Welcome to Phenotype Phebruary: Week 3 update

Patrick Ryan

OHDSI

Welcome to Phenotype Phebruary!

General

Patrick_Ryan 7d

Team:

It's finally arrived. That wonderful month when you can put all your troubles aside, cast off those New Year's resolutions you've already failed at, enjoy the freezing cold Northeastern US weather or the Australian heat, and JUST FOCUS ON PHENOTYPING!

28 days, 28 phenotypes. That's our target for OHDSI in 2022. Are you ready?

For those who missed it, our OHDSI community call recording is here 4 where I tried to provide a little background and motivation for this big community push together.

But to summarize it here: phenotypes are the foundational element in almost every real-world analysis we do in OHDSI, they are the natural bridge between our standardized data (the OMOP CDM) and our standardized analytics (such as ATLAS and the HADES packages). The reliability of the evidence we generate often lives and dies by the quality of the phenotypes that we use as inputs of indications, exposures, outcomes, and other features that we put into our analyses. And yet, across the broader research enterprise, the science of phenotype development and evaluation is relatively immature. The world doesn't yet have consensus best practices to design phenotypes, doesn't have agreed standardized tools to build phenotypes, doesn't have consistent, reproducible methods to evaluate phenotypes. Our phenotypes are fraught with substantial measurement error; we know we likely have suboptimal sensitivity, specificity, and positive predictive value, yet we don't consistently estimate the measurement error and even more rarely integrate measurement error into our analyses. No large-scale regression or fancy deep learning model is sufficient to solidify the house of cards that our analyses rest upon if we have suspect phenotypes.

Feb 1

1 / 2

Feb 2

7d ago

- type 2 diabetes mellitus
- Alzheimer disease
- heart failure
- pulmonary embolism
- type 1 diabetes mellitus
- suicidal thoughts or behavior
- deep vein thrombosis
- Long COVID
- non-small cell lung cancer (NSCLC)
- depression
- hypertension
- anxiety
- acute myocardial infarction
- cervical cancer
- multiple sclerosis
- Guillain-Barre syndrome
- epilepsy
- kidney stones
- hemorrhagic stroke
- Systemic Lupus Erythematosus
- prostate cancer
- diabetes mellitus
- Parkinsonism
- autistic disorder
- rheumatoid arthritis
- migraine
- hyperthyroidism
- cardiomyopathy
- homelessness
- Neutropenia
- ischemic stroke
- Crohn's disease
- psoriasis
- anaphylaxis
- Asthma/COPD
- pregnancy
- seizure
- multiple myeloma
- atrial fibrillation
- melanoma
- acute hepatitis
- Triple Negative Breast Cancer
- acute hepatic failure
- attention deficit hyperactivity disorder
- ulcerative colitis
- bipolar disease
- peripheral artery disease
- HIV
- gastrointestinal bleeding
- hypoglycemia
- pulmonary arterial hypertension
- hepatic cirrhosis
- NASH (Non-Alcoholic SteatoHepatitis)
- Acute Kidney Injury

https://ohdsi.org/phenotype-phebruary/

How can you get involved in Phenotype Phebruary?

- Join the conversation!
  - Discussions will be on forums.ohdsi.org
  - Each day will be a new thread, all threads available via: https://ohdsi.org/phenotype-phebruary/
  - Explore the definitions and review the results provided
  - Reply with your thoughts, reflections, insights and questions
- Evaluate the cohort definitions in your data!
  - Execute cohort definitions and CohortDiagnostics in your CDM
  - Share insights you learn from your data on the forums
  - Share results to compile across the network on data.ohdsi.org
- Lead a discussion!
  - Add your own phenotype discussion above and beyond those scheduled to be led by the community

Phenotype Phebruary resources

- https://atlas-phenotype.ohdsi.org/
  - ATLAS instance for OHDSI Phenotype Development WG to share cohort definitions
  - Want to get read access to this ATLAS instance?
    Fill out form here: https://forms.gle/6fxcZFyufhL39pLj7
- https://data.ohdsi.org/phenotypePhebruary/
  - CohortDiagnostics instance that we'll be results each day from Phenotype Phebruary evaluations
- https://github.com/ohdsi-studies/PhenotypePhebruary
  - Git repository where we can share code to run CohortDiagnostics
- Phenotype Development and Evaluation WG

Phenotype Phebruary

February 2022: Every day, a new phenotype will be developed and evaluated following OHDSI best practices

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28 ***Developmental disabilities*** *Claudia Pulgarin*						

Respond at **PollEv.com/patrickryan800**

What has been your phavorite Phenotype Phebruary phun phact so phar?

Top

No responses received yet. They will appear here...

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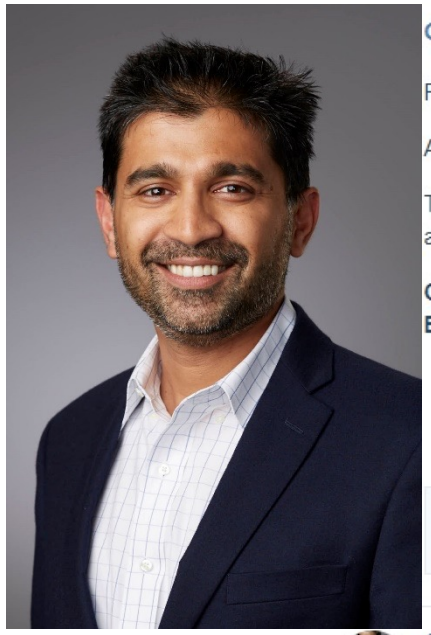
Phenotype Phebruary Day 15 - Acute Myocardial Infarction



