

R as a tool for graphical diagnostics in population pharmacokinetic modeling

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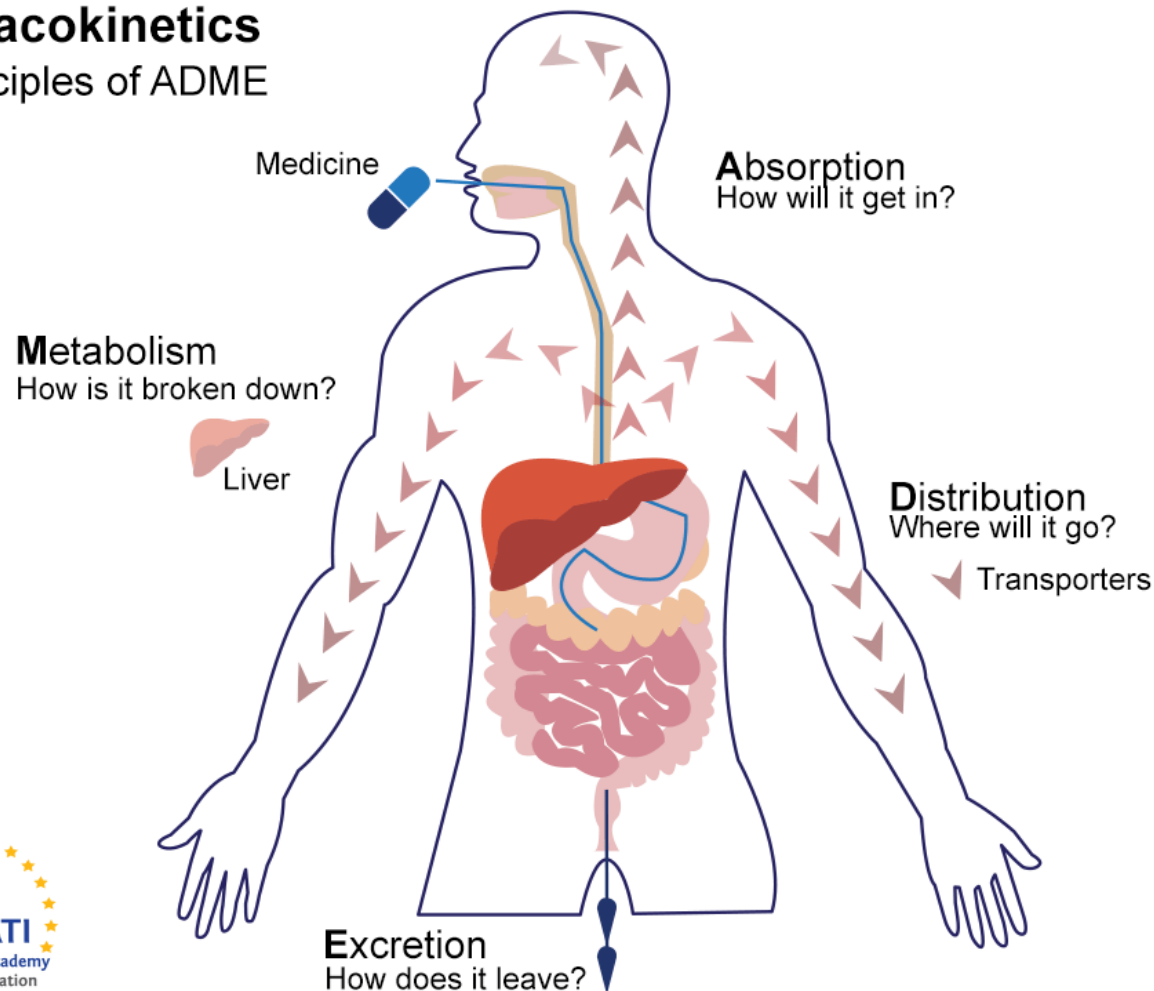
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Pharmacokinetics (PK)

