Where have we been?
Where are we going?
OHDSI OKR mid-year review

Patrick Ryan, PhD

Janssen Research & Development

Columbia University

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OHDSI's mission

To improve health by empowering a community to collaboratively generate the evidence that promotes better health decisions and better care

12 Jan 2021

Where have we been?
Where should we go in 2021?

Patrick Ryan, PhD
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Why are you on the journey with OHDSI?

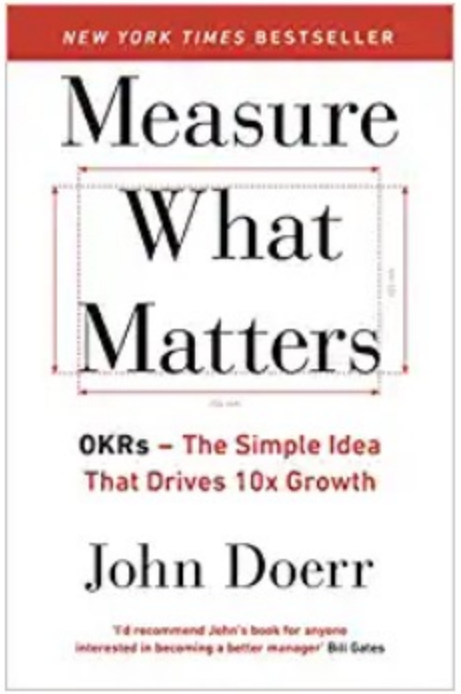
Patrick Ryan, PhD
Janssen Research & Development
Columbia University

Top

24	To collaborate with other researchers around the world
19	I want to generate evidence
16	To develop open source solutions to public health problems
11	For the data network
7	To be part of a community trying to make a positive impact
6	improve the quality of epidemiological studies using observational data
5	To improve the way in which medical evidence is generated!

An organizing framework

- Objective: Ambitious goal of what is to be achieved
- Key Result: Specific measurable to benchmark and monitor how we get to the objective



Patrick Ryan, PhD
Janssen Research & Development
Columbia University

Writing effective OKRs

- Objectives are the 'Whats'. They:
  - Express goals and intents
  - Are aggressive yet realistic
  - Must be tangible, objective, and unambiguous; should be obvious to a rational observer whether an objective as been achieved
  - The successful achievement of an objective must provide clear value to the organization
- Key results are the 'Hows'. They:
  - Express measureable milestones which, if achieved, will advance objective(s) in a useful manner to their constituents
  - Must describe **outcomes**, not activities
  - Must include evidence of completion. This evidence must be available, credible and easily discoverable.

What should be OHDSI's 2021 Objectives?

Top

OKR review and grading

Score range	Question to ask:
9.5 - 10	Are we being ambitious enough?
6.5 - 9.4	What have we learned?
4.0 - 6.4	How can we focus/help?
1.5 - 3.9	What do we need to change?
0 - 1.4	Should this remain an priority objective?

Respond at **PollEv.com/patrickryan800**

What are your reflections on OHDSI's progress towards its 2021 objectives and key results (OKRs)?

Top

1	We should continue with our objective, "Build an international medical product safety surveillance system that provides all stakeholders access to evidence abo...
1	We should continue with our objective, "Enable a community to generate real-world evidence using OHDSI tools and scientific best practices"
1	We should continue with our objective, "Generate and disseminate real-world evidence about the 3 substantial public health issues: COVID-19, type 2 diabetes,...

OHDSI in 2021

Objective: Generate and disseminate real-world evidence about the 3 substantial public health issues: COVID-19, type 2 diabetes, and health inequalities.

