

All of Us

RESEARCHER WORKBENCH

*Cloud based access and analytics to advance
precision medicine*

Andrea H. Ramirez, MD, MS¹, **Kelsey Mayo, PhD²**, Karthik Muthuraman, MS³, Robert J. Carroll, PhD⁴, Melissa Basford, MBA², David Glazer, SB³, Paul A. Harris, PhD⁴, Anthony A. Philippakis, MD, PhD⁵, Dan M. Roden, MD^{1,4,6}, on behalf of the *All of Us* Research Program Data and Research Center, VUMC, Nashville, TN

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Thank you to our participants and community partners!



All of Us Community and Provider Partner Network (as of July 2020)



Thank you to our consortium partners!

The Participant Center



Communications & Engagement



HPO Network (Health Care Provider Organizations)

RMCS

All of Us California



Illinois Precision Medicine Consortium



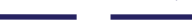
All of Us New England



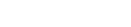
Trans America Consortium



New York City Consortium



All of Us Southern Network



All of Us SouthEast Enrollment Center



All of Us Wisconsin



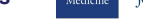
All of Us Pennsylvania



University of Arizona and Banner Health



FQHCs (Federally Qualified Health Centers)



VA Medical Centers



Participant Technology Systems Center (PTSC)



Biobank



Data & Research Center (DRC)



Genomics Partners



Thank you Data and Research Center (DRC) and NIH teams!



VANDERBILT UNIVERSITY



MEDICAL CENTER



All of Us Research Program Objectives

Nurture relationships

with **one million or more** participant partners, from all walks of life, for decades

Catalyze a robust ecosystem

of researchers and funders hungry to use and support it



All of Us

Research Hub

Welcome, *All of Us* Researchers.

The *All of Us* Research Program, part of the National Institutes of Health, is building one of the largest biomedical data resources of its kind. The *All of Us* Research Hub will store health data from a diverse cohort of one million or more participants in the *All of Us* Research Program.

Here in the Research Hub, everyone can learn more about the types of data participants are providing and how approved researchers can use our data and tools to conduct studies that may speed up medical breakthroughs.

