

TriNetX平台簡介 (全球健康研究網路平台)

2023-07-05



TriNetX平台介紹

TriNetX操作介紹

- 基本操作
- 操作範例

帳號申請

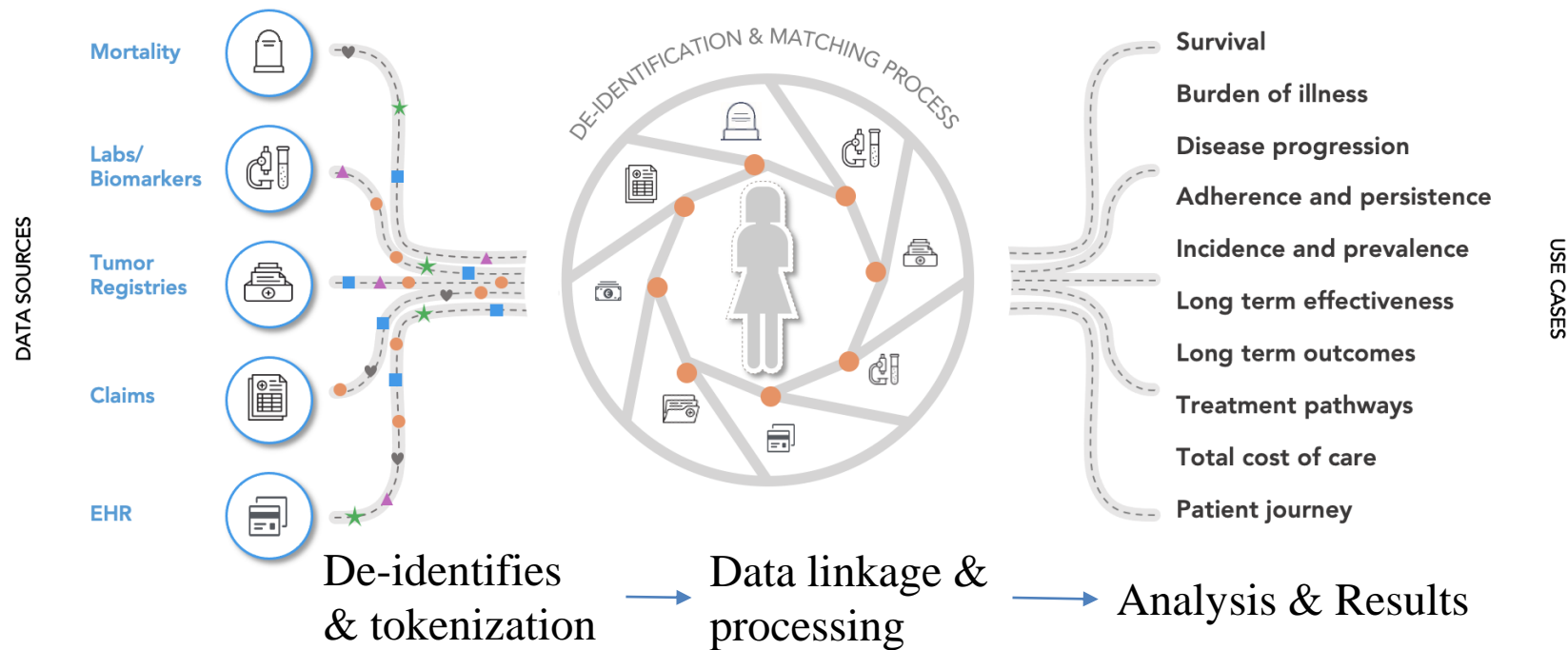
TriNetX平台介紹

- TriNetX是一家全球性健康研究網路公司(Health research network)，於2013年成立，透過跨區域、跨機構共享真實世界數據(Real-world data)，使得執行臨床和觀察性研究更加具有效率且容易。
- 共享電子病歷資料(Electronic Medical records, EMR)外，包含：檢驗檢查(Lab data)、醫療處置和死亡資料等。
- 目前台灣已有12家醫院簽約合作 (e.g., 中山醫、奇美等)

TriNetX, a global federated EHR



- TriNetX 透過**標準化資料格式**(Fast Healthcare Interoperability Resources, **FHIR**)，可將不同來源的數據進行整合，研究者可以專注於提出和測試研究假設，而不用花大量的時間和精力「處理數據」，讓研究更有效率。
- TriNetX平台符合HIPAA (健康保險流通與責任法案) 和GDPR(一般資料保護規則)的架構規範，保障數據的安全和隱私，共享EMR資料會進行去識別化(de-identifies)，透過tokenization的技術，可在不需要揭露病人身分情況下去，串接其他醫療資訊資訊。



