

TriNetX Clinical Query Tool

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Scientific Computing and Data

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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

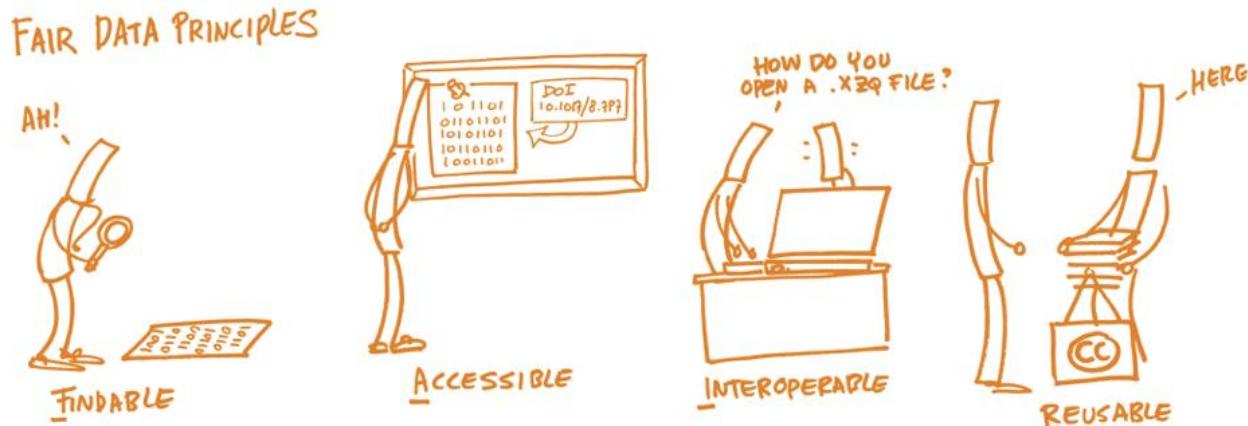
Scientific Computing FAIR Principles for Data

Findable

Accessible

Interoperable

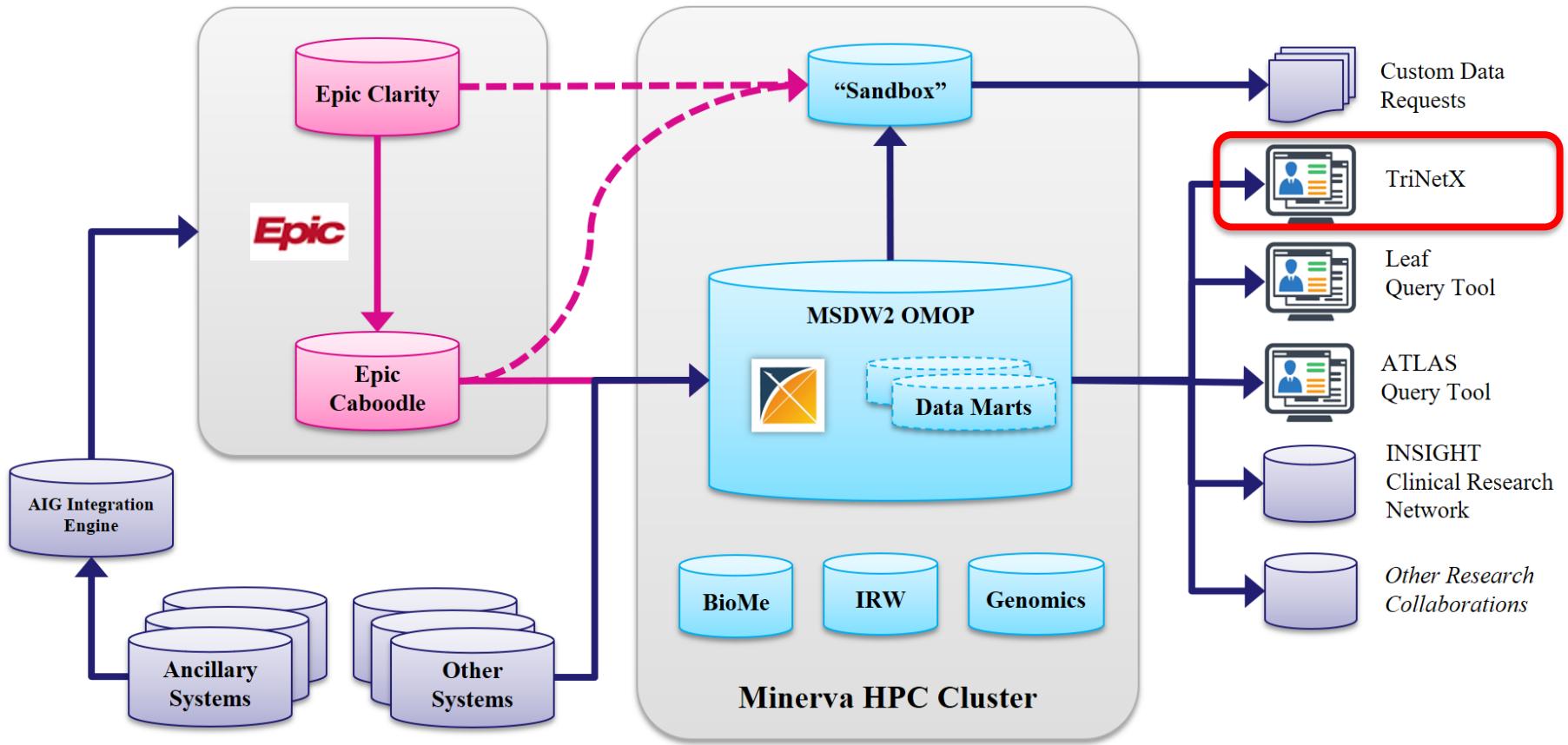
Reusable /
Reproducible



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

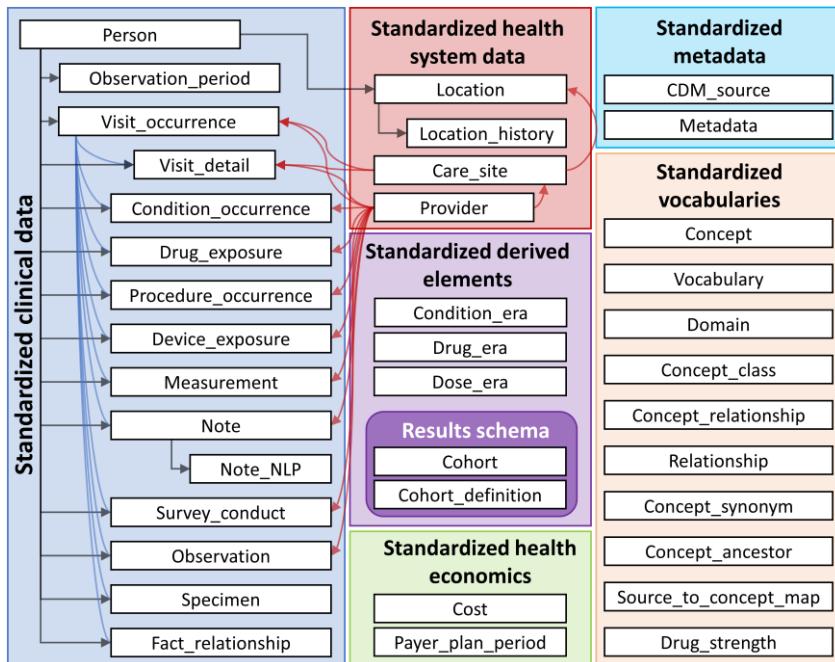
Image Source: <https://book.fosteropenscience.eu/>

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.icahn.mssm.edu/msdw/data-sources/>

Introduction: TriNetX Cohort Query Tool

Clinical Query Tools - Overview

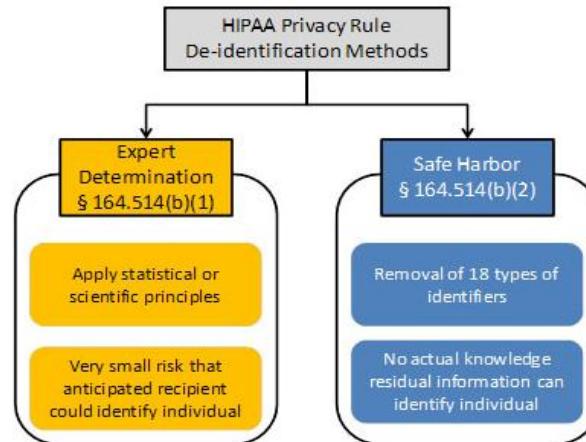
	Leaf	ATLAS	TriNetX
Description	Web-based, lightweight drag-and-drop cohort query tool that quickly analyzes population demographics	A web-based cohort query tool for database exploration, standardized vocabulary browsing, cohort definition, and patient cohort-level analysis	A web-based cohort query tool
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

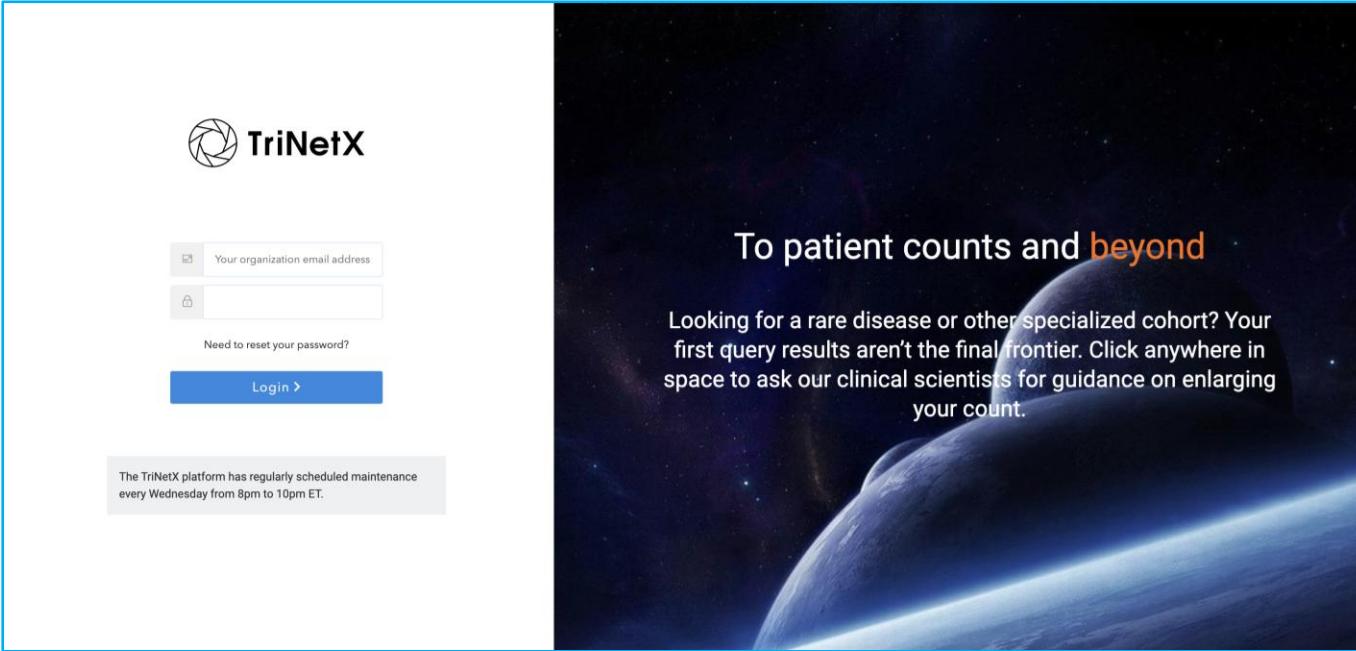
- Name
- Street Address, city, county, zip code (the first three digits of the zip code may be used if there are more than 20,000 people in the zip code)
- All element of dates (except year), including dates of birth, admission, discharge or death
- All ages over 89
- All telephone/fax numbers
- Fax 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.trinext.com>
- Google Chrome is the preferred browser
- Requires VPN access and use of your Mount Sinai Login credentials



The image shows the TriNetX login interface on the left and a promotional banner on the right.

