case-01-ec-rmd

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```
library(tidyverse)
library(dplyr)
library(tidyr)
library(MKinfer)
library(survival)
library(survminer)
```

```
data <- read_csv("data/dig.csv")

dig <- data %>%
  filter(TRTMT == 1)

plac <- data %>%
  filter(TRTMT == 0)
```

Table 1 Values for Digoxin

```
#mean and sd of age
mean(dig$AGE)
```

```
## [1] 63.4189
```

```
sd(dig$AGE)
```

```
## [1] 11.0244
```

```
#mean and sd of ejection fraction
mean(dig$EJF_PER)
```

```
## [1] 28.63497
```

```
sd(dig$EJF_PER)
```

```
## [1] 8.845343
```

```
#median duration of CHF
dig %>%
  filter(!is.na(CHFDUR)) %>%
  summarise(med = median(CHFDUR))
```

```
## # A tibble: 1 x 1
##     med
##   <dbl>
## 1    17
```

```r
#prop female
dig %>%
  mutate(SEX = case_when(
    SEX == 1 ~ "Male",
    TRUE ~ "Female"
  )) %>%
  count(SEX) %>%
  mutate(freq = round(n / nrow(dig),3)) %>%
  filter(SEX =="Female")
```

```
## # A tibble: 1 x 3
##   SEX        n  freq
##   <chr>  <int> <dbl>
## 1 Female   755 0.222
```

```r
#prop non-white
dig %>%
  mutate(RACE = case_when(
    RACE == 1 ~ "White",
    TRUE ~ "Non-white"
  )) %>%
  count(RACE) %>%
  mutate(freq = round(n / nrow(dig),3)) %>%
  filter(RACE =="Non-white")
```

```
## # A tibble: 1 x 3
##   RACE          n  freq
##   <chr>     <int> <dbl>
## 1 Non-white   487 0.143
```

```r
#prop older than 70
dig %>%
  filter(`AGE` > 70) %>%
  nrow()/ nrow(dig)
```

```
## [1] 0.2667059
```

```r
#prop each method of assessing ejection fraction
dig %>%
  mutate(`EJFMETH` = case_when(
    `EJFMETH` == 1 ~ "Radionuclide ventriculography",
     `EJFMETH` == 2 ~ "Contrast angiography",
     `EJFMETH` == 3 ~ "Two-dimensional echocardiography")) %>%
  count(`EJFMETH`) %>%
  group_by(`EJFMETH`) %>%
  summarise(freq = round(n / nrow(dig),3))
```

```
## # A tibble: 3 x 2
##   EJFMETH                          freq
##   <chr>                           <dbl>
## 1 Contrast angiography            0.055
## 2 Radionuclide ventriculography   0.65
## 3 Two-dimensional echocardiography 0.295
```

```r
#prop cardiothoracic ratio
dig %>%
  filter(`CHESTX` > .55) %>%
```

```
  nrow()/ nrow(dig)
```

```
## [1] 0.3461878
```

```
#prop NYHA class
dig %>%
  mutate(`FUNCTCLS` = case_when(
    `FUNCTCLS` == 1 ~"I",
    `FUNCTCLS` == 2 ~"II",
    `FUNCTCLS` == 3 ~"III",
    `FUNCTCLS` == 4~"IV")) %>%
  count(`FUNCTCLS`) %>%
  group_by(`FUNCTCLS`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  drop_na()
```

```
## # A tibble: 4 x 2
##   FUNCTCLS  freq
##   <chr>    <dbl>
## 1 I        0.137
## 2 II       0.533
## 3 III      0.307
## 4 IV       0.022
```

```
#prop for each number of signs/symptoms
dig %>%
  count(`NSYM`) %>%
  group_by(`NSYM`) %>%
  summarise(freq = round(n / nrow(dig),3))
```

```
## # A tibble: 5 x 2
##    NSYM  freq
##   <dbl> <dbl>
## 1     0 0.011
## 2     1 0.024
## 3     2 0.071
## 4     3 0.093
## 5     4 0.802
```