- Query Builder
- Explore Cohort
- Demographics**
- Diagnoses
- Procedures
- Medications
- Labs
- Genomics
- Regional Distribution
- Analyze Criteria
- Rate of Arrival
- Summary Statistics
- Analytics
- Pending Datasets
- Available Datasets
- Trial Connect LEGACY
- Connect NEW
- Study Management
- Design Assistance

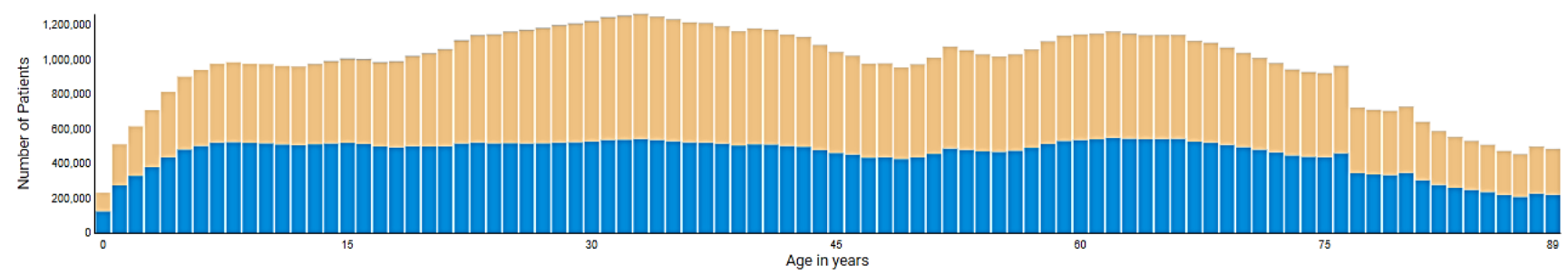
☆ Patients
Jun 14, 2023 at 4:12 pm by Chien-Chou Su

*有 ICD-9/ICD-10 診斷資訊

Patients: 92,669,314
HCOs: 76
Run
View History

Demographics

Grouped Stacked F M U



Patients 90 and Older: 4,805,188

Total Patients	Minimum Age	Maximum Age	Mean Age	Standard Deviation
92,669,314	0	90	45	25

Sex

Female	53%
Male	47%
Unknown	0%

Race

White	52%
Unknown Race	33%
Black or African American	12%
Asian	3%
Native Hawaiian or Other Paci...	0%
American Indian or Alaska Nati...	0%

