

# case-01-ec-rmd

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## Table 1 Values for Digoxin

mean and sd of age

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

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

mean and sd of ejection fraction

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

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

median duration of CHF

```
## # A tibble: 1 x 1
```

```
##   med
```

```
##   <dbl>
```

```
## 1    17
```

prop female

```
## # A tibble: 1 x 3
```

```
##   SEX      n freq
```

```
##   <chr> <int> <dbl>
```

```
## 1 Female   755 0.222
```

prop non-white

```
## # A tibble: 1 x 3
```

```
##   RACE      n freq
```

```
##   <chr> <int> <dbl>
```

```
## 1 Non-white  487 0.143
```

prop older than 70

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

prop each method of assessing ejection fraction

```
## # 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
```

prop cardiothoracic ratio

```

## [1] 0.3461878

prop NYHA class

## # 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

## # 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

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

prop angina

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

prop diabetes

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

prop hypertension

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

prop previous digoxin use

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

prop primary cause nonischemic or ischemic

## # A tibble: 2 x 2
##   CHFETIOL_ni freq

```

```

##   <chr>      <dbl>
## 1 Ischemic    0.708
## 2 Nonischemic 0.292

prop primary cause within nonischemic

## # 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

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

prop ace inhibitor

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

prop nitrates

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

prop other vasodilators

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

prop daily dose

## # 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

mean and sd of age

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

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

mean and sd of ejection fraction

```

## [1] 28.44637
## [1] 8.852056
median duration of CHF
## # A tibble: 1 x 1
##   med
##   <dbl>
## 1    16
prop female
## # A tibble: 1 x 3
##   SEX      n freq
##   <chr> <int> <dbl>
## 1 Female   764 0.225
prop non-white
## # A tibble: 1 x 3
##   RACE      n freq
##   <chr> <int> <dbl>
## 1 Non-white   504 0.148
prop older than 70
## [1] 0.2735821
prop each method of assessing ejection fraction
## # 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
prop cardiothoracic ratio
## [1] 0.3438143
prop NYHA class
## # 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
## # 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

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

prop angina

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

prop diabetes

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

prop hypertension

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

prop previous digoxin use

## # A tibble: 1 x 2
##   DIGUSE   freq
##   <dbl> <dbl>
## 1       1 0.446

prop primary cause nonischemic or ischemic

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

prop primary cause within nonischemic

## # 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

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

prop ace inhibitor

```

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

prop nitrates

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

prop other vasodilators

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

prop daily dose

```
## # 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

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

ejection fraction < .25

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

previous use of digoxin

```
## # 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

```
## # 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

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

cardiothoracic ratio > .55

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

nyha class

## # 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

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

```

## Table 4 Placebo Values

```

ejection fraction .25-.45

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

ejection fraction < .25

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

previous use of digoxin

## # 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

```

```

## # 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

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

cardiothoracic ratio > .55

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

nyha class

## # 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

## # 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

```

## [1] -0.053
## [1] -0.080 -0.027
## attr(,"conf.level")
## [1] 0.95

```

absolute dif ejection fraction <.25

```

## [1] -0.112
## [1] -0.153 -0.072
## attr(,"conf.level")
## [1] 0.95

```

absolute dif previous digoxin use = yes

```

## [1] -0.086
## [1] -0.121 -0.051
## attr(,"conf.level")

```



```

## [1] 0.95
absolute dif previous digoxin use = no
## [1] -0.062
## [1] -0.090 -0.033
## attr(,"conf.level")
## [1] 0.95
absolute dif cause of heart failure = ischemic
## [1] -0.06
## [1] -0.088 -0.035
## attr(,"conf.level")
## [1] 0.95
absolute dif cause of heart failure = nonischemic
## [1] -0.103
## [1] -0.145 -0.061
## attr(,"conf.level")
## [1] 0.95
absolute dif ct ratio <= .55
## [1] -0.054
## [1] -0.081 -0.027
## attr(,"conf.level")
## [1] 0.95
absolute dif ct ratio > .55
## [1] -0.11
## [1] -0.149 -0.070
## attr(,"conf.level")
## [1] 0.95
absolute dif nyha class = 1 or 2
## [1] -0.058
## [1] -0.084 -0.031
## attr(,"conf.level")
## [1] 0.95
absolute dif nyha class = 3 or 4
## [1] -0.108
## [1] -0.149 -0.067
## attr(,"conf.level")
## [1] 0.95
absolute dif overall pop
## [1] -0.073
## [1] -0.095 -0.050
## attr(,"conf.level")
## [1] 0.95

```

## Table 4: Risk Ratio

risk ratio ejection fraction .25-.45

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

```
## [1] 0.835 0.836
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

risk ratio ejection fraction <.25

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

```
## [1] 0.771 0.773
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

risk ratio prev digoxin use = yes

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

```
## [1] 0.810 0.811
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

risk ratio prev digoxin use = no

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

```
## [1] 0.807 0.809
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

risk ratio cause of heart failure = ischemic

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

```
## [1] 0.834 0.835
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

risk ratio cause of heart failure = nonischemic

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

```
## [1] 0.749 0.752
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

risk ratio ct ratio <= .55

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

```
## [1] 0.815 0.816
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

risk ratio ct ratio > .55

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

```
## [1] 0.773 0.775
```

```
## attr(,"conf.level")
```

```
## [1] 0.95
```

```

risk ratio nyha = 1 or 2
## [1] 0.821
## [1] 0.820 0.821
## attr(,"conf.level")
## [1] 0.95

risk ratio nyha = 3 or 4
## [1] 0.784
## [1] 0.783 0.785
## attr(,"conf.level")
## [1] 0.95

risk ratio overall pop
## [1] 0.808
## [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 the 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 greater confusion. I couldn't figure out what other calculations/formulas the researchers were doing to get those numbers, so I just chose the traditional method to find risk ratios since that was what the paper originally indicated.