Graphical display of population data

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Nature of population data

- Hierarchical
- Variable
- Multi-dimensional
- Potentially non-continuous
- Potentially lots of it!

Scope of the presentation

1. Basic graphical techniques for continuous population data

2. Graphical techniques for ordered categorical data

# Spaghetti plots
Hierarchy and variability
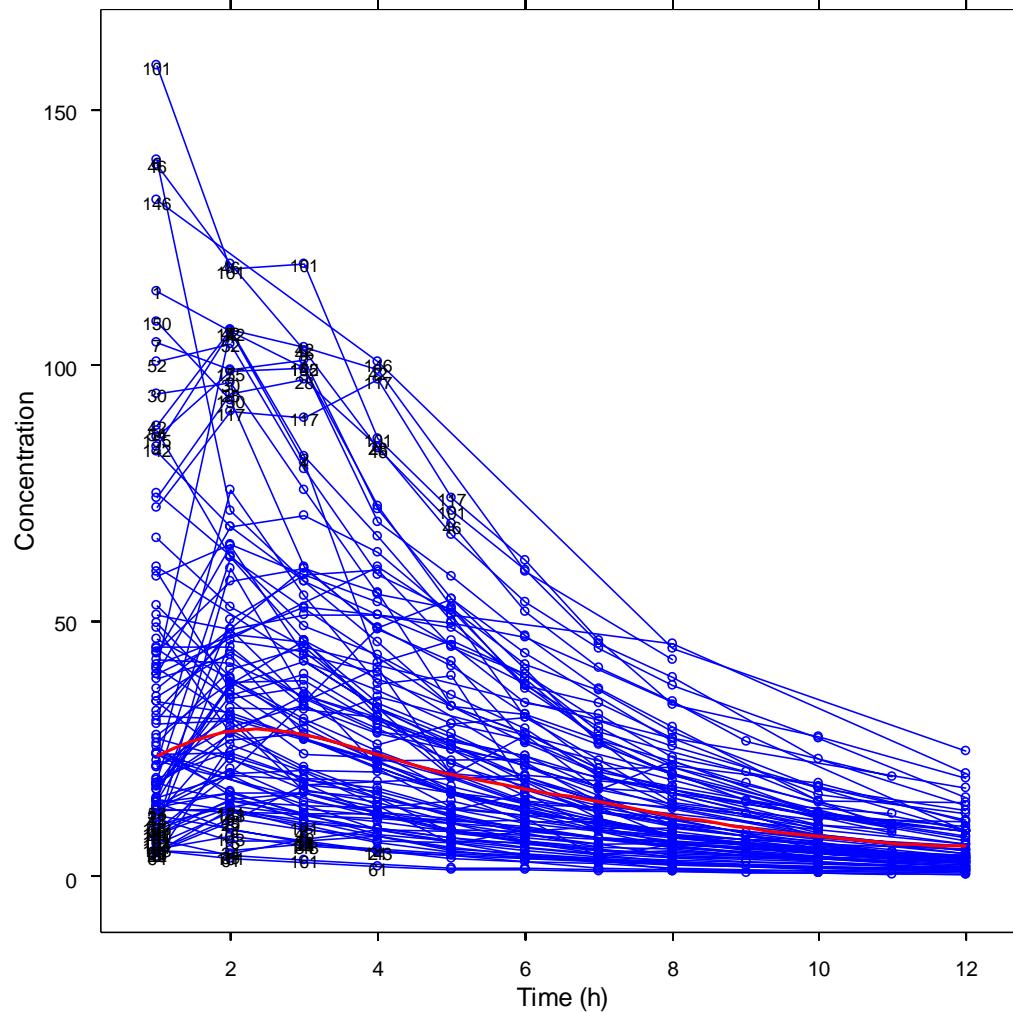
Data dilution
Multitude
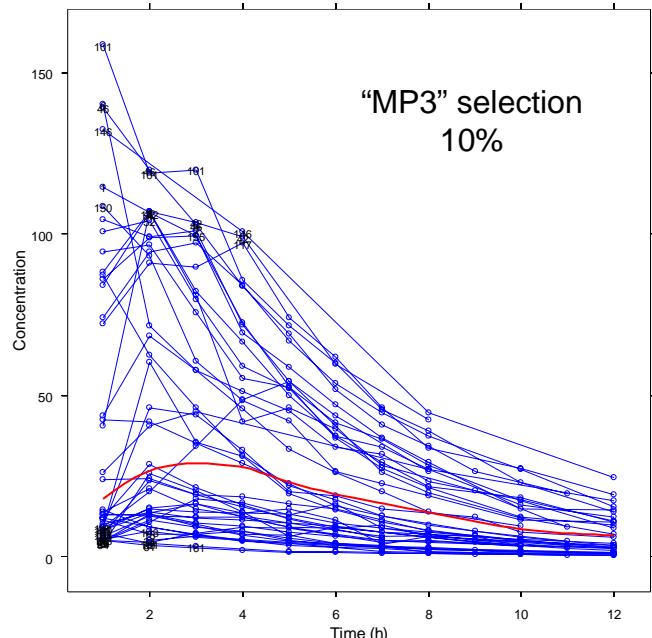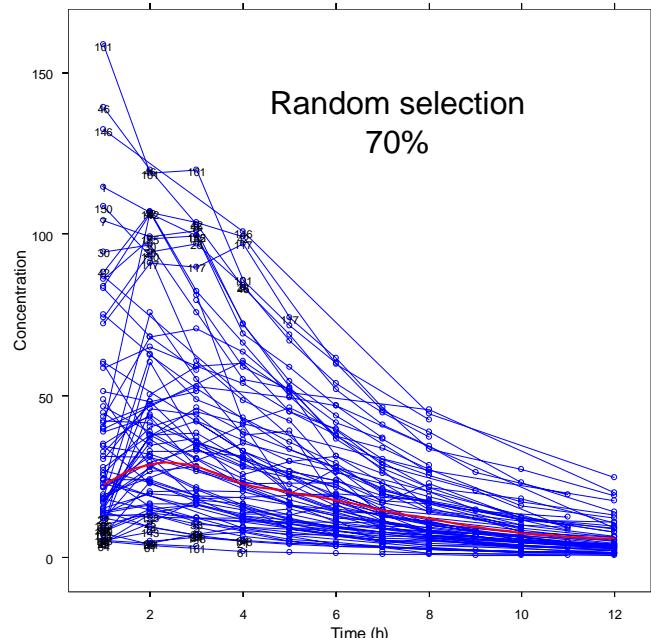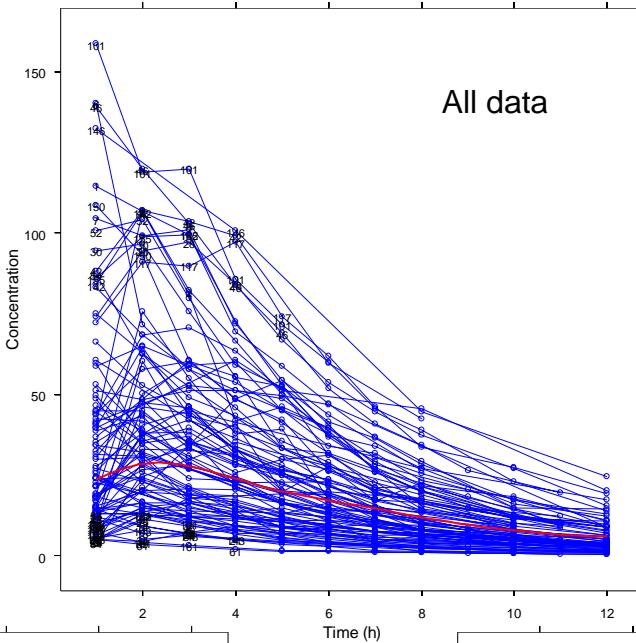
Multi-panel conditioning
Dimensionality

Conditioning variable

Level of the conditioning variable

Strip

Panel

Visual reference grid
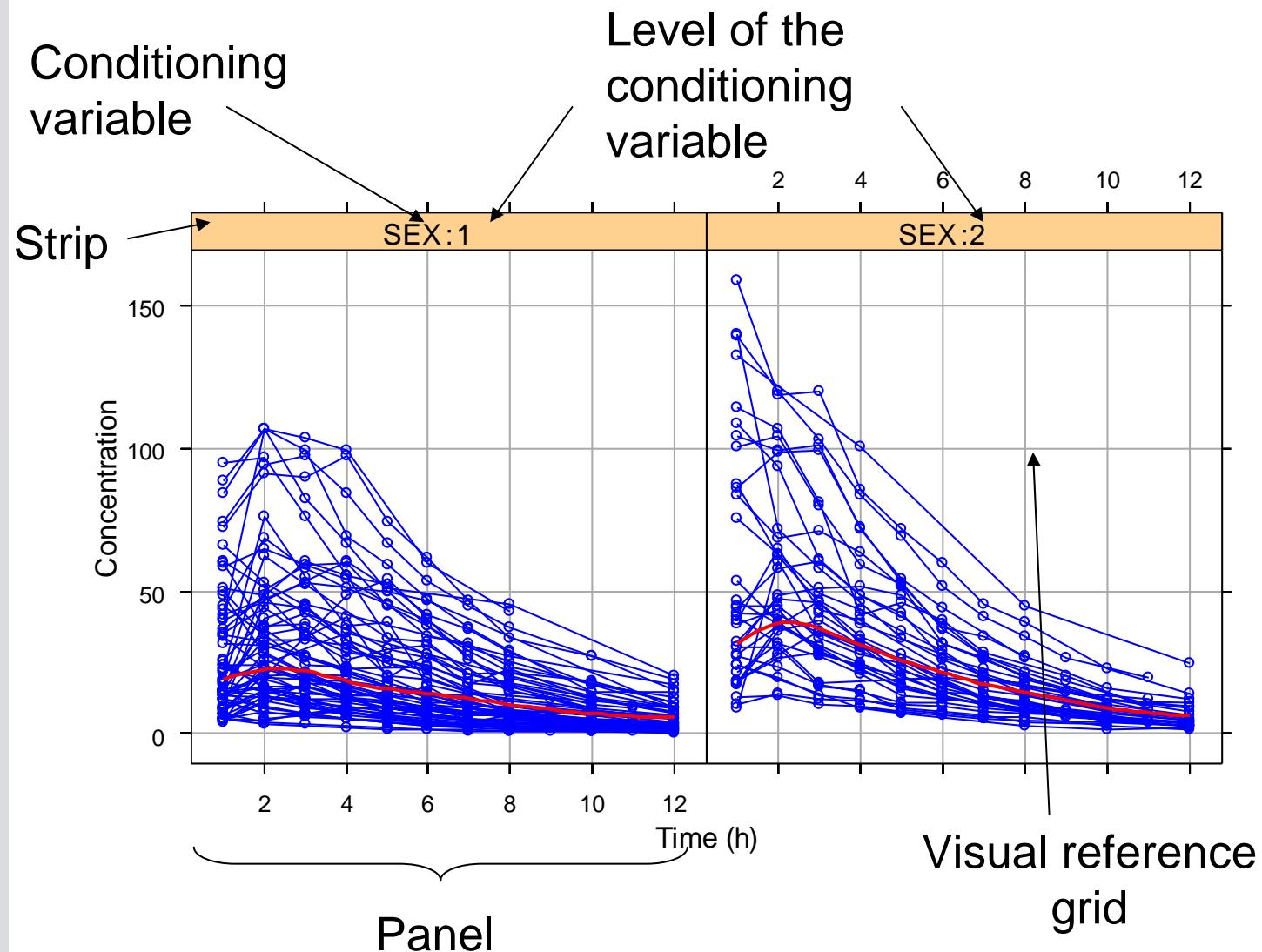
Continuous conditioning variable