Ethnicity

Not Hispanic or Latino	47%
Unknown Ethnicity	45%
Hispanic or Latino	8%

New Query Hide

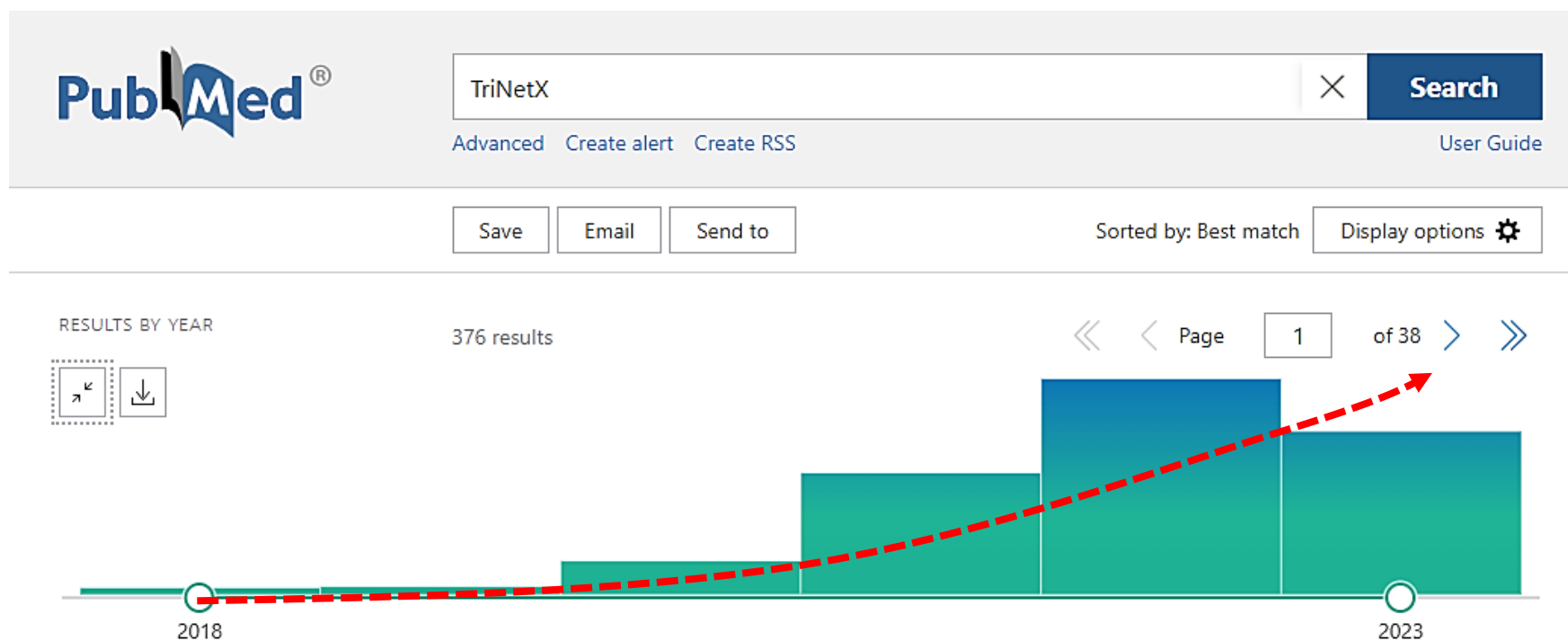
Filter By: Filter Sort By: Most Recent

Request Dataset

- ☆ Patients by Chien-Chou Su Jun 14, 2023 4:12 PM
- Patients 0
- HCOs 0
- Network Research

PubMed搜尋TriNetX：

- 2018至2023年期間，目前共有376個結果。
- 使用TriNetX平台進行研究，有逐年上升的趨勢。



優點：

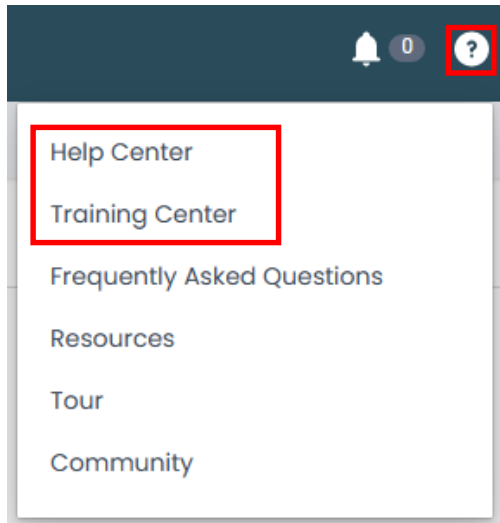
- 1) 龐大的數據量，涵蓋全球19個地區與超過120家醫療機構。
- 2) 友善的操作介面，拖拉與點選即可完成分析。
- 3) 高效率執行研究，節省繁瑣的「資料前處理」時間。

限制：

- 1) 僅有單一種研究設計架構：cohort study，其他如：case-control、case-crossover study等設計沒有支援。
- 2) 有限制的統計方法：如T-test、Chi-square、Std. diff.、Kaplan-Meier survival、Hazard ratio、Propensity score等，但缺少多變量統計，如：Multiple variable linear regression/ Logistic regression目前沒有支援。

TriNetX操作介紹

• Help Center/Training Center



介面操作的教學

主題式的教學

Promoted articles Help Center

What's New? Build Your Own Custom Term

What's New? Curated Oncology Datasets

What's New? Custom gap days for continuous enrollment in for TriNetX Linked queries

What's New? Bring Your Own Model

What's New? TriNetX Diversity Lens

TriNetX - Best Practices in Querying Patient Diversity

TNX 101 - Basic Functionality: Query Building

TNX 102 - Basic Functionality: Basic Analytics

TNX 201 - Best Practices in Oncology

TNX 202 - Best Practices in Rare Disease

TNX 234 - Best Practices in Querying Ex-US Data

TNX 401 Part 1 - Advanced Analytics - Analyze Outcomes, Compare Outcomes and Compare Cohort

TNX 401 Part 2 - Advanced Analytics - Incidence & Prevalence and Treatment Pathways