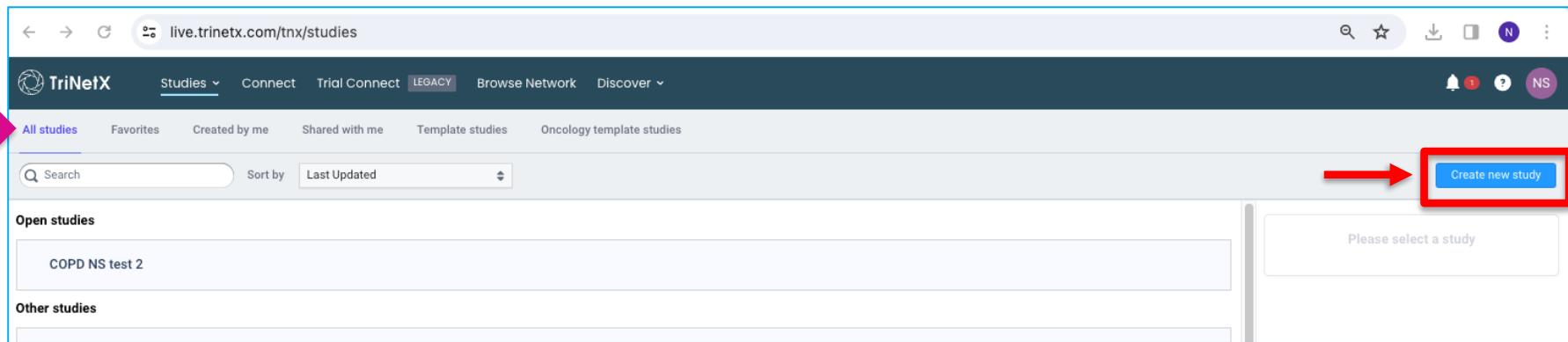
TriNetX Login Page:

- The page features the TriNetX logo with a camera shutter icon.
- Input fields for "Your organization email address" and a password.
- A "Login" button.
- A link for "Need to reset your password?"
- A note about maintenance: "The TriNetX platform has regularly scheduled maintenance every Wednesday from 8pm to 10pm ET."

Promotional Banner:

- Background image of a planet in space.
- Text: "To patient counts and **beyond**".
- Text: "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



The screenshot shows the TriNetX Studies interface. At the top, there is a navigation bar with links for 'Studies', 'Connect', 'Trial Connect', 'LEGACY', 'Browse Network', and 'Discover'. Below the navigation bar, there is a search bar and a 'Create new study' button. A pink arrow points to the 'All studies' tab, and a red arrow points to the 'Create new study' button, which is highlighted with a red box.

live.trinext.com/tnx/studies

TriNetX Studies Connect Trial Connect LEGACY Browse Network Discover

All studies Favorites Created by me Shared with me Template studies Oncology template studies

Search Sort by Last Updated

Create new study

Open studies

COPD NS test 2

Other studies

Please select a study

Duplicate a Study from My Studies

The screenshot illustrates the process of duplicating a study within the TriNetX platform. The main interface shows a list of studies under 'Open studies' and 'Other studies'. A study titled 'COPD NS test 2' is selected. A red box highlights the 'Duplicate' button next to the study's name. A red arrow points from this button to a modal window titled 'Duplicate Study'. The modal contains fields for 'Study Name*' and 'Duplicate Study Name*', both of which are highlighted with a red box. A large red arrow points from the 'Duplicate' button in the main interface to this modal. The modal also includes sections for 'Copy the following to new study' (with 'Current Study' checked), 'Research Purpose*' (with 'Clinical Trial Research' checked), and 'Other Scientific Research'.

Study Name*

Enter a descriptive name for the study.

Study Name*

Duplicate Study Name*

Copy the following to new study

Current Study

Query History

Results History

Attached Documents

Analytics Inputs

Lucid Inputs

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

COPD NS test 2

Created By

Naomi So

Dec 28, 2023

Links

Team (0)

Documents (0)

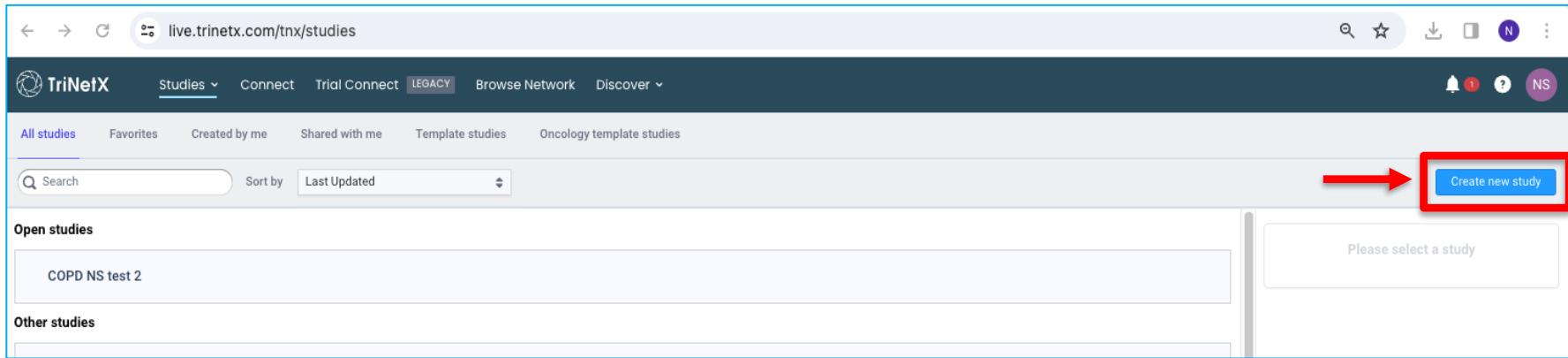
Delete

Duplicate

Sample Study:

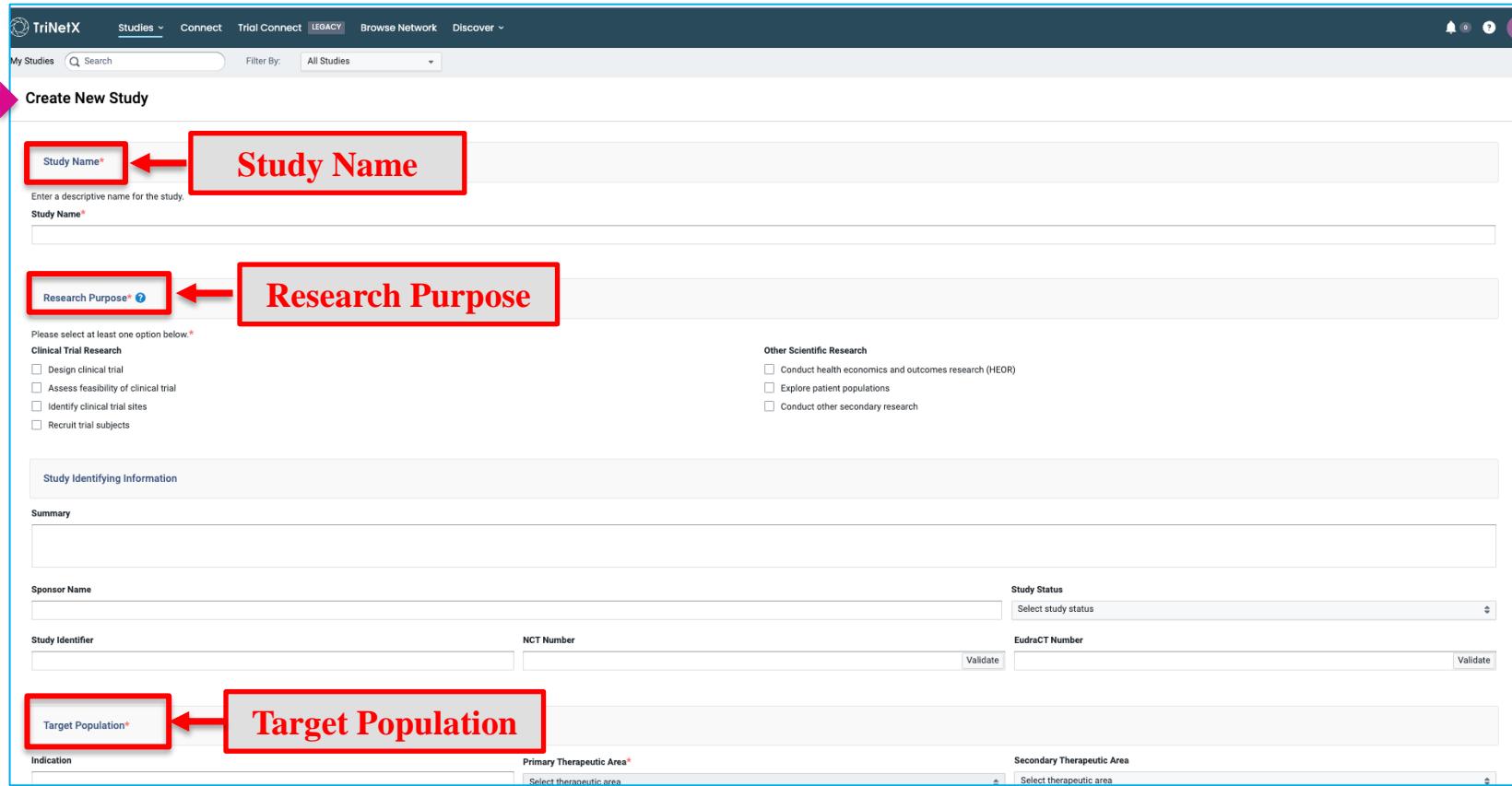
How many adult patients with a diagnosis of COPD and on fluticasone + umeclidinium + vilanterol, had an ED or inpatient visit at least once in the last year?

