Project 3 in Linear and Logistic Regression

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Introduction

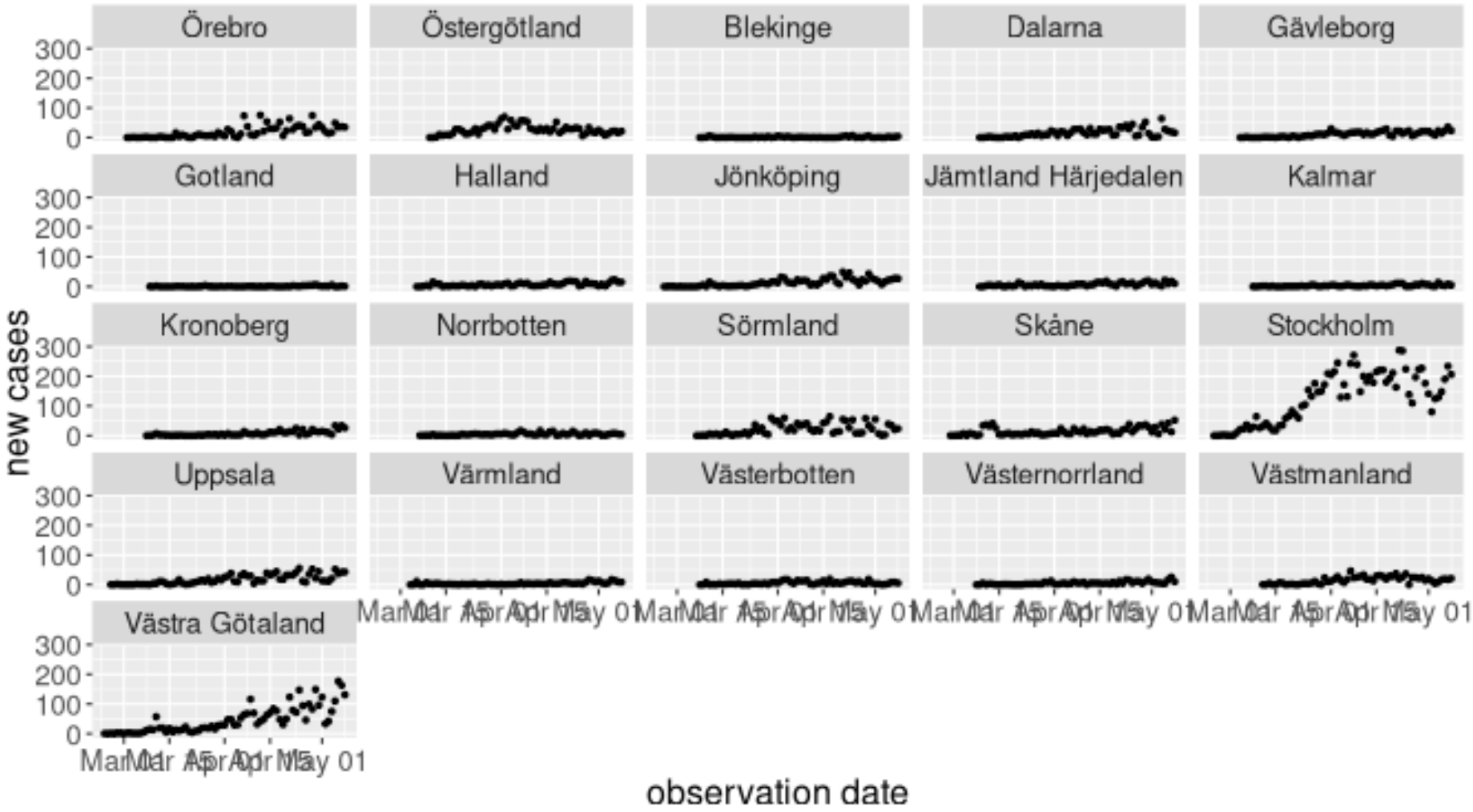
Purpose and expectations of this project

- COVID-19
- Implementing what we have learnt throughout the course.
- Train presenting your independent work.

Data structure

- obs_date, **The date (in R date format).**
- day_nbr, **Consecutive day number 1 = 24/2-20.**
- day_nbr_region, **Consecutive day number within region. 1 = 2 days before the first case in the region.**
- region **The name of the region.**
- population, **The population size.**
- new_cases, **the number of new confirmed cases.**

Raw data


Örebro
Östergötland
Blekinge
Dalarna
Gävleborg
Gotland
Halland
Jönköping
Jämtland Härjedalen
Kalmar
Kronoberg
Norrbotten
Sörmland
Skåne
Stockholm
Uppsala
Värmland
Västerbotten
Västernorrland
Västmanland
Västra Götaland
300
200
100
0
new cases
May 01
observation date

NB/PO-models

Model:

`new_cases` $\sim$ `(day_nbr_region) * (day_nbr) * obs_date + region`

`population` as offset variable

Family = negative binomial or poisson ?