```
#prop previous myo infection
dig %>%
  count(`PREVMI`) %>%
  group_by(`PREVMI`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`PREVMI` == 1)
```

```
## # A tibble: 1 x 2
##   PREVMI  freq
##    <dbl> <dbl>
## 1      1 0.647
```

```
#prop angina
dig %>%
  count(`ANGINA`) %>%
  group_by(`ANGINA`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`ANGINA` == 1)
```

```
## # A tibble: 1 x 2
##   ANGINA  freq
##    <dbl> <dbl>
## 1      1 0.271
```

```
#prop diabetes
dig %>%
  count(`DIABETES`) %>%
  group_by(`DIABETES`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`DIABETES` == 1)
```

```
## # A tibble: 1 x 2
##   DIABETES  freq
##      <dbl> <dbl>
## 1        1 0.283
```

```
#prop hypertension
dig %>%
  count(`HYPERTEN`) %>%
  group_by(`HYPERTEN`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`HYPERTEN` == 1)
```

```
## # A tibble: 1 x 2
##   HYPERTEN  freq
##      <dbl> <dbl>
## 1        1  0.45
```

```
#prop previous digoxin use
dig %>%
  count(`DIGUSE`) %>%
  group_by(`DIGUSE`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`DIGUSE` == 1)
```

```
## # A tibble: 1 x 2
##   DIGUSE  freq
##    <dbl> <dbl>
## 1      1 0.441
```

```
#prop primary cause nonischemic or ischemic
dig %>%
  mutate(`CHFETIOL_ni` = case_when(
   `CHFETIOL` == 1 ~ "Ischemic",
   TRUE ~ "Nonischemic")) %>%
  count(`CHFETIOL_ni`) %>%
  group_by(`CHFETIOL_ni`) %>%
  summarise(freq = round(n / nrow(dig),3))
```

```
## # A tibble: 2 x 2
##   CHFETIOL_ni  freq
##   <chr>       <dbl>
## 1 Ischemic    0.708
## 2 Nonischemic 0.292
```

```
#prop primary cause within nonischemic
dig %>%
```

```
  mutate(`CHFETIOL` = case_when(
    `CHFETIOL` == 3 |`CHFETIOL`== 6 |`CHFETIOL`== 5 ~ "Other",
    `CHFETIOL` == 1 ~ "Ischemic",
    `CHFETIOL` == 2 ~ "Hypertensive",
    `CHFETIOL` == 4 ~ "Idiopathic")) %>%
  count(`CHFETIOL`) %>%
  group_by(`CHFETIOL`) %>%
  summarise(freq = (n / nrow(dig))) %>%
  drop_na()
```

```
## # A tibble: 4 x 2
##   CHFETIOL       freq
##   <chr>         <dbl>
## 1 Hypertensive 0.0801
## 2 Idiopathic   0.155
## 3 Ischemic     0.708
## 4 Other        0.0548
```

```
#prop diuretics
dig %>%
  mutate(`diurets` = case_when(
   `DIURET` == 1 | `DIURETK` == 1 ~ "Diuretics")) %>%
  count(`diurets`) %>%
  group_by(`diurets`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(diurets == "Diuretics")
```

```
## # A tibble: 1 x 2
##   diurets    freq
##   <chr>     <dbl>
## 1 Diuretics 0.812
```

```
#prop ace inhibitor
dig %>%
  count(`ACEINHIB`) %>%
  group_by(`ACEINHIB`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`ACEINHIB` == 1)
```

```
## # A tibble: 1 x 2
##   ACEINHIB  freq
##      <dbl> <dbl>
## 1        1 0.941
```

```
#prop nitrates
dig %>%
  count(`NITRATES`) %>%
  group_by(`NITRATES`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`NITRATES` == 1)
```

```
## # A tibble: 1 x 2
##   NITRATES  freq
##      <dbl> <dbl>
## 1        1 0.422
```

```r
#prop other vasodilators
dig %>%
  count(`VASOD`) %>%
  group_by(`VASOD`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`VASOD` == 1)
```