Shingle plot
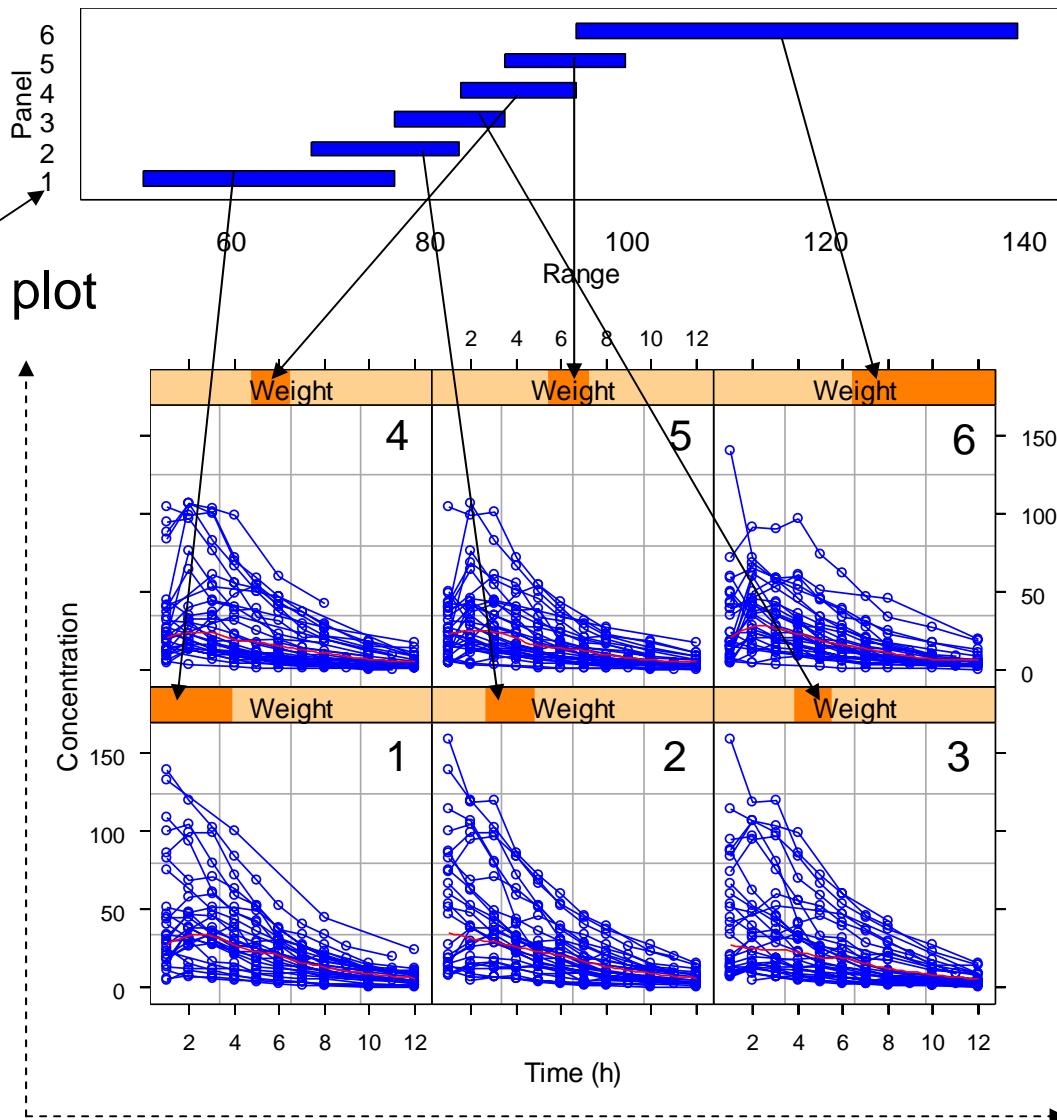
# Multiple conditioning variables
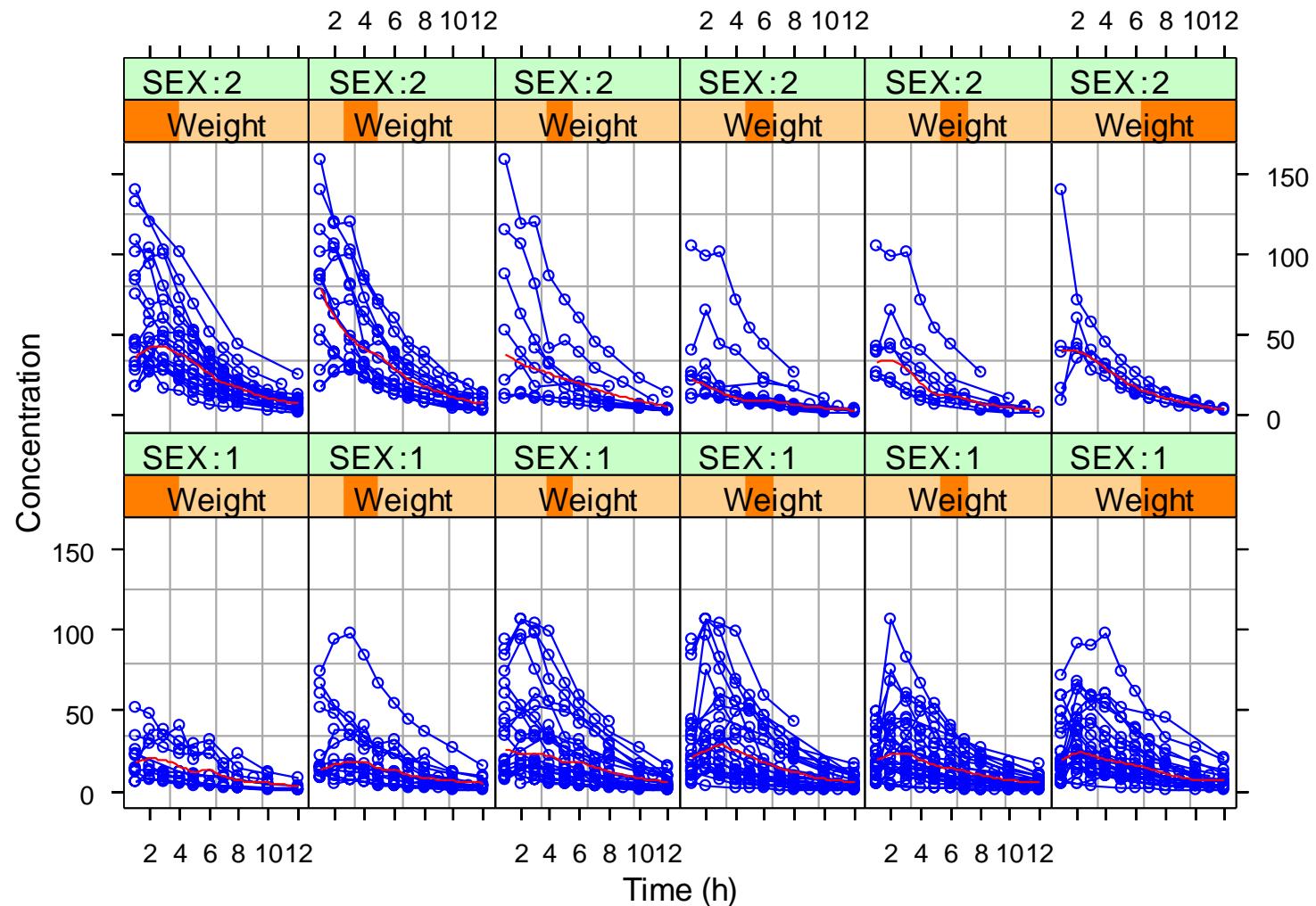
# Main effects ordering
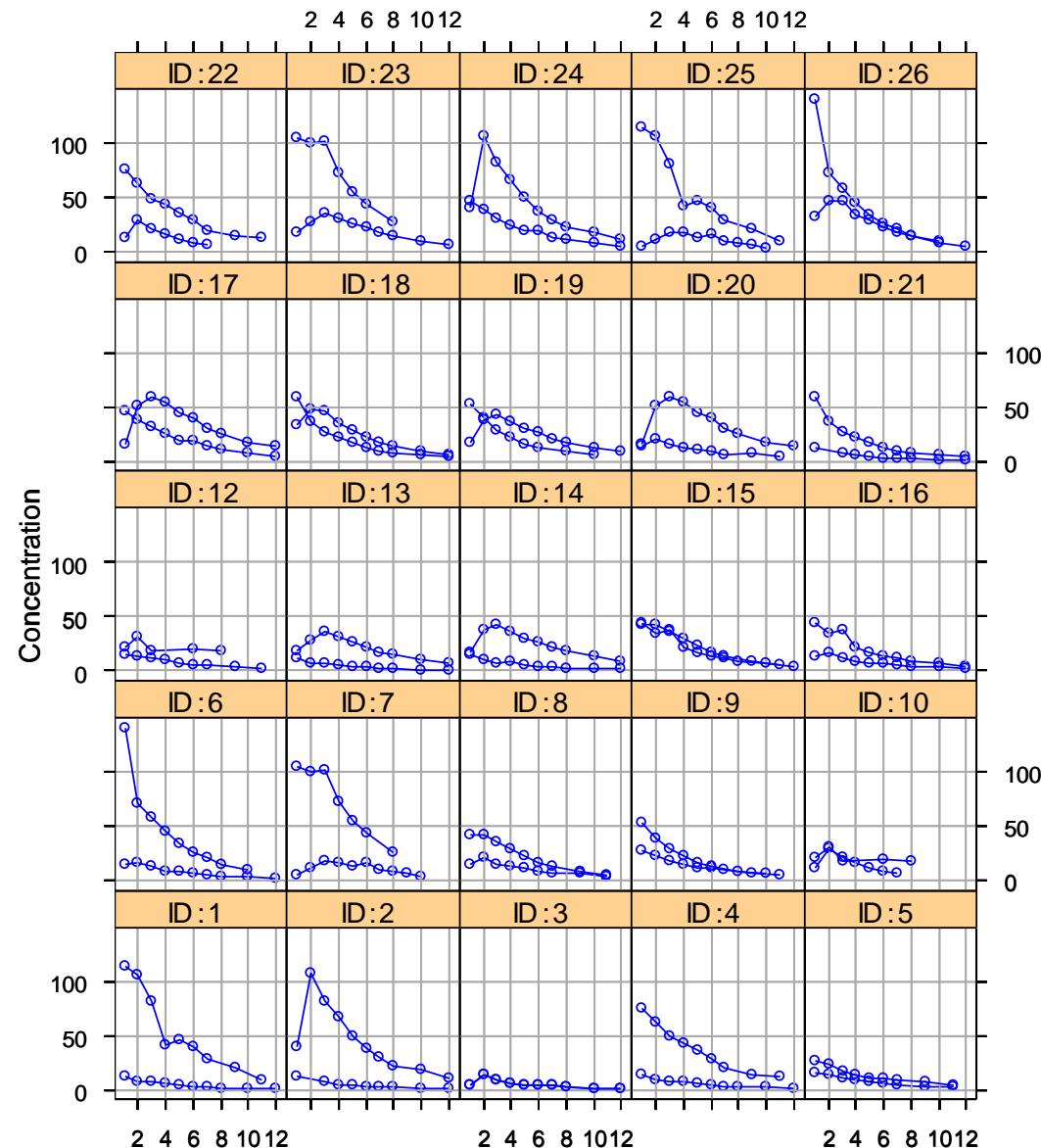
Further reading
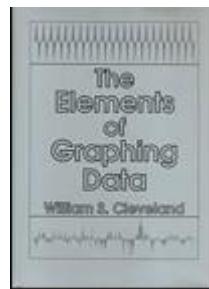
The elements of graphing data
William S. Cleveland
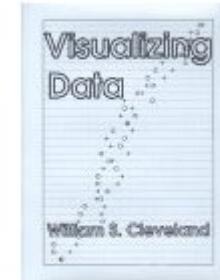
Visualizing data
William S. Cleveland