Key Results:

- 3 fully-reproducible study packages executed across at least 20 OHDSI data partners
- 10 publications accepted in journals with impact factor > 10
- 10 uses of OHDSI results by external stakeholders that demonstrate influence in policy or clinical decision-making

6

8

5

Key result 1: 3 fully-reproducible study packages executed across at least 20 OHDSI data partners

README.md

Evaluating Use of Methods for Adverse Event Under Surveillance (for vaccines)

Study Status: Results Available

- Analytics use case(s): **Population-Level Estimation**
- Study type: **Methods Research**
- Tags: -
- Study lead: **Martijn Schuemie**
- Study lead forums tag: schuemie
- Study start date: **January 12, 2021**
- Study end date: -
- Protocol: HTML document, ENCEPP registration
- Publications: -
- Results explorer: Shiny app

Similar to our previous research on the evaluation of causal effe
systematically evaluate methods for (safety) surveillance of vacc

README.md

Calculating the background rates of adverse events of special interest (AESI) for the COVID vaccines

Study Status: Design Finalized

- Analytics use case(s): Characterization
- Study type: Clinical Application
- Tags: COVID-19
- Study lead: George Hripcsak, Patrick Ryan, Marc Such
- Study lead forums tag: Patrick_Ryan
- Study start date: -
- Study end date: -
- Protocol: pdf file
- Publications: -
- Results explorer: -

Calculating the background rates of adverse events of spe

README.md

Evaluating the Sensitivity Of Prediction Model Development and Performance Due To Phenotypes Applied To COVID-19 VACCINES

Study Status: Started

- Analytics use case(s): **Patient-Level Prediction**
- Study type: **Methods Research, Clinical Application**
- Tags: **COVID-19**
- Study lead: **Jenna Reps**
- Study lead forums tag: jreps
- Study start date: **2021-03-21**
- Study end date: -
- Protocol: Click Here
- Publications: -
- Results explorer: -

Method research into the target population and outcome phenotypes we should use to develop COVID-19 vaccine prediction models for various outcomes of interest

Key result 2: 10 publications accepted in journals with impact factor > 10

PEDIATRIC RHEUMATOLOGY

Rheumatology 2021;0:1–14
doi:10.1093/rheumatology/keab250

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thebmj

RESEARCH

Use of repurposed and adjuvant drugs in hospital patients with covid-19: multinational network cohort study

Albert Prats-Uribe,[1] Anthony G Sena,[2,3] Lana Yin Hui Lai,[4] Waheed-Ul-Rahman Ahmed,[5,6] Heba Alghoul,[7] Osaid Alser,[8] Thamir M Alshammari,[9] Carlos Areia,[10] William Carter,[11] Paula Casajust,[12] Dalia Dawoud,[13,14] Asieh Golozar,[15,16] Jitendra Jonnagaddala,[17] Paras P Mehta,[18] Mengchun Gong,[19] Daniel R Morales,[20,21] Fredrik Nyberg,[22] Jose D Posada,[23] Martina Recalde,[24,25] Elena Roel,[24,25] Karishma Shah,[5] Nigam H Shah,[23] Lisa M Schilling,[11] Vignesh Subbian,[26] David Vizcaya,[27] Lin Zhang,[28,29] Ying Zhang,[19] Hong Zhu,[30] Li Liu,[30] Jaehyeong Cho,[31] Kristine E Lynch,[32] Michael E Matheny,[33,34] Seng Chan You,[35] Peter R Rijnbeek,[3] George Hripcsak,[36] Jennifer CE Lane,[5] Edward Burn,[1,24] Christian Reich,[37] Marc A Suchard,[38] Talita Duarte-Salles,[24] Kristin Kostka,[37,39] Patrick B Ryan,[2,40] Daniel Prieto-Alhambra[1]

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DOI: 10

Background Angiotensin-co

Key result 3: 10 uses of OHDSI results by external stakeholders that demonstrate influence in policy or clinical decision-making

5

FDA U.S. FOOD & DRUG ADMINISTRATION

Center for Biologics Evaluation and Research
Office of Biostatistics and Epidemiology

CBER Surveillance Program

COVID-19 Vaccine Safety Surveillance: Active Monitoring Master Protocol

February 10, 2021

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AstraZeneca's COVID-19 vaccine: EMA finds possible link to very rare cases of unusual blood clots with low blood platelets