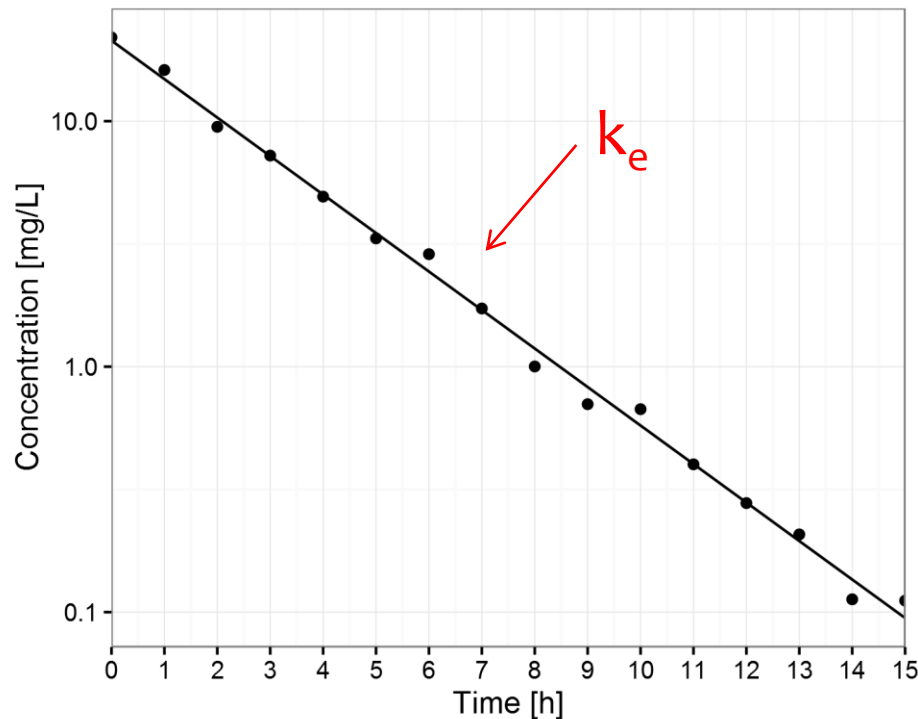
Pharmacokinetics

The principles of ADME

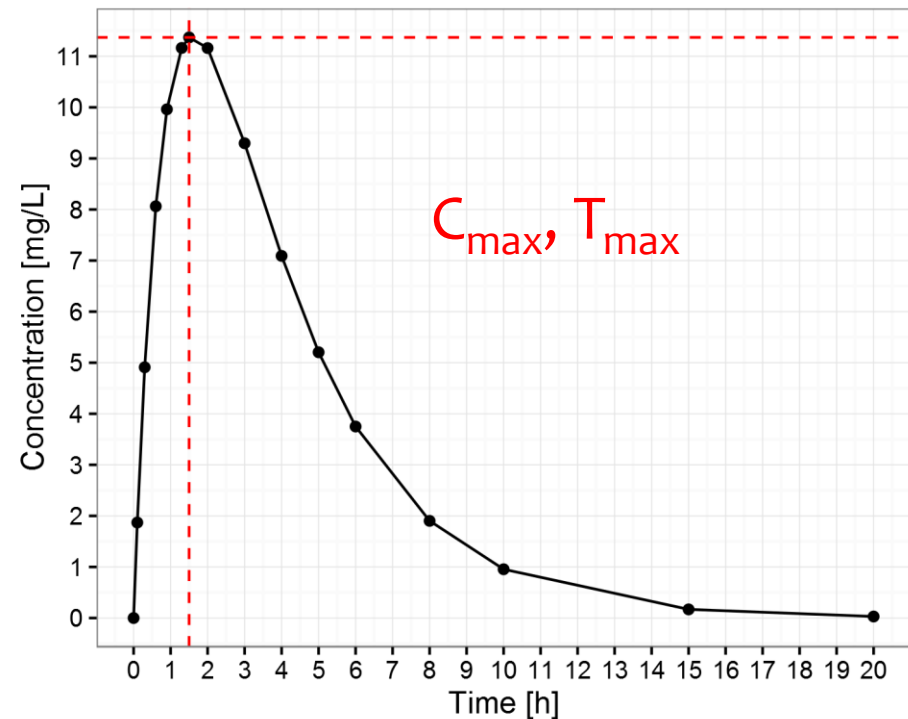


Graphics in pharmacokinetics

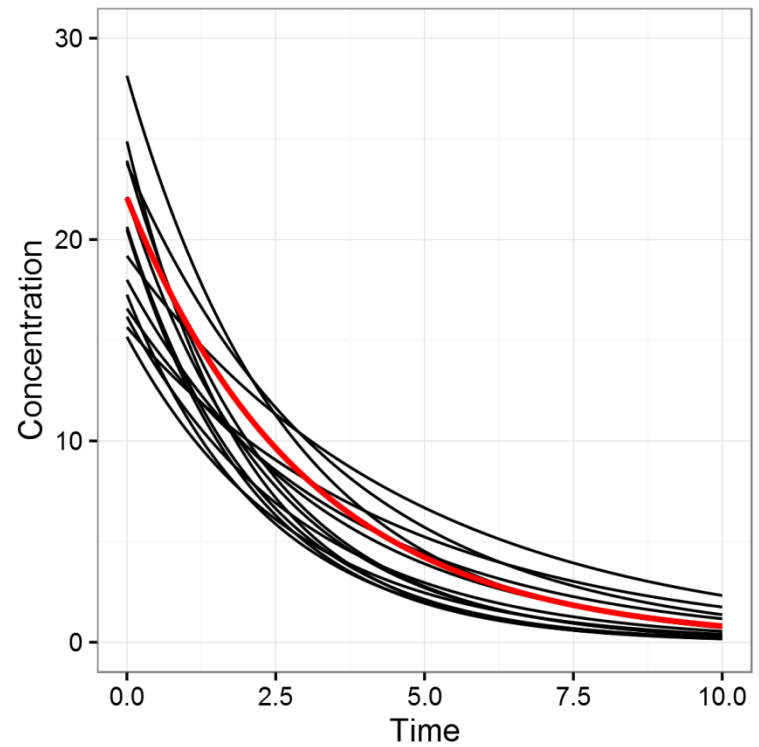
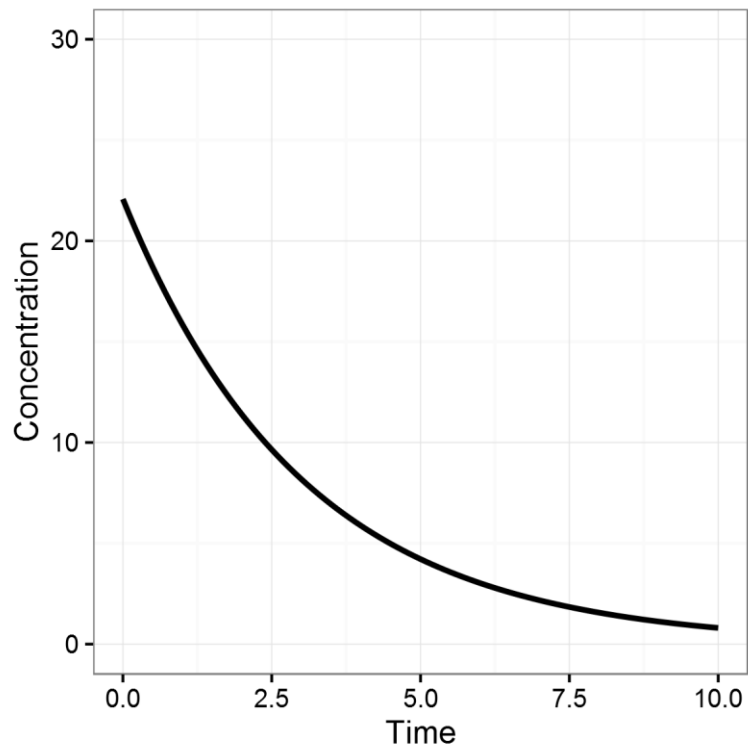
Intravenous route



Extravascular route



Population pharmacokinetics (PopPK)



Graphics in PopPK

Steps of PopPK analysis:

- (1) exploratory data analysis
- (2) model development
- (3) model validation

Graphical analysis employed in each of these steps.

Why R?

