

TriNetX Clinical Query Tool

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Scientific Computing and Data

Icahn School of Medicine at Mount Sinai

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Icahn
School of
Medicine at
**Mount
Sinai**

Agenda

1. The Mount Sinai Data Warehouse
2. Introduction to TriNetX Cohort Query Tool
3. Building a Query in TriNetX
4. MSDW Custom Data Set Request

Mount Sinai Data Warehouse

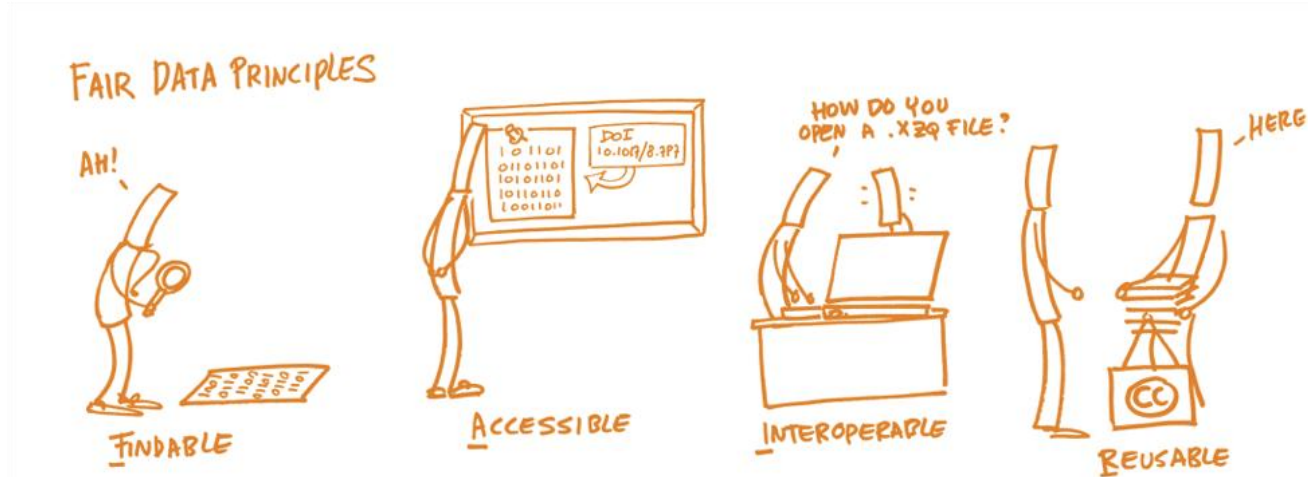
Scientific Computing FAIR Principles for Data

Findable

Accessible

Interoperable

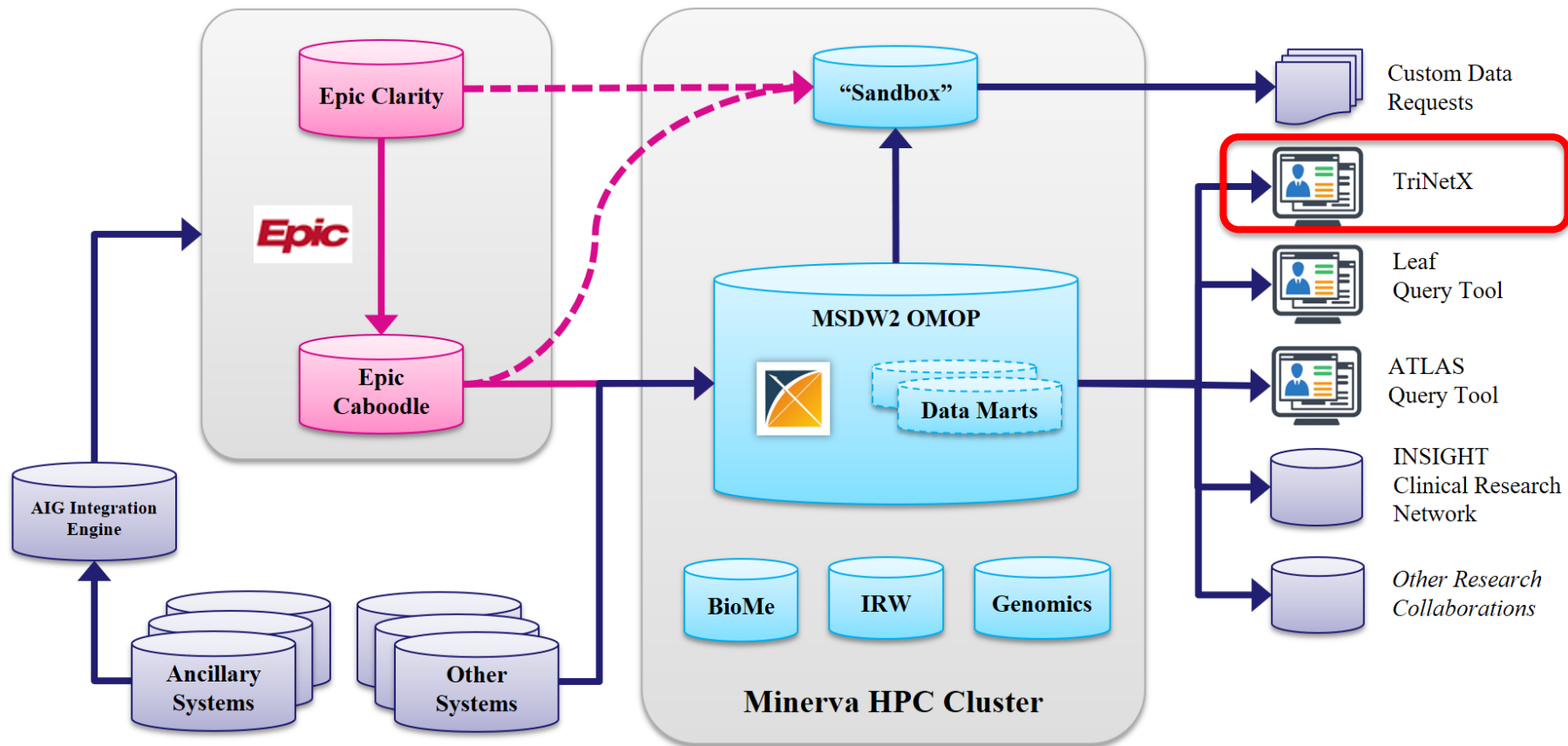
Reusable /
Reproducible



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

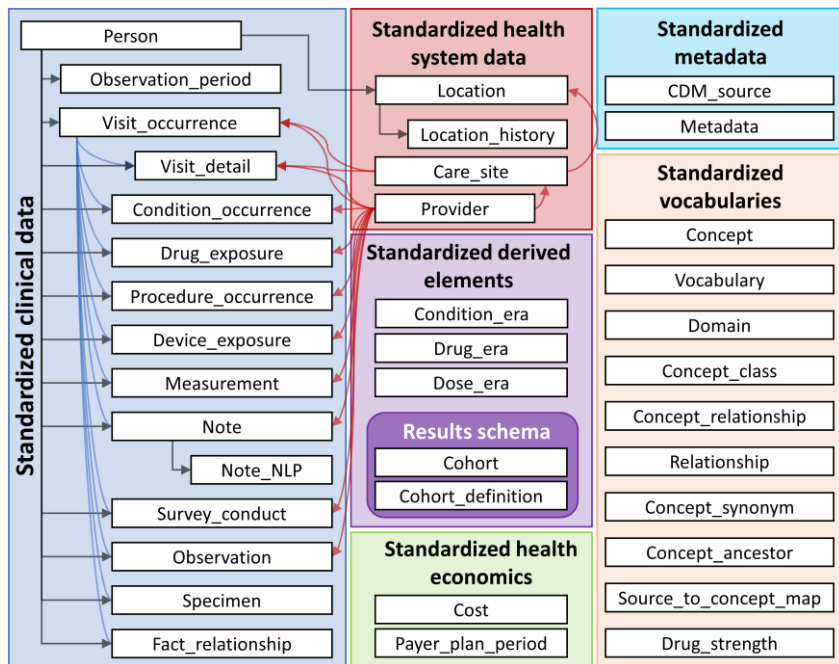
Image Source: <https://book.fosteropenscience.eu/>

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 March 2025*)

OMOP Table	Record Type	Distinct Patients	Record Count
person	Patient Demographics	12,183,142	12,183,142
death	Patient Date of Death	55,626	55,626
visit_occurrence	Chart Documentation Event	6,239,525	115,434,061
visit_occurrence	Mobile Unit Encounter	99,818	169,340
visit_occurrence	Inpatient Hospitalization from ED Visit	335,127	652,658
visit_occurrence	Hospital Outpatient Visit	1,035,604	3,017,867
visit_occurrence	Urgent Care Visit	7,142	7,826
visit_occurrence	ED Visit	1,342,653	3,359,116
visit_occurrence	Inpatient Hospitalization	676,614	1,012,456
visit_occurrence	Telehealth Visit	794,235	3,683,284
visit_occurrence	Outpatient Visit	4,727,970	93,872,652
condition_occurrence	Billing Diagnosis	2,829,062	74,065,186
condition_occurrence	Encounter Diagnosis	4,353,043	125,919,573
condition_occurrence	Problem List	2,462,239	13,779,826
condition_occurrence	Hospital Problem	952,609	3,969,045
measurement	Vital Signs	3,983,408	709,682,208
measurement	Flowsheet Measurement	1,945,060	258,022,030
measurement	Lab Component Result	4,308,922	1,136,014,375
drug_exposure	Medication Order with Administration	1,698,995	141,076,077
drug_exposure	Outpatient Medication Order with Dispense	28,980	294,784