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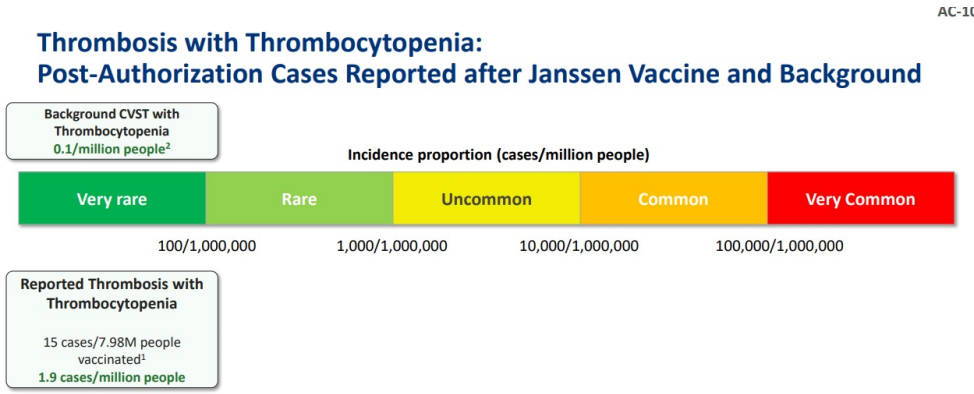
News 07/04/2021

EMA confirms overall benefit-risk remains



1. Cases, # people vaccinated: CDC (April 22)
2. Incidence based on CVST + Thrombocytopenia in 2018 from 5 observational sources (n=63 million persons)

OHDSI in 2021

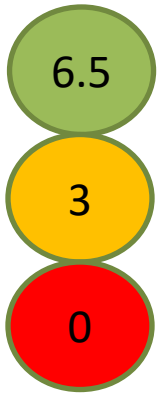
Objective:

Generate and disseminate real-world evidence about the 3 substantial public health issues: COVID-19, type 2 diabetes, and health inequalities.

COVID-19:

Type 2 diabetes:

Health inequalities:



OHDSI in 2021

Objective:

Enable a community to generate real-world evidence using OHDSI tools and scientific best practices

Key Results:

- 100 organizations have a fully-operational technical infrastructure (CDM + ATLAS + HADES) sufficient to perform local analyses
- 1000 researchers complete RWE curriculum through EHDEN Academy
- 100 publications generated using and citing OHDSI tools

?

9

6

EHDEN Academy Marks One-Year Anniversary with 1,000th Enrollee

26th April 2021

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National Center for Biotechnology Information

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("OMOP" or "OHDSI") AND ("2021/01/01"[Date - Publication] : "3000"[Date -

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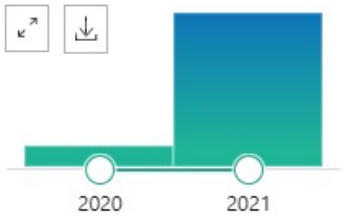
RESULTS BY YEAR



TEXT AVAILABILITY

- Abstract
- Free full text
- Full text

ARTICLE ATTRIBUTE

- Associated data

ARTICLE TYPE

- Books and Documents
- Clinical Trial
- Journal Article
- Meta-Analysis
- Preprint

1 Cite Share

Evaluation of the Privacy Risks of Personal Health Identifiers and Quasi-Identifiers in a Distributed Research Network: Development and Validation Study.

Oh S, Sung M, Rhee Y, Hong N, Park YR.

JMIR Med Inform. 2021 May 31;9(5):e24940. doi: 10.2196/24940.

PMID: 34057426

METHODS: We detected PHIs and QIs in an Observational Medical Outcomes Partnership (**OMOP**) CDM as threatening privacy, based on 18 Health Insurance Portability and Accountability Act of 1996 (HIPPA) identifiers and previous studies. To compare the privacy risk according to ...

2 Cite Share

Accessing **OMOP** Common Data Model Repositories with the i2b2 Webclient - Algorithm for Automatic Query Translation.

Majeed RW, Fischer P, Günther A.

Stud Health Technol Inform. 2021 May 24;278:251-259. doi: 10.3233/SHTI210077.

PMID: 34042902

In the era of translational research, data integration and clinical data warehouses are important enabling technologies for clinical researchers. The **OMOP** common data model is a wide-spread choice as a target for data integration in medical informatics. ...Aim of this stud ...