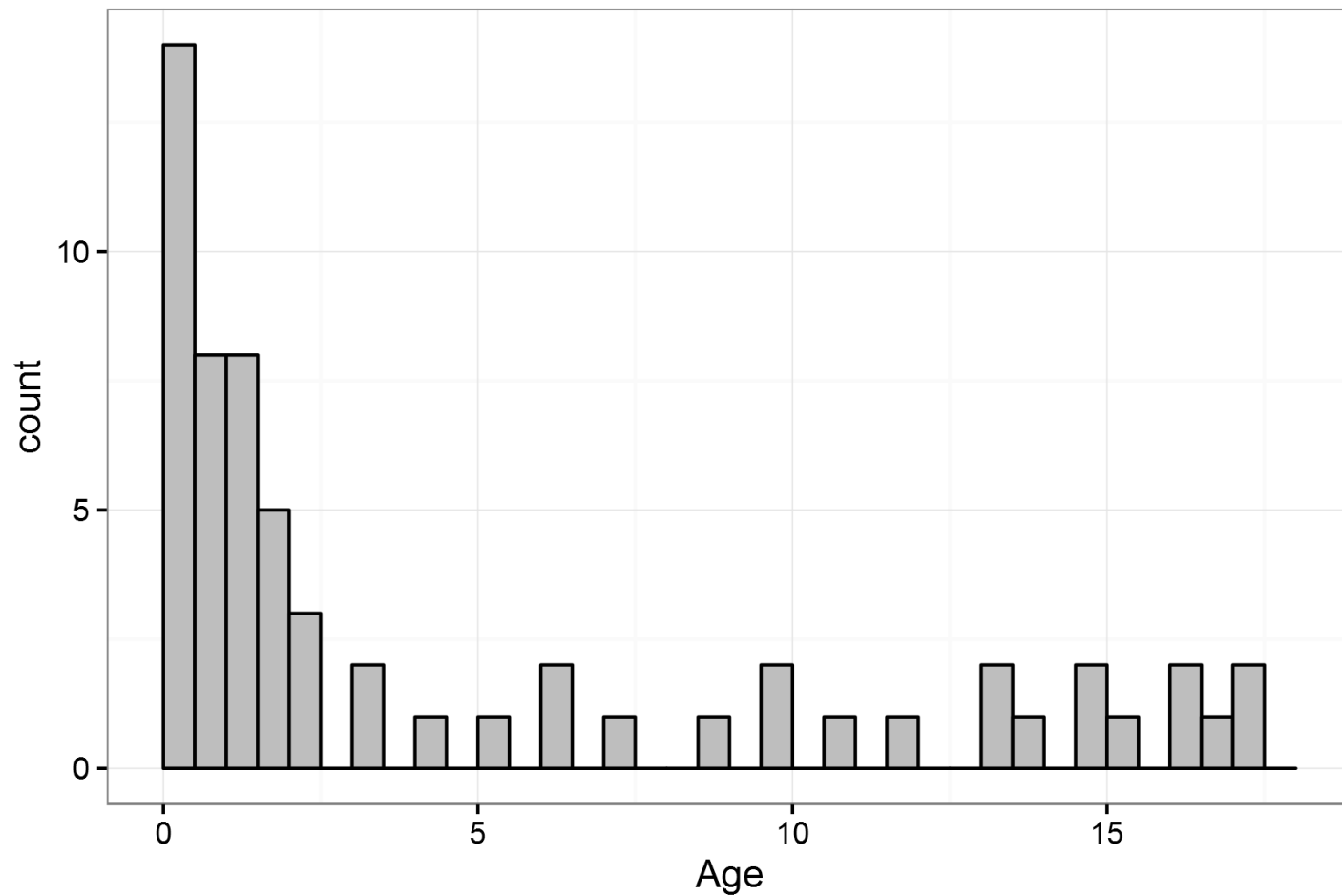
- **quick, versatile** graphics
- **easily adjustable** plots
- **publication-ready** graphics
- **automatized** reports

Packages:

- base graphics
- lattice/ggplot2

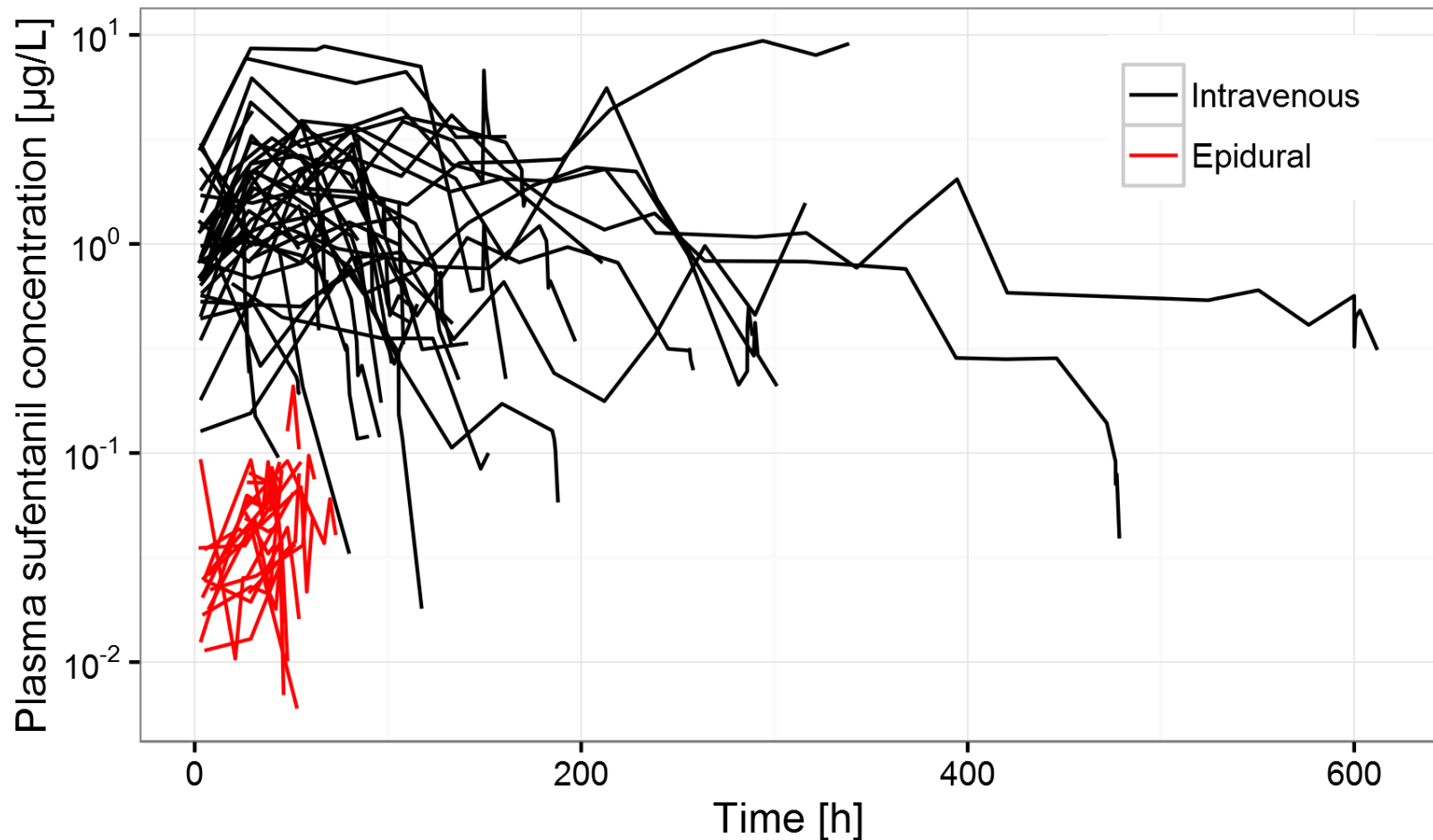
Exploratory data analysis

Covariates



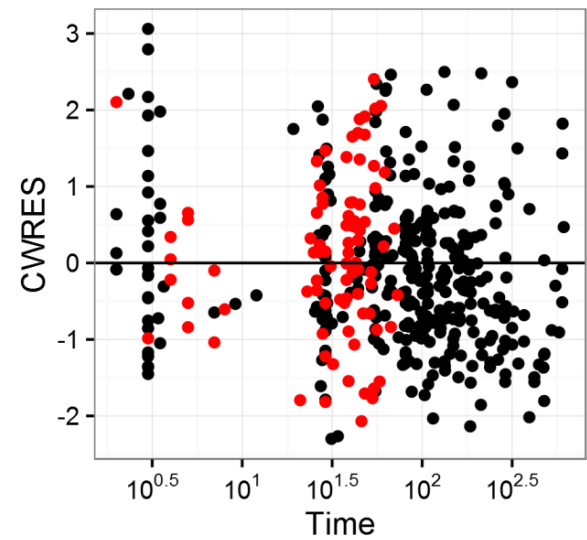