```
## # A tibble: 1 x 2
##   VASOD  freq
##   <dbl> <dbl>
## 1     1 0.009
```

```r
#prop daily dose
dig %>%
  filter(`DIGDOSE` %in% c(0.125, 0.250, 0.375, 0.500)) %>%
  count(`DIGDOSE`) %>%
  group_by(`DIGDOSE`) %>%
  summarise(freq = (n / nrow(dig)))
```

```
## # A tibble: 4 x 2
##   DIGDOSE   freq
##     <dbl>  <dbl>
## 1   0.125 0.175
## 2   0.25  0.706
## 3   0.375 0.103
## 4   0.5   0.0106
```

Table 1 Values for Placebo

```r
#mean and sd of age
mean(plac$AGE)
```

```
## [1] 63.54746
```

```r
sd(plac$AGE)
```

```
## [1] 10.8136
```

```r
#mean and sd of ejection fraction
mean(plac$EJF_PER)
```

```
## [1] 28.44637
```

```r
sd(plac$EJF_PER)
```

```
## [1] 8.852056
```

```r
#median duration of CHF
plac %>%
  filter(!is.na(CHFDUR)) %>%
  summarise(med = median(CHFDUR))
```

```
## # A tibble: 1 x 1
##     med
##   <dbl>
## 1    16
```

```r
#prop female
plac %>%
  mutate(SEX = case_when(
    SEX == 1 ~ "Male",
    TRUE ~ "Female"
  )) %>%
  count(SEX) %>%
  mutate(freq = round(n / nrow(plac),3)) %>%
  filter(SEX =="Female")
```

```
## # A tibble: 1 x 3
##   SEX        n  freq
##   <chr>  <int> <dbl>
## 1 Female   764 0.225
```

```r
#prop non-white
plac %>%
  mutate(RACE = case_when(
    RACE == 1 ~ "White",
    TRUE ~ "Non-white"
  )) %>%
  count(RACE) %>%
  mutate(freq = round(n / nrow(plac),3)) %>%
  filter(RACE =="Non-white")
```

```
## # A tibble: 1 x 3
##   RACE          n  freq
##   <chr>     <int> <dbl>
## 1 Non-white   504 0.148
```

```r
#prop older than 70
plac %>%
  filter(`AGE` > 70) %>%
  nrow()/ nrow(plac)
```

```
## [1] 0.2735821
```

```r
#prop each method of assessing ejection fraction
plac %>%
  mutate(`EJFMETH` = case_when(
    `EJFMETH` == 1 ~ "Radionuclide ventriculography",
     `EJFMETH` == 2 ~ "Contrast angiography",
     `EJFMETH` == 3 ~ "Two-dimensional echocardiography")) %>%
  count(`EJFMETH`) %>%
  group_by(`EJFMETH`) %>%
  summarise(freq = round(n / nrow(plac),3))
```

```
## # A tibble: 3 x 2
##   EJFMETH                          freq
##   <chr>                           <dbl>
## 1 Contrast angiography            0.058
## 2 Radionuclide ventriculography   0.642
## 3 Two-dimensional echocardiography 0.3
```

```r
#prop cardiothoracic ratio
plac %>%
  filter(`CHESTX` > .55) %>%
```

```
  nrow()/ nrow(plac)
```

```
## [1] 0.3438143
```

```
#prop NYHA class
plac %>%
  mutate(`FUNCTCLS` = case_when(
    `FUNCTCLS` == 1 ~"I",
    `FUNCTCLS` == 2 ~"II",
    `FUNCTCLS` == 3 ~"III",
    `FUNCTCLS` == 4~"IV")) %>%
  count(`FUNCTCLS`) %>%
  group_by(`FUNCTCLS`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  drop_na()
```

```
## # A tibble: 4 x 2
##   FUNCTCLS  freq
##   <chr>    <dbl>
## 1 I        0.13
## 2 II       0.545
## 3 III      0.305
## 4 IV       0.019
```

