Package 'nlmixr2data'

January 31, 2024

Title Nonlinear Mixed Effects Models in Population PK/PD, Data

Version 2.0.9

Description Datasets for 'nlmixr2' and 'rxode2'. 'nlmixr2' is used for fitting and comparing nonlinear mixed-effects models in differential equations with flexible dosing information commonly seen in pharmacokinetics and pharmacodynamics (Almquist, Leander, and Jirstrand 2015 <doi:10.1007/s10928-015-9409-1>). Differential equation solving is by compiled C code provided in the 'rxode2' package (Wang, Hallow, and James 2015 <doi:10.1002/psp4.12052>).

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.2.3

Depends R (>= 2.10)

LazyData true

BugReports https://github.com/nlmixr2/nlmixr2data/issues/

URL https://nlmixr2.github.io/nlmixr2data/, https://github.com/nlmixr2/nlmixr2data/

NeedsCompilation no

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Repository CRAN

Date/Publication 2024-01-31 20:40:02 UTC

R topics documented:

`Bolus_1CPT` *1 Compartment Model Simulated Data from ACOP 2016*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Bolus_1CPT
```

Format

A data frame with 7,920 rows and 14 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V Individual Simulated Volume

CL Individual Clearance

SS Steady State

II Interdose Interval

SD Single Dose Flag

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

Bolus_1CPTMM *1 Compartment Model w/ Michaelis-Menten Elimination*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Bolus_1CPTMM
```

Format

A data frame with 7,920 rows and 14 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V Individual Simulated Volume

VM Individual Vm constant

KM Individual Km constant

SD Single Dose Flag

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

`Bolus_2CPT` *2 Compartment Model*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Bolus_2CPT
```

Format

A data frame with 7,920 rows and 16 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V1 Individual Central Compartment Volume

CL Individual Clearance

Q Individual Between Compartment Clearance

V2 Periperial Volume

SS Steady State Flag

II Interdose interval

SD Single Dose Flag

CMT Compartment Indicator

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

Bolus_2CPTMM *2 Compartment Model with Michaelis-Menten Clearance*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Bolus_2CPTMM
```

Format

A data frame with 7,920 rows and 15 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V Individual Central Compartment Volume

VM Individual Vmax

KM Individual Km

Q Individual Q

V2 Individual Peripheral Compartment Volume

SD Single Dose Flag

CMT Compartment Indicator

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

Infusion_1CPT *1 Compartment Model Simulated Data from ACOP 2016*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Infusion_1CPT
```

Format

A data frame with 7,920 rows and 14 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V Individual Simulated Volume

CL Individual Clearance

SS Steady State

II Interdose Interval

SD Single Dose Flag

RATE NONMEM Rate

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nimoData, nmtest, pheno_sd, rats, theo_md, theo_sd, warfarin, wbcSim

---

Infusion_1CPTMM *1 Compartment Model w/MM elimination Simulated Data from ACOP 2016*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Infusion_1CPTMM
```

Format

A data frame with 7,920 rows and 14 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V Individual Simulated Volume

KM Individual Km constant

VM Individual Vm constant

SD Single Dose Flag

RATE NONMEM Rate

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nimoData, nmtest, pheno_sd, rats, theo_md, theo_sd, warfarin, wbcSim

---

Infusion_2CPT *2 Compartment Model with Infusion Simulated Data from ACOP 2016*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Infusion_2CPT
```

Format

A data frame with 7,920 rows and 17 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V Individual Simulated Volume

CL Individual Clearance

Q Individual Inter-compartmental Clearance

V2 Individual Peripheral Volume

SS Steady State

RATE NONMEM Rate

II Interdose Interval

SD Single Dose Flag

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

`Infusion_2CPTMM` *2 Compartment Model w/MM elimination Simulated Data from ACOP 2016*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Infusion_2CPTMM
```

Format

A data frame with 7,920 rows and 14 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

Q Individual Between Compartment Clearance

V Individual Simulated Volume

V2 Individual Peripheral Volume

KM Individual Km constant

VM Individual Vm constant

SD Single Dose Flag

RATE NONMEM Rate

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4.

Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

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invgaussian *Inverse Guassian absorption model*

Description

Inverse Guassian absorption model

Usage

```
invgaussian
```

Format

A data frame with 32 rows and 6 columns

time Time of observation

cp Concentration

Source

Figure 9.7 in D'Argenio DZ, Schumitzky A, and Wang X (2009). "ADAPT 5 User's Guide: Pharmacokinetic/Pharmacodynamic Systems Analysis Software".

`mavoglurant` *Mavoglurant PK data*

Description

This was used in a full PBPK model. This one was published for mavoglurant (Wendling et al. 2016).