step()

Model:

`new_cases` $\sim$ `(day_nbr_region) * (day_nbr) * obs_date + region`

`population` as offset variable
Family = negative binomial

	Df	BIC
none		110323
- day_nbr_region:day_nbr:obs_date	1	110567
- region	19	131846

step()

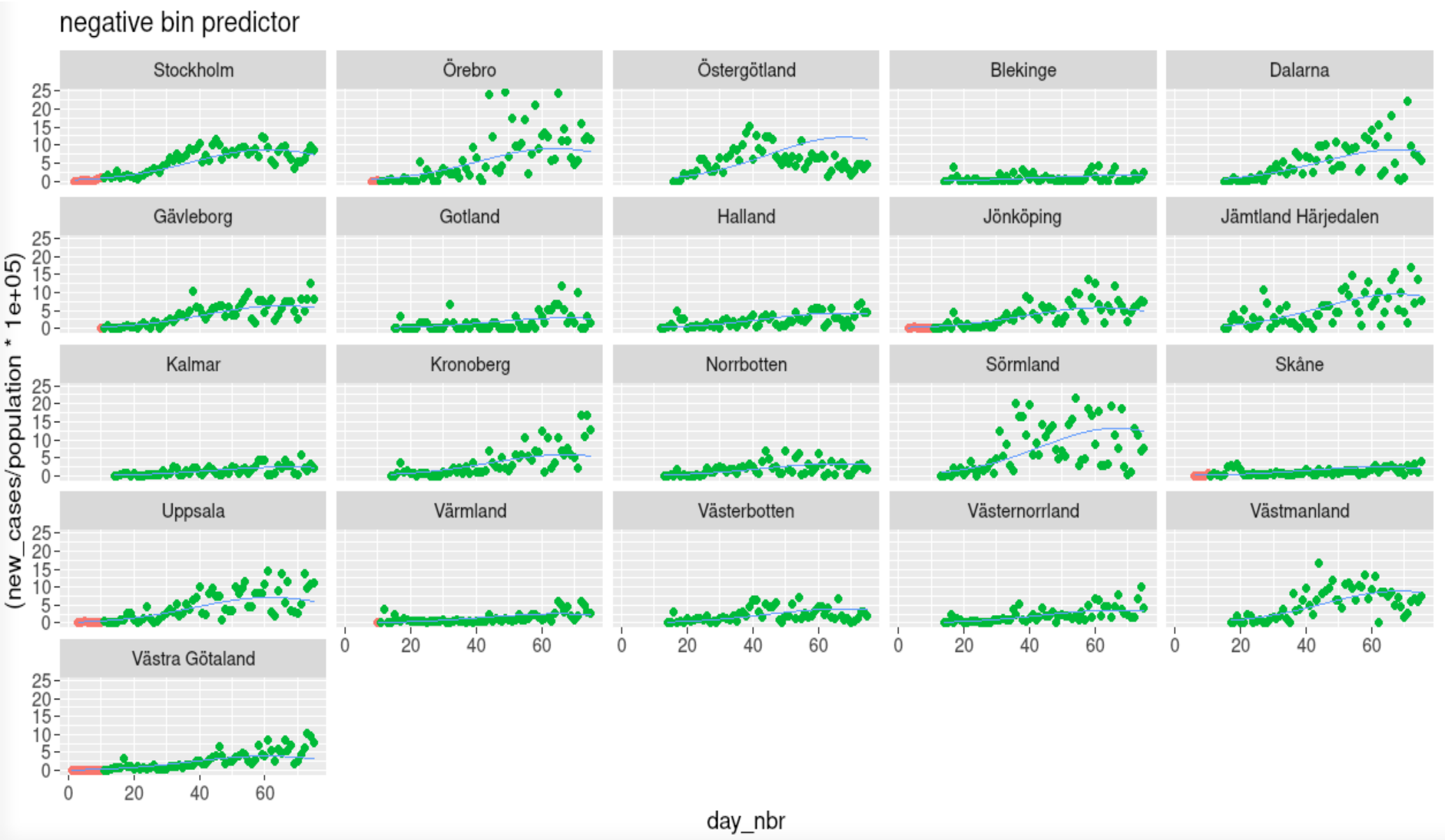
Model:

`new_cases ~ (day_nbr_region) * (day_nbr) * obs_date + region`

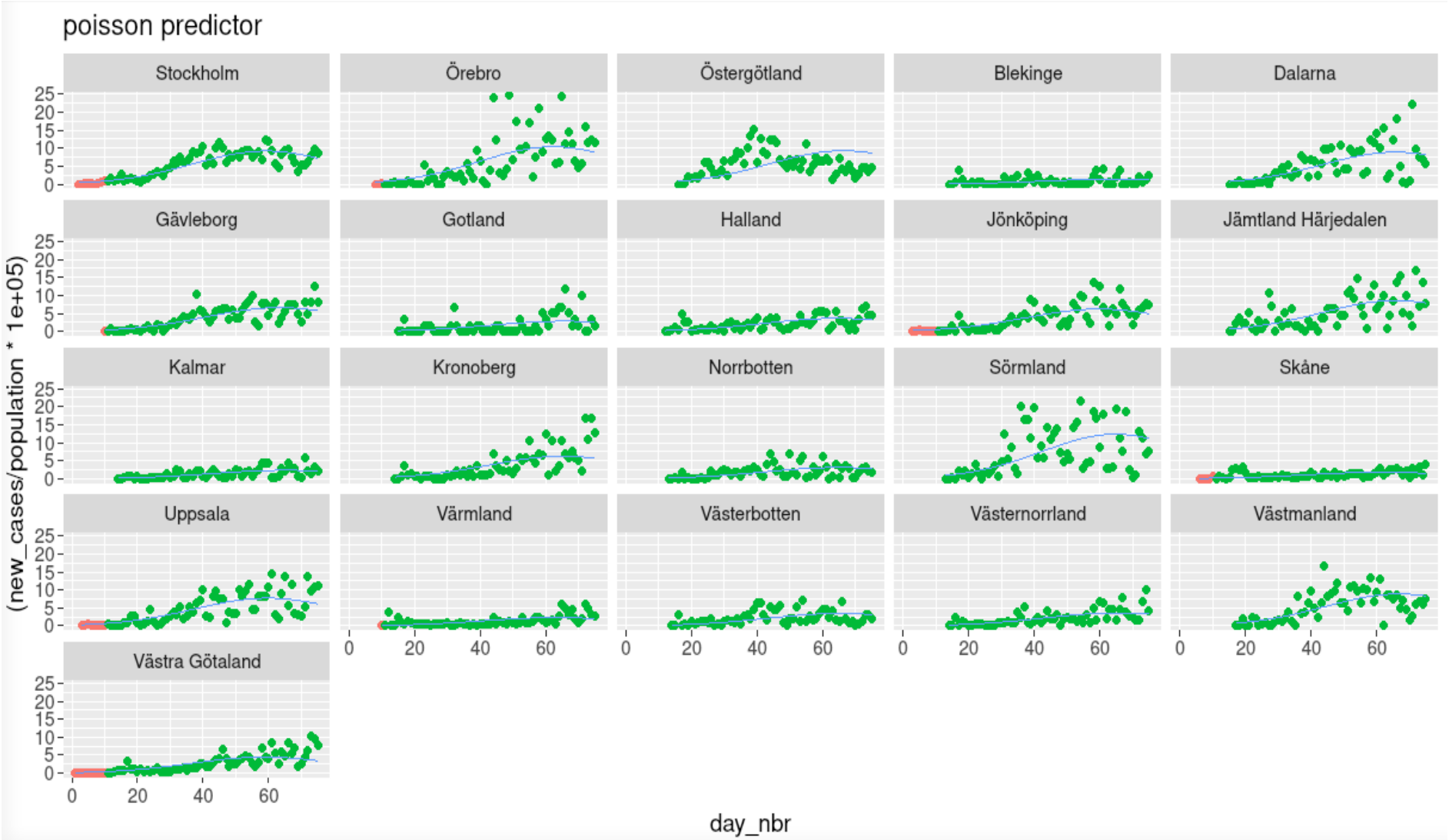
`population` as offset variable
Family = negative binomial

	Df	BIC
none		**110323**
- day_nbr_region:day_nbr:obs_ date	1	110567
- region	19	131846