APPLY FOR ACCESS

Scroll Down

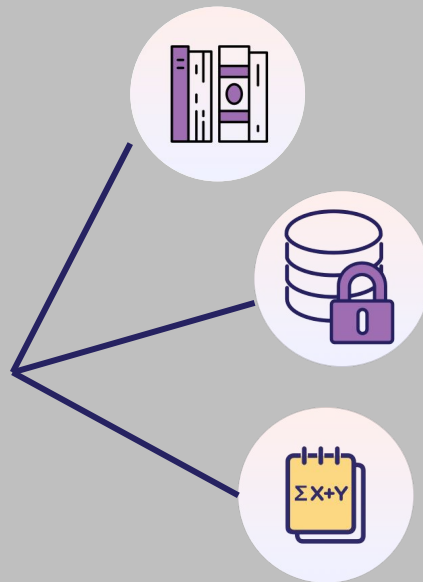
Help



All of Us

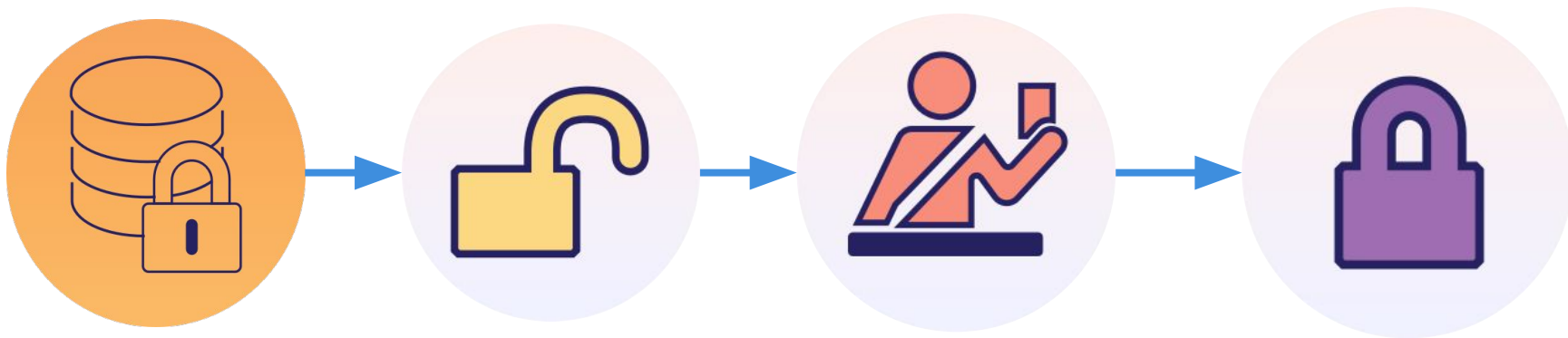
RESEARCHER WORKBENCH

Launched Beta in May 2020!



