Final remarks

Workshop: Analysis of Longitudinal Data
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Scientific questions

- Horses (science) vs. carts (statistics)

- Interpretation of the results (software output)

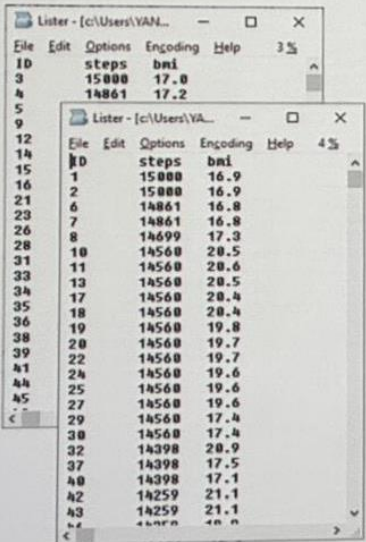- Clinical trials vs. observational data vs. "data" from the web

Statistical analysis

− Data exploration: plots, summaries, EDA

− More complex is not necessarily better, for example, if you have pre-post design or if just have a few clusters (two or three), you might consider fixed effects only

− ML/AI vs. statistical methods

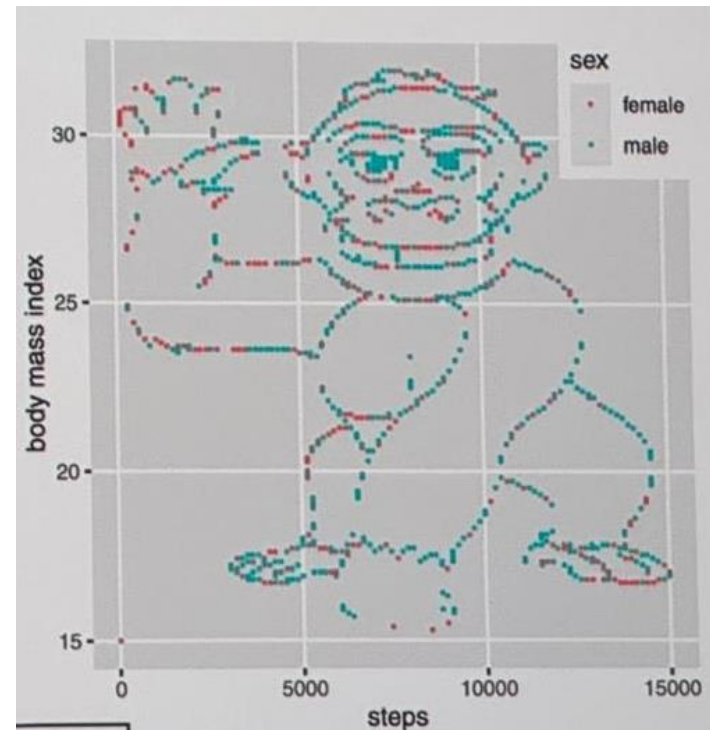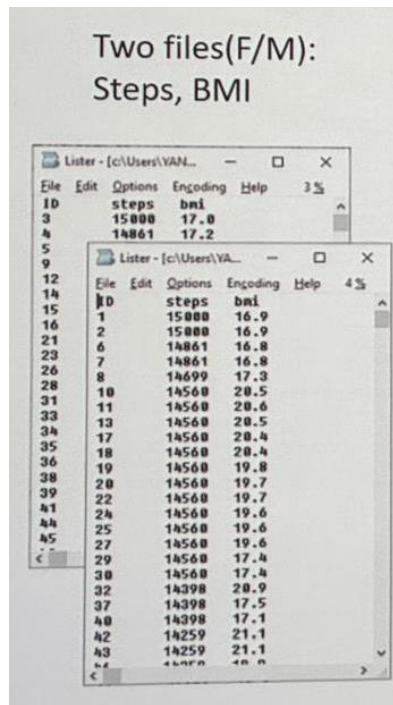− More data is not necessarily better (noise, heterogeneity, etc.)

Fun example

https://www.biorxiv.org/content/10.1101/2020.07.30.228916v1.full.pdf

Fun example

Design and data collection

- Confounding, bias

- Data harmonization

- Data missingness

- Causal inference?

Topics not covered

— **Diagnostics**   Very similar to GLM

— **Other distributions for random effects**   Normal distribution works well

— **GEE for MAR**   Not commonly used

— **GLS and ANOVA for repeated measures**   Classical methods

— **Joint survival/longitudinal models**   Advanced methods

— **Computational methods**   Advanced methods