

Course review

- Revisions
 - Changes to due dates- see Brightspace
 - No revisions for Labs 8 and 9
 - Submit as an email to Marcos

Last week- Categorical variables

The diagram illustrates the components of a logit model for survival analysis. At the center is the equation $logit(S) = \beta_{Sex} * Sex + \beta_0$. Four arrows point towards this equation from surrounding text labels:

- An arrow from the top label "Difference in survival between sexes" points to the coefficient β_{Sex} .
- An arrow from the top label "Intercept (baseline survival)" points to the intercept term β_0 .
- An arrow from the bottom label "Interval survival, transformed by a link function" points to the $logit(S)$ term on the left.
- An arrow from the bottom label "Sex (categorical variable expressed as 0s and 1s)" points to the Sex variable in the equation.

Difference in survival between sexes

Intercept (baseline survival)

$$logit(S) = \beta_{Sex} * Sex + \beta_0$$

Interval survival, transformed by a link function

Sex (categorical variable expressed as 0s and 1s)

Continuous variables

Difference in survival with each
increment of precipitation



$$\textit{logit}(S) = \beta_{precip} * Precip + \beta_0$$



Continuous numeric variable

Continuous variables

$$\textit{logit}(S) = \beta_{\textit{precip}} * \textit{Precip} + \beta_0$$

$$\textit{logit}(S) = -0.2 * 0.5\text{in} + \beta_0$$



Rain in a given month

Continuous variables

$$\textit{logit}(S) = \beta_{\textit{precip}} * \textit{Precip} + \beta_0$$

