

# Leaf and ATLAS Query Tools

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October 11, 2023



Icahn  
School of  
Medicine at  
**Mount  
Sinai**

# Agenda

1. The Mount Sinai Data Warehouse
2. Introduction to Leaf & ATLAS Cohort Query Tools
3. Leaf
4. ATLAS
5. MSDW Custom Data Set Request

# Mount Sinai Data Warehouse

# Scientific Computing FAIR Principles for Data

F<sub>i</sub>ndable

A<sub>a</sub>ccessible

I<sub>i</sub>nteroperable

R<sub>e</sub>usable /  
R<sub>e</sub>producible

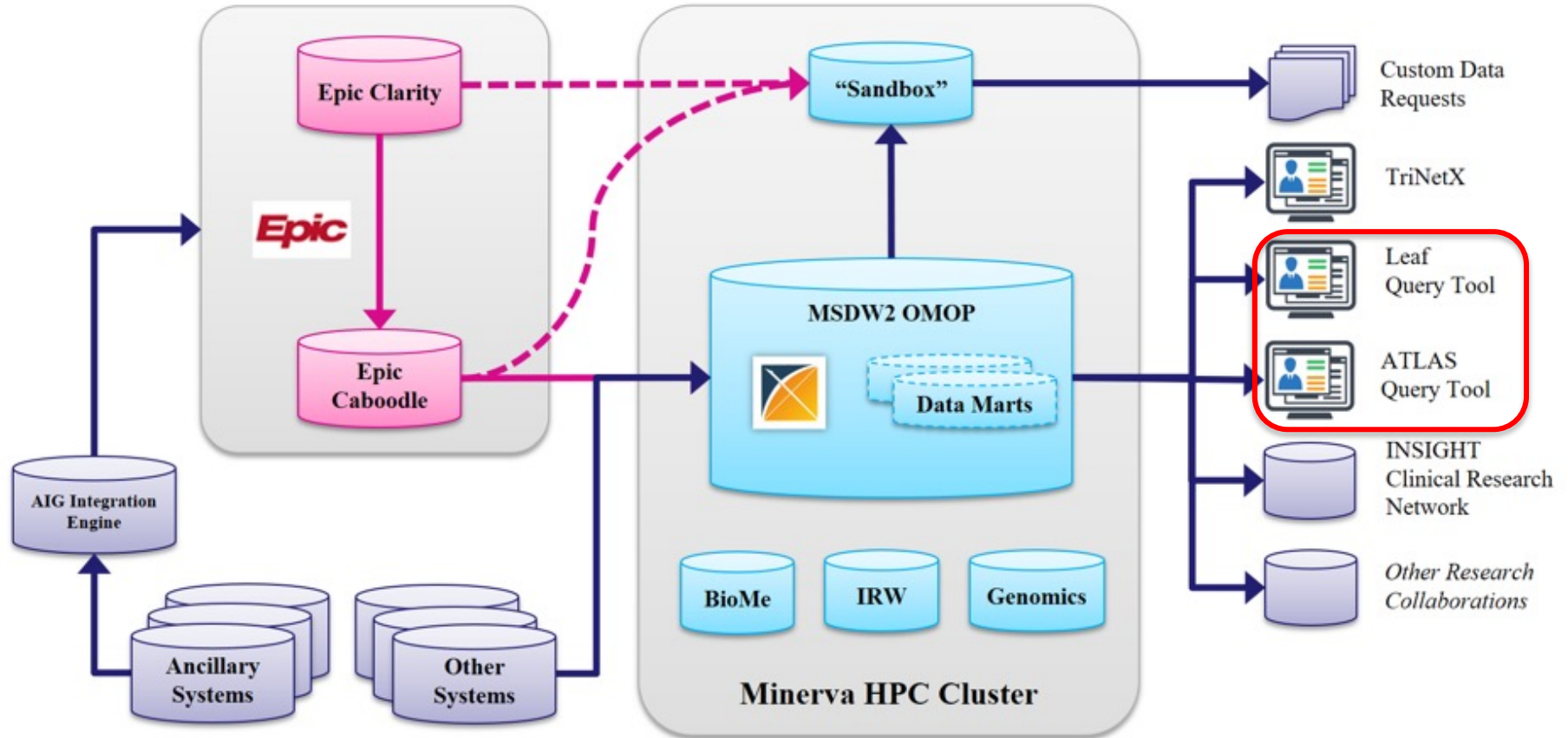
FAIR DATA PRINCIPLES



Source: NIH's Big Data to Knowledge (BD2K) Initiative (<https://commonfund.nih.gov/bd2k>)

Image Source: <https://book.fosteropenscience.eu/>

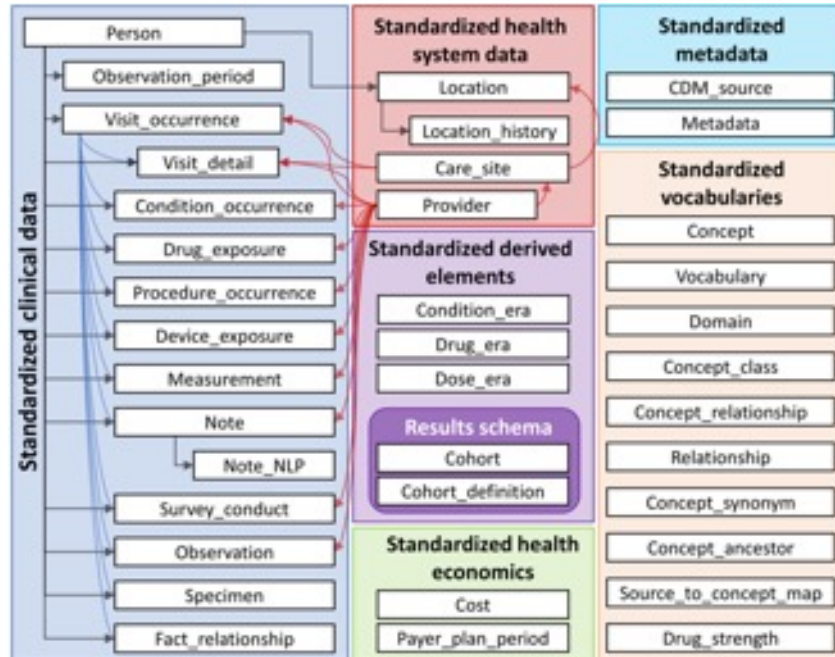
# Mount Sinai Data Warehouse Ecosystem



# OMOP Common Data Model Requirements



1. Standardize **data structure** via common format



2. Standardize **data content** via mapping EHR codes to standard healthcare vocabularies

OMOP Domain	Standard Vocabularies	Non-standard Vocabularies
Condition	SNOMED-CT	ICD-10-CM, ICD-9-CM
Drug	RxNorm, CVX	ATC, NDC, Multum
Measurement	LOINC	SNOMED-CT, Nebraska Lexicon
Procedure	CPT4, HCPCS, ICD-10-PCS	ICD-9-Proc
Observation	SNOMED-CT, LOINC	ICD-10-CM, ICD-9-CM
Race, Ethnicity	OMOP Race, OMOP Ethnicity	SNOMED-CT, Nebraska Lexicon
Provider (Specialty)	NUCC, Medicare Specialty	SNOMED-CT, Nebraska Lexicon
Route	SNOMED-CT	Nebraska Lexicon
Unit	UCUM	SNOMED-CT, Nebraska Lexicon

# MSDW Data Contents (*examples as of May 2023*)



OMOP Table	Record Type	Distinct Patients	Record Count
person	Patient Demographics	11,359,705	11,359,705
death	Patient Date of Death	45,954	45,957
visit_occurrence	Mobile Unit Encounter	68,743	111,327
visit_occurrence	Inpatient Hospitalization from ED Visit	277,736	525,105
visit_occurrence	Hospital Outpatient Visit	894,661	2,472,103
visit_occurrence	Urgent Care Visit	190	296
visit_occurrence	ED Visit	1,131,817	2,732,247
visit_occurrence	Inpatient Hospitalization	609,075	919,758
visit_occurrence	Outpatient Visit	4,061,760	73,545,946
visit_occurrence	Telehealth Visit	660,939	2,706,066
visit_occurrence	Chart Documentation Event	5,434,697	87,301,399
condition_occurrence	Hospital Problem	847,633	3,136,818
condition_occurrence	Encounter Diagnosis	3,856,726	103,437,716
condition_occurrence	Billing Diagnosis	2,204,779	44,863,750
condition_occurrence	Problem List	2,258,485	11,899,865
measurement	Vital Signs	3,424,374	566,300,804
measurement	Flowsheet Measurement	1,631,208	181,917,868
measurement	Lab Component Result	3,848,811	954,973,027

See MSDW website for the complete list: <https://labs.icaahn.mssm.edu/msdw/data-sources/>

# Introduction: Leaf & ATLAS Cohort Query Tools



# Self-Service Cohort Query Tools

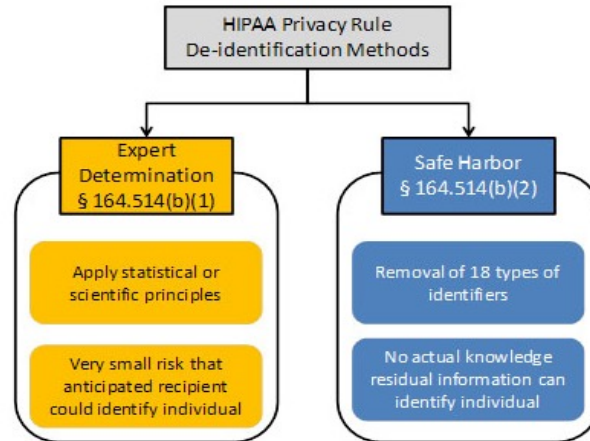
	Leaf 	Atlas 
<b>Development</b>	Nic Dobbins, Univ. of Washington, plus collabs., including at ISMMS	OHDSI community: <a href="http://www.ohdsi.org">www.ohdsi.org</a>
<b>License</b>	Free and Open-Source Software (FOSS)	
<b>Tradeoff</b>	Easier, quicker, less powerful	Harder, laborious, more powerful
<b>Data available</b>	De-identified only	De-identified or PHI (with IRB)
<b>Capabilities</b>	<ul style="list-style-type: none"> <li>• Simple Boolean logic</li> <li>• Predefined stats &amp; visualizations</li> <li>• Can download lists of patients (with masked IDs)</li> </ul>	<ul style="list-style-type: none"> <li>• Sophisticated logic</li> <li>• Customized stats &amp; visualizations</li> <li>• Save your work and reuse parts</li> <li>• Run entire statistical analyses</li> <li>• <b>No data downloads</b></li> </ul>

