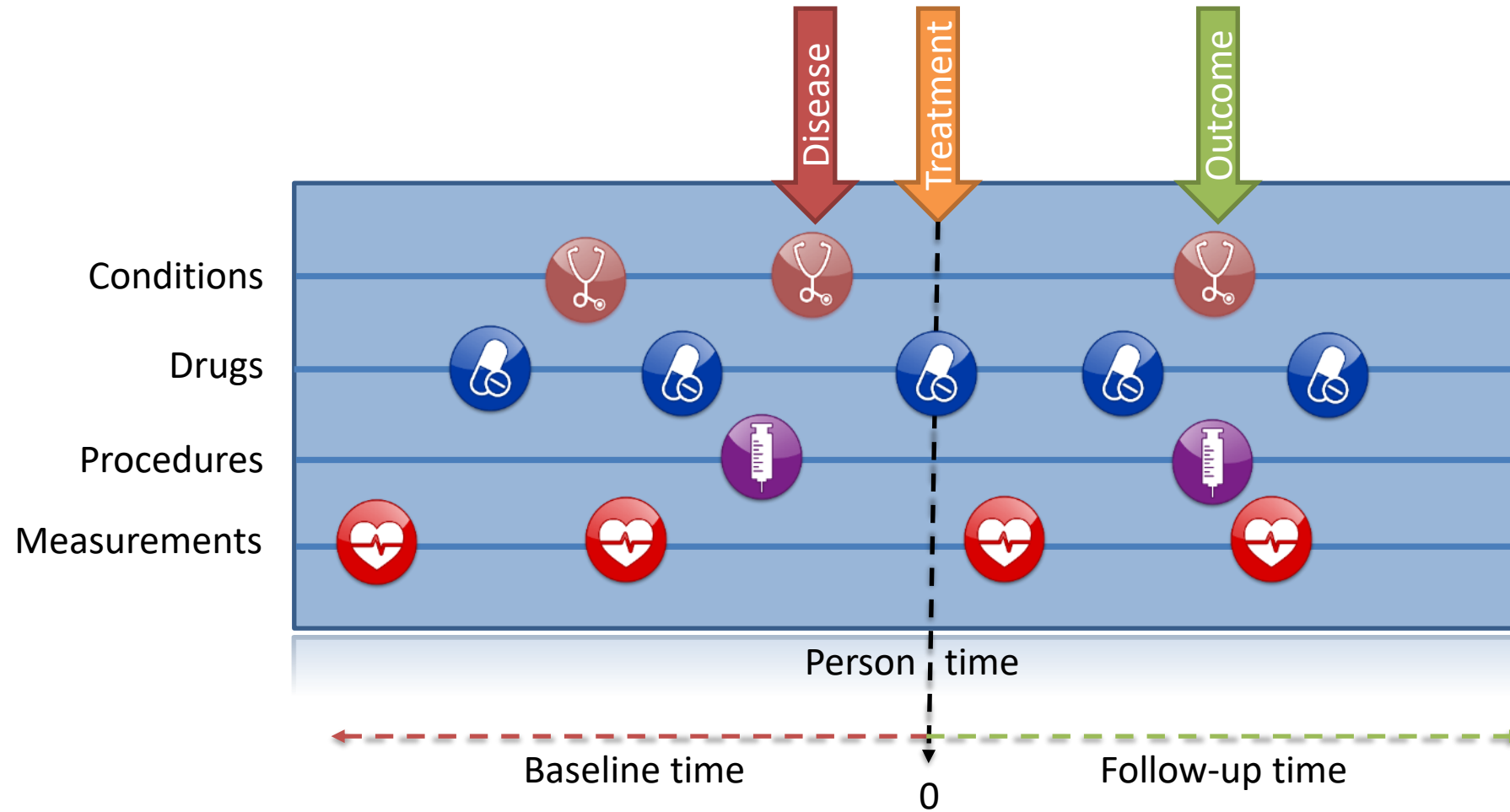# Characterization

Patrick Ryan

With thanks to