Outline for Today

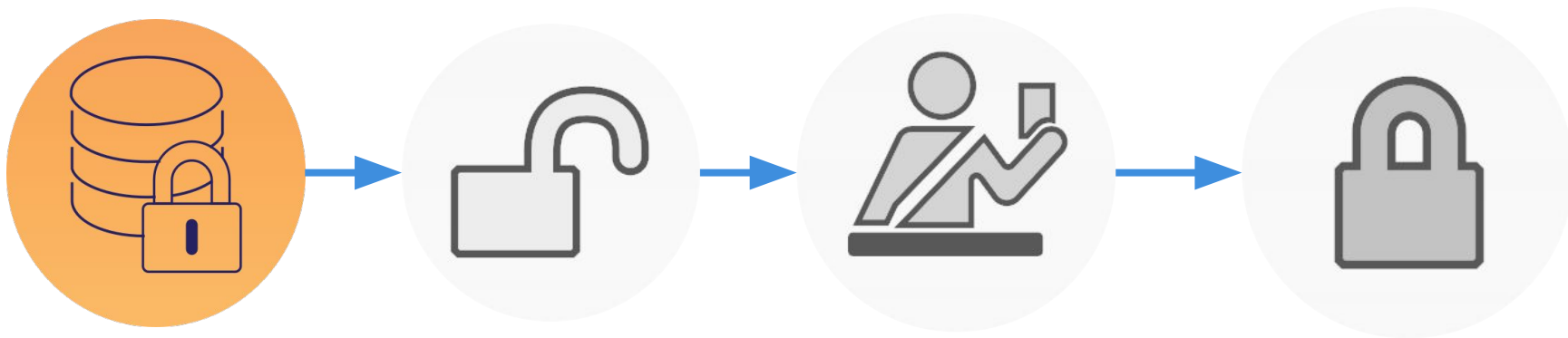
1. Data Overview



2. Live demo of researchallofus.org & Researcher Workbench

Outline for Today

1. Data Overview



2. Live demo of researchallofus.org & Researcher Workbench

Our Data are Growing. Here are the Current Data Types



**Electronic Health
Records (EHR)**



**Participant
Surveys**



**Physical
Measurements**



Biosamples



**Mobile and Wearable
Technologies**

Available in the Current Research Dataset

Data are harmonized and standardized to a common data model

Data Curation Process



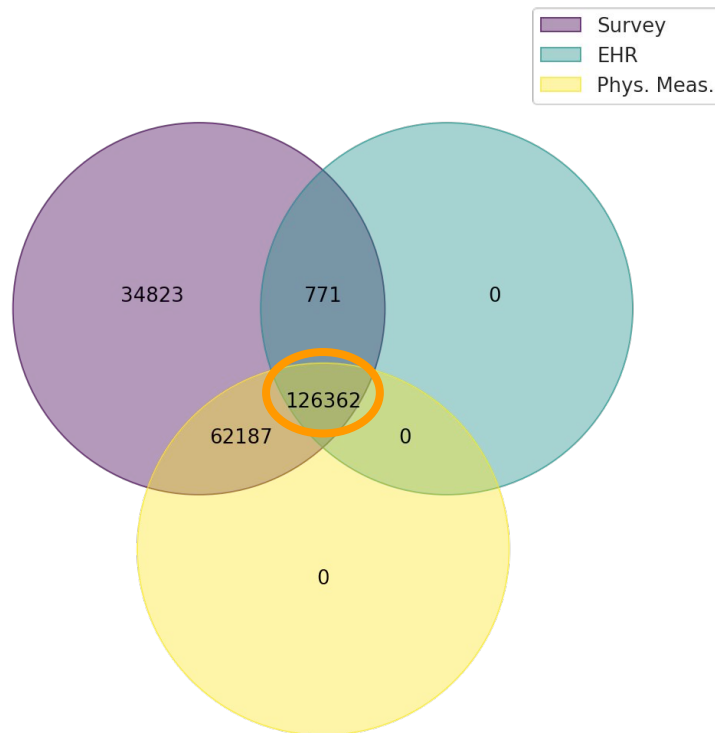
We use the OHDSI collaborative's OMOP Common Data Model (more info [here](#))

Research Data Available Now

Data Type	Participant Count
Survey	>224,000
Physical Measurement	>188,000
Electronic Health Record	>127,000

*Counts reflect unique participants with ANY of data of the specified type.

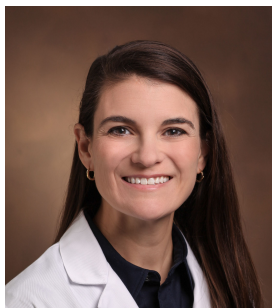
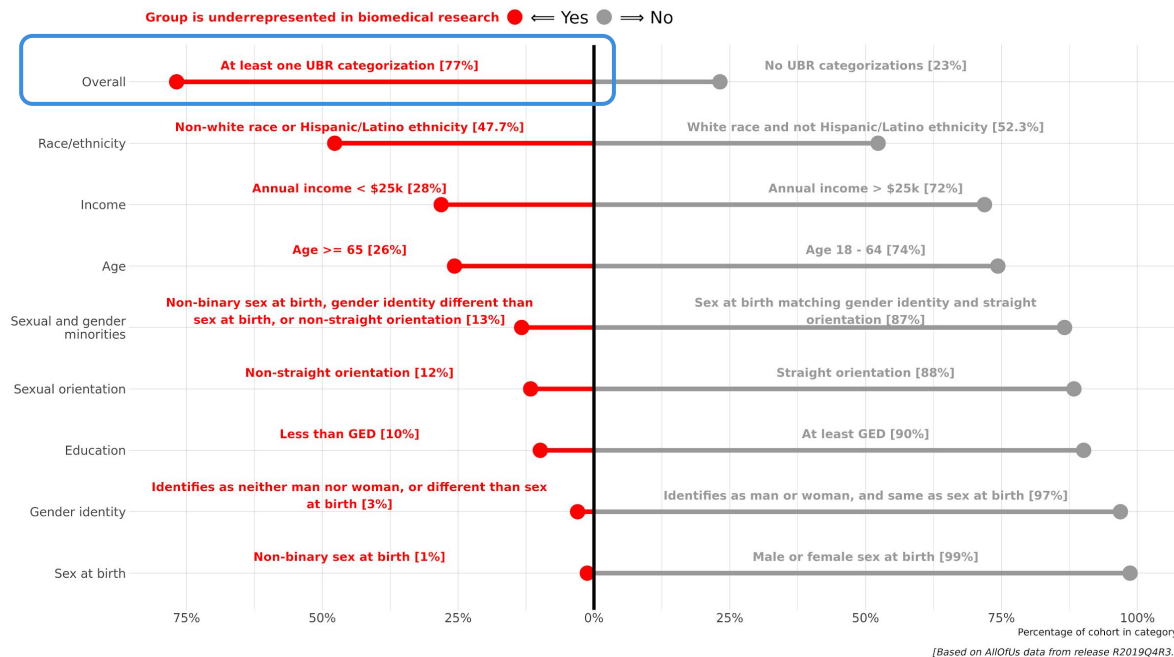
Count of participants with multiple data types



Participants included in this dataset are diverse.