See more details at <https://labs.icaahn.mssm.edu/msdw/services/>

# What is PHI? What is De-identification?

“**PHI** (Protected Health Information) is information (demographic, financial, social, clinical) relating to an individual’s past, present, or future health history, treatment, or payment for health care services that is held or transmitted by a CE or its BA that identifies the individual or **for which there is a reason to believe it can be used to identify the individual.**”

**De-identification** is the process by which PHI is rendered not individually identifiable. The HIPAA Privacy Rule establishes two methods to de-identify PHI:



# Types of Identifiers

- Name
- Street Address, city, county, zip code (the first three digits of the zip code may be used if there are more than 20,000 people in the zip code)
- All element of dates (except year), including dates of birth, admission, discharge or death
- All ages over 89
- All telephone/fax numbers
- Fax number
- E-mail addresses
- Social Security Number (SSN)
- Medical Record Number (MRN)
- Health plan beneficiary number
- Account numbers (health plan IDs, credit card, bank, invoice #s)
- Certificate/License numbers
- Vehicle identifiers, including license plate numbers
- Device identification and/or serial number
- Uniform Resource Locator (URL)
- Internet Protocol (IP) address
- Biometric identifiers (finger, voiceprints, etc)
- Full face photographic images and other comparable images
- Any other unique identifying number, characteristic, or code

# Leaf Query Tool

# Features of the Leaf Application

- ▶ Open-source, model-agnostic and data-driven web application for cohort discovery
- ▶ Simple drag-and-drop user interface
- ▶ Simple Boolean logic-based searches
- ▶ View pre-defined basic stats and visualizations on your cohort
- ▶ Save queries for later

# Accessing Leaf

- All Mount Sinai Faculty, staff or students can access Leaf at <https://leaf.mssm.edu>
- Requires VPN access and use of your Mount Sinai Login credentials

1.

Specify usage type


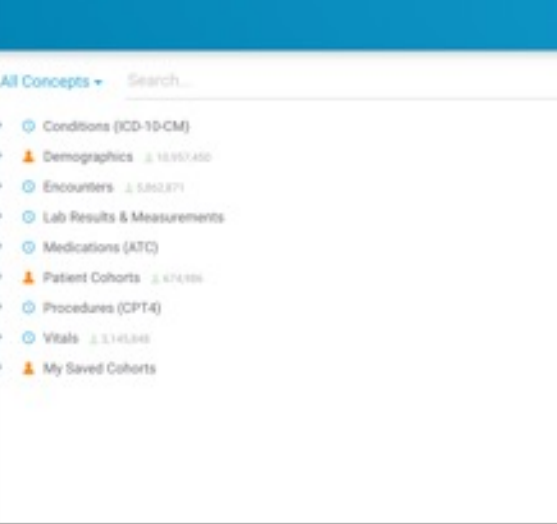
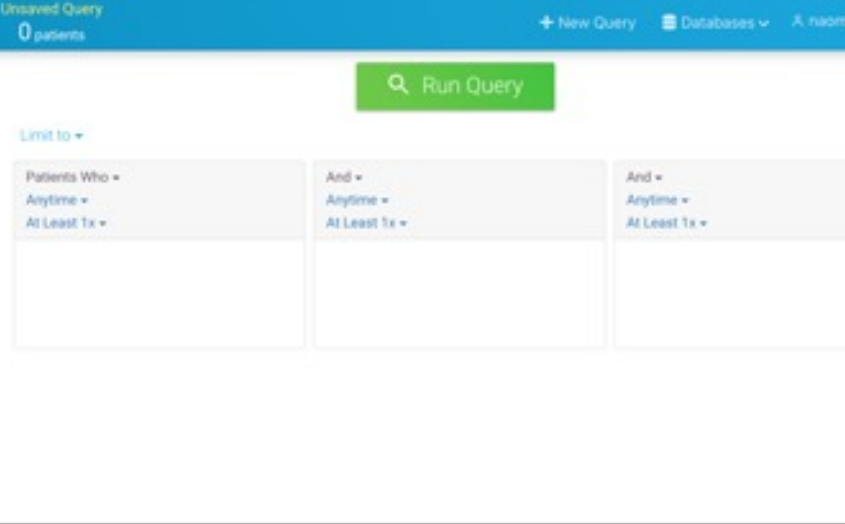
The screenshot shows the Leaf login page with the URL <https://leaf.mssm.edu> in the browser. The page has a blue header with logos for leaf, ITHS (Institute of Translational Health Sciences), and the National Center for Data to Health. A yellow banner states "Patient data restricted to De-identified mode only". Below this, there are two sections of radio buttons. The first section, "I want to find information for", has "Quality Improvement" selected and "Research" unselected. The second section, "I have an Approved IRB", has "No" selected and "Yes" unselected. A third section, "I would like Protected Health Information", has "De-identified" selected and "Identified" unselected.

2.

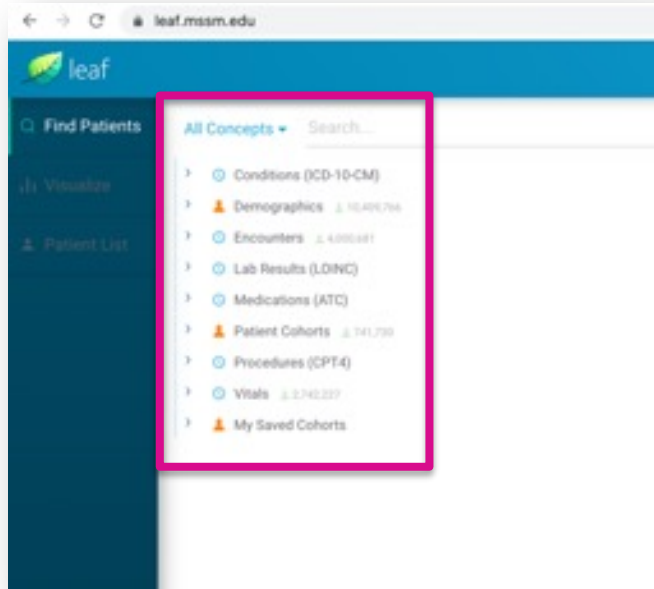
Read & Accept Consent

The screenshot shows the Leaf login page with the URL <https://leaf.mssm.edu> in the browser. The page has a blue header with logos for leaf, ITHS (Institute of Translational Health Sciences), and the National Center for Data to Health. A yellow banner states "Patient data restricted to De-identified mode only". Below this, there is a section titled "Research - De-identified" with a "Go Back" button and an "I Agree" button. The main content area contains a list of 8 terms of service and a section titled "De-identified Data Set with the following limitations:" which includes three bullet points: "Patients with an age of 80 and older are masked with a value of 'Greater than 80'", "Cohorts less than 10 are masked with a value of 'Less than 10'", and "Dates in the dataset are shifted equally per patient based on the date shift value. This ensures that the relative distance between dates in the patient's chronology remains intact".

# Leaf Landing Page

Left Side Navigation	Concept Search Bar	Build and Run Query
		
Toggle screens	Search by text or code	Use select concepts and Boolean logic to build query

# Searchable Data Domains



Domains	Vocab	Content	Time
Conditions	ICD-10-CM	Descriptive diagnoses and codes	Encounter-based
Demographics		Age, Gender, Race, Ethnicity, Vital Status	Time-invariant
Encounters		ED visit, Inpatient, Ambulatory, Telehealth	Encounter-based
Lab Results	LOINC	Lab Orders	Encounter-based
Medications	ATC	Medications Orders and Administrations	Encounter-based
Procedures	CPT-4	Procedures	Encounter-based
Vitals	LOINC	BMI, O2 sat, Pulse, Respiratory Rate, etc.	Encounter-based



# Identifying Concepts

- ▶ Two ways to search for concepts
  - Free Text search
  - Expand concept trees using left-hand arrows
- ▶ Each concept is denoted by a population quantity to the right
- ▶ To select a concept, click on it and drag it to the query box
  - The concept and all the dependent nodes will be included

The screenshot displays the 'leaf.mssm.edu' web application interface. At the top, there's a navigation bar with the 'leaf' logo and a 'Find Patients' search bar. Below this, a sidebar on the left contains a tree view of medical concepts. The main area shows a list of search results for the term 'breast'. A red box highlights the search bar and the list of results. Another red box highlights a specific concept, 'Malignant neoplasm of breast (C50)', and its associated population quantity, '1,374,328'. The interface also includes a 'Patients Who' filter on the right side.

leaf.mssm.edu

Unsaved Query  
0 patients

Find Patients

Conditions (ICM) breast

All Concepts (ICM)  
Conditions (ICD-10-CM)  
Demographics  
Encounters  
Lab Results (LORNC)  
Medications (ATC)  
Patient Cohorts  
Procedures (CPT4)  
Vitals

