

ScHARe Repository Introduction

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Deborah Duran, PhD • NIMHD
Elif Dede Yildirim, PhD • NIMHD
Mark Aronson, PhD • NIMHD







ScHARe

Research Think-a-Thons

- Novice training webinars for data science, cloud computing and research using Big Data
- Target: underrepresented populations, women, racial/ethnic and sexual gender minorities, rural and poor populations



Think-a-Thons

Goals:

- Upskill underrepresented populations in data science and cloud computing
- Foster a research paradigm shift to use Big Data in health disparities/health outcomes research
- Promote use of Dark Data

3rd
Wednesday
of every
month
2 pm

1. TUTORIAL AND TARGETED THINK-A-THONS

- Monthly sessions (2 1/2 hours)
- Instructional/interactive
- Designed for new/experienced users
- Networking
- Mentoring and coaching
- Topics include:
 - Data Science 101
 - Terra
 - Social Determinants of Health analytics

Launched

April 2024

- Common Data Elements
- Al readiness
- Ethical and transparent Al
- Bias mitigation

2. RESEARCH THINK-A-THONS

- Multi-career (students to senior investigators)
- Multi-discipline (data scientists and researchers)
- Featured datasets with guest experts leads
- Guest experts in topic areas, analytics, data sources etc. to provide guidance
- Generate research idea decide design, datasets and analytics
- Learn Ethical Al
- Publications

Register: bit.ly/think-a-thons



Think-a-Thon tutorials

bit.ly/think-a-thons

Think-a-thon Archive

February Artificial Intelligence and Cloud Computing 101

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SPECIAL EVENTS

- ScHARe for Educators
 (Community Colleges and low-resource MSIs)
- ScHARe for American Indian/
 Alaska Native Researchers
- ScHARe for Coders and Programmers to conduct research

Recent Think-a-thons

October Preparing for Al 1: Common Data Elements and Data Aggregation

November Preparing for AI 2: An Introduction to FAIR Data and AI-ready Datasets

January Preparing for AI 3: Computational Data Science Strategies 101

February/March Preparing for AI 4: Overview Prep for AI Summary with Transparency, Privacy, Ethics

April Research Teams – SDoH and Health Disparities

May

Be a Part of the Future of Knowledge Generation 1: Al/Cloud Computing Basics and CDEs

July Be a Part of the Future of Knowledge Generation 2: Al-Ready Datasets and Computations

August An Introduction to Python for Data Science

September Data Management and Analysis in Python

October ScHARe Data Repository

Experience conducting ethical Al

Transparency

Public perception and understanding of how AI works

- Technical documentation for duplication/re-use
- Tools:
 - Data dictionary
 - Health sheet (Data sheet)
 - Model cards (capabilities and purpose of algorithms are openly and clearly communicated to relevant stakeholders)

Fairness

Findable: providing metadata, documentation, and clear identifiers

Accessible: wide audience
Interoperable: standardized formats and APIs enable seamless integration

Reusable: clear documentation, licensing, reduce redundancy

- Metadata and data should be easy to find for both humans and computers
- Ensure that data represents relevant populations

Think-a-Thons training/mentoring pipeline

NLM OIC Experts Fellows Think-a-Thons

- ✓ Instructional ✓ Research
 - structional

AnVil HEAL

N3C All of US

BioData Catalyst

Using AI experts

to train and mentor novice AI users

to upskill and mentor diverse perspectives in AI

AIM-AHEAD

to increase diverse perspectives in biomedical research

Goal: "Upskilling"

- ✓ Data science specialists into health disparities and health outcomes research
- ✓ Health disparities/outcomes researchers into using big data and cloud computing

Target Audience:

Underrepresented populations (women, race/ethnic) users not trained in data science

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- ✓ Data scientists with no or little research experience
- Resource and tool for Community Colleges and lowresource MSIs and organizations

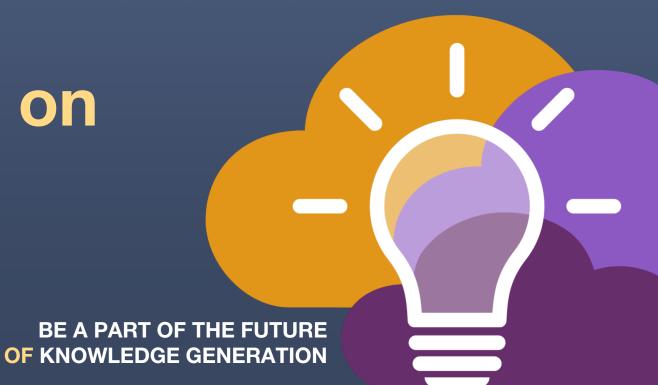
Slido Poll

Which statement is most true for Common Data Elements:

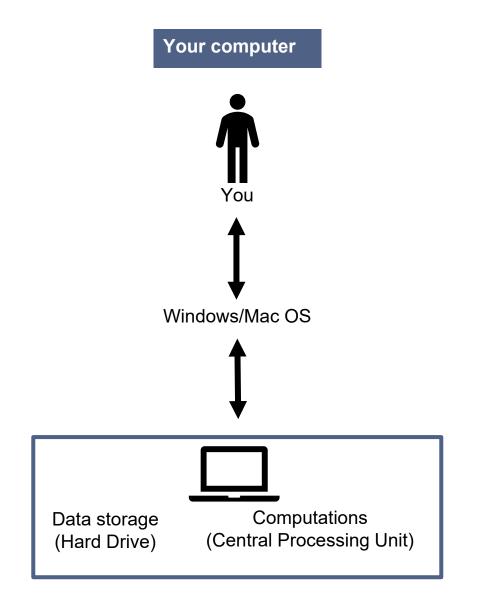
- a) Questions that are forced upon investigators to use
- b) Questions that are asked the same way for everyone involved in a study
- c) Questions that are universally semantically defined and can be used similarly by all
- d) Questions that require a series of questions and a set of responses only relevant to the study

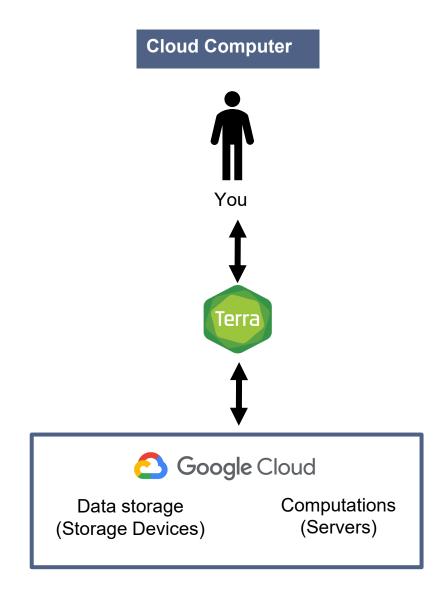
SCHARE

Getting Started on Terra



ScHARe provides an easy portal to cloud computing





Getting Set Up on Terra

A tour of the ScHARe Workspace

Your first steps

Register for ScHARe

Create a Terra Account

Link a billing account

Getting Set Up on Terra

Register for ScHARe



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Link a billing account

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A tour of the ScHARe Workspace

Slido Poll

Which of the following do you NOT need to do before running your own data analysis on Terra?