Cohort diversity: underrepresented groups in biomedical research

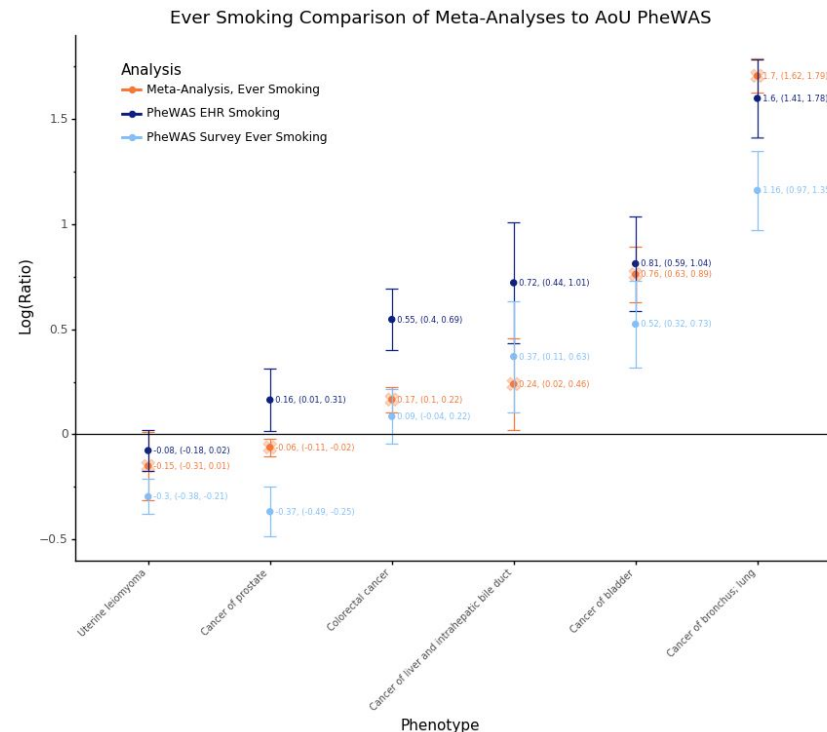
Categorizations based on explicit responses to survey questions.



A. Ramirez, L. Suleiman, D. Schlueter, et al., *The All of Us Research Program: data quality, utility, and diversity*, medRxiv 2020.05.29.20116905; doi: <https://doi.org/10.1101/2020.05.29.20116905>

This dataset reproduces known associations.

Description	EHR Ever Smoking OR (95% CI)	Survey Ever Smoking OR (95% CI)
Top 3 Increased risk effects		
Cancer of the bronchus; lung	4.94 (4.11, 5.95)	3.19 (2.65, 3.84)
Cancer within the respiratory system	4.94 (4.12, 5.92)	3.15 (2.62, 3.78)
Malignant neoplasm of bladder	2.36 (1.87, 2.98)	1.76 (1.42, 2.18)
Top 3 Decreased risk effects		
Vascular hamartomas and non-neoplastic nevi	0.51 (0.42, 0.62)	0.55 (0.48, 0.64)
Nevus, non-neoplastic	0.52 (0.43, 0.64)	0.57 (0.49, 0.66)
Benign neoplasm of skin	0.53 (0.49, 0.58)	0.62 (0.58, 0.66)



A. Ramirez, L. Suleiman, D. Schlueter, et al., *The All of Us Research Program: data quality, utility, and diversity*, medRxiv 2020.05.29.20116905; doi: <https://doi.org/10.1101/2020.05.29.20116905>

Want to learn more?



