# overdispersion simulations

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## CI's

The bootstrap has now been calculated by refitting the model.

```
## Warning in is.na(results$ee): is.na() applied to non-(list or vector) of
## type 'NULL'
```

```
library(knitr)
header.cols <- c(1,3,4,5,19,20,2)
kable(results[,c(header.cols,7,8,9)],
      caption='Coverage of 90% CIs',
      digits=2)
```

Coverage of 90% CIs

| Population | n | b1 | b2 | mu.lower | mu.upper | phi | cover.chisq | cover.boots | cover.vgam |
|---|---|---|---|---|---|---|---|---|---|
| Poisson | 30 | -3 | 3 | 0.05 | 1 | 1 | 0.84 | 0.79 | NaN |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 3 | 0.94 | 0.92 | NaN |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 5 | 0.96 | 0.93 | NaN |

```
kable(results[,c(header.cols,10,11,12)],
      caption='CI for beta excludes zero',
      digits=2)
```

CI for beta excludes zero

| Population | n | b1 | b2 | mu.lower | mu.upper | phi | pow.chisq | pow.boots | pow.vgam |
|---|---|---|---|---|---|---|---|---|---|
| Poisson | 30 | -3 | 3 | 0.05 | 1 | 1 | 0.73 | 0.75 | NaN |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 3 | 0.26 | 0.34 | NaN |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 5 | 0.18 | 0.24 | NaN |

```
kable(results[,c(header.cols,13,14,15)],
      caption = '90% CIs median width',
      digits = 2)
```

90% CIs median width

| Population | n | b1 | b2 | mu.lower | mu.upper | phi | med.chisq | med.boots | med.vgam |
|---|---|---|---|---|---|---|---|---|---|
| Poisson | 30 | -3 | 3 | 0.05 | 1 | 1 | 4.24 | 3.80 | NA |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 3 | 9.70 | 9.35 | NA |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 5 | 15.86 | 15.77 | NA |

```
kable(results[,c(header.cols,16,17,18)],
      caption = 'Proportion of times method does not work',
    digits = 2)
```

Proportion of times method does not work

| Population | n | b1 | b2 | mu.lower | mu.upper | phi | err.chisq | err.boots | err.vgam |
|---|---|---|---|---|---|---|---|---|---|
| Poisson | 30 | -3 | 3 | 0.05 | 1 | 1 | 0 | 0 | 0 |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 3 | 0 | 0 | 0 |
| Negbin | 30 | -3 | 3 | 0.05 | 1 | 5 | 0 | 0 | 0 |