OHDSI US faculty Kristin Kostka
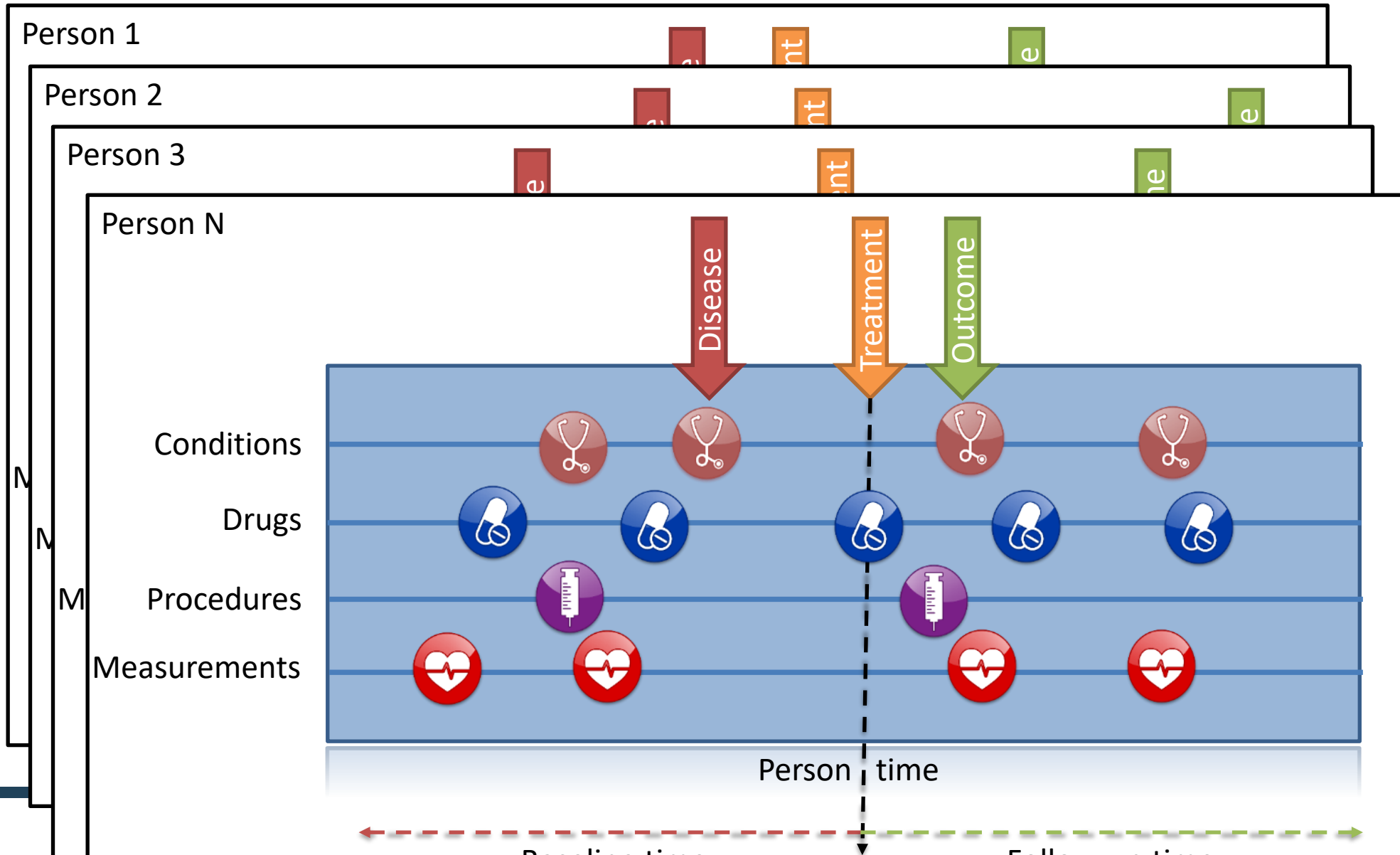
A caricature of the