Ordered categorical data
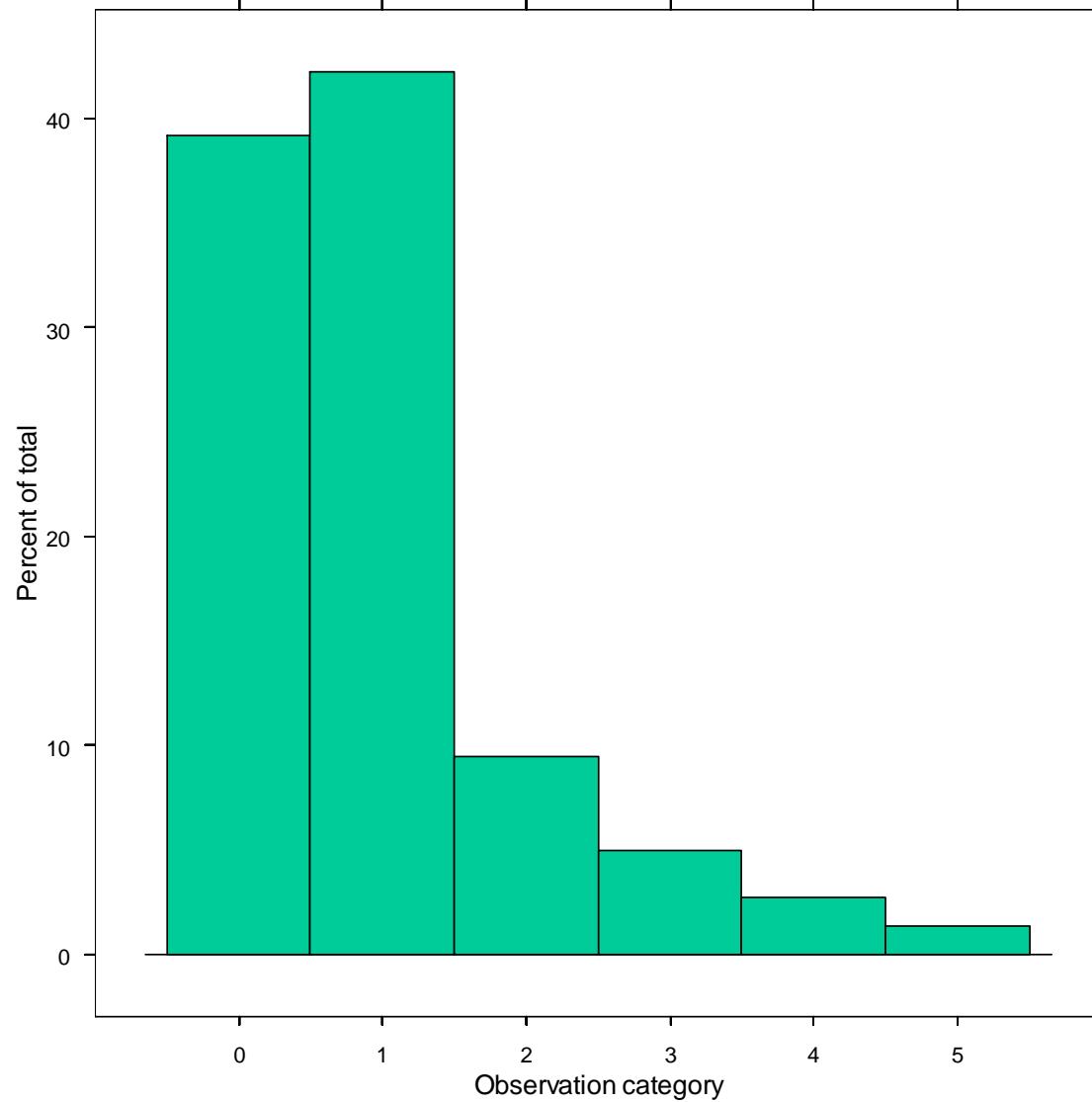
Taking one predictor into account…
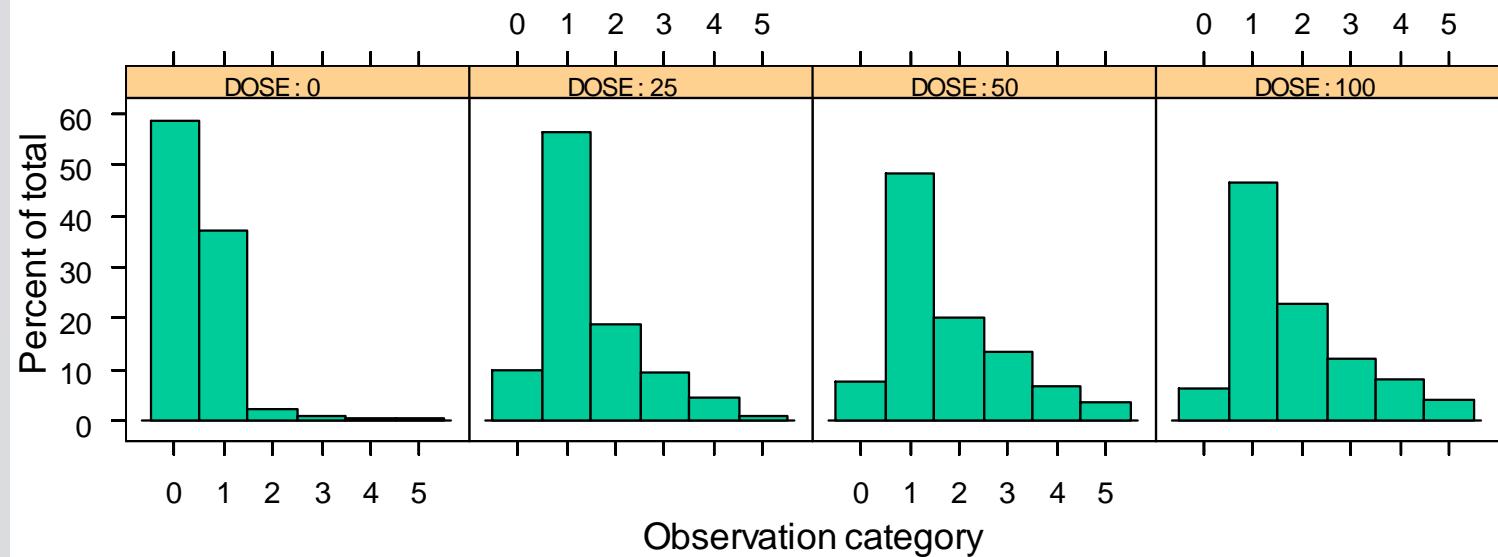
# Taking another predictor into account…
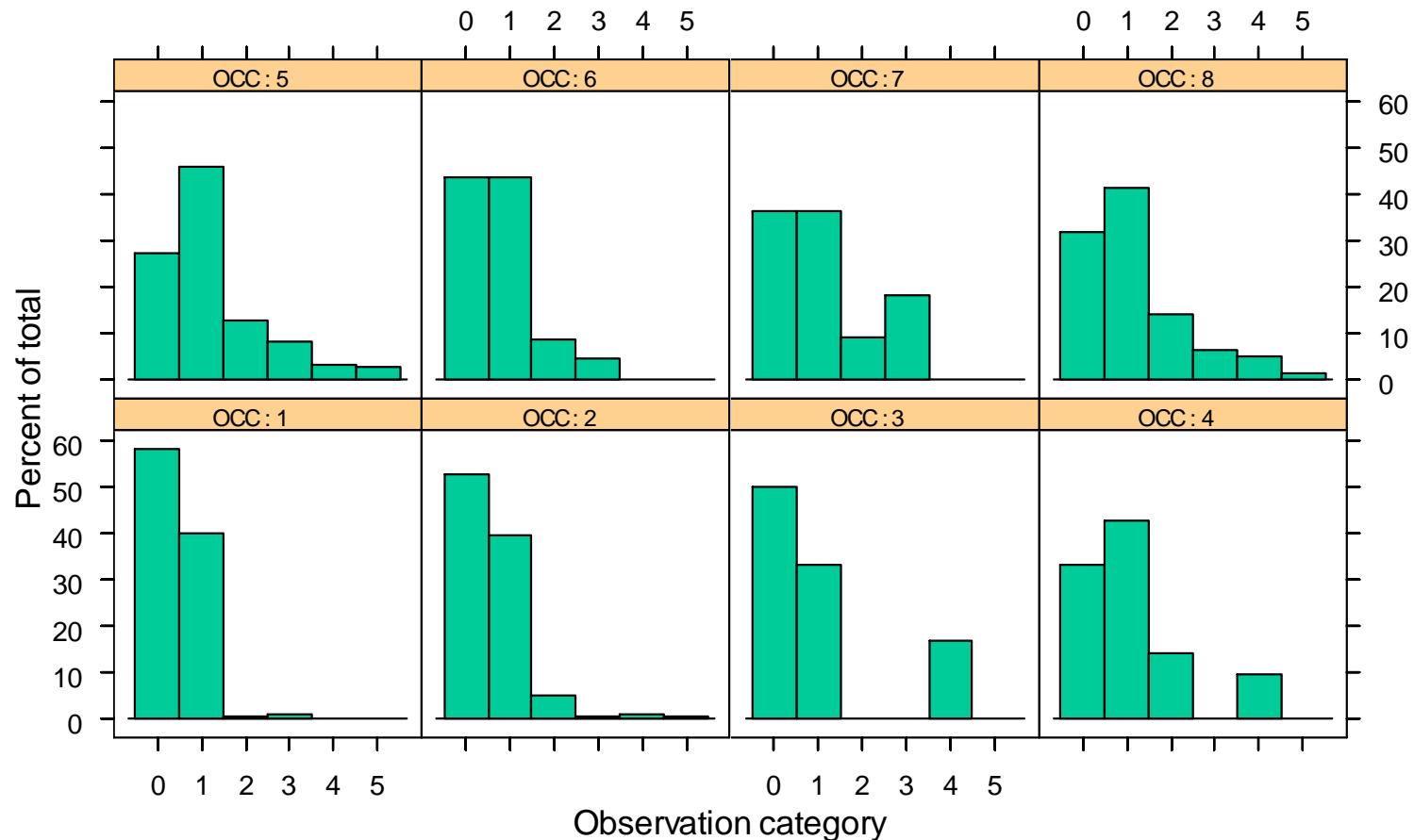
