Characterization

Patrick Ryan

With thanks to OHDSI US faculty Kristin Kostka
A caricature of the patient journey

- Conditions
- Drugs
- Procedures
- Measurements

Person time
Baseline time 0 Follow-up time

Disease Treatment Outcome
Each observational database is just an (incomplete) compilation of patient journeys.
Complementary evidence to inform the patient 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?
- What is the probability I will develop the disease?
- Does one treatment cause the outcome more than an alternative?
- Does treatment cause outcome?
- What is the probability I will experience the outcome?
Incidence Analysis
Cohort Pathways
OHDSI in action: Clinical characterization

Characterizing treatment pathways at scale using the OHDSI network

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How are patients with major depressive disorder **ACTUALLY** treated?

Hripcsak et al, PNAS, 2016
How are patients with major depressive disorder *ACTUALLY* treated?

- Substantial variation in treatment practice across data sources, health systems, geographies, and over time
- Consistent heterogeneity in treatment choice as no source showed one preferred first-line treatment
- 11% of depressed patients followed a treatment pathway that was shared with no one else in any of the databases

Hripcsak et al, PNAS, 2016
What questions does this answer?
What question does it prompt to ask?

Which treatment did patients choose after diagnosis?
Which patients chose which treatments?
How many patients experienced the outcome after treatment?

What is the probability I will experience the outcome?

Does treatment cause the outcome?
Does one treatment cause the outcome more than an alternative?

Hripcsak et al, PNAS, 2016
Demo #1: Incidence of myocardial infarction among new users of lisinopril in ‘on treatment’ time-at-risk
Let’s play with ATLAS!
Tutorial infrastructure

Exercise: Incidence of angioedema among new users of lisinopril in ‘on treatment’ time-at-risk
Extra credit #1: Incidence of myocardial infarction among new users of lisinopril in ‘on treatment’ time-at-risk, within subpopulations of interest (age<18, women, Black)
“You’ll never walk alone on your OHDSI Journey.”