How to Run an OHDSI Network Study

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Confession: I’m hooked on network research.

2018 US Symposium Live Study – Predicting HT after Ischemic Stroke (Oct ‘18)

F2F 2018 Study-a-thon – Recreating a Rheumatoid Arthritis RCT (May ‘18)

Fudan Bootcamp – Endometrial Cancer Study (Aug ‘19)

Women of OHDSI Breast Cancer Study (Sep ‘19)
Why conduct OHDSI research?

**World’s Largest Multi-center Studies**
Corroborating single-center research with a diverse, global network of more than 152 databases in 18 countries

**Established Reproducibility**
Framework for large scale validation of results and reproducibility of hypothesis cross a variety of healthcare settings

**Preeminent Scientific Network**
Expertise from Columbia, Stanford, Oxford, UPenn, Vanderbilt, Yale, Cornell, Northwestern, UCLA, Uni of South Australia, Erasmus MC and more

**Robust Methodologies**
Empirical validation of the design and implementation of OHDSI statistical methods library and open source tools/packages

**Potential to Impact Practice Patterns**

*Source: The Lancet*
Starting the journey...
OHDSI has maps for your journey...

Clinical characterization: What happened to them?

Patient-level prediction: What will happen to me?

Population-level effect estimation: What are the causal effects?

observation

inference

causal inference
Questions asked across the patient journey

- Which treatment did patients choose after diagnosis?
- Which patients chose which treatments?
- How many patients experienced the outcome after treatment?
- Does one treatment cause the outcome more than an alternative?
- Does treatment cause the outcome?
- What is the probability I will develop the disease?
- What is the probability I will experience the outcome?
The common building block of all observational analysis: cohorts

**Required inputs:**

- Target cohort: Person
cohort start date
cohort end date

- Comparator cohort: Person
cohort start date
cohort end date

- Outcome cohort: Person
cohort start date
cohort end date

**Desired outputs:**

- Clinical characterization
  Baseline summary of exposures (treatment utilization)

- Clinical characterization
  Baseline summary of outcome (disease natural history)

- Incidence summary
  Proportion/rate of outcome occurring during time-at-risk for exposure

- Population-level effect estimation
  Relative risk (HR, OR, IRR) of outcome occurring during time-at-risk for exposure

- Patient-level prediction
  Probability of outcome occurring during time-at-risk for each patient in population
Welcome to ATLAS.
ATLAS is an open source application developed as a part of OHDSI intended to provide a unified interface to patient level data and analytics.

Documentation
The ATLAS user guide can be found here.

Getting Started
- Define a New Cohort
- Search the Vocabulary

Release Notes

ATLAS Version 2.7.4 Release Notes
WebAPI Version 2.7.4 Release Notes

This latest release contains 12 feature enhancements and issue resolutions:

- WebAPI fails to compile with missing zip4j dependency
- Blinking horizontal scroll during page navigation
- Colors Not Working in Event Highlighting for Patient Viewer
- Show closed issues both from Atlas and WebAPI in the Latest release block
- Concept set filter fails on included concepts
- PLE / PLP execution results contain keyfile when executed using BigQuery
- Cohort definition message tab
- /cache/clear endpoint cannot be accessed in secure mode
- Cohort generation fails on IMPALA due to wrong SQL
- WebAPI fails with heavily parametrized PG connection URL
- Allow identical instances to connect without user context - impact on performance
You have one of those genius moments...

I have a brilliant idea for a network study!
And you think to yourself...

I'M READY! I'M READY!

I'M READY! I'M READY!
Not so fast...

let's pump the brakes.
Scenario 1: You don’t attend this community call...

YOUR "PLANS"

THE UNIVERSE'S PLANS FOR YOU
Scenario 2: You showed up here today and get a cheat sheet for success!
The essentials of network research

Access to a Bench of Experts
Possess cross-cutting expertise in epidemiology, statistics and clinical care

A Novel Idea
Develop a study question to execute in the OHDSI research network

Time / Bandwidth
Ability to iterate on a regular basis with research team

Capabilities
Skill to install tools, debug code, synthesize results and disseminate evidence
Embarking on your network study journey

**Started**
You’ve worked with the OHDSI community to open a GitHub study repo. You’re starting to get an idea of your study question via literature review and clinical input.

**Design Finalized**
The protocol and study code have been finalized. Collaboration period begins with network sites to get protocol approved to run and study code executed in additional environments.

**Iterative Design Review**
You’re building your concept sets. You’re testing cohort definitions. You’re evaluating study settings. You’re running diagnostics and evaluating across multiple databases.

**Results Consolidation**
Process time for collecting and assembling results from contributing centers. Effort related to the activities related to preparing final presentation of results.

**Results Available**
The study results are publicly available, for example in a paper or results explorer app. Opportunity to present on community call or at a symposium.

**Complete**
The study is complete, no further dissemination planned.
Making the transition...

To go from crawling to walking:

• Engage with clinical experts
• Build cohorts
• Run diagnostics on your ideal design
• Test out your study package on your data (if you have it) and solicit input from other centers
• NO peeking at the good stuff (aka unblinded results)!
Making the transition...

To go from walking to running:
• Fully specified design including a written protocol and complete study package
• Set limits on how long you’ll be collecting results
• Be ready to triage bumps in the road
Making the transition...

To go from running to done:
- Identify target journal and documenting journal submission guidelines
- Draft manuscript and review with research team
- Go through publication approvals
- Finalize of manuscript – including responses to reviewers
Don’t forget to submit abstracts for OHDSI Symposiums across the globe or volunteer to speak on a community call!
“You’ll never walk alone on your OHDSI Journey.”
– Peter Rijnbeek (probably)
The community has your back.
Questions?
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Join the Journey
http://ohdsi.org