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

Introduction: TriNetX Cohort Query Tool

Clinical Query Tools - Overview

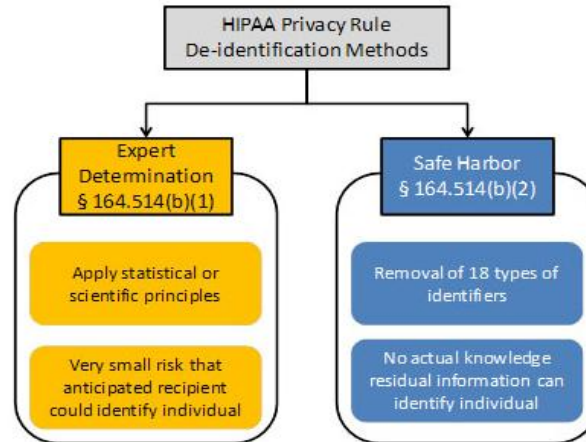
	Leaf	ATLAS	TriNetX
Description	Web-based, lightweight drag-and-drop cohort query tool that quickly analyzes population demographics	A web-based cohort query tool for database exploration, standardized vocabulary browsing, cohort definition, and patient cohort-level analysis	A web-based cohort query tool
Access	Use your Mount Sinai network username/password to login.	Use your Mount Sinai network username/password to login	Request access here . Log in to the TriNetX system using your email address and password.
Training	Written Tutorial ; PEAK Tutorial	Written Tutorial ; PEAK Tutorial ; Videos	PEAK Tutorial
Data Types	Patient demographics, diagnoses, procedures, medications, labs, orders, vitals, institutional patient cohorts (BioMe, IRW, etc.)	Patient demographics, diagnoses, procedures, medications, labs, orders, vitals	Patient demographics, diagnoses, procedures, medications, labs, orders, vitals
PHI	No	No	De-identified data only
Cost	No charge	No charge	No charge
Application Status	Leaf Status and Roadmap	ATLAS Status and Roadmap	
Advantages	Can visualize demographic details of cohorts, drag-and-drop query feature; download de-identified patient cohort list	Utilizes common data model and queries	Offers a polished, commercially developed user interface

See more details at <https://labs.icahn.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

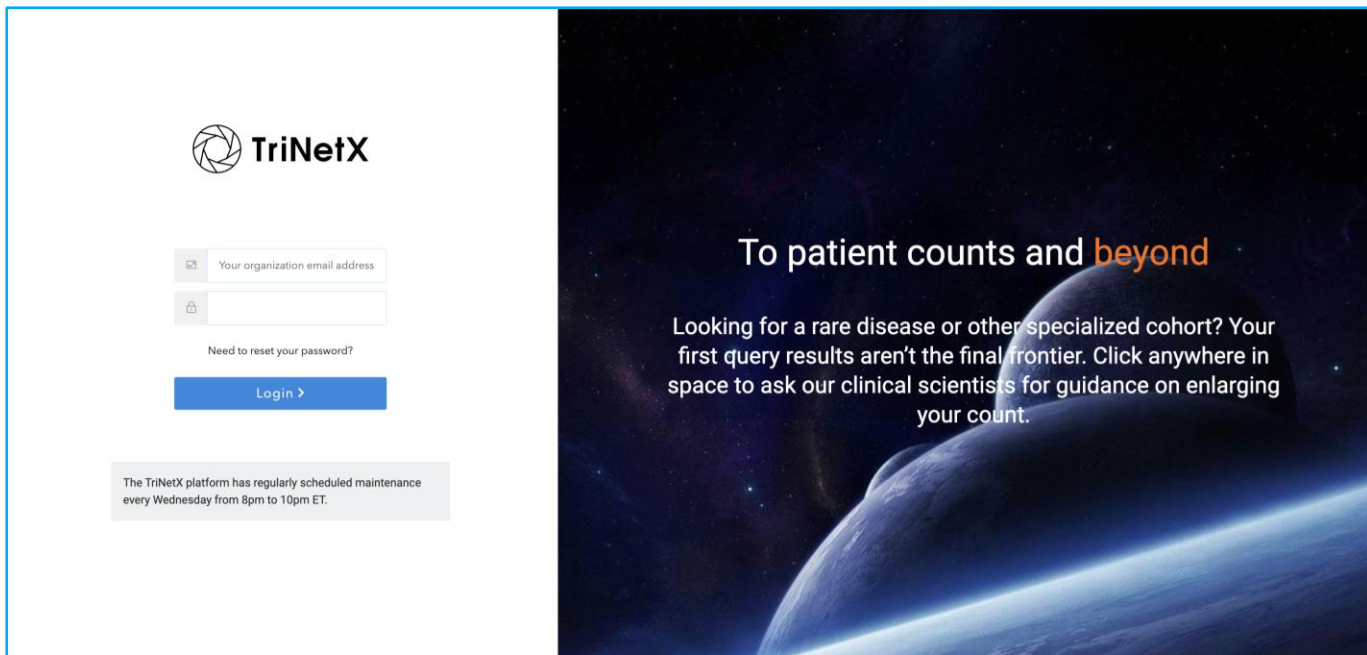
- Name
- Street Address, city, county, zip code (the first three digits of the zip code may be used if there are more than 20,000 people in the zip code)
- All element of dates (except year), including dates of birth, admission, discharge or death
- All ages over 89
- All telephone/fax numbers
- Fax 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


TriNetX Query Tool

- TriNetx can be used to query the MSDW for QI and Research purposes
- Access **De-identified** data across the following domains:
 - Diagnoses using ICD-10-CM
 - Encounters
 - Lab results using LOINC
 - Medications using ATC, RxNorm Ingredient
 - Procedures using CPT4
 - Demographics
 - Vitals
- Additional Features:
 - Simulate patient populations based on inclusion and exclusion criteria
 - Explore patient cohort to learn about any comorbid conditions, etc.
 - Predict number of newly eligible patients for your study
- Maintained by a third-party private company

Accessing TriNetX

- All Mount Sinai faculty, staff or student can access TriNetX at <https://live.trinetx.com>
- Google Chrome is the preferred browser
- Requires VPN access and use of your Mount Sinai Login credentials



 **TriNetX**

[Need to reset your password?](#)

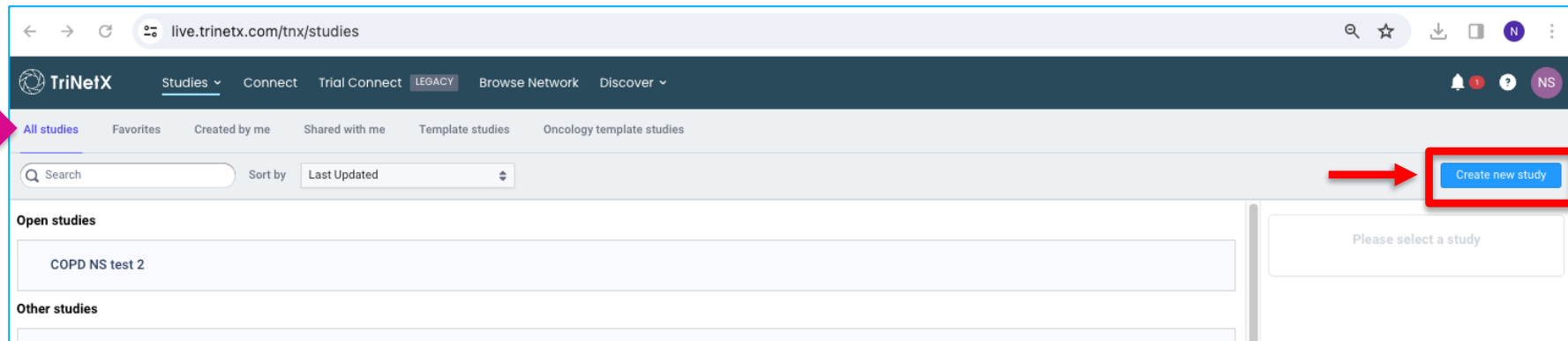
[Login >](#)

The TriNetX platform has regularly scheduled maintenance every Wednesday from 8pm to 10pm ET.

To patient counts and **beyond**

Looking for a rare disease or other specialized cohort? Your first query results aren't the final frontier. Click anywhere in space to ask our clinical scientists for guidance on enlarging your count.

TriNetX Interface



Duplicate a Study from My Studies

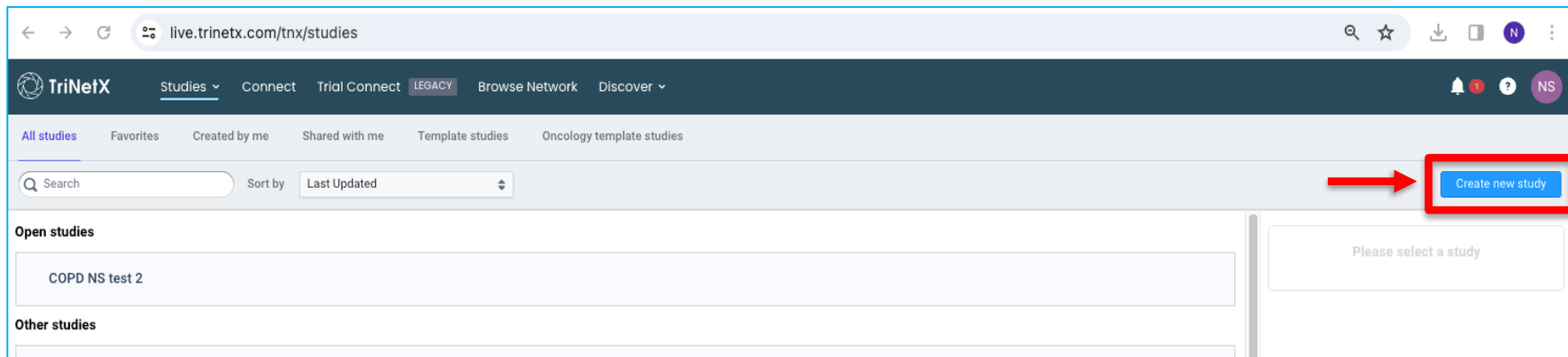
The screenshot shows the TriNetX interface. At the top, there's a navigation bar with 'TriNetX' logo and tabs for 'Studies', 'Connect', 'Trial Connect', 'LEGACY', 'Browse Network', and 'Discover'. Below this, a filter bar shows 'All studies', 'Favorites', 'Created by me' (selected), 'Shared with me', 'Template studies', and 'Oncology template studies'. A search bar and a 'Sort by' dropdown (set to 'Last Updated') are also present. The main content area is divided into 'Open studies' and 'Other studies'. Under 'Open studies', there's a card for 'COPD NS test 2'. To the right of this card is a details panel for 'COPD NS test 2', showing 'Created By' (Naomi So, Dec 28, 2023) and 'Links' (Team (0), Documents (0)). At the bottom of this panel are 'Delete' and 'Duplicate' buttons. A red box labeled 'Duplicate' points to the 'Duplicate' button.