TriNetX – Create New Study



The screenshot shows the TriNetX interface for managing studies. The top navigation bar includes links for 'Studies', 'Connect', 'Trial Connect', 'LEGACY', 'Browse Network', and 'Discover'. Below the navigation, there are tabs for 'All studies', 'Favorites', 'Created by me', 'Shared with me', 'Template studies', and 'Oncology template studies'. A search bar and a 'Sort by' dropdown are also present. On the right side, there is a 'Create new study' button, which is highlighted with a red box and a red arrow pointing to it. The main content area shows a list of 'Open studies' with one entry: 'COPD NS test 2'. To the right of this list is a panel with the placeholder text 'Please select a study'.

TriNetX – Create New Study



The screenshot shows the 'Create New Study' page on the TriNetX platform. A large pink arrow on the left points to the 'Study Name' field, which is highlighted with a red box and a red arrow pointing to the label 'Study Name' above it. Below this, a red box highlights the 'Research Purpose*' field, with a red arrow pointing to the label 'Research Purpose' above it. At the bottom, another red box highlights the 'Target Population*' field, with a red arrow pointing to the label 'Target Population' above it. The page includes sections for Study Identifying Information, Summary, Sponsor Name, Study Status, Study Identifier, EudraCT Number, and various therapeutic area selection fields.

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 Status

Study Identifier

NCT Number

EudraCT Number

Target Population*

Target Population

Indication

Primary Therapeutic Area*

Select therapeutic area

Secondary Therapeutic Area

Select therapeutic area

Create New Study – Query Builder

The screenshot shows the TriNetX Query Builder interface. A pink arrow on the left points to the 'Query Builder' option in the sidebar. A red box highlights the 'Age/Sex' section. A blue arrow points from the 'Hierarchy Tree' box to the 'Import Query' box. Other highlighted areas include 'Inclusion Criteria', 'Exclusion Criteria', and 'Import Query'.

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

Age/Sex

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...

Hierarchy Tree

Build a new query

Import Query

Import Query

Count Patients

of 4,973,226 patients of 1 HCO

Hierarchy Tree – Search from Clinical Domains

Mount Sinai Health System Any country
1 of 1 HCOs online

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 [?](#)

Patients → Patients 3,816,070

<input type="checkbox"/> ICD-10-CM	Diagnoses: ICD-10	3,816,070
> <input type="checkbox"/> ICD-10-CM	A00-B99 Certain infectious and parasitic diseases	549,950
> <input type="checkbox"/> ICD-10-CM	C00-D49 Neoplasms	495,730
> <input type="checkbox"/> ICD-10-CM	D50-D89 Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	300,360
> <input type="checkbox"/> ICD-10-CM	E00-E89 Endocrine, nutritional and metabolic diseases	1,047,430
> <input type="checkbox"/> ICD-10-CM	F01-F99 Mental, Behavioral and Neurodevelopmental disorders	576,570
> <input type="checkbox"/> ICD-10-CM	G00-G99 Diseases of the nervous system	584,430
> <input type="checkbox"/> ICD-10-CM	H00-H59 Diseases of the eye and adnexa	343,880
> <input type="checkbox"/> ICD-10-CM	H60-H95 Diseases of the ear and mastoid process	281,380
> <input type="checkbox"/> ICD-10-CM	I00-I99 Diseases of the circulatory system	862,510
> <input type="checkbox"/> ICD-10-CM	J00-J99 Diseases of the respiratory system	788,180

Show Terms with Zero Patients Show Deprecated

Add To Query Cancel

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

Mount Sinai Health System

Any country

1 of 1 HCOs online

Search “COPD”

MUST HAVE

CANNOT HAVE

Search Term...

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

Code

Term Description

Patients

ICD-10-CM J44 Other chronic obstructive pulmonary disease

ICD-10-CM J44.1 Chronic obstructive pulmonary disease with (acute) exacerbation

ICD-10-CM J44.0 Chronic obstructive pulmonary disease with (acute) lower respiratory infection

Patient Count 42,200

Hierarchy Tree

42,200

1,850

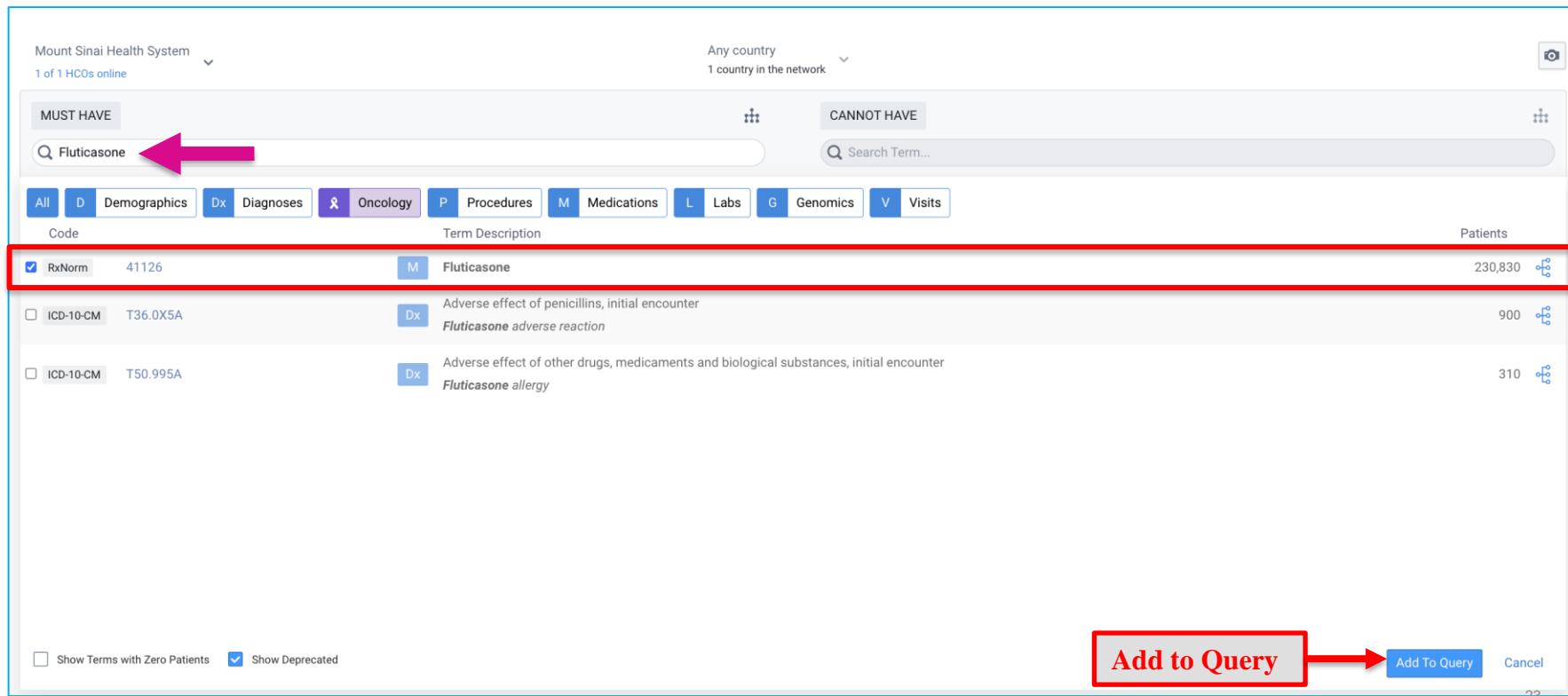
1,200

Add to Query Cancel

Show Terms with Zero Patients Show Deprecated

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

Fluticasone

CANNOT HAVE

Search Term...

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

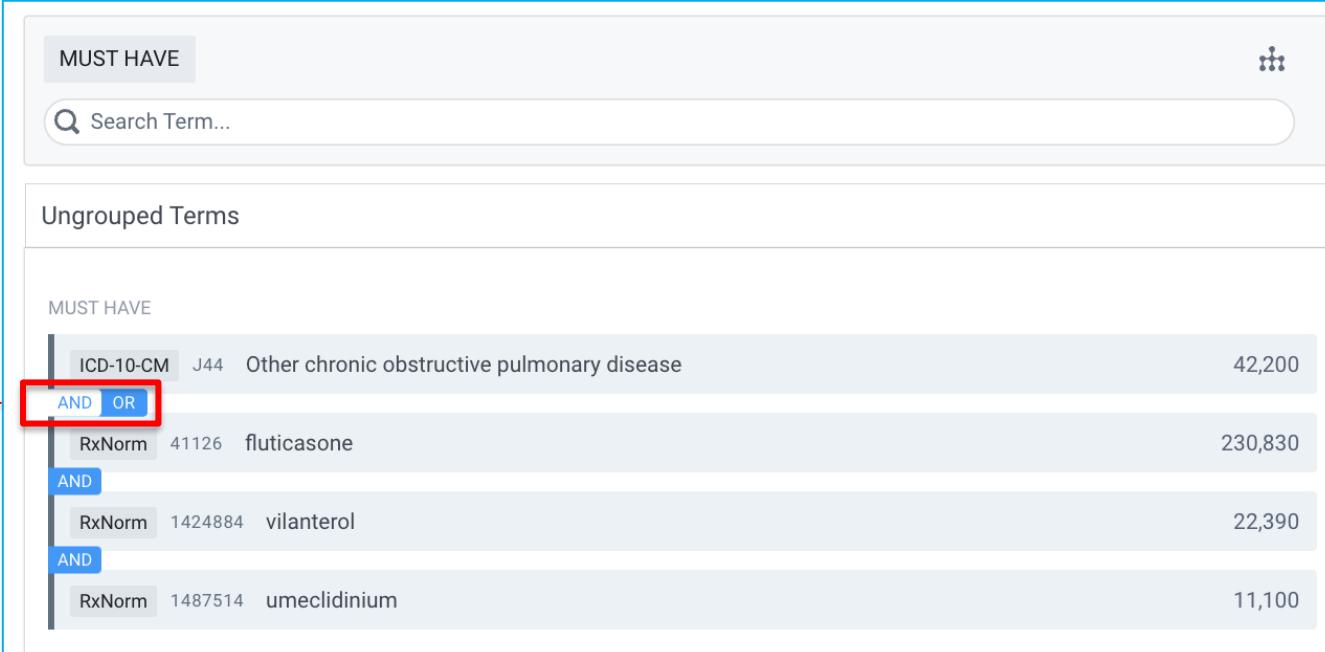
Code	Term Description	Patients
<input checked="" type="checkbox"/> RxNorm 41126	M Fluticasone	230,830
<input type="checkbox"/> ICD-10-CM T36.0X5A	Dx Adverse effect of penicillins, initial encounter <i>Fluticasone</i> adverse reaction	900
<input type="checkbox"/> ICD-10-CM T50.995A	Dx Adverse effect of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



The screenshot shows a search interface with a blue border. At the top left is a 'MUST HAVE' button and a search bar with the placeholder 'Search Term...'. At the top right is a three-dot menu icon. Below the search bar is a section titled 'Ungrouped Terms'.

