

# PLSC 504

## Exercise Six

October 21, 2020

### Introduction and Data

The purpose of this (relatively straightforward) exercise is to estimate and interpret parametric and Cox proportional hazards models, and to compare the conclusions one might draw from them. The subject is leadership tenure; the data (available in [CSV](#) format) are drawn from the *Archigos* project, directed by Kristian Gleditsch, Hein Goemans, and Giacomo Chiozza (see [here](#) for details). They consist of time-varying data on 3,023 world leaders who served between 1875 and 2004, inclusive ( $NT = 15446$ ), and include time-varying information on how long the leader was in office (in both days and rounded to the nearest year) and an indicator of when s/he left office.\*

We're not going to get too complicated here; the relevant covariates are:

- the age of the leader, in years,
- whether or not a leader is female, which means exactly what you think it does, and
- five indicator variables for region: LatinAmerica, Europe, Africa, MidEast, and Asia (with North America omitted as the implicit reference category).

### Assignment

1. Begin by fitting one or more parametric model(s) of leader survival, using some combination of the seven covariates provided. Use your own judgement about (e.g.) if and how to specify interactions and other such things. Talk briefly about the results you obtain, being sure to include a discussion of the substantive importance of each covariate.
2. Reestimate the model in (1) using Cox's proportional hazards model. Again, use what you have learned in class and the readings to make informed, justifiable choices about what sort of model to estimate. Once again, briefly discuss your findings, this time with explicit attention to any differences between the parametric and Cox model results.

This assignment is due *electronically*, as a *PDF file*, at 11:59 p.m. EST on Friday, October 30, 2020; you can submit your homework by emailing copies **both** to Dr. Zorn ([zorn@psu.edu](mailto:zorn@psu.edu)) and Mr. Bolte ([blb72@psu.edu](mailto:blb72@psu.edu)). In addition to your responses to the items above, please include all code used to fit models, conduct diagnostics, generate plots, and so forth. This assignment is worth 50 possible points.

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\*For now, we'll put aside the important and fascinating question of the various means by which leaders can leave office, and treat all departures as equivalent to one another.