Gowtham_Rao 2 2d

Part of the Valentines week 1

As described in the hypertension post I start with my notes - sources from medical text books

The phrase Acute Myocardial Infarction - is ambiguous and i read three related chapters in the text book and summarized them as my notes below

Chronic Stable Angina, Unstable Angina, Non ST Segment Elevation of Myocardial Infraction, ST Elevation Myocardial Infarction

Reply

created	last reply	13	19	1	1
2d	5h	replies	views	user	link

Gowtham_Rao 2d

Chronic Stable Angina, Unstable Angina, Non ST Segment Elevation of Myocardial Infraction, ST Elevation Myocardial Infarction

> **Chronic Stable Angina:**
> *Overview*:
> most common clinical manifestation of coronary artery disease (CAD) - imabalnce between myocardial metabolic O2 demand vs supply commonly because of atherosclerotic coronary artery obstruction.
> *Presentation*:
> Associated with exertion or emotional upset
> Relieved quickly by rest or nitroglycerin
>
> *Assessment*:
> History of established risk factors: Cigarette smoking, hypertension, hypercholesterolemia, diabetes, obesity
> EKG - maybe normal

Feb 13

1 / 14
Feb 13

5h ago

Phenotype Phebruary Day 16 - Heart Failure (Chronic Heart Failure, Acute Decompensated HF, Cor-Pulmonale)

Gowtham_Rao 5d

Reserved - for summary

Reply

created	last reply	replies	views	user
5d	4d	8	22	1

Gowtham_Rao 5d

Clinical description - Chronic Heart Failure

Chronic Heart Failure
Overview: Abnormal cardiac function or structure that results in clinical symptoms (e.g. dyspnea, fatigure) and

Feb 16

1 / 9
Feb 16

4d ago

Phenotype Phebruary Day 17 - Cardiomyopathy

Gowtham_Rao 8 4d

This is a complex clinical idea - and i have found conflicting ways in authoritative sources have defined it. This makes it difficult to phenotype. Can we phenotype Cardiomyopathy? A general principle that we follow - If we cannot come to shared understanding of what the phenotype is - by authoring a clear clinical description - then we probably cannot phenotype it?

I started by reviewing authoritative sources (Harrison's text book, Uptodate) and put my notes here. Because of the wide variation, i struggled because the sub-types were truly different clinical ideas and considering them as one broad "cardiomyopathy" seemed not appropriate.

Because i felt like i was stuck - i went to Atlas and did a lexical search and found that there were many concept id's for the idea of cardiomyopathy with two of them accounting for almost all of the concept id. These two were also non specific - and different from the contemporary classification of dilated cardiomyopathy, restrictive cardiomyopathy and hypertrophic cardiomyopathy.

I then investigated the trends in use of such codes in various data sources. see ARES reports for concept id and found that their utilization changed (increased dramatically) after 2016 (in US datasets) when the switch happened from ICD9-CM to ICD10-CM.

Feb 17

1 / 11
Feb 18

28m ago

Phenotype Phebruary Day 18 -Multiple sclerosis

General

Gowtham_Rao 3d

Hi team,

wow it's day 18 already! and it's me again @azzashoaibi and again using @Gowtham_Rao account. Today, I would like to start a discussion about the phenotype- Multiple sclerosis. Some of the material discussed here is captured from a prior work by @Jill_Hardin and @rmakadia !

You all now learned from @Gowtham_Rao the importance of clinical description! so let's start MS clinical description.

Clinical description:
you can find the following definition by the national institute of Neurological disorder and stroke, Multiple Sclerosis Information Page | National Institute of Neurological Disorders and Stroke
Overview :
An unpredictable disease of the central nervous system, multiple sclerosis (MS) can range from relatively benign to somewhat disabling to devastating, as communication between the brain and other parts of the body is disrupted. Many investigators believe MS to be an autoimmune disease – one in which the body, through its immune system, launches a defensive attack against its own tissues. In the case of MS, it is the nerve-insulating myelin that comes under assault. Such assaults may be linked to

OHDSI

Phenotype Phebruary Day 19 - Triple negative breast cancer

General cohort

Adam_Black 11 5d

First I want to thank everyone for the informative phenotype discussions so far. I have learned a lot from reading them.

Along with lots of help from my colleagues Darya Kosareva and @agolozar I have created a few cohort definitions for triple negative breast cancer to share. In the process I have learned some lessons about the importance of understanding the vocabulary and how clinical concepts are recorded in actual data. I'd like to summarize the cohorts first then put the clinical definition and references in then next post. Keep in mind that I rely on others for clinical expertise since I have no clinical training and have been lucky to have many people around me with significant clinical expertise.

Triple negative breast cancer (TNBC) is an aggressive form of breast cancer that is estrogen receptor (ER), progesterone receptor (PR) negative, and HER2 negative. There are few treatment options and the prognosis is bad. I'm trying to identify incident cases of TNBC. I'll put a more complete clinical description in the next post.

Initially I expected standardization to allow for the creation of one cohort definition that captures persons meeting a particular phenotype definition across a network of databases without having direct access to the data or knowing how the source data was recorded. This expectation is based on two assumptions

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OHDSI

Putting the PH in PHenotype PHebraury: Day 20

General

Evan_Minty 2 20h

If you thought you were going to get out of PHebruary, without PH, well, you haven't been paying attention. Without further ado I introduce to the reader: **P**ulmonary **H**ypertension.