patient journey
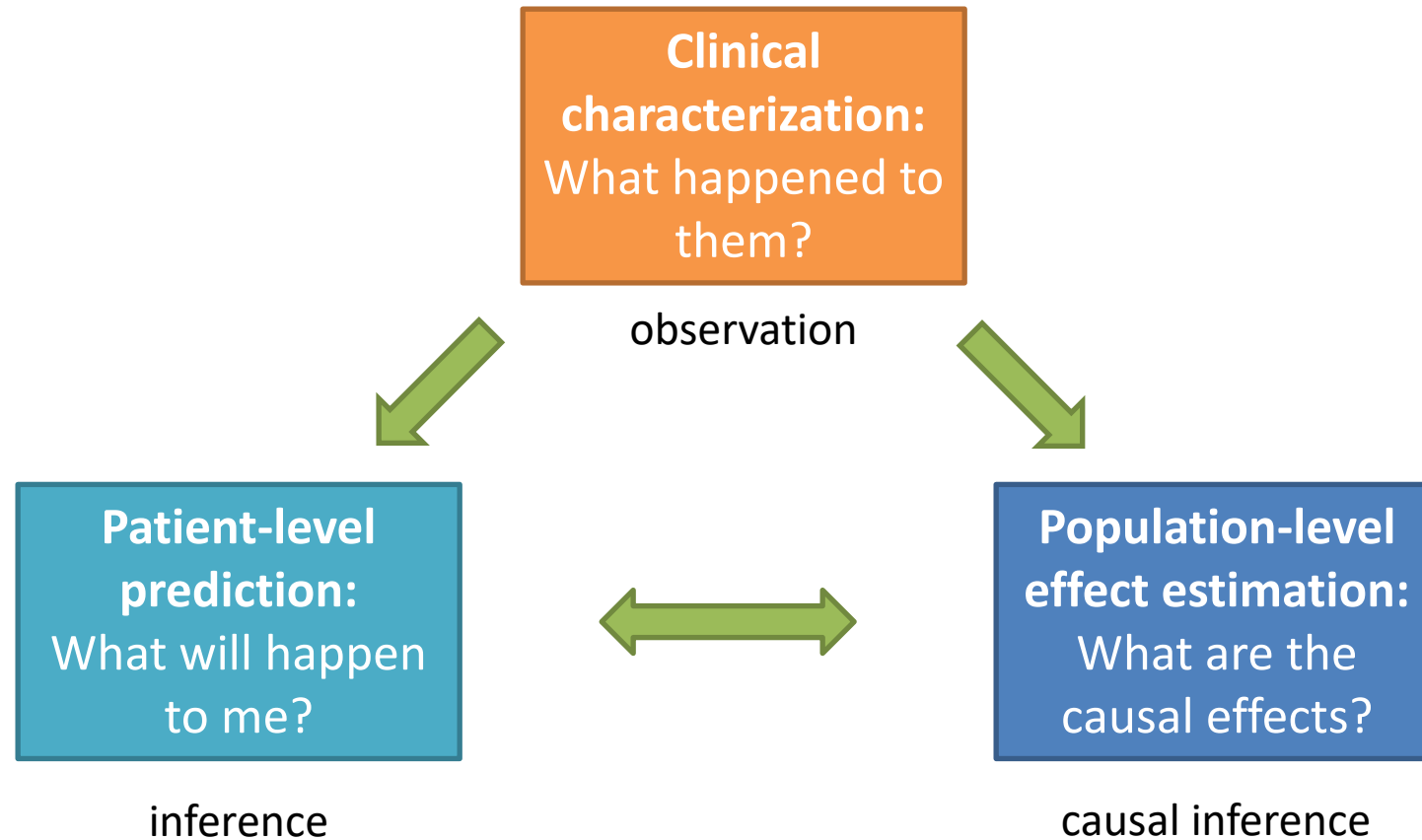
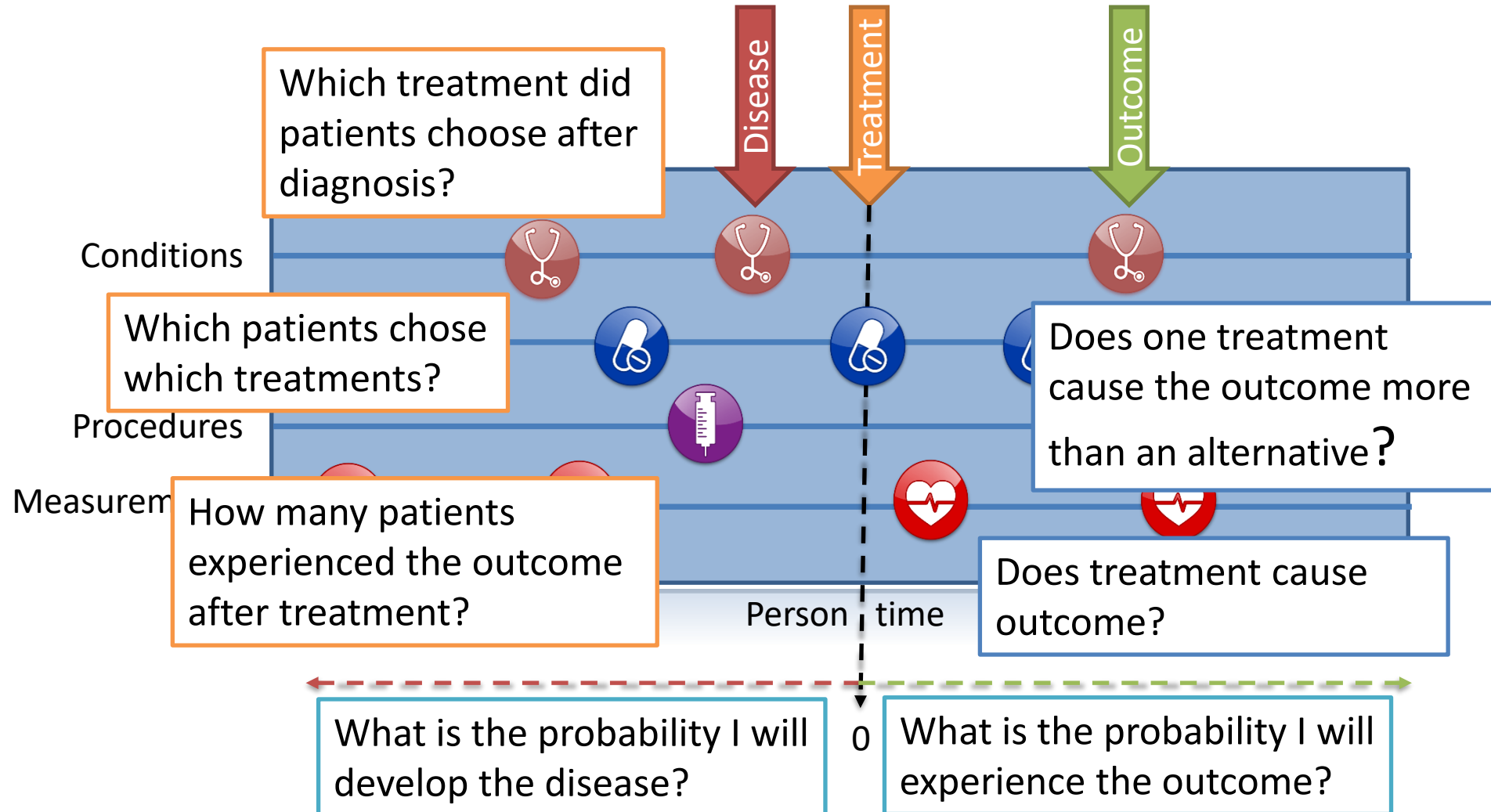# Each observational database is just an (incomplete) compilation of patient journeys

