

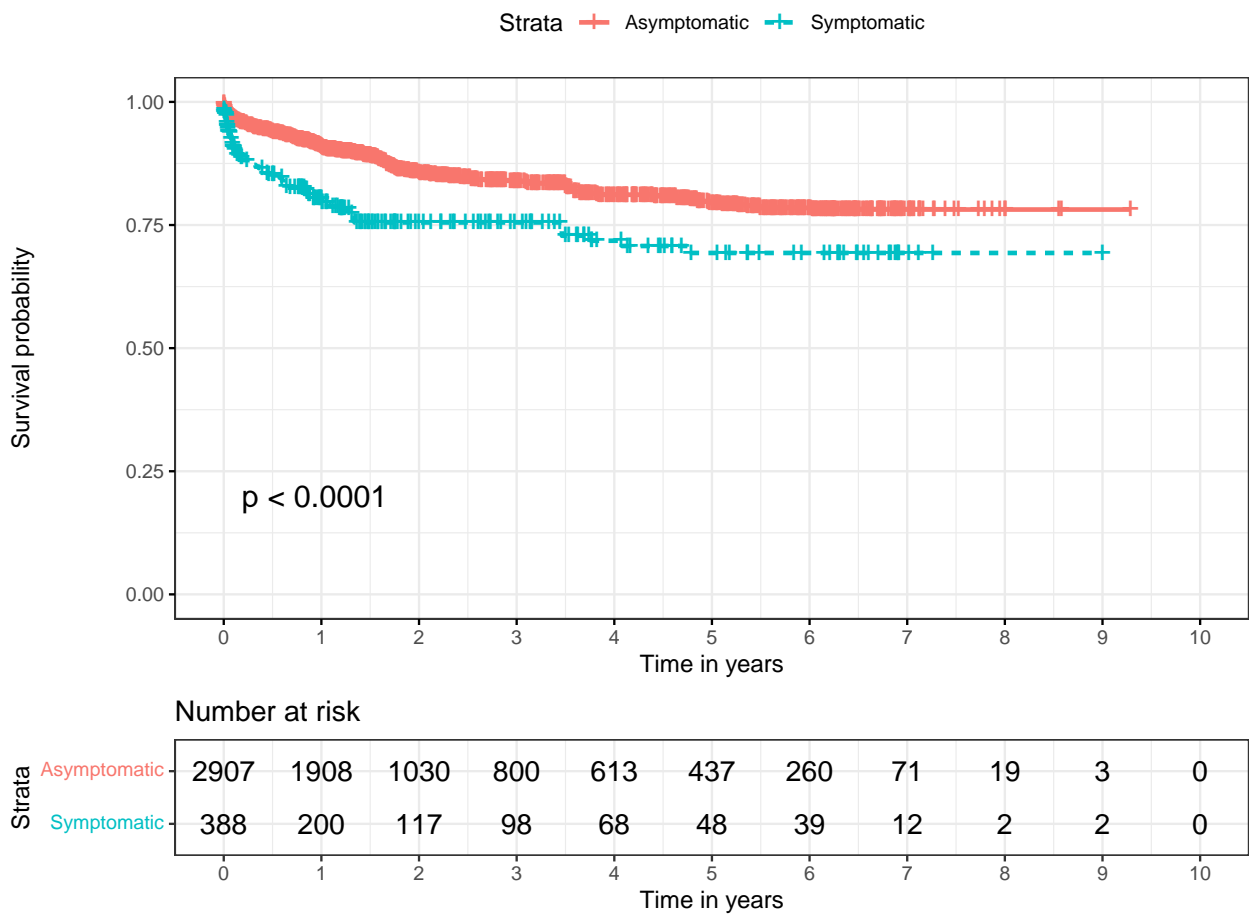
# Survival Analysis for the VQI FBVAR Dataset

Jennifer Ci, Thu Vu, Lily Hanyi Wang

## Cox proportional hazards model for survival analysis

Unadjusted survival curves. Time scale changed from calendar days to calendar years. Used log rank test to produce p-value. Median survival never reached.

Any changes needed? (e.g, time scale, colors, change to at risk table, add number of censored and/or uncensored events, etc.)



Univariate (unadjusted) and Multivariate (adjusted) Cox Proportional Hazards Models. Reference group is asymptomatic patients.