Limit to: +

Patients Who: +  
Anytime +  
At Least 1x +

Personal history of in-situ and benign neoplasms and neoplasms of uncertain behavior (ICD10CM Z86.000-Z86.03)  
Personal history of in-situ neoplasm (ICD10CM Z86.000-Z86.008)  
Personal history of in-situ neoplasm of breast (ICD10CM Z86.000)  
Personal history of malignant neoplasm (ICD10CM Z85.00-Z85.9)  
Personal history of malignant neoplasm of breast (ICD10CM Z85.3)

Neoplasms (C00-C49) (ICD10CM C00.0-C49.9)  
Malignant neoplasms of breast (C50) (ICD10CM C50.011-C50.929)  
Malignant neoplasm of breast (ICD10CM C50.011-C50.929) 1,374,328  
Malignant neoplasm of axillary tail of breast (ICD10CM C50.611-C50.629) 1,301  
Malignant neoplasm of axillary tail of breast, male (ICD10CM C50.621-C50.629)  
Malignant neoplasm of axillary tail of unspecified male breast (ICD10CM C50.629) 8  
Malignant neoplasm of breast of unspecified site (ICD10CM C50.911-C50.929)  
Malignant neoplasm of breast of unspecified site, female (ICD10CM C50.911-C50.919)  
Malignant neoplasm of unspecified site of left female breast (ICD10CM C50.912) 1,112  
Malignant neoplasm of central portion of breast (ICD10CM C50.111-C50.129)  
Malignant neoplasm of central portion of breast, male (ICD10CM C50.121-C50.129)  
Malignant neoplasm of central portion of unspecified male breast (ICD10CM C50.129) 2  
Malignant neoplasm of lower-outer quadrant of breast (ICD10CM C50.913-C50.929)

# Institutional Patient Cohorts are Searchable in Leaf

The screenshot displays the Leaf clinical data platform interface. The left sidebar contains navigation options: 'Find Patients', 'Visualize', and 'Patient List'. The main area shows a search for 'Patient Cohorts' with a list of results. A red box highlights the 'Cancer Patient Cohort' entry, which is also highlighted in the main results list. The interface includes a 'Run Query' button and a 'Limit to' section for filtering results.

leaf.mssm.edu

Unsaved Query  
0 patients

+ New Query Databases sharon.nirenberg

Find Patients

Visualize

Patient List

All Concepts Search...

Conditions (ICD-10-CM)

Demographics 10,409,756

Encounters 4,900,681

Lab Results (LOINC)

Medications (ATC)

Patient Cohorts 741,730

BioMe Biobank 61,541

BioMe Biobank Global Diversity Array (Sema4) 20,521

BioMe Biobank Global Screening Array (Regeneron) 31,304

BioMe Biobank Whole Exome Sequencing (Regeneron) 30,656

Cancer Institute Biorepository 14,831

Cancer Patient Cohort 254,041

Imaging Research Warehouse 1.0 528,865

Procedures (CPT4)

Vitals 5,740,227

My Saved Cohorts

Limit to

Patients Who

Anytime

At Least Tx

And

Anytime

At Least Tx

And

Anytime

At Least Tx

Run Query

Patient Cohorts 741,730

BioMe Biobank 61,541

BioMe Biobank Global Diversity Array (Sema4) 20,521

BioMe Biobank Global Screening Array (Regeneron) 31,304

BioMe Biobank Whole Exome Sequencing (Regeneron) 30,656

Cancer Institute Biorepository 14,831

Cancer Patient Cohort 254,041

Imaging Research Warehouse 1.0 528,865

Use Leaf to query the Cancer Patient, BioMe or IRW Cohorts

# Leaf – Patient Cohorts

Patient Cohorts on Leaf	Description
BioMe Biobank	Patients who submitted tissue samples to Mount Sinai's BioMe Biobank
BioMe Biobank Global Diversity Array - Sem4	Patients who submitted tissue samples to Mount Sinai's BioMe Biobank and have had their DNA analyzed with Illumina's Global Diversity Array by Sema4
BioMe Biobank Global Screening Array – Regeneron	Patients who submitted tissue samples to Mount Sinai's BioMe Biobank and have had their DNA analyzed with Illumina's Infinium Global Screening Array by Regeneron
BioMe Biobank whole Exome Sequencing – Regeneron	Patients who submitted tissue samples to Mount Sinai's BioMe Biobank with whole exome sequence (WES) data generated by Regeneron
Cancer Institute Biorepository	
Cancer Patient Cohort	Patients who have been diagnosed with cancer, refreshed on a monthly basis around the 15th of every month
Imaging Research Warehouse 1.0	Patients who have image data in version 1.0 of the Imaging Research Warehouse (IRW)

# Building a Query

**leaf** RxTreatment\_BC 1,658 patients ⓘ

+ New Query Databases sharon.nirenberg

**Patients Who**  
In Past 12 Months  
At Least 1x  
Had diagnosis of Malignant neoplasms of breast (C50) (ICD10CM:C50.011-C50.929)

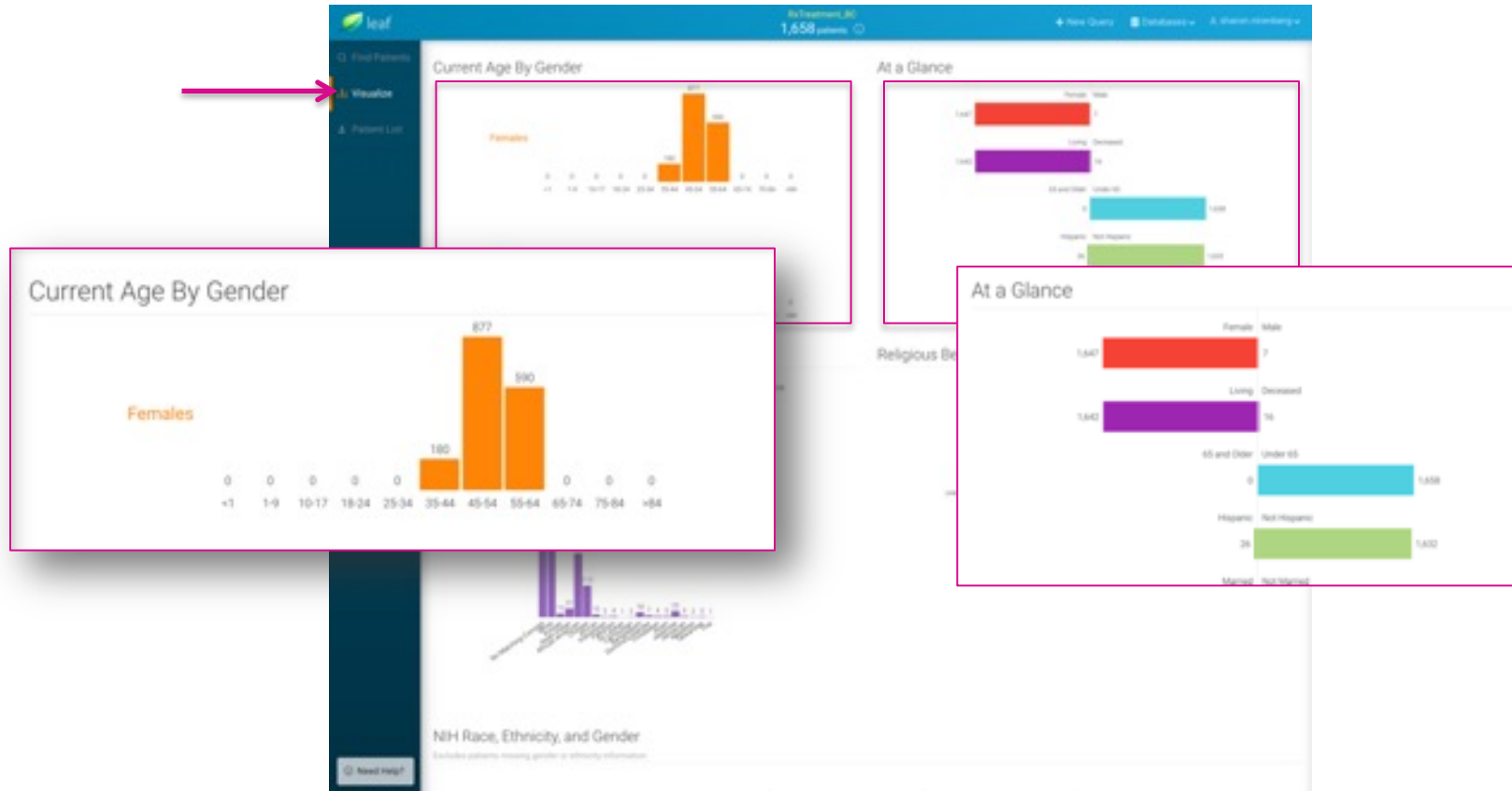
**And**  
Anytime  
At Least 1x  
Are between 40 and 60 years old

**And**  
Anytime  
At Least 2x  
Treated with ANTINEOPLASTIC AGENTS  
or  
Treated with ENDOCRINE THERAPY

**Patients Who**  
In Past 12 Months  
Anytime  
Custom Date Range  
In Past 24 Hours  
In Past 48 Hours  
In Past 72 Hours  
In Past 7 Days  
In Past 30 Days  
In Past 6 Months  
In Past 12 Months  
In Past 2 Years  
In Past 3 Years  
In Next 10 Days  
In Next 30 Days  
In Next 6 Months

**And**  
Anytime  
At Least 1x  
At Least 2x  
At Least 3x  
At Least 4x  
At Least 5x  
At Least 6x  
At Least 7x  
At Least 8x  
At Least 9x  
At Least 10x

# Basic Cohort Demographics



# Patient List

[illegible]

## Leaf - Timeline

Used to explore temporal relationships of additional clinical events (aka concepts) to your defined patient cohort.