```
#prop for each number of signs/symptoms
plac %>%
  count(`NSYM`) %>%
  group_by(`NSYM`) %>%
  summarise(freq = round(n / nrow(plac),3))
```

```
## # A tibble: 5 x 2
##    NSYM  freq
##   <dbl> <dbl>
## 1     0 0.011
## 2     1 0.02
## 3     2 0.071
## 4     3 0.086
## 5     4 0.812
```

```
#prop previous myo infection
plac %>%
  count(`PREVMI`) %>%
  group_by(`PREVMI`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(`PREVMI` == 1)
```

```
## # A tibble: 1 x 2
##   PREVMI  freq
##    <dbl> <dbl>
## 1      1 0.653
```

```
#prop angina
plac %>%
  count(`ANGINA`) %>%
  group_by(`ANGINA`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(`ANGINA` == 1)
```

```
## # A tibble: 1 x 2
##   ANGINA  freq
##    <dbl> <dbl>
## 1      1 0.264
```

```
#prop diabetes
plac %>%
  count(`DIABETES`) %>%
  group_by(`DIABETES`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(`DIABETES` == 1)
```

```
## # A tibble: 1 x 2
##   DIABETES  freq
##      <dbl> <dbl>
## 1        1 0.286
```

```
#prop hypertension
plac %>%
  count(`HYPERTEN`) %>%
  group_by(`HYPERTEN`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(`HYPERTEN` == 1)
```

```
## # A tibble: 1 x 2
##   HYPERTEN  freq
##      <dbl> <dbl>
## 1        1 0.458
```

```
#prop previous digoxin use
dig %>%
  count(`DIGUSE`) %>%
  group_by(`DIGUSE`) %>%
  summarise(freq = round(n / nrow(dig),3)) %>%
  filter(`DIGUSE` == 1)
```

```
## # A tibble: 1 x 2
##   DIGUSE  freq
##    <dbl> <dbl>
## 1      1 0.441
```

```
#prop primary cause nonischemic or ischemic
plac %>%
  mutate(`CHFETIOL_ni` = case_when(
   `CHFETIOL` == 1 ~ "Ischemic",
   TRUE ~ "Nonischemic")) %>%
  count(`CHFETIOL_ni`) %>%
  group_by(`CHFETIOL_ni`) %>%
  summarise(freq = round(n / nrow(plac),3))
```

```
## # A tibble: 2 x 2
##   CHFETIOL_ni  freq
##   <chr>       <dbl>
## 1 Ischemic    0.705
## 2 Nonischemic 0.295
```

```
#prop primary cause within nonischemic
plac %>%
```

```
  mutate(`CHFETIOL` = case_when(
    `CHFETIOL` == 3 |`CHFETIOL`== 6 |`CHFETIOL`== 5 ~ "Other",
    `CHFETIOL` == 1 ~ "Ischemic",
    `CHFETIOL` == 2 ~ "Hypertensive",
    `CHFETIOL` == 4 ~ "Idiopathic")) %>%
  count(`CHFETIOL`) %>%
  group_by(`CHFETIOL`) %>%
  summarise(freq = (n / nrow(plac))) %>%
  drop_na()
```

```
## # A tibble: 4 x 2
##   CHFETIOL       freq
##   <chr>         <dbl>
## 1 Hypertensive 0.0914
## 2 Idiopathic   0.142
## 3 Ischemic     0.705
## 4 Other        0.0597
```

```
#prop diuretics
plac %>%
  mutate(`diurets` = case_when(
   `DIURET` == 1 | `DIURETK` == 1 ~ "Diuretics")) %>%
  count(`diurets`) %>%
  group_by(`diurets`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(diurets == "Diuretics")
```

```
## # A tibble: 1 x 2
##   diurets    freq
##   <chr>     <dbl>
## 1 Diuretics 0.822
```

```
#prop ace inhibitor
plac %>%
  count(`ACEINHIB`) %>%
  group_by(`ACEINHIB`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(`ACEINHIB` == 1)
```