Complementary evidence to inform the patient journey

Questions asked across the patient journey
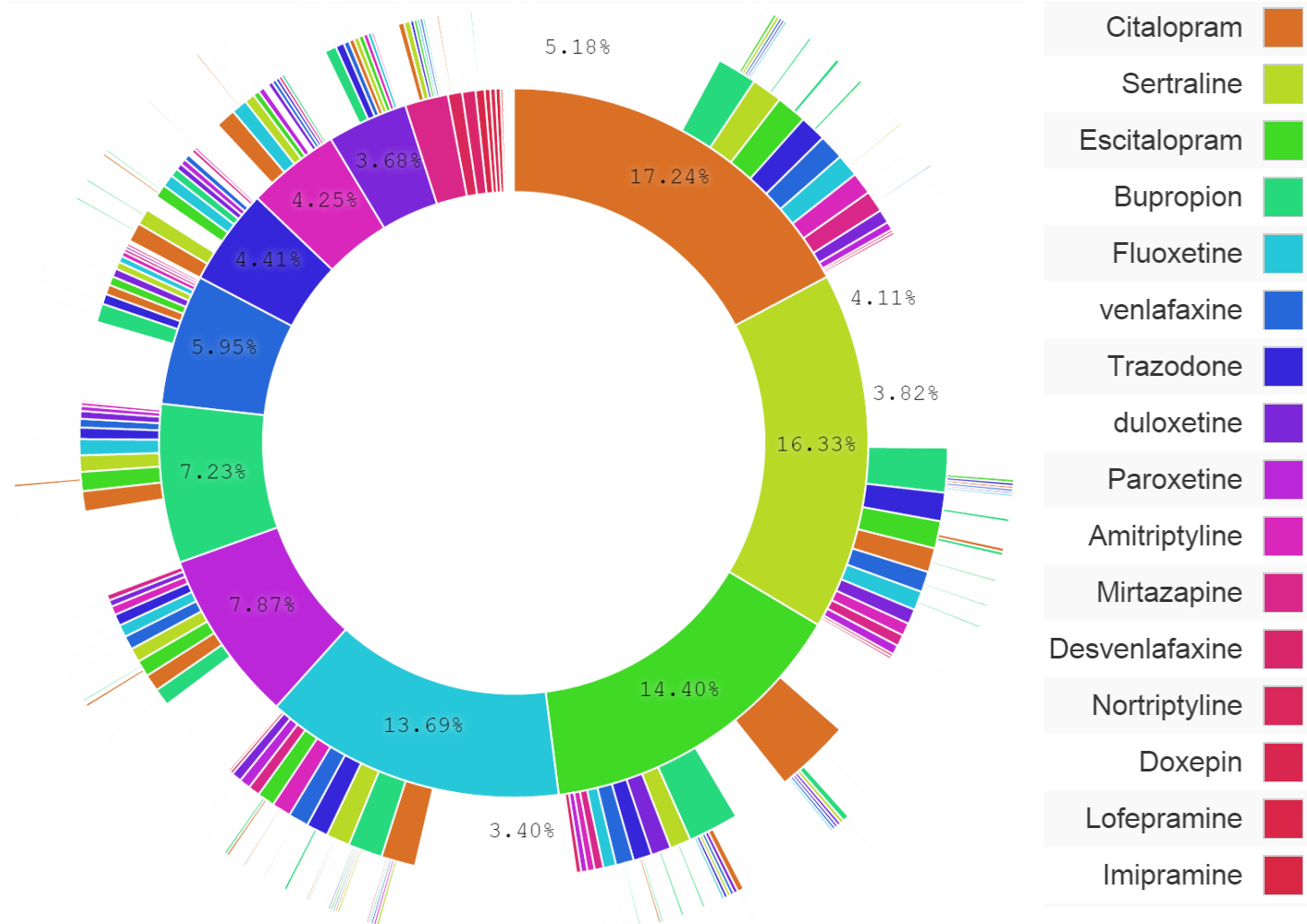
Incidence Analysis

