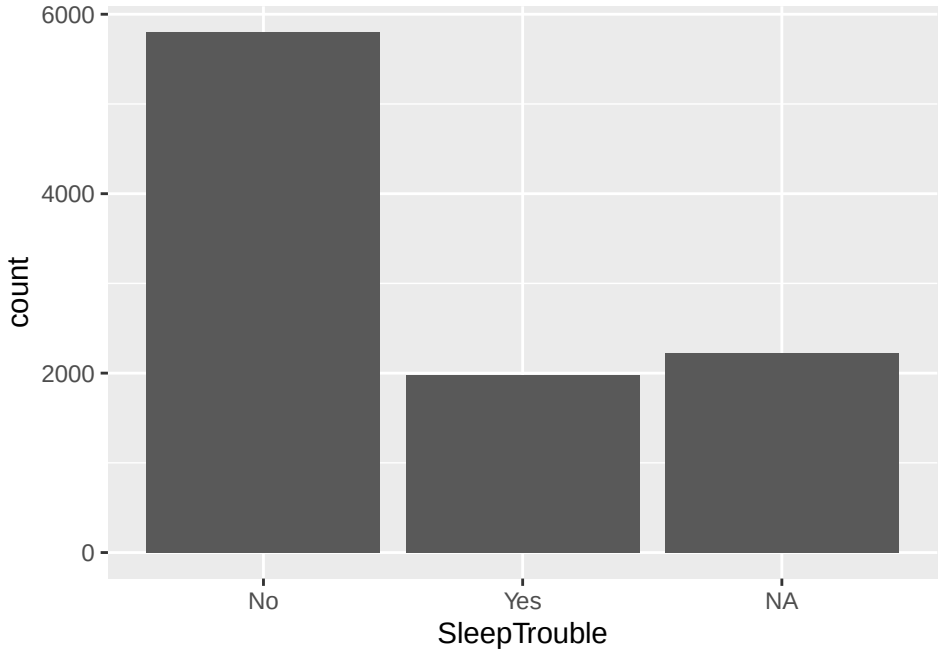



```
OurData %>%
  ggplot(aes(x = Age)) + # which column are the residuals?
  geom_histogram()  # nothing to do here, but remember this function for later!
```

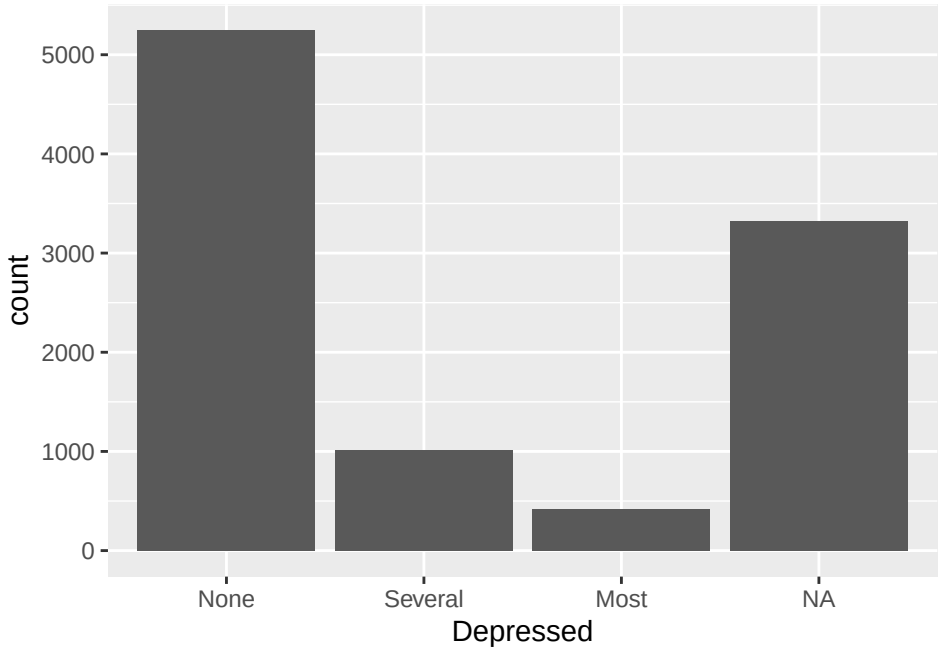



```
OurData %>%
  ggplot(aes(x = Gender)) + # which column are the residuals?
  geom_bar()  # nothing to do here, but remember this function for later!
```