The 'Duplicate Study' form is displayed. It has a 'Study Name*' field with a placeholder 'Duplicate Study Name'. Below this is a section 'Copy the following to new study' with checkboxes for 'Current Study', 'Query History', 'Results History', 'Attached Documents', 'Analytics Inputs', and 'Lucid Inputs'. There's a 'Research Purpose*' field with a help icon. Below this is a section 'Please select at least one option below.*' with two columns of checkboxes: 'Clinical Trial Research' (Design clinical trial, Assess feasibility of clinical trial, Identify clinical trial sites, Recruit trial subjects) and 'Other Scientific Research' (Conduct health economics and outcomes research (HEOR), Explore patient populations, Conduct other secondary research).

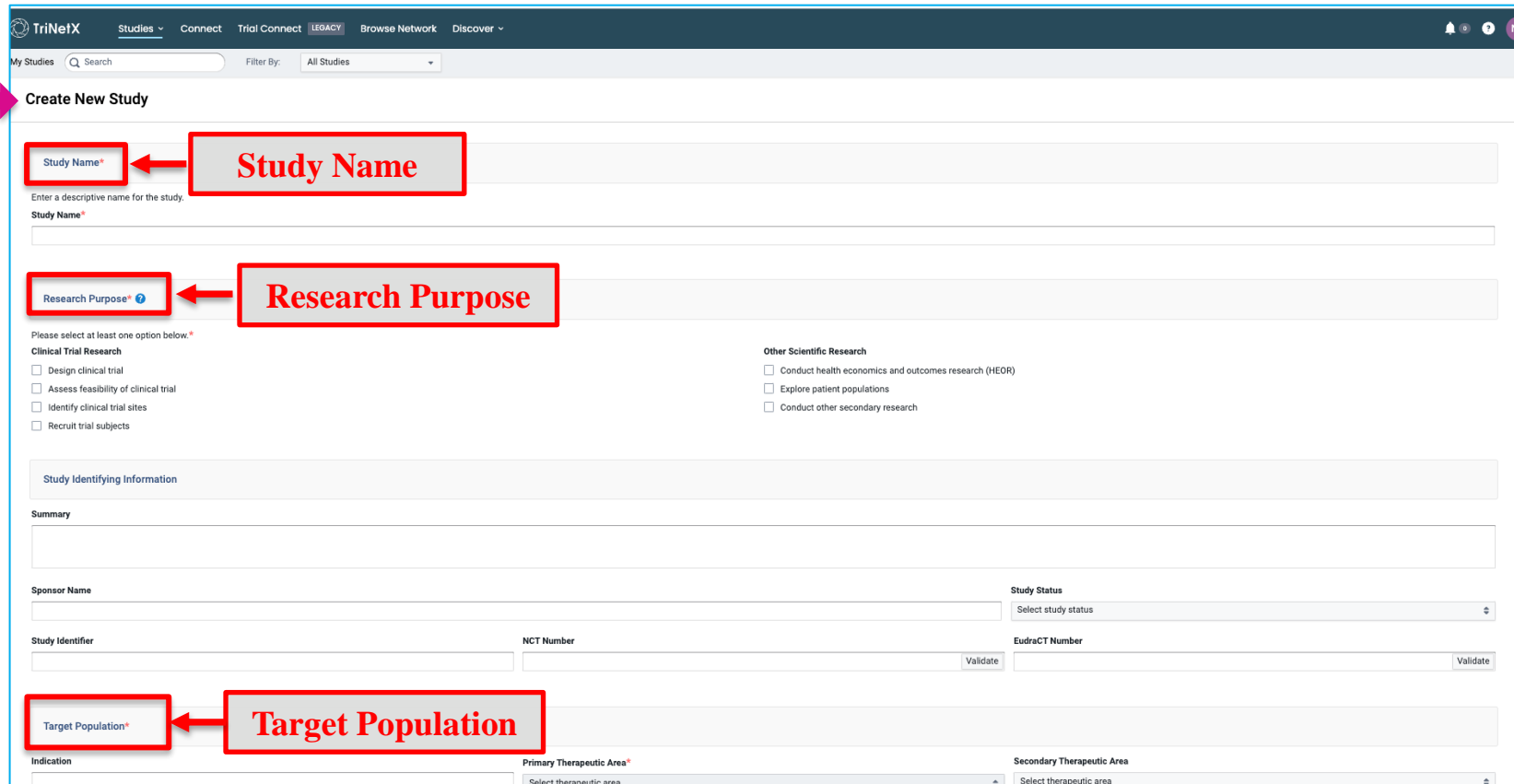
Sample Study:

How many adult patients with a diagnosis of COPD and on fluticasone + umeclidinium + vilanterol, had an ED or inpatient visit at least once in the last year?

TriNetX – Create New Study



TriNetX – Create New Study



The screenshot shows the 'Create New Study' page in the TriNetX application. A pink arrow points to the 'Create New Study' header. Red boxes and arrows highlight specific fields: 'Study Name', 'Research Purpose', and 'Target Population'. The form includes sections for 'Study Identifying Information', 'Summary', 'Sponsor Name', 'Study Identifier', 'NCT Number', 'Study Status', 'EudraCT Number', 'Primary Therapeutic Area', and 'Secondary Therapeutic Area'. The 'Research Purpose' section has two categories: 'Clinical Trial Research' and 'Other Scientific Research', each with several checkboxes.

TriNetX Studies Connect Trial Connect LEGACY Browse Network Discover

My Studies Search Filter By: All Studies

Create New Study

Study Name* Study Name

Enter a descriptive name for the study.

Study Name*

Research Purpose* Research Purpose

Please select at least one option below.*

Clinical Trial Research

- ☐ Design clinical trial
- ☐ Assess feasibility of clinical trial
- ☐ Identify clinical trial sites
- ☐ Recruit trial subjects

Other Scientific Research

- ☐ Conduct health economics and outcomes research (HEOR)
- ☐ Explore patient populations
- ☐ Conduct other secondary research

Study Identifying Information

Summary

Sponsor Name

Study Identifier **NCT Number** **Study Status** **EudraCT Number**

Target Population* Target Population

Indication **Primary Therapeutic Area*** **Secondary Therapeutic Area**

Create New Study – Query Builder

The screenshot displays the TriNetX Query Builder interface. A pink arrow points to the 'Query Builder' option in the left sidebar. The main area shows a study named 'Unnamed' with filters for 'Mount Sinai Health System' and 'Any medical center type | Any data type | Any age / Any sex'. Two red boxes highlight the 'Inclusion Criteria' (MUST HAVE) and 'Exclusion Criteria' (CANNOT HAVE) search boxes. A blue box labeled 'Hierarchy Tree' points to a button with a grid icon. A red box labeled 'Import Query' points to the 'Import Query' button in the 'Build a new query' section.

TriNetX

Studies ▾ Connect Browse Network What's New ▾ 13

My Studies / test / Query Builder

Query Builder

Healthcare Organizations (HCOs)

Explore Cohort

Analyze Criteria

Rate of Arrival

Analytics

Connect

Study Management

Design Assistance

☆ Unnamed

Mount Sinai Health System
1 of 1 HCOs online

Filters
Any medical center type | Any data type | Any age / Any sex

MUST HAVE Inclusion Criteria

Search Term...

CANNOT HAVE Exclusion Criteria

Search Term...

Count Patients

of 4,973,226 patients of 1 HCO

Hierarchy Tree

Build a new query

Use the search boxes above to add new terms, or the button below to import a query

Import Query

Import Query

Hierarchy Tree – Search from Clinical Domains

☆ Unnamed

Count Patients

Mount Sinai Health System
1 of 1 HCOs online

Any country
1 country in the network

MUST HAVE

CANNOT HAVE

Diagnoses: ICD-10

Search Term...

All

D

Demographics

Dx **Diagnoses**

Oncology

P

Procedures

M

Medications

L

Labs

G

Genomics

V

Visits

Organized by ICD-10

☒ Show ICD-9 terms

☒ ICD-10-CM

Diagnoses: ICD-10

> ☐ ICD-10-CM

A00-B99

Certain infectious and parasitic diseases

549,950

> ☐ ICD-10-CM

C00-D49

Neoplasms

495,730

> ☐ ICD-10-CM

D50-D89

Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism

300,360

> ☐ ICD-10-CM

E00-E89

Endocrine, nutritional and metabolic diseases

1,047,430

> ☐ ICD-10-CM

F01-F99

Mental, Behavioral and Neurodevelopmental disorders

576,570

> ☐ ICD-10-CM

G00-G99

Diseases of the nervous system

584,430

> ☐ ICD-10-CM

H00-H59

Diseases of the eye and adnexa

343,880

> ☐ ICD-10-CM

H60-H95

Diseases of the ear and mastoid process

281,380

> ☐ ICD-10-CM

I00-I99

Diseases of the circulatory system

862,510

> ☐ ICD-10-CM

J00-J99

Diseases of the respiratory system

788,180

☐ Show Terms with Zero Patients

☒ Show Deprecated

Add To Query

Cancel

Patients

Patients

Adding a term to the Query Builder:

Search for terms using the search box. For a given search result, click on the hierarchy tree to view parent and child terms

The screenshot displays the Mount Sinai Health System Query Builder interface. At the top, there are filters for 'Mount Sinai Health System' (1 of 1 HCOs online) and 'Any country' (1 country in the network). Below these are tabs for 'MUST HAVE' and 'CANNOT HAVE'. A search bar contains 'COPD', highlighted with a red box and labeled 'Search "COPD"'. Below the search bar are tabs for various categories: All, D, Demographics, Dx, Diagnoses, Oncology, P, Procedures, M, Medications, L, Labs, G, Genomics, and V, Visits. The 'Dx' tab is selected. The main table shows search results for 'COPD' with columns for 'Code', 'Term Description', and 'Patients'. The first row is selected, showing 'ICD-10-CM J44' and 'Other chronic obstructive pulmonary disease COPD', with a patient count of 42,200. A red box labeled 'Patient Count' points to this value. A red box labeled 'Hierarchy Tree' points to a tree icon next to the patient count. At the bottom, there are checkboxes for 'Show Terms with Zero Patients' and 'Show Deprecated'. A red box labeled 'Add to Query' points to the 'Add To Query' button.