- A. Link a Google Cloud Billing account to your Terra account
- B. Use an .edu email account to create a Terra account
- C. Use a Google account to register for SCHARE
- D. Create a Terra account

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Link a billing account



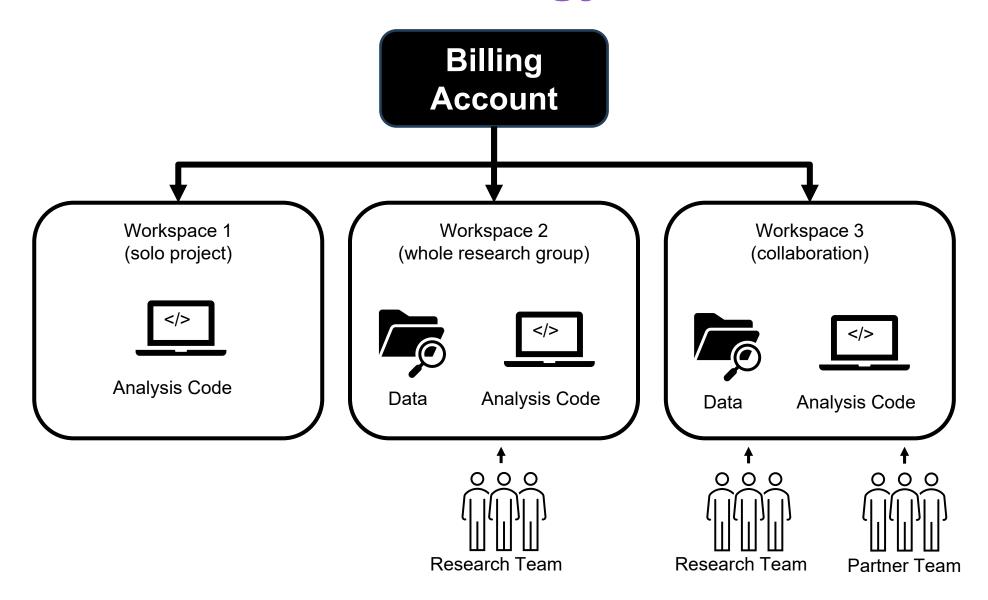
A tour of the ScHARe Workspace

Terra Terminology

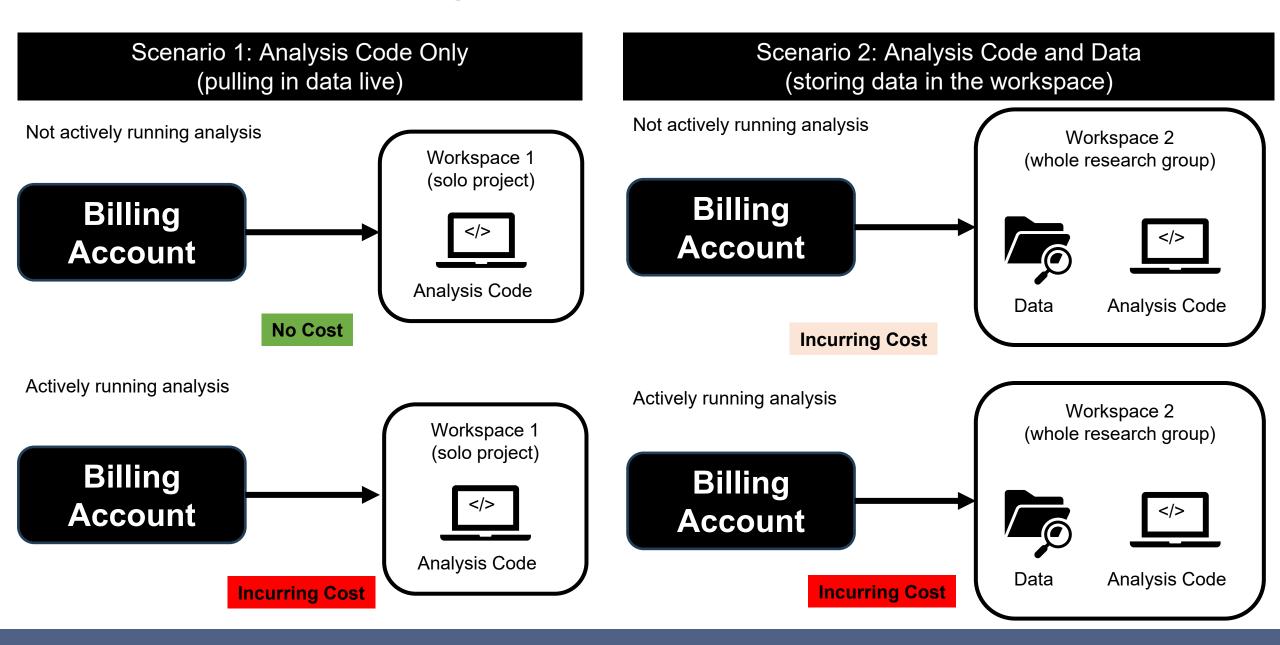
ScHARe Workspace: Data Tab

ScHARe Workspace: Analyses Tab

An intro to Terra Terminology



What costs money on Terra



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A tour of the ScHARe Workspace

Terra Terminology



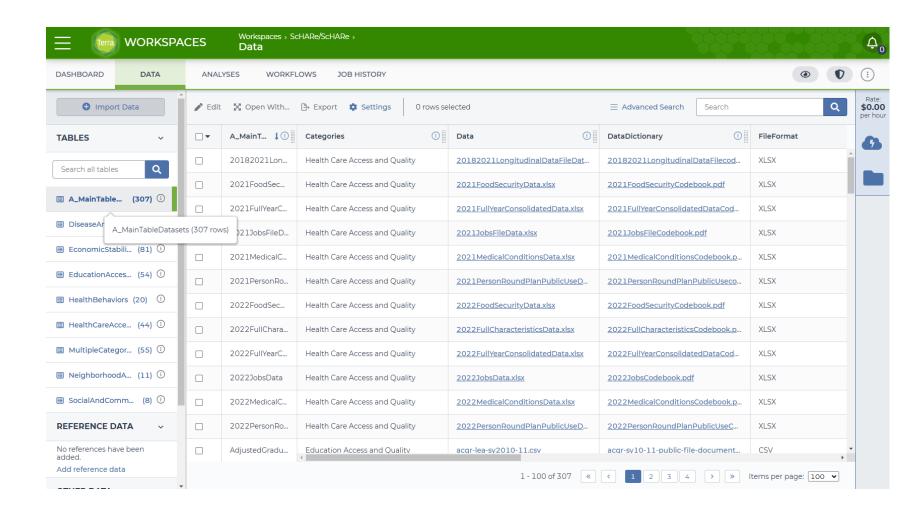
ScHARe Workspace: Data Tab

ScHARe Workspace: Analyses Tab

Find public datasets on the ScHARe Data Tab

Datasets hosted on SCHARE Workspace are:

- public data
- contain no personal identifiable information (PII)



