Distributed Hospital Comparer: A new end-to-end data aggregation approach for comparing hospital performance without sharing patient-level data

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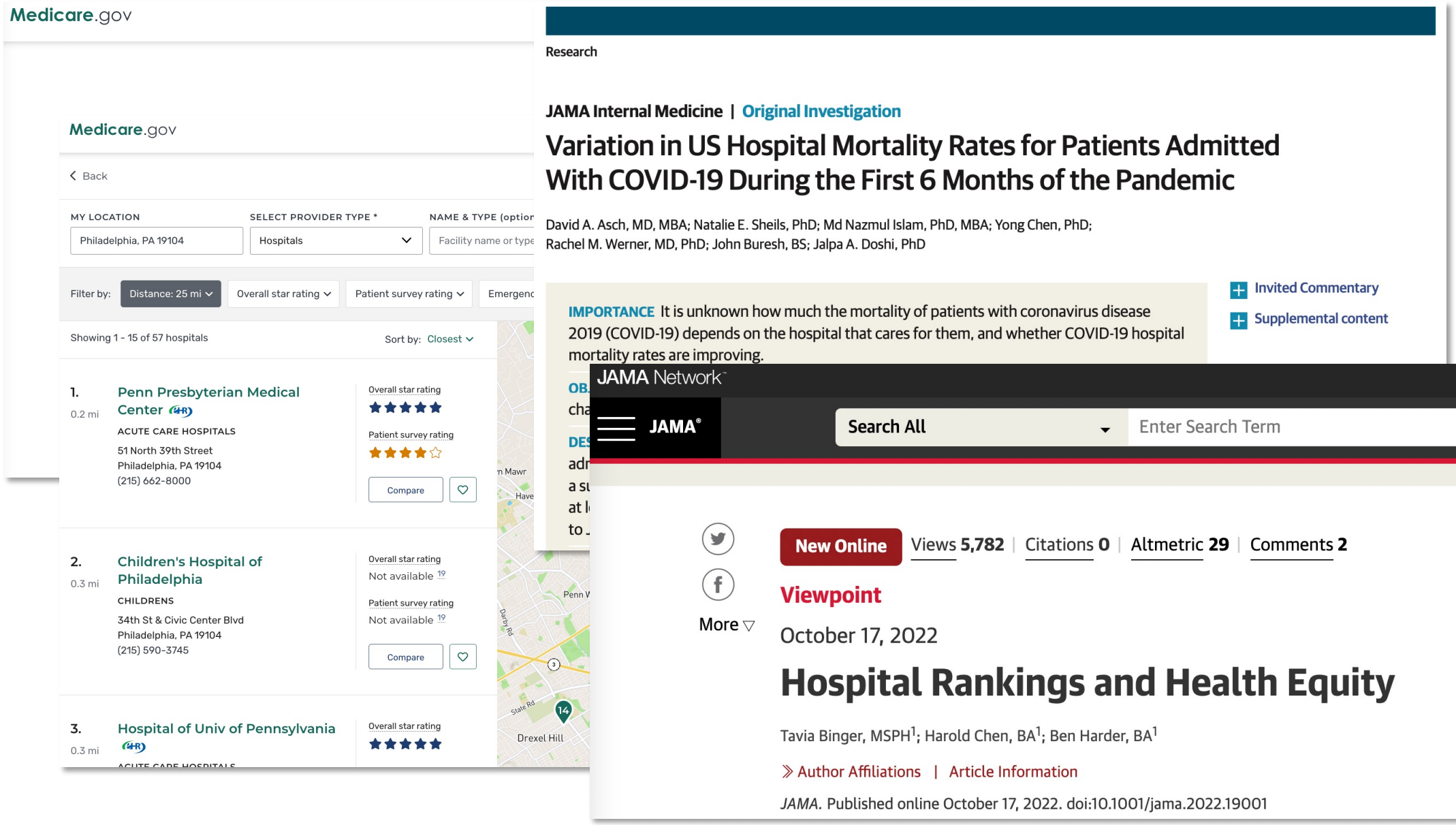
Hospital profiling

- "involves a comparison of a health care provider's structure, processes of care, or outcomes" – Normand and Shahian 2007
- **Goal:**
  - compare the quality of care between hospitals via structural measures
    - E.g., nursing ratios, presence of residency programs, availability of advanced technology, volume

Images from internet


Medicare.gov
Back
MY LOCATION
Philadelphia, PA 19104
SELECT PROVIDER TYPE *
Hospitals
Filter by:
Distance: 25 mi
Overall star rating
Patient survey rating
Showing 1 - 15 of 57 hospitals
Sort by: Closest
1. Penn Presbyterian Medical Center
0.2 mi
ACUTE CARE HOSPITALS
51 North 39th Street
Philadelphia, PA 19104
(215) 662-8000
Overall star rating
Patient survey rating
Compare
2. Children's Hospital of Philadelphia
0.3 mi
CHILDRENS
34th St & Civic Center Blvd
Philadelphia, PA 19104
(215) 590-3745
Overall star rating
Not available 19
Patient survey rating
Not available 19
Compare
3. Hospital of Univ of Pennsylvania
0.3 mi
Drexel Hill
Research
JAMA Internal Medicine | Original Investigation
Variation in US Hospital Mortality Rates for Patients Admitted With COVID-19 During the First 6 Months of the Pandemic
David A. Asch, MD, MBA; Natalie E. Sheils, PhD; Md Nazmul Islam, PhD, MBA; Yong Chen, PhD; Rachel M. Werner, MD, PhD; John Buresh, BS; Jalpa A. Doshi, PhD
IMPORTANCE It is unknown how much the mortality of patients with coronavirus disease 2019 (COVID-19) depends on the hospital that cares for them, and whether COVID-19 hospital mortality rates are improving.
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October 17, 2022
Hospital Rankings and Health Equity
Tavia Binger, MSPH[1]; Harold Chen, BA[1]; Ben Harder, BA[1]
Author Affiliations | Article Information
JAMA. Published online October 17, 2022. doi:10.1001/jama.2022.19001