I've reached out to and involved a friend and colleague, Jason Weatherald (not yet on the forums but joining soon). Some of you might recognize his name, we've been working together with Patrick Alba, Scott Duvall, and others at the VA, as well as Jose Posada on the Covid Prone NLP study. Jason is a pulmonologist who did his fellowship in pulmonary hypertension, he's just relocated to the U of Alberta (in Edmonton) from Calgary, although we won't hold that against him.

Frankly, for many of these descriptions, I feel like I should have received CME credit for reading them (looking at you in particular, @Allen Wu). As an internist, I vowed to love all my children organ systems equally, however I do think the gauntlet has been thrown down to convince the audience that the heart and lungs are *at least* as cool as the brain.

There's another method to this madness, in that Jason and I have been discussing and think there's exceptional alignment between the capacities and interest of the OHDSI community, and the RWE research needs within pulmonary HTN, so part of this is to generate some interest in a really interesting area of pathophysiology and emerging therapeutics, and lead some work in this area.

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Phenotype Phebruary Day 21- Prostate Cancer

General

agolozar Asieh Golozar 6 5h

Hi everyone,

It is Phenotype Phenbruary-Day 21 and it is time to talk about **prostate cancer**. Some of the materials I am presenting here are based on previous works from the PIONEER study-a-thon, the Oncology WG (specifically the work @mgurley is leading on deriving initial disease episode from discrete diagnosis and an amazing discussions and team work. A shout out to Darya Kosareva, @Ajit_Londhe and the Amgen team, @mmayer, @mgurley, @Adam_Black.

Clinical Definition
Prostate cancer is a cancer of the prostate gland, an organ of the male reproductive system located below the bladder and surrounding the urethra. It is the second most common malignancy in men and the fifth leading cause of death worldwide. Median age at diagnosis is approximately 67 years.

Clinical Presentation

- Most prostate cancer patients are asymptomatic at the time of diagnosis and are diagnosed during screening.
- Local growth of the tumor can lead to symptoms of urinary obstruction including urgency,

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1m ago

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What has been your phavorite Phenotype Phebruary phun phact so phar?

Top

2	I learned through the power of community - feedback from others in OHDSI improved my cohort algorithms
1	I commit to not look at codes before writing a clinical description! That clinical description is the most important first step for phenotyping
	clarify of the clinical idea/ description matters. ex. Any delirium (some that may be related to aging

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Phenotype Phebruary Day 1 – Type 2 diabetes mellitus

General

Patrick_Ryan 6d

Today, we'll be using OHDSI tools to develop and evaluate cohort definitions for the phenotype target of Type 2 diabetes mellitus (T2DM).

Clinical description:

The American Diabetes Association (ADA) "Standards of Medical Care in Diabetes" is a tremendous resource to learn more about diabetes for those interested. It classifies diabetes into "the following general categories:

1. Type 1 diabetes (due to autoimmuneb-cell destruction, usually leading to absolute insulin deficiency, including latent autoimmune diabetes of adulthood)
2. Type 2 diabetes (due to a progressive loss of adequate b-cell insulin secretion frequently on the background of insulin resistance)
3. Specific types of diabetes due to other causes, e.g.,monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young), diseases of the exocrine pancreas (such as cystic fibrosis and pancreatitis), and drug- or chemical-induced diabetes (such as with glucocorticoid use, in the treatment of HIV/AIDS, or after organ transplantation)
4. Gestational diabetes mellitus (diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation)"

It provides objective diagnostic criteria based on readily-accessible laboratory measures used in routine practice. "Diabetes can be diagnosed based on plasma glucose criteria, either the fasting plasma glucose (FPG) value or the 2-h plasma glucose (2-h PG) value during a 75-g oral glucose tolerance test (OGTT), or A1C criteria"

The epidemiology and disease natural history of T2DM has been extensively characterized in the literature. Common symptoms of T2DM onset include thirst, frequent urination, weight loss. Common 'risk factors' include age, obesity, hypertension and hyperlipidemia. Management of T2DM can include lifestyle modifications, including diet and exercise, as well as pharmacologic treatment (with notable drugs including metformin, Sulfonylureas, Sodium Glucose Co-Transporter 2 (SGLT2) inhibitors, Glucagon-like Peptide-1 Receptor Agonists (GLP1RA), Dipeptidyl peptidase-4 inhibitor (DPP4i), Thiazolidinediones, and insulin). Long-term complications associated ofT2DM can include cardiovascular events (ischemic heart disease, stroke), diabetic retinopathy, kidney failure, and amputation. The incidence of T2DM has been increasing over time. Current prevalence estimates of

Feb 1
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Feb 2
1d ago

Phenotype Phebruary Day 2 - Type 1 diabetes mellitus

General

Patrick_Ryan 5d

Welcome everyone to Day 2 of Phenotype Phebruary! I hope you enjoyed reading the kick-off to the discussion of phenotyping Type 2 Diabetes Mellitus on Day 1 3, and encourage you to join that conservation. Meanwhile, here, I hope to stimulate another discussion, this one on Type 1 Diabetes Mellitus (T1DM).

Now admittedly, I wasn't planning to consider T1DM as a phenotype to work through during the month, because I thought it might be too close in spirit to T2DM. However, the community spoke loudly in their voting, with 20 individuals asking to explore T1DM, putting it in the top 5 of desired targets, so here we are.

And since we did T2DM yesterday, I figured today's a good opportunity stay in this related space, but highlight some different insights and observations that arise from going through the OHDSI phentoype development and evaluation process.

