Mount Sinai Data Warehouse (MSDW) Town Hall

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Icahn
School of
Medicine at
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Agenda

- MSDW Overview
- Recent Accomplishments & Future Work
- Usage Metrics
- User Survey Results
- How to Contact Us

The MSDW Team

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MSDW Overview

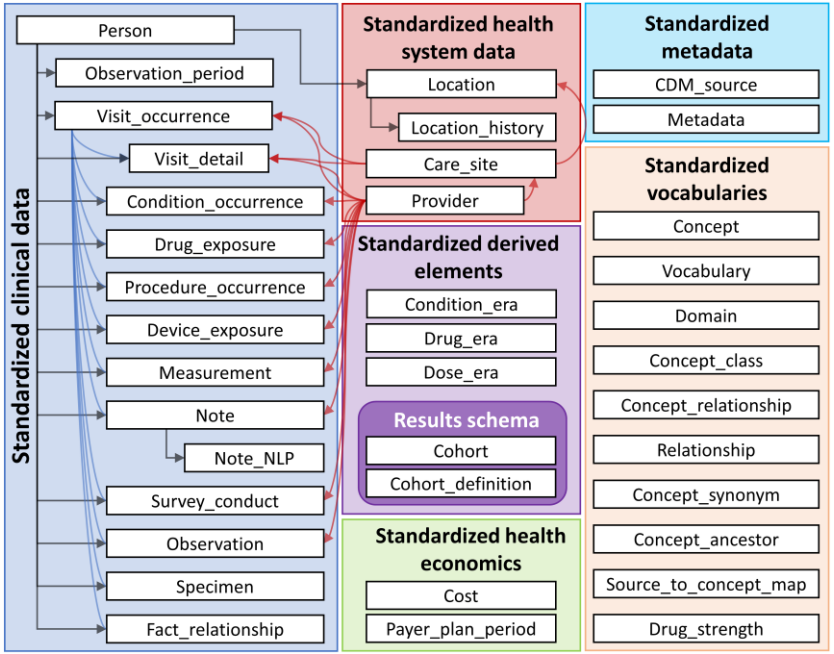
MSDW Relaunched in September 2021

MSDW Evolution	Benefits
Epic as Primary Data Source	• Higher data quality • Transparent data lineage • Access to more data elements
OMOP Common Data Model	• The *de facto* standard data model for research • Standardized structure & content • Vibrant research community & tools • Easier data sharing with research networks
Restore Daily Refreshes	• Faster access to data • Full history of all changes
MSDW on Minerva	• MSDW co-located with Data Ark and other research data sets