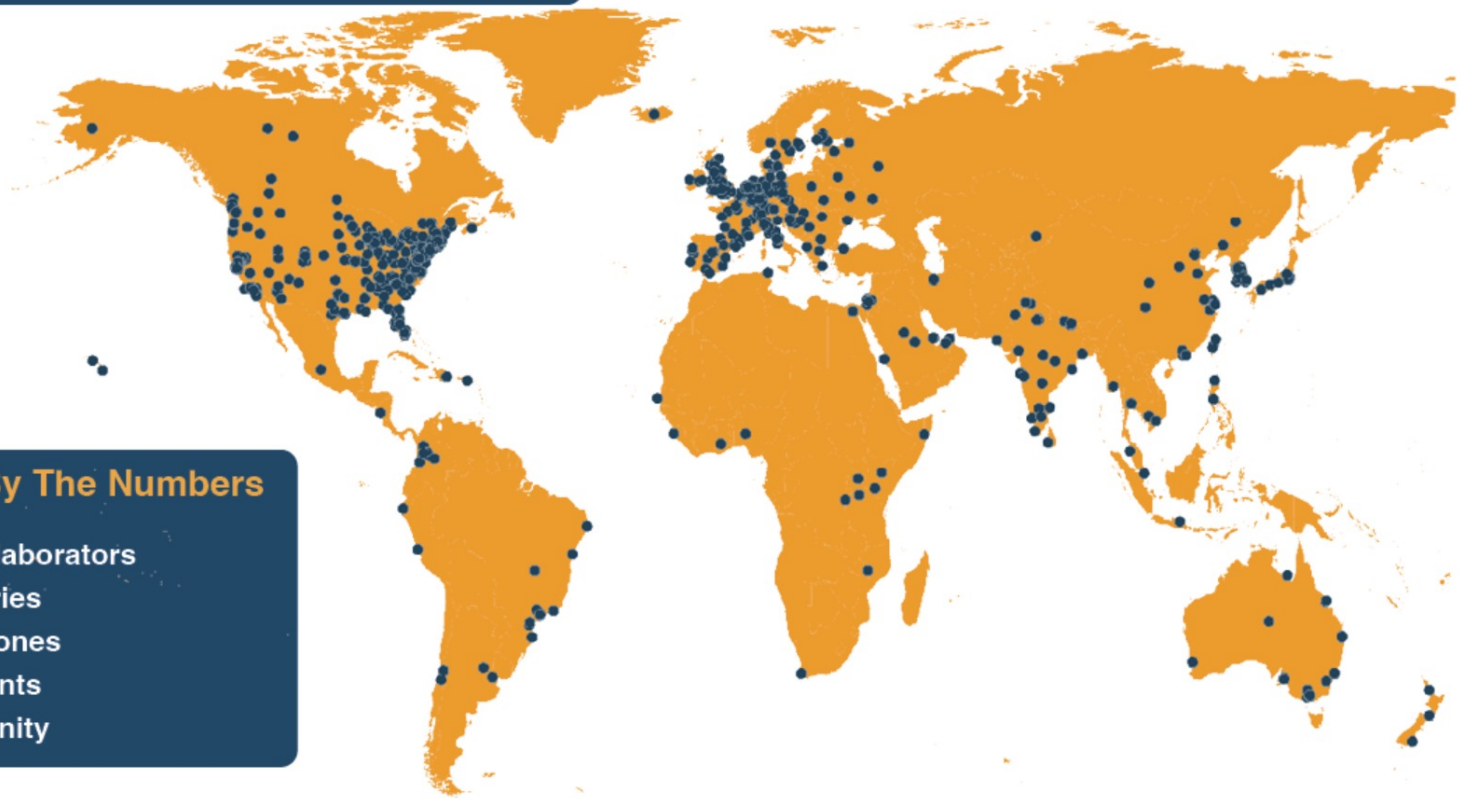
OHDSI
OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

Map of Collaborators

The OHDSI community brings together volunteers from around the world to establish open community data standards, develop open-source software, conduct methodological research, and apply scientific best practices to both answer public health questions and generate reliable clinical evidence.

OHDSI COLLABORATORS

Our community is ALWAYS seeking new collaborators. Do you want to focus on data standards or methodological research? Are you passionate about open-source development or clinical applications? Do you have data that you want to be part of global network studies? Do you want to be part of a global community that truly values the benefits of open science? Add a dot to the map below and JOIN THE JOURNEY!