Webinar recording: Best Practices in Querying COVID-19

Training Center

TriNetX Training Program

Introduction to TriNetX Training Program

Upcoming Live Training Webinars

Getting started with TriNetX

TNX 101 - TriNetX 101 Basic Functionality Query Building

TNX 102 - Basic Functionality Basic Analytics

TNX 121 - Connect and Export ID Training

TNX 201 - Best Practices in Querying Oncology

TNX 202 - Best Practices in Querying Rare Diseases

TNX 234 - Best Practices in Querying for Global Data

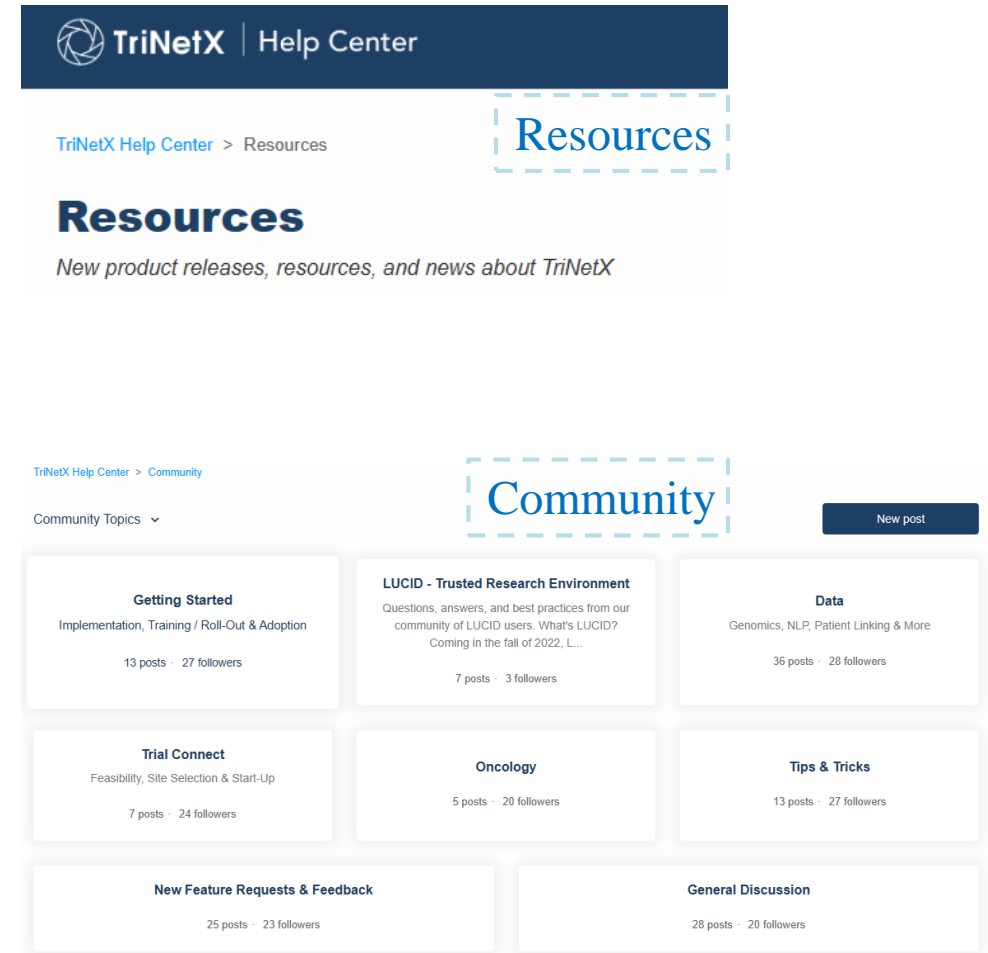
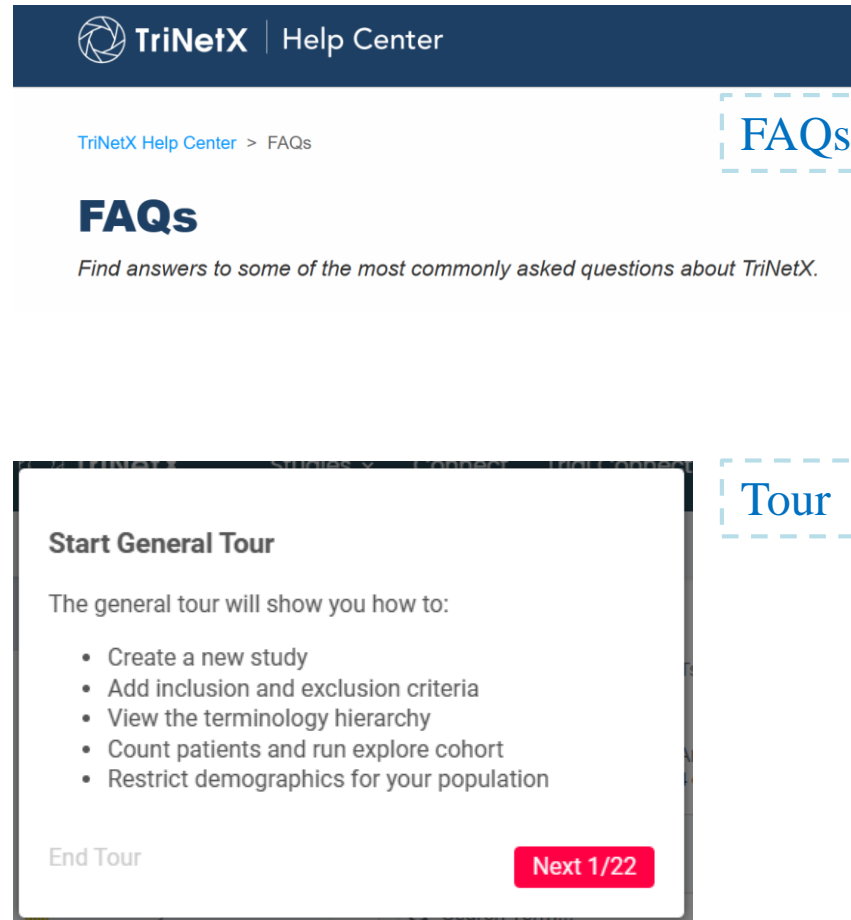
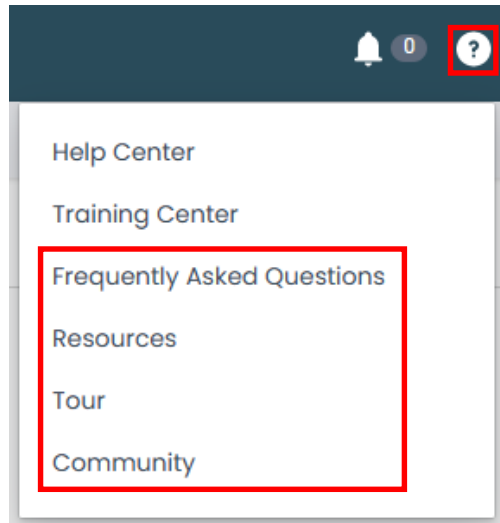
TNX 240 - Best Practices in Querying Patient Diversity

