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)
```

Zero-Truncated Poisson regression

Fitting the Model with R

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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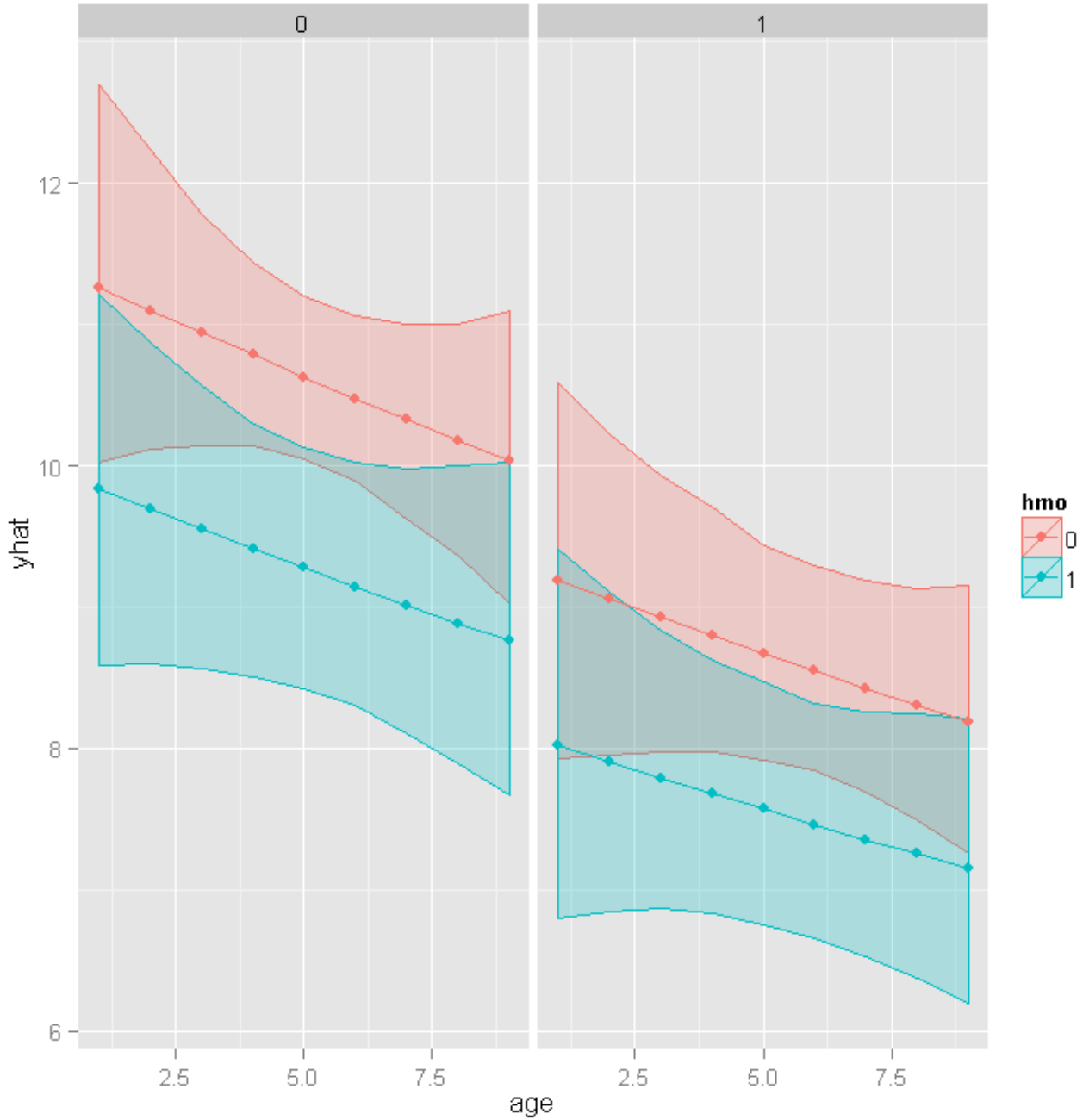
- The value of the coefficient for age, -0.0144 suggests that the log count of stay decreases by 0.0144 for each year increase in age.
- The coefficient for hmo, -0.1359 indicates that the log count of stay for HMO patient is 0.1359 less than for non-HMO patients.
- The log count of stay for patients 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.

Zero-Truncated Poisson regression

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


0
1
12
10
8
6
yhat
2.5
5.0
7.5
age
hmo
0
1