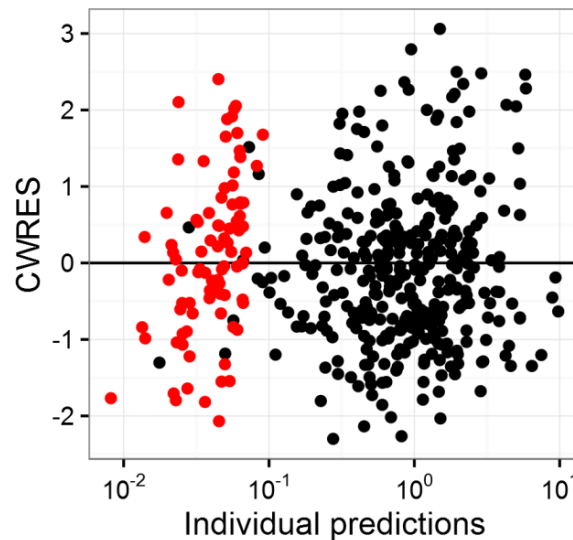
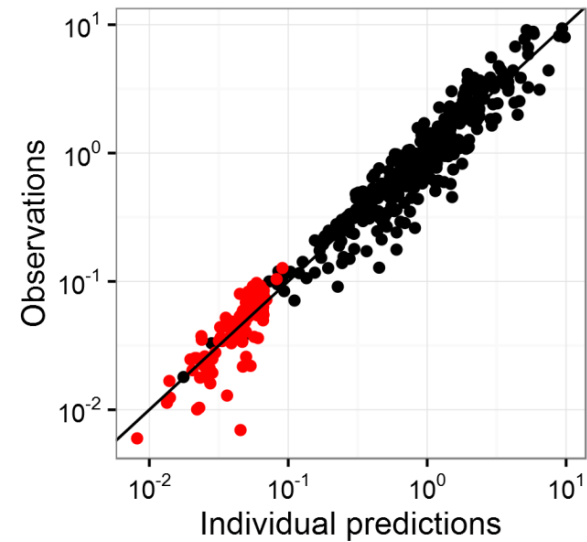
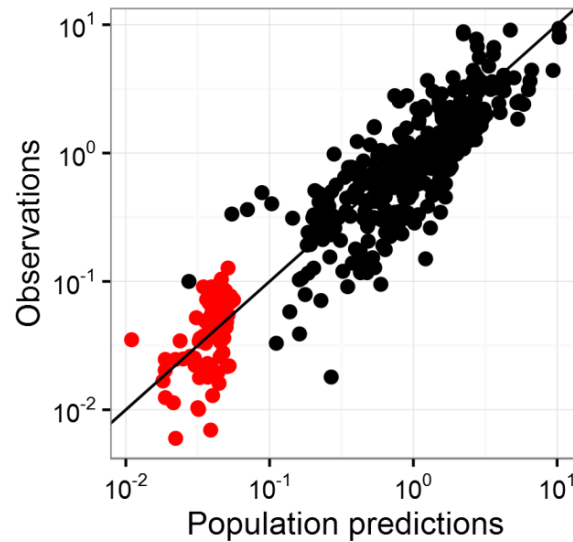
Exploratory data analysis