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CSH Cold Spring Harbor Laboratory BMJ Yale

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The All of Us Research Program: data quality, utility, and diversity

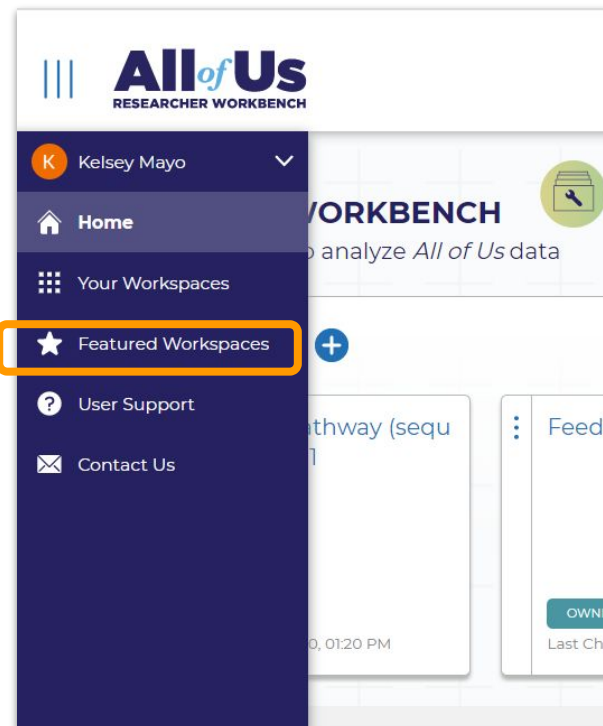
Andrea H Ramirez, Lina Sulleman, David J Schlueter, Alese Halvorson, Jun Qian, Francis Ratsimbazafy, Roxana Loperena, Kelsey Mayo, Melissa Basford, Nicole Deflaux, Karthik N Muthuraman, Karthik Natarajan, Abel Kho, Hua Xu, Consuelo Wilkins, Hoda Anton-Culver, Eric Boerwinkle, Mine Cicek, Cheryl R Clark, Elizabeth Cohn, Lucila Ohno-Machado, Sheri Schully, Brian K Ahmedani, Maria Argos, Robert M Cronin, Christopher O'Donnell, Mona Fouad, David B Goldstein, Philip Greenland, Scott J Hebbaring, Elizabeth W Karlson, Parinda Khatri, Bruce Korf, Jordan W Smoller, Stephen Sodeke, John Wilbanks, Justin Hentges, Christopher Lunt, Stephanie A Devaney, Kelly Gebo, Joshua C Denny, Robert J Carroll, David Glazer, Paul A Harris, George Hripcsak, Anthony Philippakis, Dan M Roden, On behalf of the All of Us Research Program
doi: <https://doi.org/10.1101/2020.05.29.20116905>

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should not be used to guide clinical practice.

Abstract Info/History Metrics [Preview PDF](#)

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medRxiv preprint doi: <https://doi.org/10.1101/2020.05.29.20116905>; this version posted June 3, 2020. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted medRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY 4.0 International license.



All of Us
RESEARCHER WORKBENCH

Kelsey Mayo

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WORKBENCH

to analyze All of Us data

pathway (sequ

Feedb

OWNER

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A. Ramirez, L. Suleiman, D. Schlueter, et al., *The All of Us Research Program: data quality, utility, and diversity*, medRxiv 2020.05.29.20116905; doi: <https://doi.org/10.1101/2020.05.29.20116905>

Coming Soon (Late 2020)...