Sample Query: *How many patients  $\geq 18$  y.o. with a diagnosis of COPD (Chronic Obstructive Pulmonary Disease) had an ED visit in the past 12 months?*

*Secondly, what percentage of these patients had any of the following clinical events after their ED visit?*

- *An inpatient visit*
- *Diagnosis of Lung Cancer*

# Leaf - Timeline

1. Build and Run query to identify patient cohort
2. Click on **Timelines** from the left-hand menu

The screenshot displays the Leaf application interface. On the left, a dark blue sidebar contains a menu with the following items: Find Patients, Map, Visualize, **Timelines** (highlighted with a red box and a red arrow), Patient List, and Admin. The main content area has a top blue header with the Leaf logo, a red box around 'Unsaved Query 2,253 patients', and links for '+ New Query', 'Databases', and 'admin'. Below the header, there's a search bar and a list of concepts: Conditions (ICD-10-CM), Demographics (10,960,825), Encounters (3,554,100), Lab Results & Measurements, Medications (ATC), Patient Cohorts (444,168), Procedures (CPT4), Vitals (3,030,060), and My Saved Cohorts. On the right, a green 'Save Query' button is visible. Below it, three blue boxes represent query filters: 'Patients Who' (Anytime, At Least 1x, Are >= 18 years old, In the Same Encounter), 'And' (Anytime, At Least 1x, Had diagnosis of Chronic obstructive pulmonary disease, unspecified (ICD10CM.J44.9), In the Same Encounter), and 'And' (In Past 12 Months, At Least 1x, Had Emergency Room Visit encounter, In the Same Encounter).



# Leaf - Timeline

Identify an **Index Event** for your cohort. This is the starting point for your timeline and allows you to view other clinical events (aka concepts) that happened before and/or after, at defined time intervals.

The screenshot displays the Leaf Timeline interface. On the left, a sidebar contains navigation options: Find Patients, Map, Visualize, Timelines (selected), Patient List, and Admin. The main area shows a 'Choose an index event' step with instructions: 'Index events serve as the starting point for a timeline. Events can be chosen from the panels used to define the cohort. If a patient has more than one event, the earliest is used.' A red box highlights the '+ Choose Index Event' button, with a red arrow pointing to a larger selection screen.

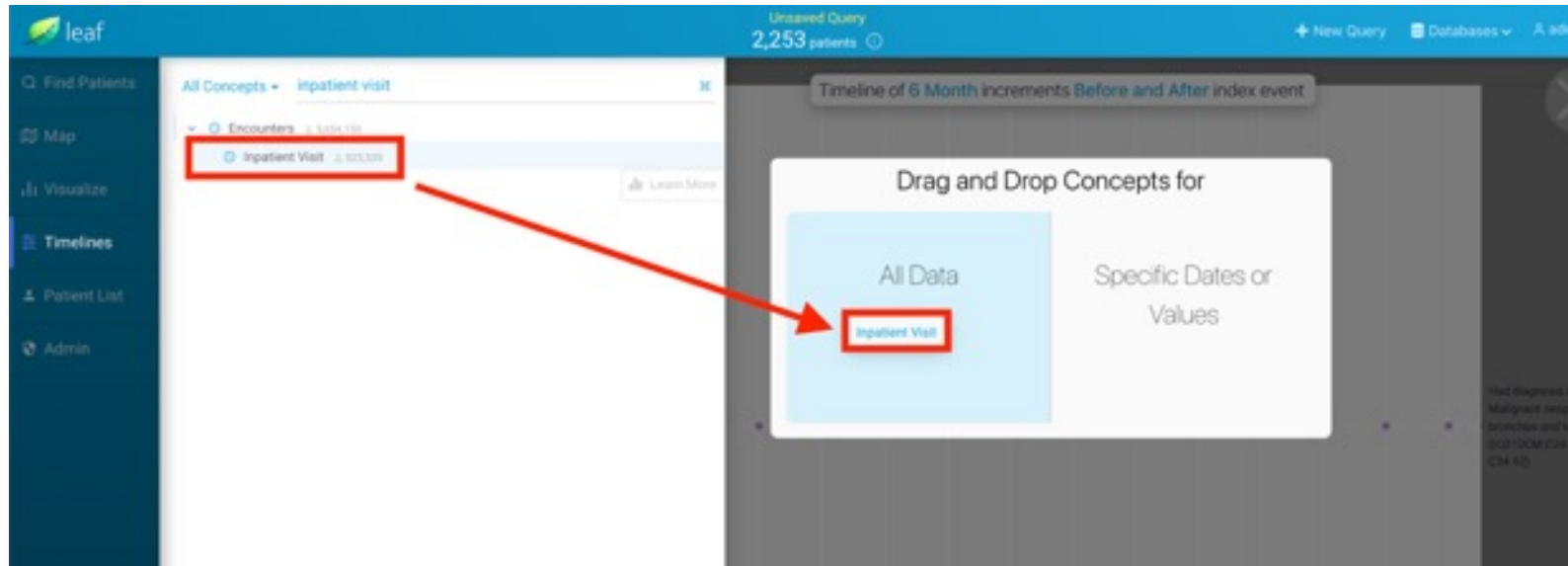
The selection screen is titled 'Which event should be the index event?' and features three panels:

- Panel 1:** Patients Who + Anytime + At Least 1x + Age >= 18 years old. Below this, there is a section for 'In the Same Encounter'.
- Panel 2:** And + Anytime + At Least 1x + Had diagnosis of Chronic obstructive pulmonary disease, unspecified (ICD10CM J44.9). Below this, there is a section for 'In the Same Encounter'.
- Panel 3:** And + In Past 12 Months + At Least 1x + Had Emergency Room Visit encounter. Below this, there is a section for 'In the Same Encounter'.

Panel 3 is highlighted with a red border.

# Leaf - Timeline

Add concepts of interest to your timeline by dragging and dropping from the **All Concepts** menu on the left to the **Drag and Drop Concepts for** window on the right.



# Leaf - Timeline

Under **Configure Time Spans**, adjust timeline intervals..

1 Choose an index event  
Index events serve as the **starting point** for a timeline. Events can be chosen from the panels used to define the cohort. If a patient has more than one event, the **earliest** is used.  
✓ Panel 3 (click to change)

2 Drag Concepts over to view data  
Concepts can be dropped anywhere to the right to add them to the chart.  
+ Add Concepts (2 selected)

3 Configure time spans  
Configure timeline date increments  
**After Index Event** 6 Months

4 Additional Options  
Count only first occurrence ☐

3 Configure time spans  
Configure timeline date increments

After Index Event 6 Months

Before / After Index Event

Before Index Event

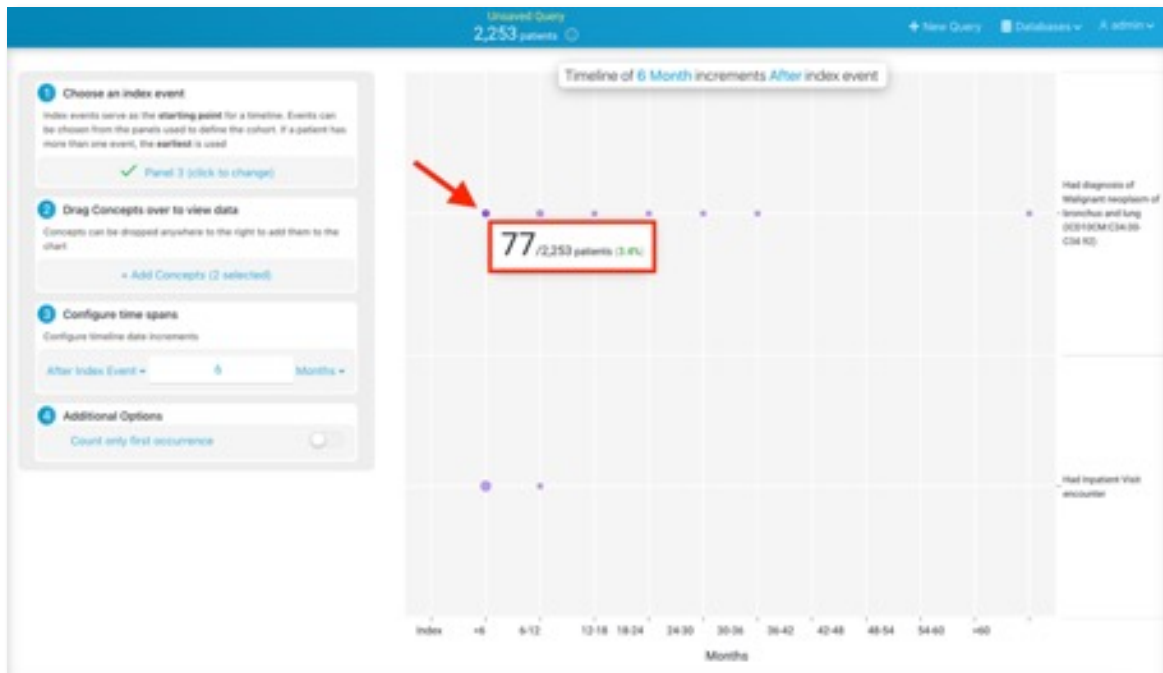
After Index Event

Under **Additional Options**, click on **Count only first occurrence** to *only* take into consideration the first time that each event took place (this applies to all added concepts in your timeline)

4 Additional Options  
Count only first occurrence ☒

# Leaf's Timeline

Hover over the circles in your timeline to view how many patients from your initial cohort fall within that category (as defined by the concept and time interval)



To remove a clinical event (aka concept) from your timeline, hover over it and click on the **X**