Raw data

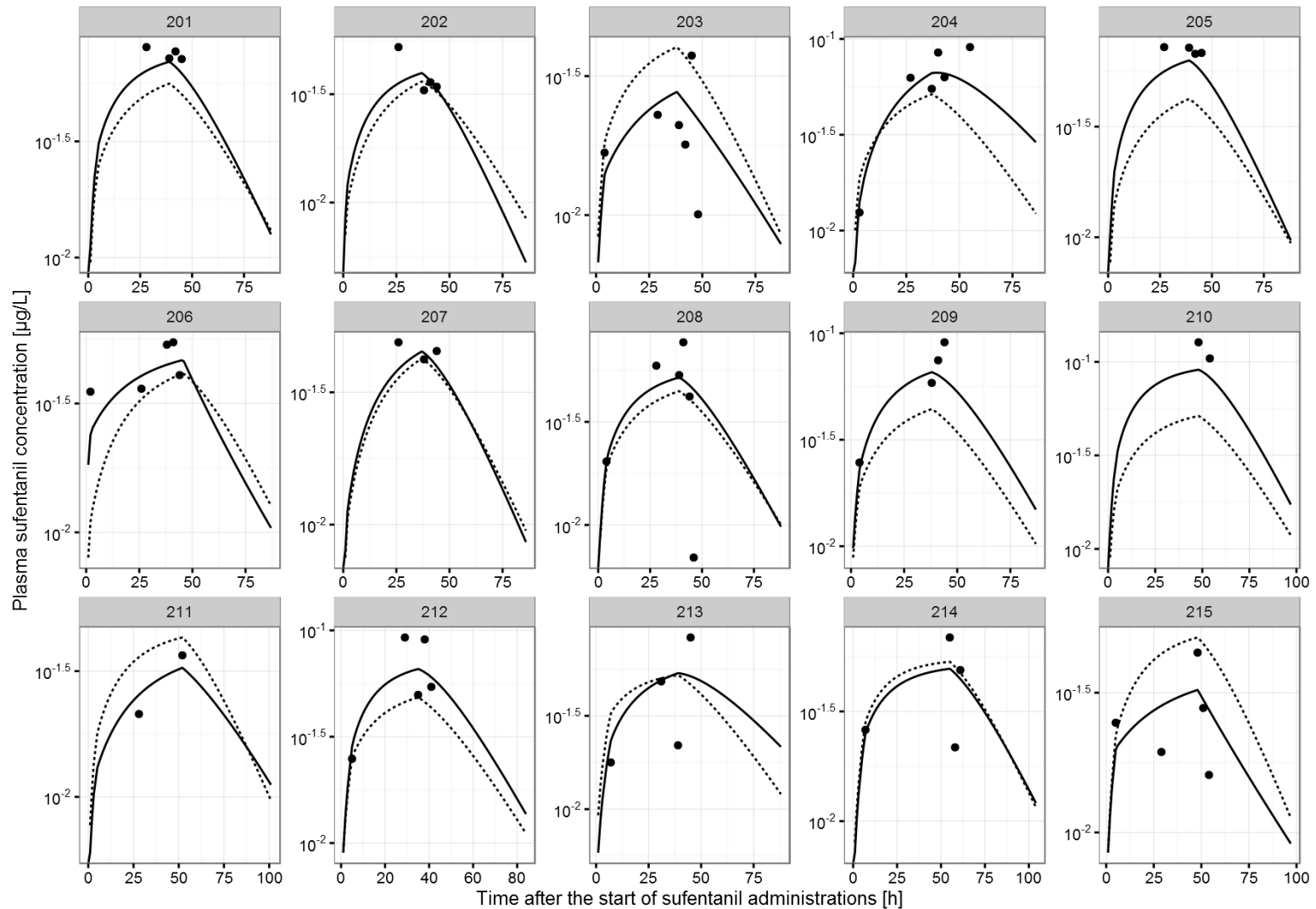


Model development

Goodness
of fit

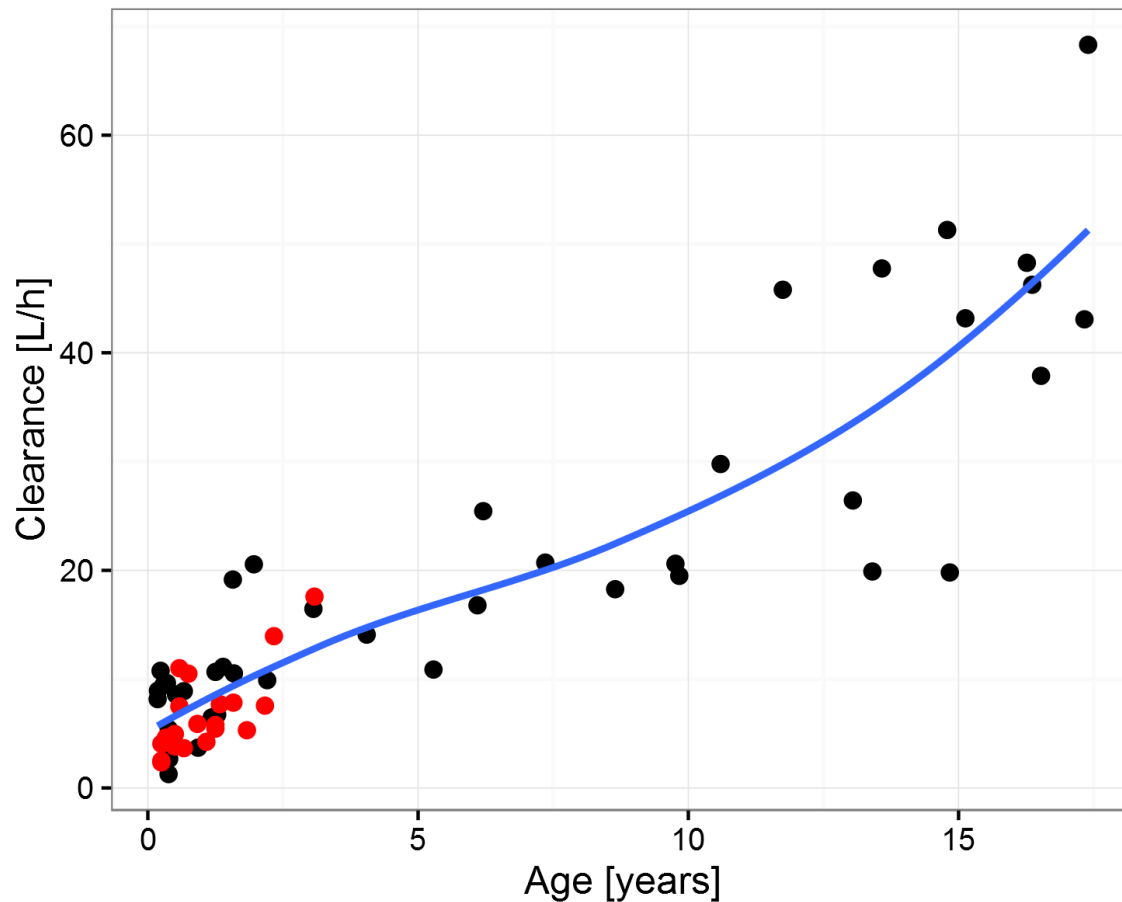


Model development



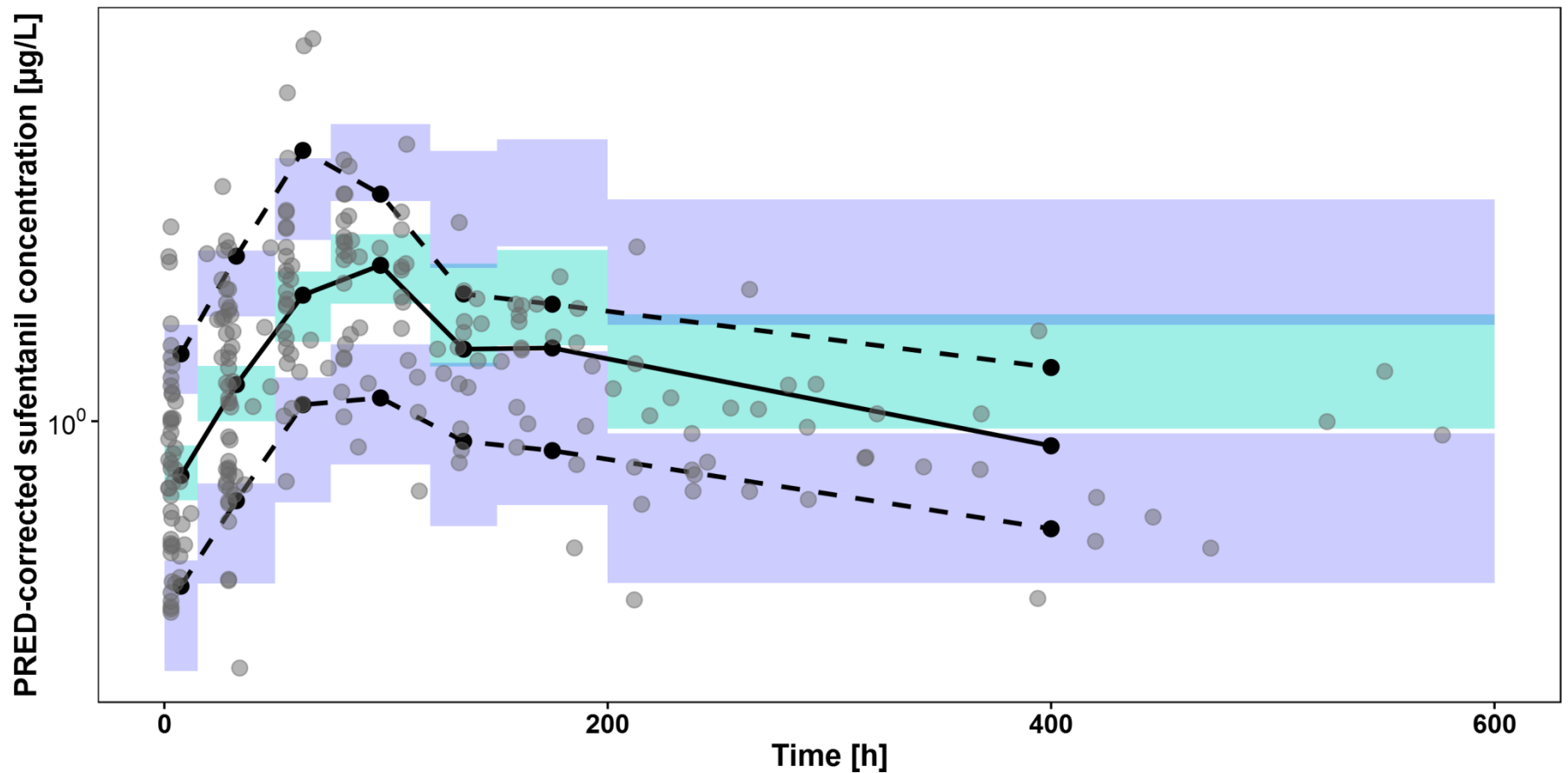
Model development

Covariate analysis



Model validation

Visual Predictive Check



Conclusions

- ⇒ Graphical analysis plays a unique role in PopPK analysis
- ⇒ Easily interpretable plots are essential in every PopPK report
- ⇒ R offers high quality plots even with default settings
- ⇒ The application of R as graphical tool in PopPK is increasing