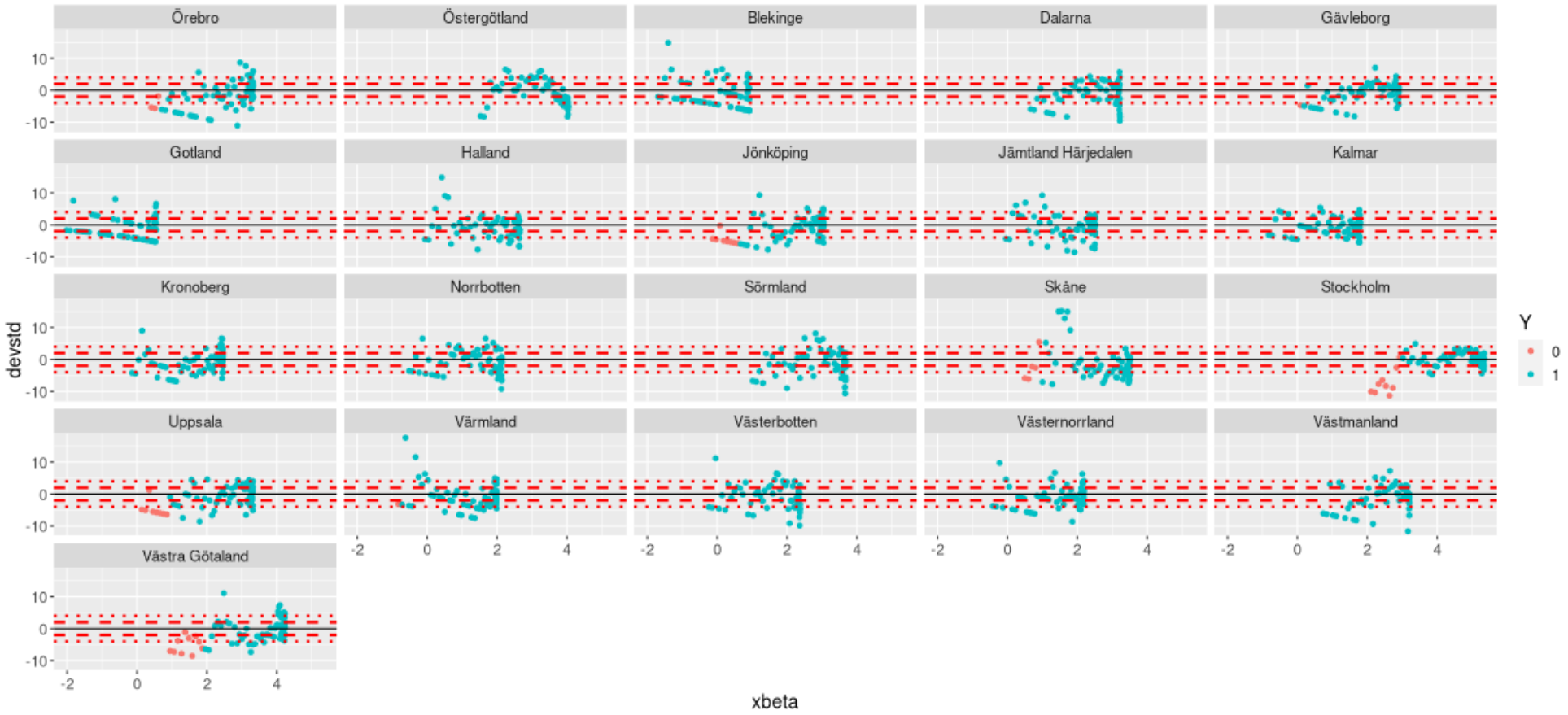
Negative binomial predictions



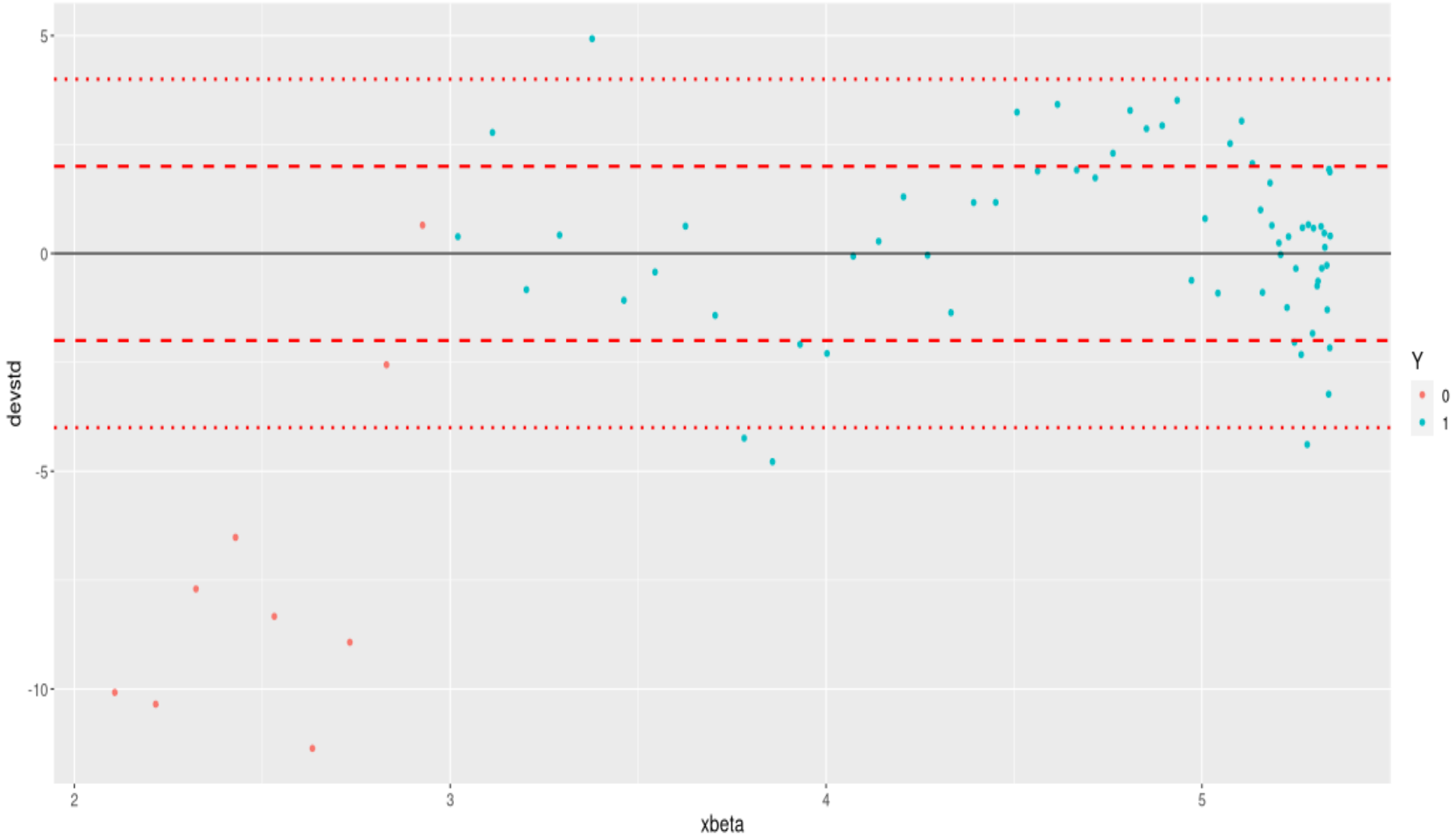