Code	Term Description	Patients
<input checked="" type="checkbox"/> ICD-10-CM J44	Dx Other chronic obstructive pulmonary disease COPD	42,200
<input type="checkbox"/> ICD-10-CM J44.1	Dx Chronic obstructive pulmonary disease with (acute) exacerbation COPD w acute exacerbation	1,850
<input type="checkbox"/> ICD-10-CM J44.0	Dx Chronic obstructive pulmonary disease with (acute) lower respiratory infection COPD w acute bronchitis	1,200

☐ Show Terms with Zero Patients ☒ Show Deprecated

Add to Query Add To Query Cancel

Adding Additional Terms

Next search for medications under **MUST HAVE** and add all three meds to Query

Mount Sinai Health System
1 of 1 HCOs online

Any country
1 country in the network

MUST HAVE **CANNOT HAVE**

Q Fluticasone

Q Search Term...

All D Demographics Dx Diagnoses Oncology P Procedures M Medications L Labs G Genomics V Visits

Code	Term Description	Patients
<input checked="" type="checkbox"/> RxNorm 41126	M Fluticasone	230,830
<input type="checkbox"/> ICD-10-CM T36.0X5A	Dx Adverse effect of penicillins, initial encounter Fluticasone adverse reaction	900
<input type="checkbox"/> ICD-10-CM T50.995A	Dx Adverse effect of other drugs, medicaments and biological substances, initial encounter Fluticasone allergy	310


☐ Show Terms with Zero Patients ☒ Show Deprecated

Add to Query Add To Query Cancel

Adding Additional Terms

Click on the operator to switch between 'AND' & 'OR'

MUST HAVE

 Search Term...

Ungrouped Terms

MUST HAVE

ICD-10-CM	J44	Other chronic obstructive pulmonary disease	42,200
<div>AND OR</div>			
RxNorm	41126	fluticasone	230,830
<div>AND</div>			
RxNorm	1424884	vilanterol	22,390
<div>AND</div>			
RxNorm	1487514	umeclidinium	11,100

Term Filters

Hover over a term and click on the blue funnel to add details (i.e. Route, Brand, Strength for a medication)

A screenshot of a search results interface. It shows a list of three items, each with a blue 'AND' label on the left. The first item is 'RxNorm 41126 fluticasone', the second is 'RxNorm 1424884 vilanterol', and the third is 'RxNorm 1487514 umeclidinium'. The total count '11,100' is shown at the bottom right. A red arrow points from the blue funnel icon in the tooltip to the 'Add term filters' button. A large pink arrow points from the tooltip area down to the 'Medication Details' panel below.

AND	RxNorm	Term
AND	41126	fluticasone
AND	1424884	vilanterol
AND	1487514	umeclidinium

11,100

Add term filters

A screenshot of the 'Medication Details' panel. It has a header with a funnel icon, the text 'Medication Details', and a 'Clear Filter' link. Below the header are three columns: 'Route', 'Brand', and 'Strength'. Each column has a search bar with a magnifying glass icon and a close button (X). Below each search bar are two filter options with checkboxes and counts.

Medication Details Clear Filter

Route	Brand	Strength
<input type="checkbox"/> Unknown route 19,660	<input type="checkbox"/> Unknown brand 19,900	<input type="checkbox"/> Unknown strength 19,660
<input type="checkbox"/> Inhalant product 7,200	<input type="checkbox"/> Anoro 2,110	<input type="checkbox"/> 0.025 mg/actuat 7,200
	<input type="checkbox"/> Trelegy 4,200	

Visits

Add the terms for Emergency (ED) and Inpatient visit under MUST HAVE

MUST HAVE

CANNOT HAVE

All

D

Demographics

Dx

Diagnoses

V

Oncology

P

Procedures

M

Medications

L

Labs

G

Genomics

V Visits

Visits

☒ Visit

☐ Visit: Ambulatory

☒ Visit: Emergency

☒ Visit: Inpatient Encounter

☐ Visit: Unknown

☐ Visit: Virtual

Patients

4,972,780

3,598,290

1,105,710

607,200

4,703,210

577,090

☐ Show Terms with Zero Patients

Add To Query

Cancel

Create Groups of Terms

Once terms of interest have been added, click **Create a New Group** to group terms of interest

- Example: Group medications: *fluticasone*, *vilanterol*, *umeclidinium*

The screenshot shows a web interface for creating groups of terms. At the top, there are two tabs: 'MUST HAVE' and 'CANNOT HAVE'. Below each tab is a search bar labeled 'Search Term...'. The main area is titled 'Ungrouped Terms' and contains a table with two columns: 'MUST HAVE' and 'CANNOT HAVE'. The 'MUST HAVE' column lists several terms with their counts: 'ICD-10-CM J44 Other chronic obstructive pulmonary disease' (42,200), 'RxNorm 41126 fluticasone' (230,830), 'RxNorm 1424884 vilanterol' (22,390), 'RxNorm 1487514 umeclidinium' (11,100), 'Visit: Emergency' (1,105,710), and 'Visit: Inpatient Encounter' (607,200). The 'CANNOT HAVE' column is currently empty. A large pink arrow points from the 'MUST HAVE' column to a pink box labeled '1. Added MUST HAVE terms'. At the bottom left, a red box labeled '+ Create a New Group' is highlighted by a pink arrow, and a pink box labeled '2. Create a New Group' is next to it.

MUST HAVE	CANNOT HAVE
ICD-10-CM J44 Other chronic obstructive pulmonary disease 42,200	
AND	
RxNorm 41126 fluticasone 230,830	
AND	
RxNorm 1424884 vilanterol 22,390	
AND	
RxNorm 1487514 umeclidinium 11,100	
AND	
Visit: Emergency 1,105,710	
AND	
Visit: Inpatient Encounter 607,200	

1. Added MUST HAVE terms

2. Create a New Group

Groups of Terms

3. Click **Add terms** of interest → 4. Select terms (i.e. fluticasone, vilanterol, umeclidinium) for newly created Group 1

Ungrouped Terms

SELECT HAVE	CANNOT HAVE
<input type="checkbox"/> ICD-10-CM J44 Other chronic obstructive pulmonary disease 42,200	
<input type="checkbox"/> RxNorm 41126 fluticasone 230,830	
<input type="checkbox"/> RxNorm 1424884 vilanterol 22,390	
<input type="checkbox"/> RxNorm 1487514 umeclidinium 11,100	
<input type="checkbox"/> Visit: Emergency 1,105,710	
<input type="checkbox"/> Visit: Inpatient Encounter 607,200	

Group 1

Unnamed Group

3. Add terms

+ Add terms or drag and drop terms here

Group 1

Unnamed Group

Terms not included in the group

ADD TO MUST HAVE	ADD TO CANNOT HAVE
<input type="checkbox"/> ICD-10-CM J44 Other chronic obstructive pulmonary disease	
<input checked="" type="checkbox"/> RxNorm 41126 fluticasone	
<input checked="" type="checkbox"/> RxNorm 1424884 vilanterol	
<input checked="" type="checkbox"/> RxNorm 1487514 umeclidinium	
<input type="checkbox"/> Visit: Emergency	
<input type="checkbox"/> Visit: Inpatient Encounter	

4. Select terms for Group 1

Save Cancel

Define Temporal Relationship between two Clinical Events

Related Group - Can indicate that Group B occurred before, on or after Group A

- Example: Patient must be on medications before ED or Inpatient Visit
- 1a. Click **Group Rules** from Group 1 (*Meds*) → 1b. Select **Add Related Group** → 2. Click **Add terms** to Group B

AND

Group 1

Meds **Group 1**

MUST HAVE

RxNorm	41126	fluticasone	230,830
AND			
RxNorm	1424884	vilanterol	22,390
AND			
RxNorm	1487514	umeclidinium	11,100

CANNOT HAVE

1a. Group Rules

Group Rules

Add number of instances

Add number of unique instances

1b. Add Related Group

Add related group

Add time constraint

AND

Group 1

1A Meds **Group 1A**

MUST HAVE

RxNorm	41126	fluticasone	230,830
AND			
RxNorm	1424884	vilanterol	22,390
AND			
RxNorm	1487514	umeclidinium	11,100

CANNOT HAVE

Set a relationship between groups before running the query

Set Relationship

1B Unnamed Group **Group 1B**

+ Add terms

2. Add terms

Define Temporal Relationship between two Clinical Events

3. Click **Set Relationship** between Group A and Group B

The screenshot displays a clinical data management interface. At the top, a tab labeled 'AND' is visible. Below it, 'Group 1' is expanded, showing a list of medications under the heading '1A Meds'. The list is divided into 'MUST HAVE' and 'CANNOT HAVE' sections. The 'MUST HAVE' section contains three items, each with an 'AND' button to its left: 'RxNorm 41126 fluticasone 230,830', 'RxNorm 1424884 vilanterol 22,390', and 'RxNorm 1487514 umeclidinium 11,100'. Below this, a message states 'Set a relationship between groups before running the query'. A red box highlights the 'Set Relationship' button, and a red arrow points to it from a red box labeled '3. Set Relationship'. Below the message, 'Group 2' is expanded, showing a list of terms under the heading '1B Unnamed Group'. The list is divided into 'Terms not included in the group' and 'ADD TO MUST HAVE' sections. The 'Terms not included in the group' section contains three items, each with a checkbox to its left: 'ICD-10-CM J44 Other chronic obstructive pulmonary disease', 'Visit: Emergency', and 'Visit: Inpatient Encounter'. The 'ADD TO MUST HAVE' section is empty. At the bottom right, there are 'Save' and 'Cancel' buttons.