TNX 242 - Best Practices in Querying Infectious Diseases

TNX 320 - New Feature Enhancements to Query Builder and Advanced Analytics

TNX 401 - Advanced Analytics

• FAQs/Resources/Tour/Community





Create new study

- 建立研究

Query Builder

- 設定研究族群

Explore Cohort

- 資料的統計值(人數、百分比、平均數、標準差等等)

Analyze Criteria

- 篩選過程樣本數的變化

Analytics

- 選擇分析方式進行分析

- 納入條件：年齡20歲以上，診斷出有思覺失調症 (schizophrenia, ICD-10: F20)，且有服用抗精神病藥物 (antipsychotic, ATC: N05A)
- 排除條件：排除有躁鬱症診斷 (bipolar disorder, ICD-10: F31)，排除有使用鋰鹽治療 (lithium, ATC: N05AN01)
- 資料剖析：剖析篩選出的病患基本資料 (demographics)
- 分析工具：使用Analyze Outcome，Outcome選擇認知功能障礙 (ICD-10: F01, F02, F03, F04, G30, G31)

• 建立研究

The screenshot shows the TriNetX interface for creating a new study. The top navigation bar includes the TriNetX logo, a 'Studies' dropdown menu (highlighted with a red box), and links for 'Trial Connect', 'LEGACY', 'Browse Network', and 'Discover'. A search bar and a 'Filter By: All Studies' dropdown are also present. A 'Create New Study' button (highlighted with a red box) is located in the top right corner.