3 Cite Share

HIStream-Import: A Generic ETL Framework for Processing Arbitrary Patient Data Collections or Hospital Information Systems into HL7 FHIR Bundles.

Majeed RW, Stöhr MR, Günther A.

Stud Health Technol Inform. 2021 May 24;278:75-79. doi: 10.3233/SHTI210053.

PMID: 34042878

We evaluated an implementation of the algorithm using different lung research registries and used the resulting FHIR resources to fill our i2b2 based data warehouse as well an **OMOP** common data model repository....

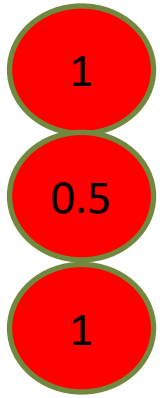
OHDSI in 2021

Objective:

Build an international medical product safety surveillance system that provides all stakeholders access to evidence about the incidence and risk of outcomes associated with drug exposure

Key Results:

- Population-level effect estimation and characterization results generated for 500 drugs and 500 outcomes across 20 databases
- 100 organizations with at least 1 active user
- 10 regulatory actions taken as a result of OHDSI system



Key results: Population-level effect estimation and characterization results generated for 500 drugs and 500 outcomes across 20 databases

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Characterizing the in
interest for COVID-I
cohort study

Xintong Li, Anna Ostropolets
Eugenia Martinez-Hernandez,
Marc Suchard, Patrick Rya

doi: https://doi.org/10.1101/2

Stud Health Technol Inform. 2021 May 27;281:555-559. doi: 10.3233/SHTI210232.

Pharmacovigilance and Clinical Environment: Utilizing OMOP-CDM and OHDSI Software Stack to Integrate EHR Data

Vlasios K Dimitriadis [1], George I Gavriilidis [1], Pantelis Natsiavas [1]

Affiliations + expand

PMID: 34042637 DOI: 10.3233/SHTI210232

However, we argue that using OMOP-CDM as a reference data model to integrate EHR data for PV purposes entails significant benefits. First, given that OMOP-CDM is a widely accepted data model, it provides a potential gateway to a big data sharing ecosystem. Furthermore, OMOP-CDM could be used to integrate other kinds of data (e.g., claims databases). Finally, the statistical and analytics tools developed by OHDSI are supported by an ecosystem of widely recognized experts, with a proven record of highly valuable results on observational studies. Although these tools are not explicitly developed for PV purposes, there is significant merit in repurposing them towards PV due their analytical prowess. This repurposing approach could be an important next step, providing significant value for both the drug safety and OHDSI ecosystem.

OHDSI MSTeams Work groups, Chapters, and Studies Registration

OHDSI is using MSTeams to further encourage active collaboration within the community. Within the OHDSI organization, there are separate teams for work groups, chapters, and studies, as well as OHDSI community activities (such as the OHDSI2020 Symposium). All teams are open to all collaborators. Below please indicate which Team you would like to join and the OHDSI coordinating center team will grant access.

...

5. Select the workgroups you want to join (you can refer to the WIKI for work group objectives www.ohdsi.org/web/wiki/doku.php?id=projects:overview)

- [ ] ATLAS
- [ ] Clinical Trials
- [ ] Common Data Model
- [ ] Data Quality Dashboard Development
- [ ] Early-stage Researchers
- [ ] Education Work Group
- [ ] Electronic Health Record (EHR) ETL
- [ ] Geographic Information System (GIS)
- [ ] HADES Health Analytics Data-to-Evidence Suite
- [ ] Latin America
- [ ] Medical Devices
- [ ] Natural Language Processing
- [ ] OHDSI APAC
- [ ] OHDSI APAC Steering Committee
- [ ] OHDSI Steering Committee
- [ ] Oncology
- [ ] Patient-Generated Health Data
- [ ] Pharmacovigiliance Evidence Investigation
- [ ] Phenotype Development and Evaluation
- [ ] Population-Level Effect Estimation / Patient-Level Prediction
- [ ] Psychiatry
- [ ] Registry (formerly UK Biobank)
- [ ] Surgery and Perioperative Medicine
- [ ] Vaccine Safety
- [ ] Vaccine Vocabulary
- [ ] Women of OHDSI