AND

Group 1

Group Rules ↑ ↓ Copy

1A Meds Edit

+ Terms Copy

MUST HAVE

CANNOT HAVE

RxNorm 41126 fluticasone 230,830

AND

RxNorm 1424884 vilanterol 22,390

AND

RxNorm 1487514 umeclidinium 11,100

Set a relationship between groups before running the query

Set Relationship

3. Set Relationship

1B Unnamed Group Edit

+ Terms Copy

Terms not included in the group

ADD TO MUST HAVE

ADD TO CANNOT HAVE

☐ ICD-10-CM J44 Other chronic obstructive pulmonary disease

☒ Visit: Emergency

☒ Visit: Inpatient Encounter

Save Cancel

Define Temporal Relationship between two Clinical Events

4. Define temporal relationship between Group A and Group B.

AND

Group 1

Group Rules

1A Meds

MUST HAVE

RxNorm	41126	fluticasone	230,830
AND			
RxNorm	1424884	vilanterol	22,390
AND			
RxNorm	1487514	umeclidinium	11,100

CANNOT HAVE

Set a Relationship between 1A (Meds) and 1B (Ed or Inpatient Visit)

Any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds

Group 1A: Any instance | Most recent instance | First instance

Group 1B: Any instance | Most recent instance | First instance

From 1 Days After To ∞ Years After

Save Cancel

1B Ed or Inpatient Visit

MUST HAVE

Visit: Emergency	1,105,710
OR	
Visit: Inpatient Encounter	607,200

CANNOT HAVE

Copy Group and Paste

1. Copy Group1B, and click **Paste Logic** to create **Group 2** (Example: COPD patients on meds who had an ED or Inpatient visit in the [past year](#))
2. Click **Group Rules** for Group 2 → Select **Add Time Constraint**

Group 1

1A Meds

MUST HAVE

RxNorm	41126	fluticasone	230,830
RxNorm	1424884	vilanterol	22,390
RxNorm	1487514	umeclidinium	11,100

CANNOT HAVE

Relationship Any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds

1B Ed or Inpatient Visit **Group 1B**

MUST HAVE

Visit: Emergency	1,105,710
Visit: Inpatient Encounter	607,200

CANNOT HAVE

+ Create a New Group or **Paste Logic**

Copy 1B (Ed or Inpatient Visit)

Group 2 **Group 2**

Ed or Inpatient Visit

MUST HAVE

Visit: Emergency	1,105,710
Visit: Inpatient Encounter	607,200

CANNOT HAVE

Group Rules

Add number of instances

Add number of unique instances

Add related group

Add Time Constraint

Add time constraint

Adding Time Constraints

- Set time constraint for Group 2

AND

^ Group 2 Group Rules ↑ ↓ 📄 🗑️

Ed or Inpatient Visit ✎ + Terms

Time Constraint for Group 2 ? Relative Time Specific Dates

Anytime 5yr 3yr 1yr 6mo 3mo 1mo 1day Today

From 1 ↑ ↓ Years To 0 ↑ ↓ Months

Save Cancel

MUST HAVE

Visit: Emergency	1,105,710
OR	
Visit: Inpatient Encounter	607,200

CANNOT HAVE

Adding Number of Instances

Example: COPD patients on meds who had an ED or Inpatient visit at least once in the past year

AND

^ Group 2

Ed or Inpatient Visit This group occurred since 1 year ago

MUST HAVE

Visit: Emergency	1,105,710
OR	
Visit: Inpatient Encounter	607,200

CANNOT HAVE

Group Rules

Add Number of Instances

Group Rules

- Add number of instances
- Add number of unique instances
- Add related group
- Edit time constraint



AND

^ Group 2

Ed or Inpatient Visit This group occurred since 1 year ago

Define number of instances for the terms in this group ?

A patient must have Greater than or equal to \geq 1 instances of these terms to be counted.

Remove

Save Cancel

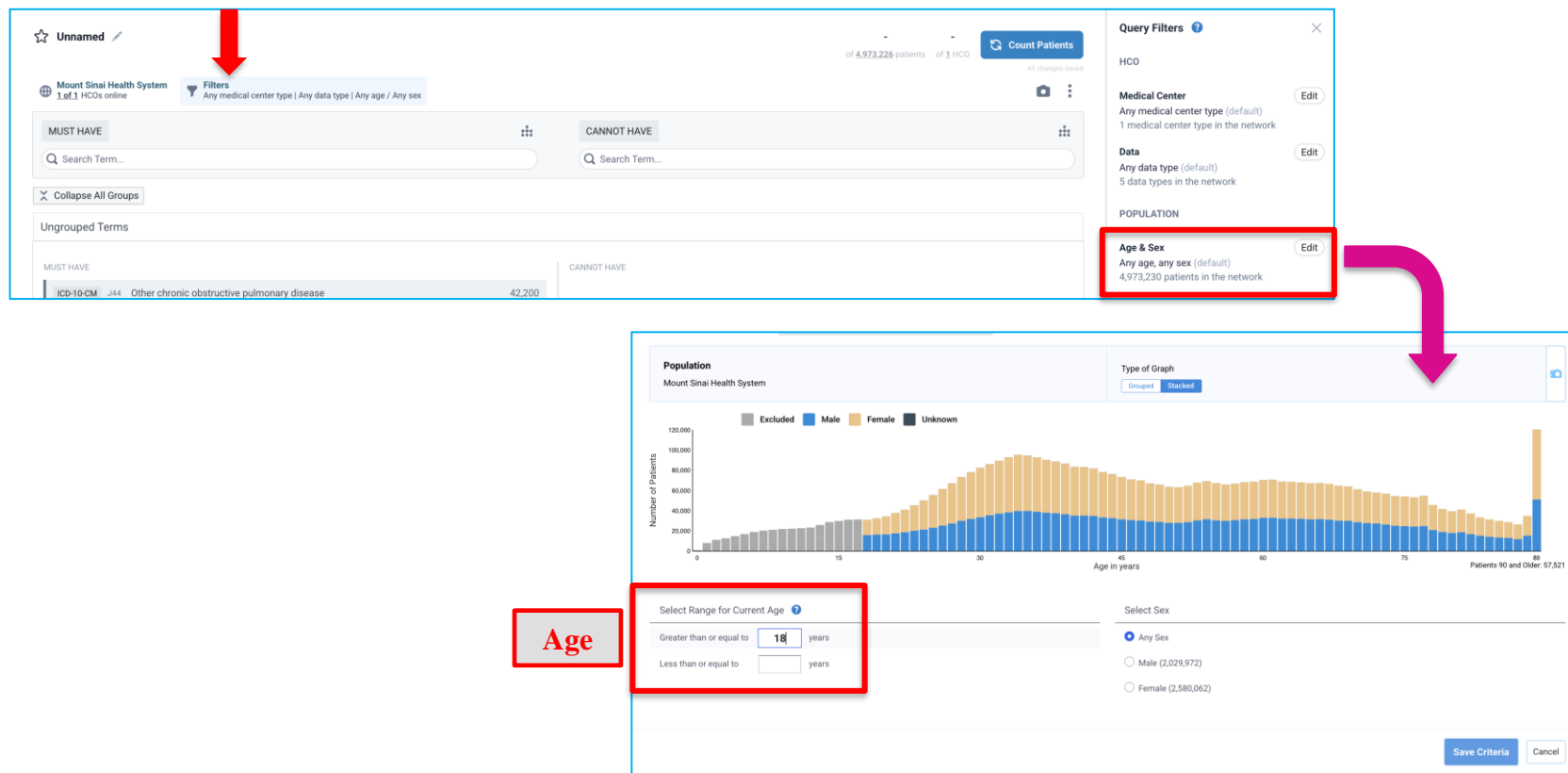
MUST HAVE

Visit: Emergency	1,105,710
OR	
Visit: Inpatient Encounter	607,200

CANNOT HAVE

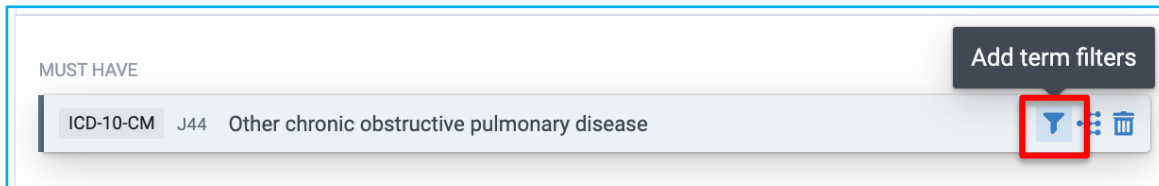
Restrict by Current Age

Example: COPD **adult** patients on meds who had an ED or inpatient visit at least once in the past year