Under 'Ungrouped Terms', there is a 'MUST HAVE' section. A red arrow points to a red box around the 'AND' and 'OR' buttons. The 'AND' button is blue with white text, and the 'OR' button is white with blue text. The list of terms includes:

Source	Code/Name	Description	Count
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

Term Filters

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

The image shows a search interface with a results summary and a detailed results view. The top part is a summary of search terms and a count of results. The bottom part is a detailed view of medication filters for 'Medication Details'.

Search Summary:

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

11,100 results

Add term filters (button with a red arrow pointing to it)

Medication Details (Section Title)

Clear Filter (Text)

Route

Filter...	X
<input type="checkbox"/> Unknown route	19,660
<input type="checkbox"/> Inhalant product	7,200

Brand

Filter...	X
<input type="checkbox"/> Unknown brand	19,900
<input type="checkbox"/> Anoro	2,110
<input type="checkbox"/> Trelegy	4,200

Strength

Filter...	X
<input type="checkbox"/> Unknown strength	19,660
<input type="checkbox"/> 0.025 mg/actuat	7,200

Visits

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

The screenshot shows a clinical search interface with the following layout:

- MUST HAVE** tab is selected.
- CANNOT HAVE** tab is available.
- Search Bar**: Contains "Visits".
- Search Term**: Placeholder "Search Term...".
- Filter Buttons**: Demographics, Dx, Diagnoses, Oncology, Procedures, Medications, Labs, Genomics, and a blue **V Visits** button, all in a horizontal row.
- Visits Section**:
 - Visits** heading.
 - Filter**: Visit.
 - Options**:
 - Visit: Ambulatory
 - Visit: Emergency
 - Visit: Inpatient Encounter
 - Visit: Unknown
 - Visit: Virtual
 - Count**: 4,972,780 (for Visit: Ambulatory).
 - Count**: 3,598,290 (for Visit: Emergency).
 - Count**: 1,105,710 (for Visit: Inpatient Encounter).
 - Count**: 607,200 (for Visit: Unknown).
 - Count**: 4,703,210 (for Visit: Virtual).
 - Count**: 577,090 (for Visit: Ambulatory).
- Show Terms with Zero Patients** checkbox.
- Add To Query** button with a red arrow pointing to it.
- Cancel** button.

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*

MUST HAVE

CANNOT HAVE

Search Term...

Ungrouped Terms

Search Term...

MUST HAVE

Term	Count
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

CANNOT HAVE

1. Added MUST HAVE terms

+ Create a New Group

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

MUST HAVE

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
Visit: Inpatient Encounter	607,200

CANNOT HAVE

AND

Group 1

Unnamed Group

3. Add terms

+ Add terms or drag and drop terms here

Group Rules

+ Terms

Terms not included in the group

ADD TO MUST HAVE

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

RxNorm: 41126 fluticasone

RxNorm: 1424884 vilanterol

RxNorm: 1487514 umeclidinium

Visit: Emergency

Visit: Inpatient Encounter

ADD TO CANNOT HAVE

Group Rules

+ Terms

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

The image shows a clinical query interface with two main sections: Group 1 (Meds) and Group 1B (Unnamed Group).

Group 1 (Meds):

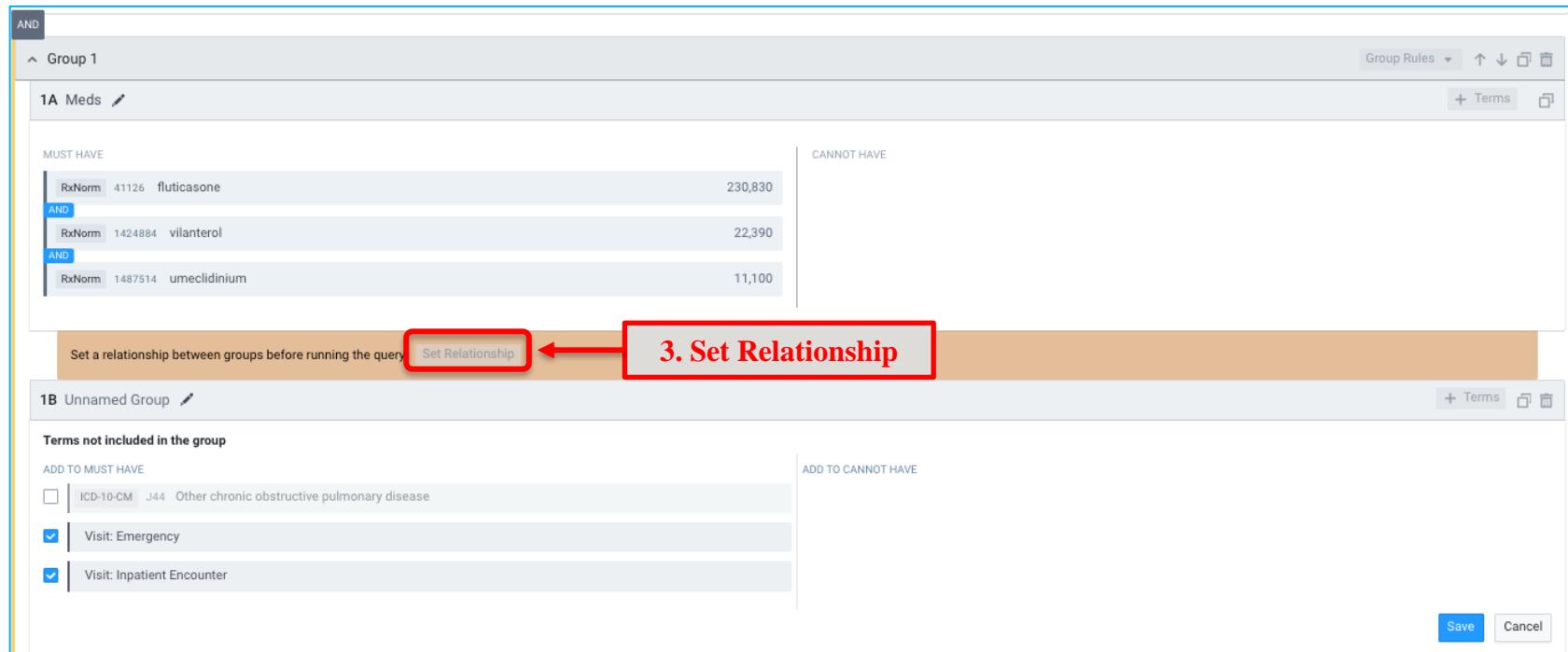
- Group Rules:** A red box highlights the "Group Rules" button, which is circled in red. A red arrow points from this button to the "Add related group" option in the dropdown menu.
- 1b. Add Related Group:** A red box highlights the "Add related group" option in the dropdown menu, which is also circled in red. A large pink arrow points from this menu to the "Group 1B" section.
- Group 1B (Unnamed Group):** A red box highlights the "Group 1B" button, which is circled in red. A red box highlights the "+ Add terms" button, which is also circled in red. A red arrow points from this button to the "2. Add terms" label.
- 2. Add terms:** A red box highlights the "2. Add terms" label, which is also circled in red.

Group 1B (Unnamed Group):

- Set a relationship between groups before running the query:** A button labeled "Set Relationship".

Define Temporal Relationship between two Clinical Events

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



AND

Group 1

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 groups before running the query **Set Relationship**

3. Set Relationship

1B Unnamed Group

Terms not included in the group

ADD TO MUST HAVE

ICD-10-CM J44 Other chronic obstructive pulmonary disease

Visit: Emergency

Visit: Inpatient Encounter

ADD TO CANNOT HAVE

Save Cancel

Define Temporal Relationship between two Clinical Events

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

AND

Group 1

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

1A (Meds)

Anytime Before 5yr 3yr 1yr 6mo 3mo 1mo 1day Same Day 1day 1mo 3mo 6mo 1yr 3yr 5yr Anytime After

From 1 Days After To 00 Years After

Group 1B: Any instance Most recent instance First instance

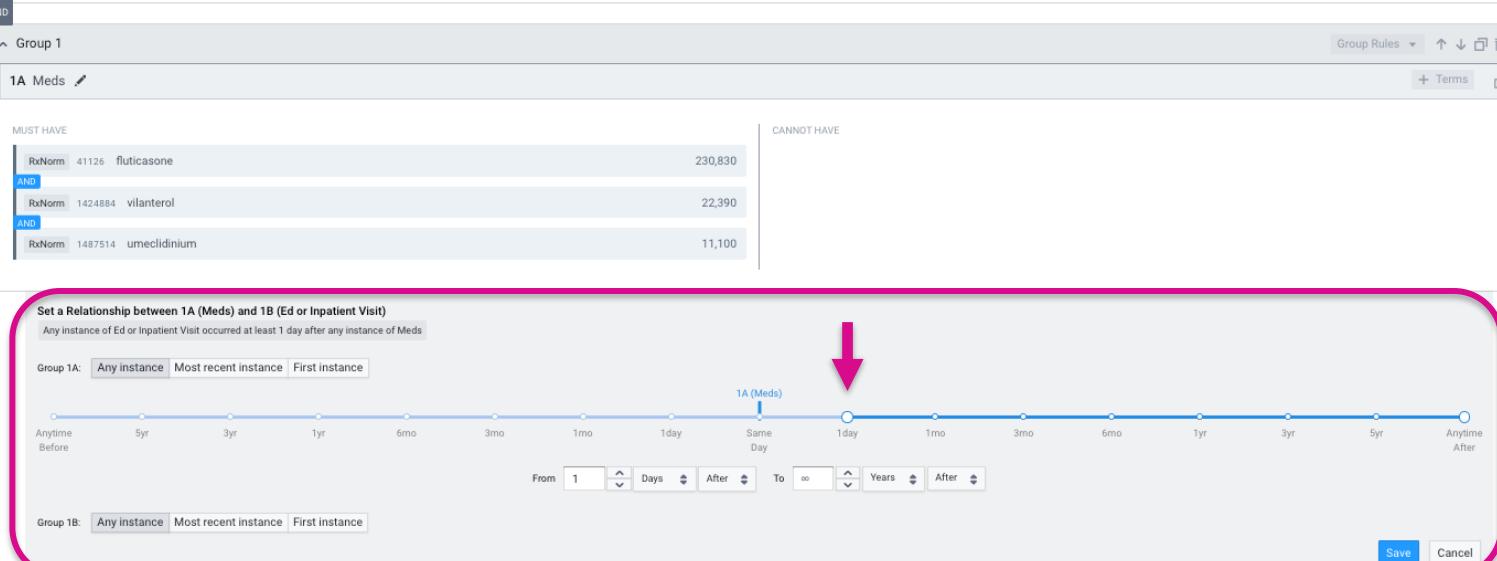
Save Cancel

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**

The screenshot shows the Group Logic editor interface. Group 1B is selected and highlighted with a pink box. The 'Relationship' section contains the text: 'Any instance of Ed or Inpatient Visit occurred at least 1 day after any instance of Meds'. Below this, the 'Group 1B' label is also highlighted with a pink box. The 'Paste Logic' button is highlighted with a red box. A 'Copy' button is highlighted with a red box and has a red arrow pointing to it from the bottom right. A large red arrow points downwards from the 'Copy' button to the 'Group Rules' section of Group 2.