Common Data Model Workgroup OKRs

- Develop and promote community adoption of CDM v6.x
  - KR1: A list of all changes and additions to be made fully communicated to all stakeholders (Q1)
  - KR2: 100% agreement from all affected workgroups by Q2
  - KR3: Release of DDLs by Q3

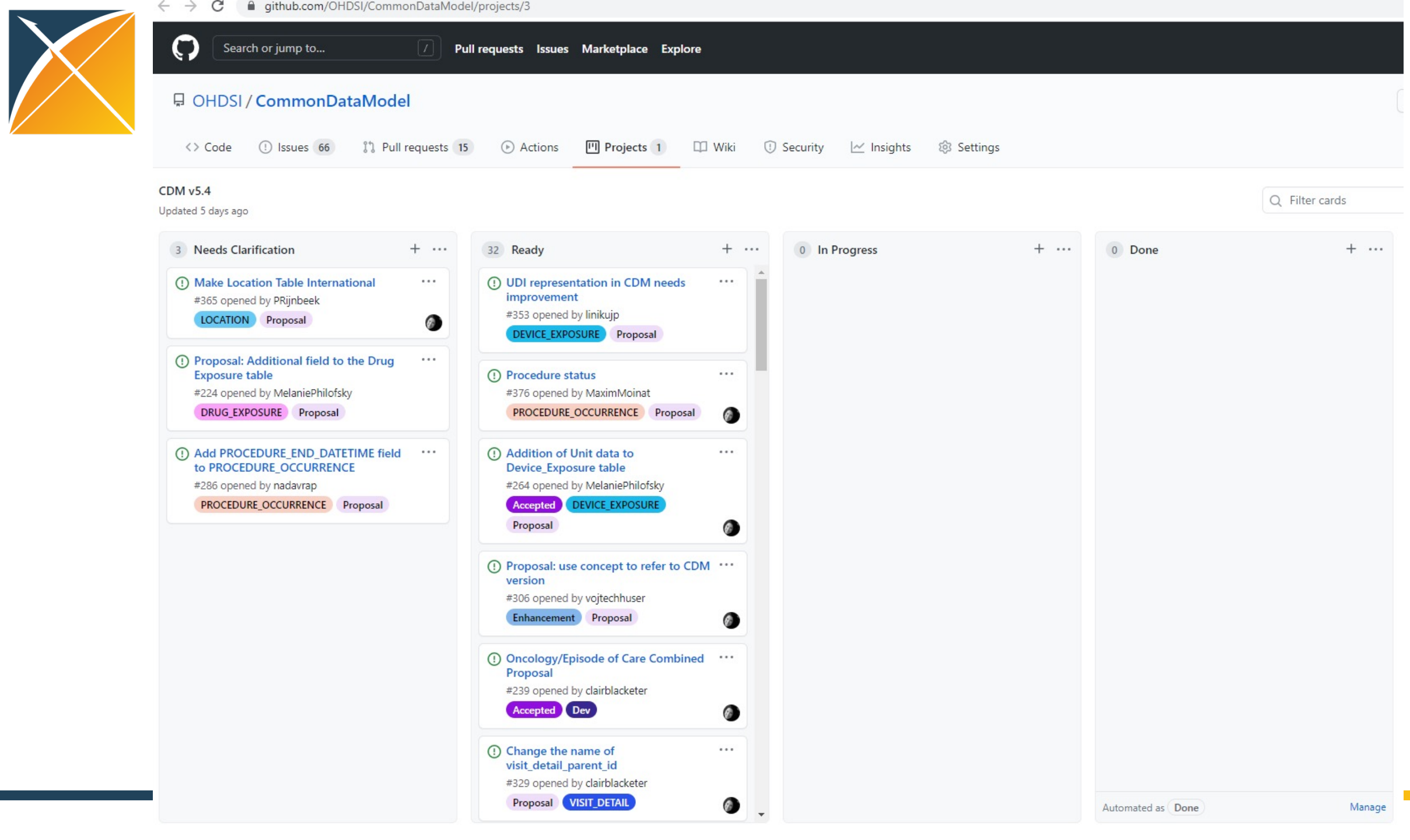
10

7.5

- Establish clear by-laws dictating the CDM change process and versioning
  - KR1: Draft initial guidelines for use cases and use case ownership by Q1
  - KR2: Draft initial guidelines for CDM model extension and versioning by Q2
  - KR3: 100% agreement from the community on proposed guidelines by Q4

2

7.5


github.com/OHDSI/CommonDataModel/projects/3
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Pull requests 15
Actions
Projects 1
Wiki
Security
Insights
Settings
CDM v5.4
Updated 5 days ago
Filter cards
3 Needs Clarification
Make Location Table International
#365 opened by PRijnbeek
LOCATION
Proposal
Proposal: Additional field to the Drug Exposure table
#224 opened by MelaniePhilofsky
DRUG_EXPOSURE
Proposal
Add PROCEDURE_END_DATETIME field to PROCEDURE_OCCURRENCE
#286 opened by nadavrap
PROCEDURE_OCCURRENCE
Proposal
32 Ready
UDI representation in CDM needs improvement
#353 opened by linikujp
DEVICE_EXPOSURE
Proposal
Procedure status
#376 opened by MaximMoinat
PROCEDURE_OCCURRENCE
Proposal
Addition of Unit data to Device_Exposure table
#264 opened by MelaniePhilofsky
Accepted
DEVICE_EXPOSURE
Proposal
Proposal: use concept to refer to CDM version
#306 opened by vojtechhuser
Enhancement
Proposal
Oncology/Episode of Care Combined Proposal
#239 opened by clairblacketer
Accepted
Dev
Change the name of visit_detail_parent_id
#329 opened by clairblacketer
Proposal
VISIT_DETAIL
0 In Progress
0 Done
Automated as Done
Manage

Population-level Estimation / Patient-level Prediction Methods Research Agenda

- Methods for vaccine effect estimation
  - Vaccine safety surveillance overall method evaluation (EUMAEUS)
  - Effect of outcome definition operating characteristics on vaccine safety surveillance
  - Comparative vaccine effectiveness in RWD

9

- Phenotype research
  - Validation of methods for establishing phenotype operating characteristics (e.g. PheValuator, guided patient profile review).

