Survival Project

Aim 1: Evaluate the relationship between two outcomes and exposure to gestational diabetes

* Subaim 1.1: Relationship between time to first occurance of obesity
* Subaim 1.2: Relationship between time to first occurrence of becoming overweight

Hypotheses:

* Subaim 1.1: Children who have been exposed to gestational diabetes during pregnancy will have a higher hazard of becoming obese.
* Subaim 1.2: Children who have been exposed to gestational diabetes during pregnancy will have a higher hazard of becoming overweight

**Methods**

Kaplan Meier curves were generated to visualize the survival curves of time to first occurrence of obesity and overweight by exposure to gestational diabetes. To investigate the first aim, a cox proportional hazards model.

A cox proportional hazards model will be used to investigate both aims. The main predictor to be assessed will be exposure to gestational diabetes during pregnancy. A Wald test will be conducted to assess a difference in the hazards at an level. Sociodemographic features will be selected for inclusion into the model based on domain knowledge and constructive feedback from this proposal document.

The assumption of the proportionality of hazards will be assessed through multiple checks. First, log-log and log plots of the survival functions will be generated and checked for proportionality and linearity respectively. Second, Schoenfeld residuals will be examined. Score residuals, deviance residuals, and martingale residuals will also be assessed for influential points, outliers, and to ensure that the model has a correct functional form for the covariates.

I will also investigate stratifying the cox proportional hazards model by gender. I will first see if this makes sense by examining the survival curves by gender. If there is a large difference between the two shapes, which could also indicate violation of the proportional hazards assumption, I will stratify by gender which will modify the baseline hazards for each group to make them more flexible.