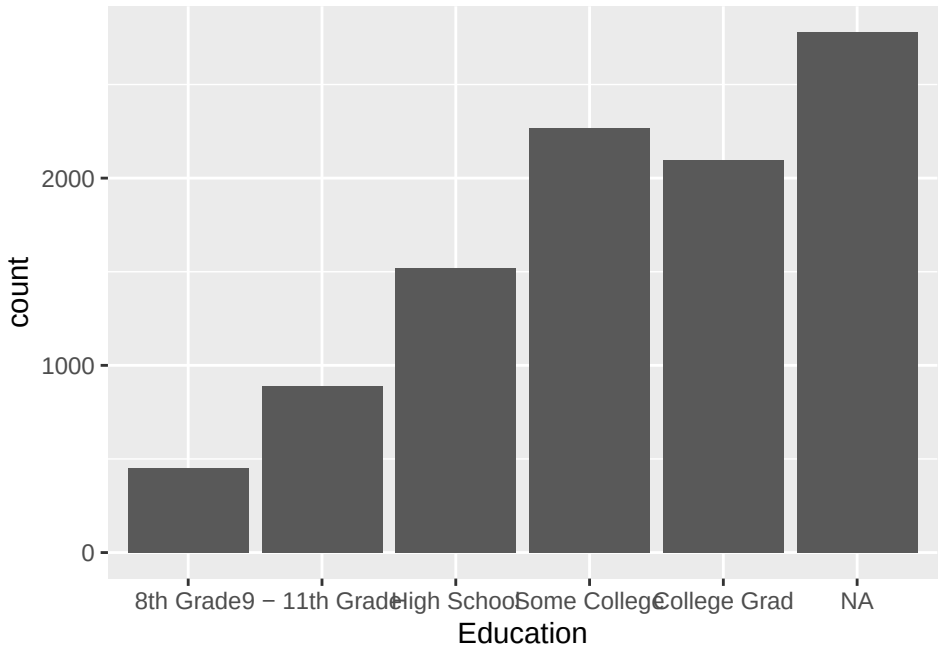

```
OurData %>%
  ggplot(aes(x = SleepTrouble)) + # which column are the residuals?
  geom_bar()  # nothing to do here, but remember this function for later!
```



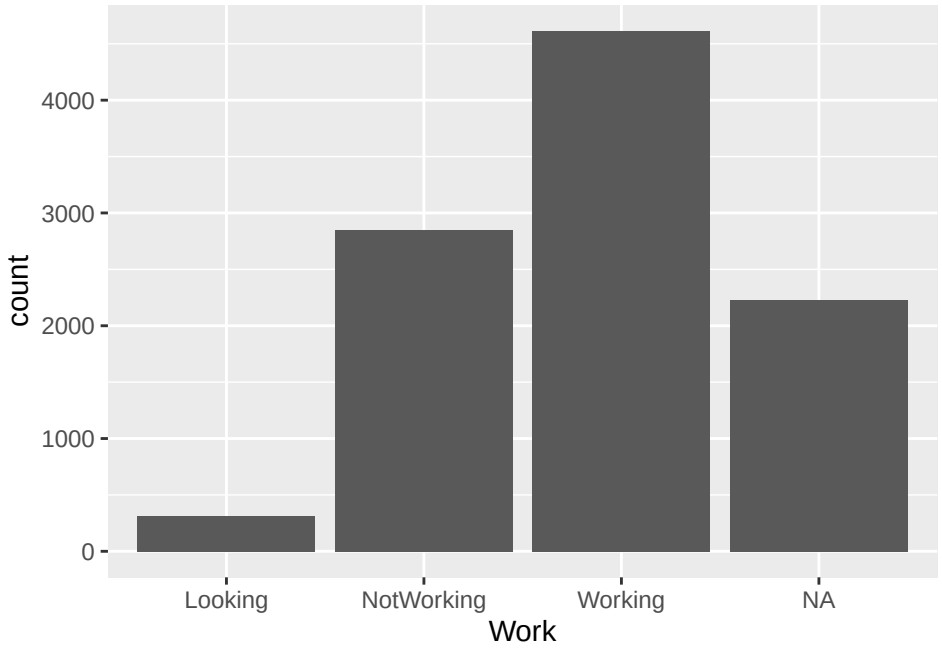

```
OurData %>%
  ggplot(aes(x = Depressed)) + # which column are the residuals?
  geom_bar()  # nothing to do here, but remember this function for later!
```