3

- Prediction
  - Investigate the impact that target and outcome definitions have on prediction models (i.e., are the models stable or unstable to small definition changes)
  - Investigate the use of proxy targets when developing models
  - Establishing a prediction model library

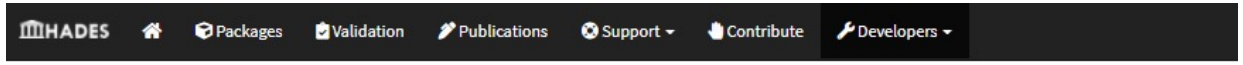
9

- Small-databases challenges
  - Few exposed: evaluation of balance metrics when counts are low
  - Few exposed: methods for addressing confounding when counts are low (e.g. cardinality matching, dimensionality reduction before PS fitting, informed priors for our PS models)

5

HADES OKR

- **Objective**: Enable the OHDSI community to perform observational research following OHDSI best practices for characterization, population-level estimation, and patient-level prediction by providing a cohesive set of open-source analytic software
  - **Key result 1**: To reduce dependency on a small number of developers, reduce the maximum number of packages per maintainer to 5 — 6
  - **Key result 2**: Increase the unit test coverage to > 80% for all packages — 5
  - **Key result 3**: Release 4 study package skeletons, and make sure they are directly available to users — 7.5



Package statuses

The table below lists, for each of the HADES packages, the following details:

- **Version:** The latest released version.
- **Maintainer(s):** The persons responsible for the package. Only maintainers can create releases.
- **Availability:** whether the package can be installed from CRAN (using `install.packages()`), or needs to be installed from GitHub (using `remotes::install_github()`).
- **Open issues:** The number of open issues.
- **Open pull-requests:** The number of open pull-requests.
- **Build status:** Whether the package passes R Check (including unit tests) on several different operating systems, and using various database platforms. The status shown is of the the latest push, including those to develop branches. Released packages (in the master branch) by definition have successful builds, and are not shown here.
- **Coverage:** The percentage of lines of code that is covered by the unit tests in the master branch (i.e. in the latest released version).