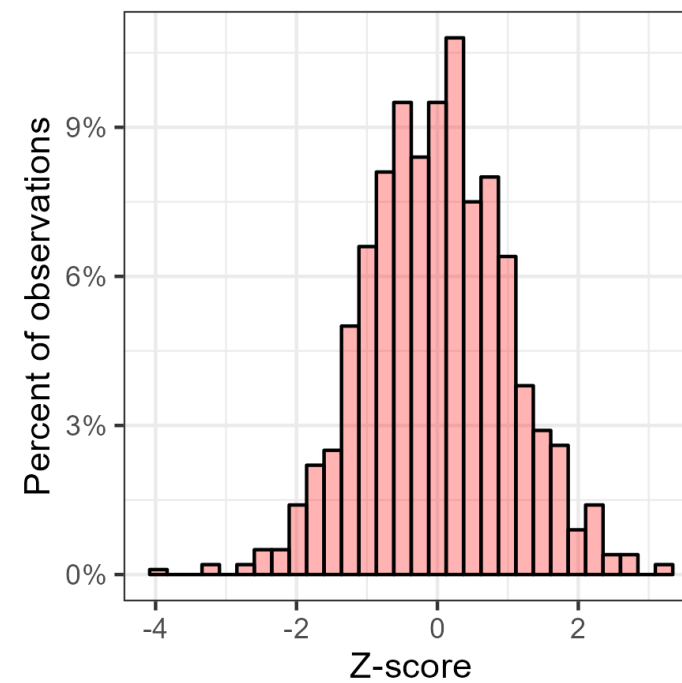
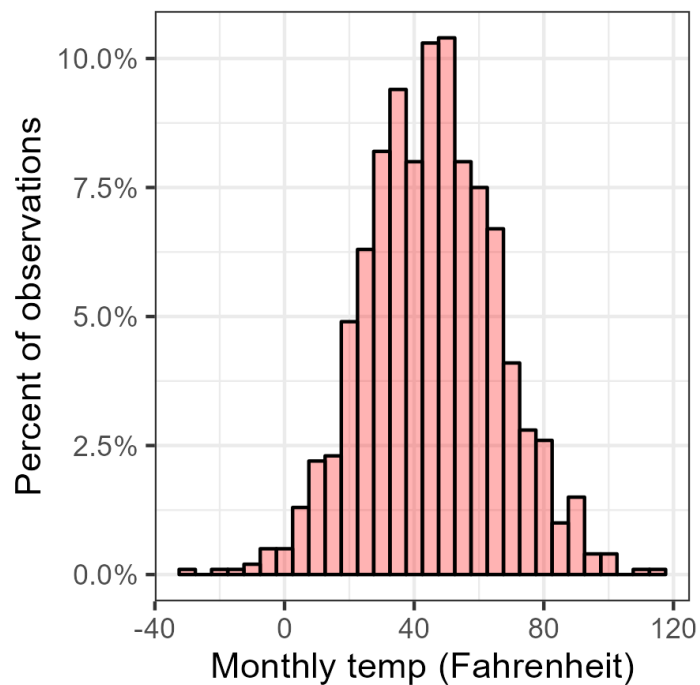
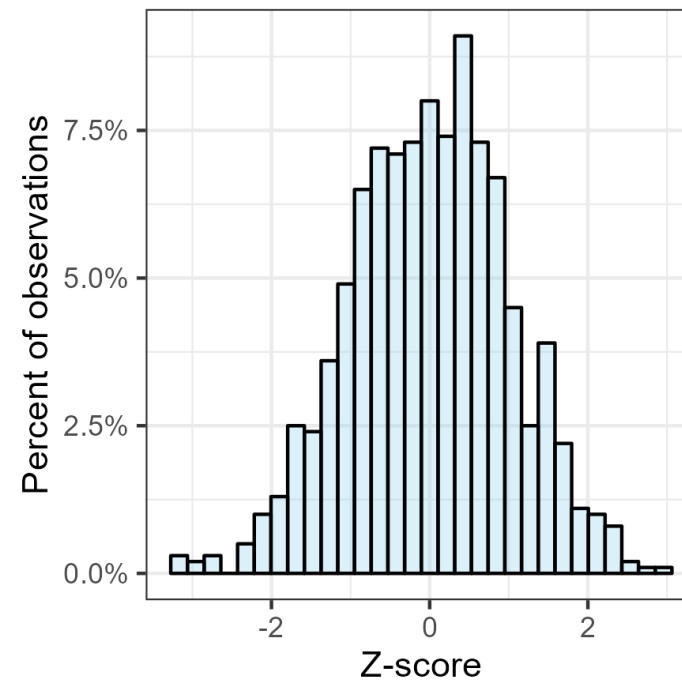
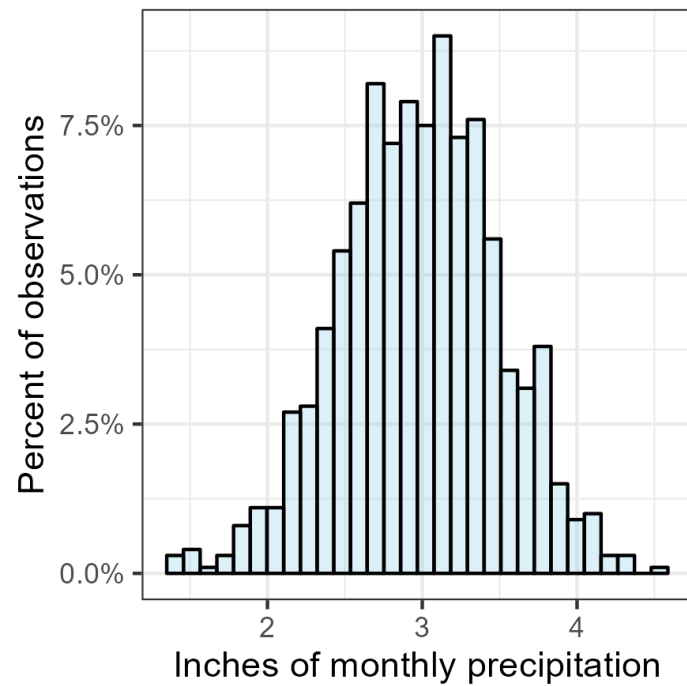
$$\textit{logit}(S) = -0.2 * 0.5\text{in} + \beta_0$$



For every additional in of rain,
survival decreases by 0.02

Comparing continuous covariates

- We have two continuous covariates
 - Precipitation- survival decreases by 0.2 for every inch of rain
 - Temperature- survival increases by 0.01 for every degree of temperature
- Both covariates are on different scales
 - Precipitation varies by ± 0.5 inches each month
 - Temperature varies by ± 20 degrees
- Can we compare the magnitude of their effects on survival?



Z-standardization

- Taking covariates with different scales, such as inches of precipitation and degrees, and putting them on a common scale
- Z-standardized distributions have two common characteristics:
 - Mean of 0
 - Standard deviation of 1
- After z-standardization, the betas of our continuous covariates are comparable

Assignment

- Write up a Results section including your results for Labs 6 & 7
- This has historically been a difficult assignment
 - Ensure that every sentence ending with a ? in the assignment text is addressed in your results
 - Choose figures and tables that you think support your results, and follow formatting conventions
 - Due in two weeks, but don't wait until the last minute

Assistance

- No office hours on Thanksgiving week
- Don't hesitate to send emails if you have questions, but responses may be delayed during the break