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Terra Terminology

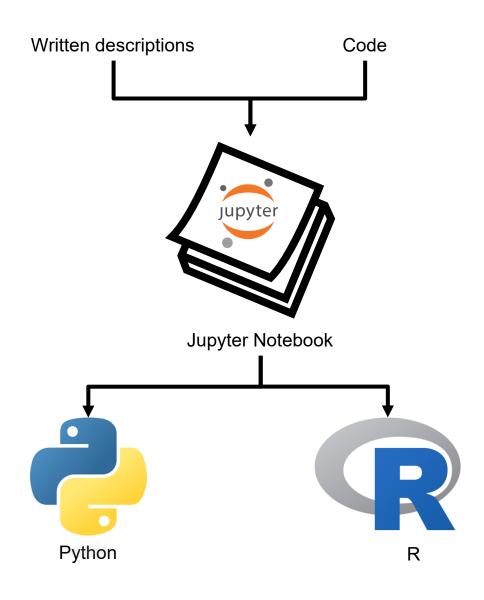


ScHARe Workspace: Data Tab



ScHARe Workspace: Analyses Tab

Data Analytics tools are found in the analyses tab



On the SCHARE Workspace







Model Notebooks

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A tour of the ScHARe Workspace

Terra Terminology



ScHARe Workspace: Data Tab



ScHARe Workspace: Analyses Tab



Slido Poll

Which of the following is TRUE about the Data Tab in the SCHARE Terra Workspace?

- A. The datasets have Personal Identifiable Information in them
- B. The datasets are public data and are free to use
- C. The datasets require a Data Use Agreement to be signed to use
- D. The datasets are from untrustworthy sources

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Terra Terminology



ScHARe Workspace: Data Tab

= Terra	WORKSPA		Workspaces > ScHARe/ScHARe > Data				
DASHBOARD	DATA	ANALYSES	WORKFLOWS	JOB HISTORY			

ScHARe Workspace: Analyses Tab



Your first steps

Creating a Workspace

Pull data from the ACS

Simple analysis and visualization

Getting Set Up on Terra

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A tour of the ScHARe Workspace

Terra Terminology



ScHARe Workspace: Data Tab



ScHARe Workspace: Analyses Tab



Your first steps

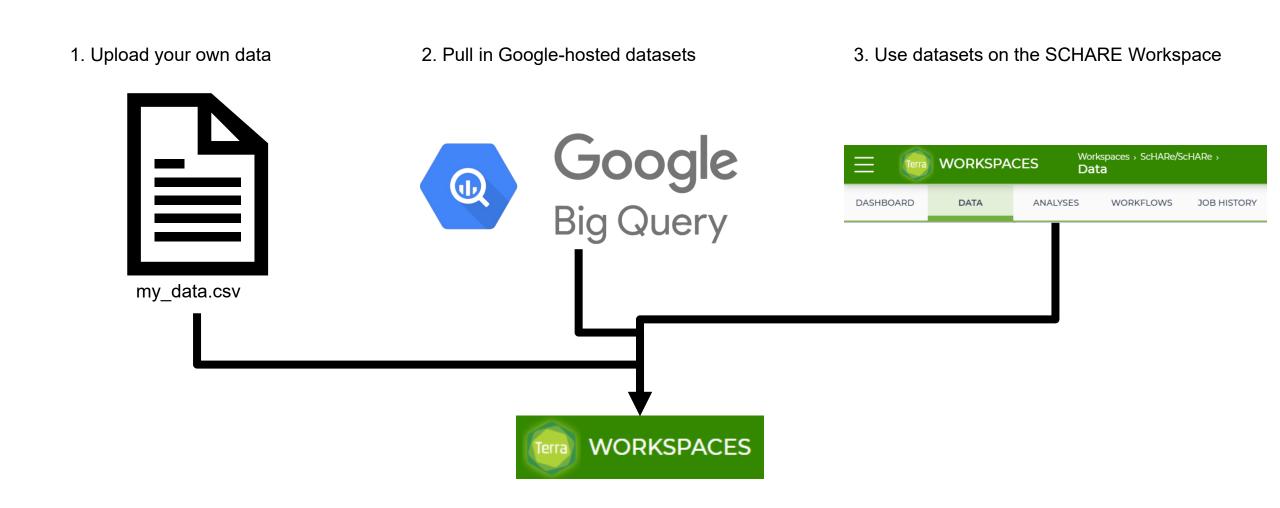
Creating a Workspace



Pull data from the ACS

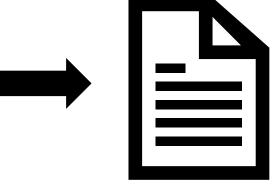
Simple analysis and visualization

Terra can take in data sources 3 ways



Let's pull in some data from the Census

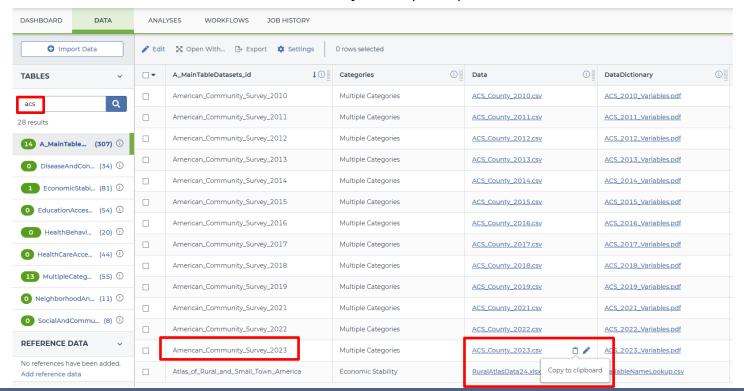








County Data (2023)



Getting Set Up on Terra

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Create a Terra Account



Link a billing account



A tour of the ScHARe Workspace

Terra Terminology



ScHARe Workspace: Data Tab



ScHARe Workspace: Analyses Tab



Your first steps

Creating a Workspace



Get Census data



Simple analysis and visualization

Finally, let's visualize some of the data in Python





Finally, let's visualize some of the data in Python

1. Copy the dataset from the SCHARE Workspace to your Workspace

!gsutil cp gs://fc-secure-d6e25d73-4b50-4dbc-ac10-ec689987eaa9/uploads/General/ACS County 2023.csv .