OMOP Common Data Model

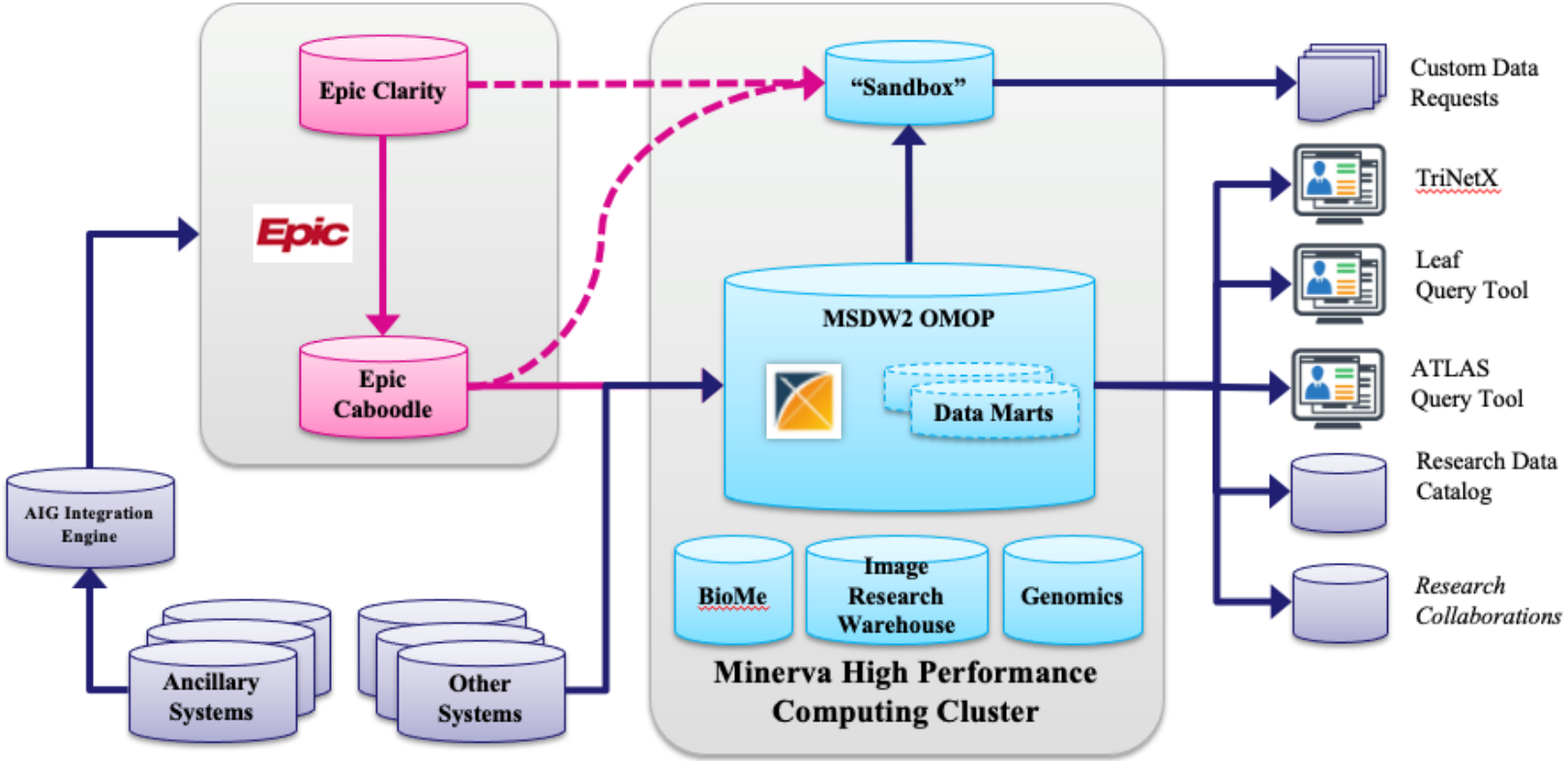
- **Observational Medical Outcomes Partnership (OMOP)**
  - Public-private partnership
  - 5-year program for surveillance of medical products
  - Claims & EHR data
  - Chaired by FDA during 2009-2013
  - Transitioned to OHDSI consortium in 2013

- **Common Data Model (CDM)**
  - Standardizes both structure & content for interoperability
  - Now used by many regional, national, and international research programs & networks



https://ohdsi.github.io/CommonDataModel/

Computational and Data Science Ecosystem



Mount Sinai Data Warehouse is part of Mount Sinai's Computational and Data Ecosystem