```
## # A tibble: 1 x 2
##   ACEINHIB  freq
##      <dbl> <dbl>
## 1        1 0.948
```

```
#prop nitrates
plac %>%
  count(`NITRATES`) %>%
  group_by(`NITRATES`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(`NITRATES` == 1)
```

```
## # A tibble: 1 x 2
##   NITRATES  freq
##      <dbl> <dbl>
## 1        1 0.431
```

```
#prop other vasodilators
plac %>%
  count(`VASOD`) %>%
  group_by(`VASOD`) %>%
  summarise(freq = round(n / nrow(plac),3)) %>%
  filter(`VASOD` == 1)
```

```
## # A tibble: 1 x 2
##   VASOD  freq
##   <dbl> <dbl>
## 1     1 0.015
```

```
#prop daily dose
plac %>%
  filter(`DIGDOSE` %in% c(0.125, 0.250, 0.375, 0.500)) %>%
  count(`DIGDOSE`) %>%
  group_by(`DIGDOSE`) %>%
  summarise(freq = (n / nrow(plac)))
```

```
## # A tibble: 4 x 2
##   DIGDOSE    freq
##     <dbl>   <dbl>
## 1   0.125 0.174
## 2   0.25  0.701
## 3   0.375 0.113
## 4   0.5   0.00940
```

Table 4 Digoxin Values

```
#ejection fraction .25-.45
dig %>%
  filter(`EJF_PER` >= 25 & `EJF_PER` <= 45) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   613  0.27
```

```
#ejection fraction < .25
dig %>%
  filter(`EJF_PER` < 25) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   428  0.38
```

```
#previous use of digoxin
dig %>%
```

```
  group_by(DIGUSE) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 2 x 4
## # Groups:   DIGUSE [2]
##   DIGUSE  DWHF     n  freq
##    <dbl> <dbl> <int> <dbl>
## 1      0     1   491 0.259
## 2      1     1   550 0.367
```

```
#cause of heart failure
dig %>%
  mutate(`CHFETIOL_ni` = case_when(
   `CHFETIOL` == 1 ~ "Ischemic",
   TRUE ~ "Nonischemic")) %>%
  group_by(CHFETIOL_ni) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 2 x 4
## # Groups:   CHFETIOL_ni [2]
##   CHFETIOL_ni  DWHF     n  freq
##   <chr>       <dbl> <int> <dbl>
## 1 Ischemic        1   731 0.304
## 2 Nonischemic     1   310 0.312
```

```
#cardiothoracic ratio <= .55
dig %>%
  filter(`CHESTX` <= .55) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   600  0.27
```

```
#cardiothoracic ratio > .55
dig %>%
  filter(`CHESTX` > .55) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   441 0.375
```

```
#nyha class
dig %>%
  mutate(`FUNCTCLS` = case_when(
   `FUNCTCLS` == 1 | `FUNCTCLS` == 2 ~ "1 or 2",
```

```
   TRUE ~ "3 or 4")) %>%
  group_by(FUNCTCLS) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 2 x 4
## # Groups:   FUNCTCLS [2]
##   FUNCTCLS  DWHF     n  freq
##   <chr>    <dbl> <int> <dbl>
## 1 1 or 2       1   601 0.264
## 2 3 or 4       1   440 0.392
```

```
#overall study
dig %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1  1041 0.306
```

Table 4 Placebo Values

```
#ejection fraction .25-.45
plac %>%
  filter(`EJF_PER` >= 25 & `EJF_PER` <= 45) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   735 0.323
```

```
#ejection fraction <.25
plac %>%
  filter(`EJF_PER` < 25) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   556 0.492
```

```
#previous use of digoxin
plac %>%
  group_by(DIGUSE) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
```

```
  filter(DWHF == 1)
```

```
## # A tibble: 2 x 4
## # Groups:   DIGUSE [2]
##   DIGUSE  DWHF     n  freq
##    <dbl> <dbl> <int> <dbl>
## 1      0     1   603 0.32
## 2      1     1   688 0.453
```