Clinical description:

As with T2DM, we can look to the American Diabetes Association (ADA) "Standards of Medical Care in Diabetes" to provide a helpful frame of reference for the disease. ADA classifies diabetes into "the following general categories:

- Type 1 diabetes (due to autoimmuneb-cell destruction, usually leading to absolute insulin deficiency, including latent autoimmune diabetes of adulthood)
- Type 2 diabetes (due to a progressive loss of adequate b-cell insulin secretion frequently on the background of insulin resistance)
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- Gestational diabetes mellitus (diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation)"

Here, I find the ADA's discussion about the evolving landscape of T1DM and T2DM quite informative:

Feb 2

1 / 11
Feb 3

19h ago

Phenotype Phebruary Day 3 - Atrial Fibrillation

General

Patrick_Ryan 4d

Today, I'd like to a little side step from the problem of creating phenotypes de novo, and talk about how to try to implement a phenotype algorithm using OHDSI tools based on an existing description from some external material, just as a publication. I'll use the phenotype of Atrial Fibrillation to demonstrate some tips and tricks, but I hope you'll see that the steps I'll follow here are completely transportable to whatever phenotype you may want to be working on.

Clinical description:

Atrial fibrillation (AFib) is an abnormal heart rhythm, often with irregular beats in the atrial chamber. CDC has a nice animated gif to illustrate what this means: Atrial Fibrillation | cdc.gov 1. Initial symptoms of AFib may include feeling of irregular heartbeat or palpitations, lightheadedness, fatigue, dyspnea, and chest pain. AFib is frequently comorbid with other cardiovascular conditions, such as hypertension, coronary artery disease, and pericarditis. Patients with AFib are at higher risk of cardiovascular complications, including heart failure and ischemic stroke. Afib is most commonly diagnosed with electrocardiogram, though echocardiogram can also be used to evaluate Afib and valvular defects. AFib can be classified as 'first detected', 'paroxysmal', 'persistent', 'longstanding persistent', and 'permanent' based on the frequency and duration of abnormal heartbeat episodes. Common pharmacologic treatment may include beta blockers, calcium channel blockers, amiodarone, and anticoagulants (such as warfarin, heparin, or a direct oral anticoagulant (DOAC) such as apixaban, rivaroxaban, and dabigatran). Other treatments can include electrical cardioversion and catheter or surgical ablation. AFib is more common in men than women, and the risk of AFib increases with age.

** Phenotype development: **

AFib is a common target for investigation in observational databases, both as a disease that impacts future outcomes and also as an indication for various treatments that are regularly evaluated for comparative effectiveness and safety.

As a case in point, just PubMed ""atrial fibrillation" AND ("claims" OR "electronic health records")" and you'll see >1,000 articles! You'll find many recent observational studies in high-profile journals. Articles like Ray et al, " Association of Rivaroxaban vs Apixaban With Major Ischemic or Hemorrhagic Events in Patients With Atrial Fibrillation", in JAMA 1 in Dec2021 (which seems like a nice target for an OHDSI replication, wink wink @agolozar). Or Kim et al, " Machine Learning Methodologies for Prediction of

Feb 4

1 / 5
Feb 4

2d ago

Phenotype Phebruary Day 4- Multiple Myeloma

General

Patrick_Ryan 1 3d

Team:

Welcome to Phenotype Phebruary Day 4! We've discuss phenotyping metabolic diseases (T2DM and T1DM) and a cardiovascular disease (AFib), so let's turn our attention to a different disease area that is a particularly active focus for many community collaborators - oncology. OHDSI's Oncology workgroup has made good progress in thinking about advances in the OMOP CDM and OHDSI vocabularies to accommodate the study of cancers and their treatments. Another key opportunity, that I know @agolozar is quite keen to lead within the Oncology WG, is developing phenotype algorithms for each cancer target, and evaluating those algorithms across a diverse array of databases that could potentially be used to generate evidence, including administrative claims, electronic health records, specialty oncology EHRs, and cancer registries. Phenotype Phebruary seems the perfect time to get community collaboration toward this objective, starting today with Multiple Myeloma.

Clinical description:

Multiple myeloma is a type of blood cancer that affects plasma cells. Malignant white blood cells develop in bone marrow, suppressing healthy plasma cells that produce antibodies against infection. Malignant plasma cells produce M protein, which can cause tumors, kidney damage, bone destruction and impaired immune function. They also cause decreased production of red blood cells and platelets, which can result in anemia and bleeding.

Multiple myeloma is diagnosed based on plasmacytoma identified on biopsy, >30% malignant plasma cells in bone marrow aspiration, evaluated levels of M protein from protein electrophoresis in the blood or urine, osteolytic lesions observed on imaging, and IgG or IgA antibody levels in the blood. Additional diagnostics tests may include measurement of Beta2-microglobulin level. Management of multiple myeloma typically requires pharmacologic treatment with proteasome inhibitors (including bortezomib, carfilzomib, ixazomib), immunomodulatory drugs (like lenalidomide, pomalidomide, thalidomide), steroids (dexamethasone, prednisone), monoclonal antibodies (such as elotuzumab, daratumumab, isatuximab, belantamab), and chemotherapy (doxorubicin, melphalan, cyclophoshamide, bendamsutine, vincristine). Autologous stem cell transplant may be considered for those eligible. Patients may also be treated with bisphosphonates to reduce risk of bone loss.

Multiple myeloma is more common in men than women, more common in Black or African American than whites, more common in older ages (with most cases occurring after 40 years old)

Feb 5

1 / 8
Feb 5

22h ago

Phenotype Phebruary Day 5- Alzheimer's Disease

General

Patrick_Ryan 2d

Team:

Day 5 of Phenotype Phebruary. Still lots of methodological topics to discuss and disease areas to investigate. Today, I'll try to start a conversation of the phenotype that was most highly voted on across our community: Alzheimer's disease.