# Both Dose and Occasion
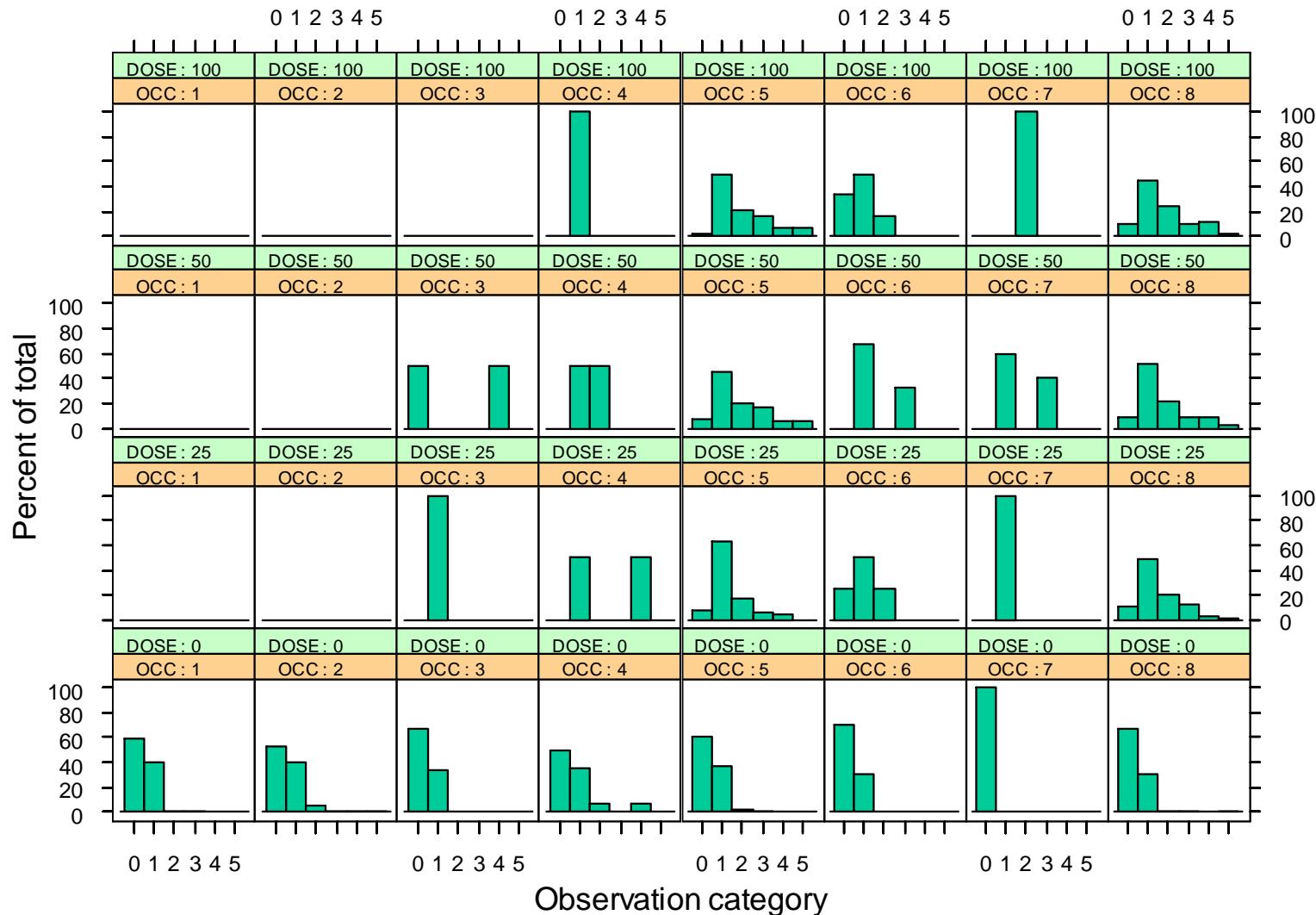
Stacked bar graphs
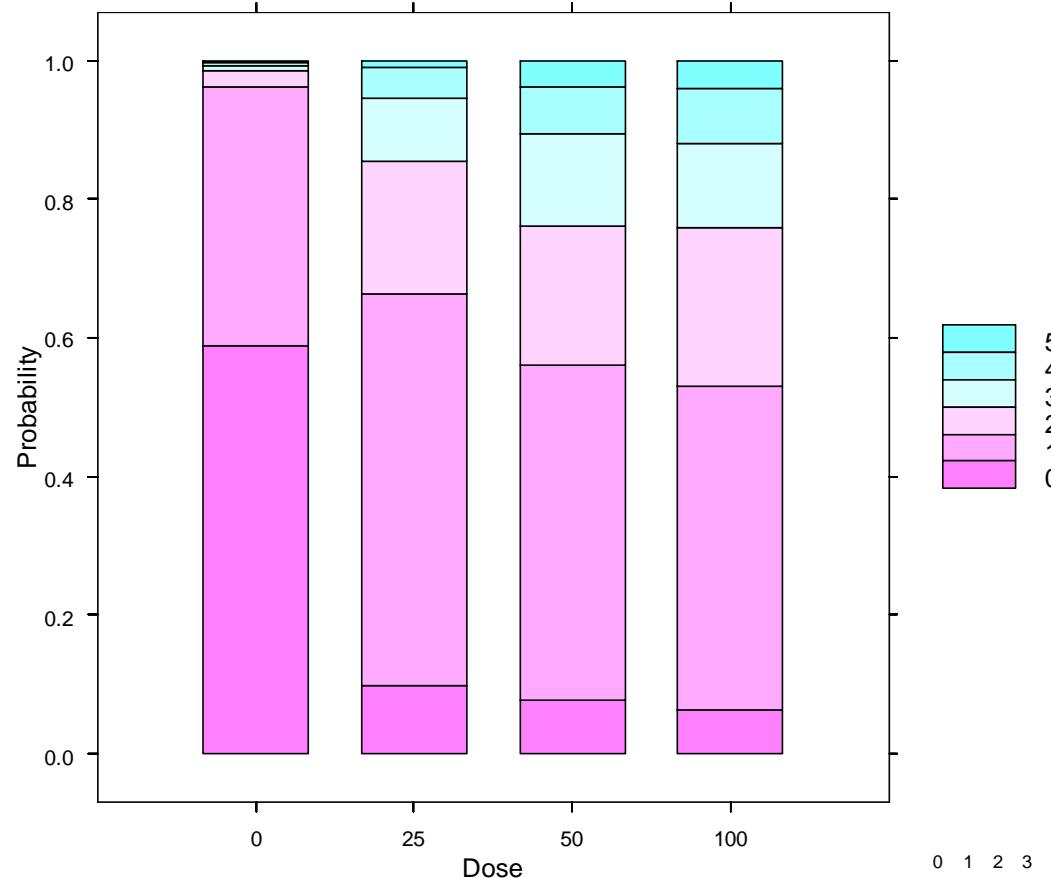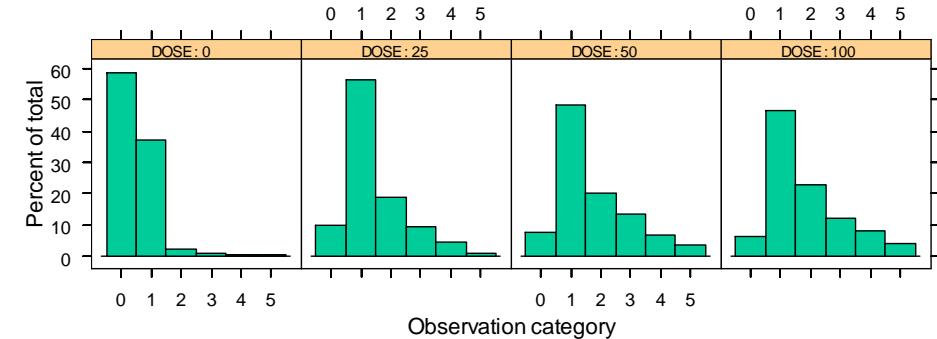
The same for Occasion…
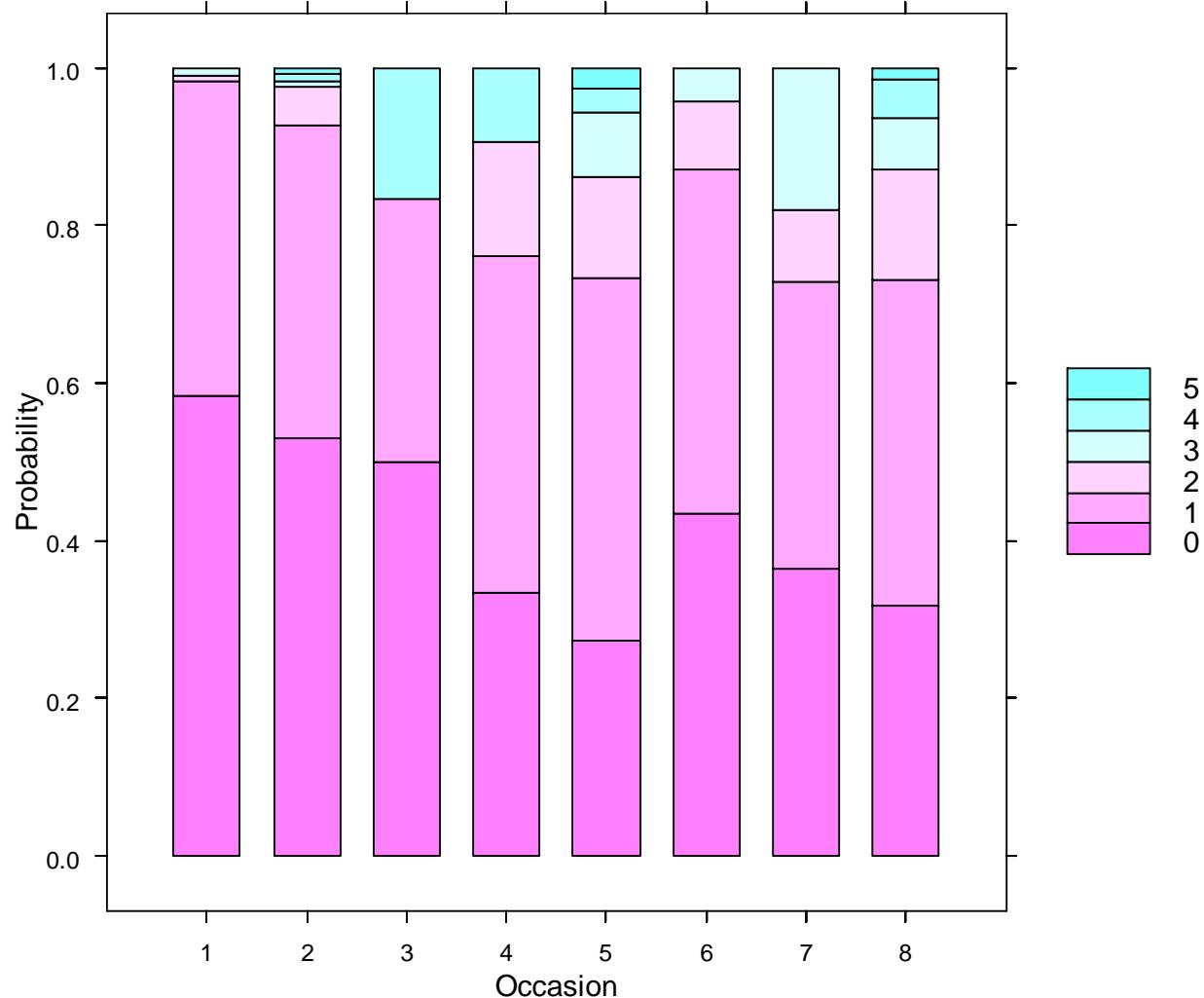
# Visualizing the cumulative probabilities – by Dose
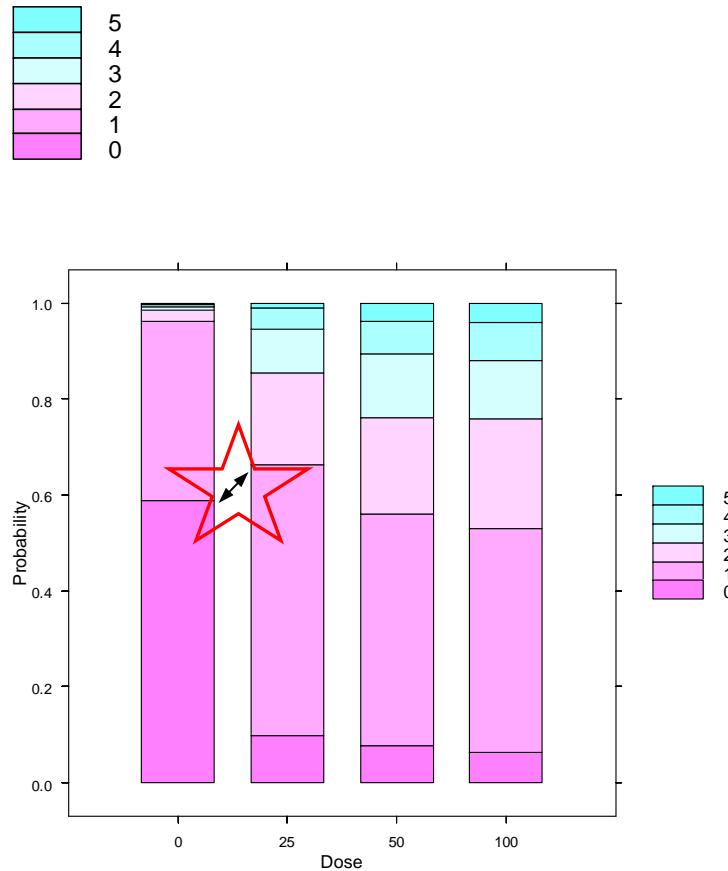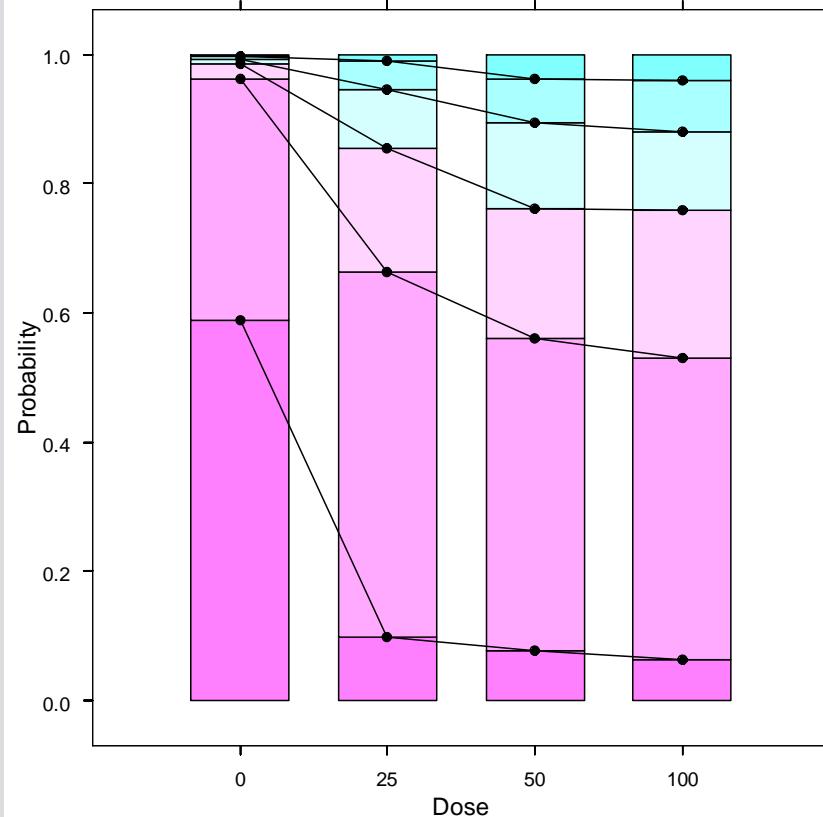
# Visualizing the cumulative probabilities – by Occasion
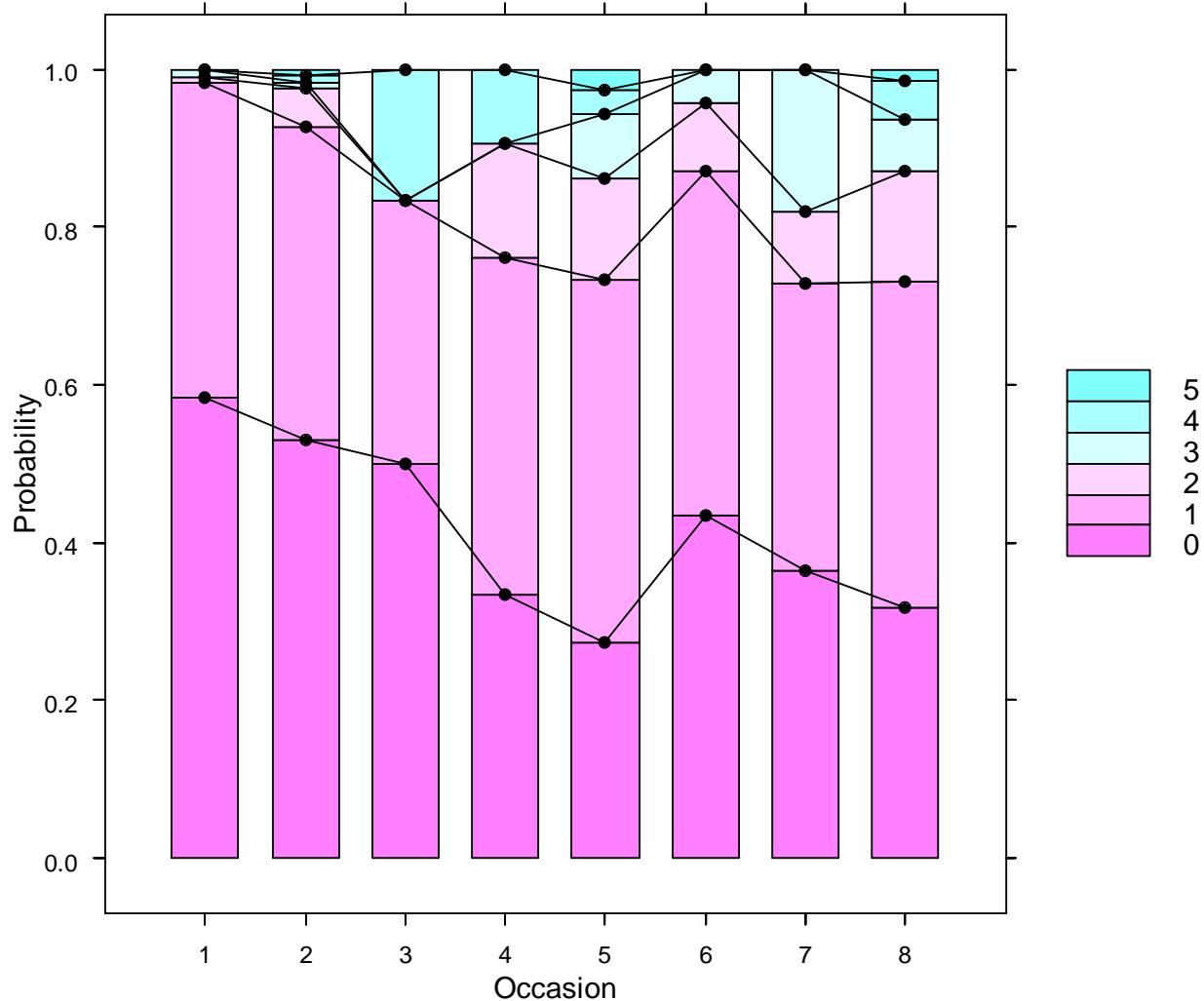
Model diagnostics – linear logit model
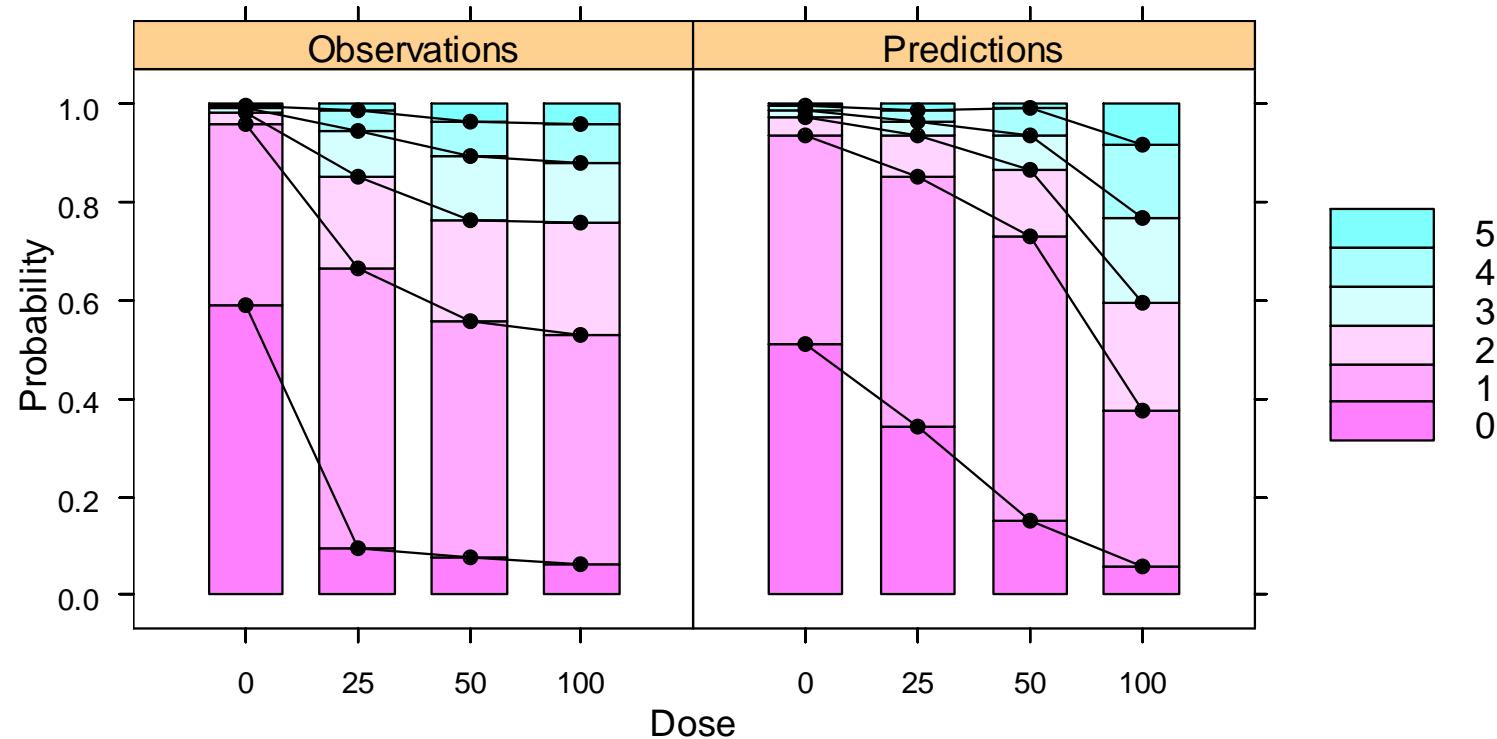