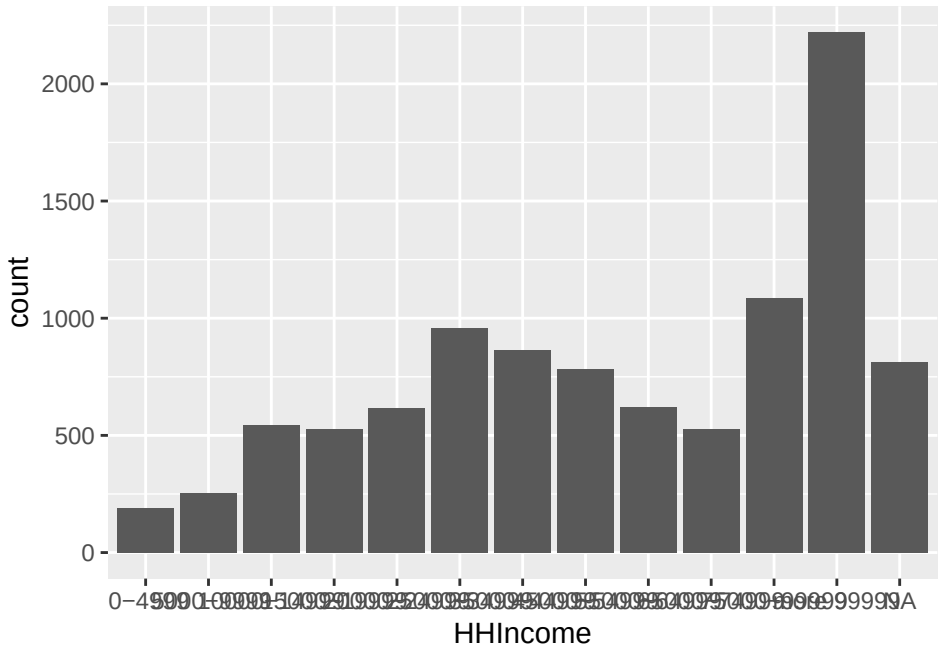

```
OurData %>%
  ggplot(aes(x = Education)) + # which column are the residuals?
  geom_bar()  # nothing to do here, but remember this function for later!
```




```
OurData %>%
  ggplot(aes(x = Work)) + # which column are the residuals?
  geom_bar()  # nothing to do here, but remember this function for later!
```




```
OurData %>%
  ggplot(aes(x = HHIncome)) + # which column are the residuals?
  geom_bar()  # nothing to do here, but remember this function for later!
```



We are using data from the National Health and Nutrition Exam Survey (NHANES) database that was collected between 2009-2012 with adjusted weighing.

There are 75 total variables, however only 10 are relevant to our project.

The target population of NHANES is "the non-institutionalized civilian resident population of the United States". Therefore, the observational unit is a civilian resident of the United States (of any age).