Clinical description:

Alzheimer's disease is a progressive neurodegenerative disorder and the most common cause of dementia (loss of cognitive functions interfering with daily activities), representing 60-80% of cases (according to Alzheimer's Association). Intitial symptoms of Alzheimer's disease may be short-term memory loss and other difficulties associated with mild cognitive impairment, such as word-finding, visual/spatial issues, and general confusion. Diagnosis of Alzheimer's disease may involve neurological exam, including brain MRI or CT scans, to identify other potential causes of dementia other than Alzheimer's, and mental cognitive status tests. Drugs approved for use in Alzheimer's disease include cholinesterase inhibitors (such as donepezil, galantamine, or rivastigmine) and memantine, which are primarily aimed at treating cognitive symptoms. In 2021, aducanumab was approved by US FDA on the basis of clinical trial data suggesting reduction of amyloid beta plaque. Alzheimer's disease risk increases with age, with most cases detected after 65 years old. Prevalence of AD is higher in females than males, though that is attenuated by female longer life span. It is one of leading causes of death globally, and second-leading cause in high-income countries (WHO).

Phenotype development:

I've mentioned in prior posts that a valuable starting point for phenotype development can be the published literature, and I've shown how you - provided that a journal article supplied enough details - you can replicate their algorithms using OHDSI tools. But I want to take a digression here for a little rant: if observational researchers all need to develop phenotypes to conduct our analyses and should all review prior literature as part of our research process, then why is so hard to search for publications of observational research and extract out the phenotypes that were previously used? If phenotypes are so central to the integrity of our research, then as a research community, why do we accept short freetext descriptions of phenotypes in manuscripts, sometimes without list of codes and often without a complete specification of the logic that was used to implement them? And for those of us promoting increased transparency, when we try to add additional detail in supplemental materials, why do we often format it in ways that make it painful for others to re-use without extensive manual curation? When I

Feb 5

1 / 1
Feb 6

2d ago

Phenotype Phebruary Day 6- Hemorrhagic events

General

Patrick_Ryan 1d

Welcome to Phenotype Phebruary Day 6!

Up to this point, we've discussed phenotype targets that are generally considered chronic diseases (T2DM 1, T1DM 1, AFib, multiple myeloma 1, Alzheimer's). As such, our focus has been primarily on identifying cohort entry, with the subposition that once a person enters the cohort, they remain in that health state until the end of their observation.

Today, I'd like to talk about creating a cohort definition that allows for a person to enter and exit the cohort multiple times. We'll use hemorrhagic events and bleeding-related hospitalizations as our example. This will subsume a couple phenotypes high on the OHDSI wishlist : hemorrhagic stroke and gastrointestinal bleeding.

Our motivating use case: In our AFib discussion, we noted a recent paper by Ray et al, " Association of Rivaroxaban vs Apixaban With Major Ischemic or Hemorrhagic Events in Patients With Atrial Fibrillation", in JAMA 1 in Dec2021. In that study, the target and comparator populations were persons with AFib with DOAC exposure, so we should be clear how we could use our AFib cohort, intersect it with a new user drug cohort, and identify the patients eligible to be analyzed. That was the easy part, now we'll tackle the trickier bit: finding the outcomes for those patients. In their publication, Ray et al classify and define ischemic and hemorrhagic events, with ischemic events including ischemic strokes and systemic embolisms, and hemorrhagic events including hemorrhagic strokes and bleeding-related hospitalizations. Today, I'll just focus on that second aspect.

Clinical description:

I had fun looking for a clinical definition to report here without sounding stupid: Medlineplus gave me this: "Bleeding is the loss of blood". Google's healthbox provides defines bleeding (aka hemorrhage) as "the release of blood from a broken blood vessel, either inside or outside the body". Perhaps not terribly informative.

In part, its because it's an ill-specified phenotype target: hemorrhage can be the result from a broad constellation of injuries, can occur anywhere throughout the body, and can have consequences that vary from inconsequential/self-remedying to fatal. External bleeding is usually easy to detect (look for red), and if that does not resolve after a few minutes of applying pressure may require to seek medical attention. Internal bleeding may be initially asymptomatic, but initial signs can include hypotension, abnormal heart rate or breathing, drowsiness or loss of consciousness, in addition to observing blood

Feb 6

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Feb 7

18h ago

Phenotype Phebruary Day 7 - Neutropenia

General

Patrick_Ryan 10h

Team:

Can you believe that the end of week 1 of Phenotype Phebruary is already here?!? Time flies when you're having fun.

In the first six days, I tried to initiate conversations around phenotyping diseases that were primarily defined by condition occurrence records (T2DM, T1DM, AFib, multiple myeloma, Alzheimers, bleeding). But there continues to be a lot of interest in our community in using measurement values as part of the phenotyping process. So, today, let's talk about Neutropenia.

Clinical description:

Neutropenia is abnormally low count of neutrophils in the blood. Neutrophils are the primary circulating white blood cells and function as part of the immune system to respond to inflammation and bacterial infections. So, persons with neutropenia are are increased risk of infection. While neutropenia itself can be asymptomatic, symptoms often manifest as a result of an infection, and can include fever, pain in swallowing or gums, or skin abcesses. Neutropenia can be congenital or acquired, and acute or chronic, and is known to be associated with various conditions and attributed to drug exposure. While neutropenia is specifically referred to decreased neutrophils, other conditions are known to observe neutropenia in conjunction with other phenomena. Pancytopenia is decrease in red blood cells, white blood cells, and platelets. Leukopenia is low white blood cells of any time, which generally is inclusive of neutropenia.