Using expected probabilities
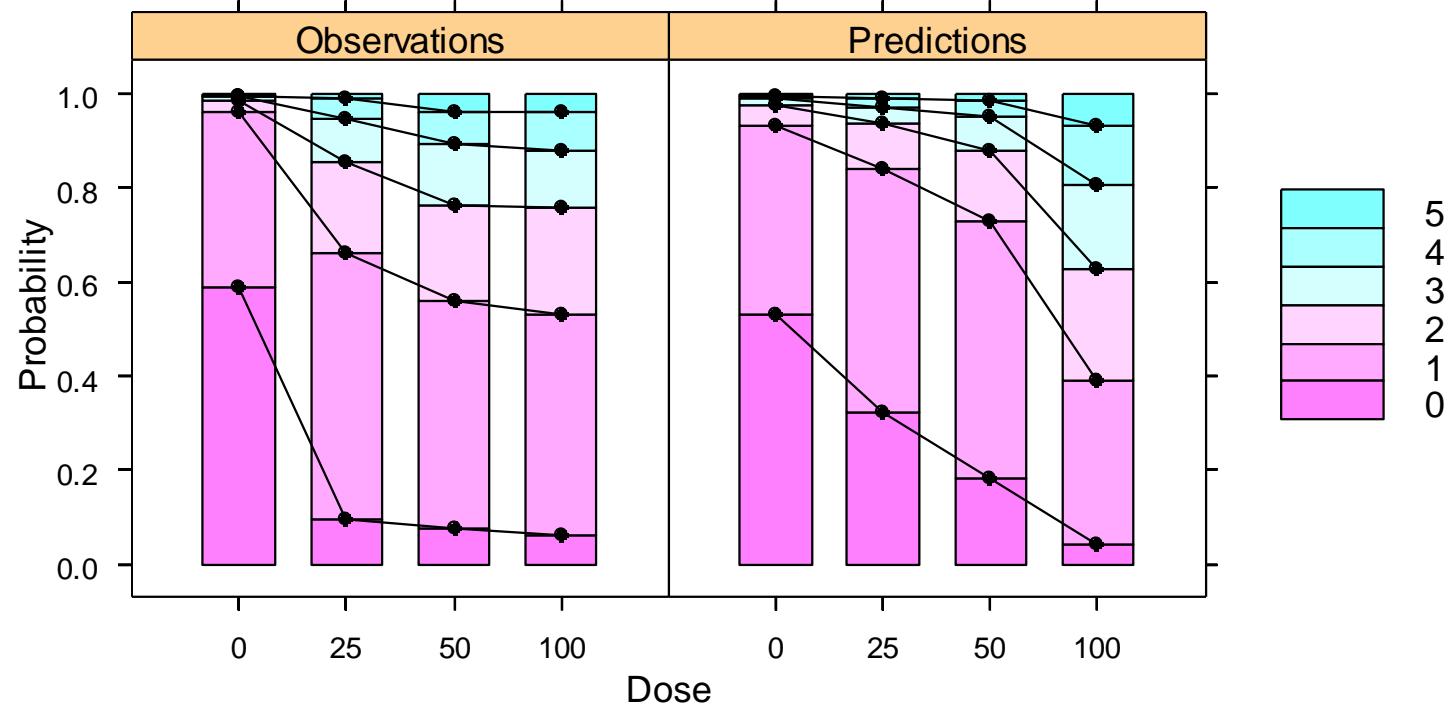
# The uncertainty in the predicted probabilities
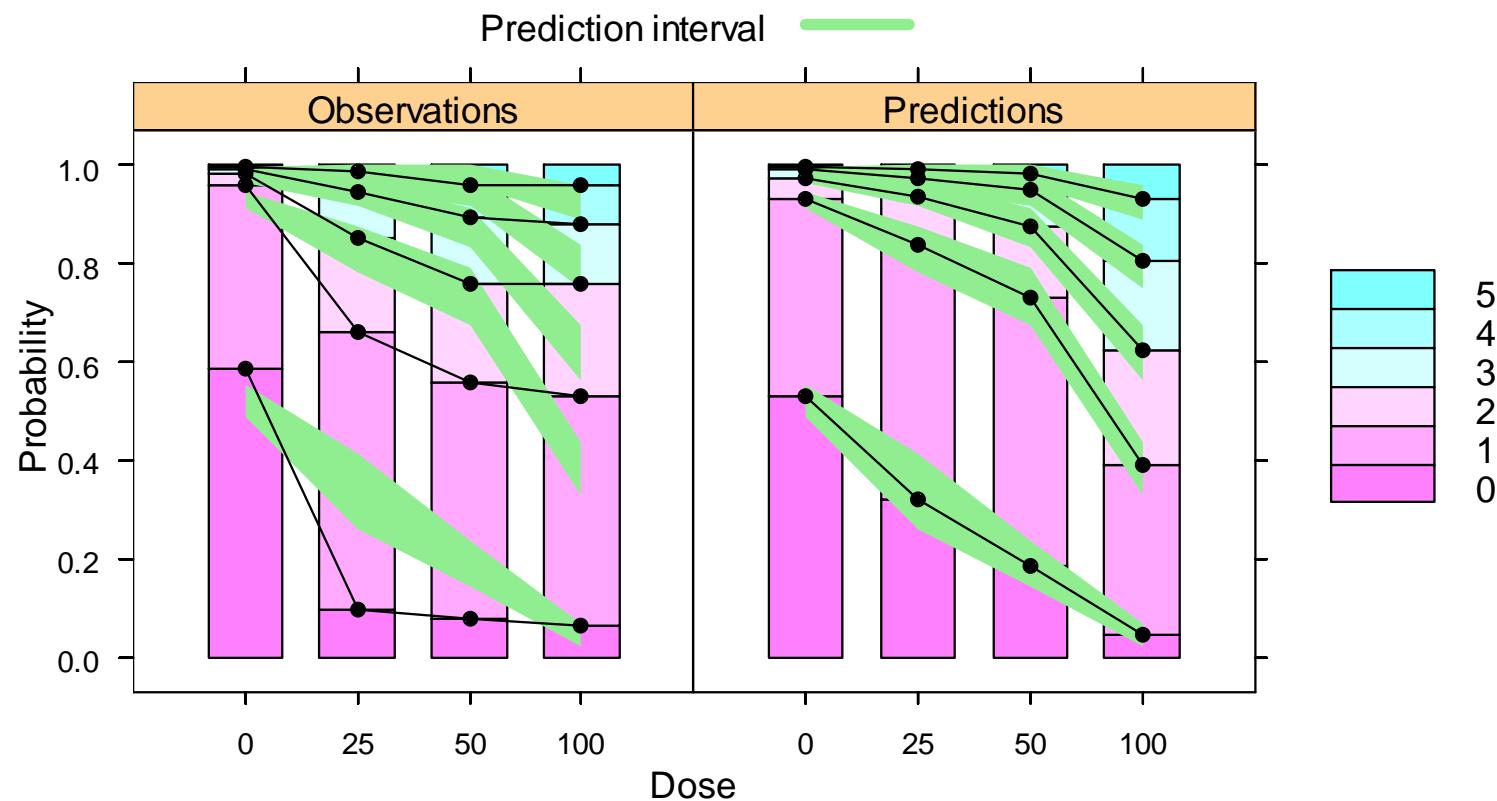
Changing the model – an Emax logit model
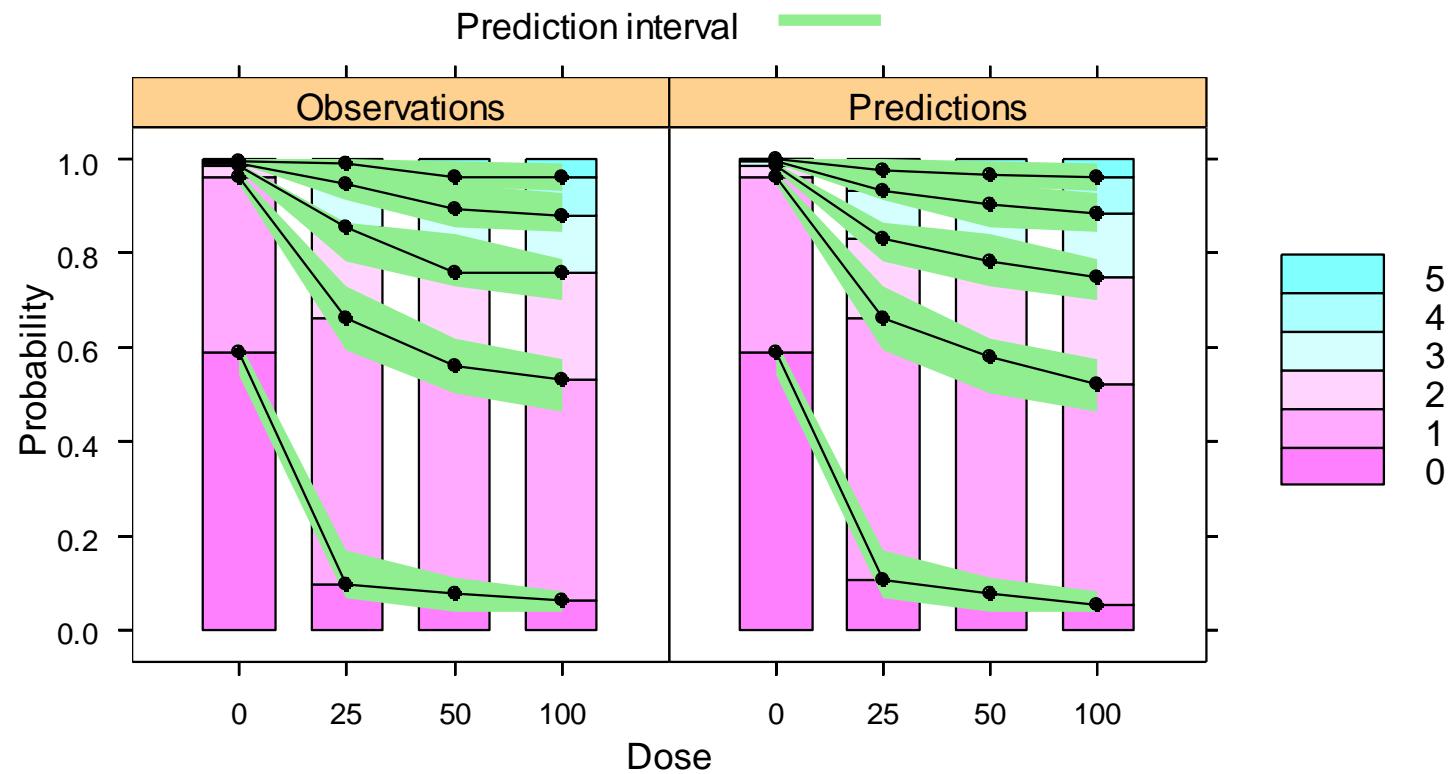
