

Simulation results

Emmanuelle Comets

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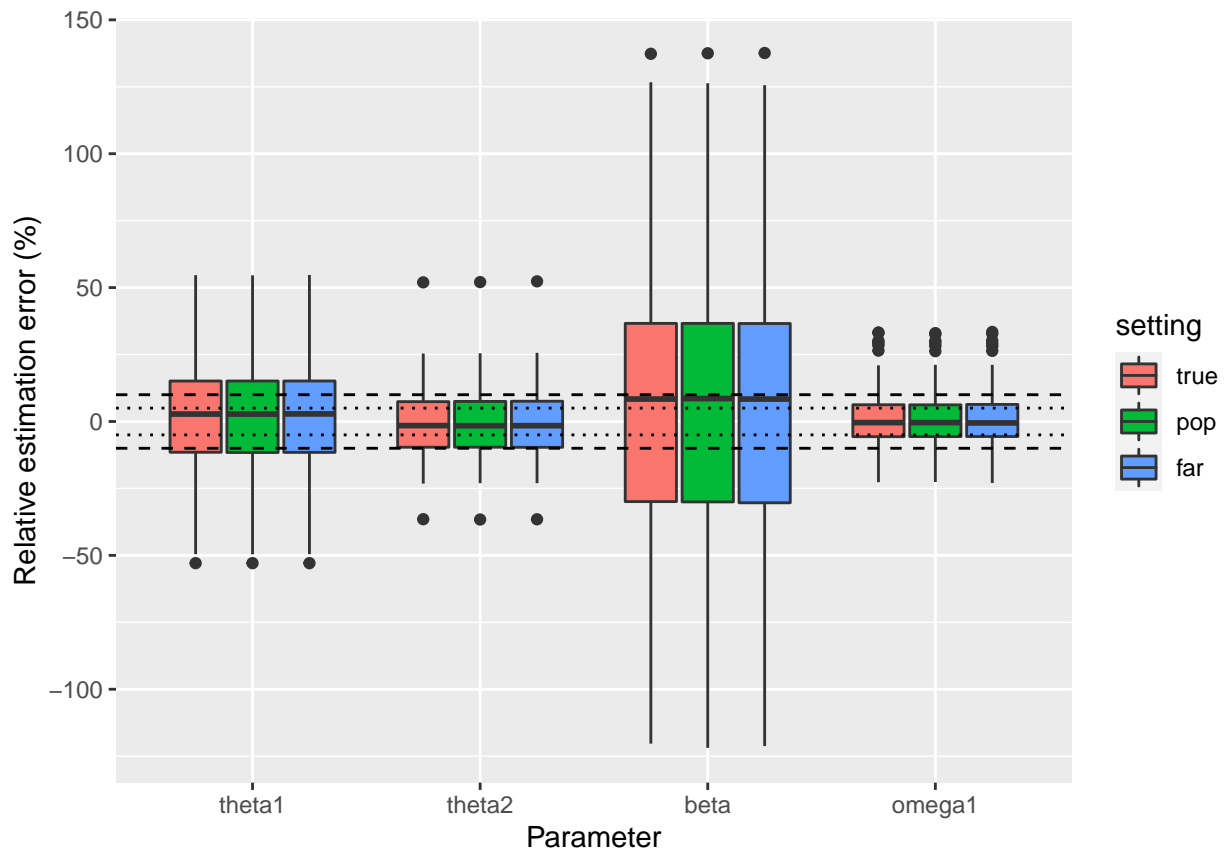
Content

Binary model

Simulations run using scripts (run before, only the results are used here)