2. Bring in a library of code that helps us store the data

import pandas as pd

3. Load in the dataset from the Workspace

data = pd.read csv('ACS County 2023.csv')

4. Take a peek at the data to see if this worked

data.head(10)

	020_10		otato	oounty	D. 02_00012	DI OL_OCOLL	D. 02_00002	D. 02_000.12	DI OL_OUGL	D. 02_00002	•••
0	0500000US01003	Baldwin County, Alabama	1	3	105698	57455	16372	5658	2244	15984	
1	0500000US01015	Calhoun County, Alabama	1	15	46310	20559	7325	2114	1083	8399	
2	0500000US01043	Cullman County, Alabama	1	43	35961	19807	7399	2285	691	5868	
3	0500000US01049	DeKalb County, Alabama	1	49	27182	14118	5138	1991	963	4965	
4	0500000US01051	Elmore County, Alabama	1	51	33692	18114	5021	1563	404	5565	

state county DP02 0001F DP02 0002F DP02 0003F DP02 0004F DP02 0005F DP02 0006F ... I

5. Bring in a library of code for visualization

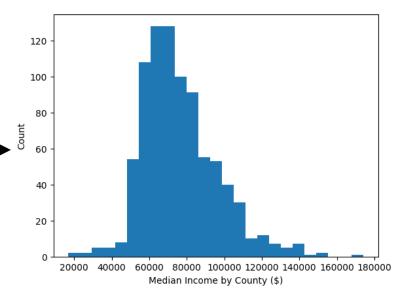
import matplotlib.pyplot as plt

6. Make a histogram of median household income by county

plt.hist(data['DP03_0062E'],25)
plt.xlabel('Median Income by County (\$)')
plt.ylabel('Count')

from the codebook:

		Census Data API: /data/2023/acs/acs1/profile/variables						
Name	Label	Concept	Required	Attributes	Limit	Predicate Type	Group	
DP03_0061PE	Percent!!INCOME AND BENEFITS (IN 2023 INFLATION-ADJUSTED DOLLARS)!!Total households!!\$200,000 or more	Selected Economic Characteristics		DP03_0061PEA, DP03_0061PM, DP03_0061PMA	0	float	<u>DP03</u>	
DP03_0062E	Estimate!!INCOME AND BENEFITS (IN 2023 INFLATION-ADJUSTED DOLLARS)!!Total households!!Median household income (dollars)	Selected Economic Characteristics	not required	DP03_0062EA, DP03_0062M, DP03_0062MA	0	int	<u>DP03</u>	



Putting it all together on Terra

```
In [44]: ▼ # import packages for data storage
           import pandas as pd
           # copy dataset from SCHARE repository
           !gsutil cp gs://fc-secure-d6e25d73-4b50-4dbc-ac10-ec689987eaa9/uploads/General/ACS County 2023.csv .
          # read in dataset and preview
           data = pd.read_csv('ACS_County_2023.csv')
           data.head(10)
In [46]: ▼ # import package to visualize data
           import matplotlib.pyplot as plt
           # make a histogram of median household income
          plt.hist(data['DP03_0062E'],25)
           plt.xlabel('Median Income by County ($)')
          plt.ylabel('Count');
             120
             100
              60
              40
              20 -
                  20000 40000 60000 80000 100000 120000 140000 160000 180000
                                    Median Income by County ($)
```

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Terra Terminology



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ScHARe Workspace: Analyses Tab



Your first steps

Creating a Workspace



Pull data from the ACS



Simple analysis and visualization



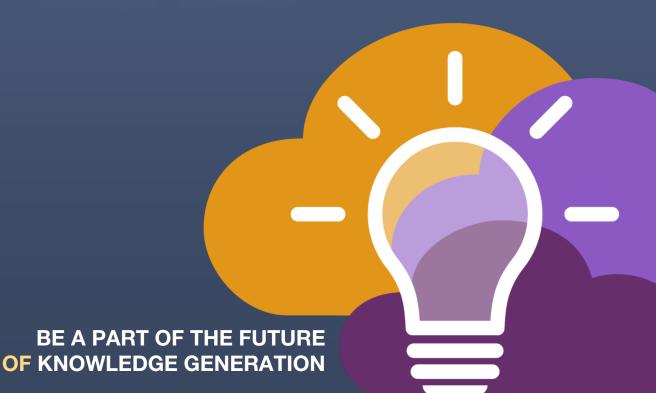
Slido Poll

Which of the following is FALSE about the Data Tab in the SCHARE Terra Workspace?

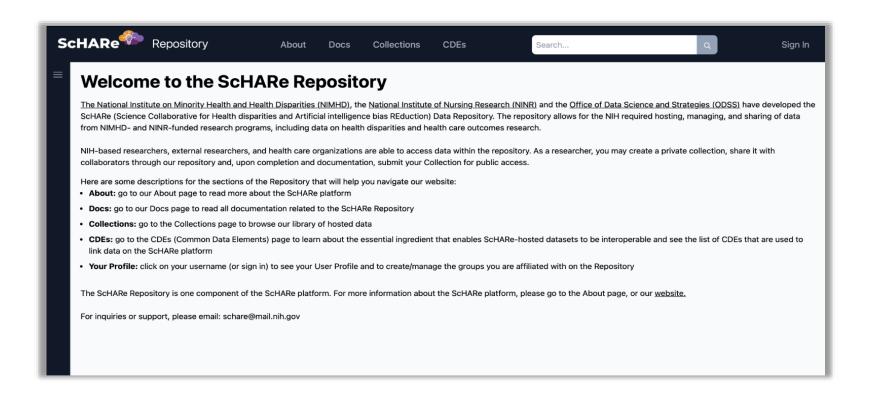
- A. Terra can input your own data to use for analysis
- B. You can run your own analyses in the SCHARE Workspace
- C. Terra can input data from the SCHARE Workspace or Google
- D. Terra currently supports writing analysis code in R or Python

SCHARE

Repository Background



ScHARe Repository



- Host your project data in a safe space with privacy levels, secure workspaces, collaboration platform
- Comply with NIH Data
 Management and Data
 Sharing Policy
- Focus: Social Science,
 SDoH, Health Disparities,
 Health Outcomes Research
- CDE centric: Map project
 CDEs or variables to
 ScHARe-PhenX CDEs
- Link your data with others and federated data

What can you do with the Repository?

Upload your own data

Store collected data and annotate with a data dictionary. Align data to the Schare CDEs.

Harmonize data to CDEs

Map uploaded data to CDEs. Join your data with project or federated data via CDEs.

Browse for data

Find relevant federated national datasets or other project data.

Manipulate and aggregate data for analysis

Filter, sort, and select subsets for specific purposes. Link and aggregate datasets.

Control privacy levels and data sharing

Share confidential data among colleagues.
Share public access data with the research community.

Data Analysis via ScHARe Terra or local analysis platform



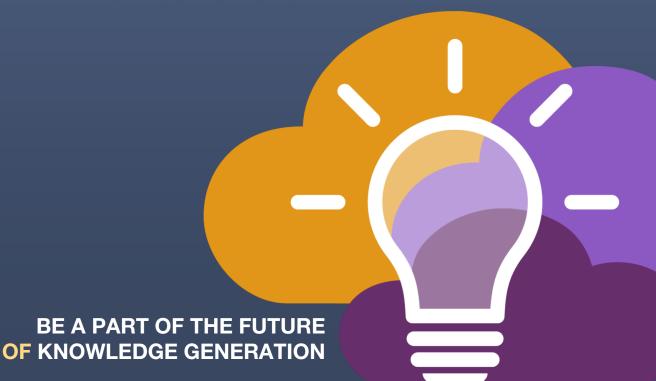
Key Features of the ScHARe Repository

- Offers secure, long-term **storage** for project data
- Provides easy access to federated and other shared population science, Social Determinants of health (SDoH) data sets
- Leverages CDEs for organizing, aggregating, and harmonizing data
 - o CDEs facilitate use of established semantic and coding systems
 - Aligns with ScHARe's focus on CDE centric data sharing
- Provides seamless tabular data management, aggregation, manipulation, and harmonization directly within the Repository
- Offers different privacy levels to meet individual data set requirements (public, restricted, confidential, private)
- Allows sharing data with other research collaborators



SCHARE

Getting Started



Visit the ScHARe Repository!

https://schare-repository.nimhd.nih.gov/

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For today's training, please use our test site:

https://test-schare.nimhd.nih.gov/

Data uploaded to this site will not be retained.





