schoenfeld_R

Data

```
y2016deaths <- read.csv("death/yearsdeaths.cvs")
```

GENERATE EXPOSURE AND OBJETCT SURV

```
y2016deaths$exposure <- ifelse(y2016deaths$cid10=="I63",0,
                               ifelse(y2016deaths$cid10=="I60",1,
                                      ifelse(y2016deaths$cid10=="I61",2,
                                             ifelse(y2016deaths$cid10=="I64",3,NA))))
y2016deaths$exposure <- factor(y2016deaths$exposure, levels = c(0,1,2,3), labels = c("I63", "I60", "I61
sum(is.na(y2016deaths$exposure)) #0
```

```
## [1] 0
```

```
y2016deaths$survivalobj0 <- with(y2016deaths,Surv(los,condicion=="Death"))
summary(y2016deaths$survivalobj0)
```

```
##       time           status
##  Min.   : 1.000   Min.   :0.0000
##  1st Qu.: 4.000   1st Qu.:0.0000
##  Median : 7.000   Median :0.0000
##  Mean   : 9.436   Mean   :0.1153
##  3rd Qu.:12.000   3rd Qu.:0.0000
##  Max.   :59.000   Max.   :1.0000
```

Cox model

```
cox1 <- coxph(survivalobj0 ~ exposure+strata(regions,level),data=y2016deaths)
summary(cox1)
```

```
## Call:
## coxph(formula = survivalobj0 ~ exposure + strata(regions, level),
##     data = y2016deaths)
##
##   n= 6565, number of events= 757
##    (1 observation deleted due to missingness)
##
```

```
##                coef exp(coef) se(coef)     z Pr(>|z|)
## exposureI60 0.9156    2.4984   0.1255 7.295 2.98e-13 ***
## exposureI61 0.6486    1.9128   0.1167 5.558 2.72e-08 ***
## exposureI64 0.3573    1.4294   0.1131 3.158  0.00159 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##             exp(coef) exp(-coef) lower .95 upper .95
## exposureI60     2.498     0.4003     1.954     3.195
## exposureI61     1.913     0.5228     1.522     2.404
## exposureI64     1.429     0.6996     1.145     1.784
##
## Concordance= 0.603  (se = 0.014 )
## Likelihood ratio test= 63.15  on 3 df,   p=1e-13
## Wald test            = 62.59  on 3 df,   p=2e-13
## Score (logrank) test = 64.83  on 3 df,   p=5e-14
```

```
cox2 <- coxph(survivalobj0 ~ exposure+sexo+ edad+ strata(regions, level),data=y2016deaths)
summary(cox2)
```

```
## Call:
## coxph(formula = survivalobj0 ~ exposure + sexo + edad + strata(regions,
##     level), data = y2016deaths)
##
##   n= 6565, number of events= 757
##    (1 observation deleted due to missingness)
##
##                 coef exp(coef) se(coef)     z Pr(>|z|)
## exposureI60 0.964795  2.624249 0.128007 7.537 4.81e-14 ***
## exposureI61 0.683784  1.981361 0.116839 5.852 4.85e-09 ***
## exposureI64 0.337851  1.401932 0.113019 2.989  0.00280 **
## sexoWomen   0.195240  1.215603 0.074470 2.622  0.00875 **
## edad        0.011660  1.011729 0.002794 4.173 3.00e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##             exp(coef) exp(-coef) lower .95 upper .95
## exposureI60     2.624     0.3811     2.042     3.373
## exposureI61     1.981     0.5047     1.576     2.491
## exposureI64     1.402     0.7133     1.123     1.750
## sexoWomen       1.216     0.8226     1.051     1.407
## edad            1.012     0.9884     1.006     1.017
##
## Concordance= 0.621  (se = 0.014 )
## Likelihood ratio test= 90.27  on 5 df,   p=<2e-16
## Wald test            = 89.32  on 5 df,   p=<2e-16
## Score (logrank) test = 91.64  on 5 df,   p=<2e-16
```