```
#cause of heart failure
plac %>%
  mutate(`CHFETIOL_ni` = case_when(
   `CHFETIOL` == 1 ~ "Ischemic",
   TRUE ~ "Nonischemic")) %>%
  group_by(CHFETIOL_ni) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 2 x 4
## # Groups:   CHFETIOL_ni [2]
##   CHFETIOL_ni  DWHF     n  freq
##   <chr>       <dbl> <int> <dbl>
## 1 Ischemic        1   873 0.364
## 2 Nonischemic     1   418 0.416
```

```
#cardiothoracic ratio <= .55
plac %>%
  filter(`CHESTX` <= .55) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   724 0.324
```

```
#cardiothoracic ratio > .55
plac %>%
  filter(`CHESTX` > .55) %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1   567 0.485
```

```
#nyha class
plac %>%
  mutate(`FUNCTCLS` = case_when(
   `FUNCTCLS` == 1 | `FUNCTCLS` == 2 ~ "1 or 2",
   TRUE ~ "3 or 4")) %>%
  group_by(FUNCTCLS) %>%
  count(`DWHF`) %>%
```

```
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 2 x 4
## # Groups:   FUNCTCLS [2]
##   FUNCTCLS  DWHF     n  freq
##   <chr>    <dbl> <int> <dbl>
## 1 1 or 2       1   739 0.322
## 2 3 or 4       1   552 0.499
```

```
#overall study
plac %>%
  count(`DWHF`) %>%
  mutate(freq= round(n/sum(n),3)) %>%
  filter(DWHF == 1)
```

```
## # A tibble: 1 x 3
##    DWHF     n  freq
##   <dbl> <int> <dbl>
## 1     1  1291 0.379
```

Table 4: Absolute Difference

```
#absolute dif ejection fraction .25-.45
dif1 = (613/2270) - (735/2273)
result1 = prop.test(x = c(613,735), n=c(2270,2273), conf.level =.95, correct = FALSE)
x1 = result1$conf.int
print(round(dif1,3))
```

```
## [1] -0.053
```

```
print(round(x1,3))
```

```
## [1] -0.080 -0.027
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif ejection fraction <.25
dif2 = (428/1127) - (556/1130)
result2 = prop.test(x = c(428,556), n=c(1127,1130), conf.level =.95, correct = FALSE)
x2 = result2$conf.int
print(round(dif2,3))
```

```
## [1] -0.112
```

```
print(round(x2,3))
```

```
## [1] -0.153 -0.072
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif previous digoxin use = yes
dif1 = (550/1498) - (688/1519)
result1 = prop.test(x = c(550,688), n=c(1498,1519), conf.level =.95, correct = FALSE)
x1 = result1$conf.int
print(round(dif1,3))
```

```
## [1] -0.086
```

```
print(round(x1,3))
```

```
## [1] -0.121 -0.051
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif previous digoxin use = no
dif2 = (491/1899) - (603/1884)
result2 = prop.test(x = c(491,603), n=c(1899,1884), conf.level =.95, correct = FALSE)
x2 = result2$conf.int
print(round(dif2,3))
```

```
## [1] -0.062
```

```
print(round(x2,3))
```

```
## [1] -0.090 -0.033
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif cause of heart failure = ischemic
dif1 = (731/2405) - (873/2398)
result1 = prop.test(x = c(731,873), n=c(2405,2389), conf.level =.95, correct = FALSE)
x1 = result1$conf.int
print(round(dif1,3))
```

```
## [1] -0.06
```

```
print(round(x1,3))
```

```
## [1] -0.088 -0.035
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif cause of heart failure = nonischemic
dif2 = (306/983) - (413/996)
result2 = prop.test(x = c(306,413), n=c(983,996), conf.level =.95, correct = FALSE)
x2 = result2$conf.int
print(round(dif2,3))
```

```
## [1] -0.103
```

```
print(round(x2,3))
```

```
## [1] -0.145 -0.061
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif ct ratio <= .55
dif1 = (600/2220) - (724/2233)
result1 = prop.test(x = c(600,724), n=c(2220,2233), conf.level =.95, correct = FALSE)
x1 = result1$conf.int
print(round(dif1,3))
```

