BCCHRI-DBC-ICORD Stats Workshop 2021

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Why are we doing this workshop?

- Biomedical Researchers and Graduate Students come from a wide variety of training backgrounds
- Not everyone has had the opportunity to spend time on statistics beyond an introductory undergraduate course
- Biomedical research publications rely heavily on statistics including hypothesis testing. Very difficult to interpret results or publish your work without the “right stats”
- Course offerings at UBC (like Stats 540, 545) presume a working knowledge of R or have a very steep learning curve.

What will we cover in this workshop?

- Ask about R/RStudio installations, make a separate breakout room if needed.
- RStudio Orientation (5-10 min, all)
- Hypothesis testing and t-test (50 min, all)
- Either: (50 min, breakouts)
  - Bootstrap distributions and Permutation Testing
  - ANOVA and multiple comparisons
- Wrap-up and topics survey for future workshops (5-10 min, all)

Learning goals:

- Increased familiarity with R/RStudio
- Comfortable performing the t-test (1-sample, 2-sample, paired) in R.
- Assessing the Null Hypothesis based on the observed sample statistic (ie mean) and its corresponding p-value.
- Second part:
  - Bootstrap/Perm. Test: Understanding the relationship between the bootstrap distribution and the sampling distribution as well as the connection between randomization/permutation and the distribution valid under the Null in a permutation test.
  - ANOVA/multi-comparisons: Appreciation of the multiple comparison problem and how to approach with methods which control Type I errors (FWER) and others that control the False Discovery rate.

Wrap-up slide

- Link for survey: https://ubc.ca1.qualtrics.com/jfe/form/SV_26333O51SqgUqj4