Repository

About

Docs Collections

CDEs

Search...

Sign In

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Welcome to the ScHARe Repository

The National Institute on Minority Health and Health Disparities (NIMHD), the National Institute of Nursing Research (NINR) and the Office of Data Science and Strategies (ODSS) have developed the ScHARe (Science Collaborative for Health disparities and Artificial intelligence bias REduction)

Data Repository. The repository allows for the NIH required hosting, managing, and sharing of data from NIMHD- and NINR-funded research programs, including data on health disparities and health care outcomes research.

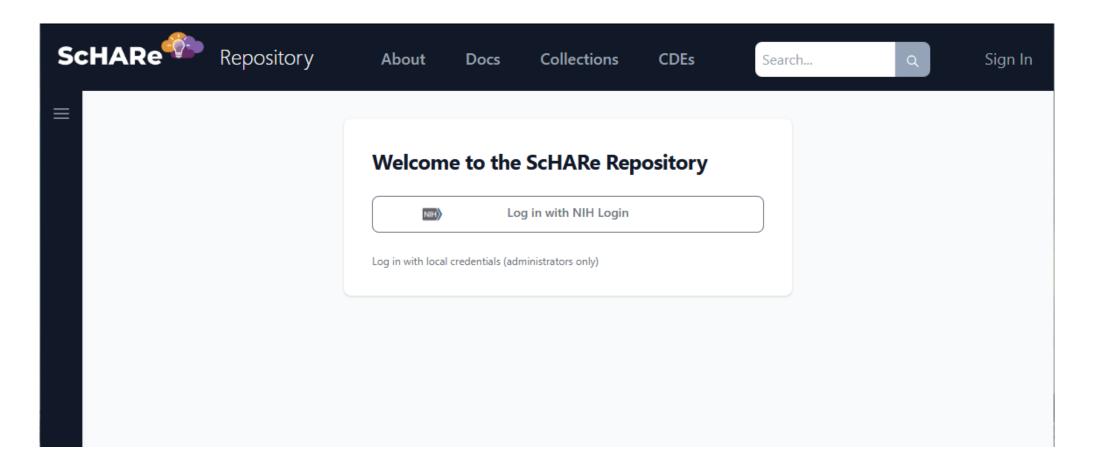
NIH-based researchers, external researchers, and health care organizations are able to access data within the repository. As a researcher, you may create a private collection, share it with collaborators through our repository and, upon completion and documentation, submit your Collection for public access.

Here are some descriptions for the sections of the Repository that will help you navigate our website:

- About: go to our About page to read more about the ScHARe platform
- Docs: go to our Docs page to read all documentation related to the ScHARe Repository
- Collections: go to the Collections page to browse our library of hosted data
- CDEs: go to the CDEs (Common Data Elements) page to learn about the essential ingredient that enables ScHARe-hosted datasets to be interoperable and see the list of CDEs that are used to link data on the ScHARe platform
- Your Profile: click on your username (or sign in) to see your User Profile and to create/manage the groups you are affiliated with on the Repository

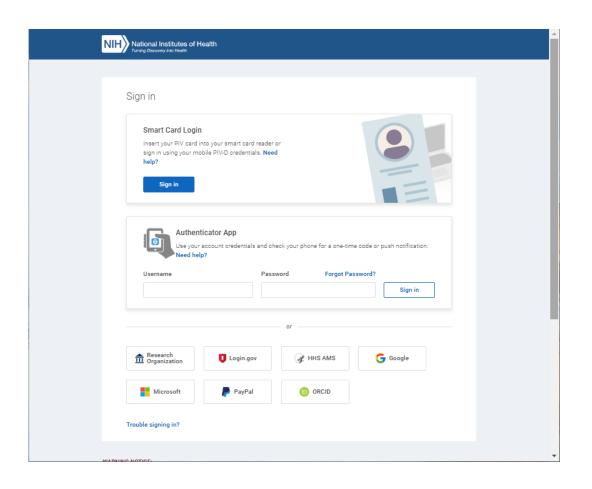
The Schare Repository is one component of the Schare platform. For more information about the Schare platform, please go to the About page, or our <u>website</u>.



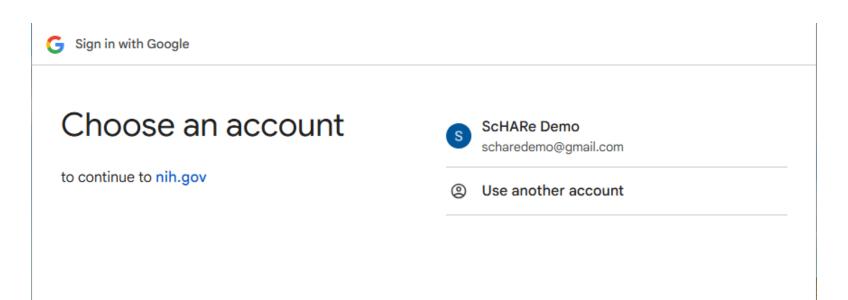




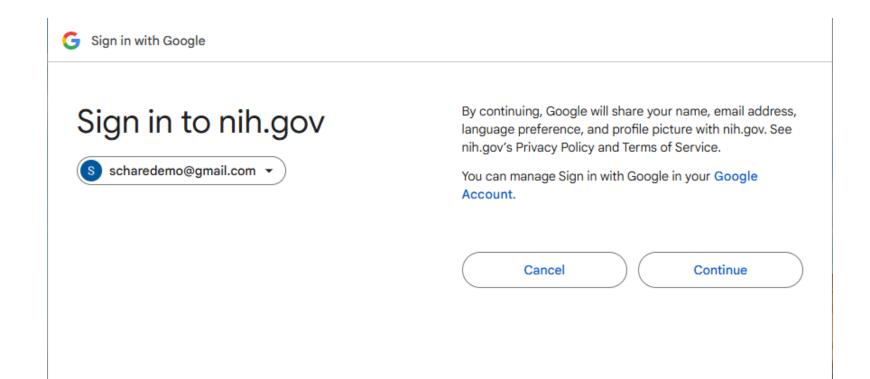
- Select the most appropriate login method
 - NIH Smart Card Login for NIH affiliates
 - Otherwise, Research Organization, Login.gov, HHS AMS preferred