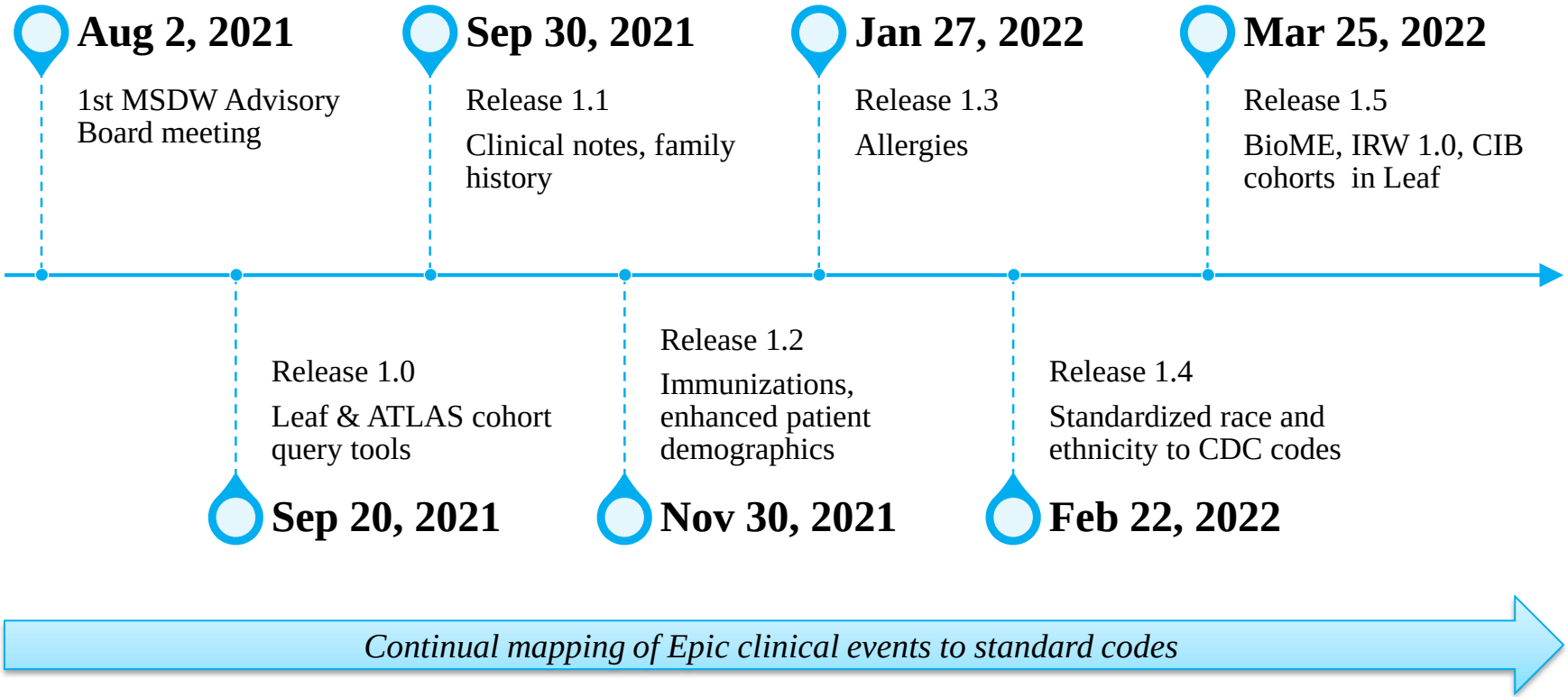
- Co-locating images, genomic data, EHR data, and other data sets with the compute enables **large-scale, multi-modal and multi-scale analyses**
- Utilizing high-performance computing **accelerates analyses**
- Enabling researchers to directly query data **maximizes accessibility**

Self-service cohort query tools

	Leaf 	Atlas 
Development	Nic Dobbins, Univ. of Washington, plus collabs., including at MSSM	OHDSI community: www.ohdsi.org
License	Free and Open-Source Software (FOSS)	
Tradeoff	Easier, quicker, less powerful	Harder, laborious, more powerful
Data available	De-identified only	De-identified or PHI (with IRB)
Capabilities	• Simple Boolean logic • Predefined stats & visualizations • Can download lists of patients (with masked IDs)	• Sophisticated logic • Customized stats & visualizations • Save your work and reuse parts • Run entire statistical analyses • **No data downloads**

Recent Accomplishments & Future Work

Release Timeline for MSDW



MSDW Release 1.0 – September 2021

Record Types	OMOP Tables
Patient Master File	person death
Provider Master File	provider
Org Hierarchy Master File	care_site
Patient Home Address Provider Office Address Facility/Clinic Address	location
Diagnosis Master File Medication Master File Procedure Master File Lab Test Master File Flowsheet Metrics Master File Reference Data Files	concept concept_class vocabulary domain
Concept Mappings	concept_relationship
Medication Orders Medication Dispenses Medication Administration Record	drug_exposure

Record Types	OMOP Tables
Inpatient Hospitalization Inpatient Hospitalization from ED Visit Hospital Outpatient Visit ED Visit Outpatient Visit Telehealth Visit Mobile Unit Encounter	visit_occurrence
Encounter Diagnosis Problem List Hospital Problem	condition_occurrence
Lab Test Results Vital Signs	measurement
General Procedures Surgical Procedures	procedure_occurrence
Patient Demographics Past Medical History Surgical History Family History Social History	observation

MSDW Data Contents (*examples*)

OMOP Table	Record Type	Distinct Patients	Record Count
person	Patient Demographics	10,884,821	10,884,821
visit_occurrence	Inpatient Hospitalization from ED Visit	244,473	454,422
visit_occurrence	Hospital Outpatient Visit	823,554	2,239,873
visit_occurrence	ED Visit	1,010,828	2,387,922
visit_occurrence	Inpatient Hospitalization	568,324	859,466
visit_occurrence	Outpatient Visit	3,767,979	66,955,368
visit_occurrence	Telehealth Visit	1,776,945	16,525,916
condition_occurrence	Hospital Problem	775,606	2,780,546
condition_occurrence	Encounter Diagnosis	3,531,110	90,079,158
condition_occurrence	Problem List	2,107,301	10,834,447
condition_occurrence	Billing Diagnosis	1,868,626	33,694,267
measurement	Vital Signs	3,110,635	522,925,760
measurement	Lab Component Result	3,622,535	863,481,147

