

Second Modeling Run

Martin Skarzynski

2018-04-19

```
library(here)

## here() starts at /Users/marskar/gdrive/nhanes
library(readr)
library(dplyr)

##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
library(tidyr)
library(survey)

## Loading required package: grid
## Loading required package: methods
## Loading required package: Matrix
##
## Attaching package: 'Matrix'
## The following object is masked from 'package:tidyr':
##
##   expand
## Loading required package: survival
##
## Attaching package: 'survey'
## The following object is masked from 'package:graphics':
##
##   dotchart
library(purrr)

# this function takes in two integers as an argument
# this function returns a dataframe
get_modelstats <- function(seed, size){

  set.seed(seed)
  #move PERMTH_INT and canc_mort to the beginning
  #sample a tenth of the dataset columns
  read_rds(here('dat/3-clean-complete-cases.rds')) %>%
```

```

select(-SEQN,
       -HAN9, #remove age variables
       -HAQ7,
       -HAT29,
       -HAJ0,
       -WTPXRP2,
       -starts_with("WTPQRP")
       ) %>%
select(PERMTH_INT, #person time in months
       canc_mort, #event
       SDPPSU6, #PSU
       SDPSTRA6, #Stratification
       WTPFQX6, #Weights
       DMAETHNR, #Ethnicity
       HAT16, #In the past month, did you lift weights
       HAK9, # times per night you get up to urinate
       HSAITMOR, #Age in months at interview (screener)
       HAQ1, #Describe natural teeth: excellent...poor
       HAR1, #Have you smoked 100+ cigarettes in life
       HAT2, #In the past month, did you jog or run
       HAT18, #In the past month, any other exercises, sports
       HAB1, #Would you say your health in general is excellent, very good, good, fair, or poor?
       everything()[sample(seq(ncol(.)),
                           round(size))]) ->

samp

# create survey design object
svydesign(ids = ~SDPPSU6,
         strata = ~SDPSTRA6,
         weights = ~WTPFQX6,
         nest = TRUE,
         data = samp) ->

des

# create left side of equations
form <- as.formula(Surv(PERMTH_INT, canc_mort) ~ x1)
# create right sides of equations
if(size == 1 & ncol(samp)==7){
vrs <- as.name(names(samp)[7])
vrs <- as.name(names(samp)[7])
} else{

vrs <- as.name(paste(names(samp)[6:ncol(samp)],
                     collapse=' + '))
vrs2 <- as.name(paste(names(samp)[6:ncol(samp)],
                      collapse=', '))
}

set.seed(seed)
#train <- sample(x = seq(nrow(samp)),
#               size = round(nrow(samp)*.7))
# generate cox models without and with penalties

```

```

cox <- try(svycoxph(update(form,
                          paste("~ ", vrs)),
                          design = des, data = samp))

rid <- try(svycoxph(update(form,
                          paste("~ ridge(", vrs2, ')')),
                          design = des, data = samp))

# define functions needed to create first table
get_con <- function(x) {
  signif(summary(x)$concordance[1]*100, digits = 2)
}
get_HR <- function(x) {
  summary(x)$conf.int[, "exp(coef)"]
}
get_HR_CI_lower <- function(x) {
  summary(x)$conf.int[, "lower .95"]
}
get_HR_CI_upper <- function(x) {
  summary(x)$conf.int[, "upper .95"]
}
get_coef_pvalue <- function(x) {
  coefs <- summary(x)$coef
  coefs[, ncol(coefs)]
}
model_list <- try(list(cox, rid))

try(data_frame(seed = rep(seed, 2),
               size = size,
               type = c('coxph', 'ridge'),
               aic = AIC(cox, rid)[, "AIC"],
               concordance = map_dbl(model_list,
                                     get_con),
               hazard_ratio = map(model_list,
                                  get_HR),
               HR_CI_lower = map(model_list,
                                 get_HR_CI_lower),
               HR_CI_upper = map(model_list,
                                  get_HR_CI_upper),
               coef_pvalue = map(model_list,
                                 get_coef_pvalue)))
}

#save an object with 800 models

map_sizes <- function(seed){
  map2_dfr(.x = seed,
          .y = seq(40),
          get_modelstats)
}
map_dfr(seq(10), map_sizes) %>%
write_rds(here(paste0("dat/5-model-second-run.rds")))

## Stratified 1 - level Cluster Sampling design (with replacement)

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