Poisson predictions



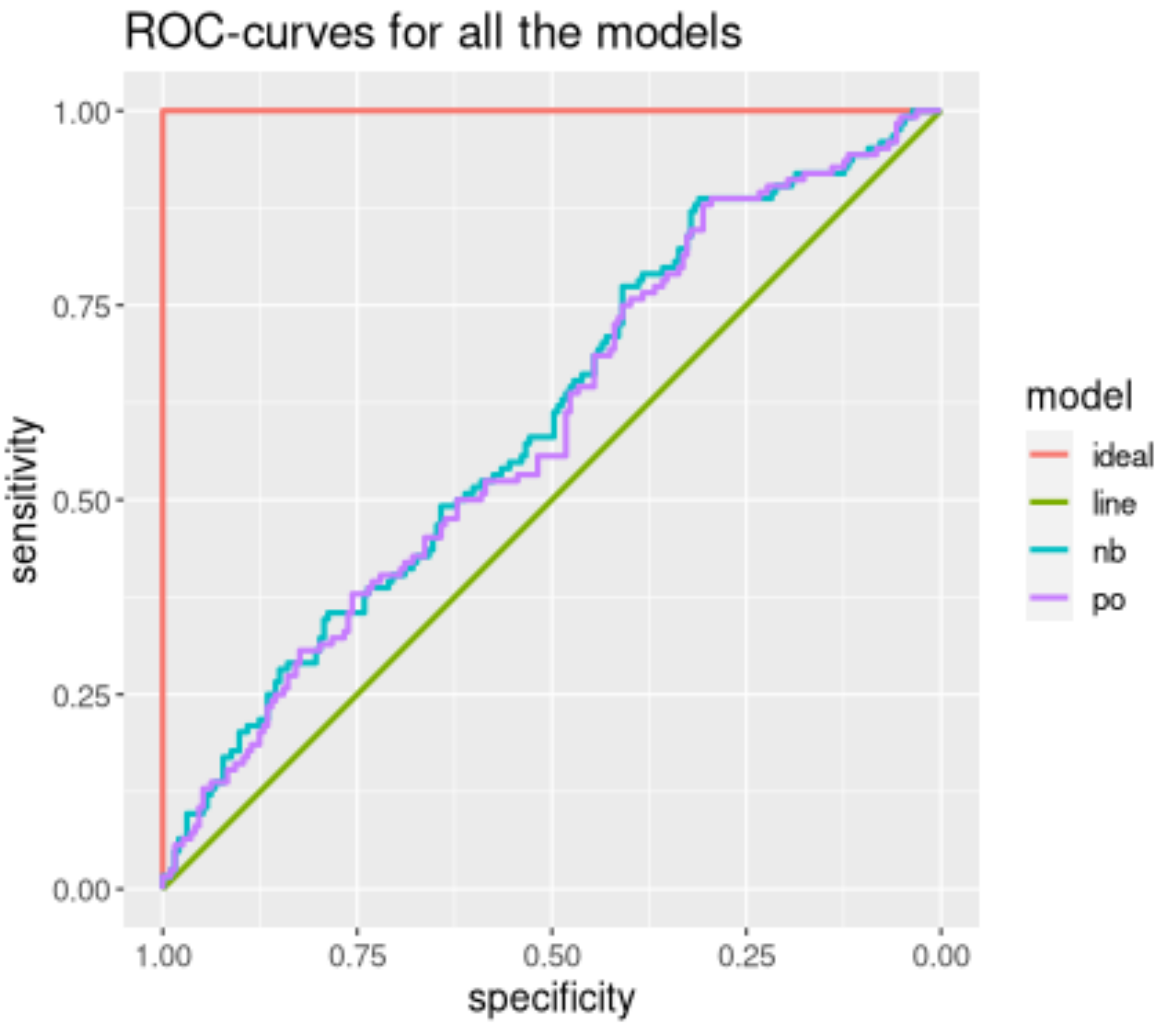
Negative binomial - Deviance standarized residuals



