Problem Set 3 - My Answer

Junjie LIU[1,*]

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[1] Department of Political Science, Trinity College Dublin, 2 Clare, Street, Dublin 2, Ireland

[*] Correspondence: Junjie LIU <liuj13@tcd.ie>

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 Friday April 12, 2024. No late assignments will be accepted.

Question 1

We're interested in modeling the historical causes of child mortality. We have data from 26855 children born in Skellefteå, Sweden from 1850 to 1884. Using the "child" 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.

My Answer

```
library(eha)
data <- eha::child
cox_model <- coxreg(Surv(exit, event)~m.age+sex, data=data, coxph=TRUE)
summary(cox_model)
```

```
## Covariate             Mean       Coef     Rel.Risk   S.E.    LR p
## m.age                32.010     0.008     1.008     0.002    0.000
## sex                                                          0.002
##             male      0.510     0         1 (reference)
##           female      0.490    -0.082     0.921     0.027
##
## Events                    5616
## Total time at risk        325030
## Max. log. likelihood      -56503
```

```
## LR test statistic         22.52
## Degrees of freedom        2
## Overall p-value           1.28921e-05
```

The model's result suggests that both the mother's age at childbirth and the infant's gender are significant predictors of child mortality in this historical context. Specifically:

1. A slight but statistically significant increase in the risk of child mortality is associated with older maternal age at the time of birth.
2. Female children have a significantly lower risk of mortality compared to male children in this population.