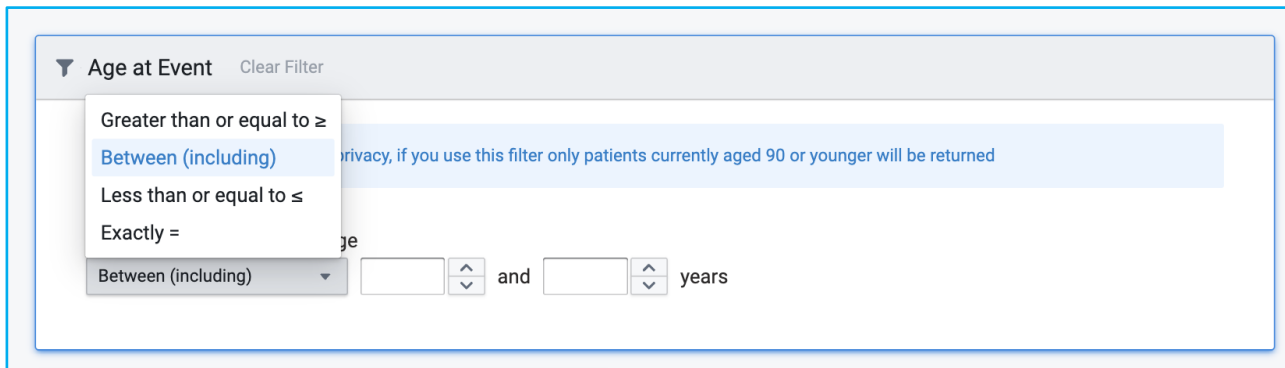


Restrict by Age at Event

Hover mouse over the term in Query Builder and click on **Blue Funnel**:



Indicate age or age range for when patient had the term documented:



Exclude Deceased Patients

Found under Demographics

The screenshot shows a patient search interface with a 'MUST HAVE' and a 'CANNOT HAVE' filter section. The 'CANNOT HAVE' section is highlighted with a red box and contains the search term 'Deceased'. Below the filter sections, there is a table of results. The table has columns for 'Code', 'Term Description', and 'Patients'. The 'Demographics' tab is selected, and the 'Deceased' term is listed with a count of 38,080 patients. At the bottom right, there are buttons for 'Add To Query' and 'Cancel'.

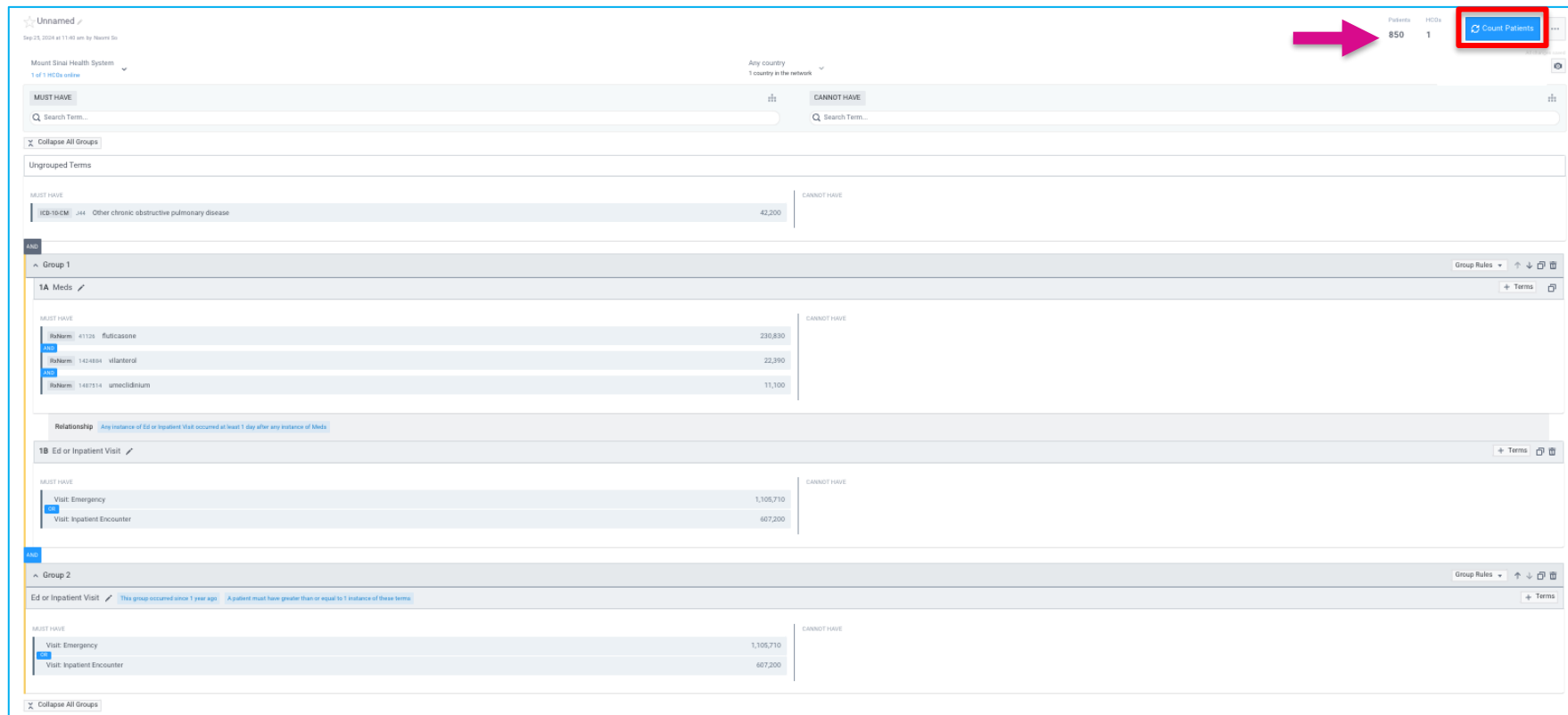
Code	Term Description	Patients
<input checked="" type="checkbox"/>	D Deceased	38,080

☐ Show Terms with Zero Patients

[Add To Query](#) [Cancel](#)

Count Patients

Once query has been built, click **Count Patients** to generate cohort

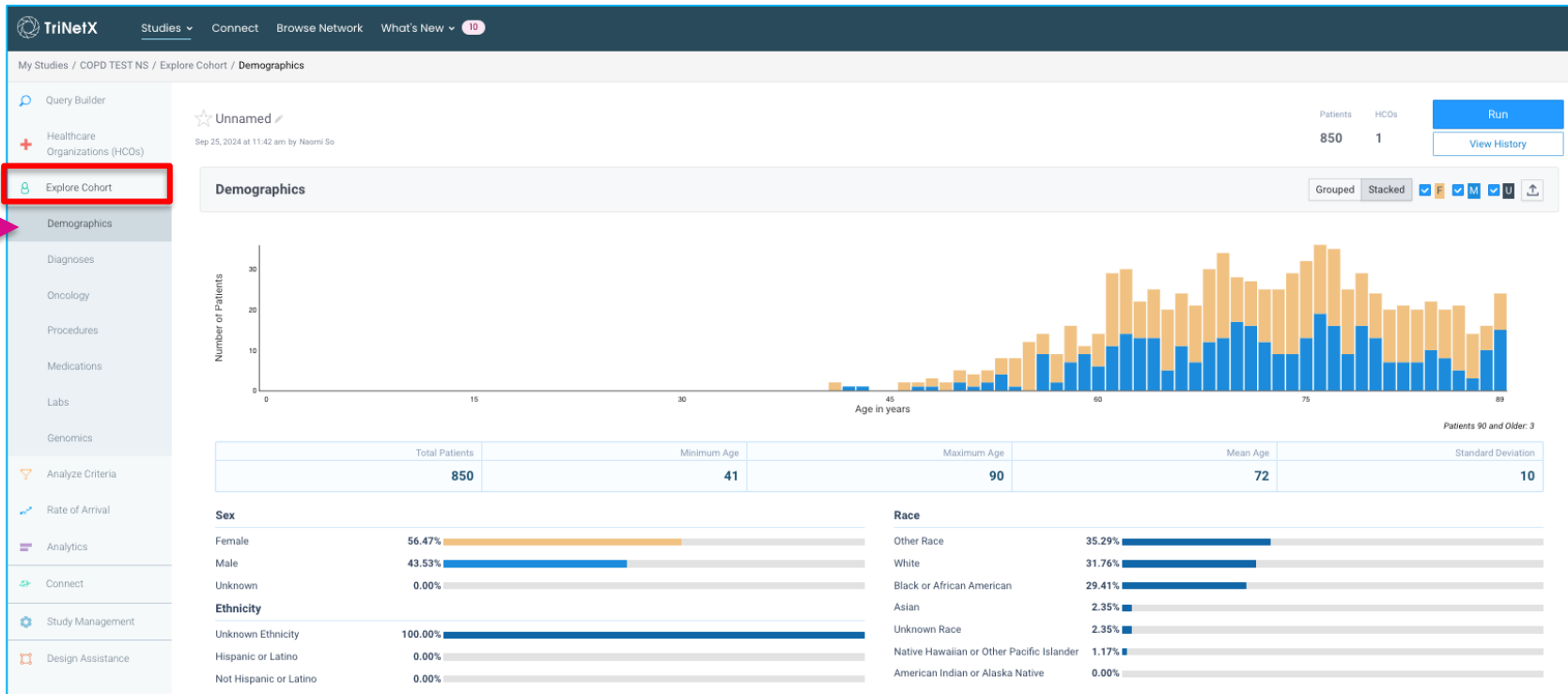


The screenshot displays a clinical query builder interface. At the top right, a pink arrow points to the 'Count Patients' button, which is highlighted with a red box. The interface shows a query for 'Mount Sinai Health System' with 1 of 1 HCDs online. The query is titled 'Group 1' and '1A Meds'. The results are displayed in a table with columns for 'MUST HAVE' and 'CANNOT HAVE'. The 'MUST HAVE' column lists three medications: fluticasone (230,830), vilanterol (22,390), and umecldium (11,100). The 'CANNOT HAVE' column is empty. Below the table, a 'Relationship' section indicates that any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds. The interface also shows a 'Group 2' section with a query for 'Ed or Inpatient Visit' and a table with two rows: 'Visit: Emergency' (1,106,710) and 'Visit: Inpatient Encounter' (607,200). The bottom of the interface has a 'Collapse All Groups' button.