Test for the proportional-hazards (PH) assumption,

```
test.ph1 <- cox.zph(cox1)
test.ph2 <- cox.zph(cox2)

test.ph1
```

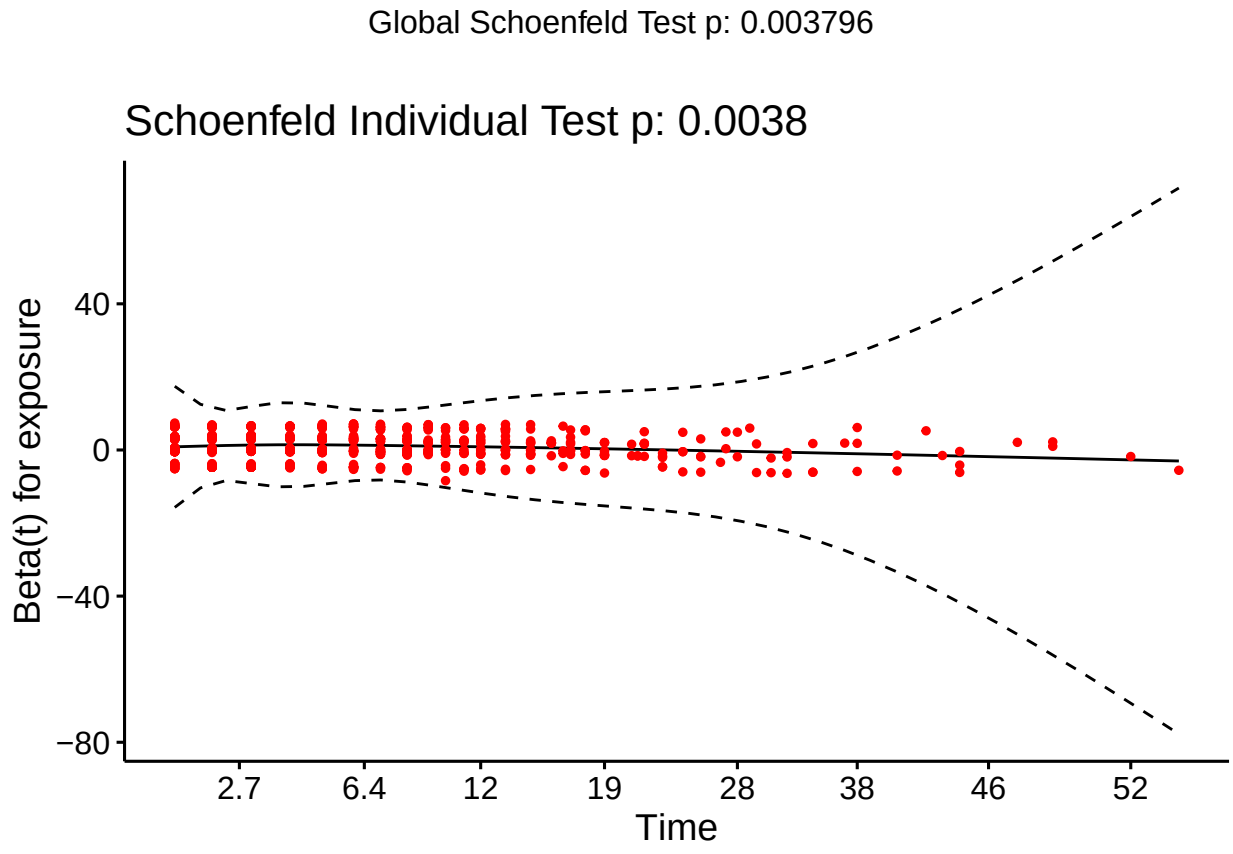
```
##          chisq df      p
## exposure  13.4  3 0.0038
## GLOBAL    13.4  3 0.0038
```

```
test.ph2
```

```
##          chisq df      p
## exposure 14.18  3 0.0027
## sexo      2.12  1 0.1454
## edad      2.66  1 0.1031
## GLOBAL   17.13  5 0.0043
```

PLOT

```
ggcoxzph(test.ph1)
```



```
ggcoxzph(test.ph2)
```