Deviance standarized residuals - Stockholm



ROC

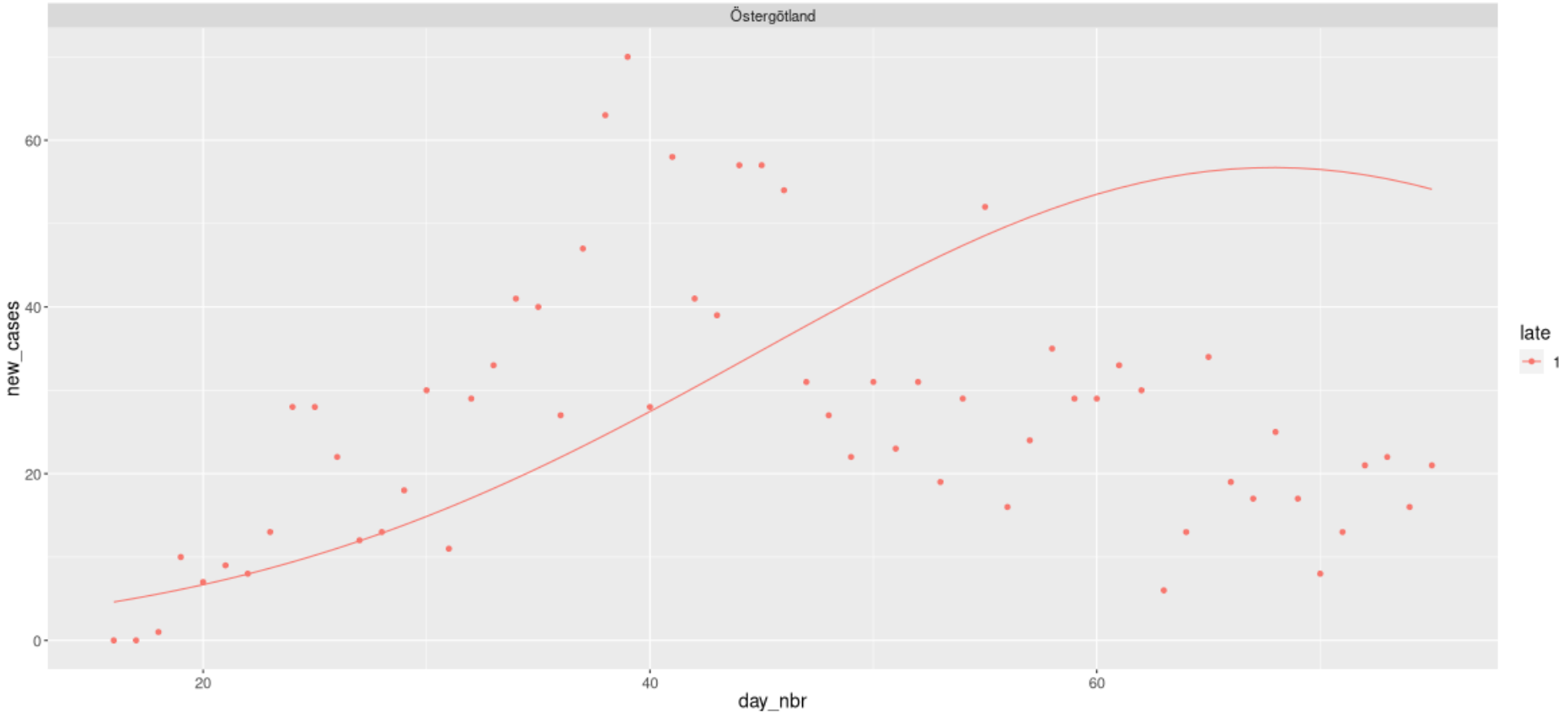

ROC-curves for all the models
sensitivity
1.00
0.75
0.50
0.25
0.00
1.00
0.75
0.50
0.25
0.00
specificity
model
ideal
line
nb
po