MUST HAVE	CANNOT HAVE
ICD-10-CM J44 Other chronic obstructive pulmonary disease 42,200	
fluticasone 230,830	
vilanterol 22,390	
umecldium 11,100	

MUST HAVE	CANNOT HAVE
Visit: Emergency 1,106,710	
Visit: Inpatient Encounter 607,200	

Explore Cohort - Demographics



Explore Cohort - Diagnoses

The screenshot shows the TriNetX 'Explore Cohort - Diagnoses' interface. A pink arrow points to the 'Diagnoses' tab in the left sidebar. A red box highlights the 'Diagnoses' section header, with a red arrow pointing to the 'Set time parameters' annotation. Another red box highlights the search bar containing '1/13 emphysema', with a red arrow pointing to the 'Search for diagnosis' annotation. A third red box highlights the '+ Add to Must Have' button, with a red arrow pointing to the 'Option to add terms to query' annotation.

TriNetX

Studies ▾ Connect Browse Network What's New ▾

My Studies / COPD TEST NS / Explore Cohort / Diagnoses

Query Builder

Healthcare Organizations (HCOs)

Explore Cohort

Demographics

Diagnoses

Oncology

Procedures

Medications

Labs

Genomics

Analyze Criteria

Rate of Arrival

Analytics

Connect

Study Management

Design Assistance

★ Unnamed

Sep 25, 2024 at 11:42 am by Naomi So

Patients 850 HCOs 1

Run

View History

Diagnoses

Set time parameters

Diagnoses within 3M 6M 12M 24M Anytime ? All Acute Chronic ? ↕

Search for diagnosis 1/13 emphysema

Diagnoses

	ICD-10-CM	J00-J99	Diseases of the respiratory system	Patients	% of Cohort
✓	ICD-10-CM	J40-J44	Chronic lower respiratory diseases	850	100%
>	ICD-10-CM	J44	Other chronic obstructive pulmonary disease	850	100%
>	ICD-10-CM	J43	Emphysema	490	58%
>	ICD-10-CM	J45	Asthma	480	56%
>	ICD-10-CM	J41	Simple and mucopurulent chronic bronchitis	200	24%
>	ICD-10-CM	J42	Unspecified chronic bronchitis	160	19%
>	ICD-10-CM	J40	Bronchitis, not specified as acute or chronic	100	12%
>	ICD-10-CM	J47	Bronchiectasis	100	12%
>	ICD-10-CM	J96-J99	Other diseases of the respiratory system	530	62%
>	ICD-10-CM	J09-J18	Influenza and pneumonia	430	51%
>	ICD-10-CM	J30-J39	Other diseases of upper respiratory tract	330	39%
>	ICD-10-CM	J00-J06	Acute upper respiratory infections	290	34%
>	ICD-10-CM	J20-J22	Other acute lower respiratory infections	190	22%
>	ICD-10-CM	J80-J84	Other respiratory diseases principally affecting the interstitium	170	20%
>	ICD-10-CM	J90-J94	Other diseases of the pleura	110	13%
>	ICD-10-CM	J60-J70	Lung diseases due to external agents	70	8%

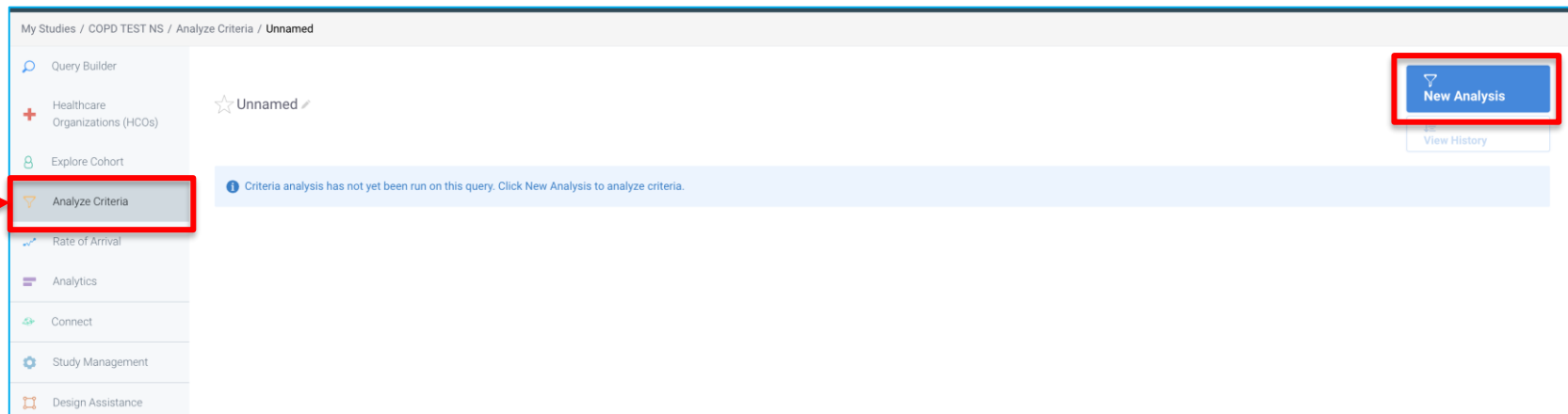
+ Add to Must Have + Add to Cannot Have

Option to add terms to query

Analyze Criteria

View the impact each criteria has on the total patient count

1. Click **New Analysis**



Analyze Criteria

2. Select Baseline Criteria to define base population (i.e. patients with COPD)
3. Select Terms for Analysis
4. Click Run

The screenshot displays the 'New Criteria Analysis' workflow in a software interface. The interface is divided into a left sidebar and a main content area. The sidebar contains navigation options: 'Query Builder', 'Healthcare Organizations (HCOs)', 'Explore Cohort', 'Analyze Criteria' (highlighted), and 'Rate of Arrival'. The main content area shows the 'New Criteria Analysis' form with two steps: '1. Select Baseline Criteria' and '2. Select Terms for Analysis'. The first step is highlighted with a red box and a red arrow pointing to it from a red box labeled '2. Select Baseline Criteria'. The second step is highlighted with a red box and a red arrow pointing to it from a red box labeled '3. Select Terms for Analysis'. The 'Run' button is highlighted with a red box and a red arrow pointing to it from a red box labeled '4. Run'. The 'Run' button is located at the top right of the main content area. The interface also shows a 'Select All' button and a 'Cancel' button. The main content area displays a list of 'Ungrouped Terms' and a 'Group 1' section with '1A Meds' and '1B Ed or Inpatient Visit' criteria. The '1A Meds' section includes a 'MUST HAVE' list with three items: 'Ruticase', 'vildagliptin', and 'umeclofenide'. The '1B Ed or Inpatient Visit' section includes a 'MUST HAVE' list with two items: 'Visit: Emergency' and 'Visit: Inpatient Encounter'. The 'Group 2' section includes a 'MUST HAVE' list with two items: 'Visit: Emergency' and 'Visit: Inpatient Encounter'. The interface also shows a 'Relationship' section with a description: 'Any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds'.

My Studies / COPD TEST NS / Analyze Criteria / Unnamed

Query Builder

Healthcare Organizations (HCOs)

Explore Cohort

Analyze Criteria

Rate of Arrival

New Criteria Analysis Select baseline terms which correspond to the condition being studied. [Learn more about baselines](#)

1 Select Baseline Criteria 2 Select Terms for Analysis

Next Cancel

Ungrouped Terms

MUST HAVE

☒ ICD-10-CM J44 Other chronic obstructive pulmonary disease

ICD-10-CM J44 Other chronic obstructive pulmonary disease

3. Select Terms for Analysis

4. Run

Group 1

1A Meds

MUST HAVE

Ruticase

vildagliptin

umeclofenide

Relationship Any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds

1B Ed or Inpatient Visit

MUST HAVE

Visit: Emergency

Visit: Inpatient Encounter

Group 2

Ed or Inpatient Visit This group occurred since 1 year ago. A patient must have greater than or equal to 1 instance of these terms.

MUST HAVE

Visit: Emergency

Visit: Inpatient Encounter

Analyze Criteria

- View the impact each criteria has on the total patient count
- The % decrease is from the criteria above

My Studies / COPD TEST NS / Analyze Criteria / Unnamed

Query Builder
Healthcare Organizations (HCOs)
Explore Cohort
Analyze Criteria
Rate of Arrival
Analytics
Connect
Study Management
Design Assistance

☆ Unnamed
Sep 26, 2024 at 9:27 am by Naomi So

Patients: 850 HCOs: 1

New Analysis
View History

Analyze Criteria

1/2 View

	Patients		HCOs	
Network	4,973,230		1	
Base Population	42,200	(-99%)	1	(0%)
Population ≥ 18 years, Any sex	42,170	(0%)	1	(0%)
Group 1A: Meds - The terms in this group occurred at any time. Must Have: RxNorm: 41126 Fluticasone AND RxNorm: 1424884 Vilanterol AND RxNorm: 1487514 Umeclidinium	1,900	(-95%)	1	(0%)
Group 1B: Ed or Inpatient Visit - Any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds. Must Have: Visit: emergency OR Visit: inpatient encounter	850	(-55%)	1	(0%)
Group 2: Ed or Inpatient Visit - This group occurred since 1 year ago. A patient must have greater than or equal to 1 instance of these terms. Must Have: Visit: emergency OR Visit: inpatient encounter				
	850		1	
	Patients		HCOs	

Analyze Criteria

Option to **Hide** criteria to see how it impacts patient count

☆ Unnamed
Sep 26, 2024 at 9:27 am by Naomi So

Patients 850 HCOs 1

New Analysis
View History

Analyze Criteria

Network

Base Population

Population ≥ 18 years, Any sex

HIDE

HIDE

Impact of hidden term

☆ Unnamed
Sep 26, 2024 at 9:27 am by Naomi So

Patients 850 HCOs 1

New Analysis
View History

Analyze Criteria

Network

Base Population

Population ≥ 18 years, Any sex

Group 2: Ed or Inpatient Visit - This group occurred since 1 year ago. A patient must have greater than or equal to 1 instance of these terms. Must Have: Visit: emergency OR Visit: inpatient encounter