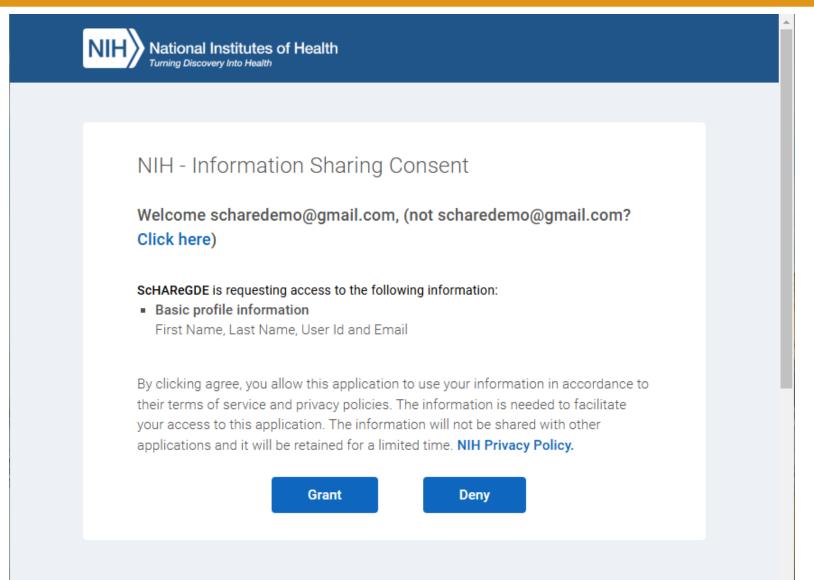




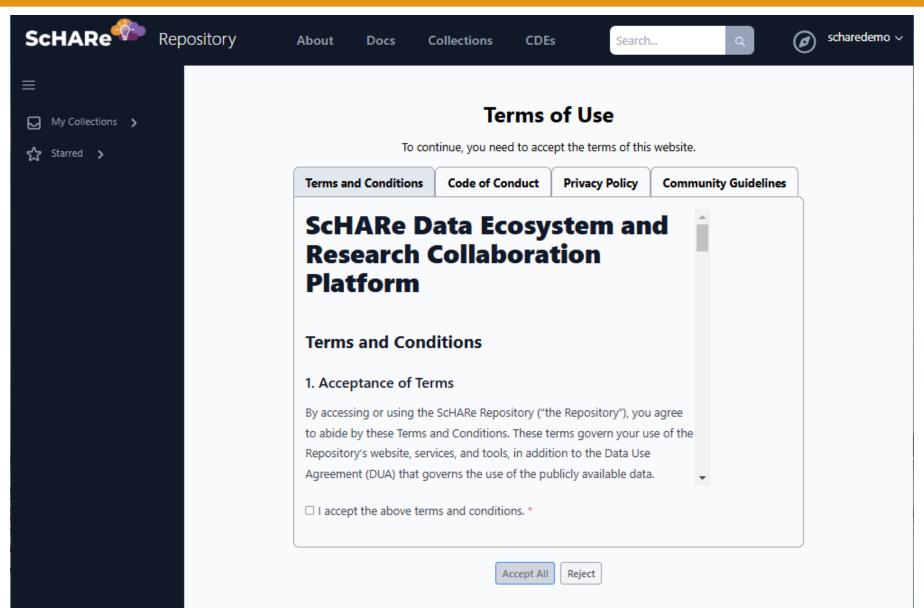




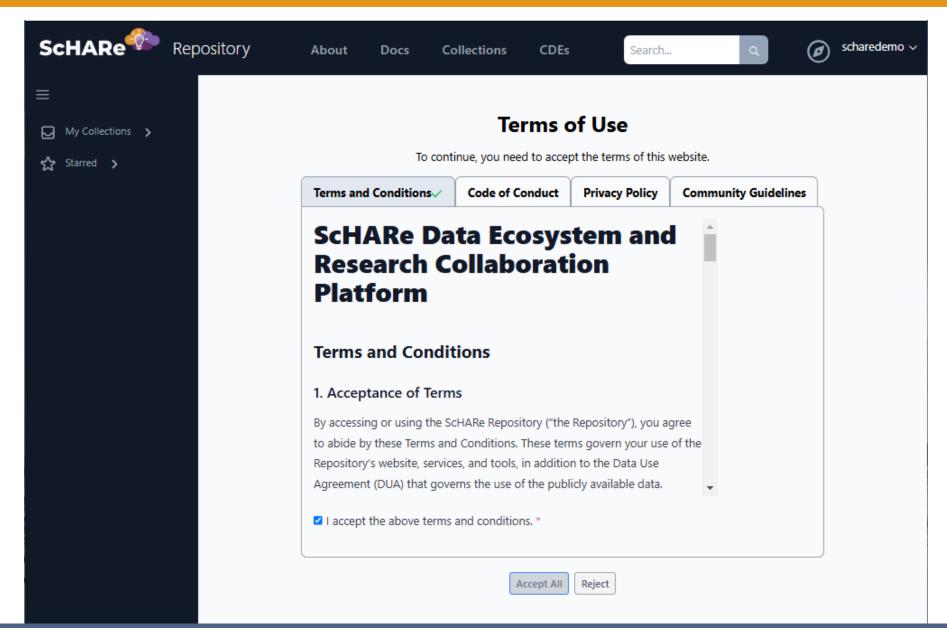




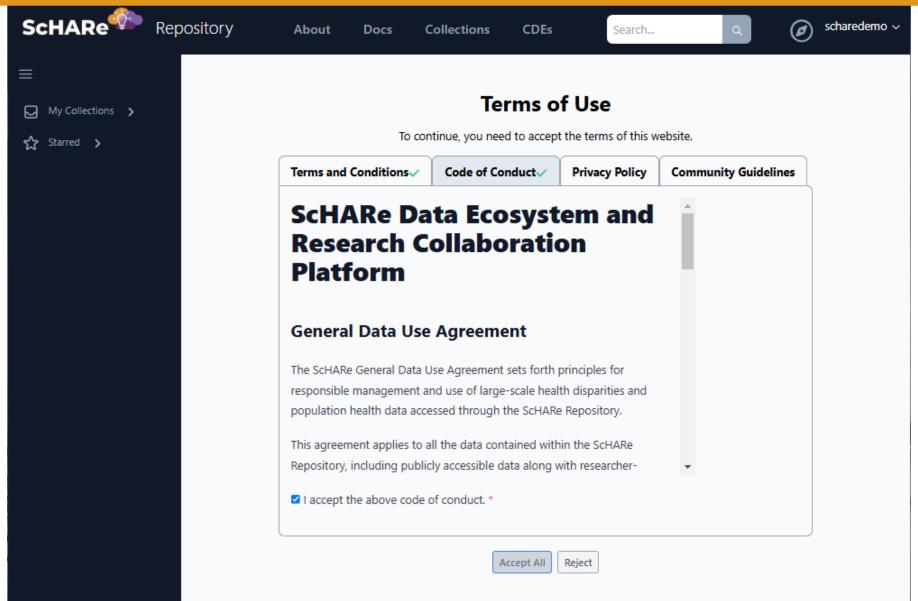




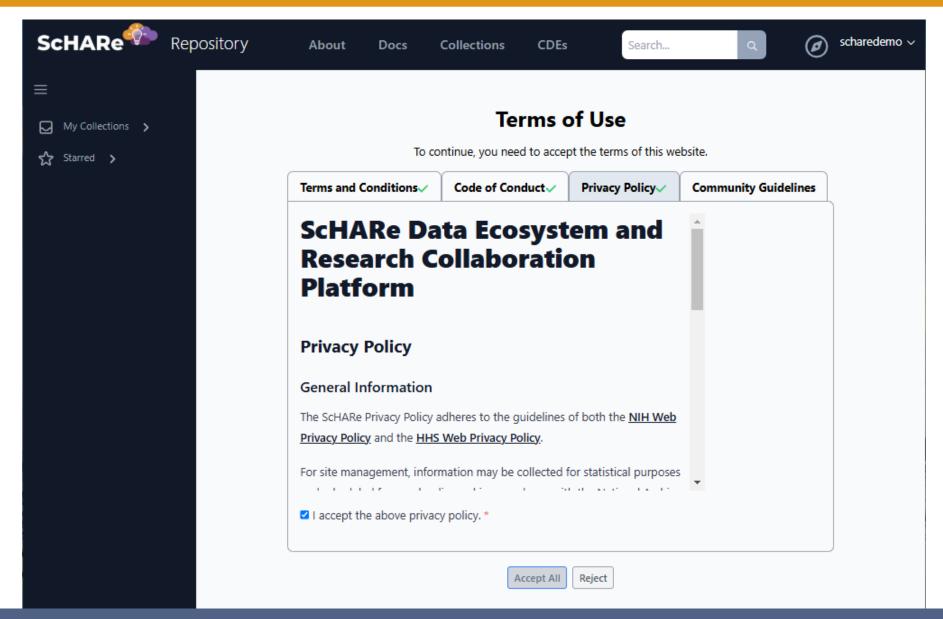




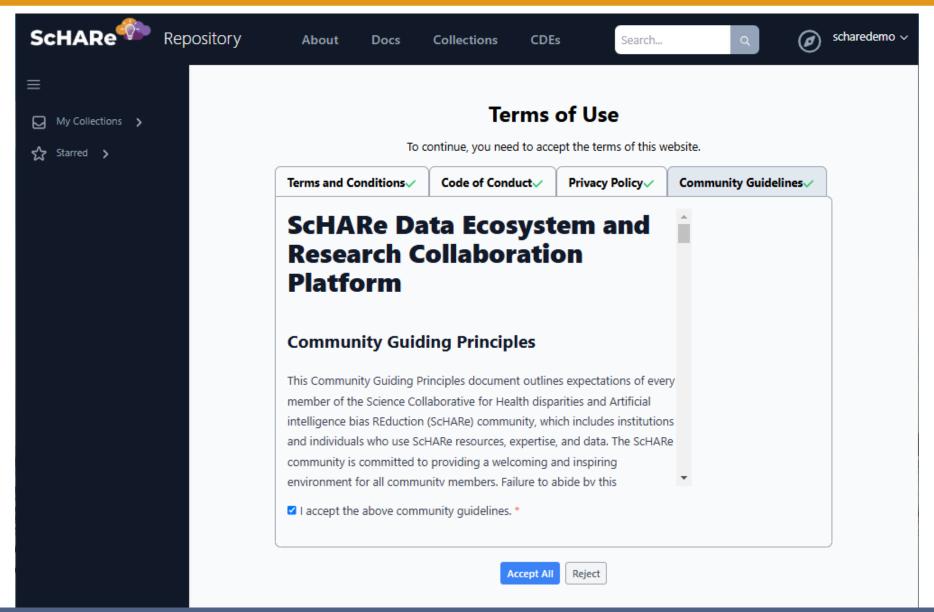