AUC

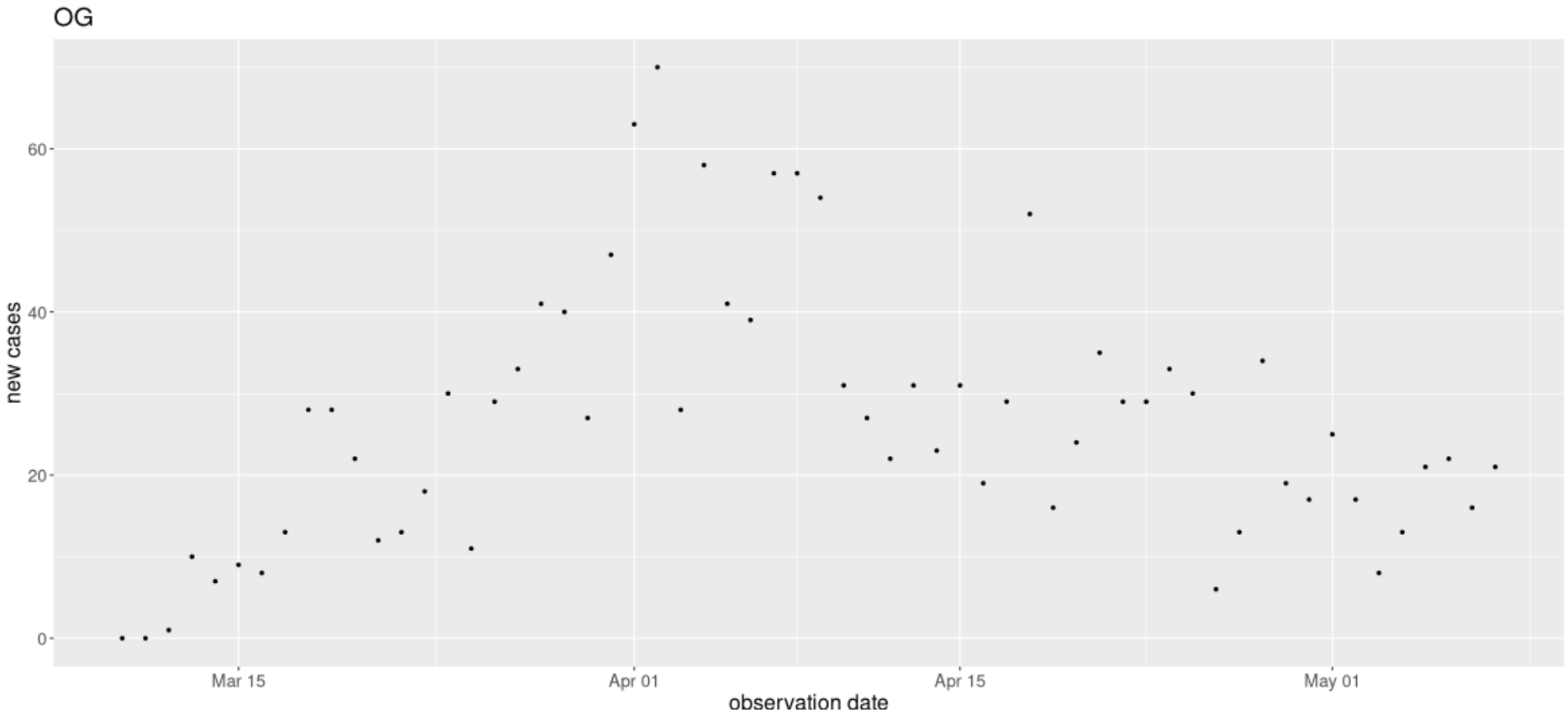
```
roc.test(mod_po.roc, mod_nb.roc)
```

AUC of Poisson	AUC of negative binomial
0.5932225	0.6014123

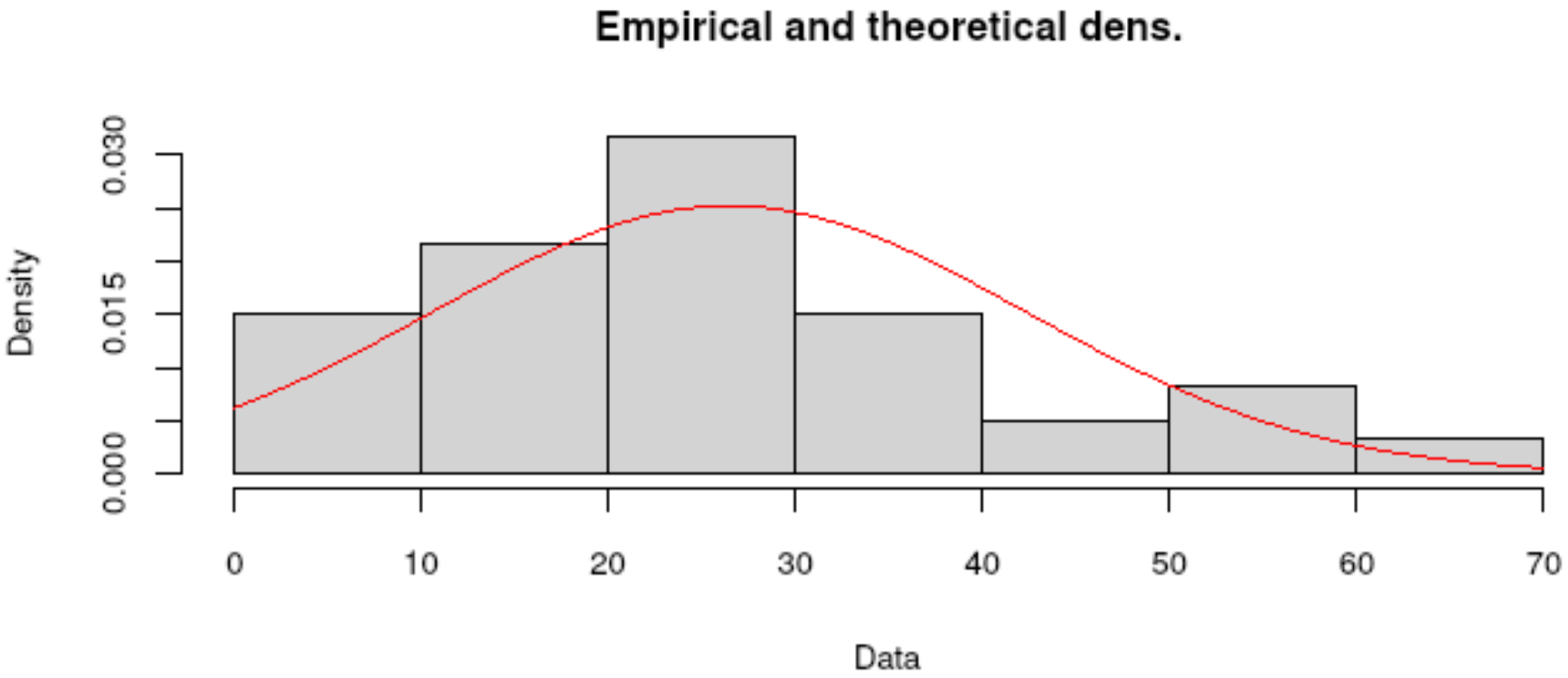
Östergötland - continuing work?



