

Zero-Truncated Poisson regression

- ▶ To fit the zero-truncated Poisson model, we use the `vglm` function in the VGAM package.
- ▶ This function fits a very flexible class of models called **vector generalized linear models** to a wide range of assumed distributions.
- ▶ In our case, we believe the data are Poisson, but without zeros.
- ▶ Thus the values are strictly positive Poisson, for which we use the positive Poisson family via the `pospoisson` function passed to `vglm`.

Zero-Truncated Poisson regression

Fitting the Model with R

We will use the *hospitalstay* data.

```
m1 <- vglm(stay ~ age + hmo + died,  
            family = pospoisson(),  
            data = hospitalstay)  
summary(m1)
```

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Model Summary

Coefficients:

##	Estimate	Std. Error	z value
## (Intercept)	2.436	0.027	89.1
## age	-0.014	0.005	-2.9
## hmo1	-0.136	0.024	-5.7
## died1	-0.204	0.018	-11.1

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- ▶ The value of the coefficient for age, -0.0144 suggests that the log count of stay decreases by 0.0144 for each year increase in age.
- ▶ The coefficient for hmo, -0.1359 indicates that the log count of stay for HMO patient is 0.1359 less than for non-HMO patients.
- ▶ The log count of stay for patients who died while in the hospital was 0.2038 less than those patients who did not die.
- ▶ Finally, the value of the constant 2.4358 is the log count of the stay when all of the predictors equal zero.

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- ▶ Can compute CIs using **boot** package
- ▶ Age does not have a significant effect, but hmo and died both do.