Usage

```
mavoglurant
```

Format

A data frame with 2,678 rows by 14 columns

ID Subject ID

CMT Compartment Number

EVID Event ID

MDV Missing DV

DV Dependent Variable, Mavoglurant

AMT Dose Amount Keyword

TIME Time (hr)

DOSE Dose

OCC Occasion

RATE Rate

AGE Age

SEX Sex

WT Weight

HT Height

Source

Wendling et al. 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

metabolite *Parent/Metabolite dataset*

Description

Parent/Metabolite dataset

Usage

```
metabolite
```

Format

A data frame with 32 rows and 6 columns

time Time of observation

y1 Parent Concentration

y2 Metabolite Concentration

Source

D'Argenio DZ, Schumitzky A, and Wang X (2009). "ADAPT 5 User's Guide: Pharmacokinetic/Pharmacodynamic Systems Analysis Software".

nimoData *Nimotuzumab PK data*

Description

ID Subject ID

TIME Time (hrs)

AMT Dose Amount Keyword

RATE Rate

DV Dependent Variable, Nimotuzumab

TAD Time After Dose

CMT Compartment Number

OCC Occasion

MDV Missing DV

EVID Event ID

WGT Weight

BSA Body Surface Area

AGE Age

HGT Height

DOS Dose

Usage

```
nimoData
```

Format

A data frame with 441 rows by 15 columns

Source

Rodriguez-Vera et al. 2015

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nmtest, pheno_sd, rats, theo_md, theo_sd, warfarin, wbcSim

---

nmtest *One compartment test dataset showing NONMEM 7.4.3 output*

Description

This is a example dataset originally created to show how similar mrgsolve and NONMEM were (See).

Usage

```
nmtest
```

Format

A data frame with 7,157 rows and 15 columns

id NONMEM id

time NONMEM time

cp NONMEM cp output from 7.4.3

cmt cmt specification 1=depot, 2=central

amt Nonmem dose

evid NONMEM Event ID

ii Interdose Interval

ss Steady state flag

addl Individual Clearance

rate Rate of the infusion

lagt Lag time

bioav Bioavailability

rat2 Modeled rate when mode == 1

dur2 Duration when mode == 2

mode Mode = 0 is no modification, modeled rate when mode=1 and modeled duration when mode=2

Details

The original dataset was created by Kyle Baron and is composed of id<100 the id>100 are modifications by Matthew Fidler to benchmark steady state infusions with lag times and other uncommon features.

Note that rxode2/nlmixr2 will not always match these behaviors by default, we choose behaviors that we believe make sense. There are options to make rxode2/nlmixr2 behave more like NONMEM. However behaviors we believe are wrong we do not support.

Author(s)

Kyle Baron & Matthew Fidler

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nimoData, pheno_sd, rats, theo_md, theo_sd, warfarin, wbcSim

---

Oral_1CPT *1 Compartment Model with Oral Absorption Simulated Data from ACOP 2016*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Oral_1CPT
```

Format

A data frame with 7,920 rows and 15 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

V Individual Simulated Volume

CL Individual Clearance

KA Individual Ka

SS Steady State

II Interdose Interval

SD Single Dose Flag

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

`Oral_1CPTMM` *1 Compartment Model w/ Oral Absorption & Michaelis-Menten Elimination*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Oral_1CPTMM
```

Format

A data frame with 7,920 rows and 14 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

KA Individual Absorption constant

V Individual Simulated Volume

VM Individual Vm constant

KM Individual Km constant

SD Single Dose Flag

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nimoData, nmtest, pheno_sd, rats, theo_md, theo_sd, warfarin, wbcSim

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`Oral_2CPT` *2 Compartment Model with Oral Absorption Simulated Data from ACOP 2016*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Oral_2CPT
```

Format

A data frame with 7,920 rows and 15 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

Q Individual Inter-compartmental Clearance

V1 Individual Simulated Volume

V2 Individual Simulated Peripheral Volume

CL Individual Clearance

KA Individual Ka

SS Steady State

II Interdose Interval

SD Single Dose Flag

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

`Oral_2CPTMM` *1 Compartment Model w/ Oral Absorption & Michaelis-Menten Elimination*

Description

This is a simulated dataset from the ACOP 2016 poster. All Datasets were simulated with the following methods.

Usage