Neutropenia can be diagnosed by measurement of neutrophils. One diagnostic criteria for severe neutropenia is absolute neutrophil count (ANC) < 500 cells per microliter of blood, while moderate neutropenia can be identified by ANC between 500-1000 cells per microliter, and mild neutropenia is classified as ANC between 1000 - 1500 cells per microliter. Severe neutropenia poses the greater infection risk, and is often where medical attention is recommended. However, since severe neutropenia is rare, it can be difficult to identify and classification, even with ease of measurement from a complete blood count test. Additional bone marrow biopsy may be required as a diagnostic procedure.

Treatment for neutropenia can include granulocyte colony stimulating factor (G-CSF), including filgrastim, and antibiotics to manage bacterial infections.

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10h ago

OHDSI

Phenotype Phebruary Day 8 - Kidney Stones

General

Patrick_Ryan 6d

Team:

For those who missed any of the fun in Phenotype Phebruary Week 1, here's a page with a running inventory of the phenotype conversations we've started: Phenotype Phebruary Daily Updates – OHDSI 1 As we embark on Week 2 of Phenotype Phebruary, I decided to select a phenotype that was highly voted on by our community that was more surprising to me. I don't know why kidney stones were of such interest to so many of you, but the community has spoken and I like the challenge of coming up with a fun and compelling story to promote phenotyping, so here goes…

Clinical description:

Kidney stone disease occurs when a calculus develops in the urinary tract, often starting in the kidney and passing through the ureters, bladder and urethra. This phenomenon, also known as neprolithiasis or urolithiasis, can be asymptomatic if the kidney stones are small enough. However, the size, shape and composition of calculi can vary substantially, and larger stones can create obstructions at any stage across the urinary tract. Such blockages can cause acute pain, typically presenting in the lower back or abdomen, and may also cause painful urination or hematuria. Kidney stones are typically diagnosed by symptoms, urine tests and imaging. Treatment often is based on patient symptoms. Pain management and hydration can allow some stones to pass spontaneously. Drugs to expedite passage, such as alpha blockers and calcium channel blockers, can be considered. Shock wave lithotripsy can be used in some circumstances to break stone into smaller pieces. Surgical removal via nephrolithotomy or ureteroscopy may be indicated depending on stone size and patient comorbidities and pain intensity.

Phenotype development:

One of the surprising statistics that I read across many different references was the notion that half of the people who have had a kidney stone will have another 10 years. This number was thrown around in many publications, and yet most cited the same seminal paper: Uribarri et al, "The first kidney stone", from BMJ in 1989. That paper provides a review of past studies that examined recurrence of kidney stones, providing their Table 1 compilation of the identified studies:

Table 1. *Cumulative Stone Recurrence Rate*

Study (Reference)	Cumulative Recurrence Rate %								
	1 Year			5 Years			10 Years		
	Total	Men	Women	Total	Men	Women	Total	Men	Women

Phenotype Phebruary Day 9 - Delirium [From Azza Shoaibi]

Gowtham_Rao 5d

Posting on behalf of @AzzaShoaibi
(the forum does not allow new users to post images or links!)

Team:

Day 9 of Phenotype Phebruary. I happen to be the bravest to pick a date for my phenotype that ends

Patrick amazing dense posts and start an era of "OK" Phenotype Phebruary posts. I hope that you will still find my input useful!

Today, I'll try to start a conversation of the phenotype that came to us during phenotype development and evaluation workgroup office hours. Our friend Aize wanted to know how can we phenotype delirium in observational data. Together we started the process of 1. Decide on the clinical description of delirium 2. Accumulate prior knowledge on the phenotype 3. Select initial concept set (codes)-using phoebe and Atlas. Those 3 steps took place during last week office hour. I then took the action of completing the next steps of 4. Build one or more cohort definition using atlas 5. Evaluate and iterate on the definition using cohort diagnostics. I will summaries my learnings today to Aize and you all, hoping that this will start a useful discussion

Clinical description:

My favorite paper that summarized what delirium is and what we know about it is here: Burns, A., Gallagley, A., & Byrne, J. (2004). Delirium. *Journal of Neurology, Neurosurgery & Psychiatry* , *75* (3), 362-367, but here is a quick overview of some points that I found relevant to the phenotyping exercise.

Delirium, or a confused mental state, occurs suddenly. A person has a change in mental status and acts disoriented and distracted. Delirium is more common in older adults, especially those with dementia, and people who need hospitalization. Prompt treatment is essential in helping a person with delirium recover. Delirium happens when a person has sudden confusion or a sudden change in mental status. The person may have trouble paying attention or thinking clearly. They may act disoriented or distracted. Delirium is more severe than having a "senior moment" — the minor problems people have with memory and understanding as they get older. It requires treatment and often hospitalization. Delirium is not a disease, It's a changed mental state. Because delirium is temporary, it's hard to know exactly how many people develop it. Researchers estimate that hospital delirium affects 15% to 50% of people. Below is the exact clinical criteria for delirium by DSM-IV to guide our way

OHDSI

Phenotype Phebruary Day 10 - Systemic Lupus Erythematosus

General

jswerdel Joel N. Swerdel 6 5d

In this edition to Phenotype Phebruary, I'd like to discuss the work @Jill_Hardin and I did for developing phenotype algorithms in the immunology space for systemic lupus erythematosus.

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease of unknown origin. Clinical manifestations include fatigue, arthropathy, and involvement of nearly all organ systems, particularly cardiac and renal.(Jump et al, Greco et al 1, Miner et al 1, Danila et al 1) A review by Stojan and Petri 1 of research on multi-country incidence rate estimates found the incidence rate of SLE to be between 1-9 cases per 100,000 person-years (PY).