# ATLAS Query Tool

# ATLAS

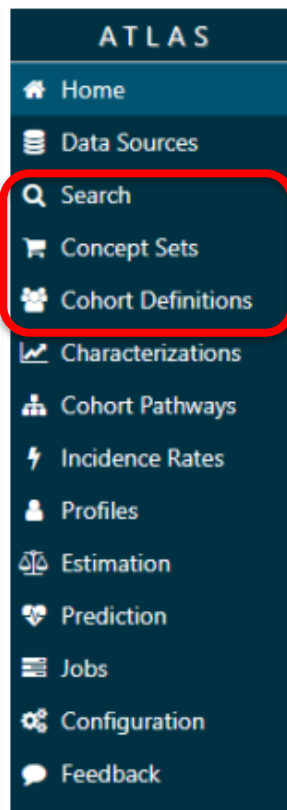
- A web-based application - design and execute observational analyses to generate real world evidence from patient level clinical data
- **Common Data Model** - A convention for representing healthcare data that allows portability of analysis
- **Concept** - A term (with a code) defined in a medical terminology, all clinical events in the OMOP CDM are expressed as concepts
- **Concept set** is an expression representing a list of concepts that can be used as a reusable component in various analyses
- **Cohort** is a set of persons who satisfy one or more inclusion criteria for a duration of time



# ATLAS Access

- All Mount Sinai Faculty, staff or student can access ATLAS at <https://atlas.msdw.mountsinai.org>
- Requires VPN access and Mount Sinai School Credentials to log in
- Mount Sinai users with a Hospital account may navigate to SailPoint and request a Mount Sinai School account.
- You will be required to read and accept the SNOMED INTERNATIONAL SNOMED CT LICENSE AGREEMENT
- Sign in using your school credentials through the button on the top right corner of the interface

# ATLAS - Interface



**Home:** Permalink redirects you to the Atlas landing page.

**Data Sources:** Provides capability to review standardized reporting for each of the data sources configured for your Atlas environment. Here, review available populations and data sets. From select drop-down menus, select from any available observational database(s). Subsequently, select from any of the corresponding standardized reports available within the previously selected source.

**Search:** Enables you to search the OMOP standardized vocabularies, and understand and apply concepts within those vocabularies.

**Concept Sets:** Enables you to create your own set of codes that will be used throughout the standardized analyses. These sets can be saved and reused in all your analyses.

**Cohort Definitions:** Provides ability to construct a set of persons who satisfy one or more criteria for a duration of time, and these cohorts can serve as a basis of inputs for all subsequent analyses.

**Characterizations:** Allows you to look at one or more of your defined cohorts and summarizes characteristics about those patient populations in an analytic capability.

**Cohort Pathways:** Reviews the sequence of clinical events that that occur within one or more populations.

**Incidence Rates:** Provides the ability to estimate the incidence of outcomes within target populations of interest.

**Profiles:** Explores an individual patient's longitudinal observational data to summarize an individual's situation.

**Estimation:** Conducts population-level effect estimation studies using a comparative cohort design. Comparisons between one or more target and comparator cohorts can be explored for a series of outcomes.



# ATLAS - Search

- Enables you to search the OMOP standardized vocabularies, and understand and apply concepts within those vocabularies

The screenshot displays the ATLAS Search interface. A red box labeled "Search" points to the search bar containing the text "hypertension". A red box labeled "Filters" points to the left sidebar, which contains a tree view of filters such as Vocabulary, Class, Domain, and Standard Concept. A red box labeled "Record Count" points to the "RC" column in the search results table. A red box labeled "Descendant Record Count" points to the "DRC" column in the search results table. A red arrow points to the "Essential hypertension" entry in the results table.

ID	Code	Name	Class	RC	DRC	Domain	Vocabulary
320128	59621000	Essential hypertension	Clinical Finding	632	7540	Condition	SNOMED
40387401	10725009	Benign hypertension	Clinical Finding	632	7540	Condition	SNOMED
312648	1301005	Benign essential hypertension	Clinical Finding	6,908	6,908	Condition	SNOMED
4332004	70995007	Pulmonary hypertension	Clinical Finding	3,403	4,169	Condition	SNOMED
4034560	106005003	Hypertension AND/OR vomiting complicating pregnancy childbirth AND/OR puerperium	Clinical Finding	0	2,018	Condition	SNOMED
4279826	367380008	Hypertension in the obstetric context	Clinical Finding	0	1,804	Condition	SNOMED
319826	31993008	Secondary hypertension	Clinical Finding	1,872	1,795	Condition	SNOMED
4718910	288350001	Maternal hypertension	Clinical Finding	247	1,360	Condition	SNOMED
4167493	48194001	Pregnancy-induced hypertension	Clinical Finding	519	1,113	Condition	SNOMED
312938	234072000	Venous hypertension	Clinical Finding	0	1,042	Condition	SNOMED
317898	78975002	Malignant essential hypertension	Clinical Finding	895	895	Condition	SNOMED
4289933	70272008	Malignant hypertension	Clinical Finding	0	895	Condition	SNOMED
4311348	86041002	Pre-existing hypertension in obstetric context	Clinical Finding	175	691	Condition	SNOMED
44783429	104931000118100	Chronic kidney disease due to hypertension	Clinical Finding	523	675	Condition	SNOMED
381290	4210003	Ocular hypertension	Clinical Finding	652	652	Condition	SNOMED

# ATLAS – Search

- ▶ Clicking on a term will open a more detailed view within the vocabularies with the following tabs:
  - **Details** presents Vocabulary ID, Concept ID, Concept Code, and other property values connected to the record
  - **Related Concepts** provides other vocabulary for similar terms that may specify or broaden the search
  - **Hierarchies** indicates parents and children of the concept within the OMOP vocabulary
  - **Record Counts** displays the source of the records as well as the quantity

The screenshot shows the ATLAS web application interface. On the left is a dark blue sidebar with navigation links: Home, Data Sources, Search, Concept Sets, Cohort Definitions, Characterizations, Cohort Pathways, Incidence Rates, Profiles, Estimation, Prediction, and Jobs. The main content area has a dark header with 'Vocabulary > Concept' and 'Essential hypertension'. Below the header are four tabs: 'Details' (highlighted with a red box), 'Related Concepts', 'Hierarchy', and 'Record Counts'. The 'Details' tab displays a table of properties and values for the concept.

Property	Value
Concept Name	Essential hypertension
Domain Id	Condition
Concept Class Id	Clinical Finding
Vocabulary Id	SNOMED
Concept Id	320128
Concept Code	59621000
Invalid Reason	Valid
Standard Concept	Standard

At the bottom of the details view, there are three checkboxes: 'Exclude', 'Descendants', and 'Mapped', followed by a green button labeled 'Add To New Concept Set'.

# ATLAS – Concept Sets

- Building blocks of ATLAS queries
- Expression that allow for identifying sets of concepts that can be grouped together and used as a reusable component in various analyses
- Can contain any set of concepts across any of the domains within the OMOP standardized vocabulary. These can be customized so that different terms can be expressed in one item.

The screenshot shows the ATLAS web application interface. On the left, a dark sidebar contains a menu with items like Home, Data Sources, Search, Concept Sets (highlighted with a red box), Cohort Definitions, Characterizations, Cohort Pathways, Incidence Rates, Profiles, Estimation, Prediction, Jobs, Configuration, and Feedback. The main content area is titled 'Concept Sets' and has 'List' and 'Export' buttons. Below this, there are filters for 'Column visibility', 'Copy', 'CDF', and 'Show 15 entries'. A table lists concept sets with columns: ID, Name, Created, Modified, and Author. The table shows 15 entries, with the first few being 'PID', 'PID\_dx', 'NSCLC', 'lung\_atc', 'High-Risk Pediatric Cancer Patients', 'Debarities', 'CAD', 'PCU', 'Total Shoulder Arthroscopy', 'Consent.set.BCOW', 'DMG', 'GLP', 'SGLT2', 'Mitraline\_Test', and 'Diabetes\_Text\_AJ'. A red box highlights the 'New Concept Set' button in the top right corner, with an arrow pointing to it from the text 'Create New Concept Set'.

ID	Name	Created	Modified	Author
123	PID	10/03/2023 8:51 PM	10/03/2023 8:51 PM	ocornp06
120	PID_dx	10/03/2023 8:45 PM	10/03/2023 8:45 PM	ocornp06
121	NSCLC	08/18/2023 1:35 PM	08/18/2023 1:35 PM	veikp01
120	lung_atc	08/18/2023 1:22 PM	08/18/2023 1:22 PM	veikp01
119	High-Risk Pediatric Cancer Patients	08/12/2023 2:09 PM	08/12/2023 2:09 PM	mozer07
118	Debarities	08/04/2023 12:25 PM	08/04/2023 12:25 PM	rsbak01
117	CAD	07/05/2023 5:39 PM	07/05/2023 5:39 PM	shang01
116	PCU	07/02/2023 12:14 PM	07/02/2023 12:14 PM	mozer07
115	Total Shoulder Arthroscopy	07/12/2023 4:48 PM	07/12/2023 4:48 PM	sternb06
114	Consent.set.BCOW	06/30/2023 4:19 PM	06/30/2023 4:41 PM	lelhea01
113	DMG	06/30/2023 4:09 PM	06/30/2023 4:09 PM	lelhea01
112	GLP	06/30/2023 3:02 PM	06/30/2023 4:06 PM	lelhea01
111	SGLT2	06/30/2023 11:41 AM	06/30/2023 12:52 PM	lelhea01
109	Mitraline_Test	06/23/2023 11:32 AM	06/23/2023 11:41 AM	son01
108	Diabetes_Text_AJ	06/22/2023 2:44 PM	06/22/2023 2:48 PM	cabera01

# ATLAS – Create New Concept Set

## New Concept Set

1. Title your Concept Set (i.e. *Hypertension – NS Test*)
2. **Add concepts** → Search for concepts of interest (i.e. *essential hypertension*)
  - Select concepts to include or exclude, along with any of their associated Descendants
3. View **Included Concepts** and **Included Source Codes** under respective tabs
4. Click **Save**

The screenshot shows the ATLAS 'Concept Set #126' interface. The title 'Hypertension - NS test' is highlighted with a red box and labeled '1. Title'. The 'Add concepts' button is highlighted with a red box and labeled '2. Add Concepts'. The 'Included Concepts' and 'Included Source Codes' tabs are highlighted with a red box and labeled '3. Included Concepts & Source Codes'. The 'Save' button is highlighted with a red box and labeled '4. Save'.