```
Oral_2CPTMM
```

Format

A data frame with 7,920 rows and 14 columns

ID Simulated Subject ID

TIME Simulated Time

DV Simulated Dependent Variable

LNDV Simulated log(Dependent Variable)

MDV Missing DV data item

AMT Dosing AMT

EVID NONMEM Event ID

DOSE Dose

KA Individual Absorption constant

V1 Individual Simulated Volume

V2 Individual Simulated Perhipheral Volume

Q Individual Inter-compartmental Clearance

VM Individual Vm constant

KM Individual Km constant

SD Single Dose Flag

CMT Compartment

Details

Richly sampled profiles were simulated for 4 different dose levels (10, 30, 60 and 120 mg) of 30 subjects each as single dose (over 72h), multiple dose (4 daily doses), single and multiple dose combined, and steady state dosing, for a range of test models: 1- and 2-compartment disposition, with and without 1st order absorption, with either linear or Michaelis-Menten (MM) clearance(MM without steady state dosing). This provided a total of 42 test cases. All inter-individual variabilities (IIVs) were set at 30%, residual error at 20% and overlapping PK parameters were the same for all models. A similar set of models was previously used to compare NONMEM and Monolix4. Estimates of population parameters, standard errors for fixed-effect parameters, and run times were compared both for closed-form solutions and using ODEs. Additionally, a sparse data estimation situation was investigated where 500 datasets of 600 subjects each (150 per dose) were generated consisting of 4 random time point samples in 24 hours per subject, using a first-order absorption, 1-compartment disposition, linear elimination model.

Source

Schoemaker R, Xiong Y, Wilkins J, Laveille C, Wang W. nlmixr2: an open-source package for pharmacometric modelling in R. ACOP 2016

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

pheno_sd *Single Dose Phenobarbitol PK/PD*

Description

This is from a PK study in neonatal infants. They received multiple doses of phenobarbital for seizure prevention.

Usage

```
pheno_sd
```

Format

A data frame with 744 rows and 8 columns

ID Infant ID

TIME Time (hr)

AMT Dose (ug/kg)

WT Weight (kg)

APGR A 5-minute Apgar score to measure infant health

DV The concentration of phenobarbitol in the serum (ug/mL)

MDV If the dependent variable (DV) is missing; 0 for observations, 1 for doses

EVID Event ID

Details

The data were originally given in Grasela and Donn(1985) and are analyzed in Boeckmann, Sheiner and Beal (1994), in Davidian and Giltinan (1995), and in Littell et al. (1996).

Source

Pinheiro, J. C. and Bates, D. M. (2000), Mixed-Effects Models in S and S-PLUS, Springer, New York. (Appendix A.23)

Davidian, M. and Giltinan, D. M. (1995), Nonlinear Models for Repeated Measurement Data, Chapman and Hall, London. (section 6.6)

Grasela and Donn (1985), Neonatal population pharmacokinetics of phenobarbital derived from routine clinical data, Developmental Pharmacology and Therapeutics, 8, 374-383.

Boeckmann, A. J., Sheiner, L. B., and Beal, S. L. (1994), NONMEM Users Guide: Part V, University of California, San Francisco.

Littell, R. C., Milliken, G. A., Stroup, W. W. and Wolfinger, R. D. (1996), SAS System for Mixed Models, SAS Institute, Cary, NC.

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nimoData, nmtest, rats, theo_md, theo_sd, warfarin, wbcSim

---

pump *Pump failure example dataset*

Description

The records the number of failures and operation time for groups of 10 pumps.

Usage

```
pump
```

Format

A data frame with 10 rows and 5 columns

y Number of pump failures

t Failure Time

group Continuous Operation (=1) or Intermittent Operation(=2)

ID ID for group of 10 pumps

logtstd Centered operation times

Source

https://support.sas.com/documentation/cdl/en/statug/63033/HTML/default/viewer.htm#statug_nlmixed_sect040.htm

References

Gaver, D. P. and O'Muircheartaigh, I. G. (1987), "Robust Empirical Bayes Analysis of Event Rates," Technometrics, 29, 1-15.

`rats` *Pregnant Rat Diet Experiment*

Description

16 pregnant rats have a control diet, and 16 have a chemically treated diet. The litter size for each rat is recorded after 4 and 21 days. This dataset is used in the SAS Probit-model with binomial data, and saved in the nlmixr2 package as rats.

Usage

```
rats
```

Format

A data frame with 32 rows and 6 columns

trt Treatment; c= control diet; t=treated diet

m Litter size after 4 days

x Litter size after 21 days

x1 Indicator for trt=c

x2 Indicator for trt=t

ID Rat ID

Source

https://support.sas.com/documentation/cdl/en/statug/63033/HTML/default/viewer.htm#statug_nlmixed_sect040.htm

References

Weil, C.S., 1970. Selection of the valid number of sampling units and a consideration of their combination in toxicological studies involving reproduction, teratogenesis or carcinogenesis. Fd. Cosmet. Toxicol. 8, 177-182.

Williams, D.A., 1975. The analysis of binary responses from toxicological experiments involving reproduction and teratogenicity. Biometrics 31, 949-952.

McCulloch, C. E. (1994), "Maximum Likelihood Variance Components Estimation for Binary Data," Journal of the American Statistical Association, 89, 330 - 335.

Ochi, Y. and Prentice, R. L. (1984), "Likelihood Inference in a Correlated Probit Regression Model," Biometrika, 71, 531-543.

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `theo_md`, `theo_sd`, `warfarin`, `wbcSim`

theo_md *Multiple dose theophylline PK data*

Description

This data set starts with the day 1 concentrations of the theophylline data that is included in the nlme/NONMEM. After day 7 concentrations were simulated with once a day regimen for 7 days (QD).

Usage