**Electronic Health
Records (EHR)**



**Participant
Surveys**



**Physical
Measurements**



**COVID Participant
Experience
(COPE Survey)**



**Mobile and Wearable
Technologies
(Fitbit)**

Refreshed + New Data Types

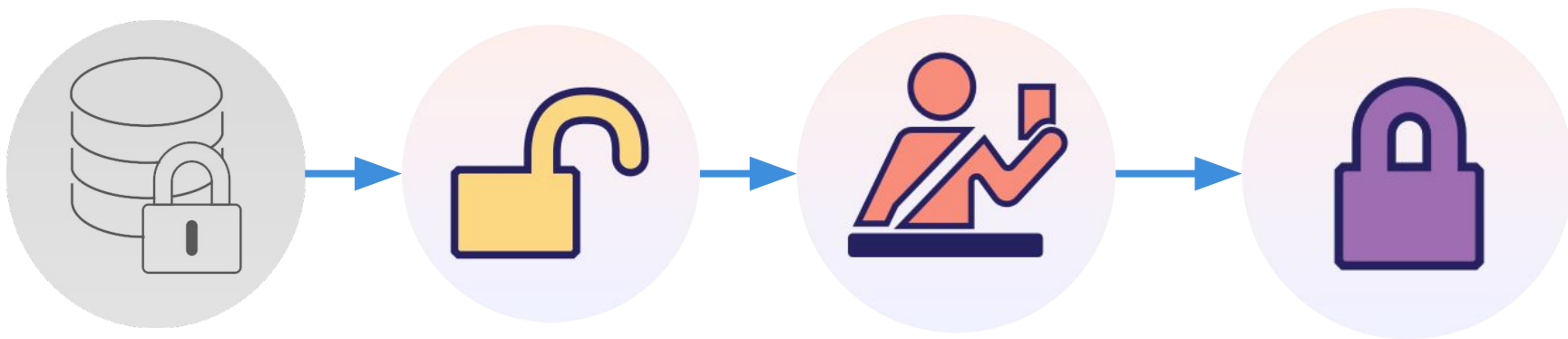
Research Data Available Soon (Winter 2020)

Data Type	Participant Count*	
Survey	>315,000	~40% increase
COPE Survey	>63,000	New!
Physical Measurement	>263,000	~40% increase
Electronic Health Record	>203,000	~60% increase!
FitBit	>8,000	New!

*Counts reflect unique participants with ANY of data of the specified
Counts are approximate and subject to change upon final release of the dataset.

Outline for Today

1. Data Overview



2. Live demo of researchallofus.org & Researcher Workbench

Welcome, *All of Us* Researchers.

The *All of Us* Research Program, part of the National Institutes of Health, is building one of the largest biomedical data resources of its kind. The *All of Us* Research Hub will store health data from a diverse cohort of one million or more participants in the *All of Us* Research Program.

Here in the Research Hub, everyone can learn more about the types of data participants are providing and how approved researchers can use our data and tools to conduct studies that may speed up medical breakthroughs.

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Data Snapshots

Our Data Snapshots are the fastest way to view the diversity of the *All of Us* Research Program participant data. These snapshots provide visualizations of participant demographics, geographic distribution, and more.

[Research Hub](#)[Data Browser](#)[Apply Page](#)[Researcher Workbench](#)[Support Hub](#)[Ex. Workspace](#)

Search Across Data Types ¹

 Keyword Search

Data includes 225,140 participants and is current as of 2/11/2020.



FAQs



Introductory
Videos



User Guide

EHR Domains: ¹

Conditions ¹

20,776

medical concepts

113,200 participants in this domain

[View Top Conditions](#)

Drug Exposures ¹

20,951

medical concepts

104,500 participants in this domain

[View Top Drug Exposures](#)

Labs & Measurements ¹

10,049

medical concepts

109,100 participants in this domain

[View Top Labs & Measurements](#)

Procedures ¹

20,546

medical concepts

102,140 participants in this domain

[View Top Procedures](#)

Survey Questions:

The Basics ¹

16

questions available

225,140 participants in this domain

This survey includes participant demographic information.

[View Complete Survey](#)

Overall Health ¹

21

questions available

219,800 participants in this domain

Survey includes information about how participants report levels of individual health.

[View Complete Survey](#)

Lifestyle ¹

26

questions available

218,500 participants in this domain

Survey includes information on participant smoking, alcohol, and recreational drug use.

[View Complete Survey](#)

Personal Medical History ¹

465

questions available

39,320 participants in this domain

This survey includes information about past medical history, including medical conditions and approximate age of diagnosis.

[View Complete Survey](#)

Health Care Access & Utilization ¹

57

questions available

45,820 participants in this domain

Survey includes information about a participant's access to and use of health care.

Family Medical History ¹

1

questions available

41,600 participants in this domain

Survey includes information about the medical history of a participant's immediate biological family members.