Cohort Pathways

Characterizing treatment pathways at scale using the OHDSI network

George Hripcsak[a,b,c,1], Patrick B. Ryan[c,d], Jon D. Duke[c,e], Nigam H. Shah[c,f], Rae Woong Park[c,g], Vojtech Huser[c,h], Marc A. Suchard[c,i,j,k], Martijn J. Schuemie[c,d], Frank J. DeFalco[c,d], Adler Perotte[a,c], Juan M. Banda[c,f], Christian G. Reich[c,l], Lisa M. Schilling[c,m], Michael E. Matheny[c,n,o], Daniella Meeker[c,p,q], Nicole Pratt[c,r], and David Madigan[c,s]
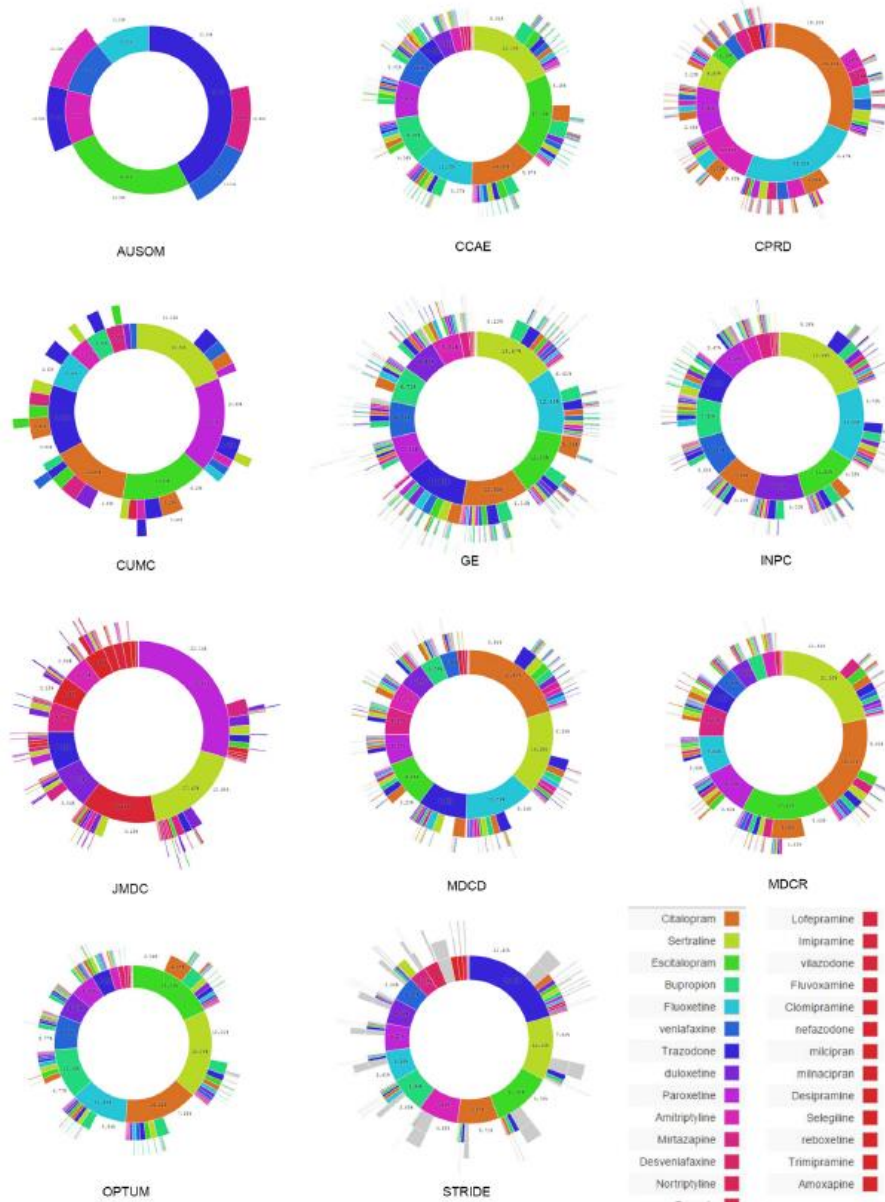
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How are patients with major depressive disorder *ACTUALLY* treated?

Citalopram
Sertraline
Escitalopram
Bupropion
Fluoxetine
venlafaxine
Trazodone
duloxetine
Paroxetine
Amitriptyline
Mirtazapine
Desvenlafaxine
Nortriptyline
Doxepin
Lofepramine
Imipramine

17.24%
5.18%
4.11%
3.82%
16.33%
14.40%
13.69%
3.40%
7.87%
7.23%
5.95%
4.41%
4.25%
3.68%