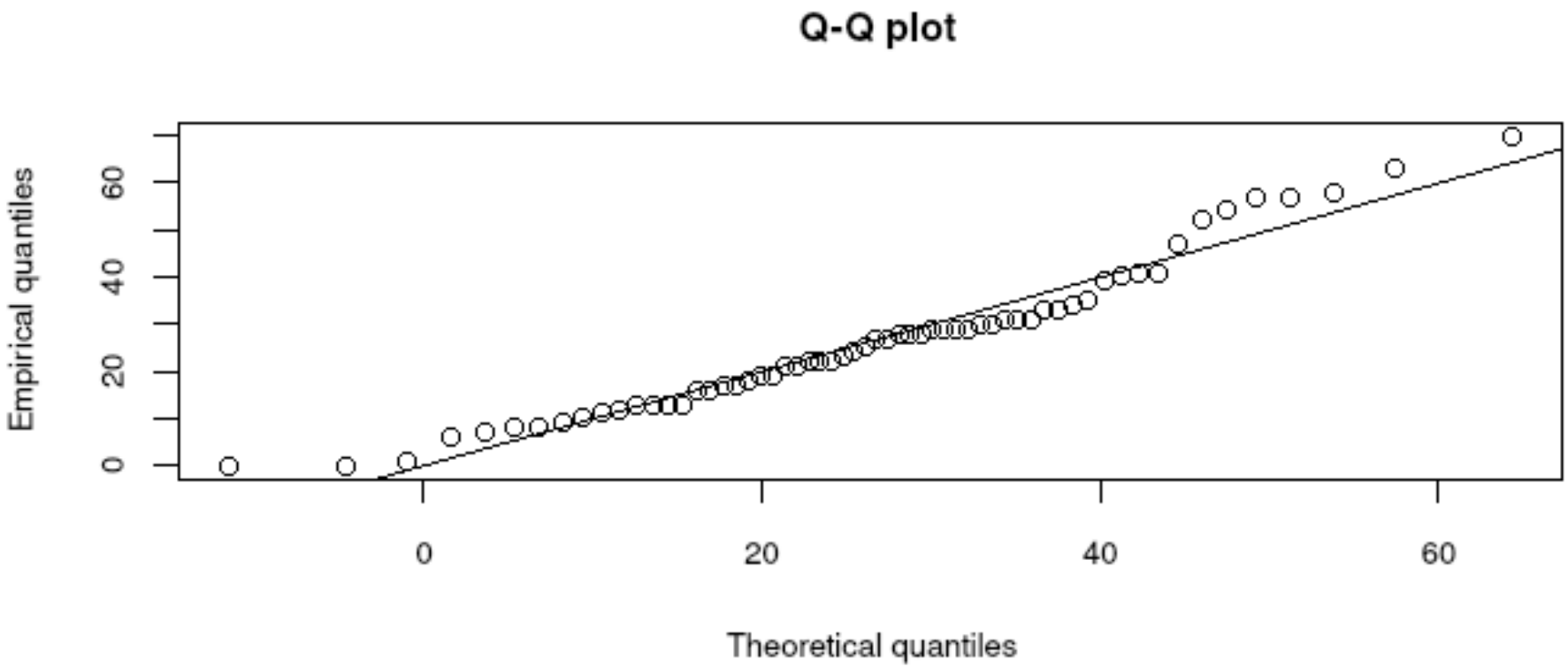
Östergötland - continuing work?



Östergötland - continuing work?



Östergötland - continuing work?



Thank you!