```
theo_md
```

Format

A data frame with 348 rows by 7 columns

ID Subject ID

TIME Time (hr)

DV Dependent Variable, theophylline concentration (mg/L)

AMT Dose Amount (kg)

EVID rxode2/nlmixr2 event ID (not NONMEM event IDs)

CMT Compartment number

WT Body weight (kg)

Source

NONMEM/nlme

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nimoData, nmtest, pheno_sd, rats, theo_sd, warfarin, wbcSim

theo_sd *Multiple dose theophylline PK data*

Description

This data set is the day 1 concentrations of the theophylline data that is included in the nlme/NONMEM.

Usage

```
theo_sd
```

Format

A data frame with 144 rows by 7 columns

ID Subject ID

TIME Time (hr)

DV Dependent Variable, theophylline concentration (mg/L)

AMT Dose Amount (mg)

EVID rxode2/nlmixr2 event ID (not NONMEM event IDs)

CMT Compartment Number

WT Body weight (kg)

Source

NONMEM/nlme

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, Wang2007, mavoglurant, nimoData, nmtest, pheno_sd, rats, theo_md, warfarin, wbcSim

Wang2007 *Simulated Data Set for comparing objective functions*

Description

This is a simulated dataset from Wang2007 where various NONMEM estimation methods (Laplace FO, FOCE with and without interaction) are described.

Usage

```
Wang2007
```

Format

A data frame with 20 rows and 3 columns

ID Simulated Subject ID

Time Simulated Time

Y Simulated Value

Source

Table 1 from Wang, Y *Derivation of Various NONMEM estimation methods*. J Pharmacokinet Pharmacodyn (2007) 34:575-593.

See Also

Other nlmixr2 datasets: Bolus_1CPTMM, Bolus_1CPT, Bolus_2CPTMM, Bolus_2CPT, Infusion_1CPTMM, Infusion_1CPT, Infusion_2CPTMM, Infusion_2CPT, Oral_1CPTMM, Oral_1CPT, Oral_2CPTMM, Oral_2CPT, mavoglurant, nimoData, nmtest, pheno_sd, rats, theo_md, theo_sd, warfarin, wbcSim

warfarin *Warfarin PK/PD data*

Description

Warfarin PK/PD data

Usage

```
warfarin
```

Format

A data frame with 519 rows and 9 columns

id Patient identifier (n=32)

time Time (h)

amt Total drug administered (mg)

dv Warfarin concentrations (mg/L) or PCA measurement

dvid Dependent identifier Information (cp: Dose or PK, pca: PCA, factor)

evid Event identifier

wt Weight (kg)

age Age (yr)

sex Sex (male or female, factor)

Source

Funaki T, Holford N, Fujita S (2018). Population PKPD analysis using nlmixr2 and NONMEM. PAGJA 2018

References

O'Reilly RA, Aggeler PM, Leong LS. Studies of the coumarin anticoagulant drugs: The pharmacodynamics of warfarin in man. Journal of Clinical Investigation 1963; 42(10): 1542-1551

O'Reilly RA, Aggeler PM. Studies on coumarin anticoagulant drugs Initiation of warfarin therapy without a loading dose. Circulation 1968; 38: 169-177.

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `wbcSim`

`wbcSim` *Simulated Friberg Myelosuppression model (Yuan Xiong)*

Description

ID Subject ID

TIME Time (hrs)

RATE Rate

AMT Dose Amount Keyword

DV Dependent Variable, WBC

CMT Compartment Number

V2I Input Peripheral Volume

V1I Input Central Volume

V1I Input Clearance

EVID nlmixr2/rxode2 classic evid

Usage

```
wbcSim
```

Format

An object of class `data.frame` with 280 rows and 10 columns.

Source

Simulated Data for WBC pac ddmore model

See Also

Other nlmixr2 datasets: `Bolus_1CPTMM`, `Bolus_1CPT`, `Bolus_2CPTMM`, `Bolus_2CPT`, `Infusion_1CPTMM`, `Infusion_1CPT`, `Infusion_2CPTMM`, `Infusion_2CPT`, `Oral_1CPTMM`, `Oral_1CPT`, `Oral_2CPTMM`, `Oral_2CPT`, `Wang2007`, `mavoglurant`, `nimoData`, `nmtest`, `pheno_sd`, `rats`, `theo_md`, `theo_sd`, `warfarin`

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