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
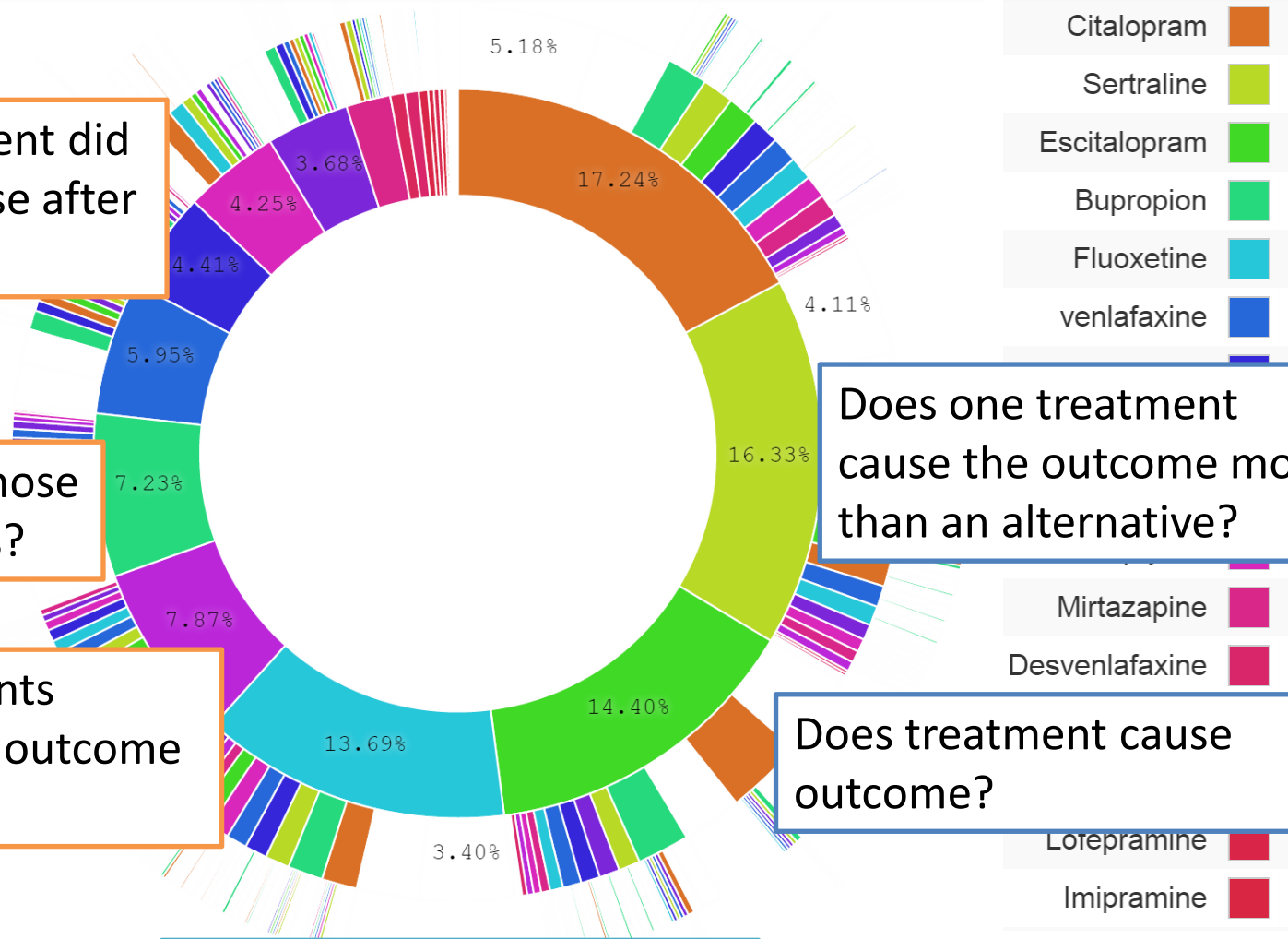
Hripcsak et al, PNAS, 2016

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?

Does one treatment cause the outcome more than an alternative?

Does treatment cause outcome?

What is the probability I will experience the outcome?

Citalopram
Sertraline
Escitalopram
Bupropion
Fluoxetine
venlafaxine
Mirtazapine
Desvenlafaxine
Lofepramine
Imipramine

17.24%
4.11%
16.33%
14.40%
13.69%
3.40%
5.18%
3.68%
4.25%
4.41%
5.95%
7.23%
7.87%

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

- Atlas : http://tutorial.ap-northeast-1.elasticbeanstalk.com

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."