OHDSI By The Numbers

- 3,266 collaborators
- 80 countries
- 21 time zones
- 6 continents
- 1 community

#JoinTheJourney 11 OHDSI.org

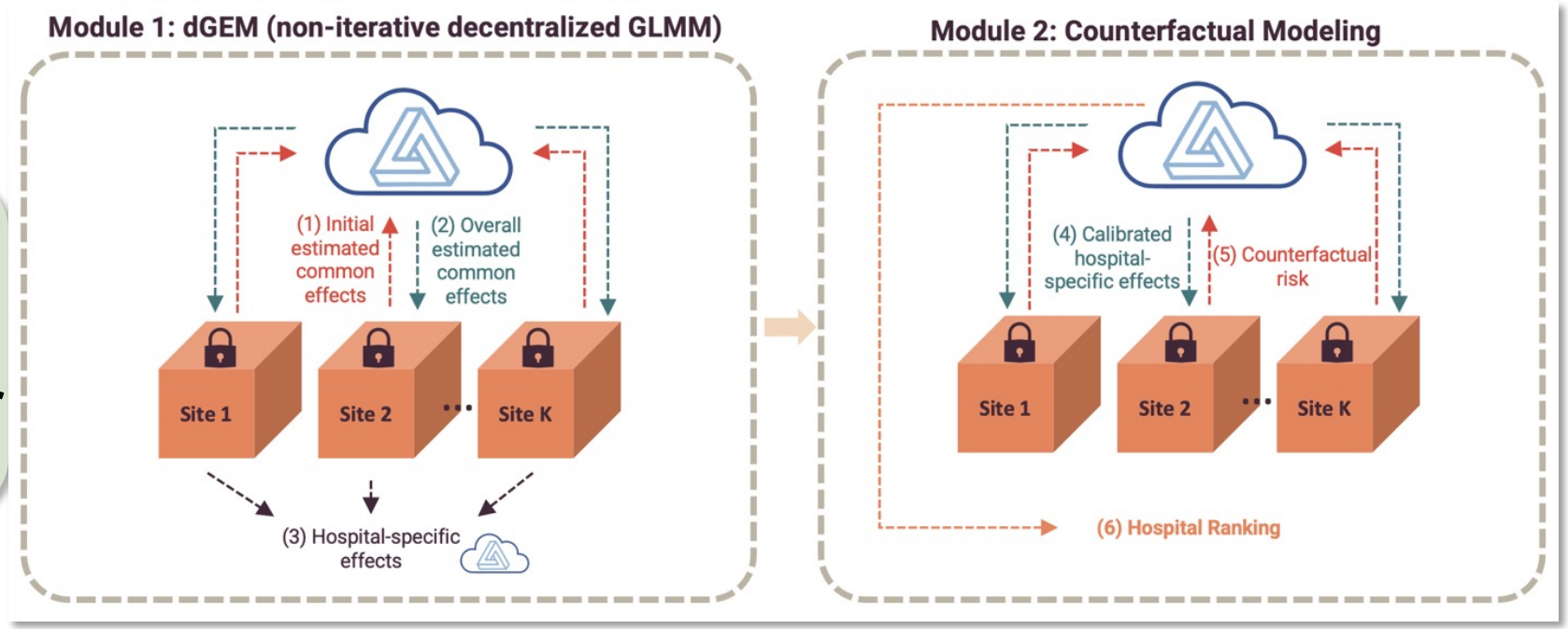
Janssen PHARMACEUTICAL COMPANIES OF Johnson & Johnson
Penn Medicine