The screenshot shows the Group Logic editor interface with Group 2 selected and highlighted with a pink box. The 'Group Rules' button is highlighted with a red box and has a red arrow pointing to it from the top right. The 'Add Time Constraint' button is highlighted with a red box and has a red arrow pointing to it from the bottom right. The 'Group Rules' dropdown menu is open, showing options: 'Add number of instances', 'Add number of unique instances', 'Add related group', and 'Add time constraint'.

Adding Time Constraints

- Set time constraint for Group 2

AND

Group Rules Group Rules ↑ ↓ □ ■

Group 2

Ed or Inpatient Visit Terms

Time Constraint for Group 2 Relative Time Specific Dates

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

From Years To 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

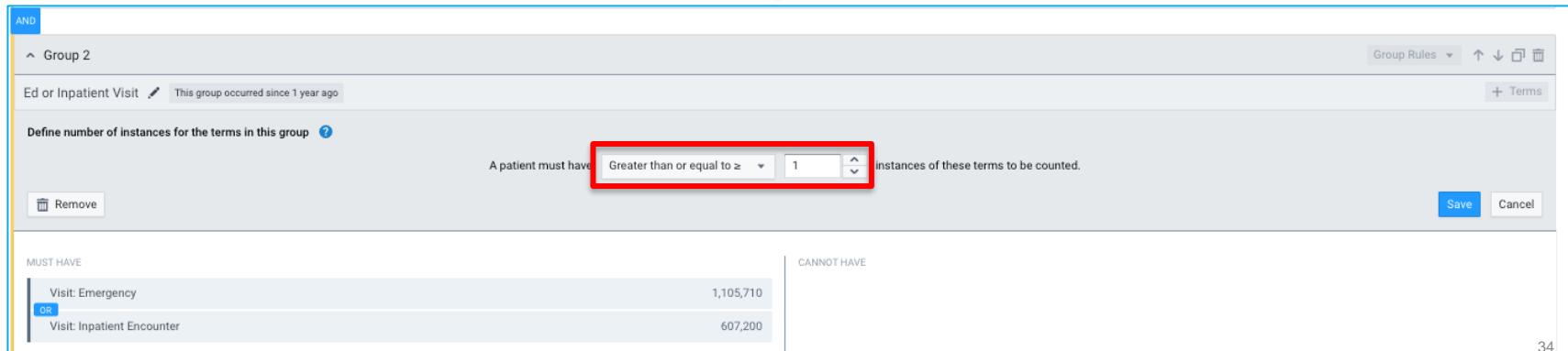
CANNOT HAVE

Group Rules 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 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

The screenshot illustrates a healthcare data analysis interface for a 'Mount Sinai Health System' network. The top navigation bar shows '1 of 1 HCOs online' and a 'Count Patients' button. The main interface is divided into 'MUST HAVE' and 'CANNOT HAVE' sections, both with search term fields. A 'Filters' button is highlighted with a red arrow. The 'Query Filters' panel on the right includes sections for 'Medical Center' (Any medical center type (default)), 'Data' (Any data type (default)), and 'POPULATION'. The 'Age & Sex' section is highlighted with a red box and shows 'Any age, any sex (default)' and '4,973,230 patients in the network'. A pink arrow points from this section to a detailed population distribution graph below. The graph, titled 'Population Mount Sinai Health System', shows the number of patients (0 to 120,000) versus age in years (0 to 80+). The legend indicates: Excluded (grey), Male (blue), Female (orange), and Unknown (black). The graph shows a peak in the 30-40 age range. A red box highlights the 'Age' section of the graph's controls, which includes fields for 'Greater than or equal to' (18 years) and 'Less than or equal to' (empty). To the right, 'Select Sex' options are shown: 'Any Sex' (radio button selected), 'Male (2,029,972)', and 'Female (2,580,062)'. Buttons for 'Save Criteria' and 'Cancel' are at the bottom right.

Mount Sinai Health System
1 of 1 HCOs online

MUST HAVE

CANNOT HAVE

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

Count Patients

of 4,973,230 patients of 1 HCO
All changes saved

Query Filters

HCO

Medical Center
Any medical center type (default)
1 medical center type in the network

Data
Any data type (default)
5 data types in the network

POPULATION

Age & Sex
Any age, any sex (default)
4,973,230 patients in the network

Population
Mount Sinai Health System

Number of Patients

Age in years

Excluded Male Female Unknown

Select Range for Current Age

Greater than or equal to years

Less than or equal to years

Select Sex

Any Sex

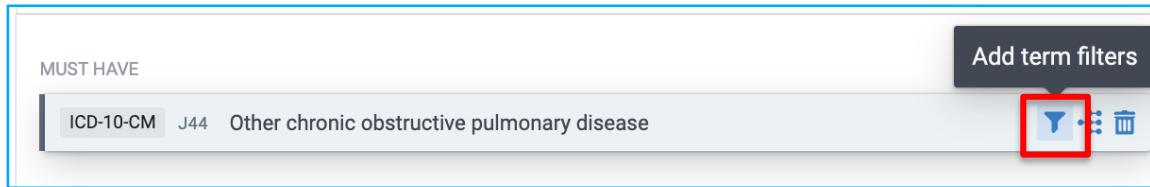
Male (2,029,972)

Female (2,580,062)

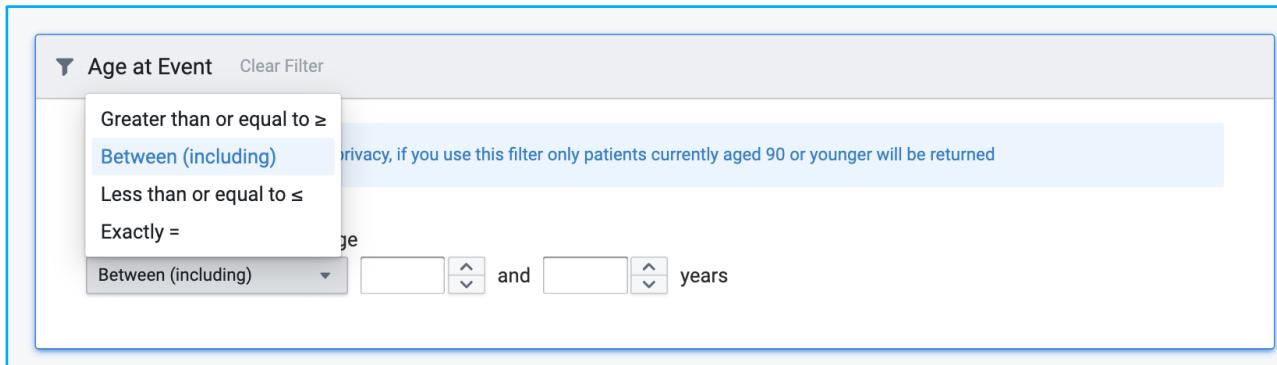
Save Criteria Cancel

Restrict by Age at Event

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

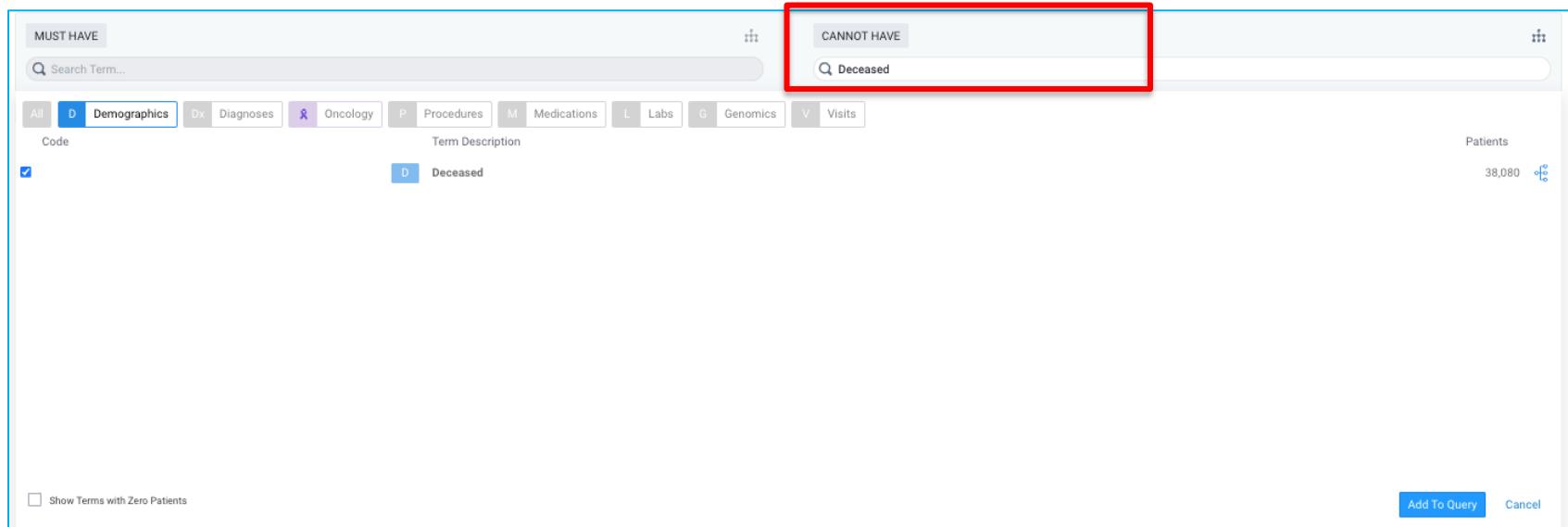


Indicate age or age range for when patient had the term documented:



Exclude Deceased Patients

Found under Demographics

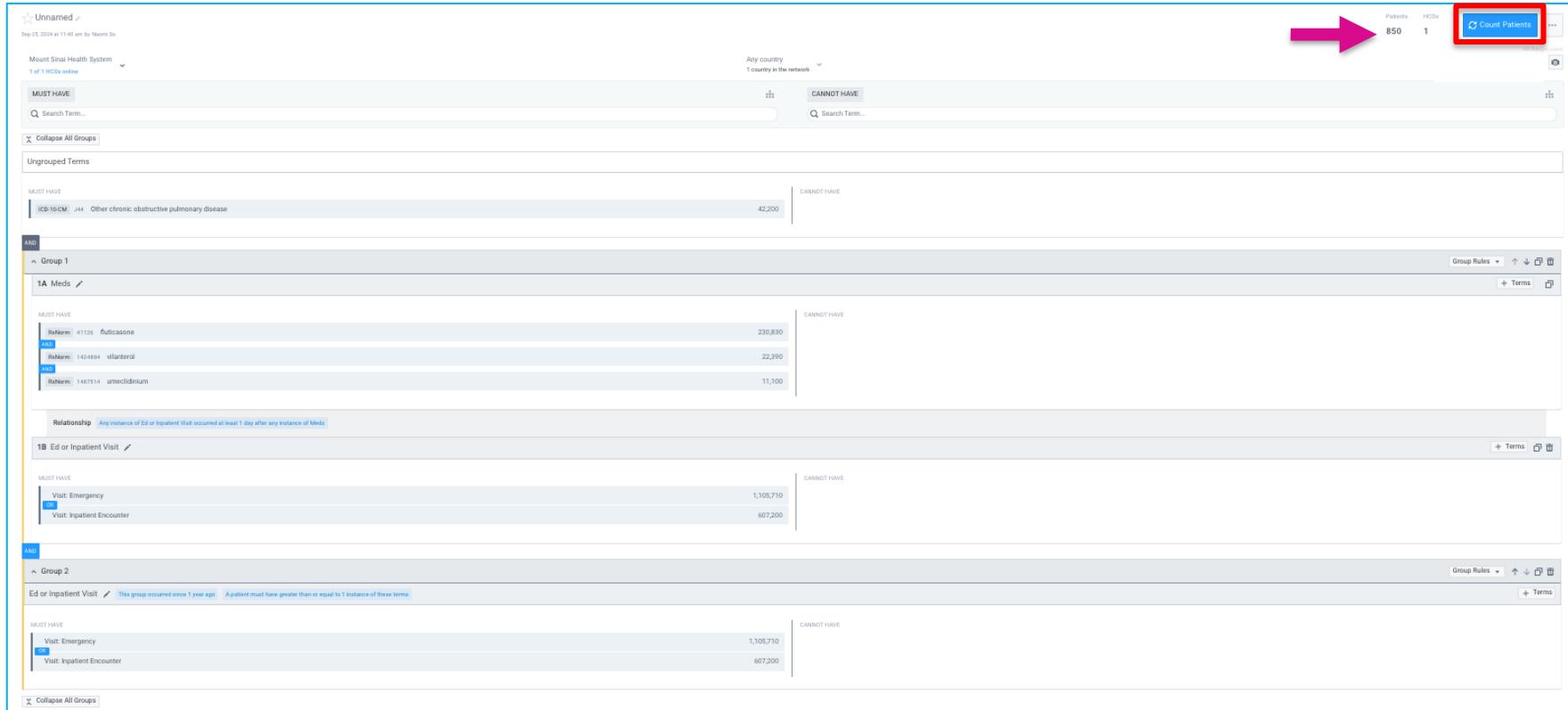


The screenshot shows a clinical search interface with the following elements:

- MUST HAVE:** A search bar with the placeholder "Search Term..." and a magnifying glass icon.
- CANNOT HAVE:** A search bar with the placeholder "Search Term..." and a magnifying glass icon. The term "Deceased" is entered and highlighted with a red box.
- Demographics Tab:** The "Demographics" tab is selected, indicated by a blue border and the label "Demographics" in blue.
- Other Tabs:** Other tabs include All, Dx, Diagnoses, Oncology, Procedures, Medications, Labs, Genomics, and Visits.
- Code:** A section showing a checked checkbox for "Deceased".
- Term Description:** The term "Deceased" is listed under the "Term Description" section.
- Patients:** A summary showing 38,080 patients.
- Buttons:** "Add To Query" and "Cancel" buttons.
- Checkboxes:** "Show Terms with Zero Patients" and "Show Terms with All Patients".

Count Patients

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



The screenshot shows the 'Count Patients' interface with the following details:

Query Overview:

- Query Name: Unnamed
- Created: Sep 21, 2018 at 11:40 am by Name
- Network: Mount Sinai Health System (1 of 1 ICDs online)
- Location: Any country (1 country in the network)
- ICD-10-CM: J44 - Other chronic obstructive pulmonary disease (42,200)

Group 1 (1A Meds):

- MUST HAVE:**
 - Item: 41128 fluticasone (236,890)
 - Item: 1424804 vilanterol (22,390)
 - Item: 1467314 umecnidinium (11,100)
- CANNOT HAVE:**

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

Group 2 (1B Ed or Inpatient Visit):

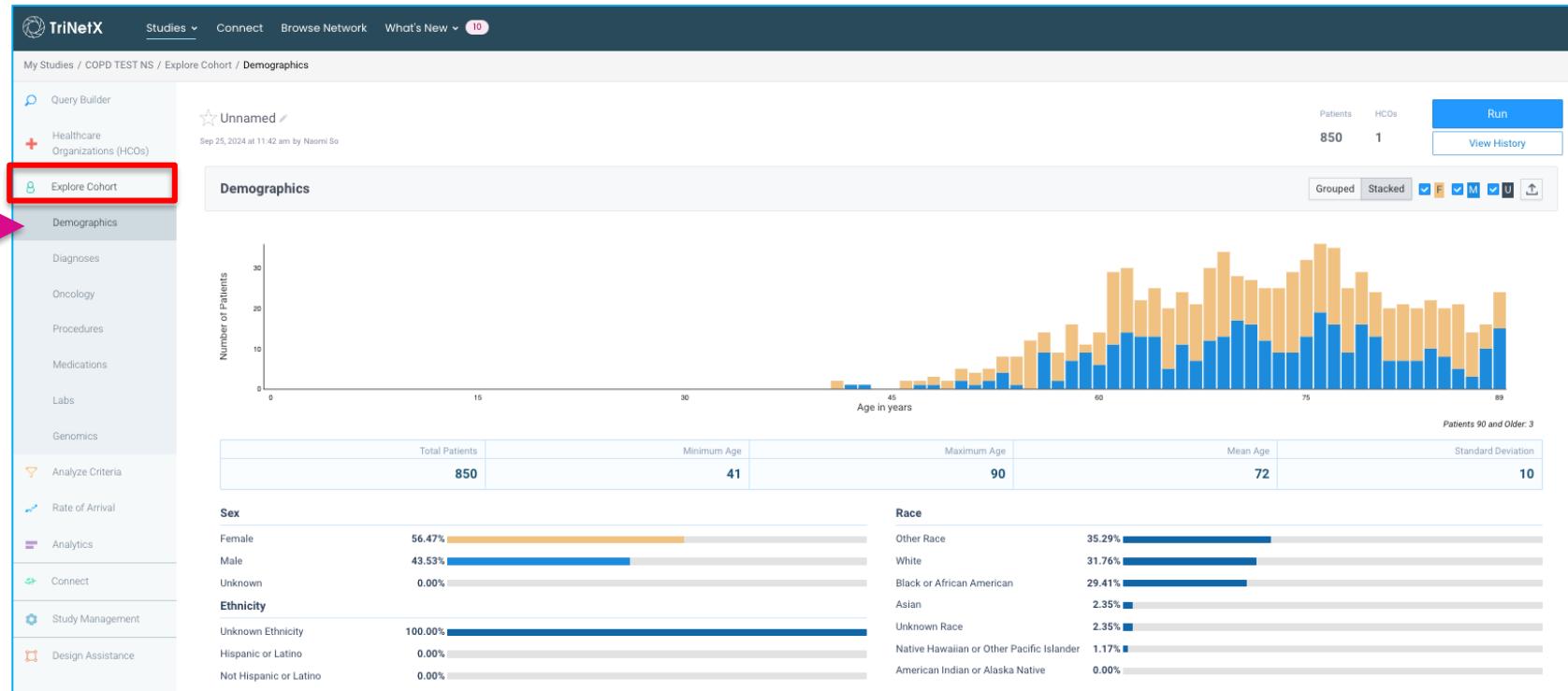
- MUST HAVE:**
 - Visit: Emergency (1,105,710)
 - Visit: Inpatient Encounter (607,200)
- CANNOT HAVE:**

Group Rules: Group Rules (Group 1 AND Group 2)

Count Patients: 850 (1 ICDs)

Buttons: Count Patients (highlighted with a red box and a pink arrow), Group Rules, Terms, and Delete.

Explore Cohort - Demographics



Explore Cohort - Diagnoses

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

Unnamed

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

Patients HCOs Run View History

850 1

Diagnoses

Set time parameters

Search for diagnosis 1/13 emphysema

Diagnoses

ICD-10-CM J00-J99 Diseases of the respiratory system

ICD-10-CM J40-J4A Chronic lower respiratory diseases

ICD-10-CM J44 Other chronic obstructive pulmonary disease

ICD-10-CM J43 Emphysema

ICD-10-CM J45 Asthma

ICD-10-CM J41 Simple and mucopurulent chronic bronchitis

ICD-10-CM J42 Unspecified chronic bronchitis

ICD-10-CM J40 Bronchitis, not specified as acute or chronic

ICD-10-CM J47 Bronchiectasis

ICD-10-CM J96-J99 Other diseases of the respiratory system

ICD-10-CM J09-J18 Influenza and pneumonia

ICD-10-CM J30-J39 Other diseases of upper respiratory tract

ICD-10-CM J00-J06 Acute upper respiratory infections

ICD-10-CM J20-J22 Other acute lower respiratory infections

ICD-10-CM J80-J84 Other respiratory diseases principally affecting the interstitium

