jobsdata

2023-12-02

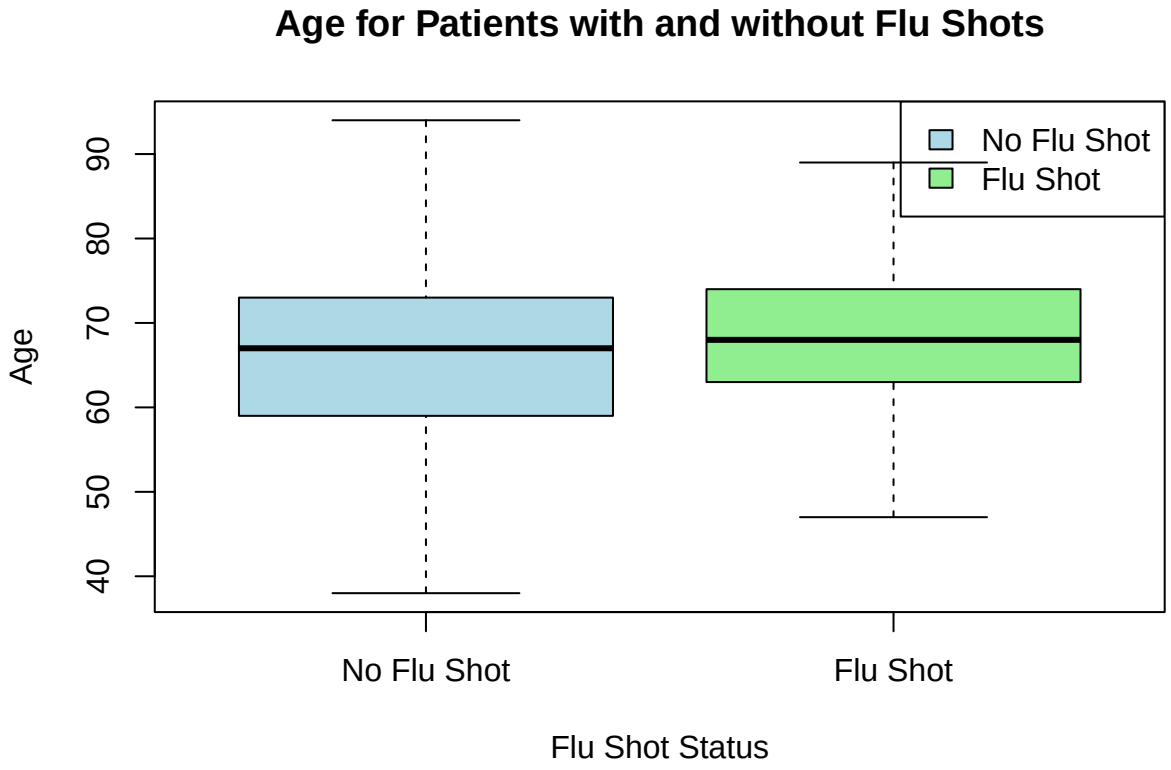
Di (treatment of interest) = indicator of patient i receiving flu shot(vaccine) Yi (outcome) = indicator for flu-related hospital visits Zi (encouragement/assignment)= indicator of patient i's physician receiving a reminder letter indicating that the patient was eligible to receive the influenza vaccine under U.S. Public Health Service Criteria

