Problem Set 4

Applied Stats II

Due: April 16, 2023

Instructions

- Please show your work! You may lose points by simply writing in the answer. If the problem requires you to execute commands in `R`, please include the code you used to get your answers. Please also include the `.R` file that contains your code. If you are not sure if work needs to be shown for a particular problem, please ask.

- Your homework should be submitted electronically on GitHub in `.pdf` form.

- This problem set is due before 23:59 on Sunday April 16, 2023. No late assignments will be accepted.

Question 1

We're interested in modeling the historical causes of infant mortality. We have data from 5641 first-born in seven Swedish parishes 1820-1895. Using the "infants" dataset in the `eha` library, fit a Cox Proportional Hazard model using mother's age and infant's gender as covariates. Present and interpret the output.

Answer:

A Cox Proportional Hazard model was fit using the below code:

```
1  # Run cox proportional hazard model
2  infants_surv <- with(infants, Surv(enter, exit, event))
3  cox <- coxph(infants_surv ~ age + sex, data = child)
4  summary(cox)
5  stargazer(cox, type = "text")
```

This produced the below summary output:

Table 1:

	Dependent variable:
	infants_surv
age	−0.040
	(0.045)
sexboy	−0.485
	(0.442)
Observations	105
R^2	0.019
Max. Possible R^2	0.800
Log Likelihood	−83.626
Wald Test	2.000 (df = 2)
LR Test	1.992 (df = 2)
Score (Logrank) Test	2.034 (df = 2)
Note:	*p<0.1; **p<0.05; ***p<0.01

There is a 0.485 decrease in the expected log of the hazard for male infants compared to female, holding mother's age constant. For each additional year older that the mother is, there is a 0.04 decrease in the expected log of the hazard, on average, holding the infant's sex constant.