ICD-10-CM J90-J94 Other diseases of the pleura

ICD-10-CM J60-J70 Lung diseases due to external agents

+ Add to Must Have + Add to Cannot Have

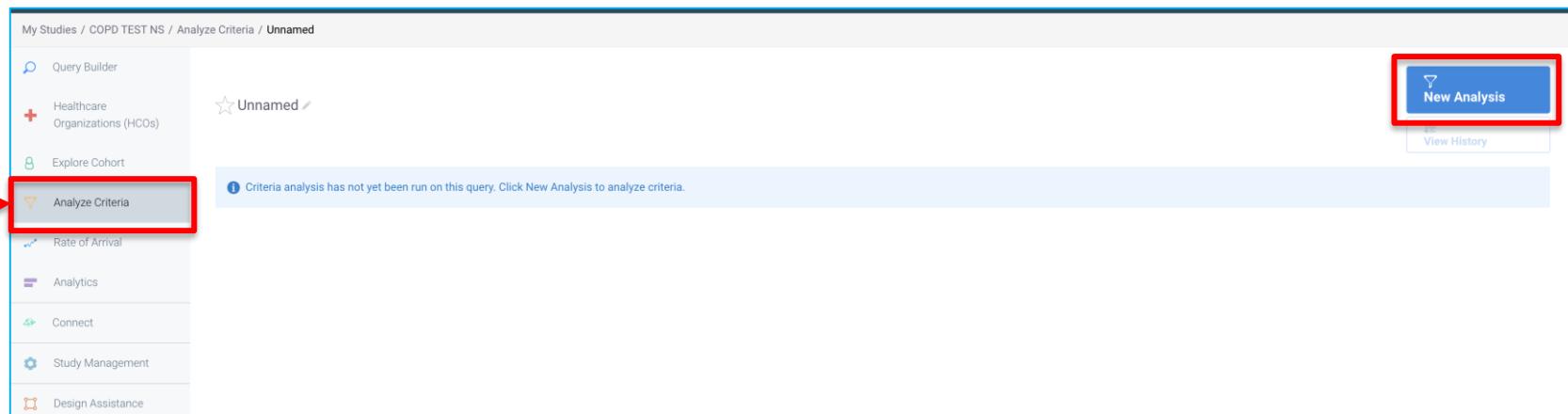
Option to add terms to query

	Patients	% of Cohort
850	100%	
850	100%	
850	100%	
490	58%	
480	56%	
200	24%	
160	19%	
100	12%	
100	12%	
530	62%	
430	51%	
330	39%	
290	34%	
190	22%	
170	20%	
110	13%	
70	8%	

Analyze Criteria

View the impact each criteria has on the total patient count

1. Click New Analysis



The screenshot shows a software interface for 'My Studies / COPD TEST NS / Analyze Criteria / Unnamed'. On the left, a sidebar lists various options: Query Builder, Healthcare Organizations (HCOs), Explore Cohort, Analyze Criteria (which is highlighted with a red arrow), Rate of Arrival, Analytics, Connect, Study Management, and Design Assistance. The main area displays a message: 'Criteria analysis has not yet been run on this query. Click New Analysis to analyze criteria.' To the right, there is a 'New Analysis' button with a magnifying glass icon, which is also highlighted with a red box. Below it is a 'View History' button.

Analyze Criteria

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

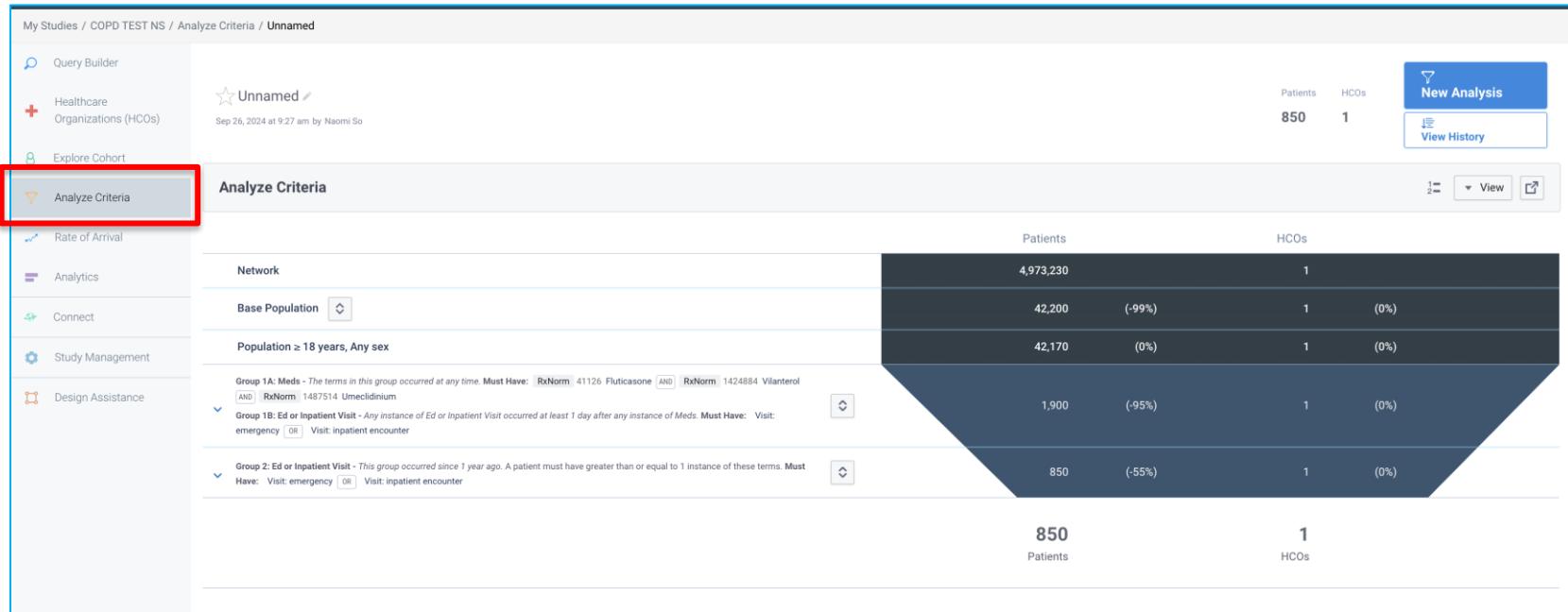
The screenshot shows the 'New Criteria Analysis' interface with the following steps highlighted:

- 2. Select Baseline Criteria** (Step 1, highlighted with a red box and an arrow pointing to the 'Select Baseline Criteria' button on the left.)
- 3. Select Terms for Analysis** (Step 2, highlighted with a red box and an arrow pointing to the 'Select Terms for Analysis' button on the left.)
- 4. Run** (Step 3, highlighted with a red box and an arrow pointing to the 'Run' button on the right.)

The interface displays 'Unsorted Terms' and 'Grouped Terms' sections, with specific criteria like 'ICD-10-CM J44 Other chronic obstructive pulmonary disease' selected. The 'Group 1' section includes '1A Meds' and '1B Ed or Inpatient Visit' criteria. The 'Group 2' section includes 'Ed or Inpatient Visit' criteria.

Analyze Criteria

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



Analyze Criteria

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

Patients HCOs

850 1

New Analysis

View History

Analyze Criteria

Patients HCOs

850 1

New Analysis

View History

Network

Base Population

Population \geq 18 years, Any sex

HIDE

Group 1A: Meds - The terms in this group occurred at any time. Must Have: RxNorm 41126 Fluticasone AND RxNorm 142684 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

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

HIDE

Impact of hidden term

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

Hidden Terms 1

Patients HCOs

4,973,230 1

42,200 (99%) 1 (0%)

42,170 (0%) 1 (0%)

5,150 (88%) 1 (0%)

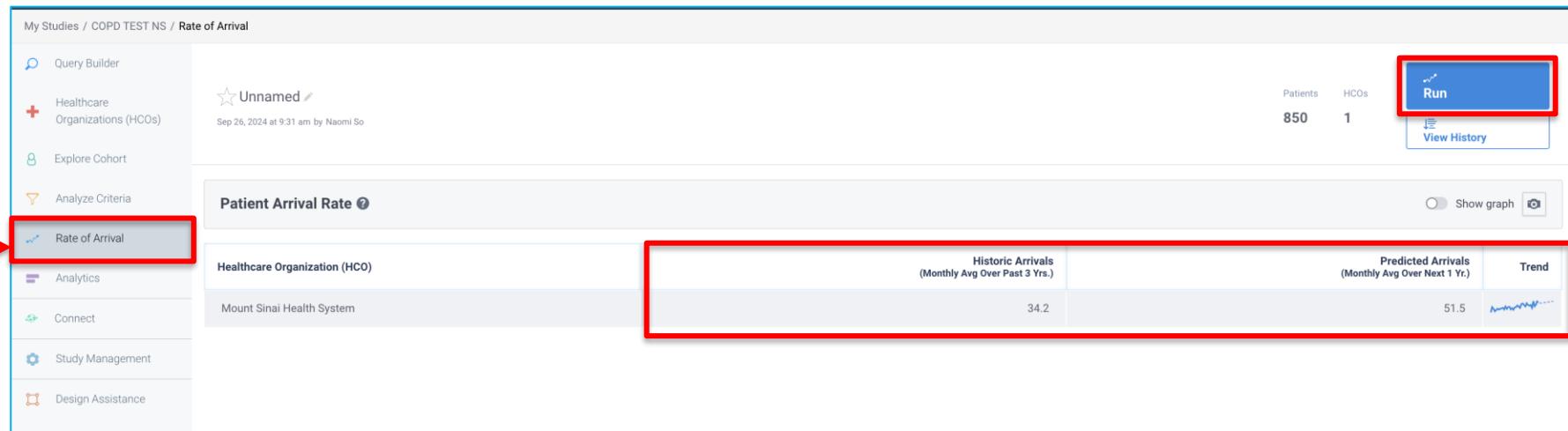
5,150 Patients 1 HCOs

Group 1A: Meds - The terms in this group occurred at any time. Must Have: RxNorm 41126 Fluticasone AND RxNorm 142684 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