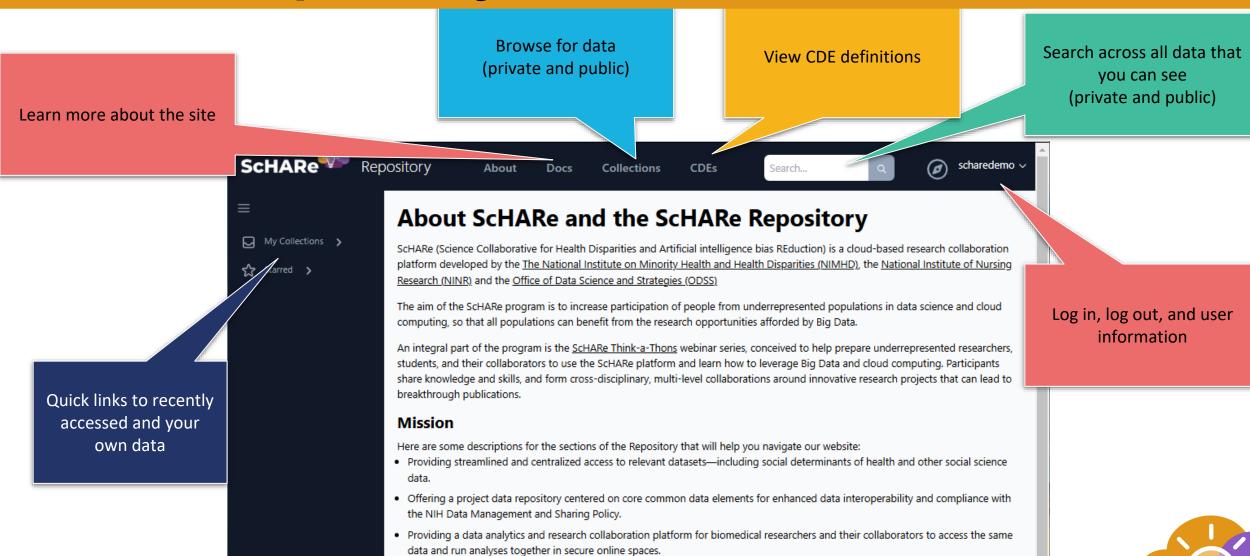






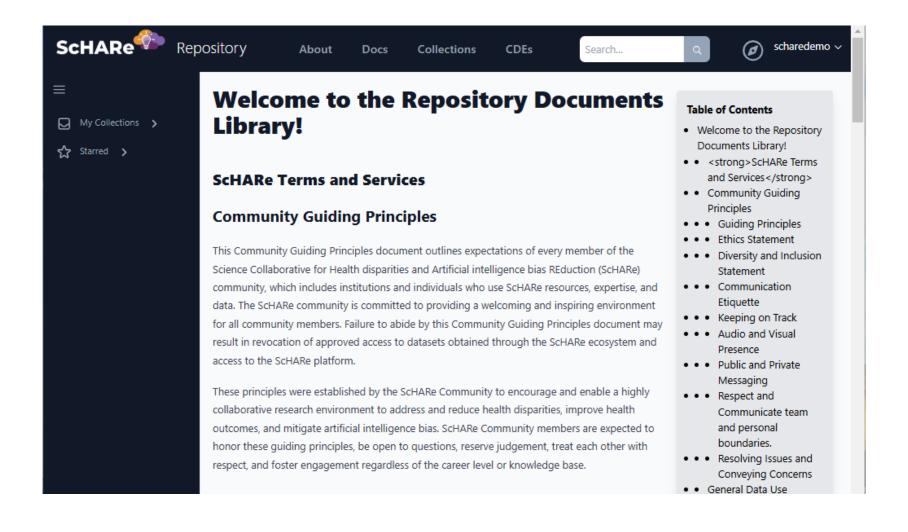


ScHARe Repository



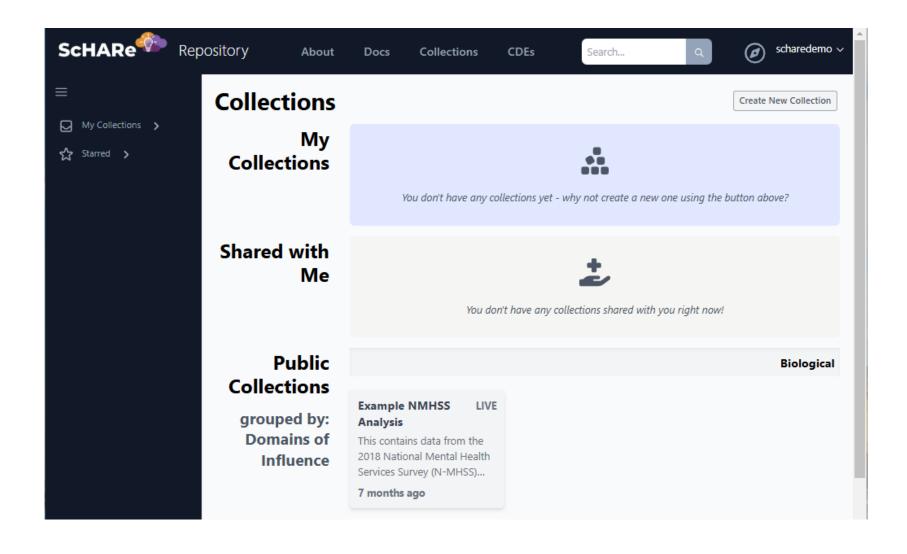
Encouraging researchers to leverage Big Data and advanced artificial intelligence analytic tools.

Schare Repository - Docs