Adjusted for the following variables: AGECAT, GENDER, PREOP\_SMOKING, PRIOR\_AORSURG, PRIOR\_CHF, PATHOLOGY, extent, POSTOP\_LOS, POSTOP\_COMPLICATIONS, POSTOP\_DIALYSIS, POSTOP\_LEGEMBO, POSTOP\_CEREBROX, POSTOP\_RESPIRATORY, POSTOP\_SPINAL\_ISCHEMIA , RETX\_R\_RTOR , and BRANCH\_POST.

Hazard ratio went from 1.88 to 1.58 after adjustment (0.3 difference).

	Hazard Ratio Estimate	Lower 95% CI	Upper 95% CI	P-value
Symptomatic (Unadjusted)	1.88	1.48	2.40	<0.001
Symptomatic (Adjusted)	1.58	1.09	2.27	0.01

## Code Appendix

```
knitr::opts_chunk$set(echo = FALSE,message = FALSE,warning = FALSE)
knitr::opts_chunk$set(fig.width=20, fig.height=20)

library(tidyverse)
library(table1)
library(survival)
library(Hmisc)
library(ggplot2)
library(ggpubr)
library(corrplot)
library(caret)
library(survminer)
library(knitr)
library(kableExtra)

## ----- working directories for Lily -----
wd_lily = '/Users/hanyiwang/Desktop/Comparative-analysis-of-treatments-of-CAA'
path_lily = c("../data/FBVAR.csv")

## ----- working directories for Jenn -----
# wd_jenn =
# path_jenn =

## ----- working directories for Thu -----
wd_thu = '/Users/thuvu/Desktop/Comparative-analysis-of-treatments-of-CAA'
path_thu = c("FBVAR.csv")

## ----- read data -----
setwd(wd_lily)
FBVAR = read.csv(path_lily)

# setwd(wd_jenn)
# FBVAR = read.csv(path_jenn)

# setwd(wd_thu)
# FBVAR = read.csv(path_thu)

## Survival analysis
# event = 1 for uncensored (Dead), event = 0 for censored (Alive)
FBVAR$event <- ifelse(FBVAR$DEAD=="TRUE", 1, 0)

tte <- FBVAR %>% with(Surv(PROC_SURVIVALDAYS/365, event))

# compute survival curves
fit <- survfit(tte ~ PRESENTATION, data=FBVAR)

# plotting Kaplan-Meier Curves
ggsurvplot(fit,
            pval = TRUE,
            risk.table = TRUE,
            linetype = "strata",
```

```

    surv.median.line = "hv",
    ggtheme = theme_bw(),
    xlab = "Time in years",
    legend.labs = c("Asymptomatic", "Symptomatic"),
    break.time.by=1)
# Unadjusted survival model
mod.cox1 <- coxph(tte ~ PRESENTATION, data=FBVAR)

tab1 <- data.frame(
  Estimate = round(summary(mod.cox1)$conf.int[1],2),
  "Lower 95% CI" = round(summary(mod.cox1)$conf.int[3],2),
  "Upper 95% CI" = round(summary(mod.cox1)$conf.int[4],2),
  "P-value" = "<0.001"
)
rownames(tab1) <- c("Symptomatic (Unadjusted)")

# Adjusted survival model
mod.cox2 <- coxph(tte ~ PRESENTATION + cluster(CENTERID) + AGE CAT + GENDER + PREOP_SMOKING
  + PRIOR_AORSURG + PRIOR_CHF + PATHOLOGY + extent + POSTOP_LOS
  + POSTOP_COMPLICATIONS + POSTOP_DIALYSIS + POSTOP_LEGEMBO + POSTOP_CEREBROSX
  + POSTOP_RESPIRATORY + POSTOP_SPINAL_ISCHEMIA + RETX_R_RTOR + BRANCH_POST,
  data=FBVAR)

tab2 <- data.frame(
  Estimate = round(summary(mod.cox2)$conf.int[1],2),
  "Lower 95% CI" = round(summary(mod.cox2)$conf.int[1,3],2),
  "Upper 95% CI" = round(summary(mod.cox2)$conf.int[1,4],2),
  "P-value" = "0.01"
)
rownames(tab2) <- c("Symptomatic (Adjusted)")

t <- rbind(tab1, tab2)
colnames(t) <- c("Hazard Ratio Estimate", "Lower 95% CI", "Upper 95% CI",
  "P-value")

kable(t)

```