```
## [1] -0.054
```

```
print(round(x1,3))
```

```
## [1] -0.081 -0.027
```

```
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif ct ratio > .55
dif2 = (441/1176) - (567/1170)
result2 = prop.test(x = c(441,567), n=c(1176,1170), conf.level =.95, correct = FALSE)
x2 = result2$conf.int
print(round(dif2,3))
```

```
## [1] -0.11
```

```
print(round(x2,3))
```

```
## [1] -0.149 -0.070
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif nyha class = 1 or 2
dif1 = (601/2275) - (739/2296)
result1 = prop.test(x = c(601,739), n=c(2275,2296), conf.level =.95, correct = FALSE)
x1 = result1$conf.int
print(round(dif1,3))
```

```
## [1] -0.058
```

```
print(round(x1,3))
```

```
## [1] -0.084 -0.031
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif nyha class = 3 or 4
dif2 = (438/1118) - (552/1105)
result2 = prop.test(x = c(438,552), n=c(1118,1105), conf.level =.95, correct = FALSE)
x2 = result2$conf.int
print(round(dif2,3))
```

```
## [1] -0.108
```

```
print(round(x2,3))
```

```
## [1] -0.149 -0.067
## attr(,"conf.level")
## [1] 0.95
```

```
#absolute dif overall pop
dif = (1041/3397) - (1291/3403)
result = prop.test(x = c(1041,1291), n=c(3397,3403), conf.level =.95, correct = FALSE)
x = result$conf.int
print(round(dif,3))
```

```
## [1] -0.073
```

```
print(round(x,3))
```

```
## [1] -0.095 -0.050
## attr(,"conf.level")
## [1] 0.95
```

Table 4: Risk Ratio

```
#risk ratio ejection fraction .25-.45
ratio1 = (613/2270) / (735/2273)
result1 = prop.test(x = 613*2273,n = 2270*735, conf.level =.95, correct=FALSE)
x1 = result1$conf.int
print(round(ratio1,3))
```

```
## [1] 0.835
```

```
print(round(x1,3))
```

```
## [1] 0.835 0.836
## attr(,"conf.level")
## [1] 0.95
```

```
#risk ratio ejection fraction <.25
ratio2 = (428/1127) / (556/1130)
result2 = prop.test(x = 428*1130,n = 1127*556, conf.level =.95, correct=FALSE)
x2 = result2$conf.int
print(round(ratio2,3))
```

```
## [1] 0.772
```

```
print(round(x2,3))
```

```
## [1] 0.771 0.773
## attr(,"conf.level")
## [1] 0.95
```

```
#risk ratio prev digoxin use = yes
ratio1 = (550/1498) / (688/1519)
result1 = prop.test(x = 550*1519,n = 1498*688, conf.level =.95, correct=FALSE)
x1 = result1$conf.int
print(round(ratio1,3))
```

```
## [1] 0.811
```

```
print(round(x1,3))
```

```
## [1] 0.810 0.811
## attr(,"conf.level")
## [1] 0.95
```

```
#risk ratio prev digoxin use = no
ratio2 = (491/1899) / (603/1884)
result2 = prop.test(x = 491*1884,n = 1899*603, conf.level =.95, correct=FALSE)
x2 = result2$conf.int
print(round(ratio2,3))
```

```
## [1] 0.808
```

```
print(round(x2,3))
```

```
## [1] 0.807 0.809
## attr(,"conf.level")
## [1] 0.95
```

```
#risk ratio cause of heart failure = ischemic
ratio1 = (731/2405) / (873/2398)
```

```r
result1 = prop.test(x = 731*2398,n = 2405*873, conf.level =.95, correct=FALSE)
x1 = result1$conf.int
print(round(ratio1,3))
```