Concept Set #126  
created by son01 on 2023-10-08 1:04, modified by son01 on 2023-10-08 1:04

Hypertension - NS test

Concept Set Expression Included Concepts Included Source Codes Export Import Compare

Show 25 entries

Showing 1 to 4 of 4 entries

<input type="checkbox"/>	Concept Id	Concept Code	Concept Name	Domain	Standard Concept Caption	<input type="checkbox"/> Exclude	<input checked="" type="checkbox"/> Descendants	<input type="checkbox"/> Mapped
<input type="checkbox"/>	4167493	48194001	Pregnancy-induced hypertension	Condition	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	4118910	288250001	Maternal hypertension	Condition	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	357898	78975002	Malignant essential hypertension	Condition	Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	320128	59621000	Essential hypertension	Condition	Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Remove selected concepts Add concepts

Classification Non-Standard Standard

# ATLAS – Cohort Definitions

- Where you define the cohort inclusion criteria that must be satisfied for a duration of time
- Can serve as a basis of inputs for subsequent analyses
- Click **New Cohort** to create a new definition

The screenshot shows the ATLAS Cohort Definitions interface. The left sidebar contains a menu with the following items: Home, Data Sources, Search, Concept Sets, Cohort Definitions (highlighted with a red box), Characterizations, Cohort Pathways, Incidence Rates, Profiles, Estimation, Prediction, Jobs, Configuration, and Feedback. The main area displays a table of cohort definitions. At the top right of the main area, there is a 'New Cohort' button, which is also highlighted with a red box and labeled 'New Cohort' with a red arrow pointing to it. The table has columns for ID, Name, Created, Updated, and Author. The table shows 15 entries, with the first few being 'LIRM\_PQ', 'Test Cohort', and 'Pts with Sonoseries 9.1.22 - 8.31.23'.

ID	Name	Created	Updated	Author
116	LIRM_PQ	10/03/2023 7:16 PM	10/03/2023 7:16 PM	ecornig06
115	Test Cohort	10/02/2023 11:40 AM	10/02/2023 11:40 AM	arora010
114	Pts with Sonoseries 9.1.22 - 8.31.23	09/27/2023 1:49 PM	09/27/2023 1:49 PM	arora010
113	Lacis.org	09/19/2023 1:24 PM	09/19/2023 1:24 PM	veiskp01
112	Total Shoulder Arthroplasty	07/12/2023 4:50 PM	07/12/2023 4:51 PM	stamb06
111	DMBCwomd	05/10/2023 4:25 PM	05/10/2023 4:55 PM	leite01
101	# Patients with Diabetes during CY2022	02/23/2023 12:29 PM	05/22/2023 2:53 PM	cabera01
104	Pediatric ECMO 3.8.2023	04/08/2023 2:41 PM	04/03/2023 10:52 AM	moosa07
109	CPT_Prospect_Test	03/23/2023 2:55 PM	03/23/2023 2:55 PM	sicam01
108	Test	03/21/2023 2:32 PM	03/21/2023 2:32 PM	cabera01
107	Heart transplant sts	03/16/2023 9:31 PM	03/16/2023 9:31 PM	kapoa07
106	Cannabis	03/15/2023 3:54 PM	03/15/2023 3:54 PM	silbee02
102	Pediatric ECMO	03/07/2023 3:49 PM	03/07/2023 4:03 PM	moosa07
92	Down Syndrome	11/30/2022 9:19 PM	11/30/2022 9:19 PM	gansan01
91	MBC PARP inhibitors	11/29/2022 2:31 PM	11/29/2022 2:34 PM	casan01

# ATLAS – Cohort Definitions

## Cohort Criteria:

- **Cohort Entry Event:** What must be observed so that someone enters the cohort?
- **Inclusion Criteria:** Use concept sets to apply specific criteria to cohort entry event to identify subpopulation
- **Cohort Exit:** How does person leave the cohort of interest?

The screenshot displays the ATLAS Cohort Definitions interface for Cohort #117. The sidebar on the left includes navigation options: Home, Data Sources, Search, Concept Sets, Cohort Definitions (highlighted with a red box), Characterizations, Cohort Pathways, Incidence Rates, Profiles, Estimation, Prediction, Jobs, Configuration, and Feedback. The main panel shows the cohort definition for Cohort #117, created by son01 on 2023-10-06 15:21. The cohort description is "New Users of ACE inhibitors with a prior diagnosis of hypertension". The interface is divided into three main sections: Cohort Entry Events, Inclusion Criteria, and Cohort Exit. Each section has a red box and an arrow pointing to it from the right. The Cohort Entry Events section includes a description field, a criteria selection dropdown, and a limit initial events dropdown. The Inclusion Criteria section includes a criteria selection dropdown and a limit qualifying events dropdown. The Cohort Exit section includes an event persistence dropdown, a censoring events dropdown, and a limit qualifying events dropdown.

**Cohort Entry Events**

Events having any of the following criteria:

with continuous observation of at least  days before and  days after event index date

Limit initial events to:  earliest event  per person.

**Inclusion Criteria**

Limit qualifying events to:  earliest event  per person.

**Cohort Exit**

**Event Persistence:**

Event will persist until:  end of continuous observation

**Censoring Events:**

Exit Cohort based on the following criteria:

No censoring events selected.

# ATLAS – Cohort Definitions: Cohort Entry Events

## Cohort Entry Events - *Example: New Users of ACE Inhibitors*

1. Add Initial Event (ie. add Drug Exposure )
2. Import Concept Set (i.e. ACE Inhibitor – NS Test)

The screenshot displays the 'Cohort Entry Events' interface. At the top, a blue header bar contains the title 'Cohort Entry Events' and a help icon. Below the header, a search bar is labeled 'Events having any of the following criteria:'. To the right of the search bar is a red-bordered box containing the text '1. Add Initial Event' and a '+ Add Initial Event +' button. Below the search bar, there is a section for defining criteria. A red-bordered box highlights the 'a drug exposure of' dropdown menu, which is currently set to 'Any Drug'. Below this dropdown is a search bar with the text 'Search...'. To the right of the search bar is a red-bordered box containing the text '2. Import Concept Set'. Below the search bar, there are buttons for 'Import Concept Set' and 'Clear Concept Set'. To the right of these buttons is a section for defining the time window, with fields for 'days before and' and 'days after event index date'. Below these fields is a button for '+ Add attribute'. To the right of the '+ Add attribute' button is a list of event types, including 'Add Condition Era', 'Add Condition Occurrence', 'Add Death', 'Add Device Exposure', 'Add Dose Era', 'Add Drug Era', 'Add Drug Exposure', 'Add Measurement', 'Add Observation', 'Add Observation Period', 'Add Payer Plan Period', 'Add Procedure Occurrence', 'Add Specimen', and 'Add Visit'. A red arrow points to the 'Add Drug Exposure' option in this list.

Events having any of the following criteria:

1. Add Initial Event + Add Initial Event +

2. Import Concept Set

a drug exposure of Any Drug

Search...

Import Concept Set

Clear Concept Set

days before and days after event index date

per person.

+ Add attribute

Add Condition Era  
Find patients with specific diagnosis era.

Add Condition Occurrence  
Find patients with specific diagnoses.

Add Death  
Find patients based on death.

Add Device Exposure  
Find patients based on device exposure.

Add Dose Era  
Find patients with dose eras.

Add Drug Era  
Find patients with with-exposure to drugs over time.

Add Drug Exposure  
Find patients with exposure to specific drugs or drug classes.

Add Measurement  
Find patients based on Measurement.

Add Observation  
Find patients based on lab tests or other observations.

Add Observation Period  
Find patients based on Observation Period.

Add Payer Plan Period  
Find patients based on Payer Plan Period.

Add Procedure Occurrence  
Find patients that experienced a specific procedure.

Add Specimen  
Find patients based on Specimen.

Add Visit  
Find patients based on visit information.

# ATLAS – Cohort Definitions: Cohort Entry Event

## Cohort Entry Events (cont.)

### 3. Add Attributes (i.e. Add First Exposure Criteria)

- Add First Exposure Criteria to define First time users
- Add Age at Occurrence Criteria (Aged  $\geq 18$ )
- Add Start Date Criteria (drug start date after 1/1/2000)

The screenshot shows the 'Cohort Entry Events' configuration page. A red box highlights the criteria list on the right, with a red arrow pointing to it from the text '3. Click to Add Attributes'. The criteria list includes: 'Add First Exposure Criteria' (Limit Drug Exposures to the first exposure in history), 'Add Age at Occurrence Criteria' (Filter Drug Exposures by age at occurrence), 'Add Gender Criteria' (Filter Drug Exposures based on Gender), 'Add Start Date Criteria' (Filter Drug Exposures by the Drug Exposure Start Date), 'Add End Date Criteria' (Filter Drug Exposures by the Drug Exposure End Date), 'Add Drug Type Criteria' (Filter Drug Exposures by the Drug Type), 'Add Visit Criteria' (Filter Drug Exposures based on visit occurrence of drug exposure), 'Add Stop Reason Criteria' (Filter Drug Exposures by the Stop Reason), 'Add Refills Criteria' (Filter Drug Exposures by Refills), 'Add Quantity Criteria' (Filter Drug Exposures by Quantity), 'Add Days Supply Criteria' (Filter Drug Exposures by Days Supply), 'Add Route Criteria' (Filter Drug Exposures by Route), 'Add Effective Dose Criteria' (Filter Drug Exposures by Effective Dose), 'Add Dose Unit Criteria' (Filter Drug Exposures by Dose Unit), and 'Add Lot Number Criteria' (Filter Drug Exposures by Lot Number). Red arrows point from the criteria list to the main configuration area. In the main area, a red box highlights the criteria list on the left, with a red arrow pointing to it from the text 'Added attributes display here'. The criteria list on the left includes: 'a drug exposure of' (Ace Inhibitor - NS Test), 'for the first time in the person's history', 'occurrence start is: After 2000-01-01', and 'with age Greater or Equal To 18'. A red box highlights the 'Restrict initial events' button, with a red arrow pointing to it from the text '4. Click to Restrict Initial Events'.