Challenges

- Patient-level data cannot be shared
- “case-mix” situation

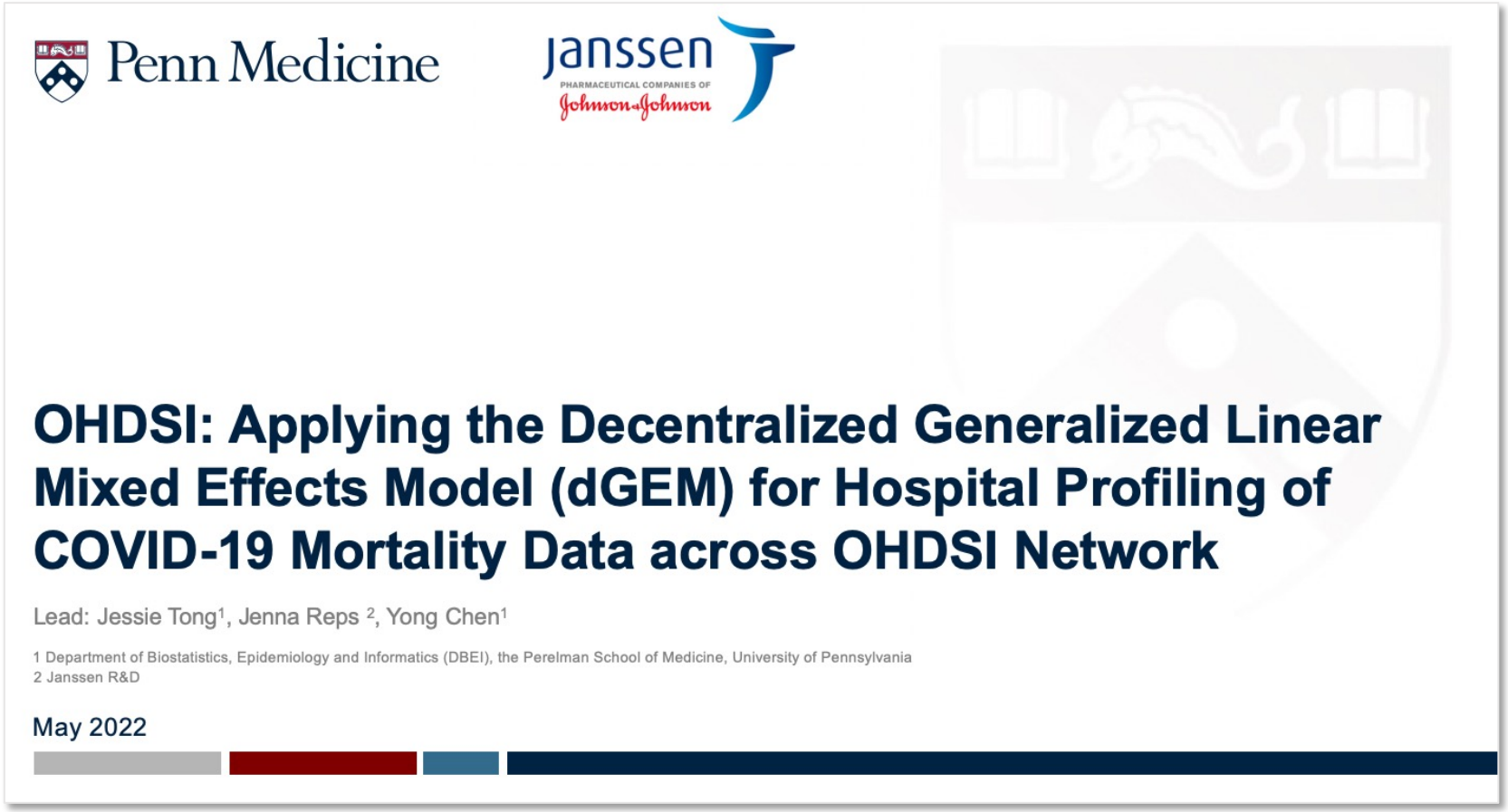
A Solution

Distributed Hospital Comparer

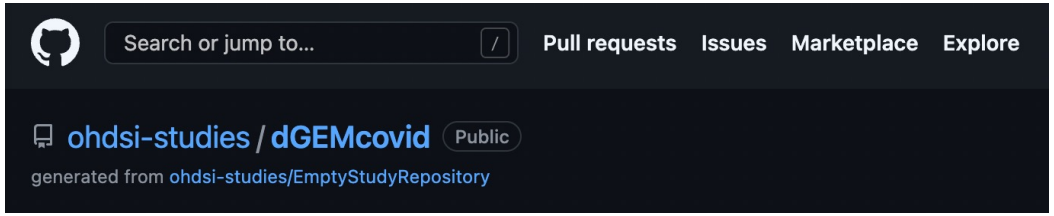


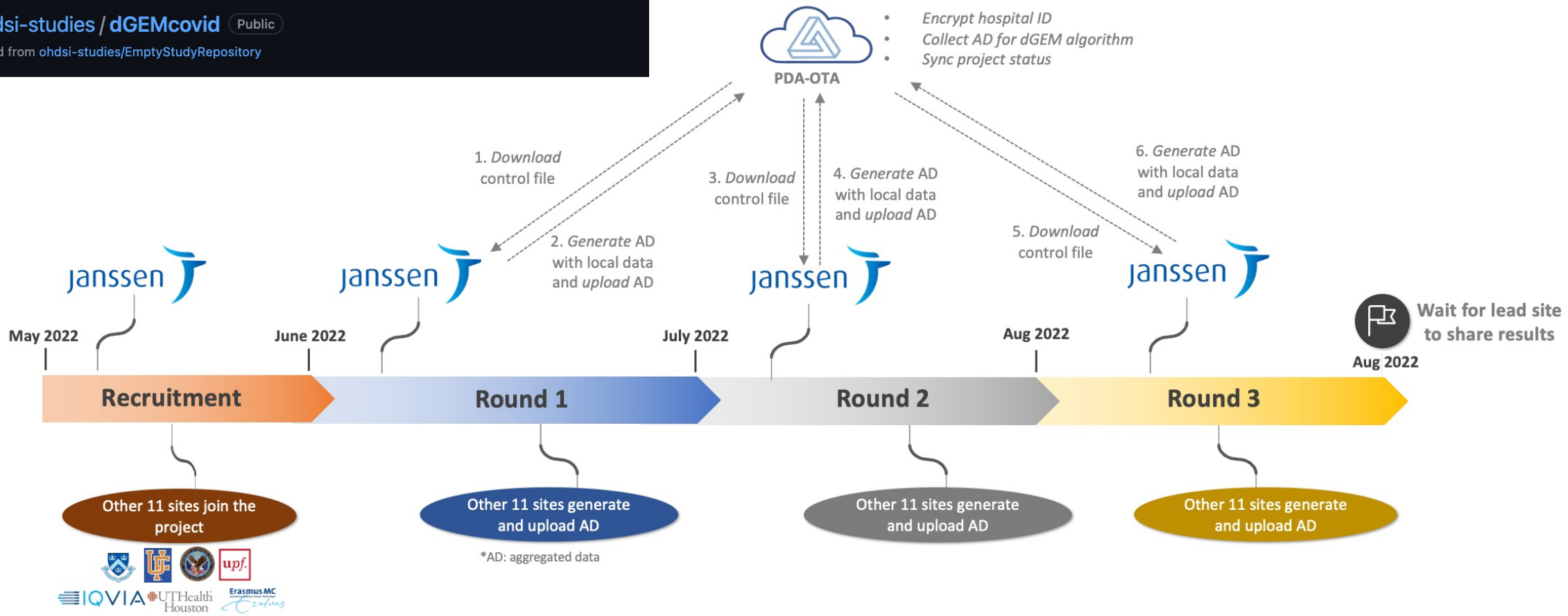
GLMM: considered as the gold standard method by National Quality Forum