```
## [1] 0.835
```

```r
print(round(x1,3))
```

```
## [1] 0.834 0.835
## attr(,"conf.level")
## [1] 0.95
```

```r
#risk ratio cause of heart failure = nonischemic
ratio2 = (306/983) / (413/996)
result2 = prop.test(x = 306*996,n = 983*413, conf.level =.95, correct=FALSE)
x2 = result2$conf.int
print(round(ratio2,3))
```

```
## [1] 0.751
```

```r
print(round(x2,3))
```

```
## [1] 0.749 0.752
## attr(,"conf.level")
## [1] 0.95
```

```r
#risk ratio ct ratio <= .55
ratio1 = (600/2270) / (724/2233)
result1 = prop.test(x = 600*2233,n = 2270*724, conf.level =.95, correct=FALSE)
x1 = result1$conf.int
print(round(ratio1,3))
```

```
## [1] 0.815
```

```r
print(round(x1,3))
```

```
## [1] 0.815 0.816
## attr(,"conf.level")
## [1] 0.95
```

```r
#risk ratio ct ratio > .55
ratio2 = (441/1176) / (567/1170)
result2 = prop.test(x = 441*1170,n = 1176*567, conf.level =.95, correct=FALSE)
x2 = result2$conf.int
print(round(ratio2,3))
```

```
## [1] 0.774
```

```r
print(round(x2,3))
```

```
## [1] 0.773 0.775
## attr(,"conf.level")
## [1] 0.95
```

```r
#risk ratio nyha = 1 or 2
ratio1 = (601/2275) / (739/2296)
result1 = prop.test(x = 601*2296,n = 2275*739, conf.level =.95, correct=FALSE)
x1 = result1$conf.int
print(round(ratio1,3))
```

```
## [1] 0.821
```

```
print(round(x1,3))
```

```
## [1] 0.820 0.821
## attr(,"conf.level")
## [1] 0.95
```

```
#risk ratio nyha = 3 or 4
ratio2 = (438/1118) / (552/1105)
result2 = prop.test(x = 438*1105,n = 1118*552, conf.level =.95, correct=FALSE)
x2 = result2$conf.int
print(round(ratio2,3))
```

```
## [1] 0.784
```

```
print(round(x2,3))
```

```
## [1] 0.783 0.785
## attr(,"conf.level")
## [1] 0.95
```

```
#risk ratio overall pop
ratio = (1041/3397) / (1291/3403)
result = prop.test(x = 1041*3403, n= 3397*1291, conf.level =.95, correct = FALSE)
x = result$conf.int
print(round(ratio,3))
```

```
## [1] 0.808
```

```
print(round(x,3))
```

```
## [1] 0.807 0.808
## attr(,"conf.level")
## [1] 0.95
```

Discussion

The values I calculated for table 1 and table 4 (except the risk ratio column) are very close to the ones in the report. Most of them are only off by .1% which is likely just due to differences in rounding. However, the risk ratio column in table 4 that I calculated has more differences from the original paper. The values are off by no more than .15, and the confidence intervals are much smaller than in the original paper. I calculated the risk ratios by dividing the percentage of patients on digoxin that experienced each level of the variable (ejection fraction, previous digoxin use cause of heart failure, ct ratio, NYHA class) by the percentage of patients on the placebo that experienced that same level. I chose to do it this way because that is how a risk ratio is usually calculated by hand. The researchers said that they estimated the risk ratios from the Cox proportional-hazards model; however, I tried finding the risk ratios using the model output, and the values were very different from the ones in the paper since many were over 1. Calculating the risk ratios by hand and using the actual definition of risk ratios brought me closer than trying to estimate them from the model, so I chose hand calculation instead. I believe are differences are because the researchers were very unclear in the paper how they calculated their risk ratios. Because it was so vague, I struggled with finding the right calculations to give me the same output. Additionally, Professor Jiang mentioned that the paper used the term risk ratio which is not actually the right term for the calculations which leads to grater confusion. I couldn't figure out what other calculations/formulas the reserarchers were doing to get those number, so I just chose the traditional method to find risk ratios since that was what the paper originally indicated.