Events having any of the following criteria:

a drug exposure of **Ace Inhibitor - NS Test**

✗ for the first time in the person's history

✗ occurrence start is: After 2000-01-01

✗ with age Greater or Equal To 18

with continuous observation of at least 0 days before and 0 days after event index date

Limit initial events to: earliest event per person.

**Restrict initial events**

**3. Click to Add Attributes**

**Added attributes display here**

**4. Click to Restrict Initial Events**

- Add First Exposure Criteria  
Limit Drug Exposures to the first exposure in history.
- Add Age at Occurrence Criteria  
Filter Drug Exposures by age at occurrence.
- Add Gender Criteria  
Filter Drug Exposures based on Gender.
- Add Start Date Criteria  
Filter Drug Exposures by the Drug Exposure Start Date.
- Add End Date Criteria  
Filter Drug Exposures by the Drug Exposure End Date.
- Add Drug Type Criteria  
Filter Drug Exposures by the Drug Type.
- Add Visit Criteria  
Filter Drug Exposures based on visit occurrence of drug exposure.
- Add Stop Reason Criteria  
Filter Drug Exposures by the Stop Reason.
- Add Refills Criteria  
Filter Drug Exposures by Refills.
- Add Quantity Criteria  
Filter Drug Exposures by Quantity.
- Add Days Supply Criteria  
Filter Drug Exposures by Days Supply.
- Add Route Criteria  
Filter Drug Exposures by Route.
- Add Effective Dose Criteria  
Filter Drug Exposures by Effective Dose.
- Add Dose Unit Criteria  
Filter Drug Exposures by Dose Unit.
- Add Lot Number Criteria  
Filter Drug Exposures by Lot Number.



# ATLAS – Cohort Definitions: New Inclusion Criteria

The screenshot displays the 'Inclusion Criteria' section of the ATLAS software. A red arrow points to the 'New inclusion criteria' button. The main form contains a list of criteria, with the first one being '1. have a prior diagnosis of hypertension'. A red box highlights the '1. Add description' step, which involves entering an inclusion rule description and selecting a condition occurrence. Another red box highlights the '3. Import Concept Set' step, where a concept set (e.g., 'Hypertension - NS test') is selected. A third red box highlights the '4. Time Parameters' step, which involves defining when the event should occur relative to the index start date. A fourth red box highlights the '2. Add Inclusion Criteria' step, which involves adding criteria to the group. A red arrow points to the 'Add Condition Occurrence' option in the right-hand menu.

**1. Add description**


**2. Add Inclusion Criteria**

**3. Import Concept Set**

**4. Time Parameters**

1. Add text description (i.e. *have a prior diagnosis of hypertension*)
2. Add criteria to group (i.e. *Add Condition Occurrence*)
3. Import Concept Set (i.e. *Hypertension – NS test*)
4. Define when the event (i.e. *Hypertension*) should occur relative to the index start date (aka Cohort entry event)

# ATLAS – Cohort Definitions: Cohort Exit

- ▶ Define how a person leaves the cohort
  - select from the drop-down menu that the event will persist until a selected end
- ▶ Remember to SAVE cohort definition 



**Cohort Exit**

**Event Persistence:**  
Event will persist until: ✓ end of continuous observation

**Censoring Events**  
Exit Cohort based on: fixed duration relative to initial event  
end of a continuous drug exposure

**Cohort Exit**

**Event Persistence:**  
Event will persist until: end of a continuous drug exposure

**Continuous Exposure Persistence:**  
Specify a concept set that contains one or more drugs. A drug era will be derived from all drug exposure events for any of the drugs within the concept set, using the specified persistence window as a maximum allowable gap in days between successive exposure events and adding a specified surveillance window to the final exposure event. If no exposure event end date is provided, then an exposure event end date is inferred to be event start date + days supply in cases when days supply is available or event start date + 1 day otherwise. This event persistence assures that the cohort end date will be no greater than the drug era end date.

Concept set containing the drug(s) of interest: Ace Inhibitor - NS Test **Import Concept Set**

- Persistence window: allow for a maximum of 30 days between exposure records when inferring the era of persistence exposure
- Surveillance window: add 0 days to the end of the era of persistence exposure as an additional period of surveillance prior to cohort exit.
- Use days supply and exposure end date for exposure duration. [change](#)

**Censoring Events:**  
Exit Cohort based on the following criteria:  
No censoring events selected.

[+ Add Censoring Event](#)

# ATLAS – Cohort Definitions: Generate Cohort

From the **Generation** tab, generate your cohort

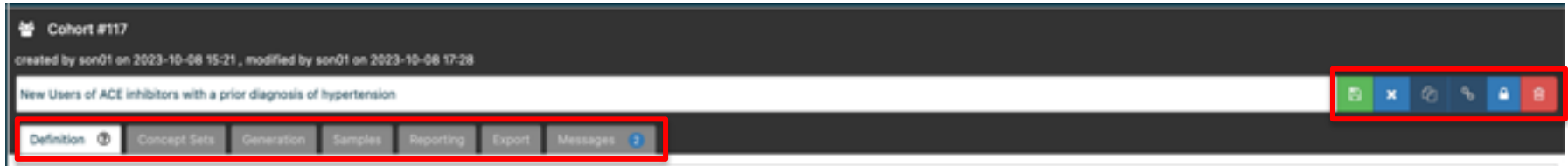
The screenshot displays the ATLAS Cohort Definitions interface. At the top, a navigation bar includes tabs for Definition, **Generation** (highlighted with a red box and arrow), Tables, Reporting, Export, and Messages. Below this, the 'Available CDM Sources' table lists three sources: MSQW2, MSQW\_FRO\_deld, and New Source. The MSQW\_FRO\_deld source is highlighted with a red box, and its 'People' count (60,066) is also highlighted with a red box and labeled 'Cohort Count'. A red box labeled 'Generate' points to the 'Generate' button next to the MSQW\_FRO\_deld source. Below the table, the 'Inclusion Report' section is visible, showing summary statistics for the MSQW\_FRO\_deld source. The report includes a table with columns for Match Rate, Matches, Total Events, Inclusion Rule, N, % Satisfied, and % To-Gain. The match rate is 45.76%, matches are 60,066, and total events are 131,268. The inclusion rule is '1. have a prior diagnosis of hypertension'. The population visualization shows a green bar and an orange bar.

Source Name	Generation Status	People	Records	Generated	Generation Duration
MSQW2	n/a	n/a	n/a	n/a	n/a
MSQW_FRO_deld	COMPLETED	60,066	60,066	10/06/2023 5:34 PM	00:04:06
New Source	n/a	n/a	n/a	n/a	n/a






Match Rate	Matches	Total Events
45.76%	60,066	131,268

Inclusion Rule	N	% Satisfied	% To-Gain
1. have a prior diagnosis of hypertension	60,066	45.76%	54.24%

# ATLAS – Cohort Definitions: Additional Features



- **Concept Sets** – review concept sets within your definition
- **Export** – review a full description of what the Cohort Definition represents
- **Messages** – review warnings or memos regarding potential errors or incomplete aspects of the defined search criteria

-  Close Cohort Definition
-  Copy
-  Create Link to Share Direct Access
-  Configure Access
-  Delete

# ATLAS – Patient List Extraction

- If you are interested in extracting the patient list, you can put in a JIRA ticket with the following details:

Question

ATLAS Cohort Patient List

Please ask the specific question here.

Description

Cohort Definition ID:  
Cohort Definition Name:

<https://scicomp.mssm.edu/jira/servicedesk/customer/portal/4/create/100>

Cohort Definitions

Column visibility Copy CSV Show 15 entries

Showing 1 to 15 of 79 entries

	Id	Name
Created	117	New Users of ACE inhibitors with a prior diagnosis of hypertension
2+ Weeks Ago (75)		
This Week (2)		
Within 24 Hours (1)		
Last Week (1)		
Updated	114	Pts with Surgeries 9.1.22 - 8.31.23
2+ Weeks Ago (75)		
This Week (2)		
Within 24 Hours (1)		
Last Week (1)		
Author	101	# Patients with Diabetes during Cr2022
medabp01 (11)		
sampa01 (8)		
knies01 (4)		