An OHDSI Study

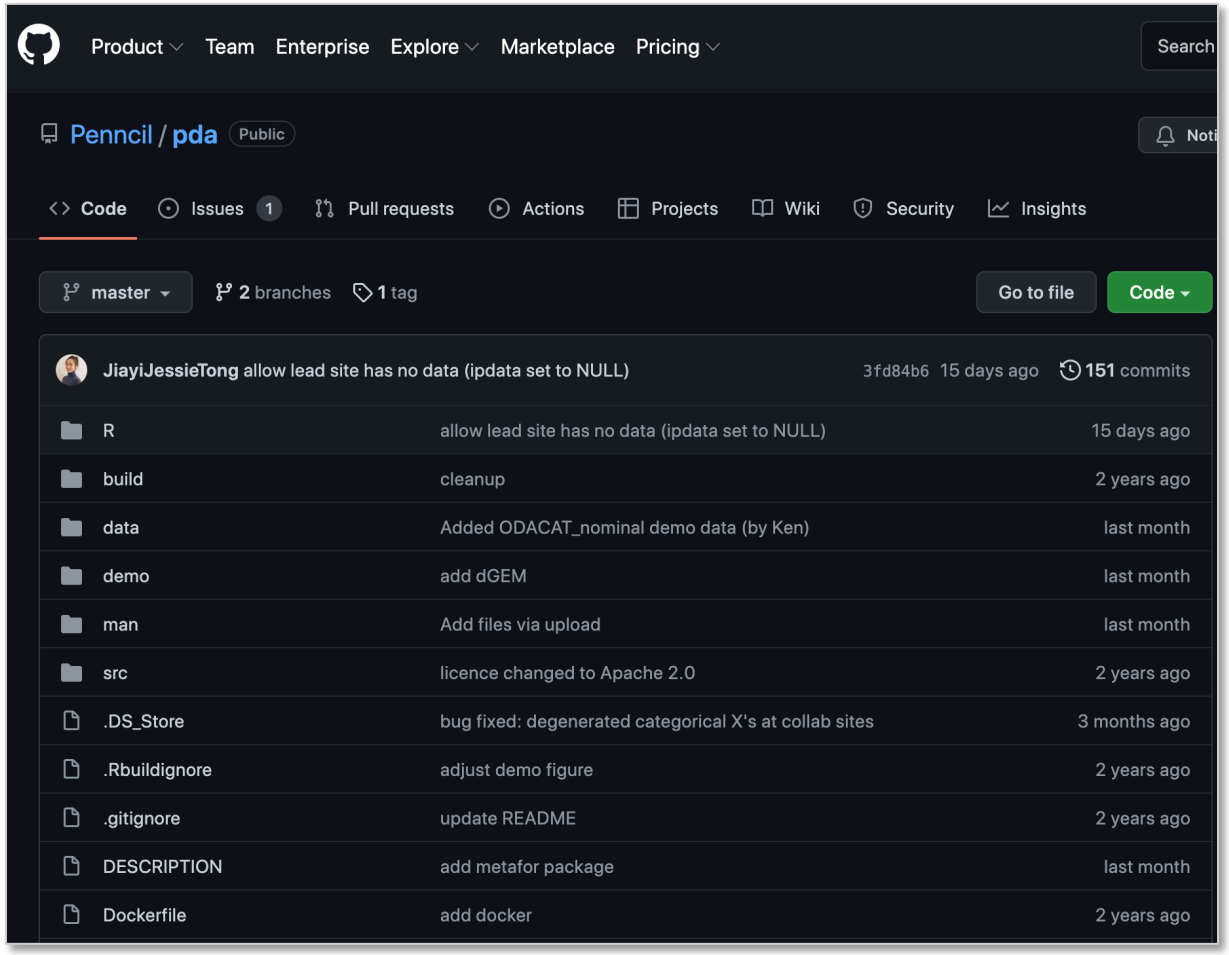


Implementation





Implementation – R package



pda: Privacy-Preserving Distributed Algorithms

A collection of privacy-preserving distributed algorithms for conducting multi-site data analyses. The regression analyses can be linear regression for continuous outcome, logistic regression for binary outcome, Cox proportional hazard regression for time-to event outcome, or Poisson regression for count outcome. The PDA algorithm runs on a lead site and only requires summary statistics from collaborating sites, with one or few iterations. For more information, please visit our software websites: <https://github.com/Penncil/pda>, and <https://pdamethods.org/>.

Version:	1.0-2
Imports:	Rcpp (≥ 0.12.19), stats, httr, rvest, jsonlite, data.table, survival
LinkingTo:	Rcpp, RcppArmadillo
Suggests:	imager
Published:	2020-12-10
Author:	Chongliang Luo [aut, cre], Rui Duan [aut], Mackenzie Edmondson [aut], Jiayi Tong [aut], Yong Chen [aut], Penn Computing Inference Learning (PennCIL) lab [cph]
Maintainer:	Chongliang Luo <luocl3009 at gmail.com>
License:	Apache License 2.0
NeedsCompilation:	yes
CRAN checks:	pda results

Documentation:

Reference manual: pda.pdf

Downloads:

Package source:	pda_1.0-2.tar.gz
Windows binaries:	r-devel: pda_1.0-2.zip, r-release: pda_1.0-2.zip, r-oldrel: pda_1.0-2.zip
macOS binaries:	r-release (arm64): pda_1.0-2.tgz, r-oldrel (arm64): pda_1.0-2.tgz, r-release (x86_64): pda_1.0-2.tgz, r-oldrel (x86_64): pda_1.0-2.tgz
Old sources:	pda archive

Implementation – PDA-OTA

Welcome to PDA-OTA

PDA-OTA is a web-based interface for secure sharing of aggregated data for multi-site studies using privacy-preserving distributed algorithms. PDA-OTA, once built, will facilitate national and international collaborations requiring aggregated data sharing for collaborative modeling. PDA-OTA synchronizes project status, offers cloud-based SFTP, and generates model-specific tasks for streamlined implementations.