See MSDW website for the complete list: https://mdsw.mountsinai.org

New Service: Custom OMOP Data Marts

- New ability to offer custom OMOP data marts
- Customized to your cohort inclusion criteria
  - Identified or de-identified or both
  - Updated dynamically or static cohort
- Data refreshed automatically with MSDW
- Direct database access (*optional*)
- Cohort searchable via ATLAS (*optional*)

MSDW Work in Progress

Adding New Data Content	Enhancing Infrastructure

• **Specific procedure flags**
  • ECMO, Dialysis
• **Health Risk Assessment**
  • PHQ-9
• **Admission, Discharge & Transfer (ADT) Transactions**
• **Radiology impressions**
• **Historical MRNs**
  • Improved patient record linking
• **Integration with IRW**
	• **Framework for Epic upgrades**
	  • Next Epic upgrade Nov 6, 2022
	• **Automated data quality checks**
	• **Support for OMOP version 5.4**
	• **Support for limited data set in data marts**

Usage Metrics

MSDW Volume Metrics 2021

Tickets Opened	
TOTAL	441
Sema4	57
Insight	33

Custom Data Sets Delivered	
TOTAL	209
Sema4	16
Insight	13

In 2021, in addition to launching the new MSDW, the team supported active research projects

Usage metrics – self-service query tools and custom data sets

	Year 2021			Year 2022		
	Mount Sinai Data Warehouse Query Tools		Custom Data	Mount Sinai Data Warehouse Query Tools		Custom Data
Metrics	**Leaf**	**Atlas**	**MSDW**	**Leaf**	**Atlas**	**MSDW**
# of user tickets created	73	17	441	58	18	198
# of user tickets closed	67	16	340	55	15	99
# of unique users over all time	24	32	-	51	58	-
# of active users (last six months)	24	32	-	51	58	-
# of queries run by users or MSDW custom queries	235	-	209	299	-	94
# of active projects/databases/cohorts (last 6 months)	-	18	-	41	25	-