The main content area is titled 'Create New Study' and includes the following sections:

- *Study Name (required)**: A text input field with the placeholder 'Enter a descriptive name for the study'.
- Study Name**: A text input field.
- *Research Purpose (required)**: A text input field.
- Clinical Trial Research**: A group of checkboxes:
 - Design clinical trial
 - Assess feasibility of clinical trial
 - Identify clinical trial sites
 - Recruit trial subjects
- Other Scientific Research**: A group of checkboxes:
 - Conduct health economics and outcomes research (HEOR)
 - Explore patient populations
 - Conduct other secondary research
- Study Identifying Information (optional)**: A dropdown menu.
- Target Population (optional)**: A dropdown menu.
- Study Protocol (optional)**: A dropdown menu.

On the right side of the form, there are 'Delete' and 'Duplicate' buttons. At the bottom right, there are 'Cancel' and 'Create' buttons.

- 納入條件：年齡20歲以上，診斷出有**思覺失調症** (schizophrenia, **ICD-10: F20**)，且有服用**抗精神病藥物** (antipsychotic, **ATC: N05A**)
- 排除條件：排除有**躁鬱症診斷** (bipolar disorder, **ICD-10: F31**)，排除有使用**鋰鹽治療** (lithium, **ATC: N05AN01**)

🔍 Query Builder

MUST HAVE
納入條件
⊞

CANNOT HAVE
排除條件
⊞

Ungrouped Terms

<p>MUST HAVE</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> ICD-10-CM F20 Schizophrenia 371,504 > ⚙️ ≥ 20 years </div> <div style="border: 1px solid #ccc; padding: 5px;"> ATC N05A ANTIPSYCHOTICS 6,497,780 > ⚙️ ≥ 20 years </div>	<p>CANNOT HAVE</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> ICD-10-CM F31 Bipolar disorder </div> <div style="border: 1px solid #ccc; padding: 5px;"> ATC N05AN Lithium </div>

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

Organized by ICD-10 Show ICD-9 terms ? Patients

- ICD-10-CM Diagnoses: ICD-10 93,598,202
- ICD-10-CM A00-B99 Certain infectious and parasitic diseases 18,919,122
- ICD-10-CM C00-D49 Neoplasms 12,623,617
- ICD-10-CM D50-D89 Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism 10,094,739
- ICD-10-CM E00-E89 Endocrine, nutritional and metabolic diseases 25,549,682
- ICD-10-CM F01-F99 Mental, Behavioral and Neurodevelopmental disorders 21,051,091
- ICD-10-CM G00-G99 Diseases of the nervous system 20,162,180
- ICD-10-CM H00-H59 Diseases of the eye and adnexa 12,470,090
- ICD-10-CM H60-H95 Diseases of the ear and mastoid process 10,996,590
- ICD-10-CM I00-I99 Diseases of the circulatory system 23,480,092
- ICD-10-CM J00-J99 Diseases of the respiratory system 29,359,553
- ICD-10-CM K00-K95 Diseases of the digestive system 24,777,506
- ICD-10-CM L00-L99 Diseases of the skin and subcutaneous tissue 18,286,744

Show Terms with Zero Patients
 Show Deprecated

Add To Query
Cancel

- 納入條件：年齡20歲以上，診斷出有思覺失調症 (schizophrenia, ICD-10: F20)，且有服用抗精神病藥物 (antipsychotic, ATC: N05A)
- 排除條件：排除有躁鬱症診斷 (bipolar disorder, ICD-10: F31)，排除有使用鋰鹽治療 (lithium, ATC: N05AN01)

Query Builder

MUST HAVE 納入條件

Search Term...

CANNOT HAVE 排除條件

Search Term...

Ungrouped Terms

MUST HAVE		CANNOT HAVE	
ICD-10-CM F20 Schizophrenia	371,504	ICD-10-CM F31 Bipolar disorder	
> ≥ 20 years		OR	
AND		ATC N05AN Lithium	
ATC N05A ANTIPSYCHOTICS	6,497,780		
> ≥ 20 years			

MUST HAVE

ICD-10-CM F20 Schizophrenia
Y
X

ATC N05A ANTIPSYCHOTICS
Y
X

test > Query Builder > Filters for ICD-10-CM F20 Schizophrenia

Go to [Age at Event](#) Primary/Secondary Priority Show Terms with Zero Patients Save Cancel

Age at Event Clear Filter

In order to protect patient privacy, if you use this filter only patients currently aged 90 or younger will be returned

Specify an age or an age range

Greater than or equal to ≥ 20 years

Primary/Secondary Priority Clear Filter

Unknown priority 306,205

Primary priority 62,047

Secondary priority 57,504

Data Source Clear Filter

Filter...