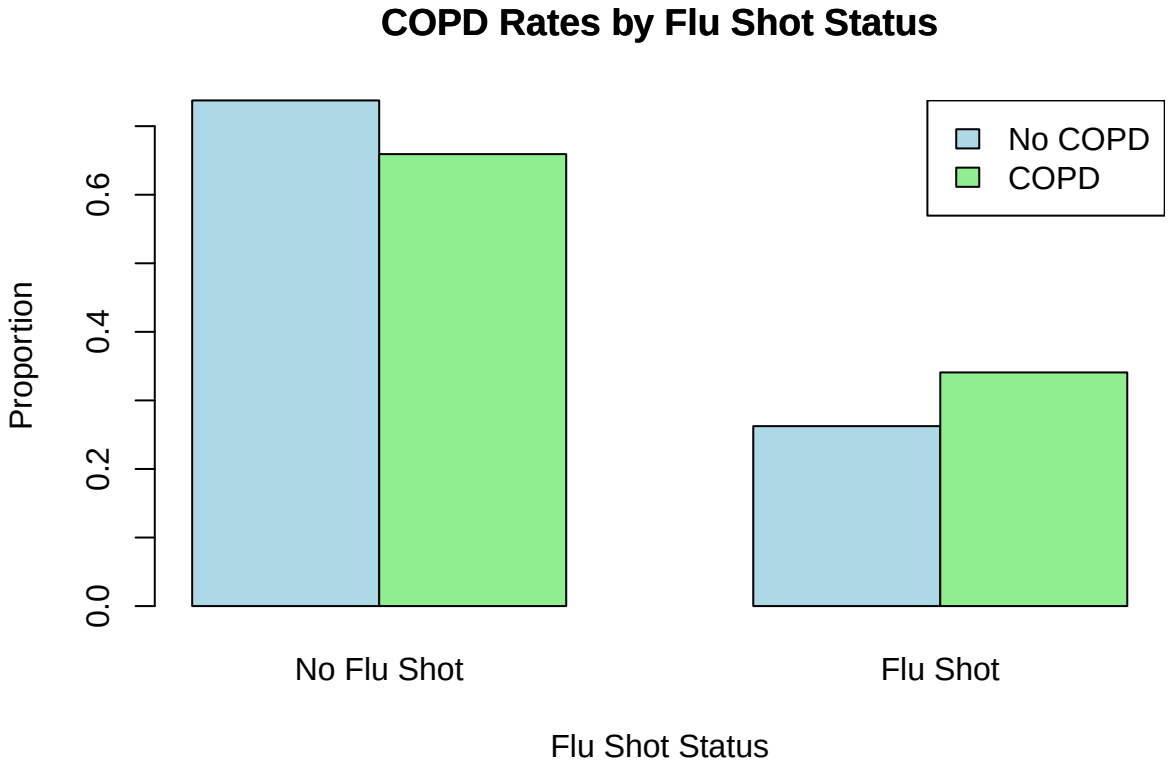
Covariate 1 = age Covariate 2 = copd

```
fludata <- read.csv("~/Desktop/Fall 2023/STATS209/data/fludata.txt", sep="")
View(fludata)

#Covariate 1: age (age of patient)
d1_age <- fludata$age[fludata$receive == 1]
d0_age <- fludata$age[fludata$receive == 0]
age_p <- t.test(d1_age, d0_age)$p.value

#Covariate 2: copd (indicator chronic obstructive pulmonary disease)
d1_copd <- fludata$copd[fludata$receive == 1]
d0_copd<- fludata$copd[fludata$receive == 0]
copd_p <- t.test(d1_copd, d0_copd)$p.value

#Covariate 3: dm (indicator of diabetes)
d1_dm <- fludata$dm[fludata$receive == 1]
d0_dm <- fludata$dm[fludata$receive == 0]
dm_p <- t.test(d1_dm, d0_dm)$p.value

#Covariate 4: heartd (indicator of heart disease)
d1_heartd <- fludata$heartd[fludata$receive == 1]
d0_heartd <- fludata$heartd[fludata$receive == 0]
heartd_p <- t.test(d1_heartd, d0_heartd)$p.value

#Covariate 5: renal (indicator of renal disease)
d1_renal <- fludata$renal[fludata$receive == 1]
d0_renal <- fludata$renal[fludata$receive == 0]
renal_p <- t.test(d1_renal, d0_renal)$p.value

#Covariate 6: liverd (indicator of liver disease)
d1_liverd <- fludata$liverd[fludata$receive == 1]
d0_liverd <- fludata$liverd[fludata$receive == 0]
liverd_p <- t.test(d1_liverd, d0_liverd)$p.value

#Covariate 7: race (race of patient #unsure what 1 indicates.. white?)
d1_race <- fludata$race[fludata$receive == 1]
d0_race <- fludata$race[fludata$receive == 0]
race_p <- t.test(d1_race, d0_race)$p.value

#Covariate 8: sex (gender of patient #unsure what 1 indicates)
```

```r
d1_sex <- fludata$sex[fludata$receive == 1]
d0_sex <- fludata$sex[fludata$receive == 0]
sex_p <- t.test(d1_sex, d0_sex)$p.value
```

```
## P-value for Age between Patients with and without Flu Shots:  1.916982e-05
## P-value for COPD between Patients with and without Flu Shots:  0.0001043497
## P-value for Diabetes between Patients with and without Flu Shots:  0.6636694
## P-value for Heart Disease between Patients with and without Flu Shots:  0.1526345
## P-value for liverd between Patients with and without Flu Shots:  0.8399011
## P-value for race between Patients with and without Flu Shots:  0.4706622
## P-value for gender between Patients with and without Flu Shots:  0.03403384
```




COPD Rates by Flu Shot Status
No COPD
COPD
Proportion
0.0
0.2
0.4
0.6
No Flu Shot
Flu Shot
Flu Shot Status

```r
# Z = assign
# D = receive
# Y = outcome
# Xi's = age, copd, sex

library(AER)
```

```
## Loading required package: car
```

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

```
## Loading required package: lmtest
```

```
## Loading required package: zoo
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
## Loading required package: sandwich
```

```
## Loading required package: survival
```

```r
# without covariates
ivsum1 <- summary(ivreg(outcome ~ receive | assign , data=fludata))

# with age and copd (as did Hirano)
ivsum2 <- summary(ivreg(outcome ~ receive + age + copd | assign + age + copd, data=fludata))

# with age, copd, and sex
ivsum3 <- summary(ivreg(outcome ~ receive + age + copd + sex | assign + age + copd + sex,
                        data=fludata))
```

Using the indicator of encouragment to receive the flu shot as the instrument, the effect of influenza vaccine on flu-related hospitalizations:

```
## Without covariates
```

```
##    Estimate  Std. Error     t value    Pr(>|t|)
## -0.12455748  0.08990306 -1.38546439  0.16601859
```

```
## With covariates age and copd (same as Hirano)
```

```
##    Estimate  Std. Error     t value    Pr(>|t|)
## -0.11927023  0.08985773 -1.32732297  0.18450792
```

```
## With covariates age, COPD, and sex
```

```
##    Estimate  Std. Error     t value    Pr(>|t|)
## -0.11482142  0.08928958 -1.28594425  0.19856676
```