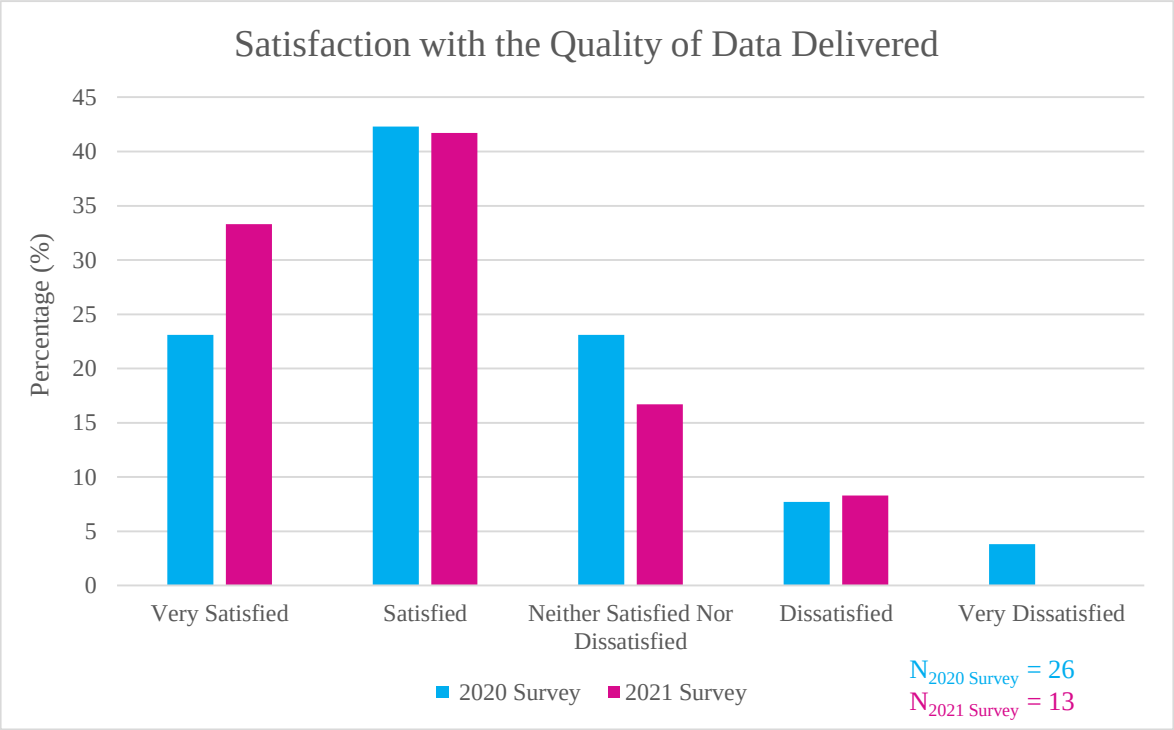
Selected MSDW Research Collaborations

Research Project	Mount Sinai Principal Investigator(s)
RECOVER –Researching COVID to Enhance Recovery*	Carlos Cardon-Cardo, MD, PhD Alexander Charney, MD, PhD Carol Horowitz, MD, MPH Girish Nadkarni, MD
INSIGHT Clinical Research Network	Carol Horowitz, MD, MPH
eMERGE - electronic Medical Records and Genomics	Noura Abul-Husn, MD, PhD Eimear Kenny, PhD
DISRUPT – Diversity and Inclusion in Research Underpinning Prevention and Therapy Trials	Nina Bickell, MD