As @Patrick_Ryan has provided an excellent review of the details of the phenotype algorithm development process, I'll build on that to demonstrate how we used the process for our cohort definitions. We first conducted a literature search for phenotype algorithms for SLE. From those resources we determined the codes used in prior studies. We used those as a starting point and entered those into the wonderful PHOEBE tool developed by @aostropolets . The final concept set was:

Concept Id	Concept Code	Concept Name	Domain	Standard Concept Caption	Exclude	Descendants
4300204	402865003	Systemic lupus erythematosus-associated antiphospholipid syndrome	Condition	Standard	☐	☑
4145240	307755009	Renal tubulo-interstitial disorder in systemic lupus erythematosus	Condition	Standard	☐	☑
4319305	95332009	Rash of systemic lupus erythematosus	Condition	Standard	☐	☑
255891	200936003	Lupus erythematosus	Condition	Standard	☐	☑
37016279	308751000119106	Glomerular disease due to systemic lupus erythematosus	Condition	Standard	☐	☑
46273369	72181000119109	Endocarditis due to systemic lupus erythematosus	Condition	Standard	☐	☑

We then began building our cohort definitions. We were concerned about possible index date misclassification as prior research 2 had indicated that there may be a long period between first symptoms and first diagnosis. We used the spectacular Cohort Diagnostics tool (thank you @Gowtham_Rao !) to examine the conditions and drugs in the time prior to an initial diagnosis of SLE and found in the IBM Commercial Claims and Encounters dataset:

Covariate Name	Start -30 to end -1
All	All
condition_occurrence: Essential hypertension (320128)	6.3%
condition_occurrence: Malaise (4272240)	4.2%
condition_occurrence: Inflammatory dermatosis (45766714)	4.1%
condition_occurrence: Joint pain (77074)	3.8%

OHDSI

Phenotype Phebruary Day 11 - Suicide attempts

General

Gowtham_Rao 3d

Azza Shoaibi

Hi team, it's me again @AzzaShoaibi using @Gowtham_Rao account. This is day 11 of Phenotype Phebruary and I would like to start a discussion about suicide attempt. This is a phenotype that I worked on with my dear friend @conovermitch . In today's post I will demonstrate:

1. how important it is to learn from what others already did (literature) as a primary input into the phenotyping process
2. how it is possible to incorporate other's findings into OHDSI phenotyping practices and tools
3. How we can but not necessarily should use "source codes" when developing phenotypes using OHDSI tools.

Suicide attempt/self-harm (clinical description):

One of the biggest challenges when working on this phenotype is agreeing on the target/clinical description. Suicide is a major public health concern and there is a big debate on what is the right target for studies looking at suicide as a target (study population) or an outcome. There is multiple overlapping but different constructs/terms like: Self-harm, suicide attempt, suicide ideation/thoughts, suicidality overall, suicidal behavior.

The table below from INTRODUCTION - Screening for Suicide Risk in Primary Care - NCBI Bookshelf [1] provides a nice summary of the clinical definitions of these terms

Term	Definition
Suicide	Death caused by self-directed injurious behavior with any intent to die as a result of the behavior.[2]
Suicide attempt	A nonfatal self-directed potentially injurious behavior with any intent to die as a result of the behavior. A suicide attempt may or may not result in injury.[2]
Suicidal self-directed violence	Behavior that is self-directed and deliberately results in injury or the potential for injury to oneself. There is evidence, whether implicit or explicit, of suicidal intent. This encompasses suicide deaths and suicide attempts.[2]
Other suicidal behavior and preparatory acts	Acts or preparation toward making a suicide attempt, but before potential for harm has begun. This can include anything beyond a verbalization or thought, such as assembling a method (e.g., buying a gun, collecting pills) or preparing for one's death by suicide (e.g., writing a suicide note, giving things away).[2,3] Referred to as "aborted suicide attempt" by the American Psychiatric Association.[4]
Suicidal ideation	Passive thoughts about wanting to be dead or active thoughts about killing oneself, not

OHDSI

Phenotype Phebruary Day 12 - Parkinson's disease & parkinsonism

General

It's been a while since we've seen allanwu — their last post was 5 months ago.

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allanwu 3d

I'd like to introduce thoughts from our joint team (at UCLA and Northwestern University) on Parkinson's disease and parkinsonism. Thanks to @Patrick_Ryan for encouragement to participate even as we have yet to setup our own OMOP-CDM instance.

Goal: to develop and evaluate algorithms (and impact of criteria used within them) that assess incidence and prevalence of

- Parkinson's disease (PD) and
- neurodegenerative parkinsonism disorders (PD included)

Clinical description

Parkinson's disease (PD) is a neurodegenerative disease that has been estimated to be increasing in prevalence based on large scale epidemiologic work. It is the most frequent form of neurodegenerative parkinsonism, itself a subset of parkinsonism syndromes. More details below.

PD is considered the condition when there is specific degeneration of the substantia nigra dopaminergic (DA) neurons over time producing the disease. It is estimated that well over 50% of DA cells will degenerate before clinical symptoms appear. This is the classic and core definition; however, increasingly there is appreciation of that PD itself is a multisystem disorder with involvement of other neurotransmitters and other systems within and not within the nervous system (often noted as non-motor symptoms – constipation, cognitive impairment, sleep disorders, autonomic dysfunction, depression, anxiety etc).