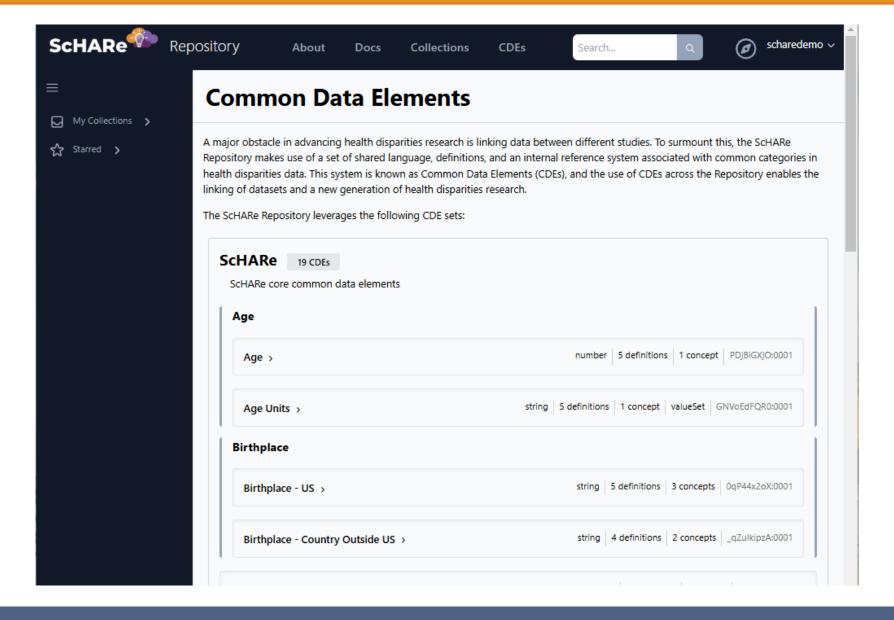


ScHARe Repository - Collections



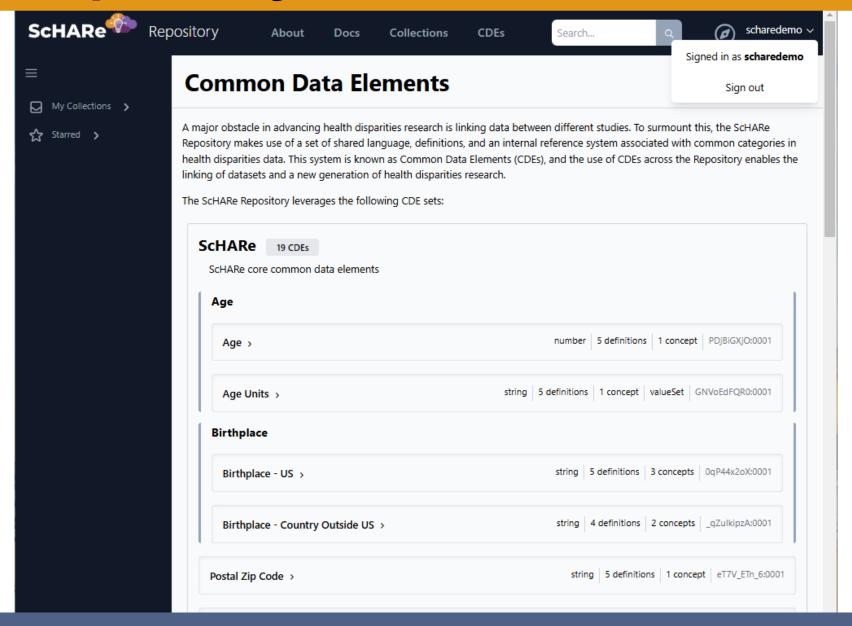


Schare Repository - CDEs



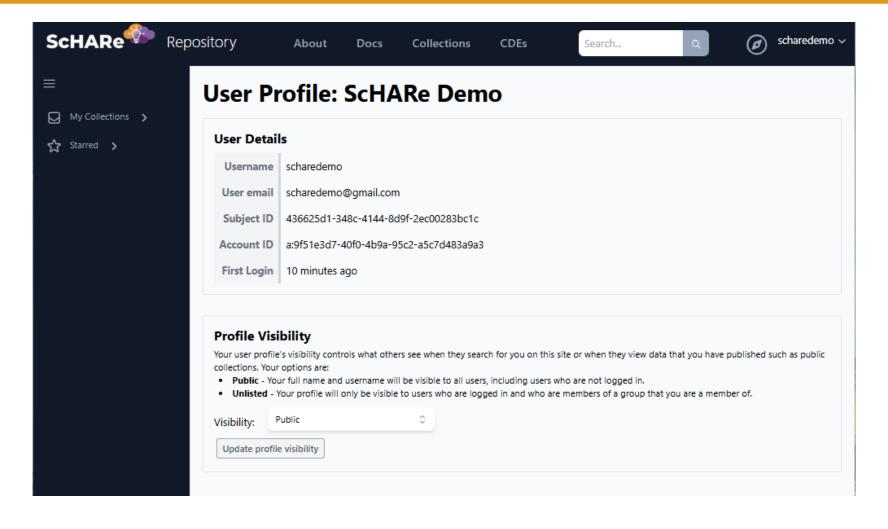


ScHARe Repository - User Profile





ScHARe Repository - User Profile





ScHARe Repository - User Profile