Sign in

* E-mail address

E-mail

* Password

Password

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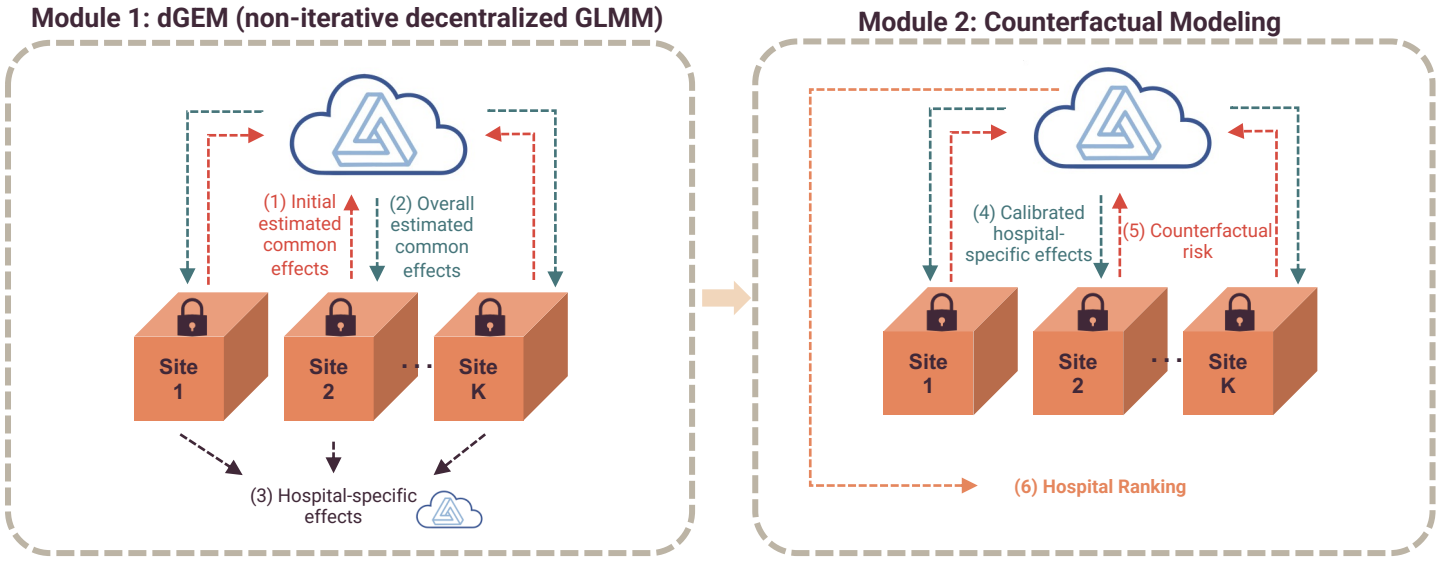
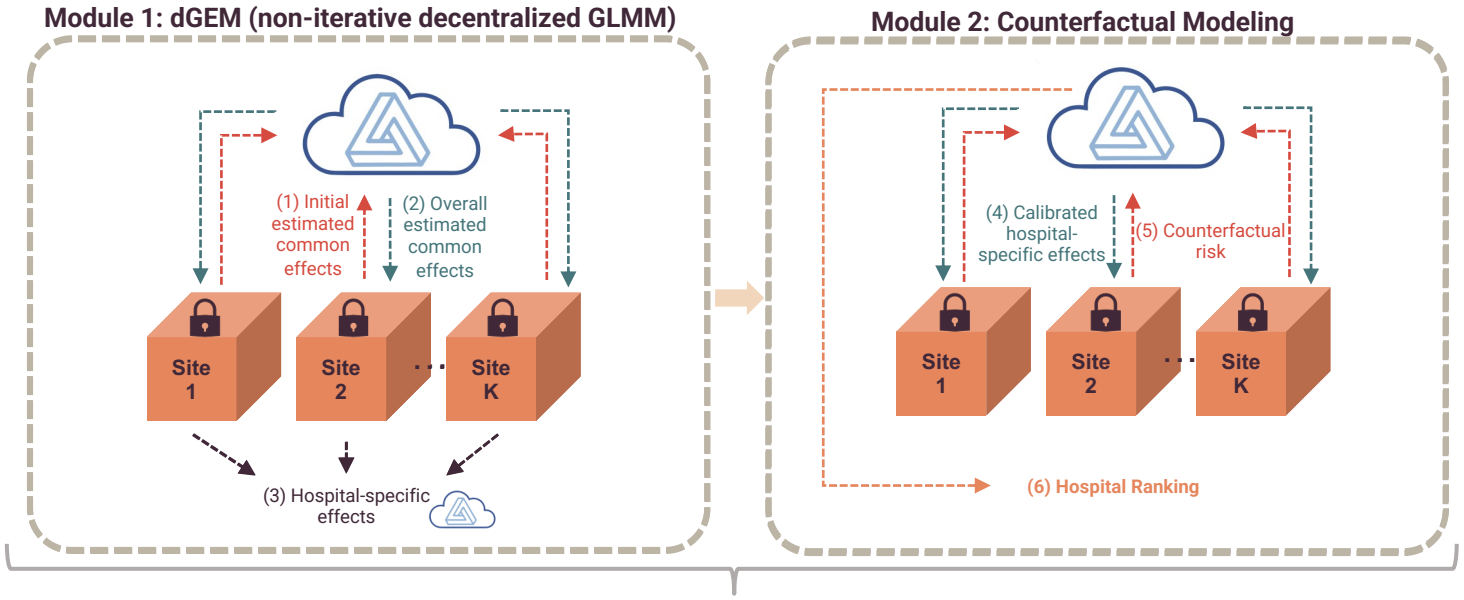
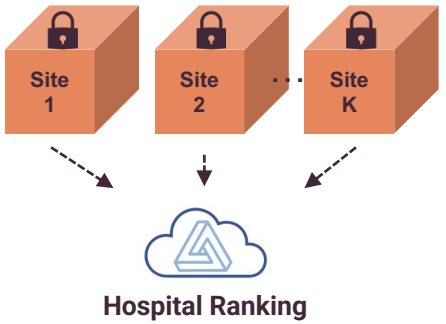

