Generalized Linear Models in General using glmmTMB

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This video covers

- background on GLMs
- some common distributions
- how to find more
- no detailed examples

Going from LMs to GLMs

- same function: `glmmTMB`
- add a `family` to specify the link and distribution
  - specific mean-variance relationship
  - specific possible responses with meaning
- interface formula refers to linear predictor (i.e., on the scale of the link function)
- e.g. Poisson with log link $\mu_y = E(\mathrm{y}) = exp(X\beta)$

```
mod3 = glmmTMB(y ~ x1 + x2, data=dat, family=poisson)
```

family

- depends on data / process
  - successes and failures : binomial
  - proportions : beta
  - counting incidences : Poisson or negative binomial

link

- keeps the parameter on the right scale
- default is usually best
- binomial has several good options
  - `logit`
  - `probit`
  - `cloglog`

Some common distributions

- Discrete
  - Poisson with log link
  - negative binomial with log link
  - Conway-Maxwell-Poisson with log link
  - binomial/ binary with logit link
- Continuous
  - beta with logit link
  - gamma with inverse link
- Both
  - compound Poisson-gamma (Tweedie) with log link

More listed in these help files

```
?family
?family_glmmTMB
```

Recap

- families other than gaussian
- link functions / inverse link functions
- linear predictor
- overview of options