NC3 - National COVID Cohort Collaborative	Rosalind Wright, MD, MPH
Characterizing and predicting colitis in immune checkpoint blockade-treated cancer patients*	Jean-Frederick Colombel, MD Jeremiah James Faith, PhD Sacha Gnjatic, PhD
Perinatal Database*	Siobhan Dolan, MD, MPH

** New in the last year*

User Survey Results

Satisfaction with Data Quality has Improved



Very Satisfied and Satisfied Users in 2021 = 75%

Very Satisfied and Satisfied Users in 2020 = 65%

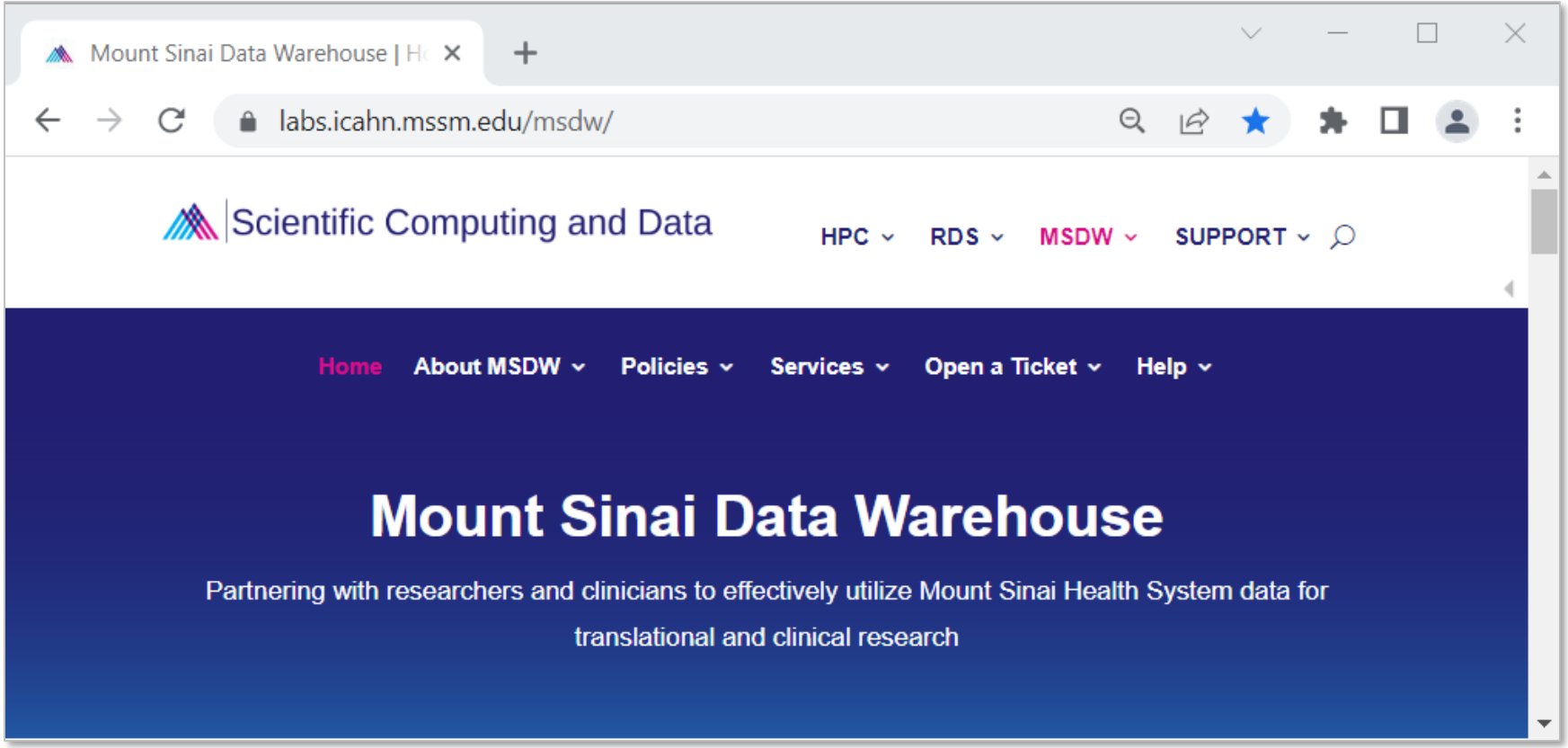
Comments from the MSDW User Satisfaction Survey