Comparing observations and predictions in a continuous manner
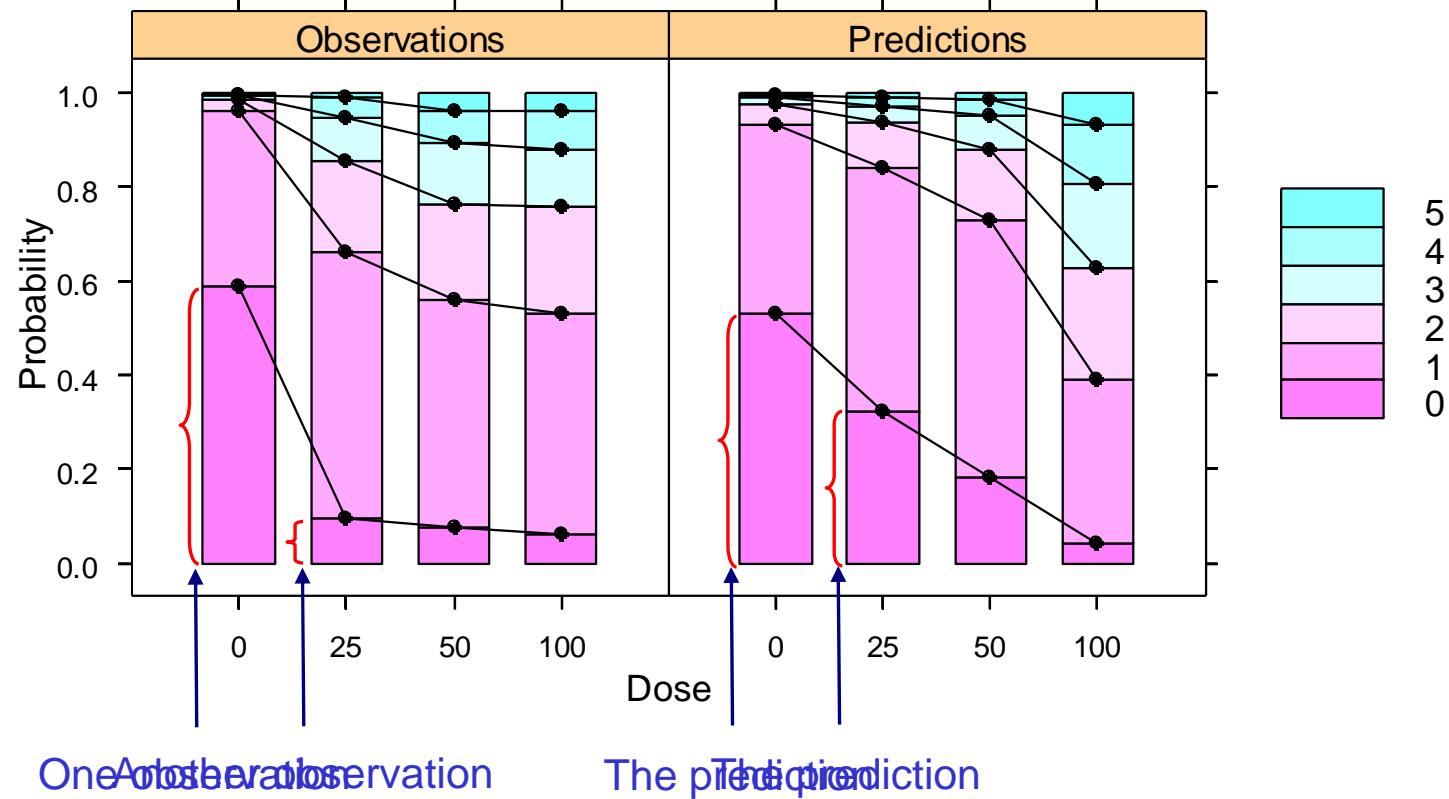
# Observed vs predicted – linear logit model
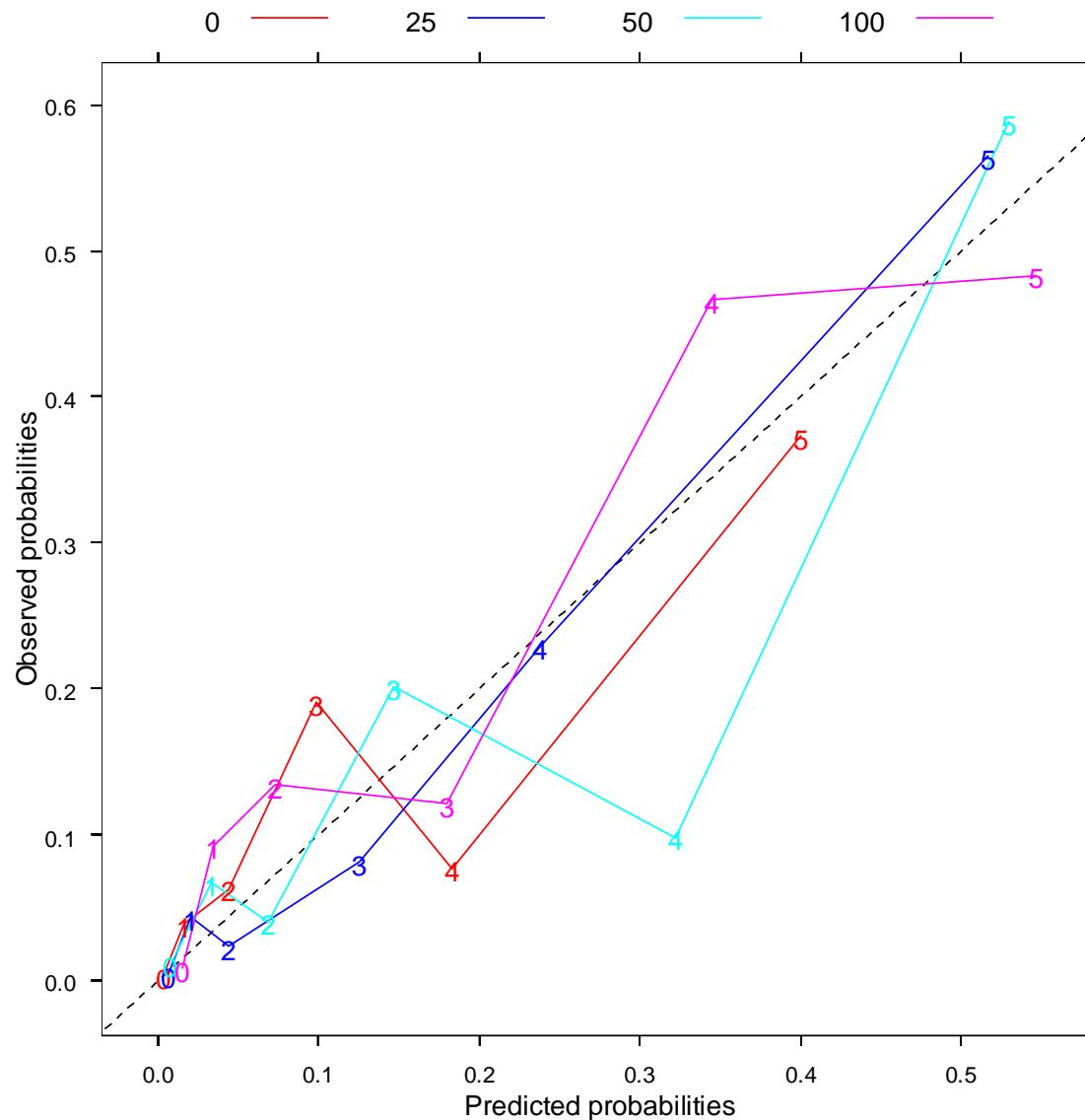
Simulations for checking goodness of fit graphs