Module 1: dGEM (non-iterative decentralized GLMM)
(1) Initial estimated common effects
(2) Overall estimated common effects
Site 1
Site 2
Site K
(3) Hospital-specific effects
Module 2: Counterfactual Modeling
(4) Calibrated hospital-specific effects
(5) Counterfactual risk
Site 1
Site 2
Site K
(6) Hospital Ranking

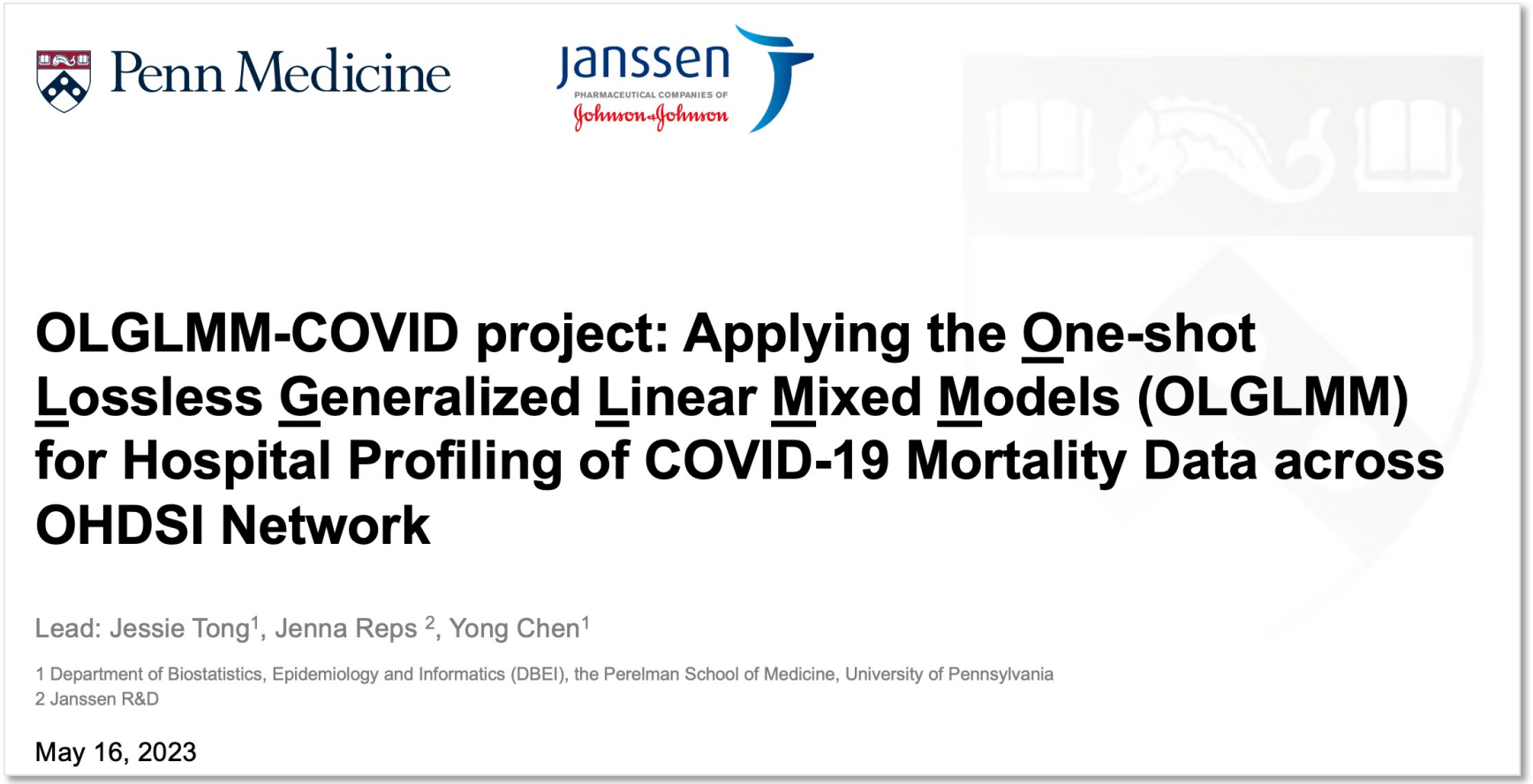


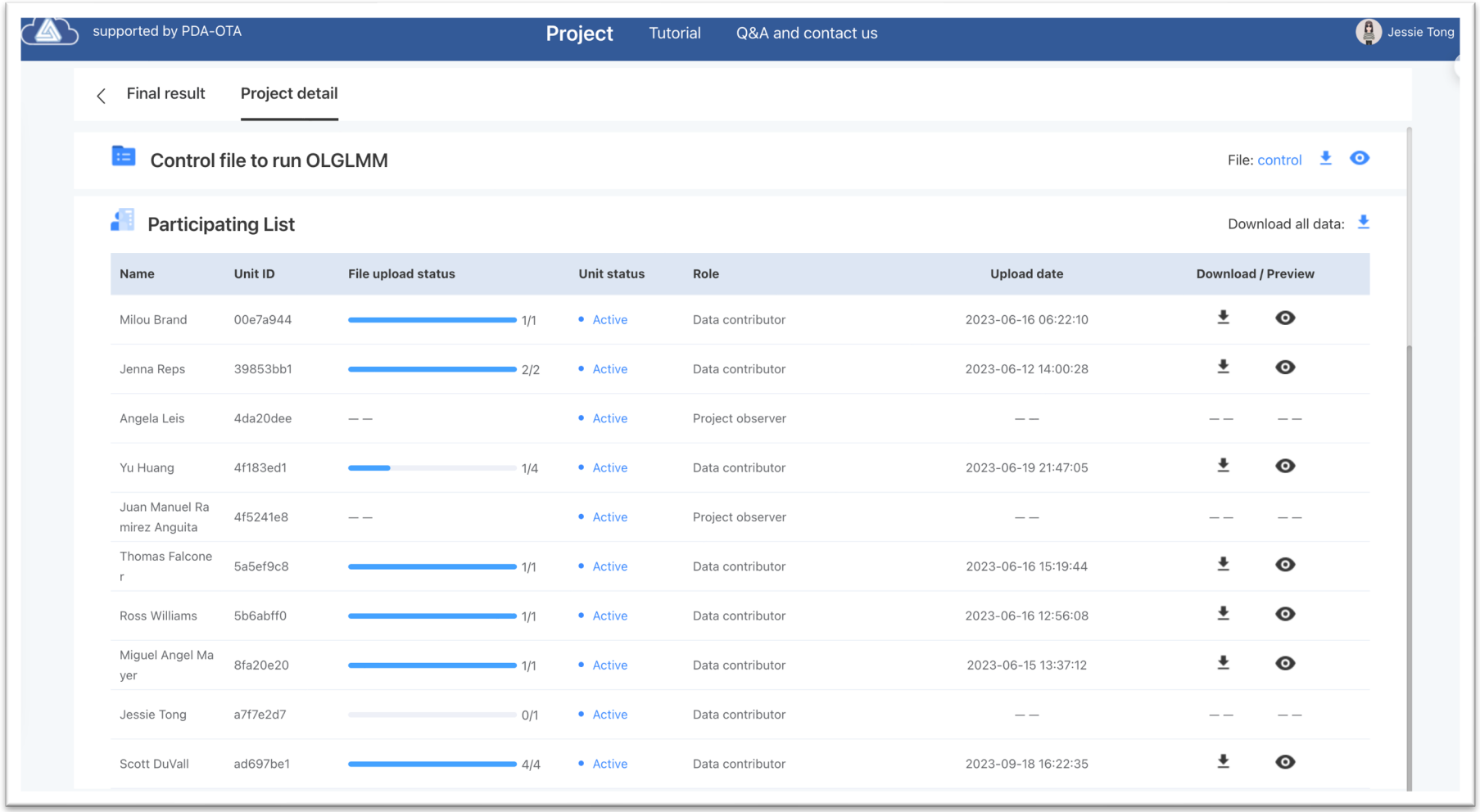
- Only one round
- No initialization



One-shot & Lossless Generalized Linear Mixed effect Model (OLGLMM)

An OHDSI Study

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Project
Tutorial
Q&A and contact us
Jessie Tong
Final result
Project detail
Control file to run OLGLMM
File: control
Participating List
Download all data:
Name
Unit ID
File upload status
Unit status
Role
Upload date
Download / Preview
Milou Brand 00e7a944 1/1 Active Data contributor 2023-06-16 06:22:10
Jenna Reps 39853bb1 2/2 Active Data contributor 2023-06-12 14:00:28
Angela Leis 4da20dee — — Active Project observer — — — — — —
Yu Huang 4f183ed1 1/4 Active Data contributor 2023-06-19 21:47:05
Juan Manuel Ramirez Anguita 4f5241e8 — — Active Project observer — — — — — —
Thomas Falconer 5a5ef9c8 1/1 Active Data contributor 2023-06-16 15:19:44
Ross Williams 5b6abff0 1/1 Active Data contributor 2023-06-16 12:56:08
Miguel Angel Mayer 8fa20e20 1/1 Active Data contributor 2023-06-15 13:37:12
Jessie Tong a7f7e2d7 0/1 Active Data contributor — — — — — —
Scott DuVall ad697be1 4/4 Active Data contributor 2023-09-18 16:22:35


Thank
you!