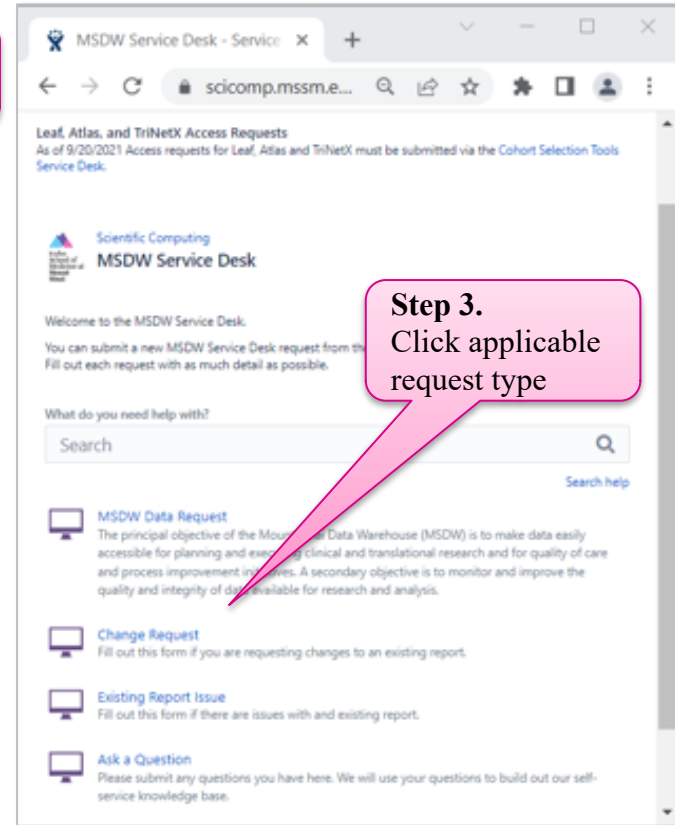
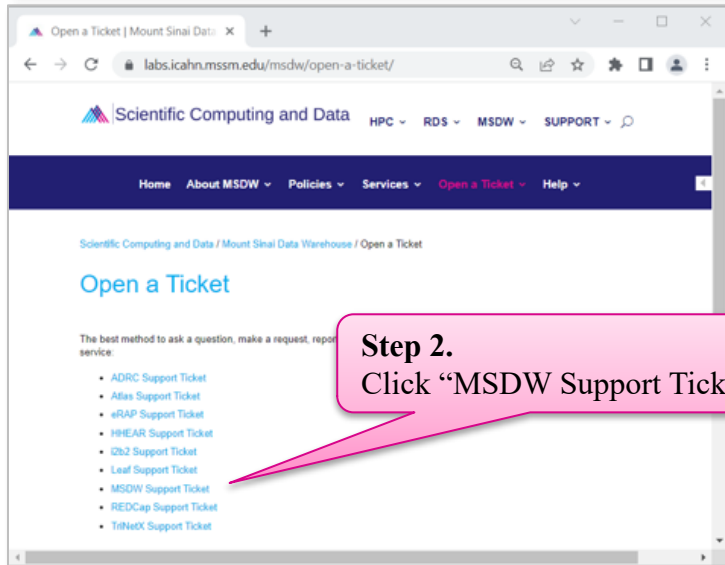
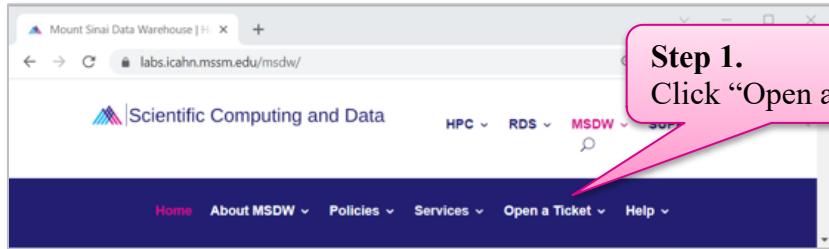
# MSDW Custom Data Request

# When You Need Custom Data

- ▶ Complex question that cannot be answered with one of the self-service query tools
- ▶ Need additional data that is not included in a de-identified data set
- ▶ Need PHI data for your analysis

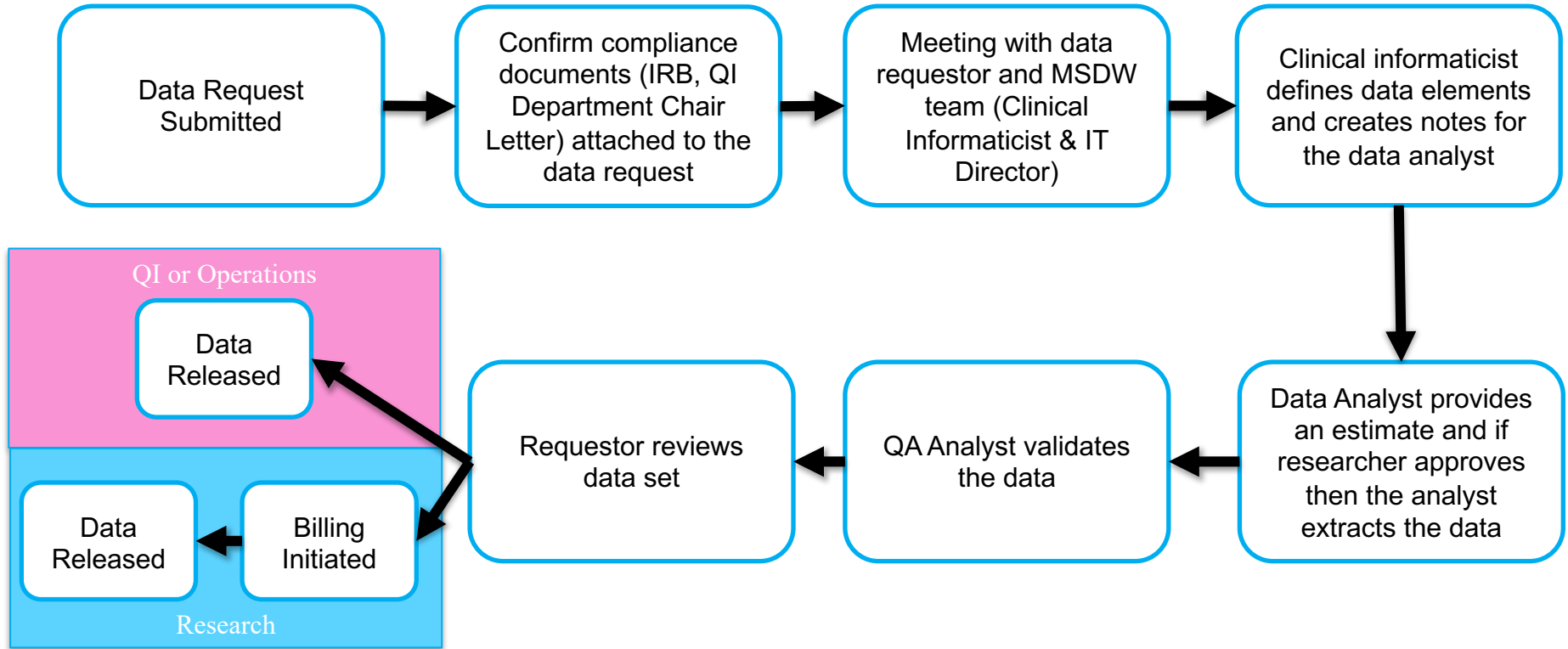
<https://scicomp.mssm.edu/jira/servicedesk/customer/portal/4>

# How to Open an MSDW Request Ticket





# Workflow Once Data Request Submitted



JIRA ticketing system used to monitor the status of data requests

# Acknowledgements

# Encourage MSDW Users to Acknowledge CTSA

The screenshot shows the Mount Sinai Data Warehouse (MSDW) website. The browser address bar displays <https://labs.icahn.mssm.edu...>. The navigation bar includes links for Home, About MSDW, Policies, Services, Open a Ticket, and Help. The main heading is "Acknowledge Mount Sinai in Your Work". Below this, a paragraph states: "All publications must include the following language in the acknowledgments section: 'This work was supported in part through the Mount Sinai Data Warehouse (MSDW) resources and staff expertise provided by Scientific Computing and Data at the Icahn School of Medicine at Mount Sinai.'" A blue button labeled "SEE DATA USE AGREEMENT" is positioned below the paragraph. A pink callout box highlights the acknowledgment text: "Supported by grant UL1TR004419 from the National Center for Advancing Translational Sciences, National Institutes of Health." Another pink callout box highlights the footer text: "© 2023 Icahn School of Medicine at Mount Sinai | Privacy Policy".

Mount Sinai Data Warehouse | S: x

<https://labs.icahn.mssm.edu...>

Sign in

Home About MSDW Policies Services Open a Ticket Help

## Acknowledge Mount Sinai in Your Work

All publications must include the following language in the acknowledgments section: "This work was supported in part through the Mount Sinai Data Warehouse (MSDW) resources and staff expertise provided by Scientific Computing and Data at the Icahn School of Medicine at Mount Sinai."

SEE DATA USE AGREEMENT

Supported by grant UL1TR004419 from the National Center for Advancing Translational Sciences, National Institutes of Health.

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Supported by grant UL1TR004419 from the National Center for Advancing Translational Sciences, National Institutes of Health.

# Acknowledge CTSA

- ▶ HPC team now requiring current & new Minerva users to agree annually to acknowledge Mount Sinai's CTSA grant
  - Users failing to agree risk having their access revoked
- ▶ REDCap team will put this policy into place
- ▶ MSDW team could enact the same policy
  - Direct database access users
  - Customers receiving custom data sets



# Your Publications

## Report publications to Scientific Computing and Data:

All publications that resulted from Scientific Computing and Data resources and services, including Leaf and ATLAS, should be reported annually.

### To report your publications, submit them here:

<https://redcap.mountsinai.org/redcap/surveys/?s=HPEMDCYLNTXF3E3E>

For 20 or more publications, email Maria at [marajulia.castro@mssm.edu](mailto:marajulia.castro@mssm.edu)

Learn more about MSDW and Clinical Query tools from the links below:

<https://labs.icahn.mssm.edu/msdw/>

<https://labs.icahn.mssm.edu/msdw/services/>

<https://labs.icahn.mssm.edu/msdw/data-sources/>

“Walk-in” Digital Concierge service hosted by the MSDW

- Every Wednesday from 3:30 PM to 4:30 PM



# Thank you!

Thank you for your time! We hope you enjoyed this presentation.

Please take a minute to complete a short survey to provide your feedback and help improve our services:



<https://redcap.mountsinai.org/redcap/surveys/?s=HNDLJ7ARHLCHTELT>