- Positive Feedback
  - “Turnaround time is great, easy to work with”
  - “data quality was excellent”
  - “We are lucky to have this service available!"
- Areas for Improvement
  - “did not give a delivery timeline”
  - “Turnaround could be better”
- Addressing feedback
  - Updating processes to more clearly communicate timeline with users

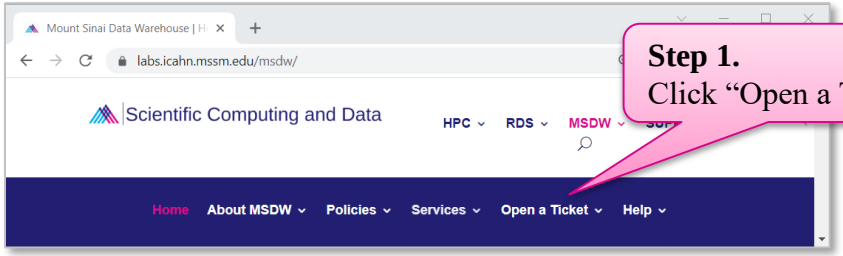
Full survey and responses posted on the MSDW website
https://msdw.mountsinai.org

How to Contact Us

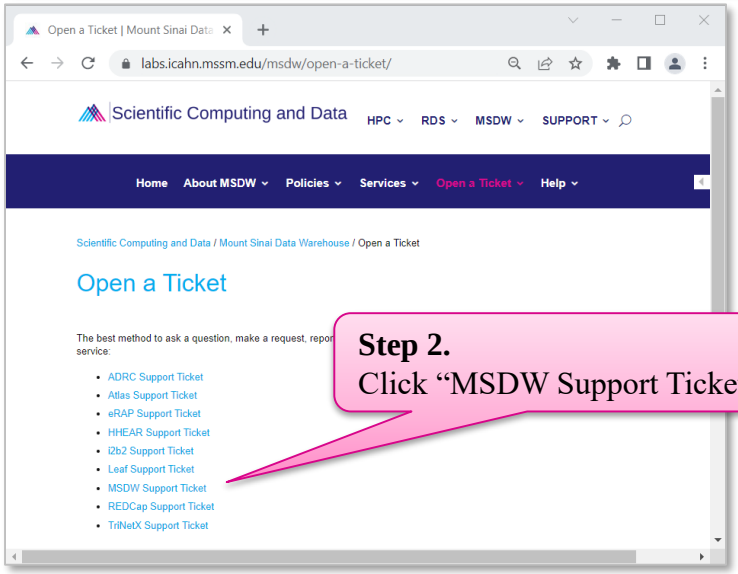
Our Website: msdw.mountsinai.org



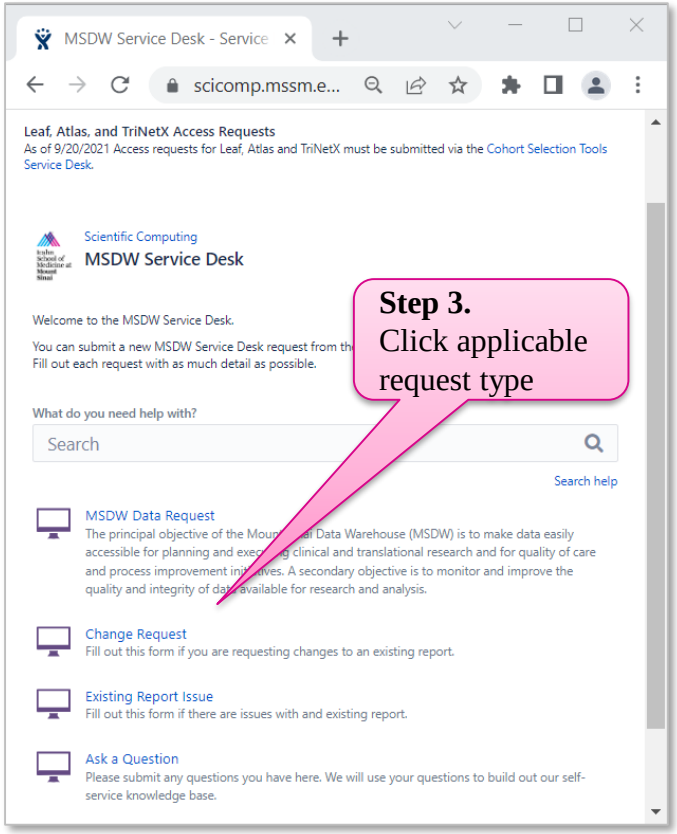
How to Open an MSDW Request Ticket



Step 1.
Click “Open a Ticket”



Step 2.
Click “MSDW Support Ticket”

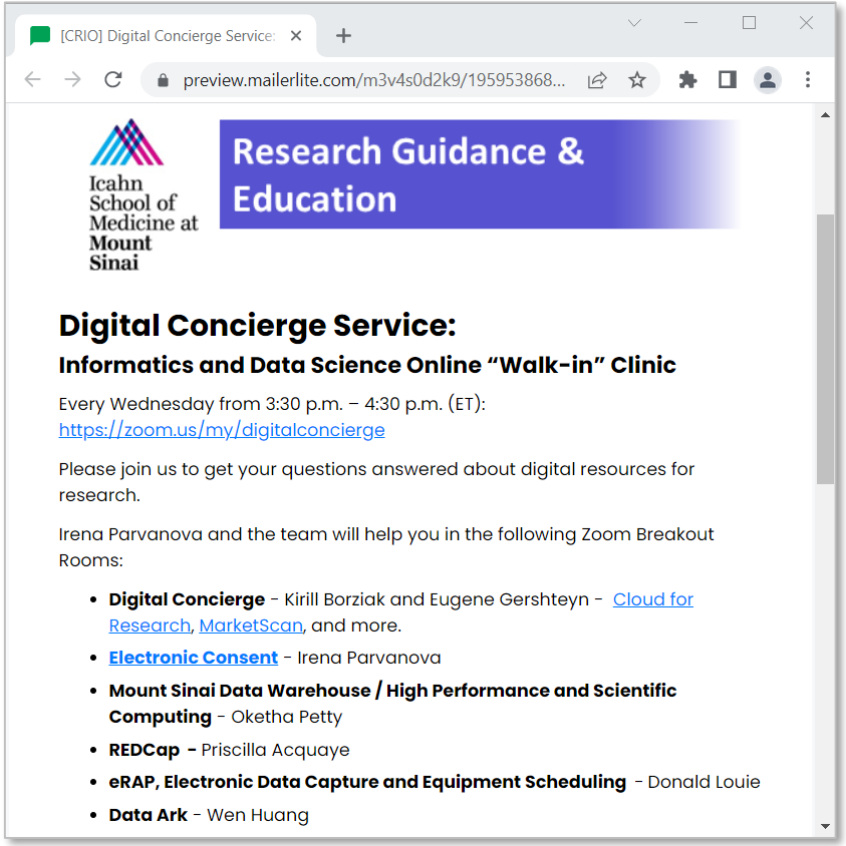


Step 3.
Click applicable request type

Digital Concierge – Walk in Clinic

- "Walk-in" **Digital Concierge** service hosted by the MSDW team **every Wednesday from 3:30 PM to 4:30 PM**

- Reminder notifications sent by the ORS team every week



Thank you!