	Patients		HCOs
	4,973,230		1
	42,200 (-99%)		1 (0%)
	42,170 (0%)		1 (0%)
	5,150 (-88%)		1 (0%)

5,150 Patients 1 HCOs

Adjusting your criteria increases your cohort by 506% or 4,300 patients

Hidden Terms 1

Group 1A: Meds - The terms in this group occurred at any time. Must Have: RxNorm: 41126 Fluticasone AND RxNorm: 1424884 Vilanterol AND RxNorm: 1487514 Umeclidinium

Group 1B: Ed or Inpatient Visit - Any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds. Must Have: Visit: emergency OR Visit: inpatient encounter

Rate of Arrival

View how many patients who meet query criteria enter patient cohort each month

My Studies / COPD TEST NS / Rate of Arrival

Query Builder

Healthcare Organizations (HCOs)

Explore Cohort

Analyze Criteria

Rate of Arrival

Analytics

Connect

Study Management

Design Assistance

★ Unnamed Sep 26, 2024 at 9:31 am by Naomi So

Patients **850** HCOs **1**

Run

[View History](#)

Patient Arrival Rate ? ☐ Show graph

Healthcare Organization (HCO)	Historic Arrivals (Monthly Avg Over Past 3 Yrs.)	Predicted Arrivals (Monthly Avg Over Next 1 Yr.)	Trend
Mount Sinai Health System	34.2	51.5	

Study Management

- **Properties** → Edit Study Properties
- **Team** → Share Study
- **Documents** → Upload relevant study documents

My Studies / COPD TEST NS / Study Management / Properties

Query Builder

Healthcare Organizations (HCOs)

Explore Cohort

Analyze Criteria

Rate of Arrival

Analytics

Connect

Study Management

Properties

Team

Documents

Design Assistance

Study Properties

Study Name*

Study Name

COPD TEST NS

Research Purpose* ?

Clinical Trial Research

Assess feasibility of clinical trial

Other Scientific Research

Study Identifying Information

Summary

Edit Study Properties

Edit Study Properties

Demo of Example Query in TriNetX

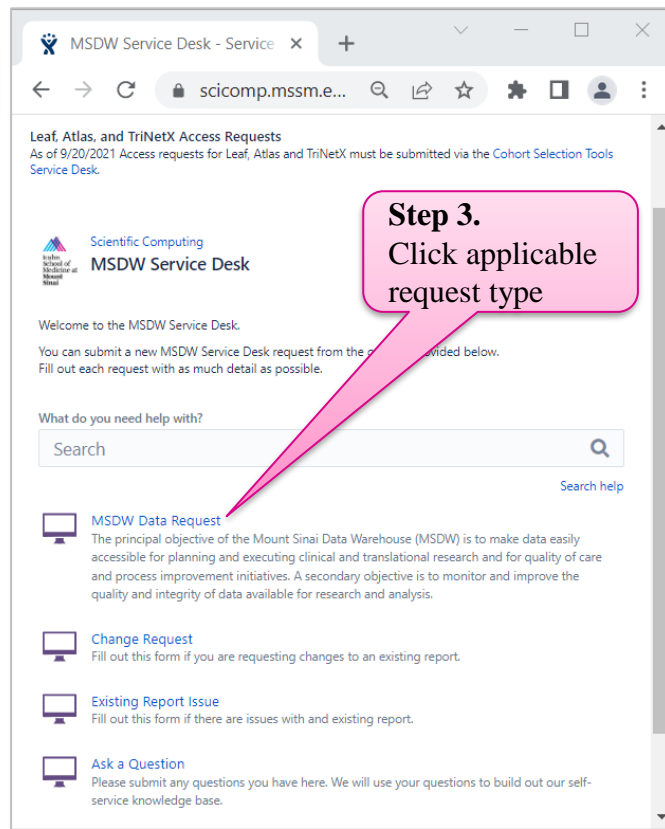
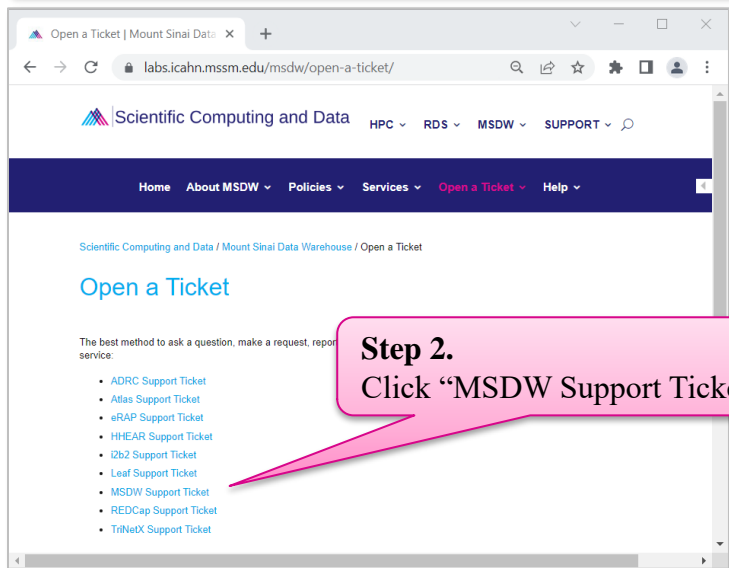
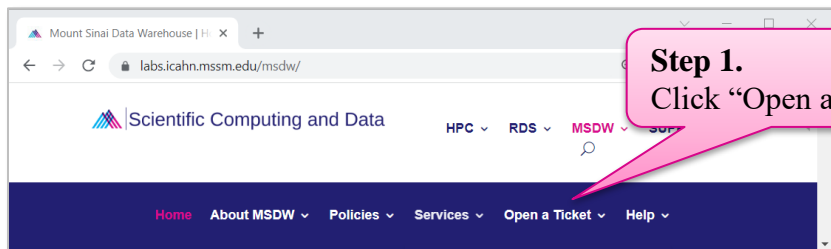
MSDW Custom Data Request

When You Need Custom Data

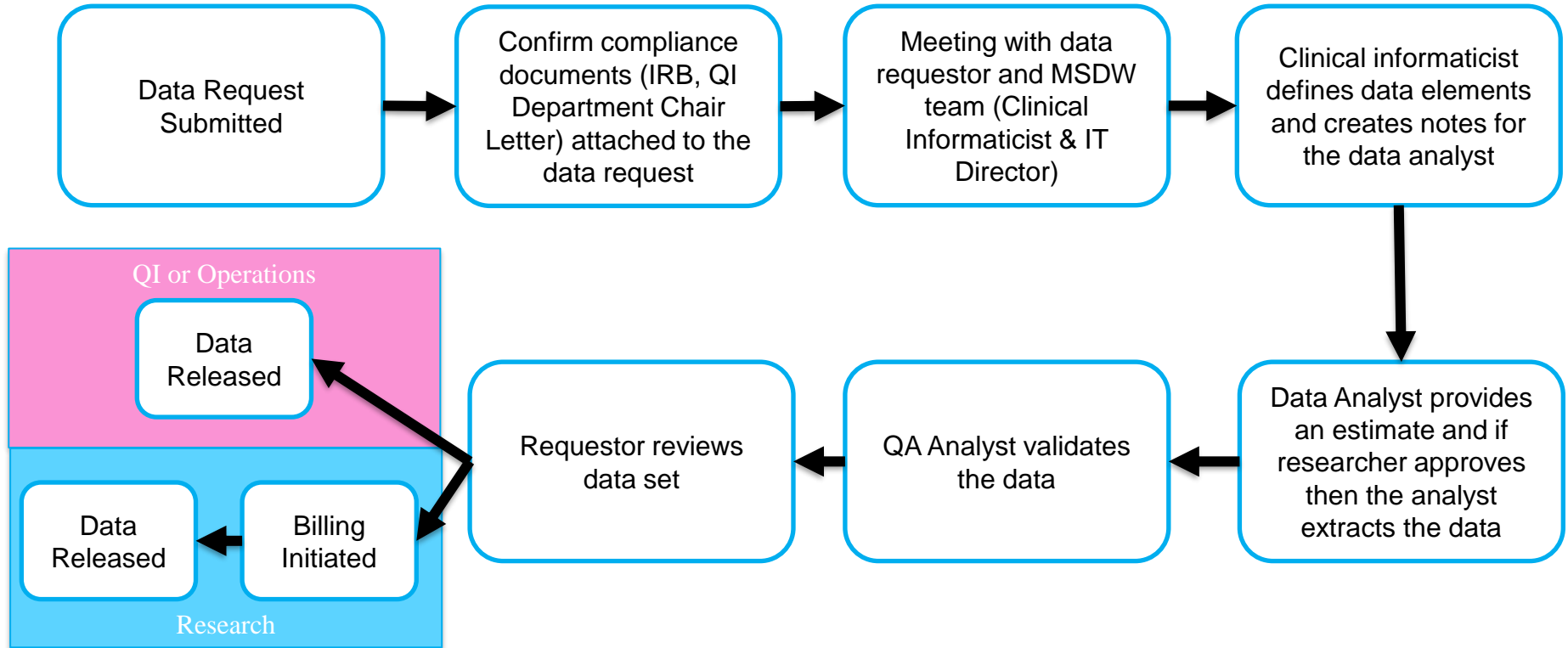
- ▶ Complex question that cannot be answered with one of the self-service query tools
- ▶ Need additional data that is not included in a de-identified data set
- ▶ Need PHI data for your analysis

<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 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: "Supported by grant UL1TR004419 from the National Center for Advancing Translational Sciences, National Institutes of Health." The footer also contains the copyright notice: "© 2023 Icahn School of Medicine at Mount Sinai | Privacy Policy".

Mount Sinai Data Warehouse | Sc x

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

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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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Your Publications

Report publications to Scientific Computing and Data:

All publications that resulted from Scientific Computing and Data resources and services, including TriNetX, 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

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



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**Mount
Sinai**

Thank you!



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

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