PD is the most common form of neurodegenerative parkinsonism (80-85%).
Neurodegenerative parkinsonisms (other than PD) are defined by having parkinsonism plus other neurologic systems that are affected by degeneration besides the specific PD degeneration described above. There will be described in more detail below – and include progressive supranuclear palsy (PSP), multiple systems atrophy (MSA), corticobasal degeneration (CBD) and others. Frequently, patients with neurodegenerative parkinsonism may be diagnosed with PD early on before neurodegenerative features become sufficiently prominent for clinical diagnosis over time. If patients have a clear diagnosis of PSP or MSA (for example), those are not considered PD, but are within neurodegenerative parkinsonism.

2h ago

Phenotype Phebruary Day 13 - Attention Deficit Hyperactivity Disorder

General

Patrick_Ryan 2d

Team:

Today, while many in the US are preparing for their Super Bowl football/commercial viewing parties, I'd like to discuss phenotyping Attention Deficit Hyperactivity Disorder (ADHD). This is work that several colleagues (@ericaVoss @jweave17 @Jill_Hardin @conovermitch) and I conducted over the past couple years that yielded a bunch of lessons learned the hard way. But the experience gave us insights to some complementary recommended practices that I've carried forward in my own research, so I thought I'd walk through the development process to show the pitfalls and ways to overcome them.

Clinical description:

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by patterns of inattention or impulsive behaviors that interferes with functions. ADHD can be classified by the most common symptoms, be it 'predominantly inattentive' presentation- where patients may struggle to organize or complete tasks, follow directions, or remember details of daily activities- or 'predominantly hyperactive-impulsive' presentation - where patients are constantly moving around or talking or interrupting when not appropriate. ADHD is most commonly diagnosed in childhood (though can occur with onset in adults), through physician examination and evaluation of ADHD symptoms over time and its impact in social settings (and ruling out alternative diagnosis from other mental health disorders or environmental factors). Management of ADHD may involve behavioral therapy or pharmacologic treatment (including stimulants such as methylphenidate, amphetamine, lisdexamfetamine, and non-stimulants such as atomoxetine and guanfacine).

Phenotype development:

Let's follow some of the practices we've discussed on prior threads. We'll start with PHOEBE to find our starting point in the OHDSI vocabulary:

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OHDSI

Phenotype Phebruary Day 14 - Hypertension

General

Gowtham_Rao 1 2d

On Valentines week - lets start he cardiovascular phenotypes. This week - we will work on

14 ***Hypertension*** *Gowtham Rao*	15 ***Acute myocardial infarction*** *Gowtham Rao*	16 ***Heart failure*** *Gowtham Rao*	17 ***Cardiomyopathy*** *Gowtham Rao*

Happy Valentines day @AzzaShoaibi

I decided to change the pattern of how we have been posting on the forums based on the feedback @ the OHDSI Phenotype Development and Evaluation workgroup (please join here 2). The feedback was - this is intimidating, too long and i dont know I (a new contributor) can do this.

So - instead of one long one per day post, i am going to break it down into multiple posts per day - hopefully this will make it easier to read.

I am going to try to use this cardiovascular week related posts to assert/express some of the best practice opinions that we have developed at the OHDSI Phenotype Development and Evaluation workgroup with focus on all the steps that needs to be done PRIOR to touching Atlas or creating code sets + the importance of such pre work.

Reply

Phenotype Phebruary Day 15 - Acute Myocardial Infarction

Weekly OHDSI Digest-14Feb2022

created	last reply	34	42	5	1	2
2d	1h	replies	views	users	like	links

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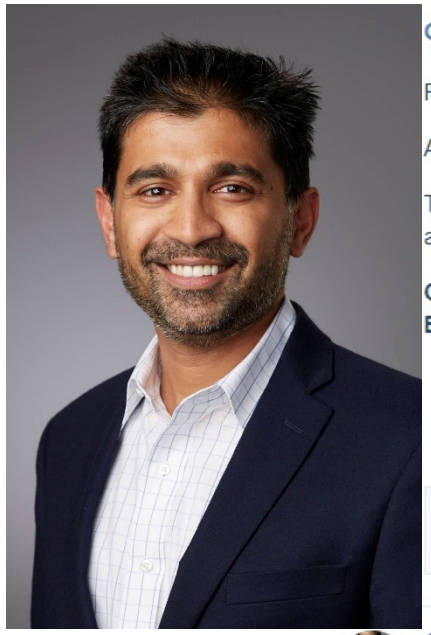
Phenotype Phebruary Day 15 - Acute Myocardial Infarction



Gowtham_Rao 2 2d

Part of the Valentines week 1

As described in the hypertension post I start with my notes - sources from medical text books

The phrase Acute Myocardial Infarction - is ambiguous and i read three related chapters in the text book and summarized them as my notes below

Chronic Stable Angina, Unstable Angina, Non ST Segment Elevation of Myocardial Infraction, ST Elevation Myocardial Infarction

Reply

created	last reply	13	19	1	1
2d	5h	replies	views	user	link

Gowtham_Rao 2d

Chronic Stable Angina, Unstable Angina, Non ST Segment Elevation of Myocardial Infraction, ST Elevation Myocardial Infarction

> **Chronic Stable Angina:**
> *Overview*:
> most common clinical manifestation of coronary artery disease (CAD) - imabalnce between myocardial metabolic O2 demand vs supply commonly because of atherosclerotic coronary artery obstruction.
> *Presentation*:
> Associated with exertion or emotional upset
> Relieved quickly by rest or nitroglycerin
>
> *Assessment*:
> History of established risk factors: Cigarette smoking, hypertension, hypercholesterolemia, diabetes, obesity
> EKG - maybe normal

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