1. Fit the model to the observed data.
2. Create the goodness of fit graph.
3. Simulate a new data set under the model from 1.
4. Fit the model from 1 to the simulated data.
5. Create the goodness of fit graph based on the fit to the simulated data.
6. Compare the graphs 2 and 5, using 5 as a reference.

Using the simulated goodness of fit graph as reference


Based on the original data
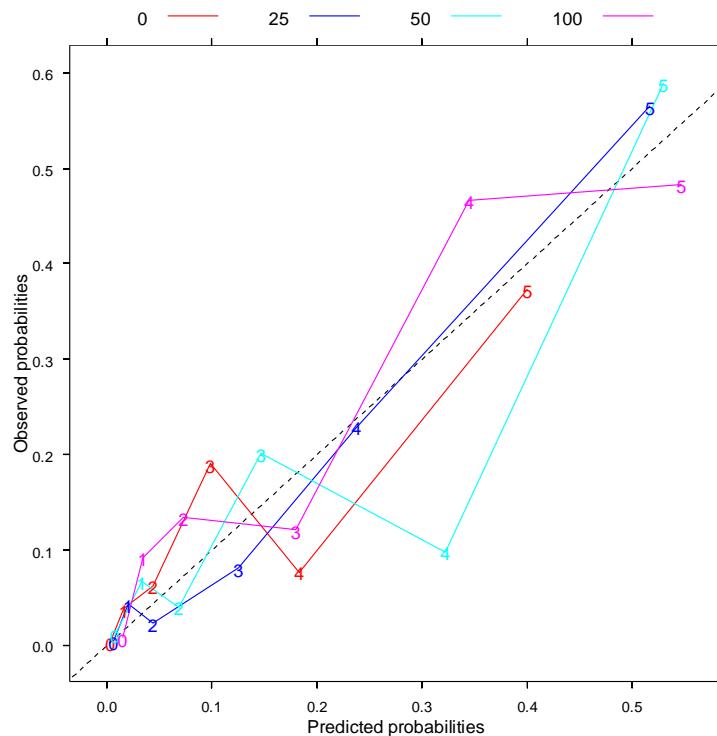
Based on simulated data
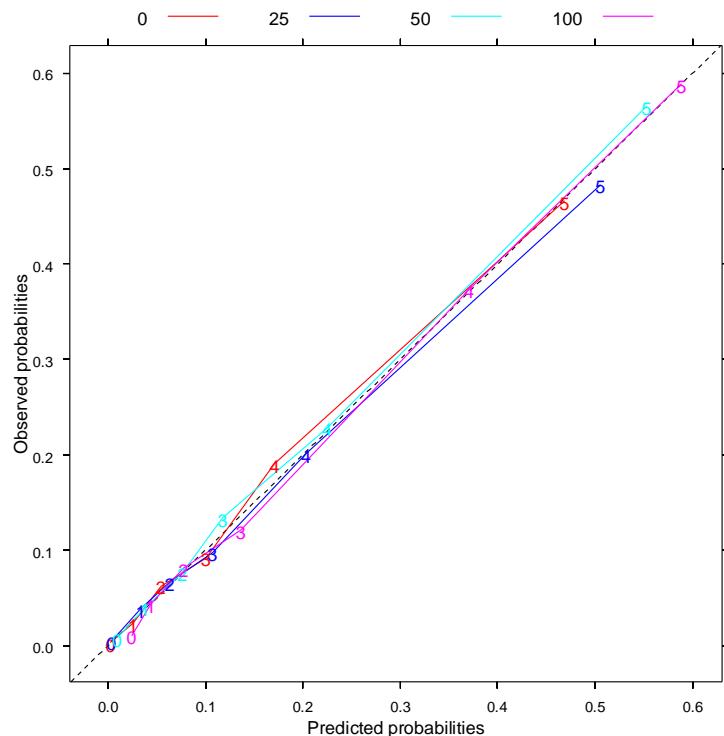
The Emax logit model
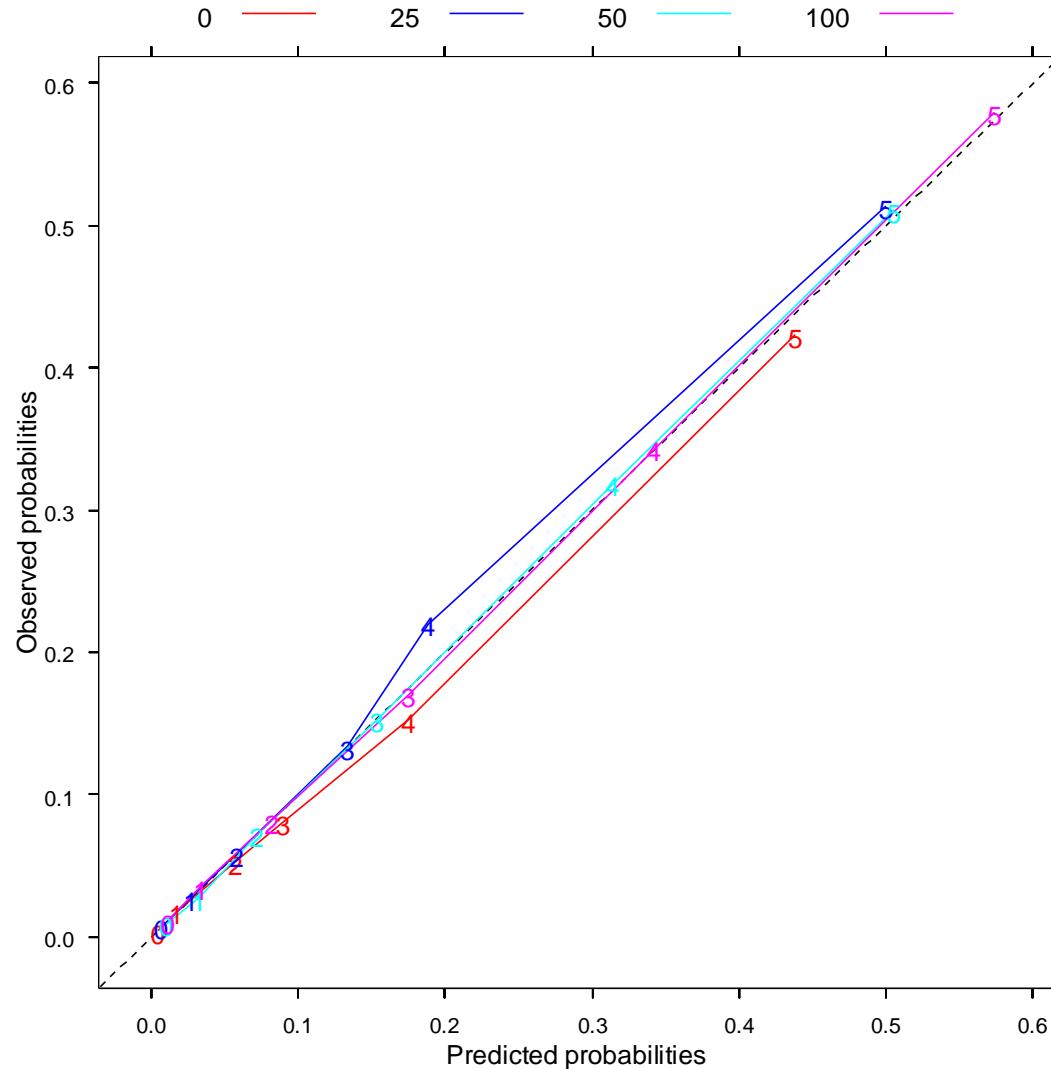
Summary

- There are graphical techniques that handles the hierarchical, variable and multitude of population data.
- Multi-panel conditioning is a powerful way of visualizing high dimension data.
- Ordered categorical data can be visualized and diagnosed by viewing the data as probabilities.
- Simulations can be a useful tool when evaluating goodness of fit graphs.