## Reproducible Data Preparation

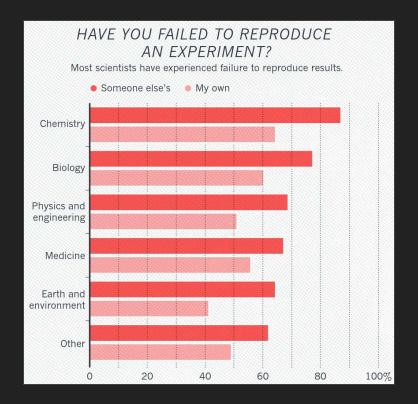
Montreal, CA. Marc-Olivier Jodoin



"Reproducibility refers to the ability of a researcher to duplicate the results of a prior study using the same materials as were used by the original investigator.

Reproducibility is a minimum necessary condition for a finding to be believable and informative."

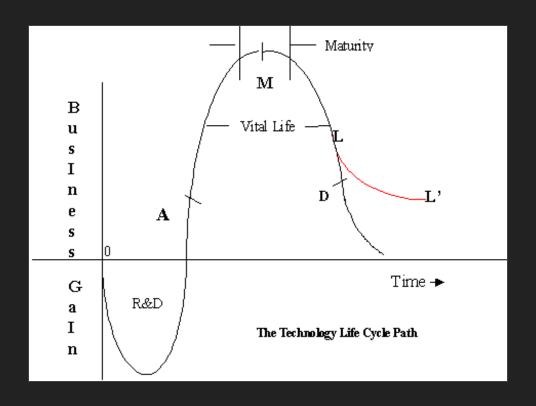
Report of the Subcommittee on Replicability in Science Advisory Committee, U.S. National Science Foundation, 2015

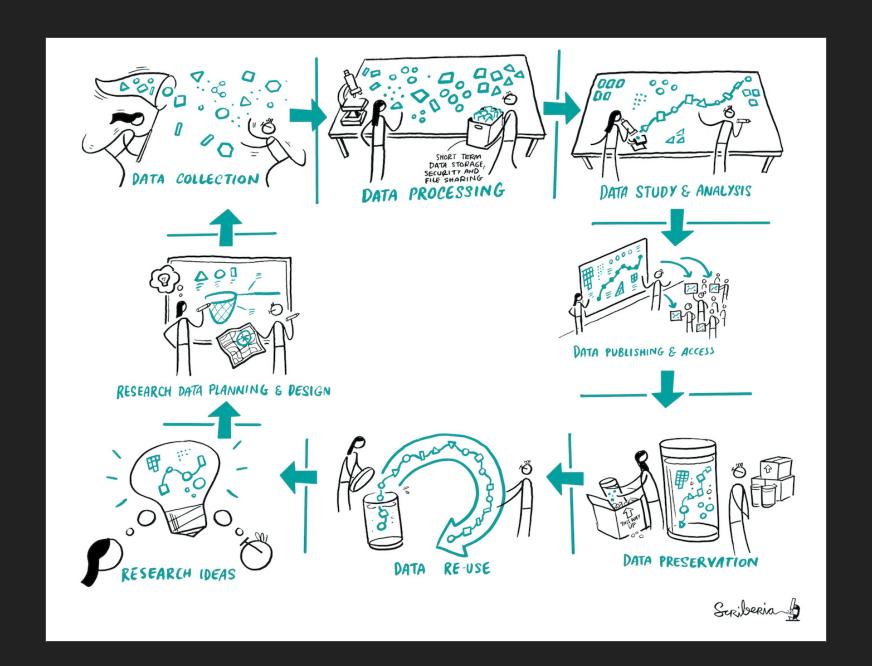


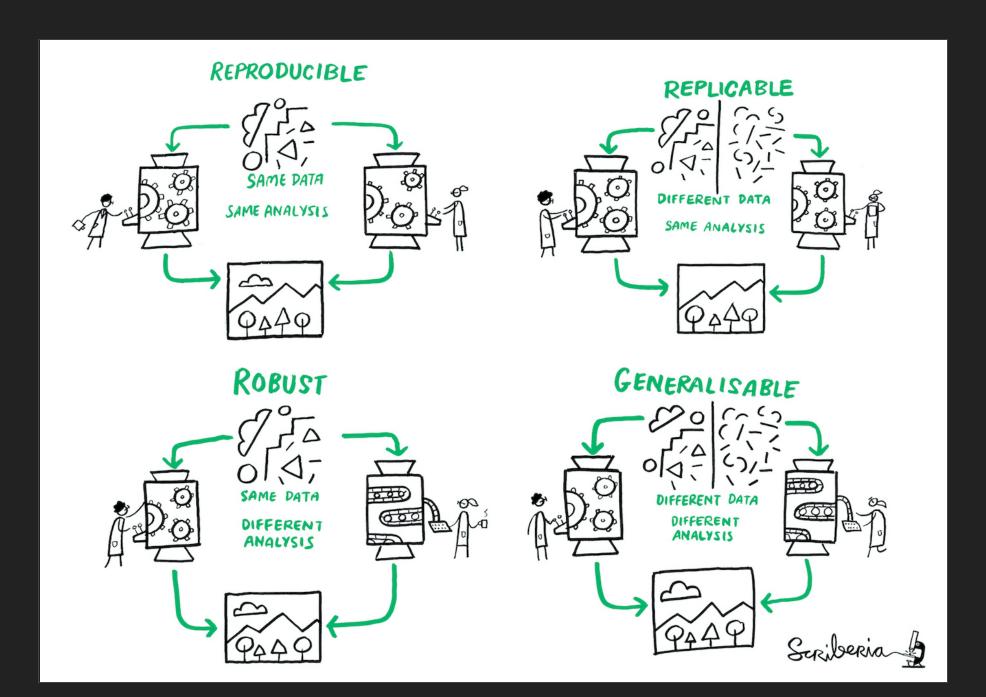
- Psychology: Open Science Collaboration,
  Science (2015)
- Cancer biology: Begley, C. G. and Ellis, L. M., Nature 483, 531–533

(2012)

## Technology Life Cycle







## Software Engineering

## for research data analysis

- Reproducibility: automation, syntax
- Transparency: docs, tests, rev control
- Modularity: packages and functions
- Generalisability: compartmentalise quirks
  - multiple-select questions
  - non-standard user-defined missing
  - erroneous coding of responses
  - reordering and reverse coding of