- Note that the model output above does not indicate in any way if our zero-inflated model is an improvement over a standard negative binomial regression.
- We can determine this by running the corresponding standard negative binomial model and then performing a Vuong test of the two models.
- We use the MASS package to run the standard negative binomial regression.

```
library(MASS)
summary(m2 <- glm.nb(count ~ child + camper, data = zinb))
.....
```

```
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept)    1.073      0.242    4.42  9.7e-06 ***
## child         -1.375      0.196   -7.03  2.1e-12 ***
## camper1        0.909      0.284    3.21   0.0013 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1
```

```
vuong(m1, m2)

## Vuong Non-Nested Hypothesis Test-Statistic: 1.702
## (test-statistic is asymptotically distributed N(0,1) und
##  null that the models are indistinguishible)
## in this case:
## model1 > model2, with p-value 0.0444
```

- The predictors child and camper in the part of the negative binomial regression model predicting number of fish caught (count) are both significant predictors.
- The predictor person in the part of the logit model predicting excessive zeros is statistically significant.
- For these data, the expected change in log(count) for a one-unit increase in child is -1.515255 holding other variables constant.
- A camper (camper $= 1$) has an expected log(count) of 0.879051 higher than that of a non-camper (camper $= 0$) holding other variables constant.

- The log odds of being an excessive zero would decrease by 1.67 for every additional person in the group.
- In other words, the more people in the group the less likely that the zero would be due to not gone fishing.
- Put plainly, the larger the group the person was in, the more likely that the person went fishing.
- The Vuong test suggests that the zero-inflated negative binomial model is a significant improvement over a standard negative binomial model.