Package	Version	Maintainer(s)	Availability	Open issues	Open pull-requests	Build status	Coverage
Andromeda	v0.4.1	Adam Black	CRAN	8	1	R-CMD-check passing	codecov 87%
BigKnn	v1.0.0	Martijn Schuemie	GitHub	1	0	R-CMD-check passing	codecov unknown
CirceR	v1.1.1	Chris Knoll	GitHub	1	0	R-CMD-check passing	codecov 87%
CohortDiagnostics	v2.1.0	Gowtham Rao	GitHub	19	1	R-CMD-check passing	codecov 81%
CohortMethod	v4.1.0	Martijn Schuemie	GitHub	5	0	R-CMD-check passing	codecov 63%
Cyclops	v3.1.1	Marc Suchard	CRAN	7	0	R-CMD-check passing	codecov 66%
DatabaseConnector	v4.0.2	Martijn Schuemie	CRAN	16	1	R-CMD-check passing	codecov 40%
EmpiricalCalibration	v2.1.0	Martijn Schuemie	CRAN	0	0	R-CMD-check passing	codecov 0%
Eunomia	v1.0.1	Frank DeFalco	CRAN	0	0	R-CMD-check passing	codecov 72%
EvidenceSynthesis	v0.2.3	Martijn Schuemie	CRAN	0	0	R-CMD-check passing	codecov 41%
FeatureExtraction	v3.1.1	Anthony Sena	GitHub	21	2	R-CMD-check passing	codecov 16%
Hydra	v0.2.0	Martijn Schuemie	GitHub	9	6	R-CMD-check passing	codecov 0%
MethodEvaluation	v2.1.0	Martijn Schuemie	GitHub	3	0	R-CMD-check passing	codecov 0%
OhdsiSharing	v0.2.2	Lee Evans	GitHub	1	1	R-CMD-check passing	codecov 0%
ParallelLogger	v2.0.1	Martijn Schuemie	CRAN	3	0	R-CMD-check passing	codecov 55%
PatientLevelPrediction	v4.3.7	Jenna Reps & Peter Rijnbeek	GitHub	25	1	R-CMD-check passing	codecov 14%
ROhdsiWebApi	v1.2.0	Gowtham Rao	GitHub	11	1	R-CMD-check passing	codecov 10%
SelfControlledCaseSeries	v3.0.0	Martijn Schuemie	GitHub	8	0	R-CMD-check passing	codecov 53%
SelfControlledCohort	v1.5.1	Jamie Gilbert	GitHub	0	0	R-CMD-check passing	codecov 95%
SqlRender	v1.7.0	Martijn Schuemie	CRAN	31	1	R-CMD-check passing	codecov 83%

KR1: Expand package ownership:

- 11 different developers maintaining HADES packages

KR1: Expand package ownership:

- Martijn still owns 10 packages
- We need broader support from community to distribute workload

KR2: Test coverage > 80%:

- Great job for the progress!
- Adam Black (Andromeda)
- Chris Knoll (Circe)
- Gowtham Rao (CohortDiagnostics)
- Jamie Gilbert (SelfControlledCohort)
- Martijn Schuemie (SqlRender)

KR2: Test coverage > 80%:

- 14 of 20 packages still don't meet the HADES target
- More community support in developing test cases is needed

https://ohdsi.github.io/Hades/packageStatuses.html

Respond at **PollEv.com/patrickryan800**

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Additional resources about OKRs

- Google page: https://rework.withgoogle.com/guides/set-goals-with-okrs/steps/set-objectives-and-develop-key-results/
- Measure What Matters, John Doerr: https://www.whatmatters.com/