HCO 371,504

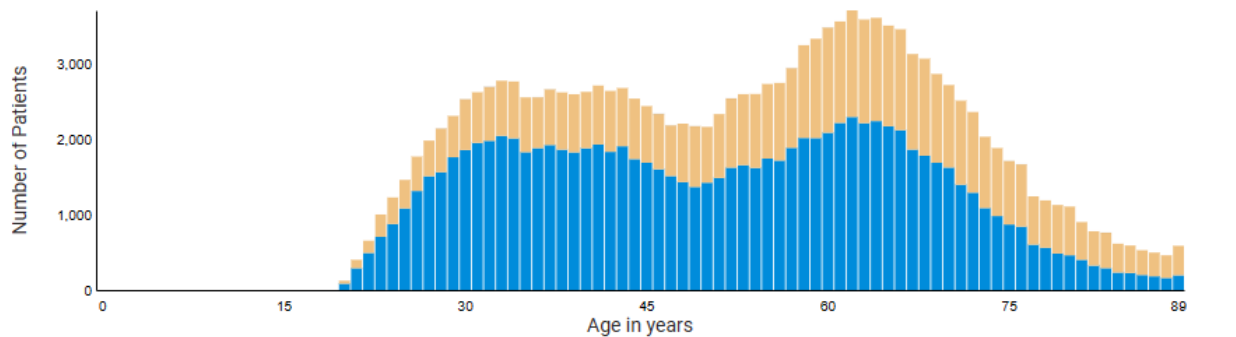
EHR 351,613

NLP 35,720

資料剖析：剖析篩選出的病患基本資料 (demographics)

- Explore Cohort
- Demographics**
- Diagnoses
- Procedures
- Medications
- Labs
- Genomics

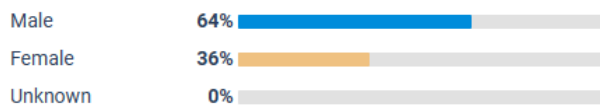
Demographics Grouped Stacked F M U



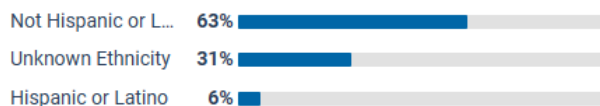
Patients 90 and Older: 408

Total Patients	Minimum Age	Maximum Age	Mean Age	Standard Deviation
151,055	20	90	53	16

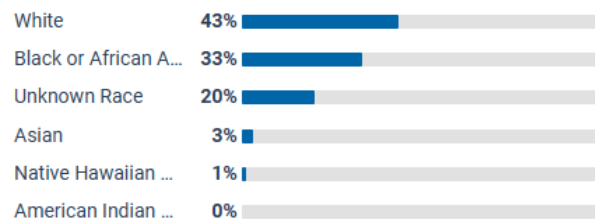
Sex



Ethnicity



Race



篩選後樣本數的變化

Analyze Criteria

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 F20 Schizophrenia
> ≥ 20 years
- AND
- ATC N05A ANTIPSYCHOTICS
> ≥ 20 years

CANNOT HAVE

- ICD-10-CM F31 Bipolar disorder
- OR
- ATC N05AN Lithium

New Criteria Analysis Select up to fifteen terms to analyze.

1 Select Baseline Criteria — 2 Select Terms for Analysis Select All ← Back Run Cancel

Ungrouped Terms

MUST HAVE

- ICD-10-CM F20 Schizophrenia
> ≥ 20 years
- AND
- ATC N05A ANTIPSYCHOTICS
> ≥ 20 years

CANNOT HAVE

- ICD-10-CM F31 Bipolar disorder
- OR
- ATC N05AN Lithium

Analyze Criteria View

	Patients		HCOs
Network	123,123,381		84
Base Population	123,123,381	(0%)	84
Population Any age / Any sex	123,123,381	(0%)	84
Criteria Not Selected for Analysis	122,080,728	(-1%)	84
Must Have: ICD-10-CM F20 Schizophrenia [≥ 20 years]	226,945	(-100%)	77
Must Have: ATC N05A Antipsychotics [≥ 20 years]	151,055	(-33%)	72
	151,055 Patients		72 HCOs

分析工具：使用 Analyze Outcome，Outcome 選擇 認知功能障礙 (ICD-10: F01, F02, F03, F04, G30, G31)

Analytics

My Analyses Analyses that are currently available to me.

Analyze Outcomes
How do patients in a cohort experience outcomes?