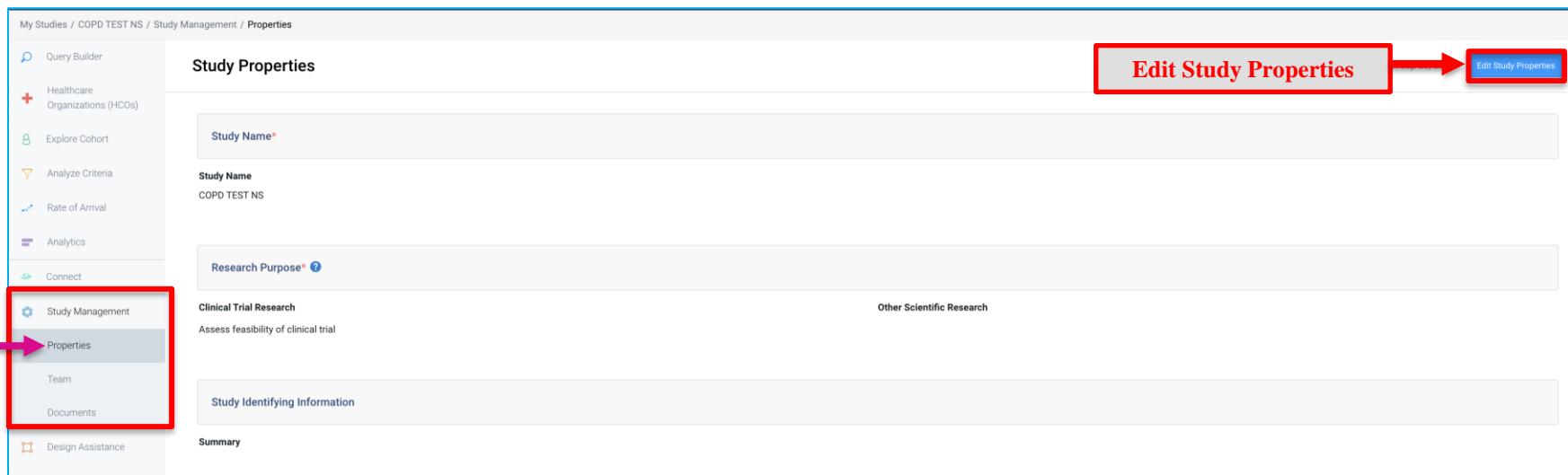


The screenshot shows a dashboard titled 'Rate of Arrival' under 'My Studies / COPD TEST NS / Rate of Arrival'. The left sidebar includes links for 'Query Builder', 'Healthcare Organizations (HCOs)', 'Explore Cohort', 'Analyze Criteria', 'Rate of Arrival' (which is highlighted with a red box and an arrow), 'Analytics', 'Connect', 'Study Management', and 'Design Assistance'. The main content area displays a table for 'Patient Arrival Rate' for 'Mount Sinai Health System'. The table has four columns: 'Historic Arrivals (Monthly Avg Over Past 3 Yrs.)' (34.2), 'Predicted Arrivals (Monthly Avg Over Next 1 Yr.)' (51.5), and 'Trend' (a line graph showing an upward trend). The 'Run' button in the top right is also highlighted with a red box. The top right also shows 'Patients: 850' and 'HCOs: 1'.

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

Study Properties

Edit Study Properties Edit 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

Study Management Properties Team Documents Design Assistance

Demo of Example Query in TriNetX

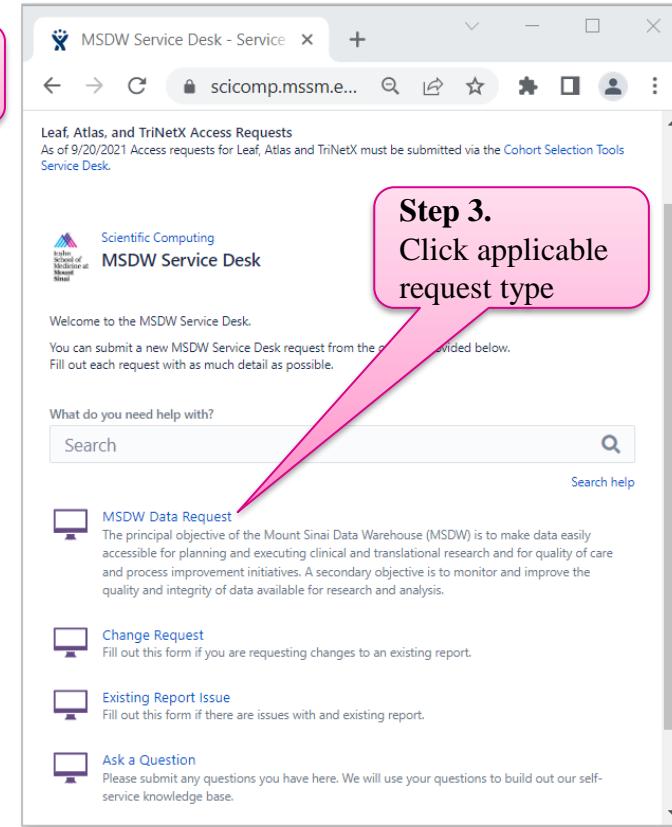
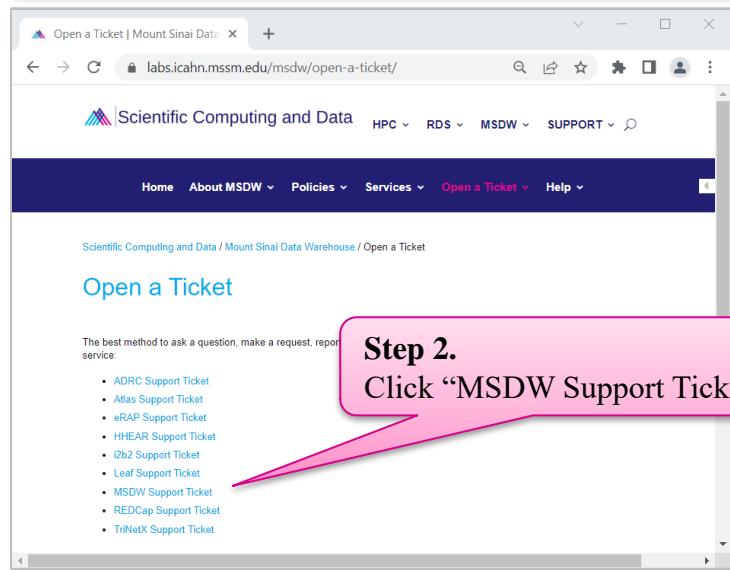
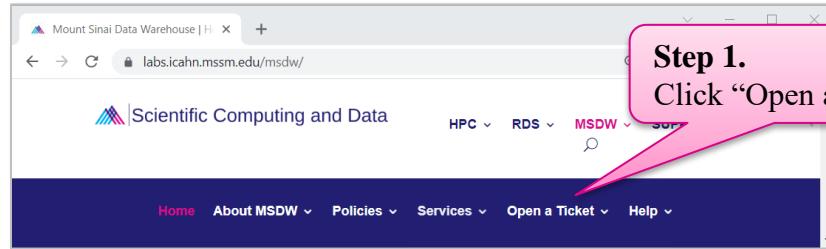
MSDW Custom Data Request

When You Need Custom Data

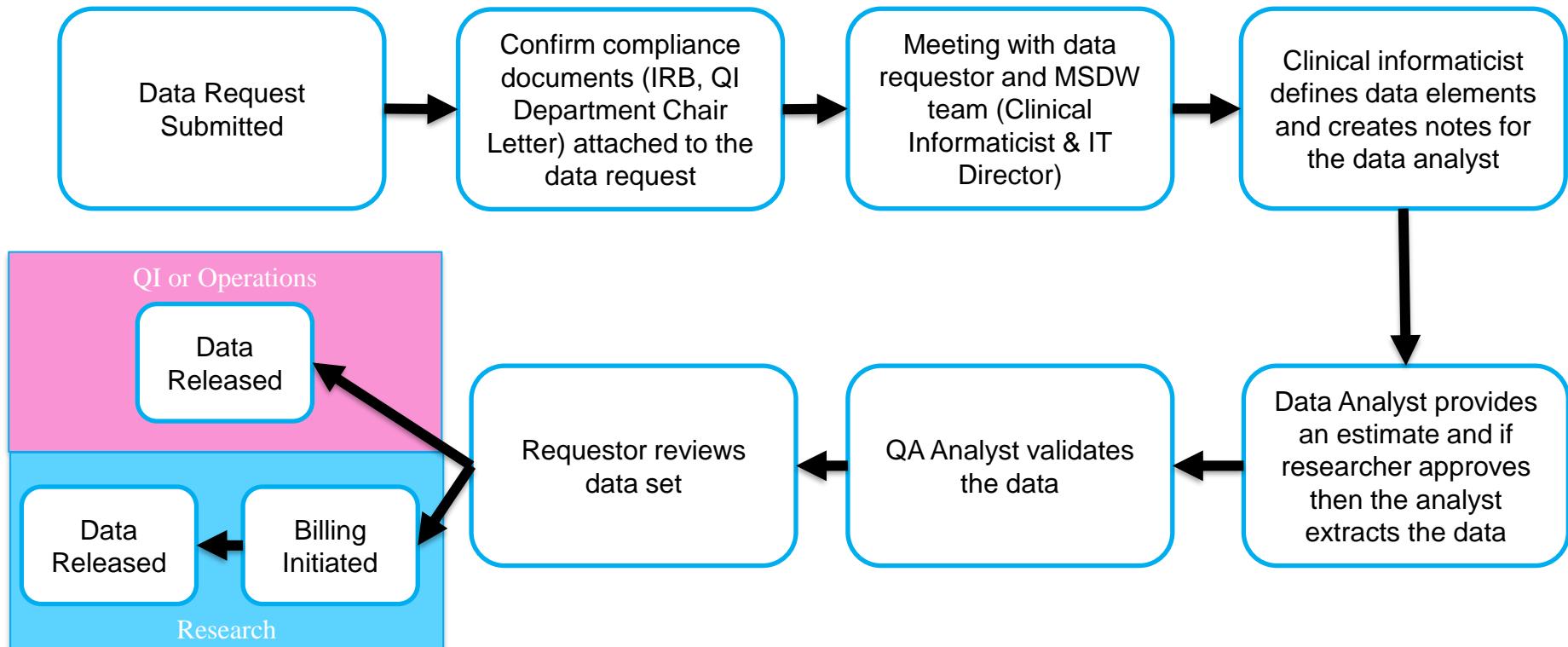
- ▶ Complex question that cannot be answered with one of the self-service query tools
- ▶ Need additional data that is not included in a de-identified data set
- ▶ Need PHI data for your analysis

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

How to Open an MSDW Request Ticket



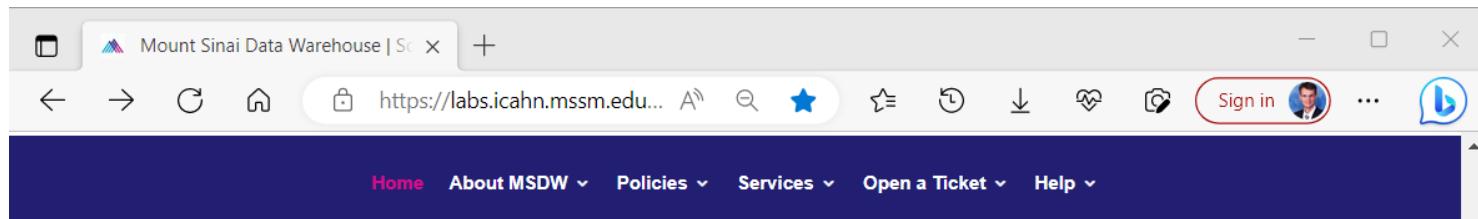
Workflow Once Data Request Submitted



JIRA ticketing system used to monitor the status of data requests

Acknowledgements

Encourage MSDW Users to Acknowledge CTSA



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

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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<https://redcap.link/47dly0jz>