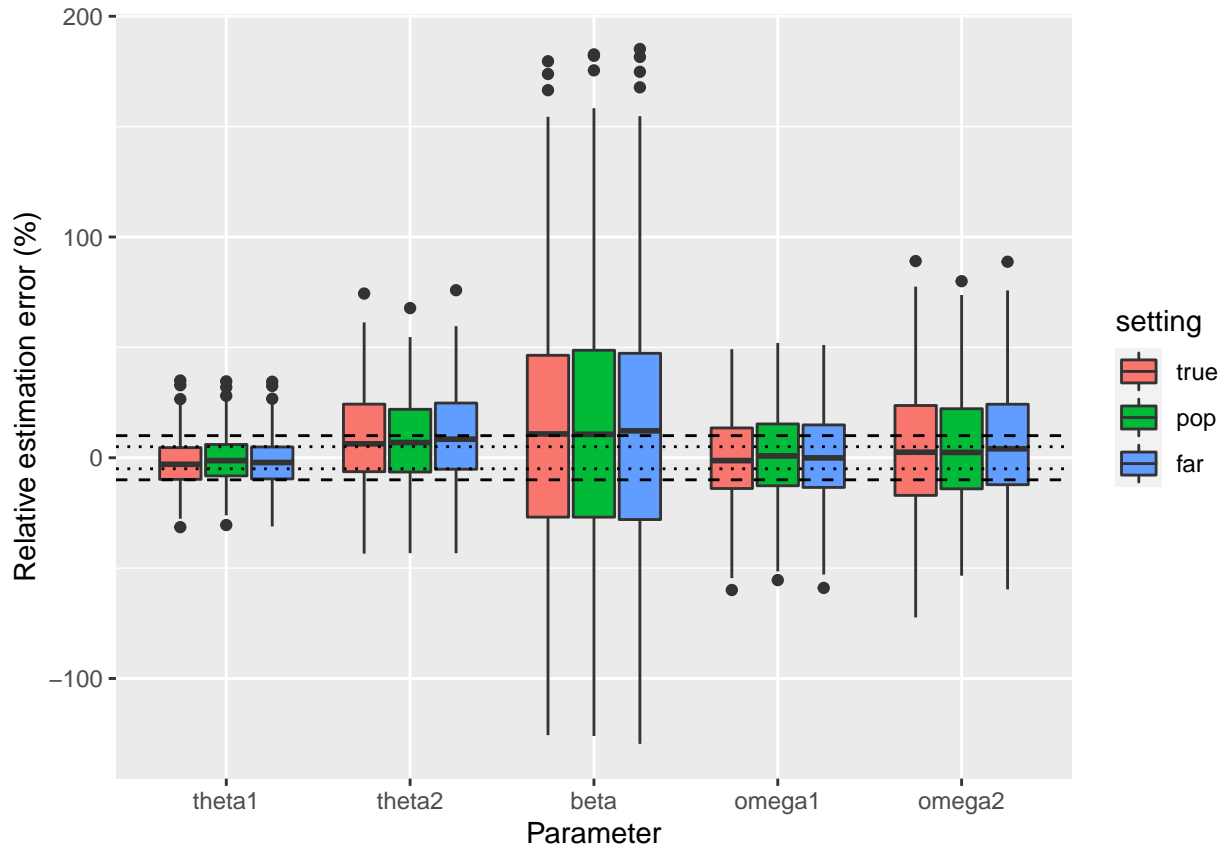
Results

- two scenarios, with design of the toenail study (per protocol)
 - IIV on θ_1 only: bias less than 5% for all parameters (mean 4% but median is 8.5% ?)
 - IIV on both parameters with 50% IIV: some bias on θ_2 and β (~10%) and a little on ω_{θ_2} (6.5%)
 - * the bias on ω_{θ_2} disappears when we start from the true parameters but the bias on θ_2 and β remains around 10%
- comparing settings for initial values
 - no difference w/r starting values of the parameters \Rightarrow runs seem to be stable with 10 chains
- Expected RSE from PFIM
 - binaryOrig: $\text{RSE}(\theta_1)=-24.86142$ $\text{RSE}(\theta_2)=-11.63633$ $\text{RSE}(\beta)=-38.29206$ $\text{RSE}(\omega_1^2)=20.39756$
 - * all parameters should be well estimated
 - binaryIIV: $\text{RSE}(\theta_1)=-10.70774$ $\text{RSE}(\theta_2)=-20.99451$ $\text{RSE}(\beta)=-112.04915$ $\text{RSE}(\omega_1^2)=36.80376$ $\text{RSE}(\omega_2^2)=65.15504$
 - * β expected to be poorly estimated (but θ_2 should be well estimated)
 - in both cases, good agreement between predicted SE and empirical SE (obtained as SD(estimates) over the 200 simulations) for all parameters (with sometimes empirical SE smaller than predicted SE, for θ_1 in original scenario and for ω_{θ_2} in scenario with two IIV)
 - * compare the SD computed here (=empirical SE) with predicted SE from seFIMAGQ_true.res in the result folder
 - * slightly smaller for ω_{θ_1} and smaller by 50% ω_{θ_2} in IIV and for θ_1 in original scenari, otherwise very close
- Compared one run with Monolix and very similar estimates when using 10 chains and the same CI



```
## pdf
## 2

##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.93347 -0.25844 -0.04748 -0.03532  0.19819  0.90479
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.52912 -0.11590  0.02777  0.02066  0.15113  0.54589
## [1] 0.3316673
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.203014 -0.029215  0.006188  0.003564  0.037472  0.142786
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.366118 -0.096081 -0.015867 -0.009138  0.074911  0.520548
## [1] 0.04730916
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.206276 -0.054955 -0.012840 -0.005868  0.045065  0.182836
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -1.21891 -0.30043  0.08560  0.03912  0.36637  1.37517
## [1] 0.07105211
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.90880 -0.22688 -0.01638  0.03389  0.24983  1.32663
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.226069 -0.056439 -0.004074  0.008431  0.062148  0.330007
## [1] 3.243
```



```
## pdf
## 2

##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.59174 -0.10267  0.02224  0.01032  0.14077  0.52136
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.304887 -0.082320 -0.013003 -0.006037  0.060041  0.346050
## [1] 0.193296
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.26439 -0.08557 -0.02681 -0.02921  0.02523  0.16859
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.43228 -0.06470  0.06873  0.07489  0.21940  0.67794
## [1] 0.07726252
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.27406 -0.07302 -0.01589 -0.01856  0.04037  0.18910
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -1.2607 -0.2691  0.1059  0.1238  0.4868  1.8271
## [1] 0.0844076
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.554304 -0.126985  0.008386  0.003908  0.153022  0.520036
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.554304 -0.126985  0.008386  0.003908  0.153022  0.520036
## [1] 0.3911807
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.106868 -0.028162  0.004818  0.010372  0.044401  0.159956
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.53434 -0.14081  0.02409  0.05186  0.22201  0.79978
```

```
## [1] 0.02202718
```