Index Event

Explore Characteristics | Review Outcomes

Single Cohort

Compare Outcomes
How do outcomes compare between cohorts?

Index Event

Compare Characteristics | Review Outcomes

Two Cohorts

Compare Cohorts
How do patient characteristics compare between cohorts?

Compare Characteristics

Two Cohorts

Competing Risks
What is the probability for a patient to have competing risks?

Index Event

Review Characteristics | Review Competing Risks

Single Cohort

Treatment Pathways
In what order do patients receive treatments following a diagnosis?

Index Event

Review Characteristics | Review Treatment Pathways

Single Cohort

Incidence and Prevalence
What are the incidence and prevalence of events of interest in a cohort?

Review Incidence and Prevalence

Single Cohort

Advanced Explore Cohort
What are the characteristics of my cohort in different time periods?

Index Event

Explore Characteristics | Explore Outcomes

Single Cohort

Search for terms to define outcome

MUST HAVE

Search Term...

★ Saved Outcomes

ICD-10-CM	F01	Vascular dementia	172,925
OR			
ICD-10-CM	F02	Dementia in other diseases classified elsewhere	403,939
OR			
ICD-10-CM	F03	Unspecified dementia	798,486
OR			
ICD-10-CM	F04	Amnesic disorder due to known physiological condition	12,234
OR			
ICD-10-CM	G30	Alzheimer's disease	364,914
OR			
ICD-10-CM	G31	Other degenerative diseases of nervous system, not elsewhere classified	587,229

Select measures to include in results

Measure	Details	Options
<input checked="" type="checkbox"/> Risk What's this?	Includes <input checked="" type="checkbox"/> % of patients in cohort with outcome	Patients at Risk for Outcome What's this? <input type="checkbox"/> Exclude patients with outcomes prior to the window
<input checked="" type="checkbox"/> Kaplan-Meier Analysis What's this?	Includes <input checked="" type="checkbox"/> Survival analysis Censoring <input checked="" type="checkbox"/> Censor patients after last fact in their record	Patients at Risk for Outcome What's this? <input type="checkbox"/> Exclude patients with outcomes prior to the window
<input checked="" type="checkbox"/> Number of Instances What's this?	Includes <input checked="" type="checkbox"/> Patient's number of instances in the Time Window <input type="checkbox"/> Include patients with zero instances What's this?	Patients at Risk for Outcome What's this? <input checked="" type="radio"/> Date <input type="radio"/> Visit What's this? <input type="checkbox"/> Exclude patients with outcomes prior to the window

● 結果

▼ Unnamed Outcome

Must Have Vascular dementia OR Dementia in other diseases classified elsewhere OR Unspecified dementia OR Amnestic disorder due to known physiological condition OR Alzheimer's disease OR Other degenerative diseases of nervous system, not elsewhere ...

1,562 patients in Cohort 1 were excluded because they met the index event more than 20 years ago. [Learn more](#)

1a : Risk

Cohort Statistics			
Cohort	Patients in Cohort	Patients with Outcome	Risk
1 s_20	149,493	9,714	6.498%

1b : Kaplan-Meier Analysis

Cohort Statistics				
Cohort	Patients in Cohort	Patients with Outcome	Median Survival (Days)	Survival Probability at End of Time Window
1 s_20	149,493	9,714	-	78.041%

1c : Number of Instances

Cohort Statistics					
Cohort	Patients in Cohort	Patients with Outcome	Mean	Standard Deviation	Median
1 s_20	149,493	9,714	5.34	11.547	2

* Patients with zero instances excluded from calculations. Percentages in chart based on patients with outcome.

* 70 data points for Cohort 1 were omitted for display purposes.

帳號申請

- 帳號申請表單：<https://forms.gle/92aGF9QuGFYHyFLb8>
 - 位置：臨床創新研發中心網頁 → 校院專區 → 智慧醫療運算平台
- 時間：1-3個工作天(開通後將E-mail通知，請留意信件)



登入途徑有兩種：

1. 登入網址登入：<https://live.trinetx.com/>
2. 從TriNetX網站(<https://trinetx.com/>)點SIGN IN至登入網站



LIFE SCIENCES HEALTHCARE DATA PRODUCTS SERVICES RESOURCES ABOUT US CONNECT WITH US SIGN IN

Explore. Discover. Connect.

Welcome to the world's largest, living ecosystem of real-world data and evidence for the life sciences and healthcare industries. **Global data, for global health.**



Your organization email address

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.

感謝您的聆聽