Research Hub

Data Browser

Apply Page

Researcher Workbench

Support Hub

Ex. Workspace

Apply to be an *All of Us* Researcher

The Researcher Workbench is open to researchers [whose institutions have signed](#) a Data Use and Registration Agreement with the *All of Us* Research Program. Researchers at this time must also have an eRA Commons account and complete the *All of Us* Research Program data access process before they can access the Researcher Workbench and Registered Tier data. For more information, please visit the [Data Use Policies](#) page. If you are a researcher who does not have an eRA Commons account, please work with your institution to create one. Once your account is established, you may apply for access to the Researcher Workbench. For more information, visit the [eRA Commons](#) website.

About the Beta Researcher Workbench

Currently, an institutional agreement & eRA Commons account must be in place.

Feedback is welcome.

The tools will continue to evolve.

The program cohort is actively growing, and so is our data.

The goal is to be a true game changer for understanding health.

How the Application Process Works

STEP
1

AGREE TO YOUR INSTITUTION'S AGREEMENT

STEP
2

REGISTER AS A RESEARCHER

STEP
3

CONNECT eRA COMMONS

Research Hub

Data Browser

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Support Hub

Ex. Workspace



Workspaces

[See all workspaces](#)

⋮ Standing Height in All of Us

WRITER

Last Changed: 10/23/20, 04:15 PM

⋮ Diabetes a1c

OWNER

Last Changed: 08/21/19, 01:24 PM

⋮ ASHG Demo - Diabetes a1c

OWNER

Last Changed: 10/27/20, 11:38 AM

⋮ Diabetes

OWNER

Last Changed: 10/27/20, 11:27 AM

Recently Accessed Items

⋮ Program Physical Measurements [Python]

Last Modified: Oct 30 2020

Notebook

⋮ Test

Last Modified: Oct 30 2020

Cohort

⋮ my other cohort

Last Modified: Oct 27 2020

Cohort

⋮ My cohort

Last Modified: Oct 27 2020

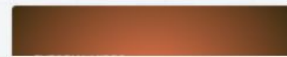
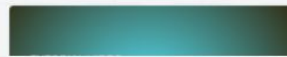
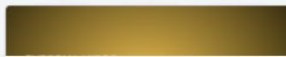
Cohort

⋮ Depression Phenotype Analysis

Last Modified: Oct 21 2020

Notebook

Quick Tour and Videos



Research Hub

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Researcher Workbench

Support Hub

Ex. Workspace

User Support Hub

Search our knowledge base for answers
to common questions

🔍 Enter a question, topic, or a keyword...

Explore *All of Us* Researcher Workbench Resources



Getting Started

New to the Researcher Workbench?
Looking for some quick help for working
with our tools or data? Start here.



Documentation

Find helpful resources to better
understand the *All of Us* dataset and
how to analyze it.



Community Forum

Post your questions and comments for
other users here.



Frequently Asked Questions

Look for answers on workspaces, concepts, and everything in
between.



Announcements

Get the latest *All of Us* news and announcements.

Research Hub

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Ex. Workspace

DATA

ANALYSIS

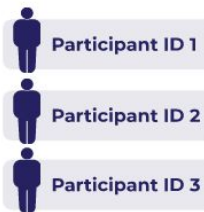
ABOUT

Cohorts +

A cohort is a group of participants based on specific criteria.



All of Us
Participants



Your Cohort

Datasets +

A dataset is a table containing data about a cohort that can be exported for analysis.



Your Cohort



Data About
Your Cohort



ID 1	Med 1	Labs 1
ID 2	Med 2	Labs 2
ID 3	Med 3	Labs 3

Your Dataset

Show: Show All

Cohorts

Cohort Reviews

Concept Sets

Datasets

Physical Measurements Concept Set 2

Physical Measurements Concept Set 2

Height

PPI height

St

Live Demo on ****Synthetic Data****

“Demonstrating *All of Us* Anthropomorphic Data Quality”

**Primary
Investigator**

Kelsey Mayo, Ph.D.



Co-Investigator

Adrienne Roman, Ph.D.



Data Scientist

Francis Ratsimbazafy, Ph.D.



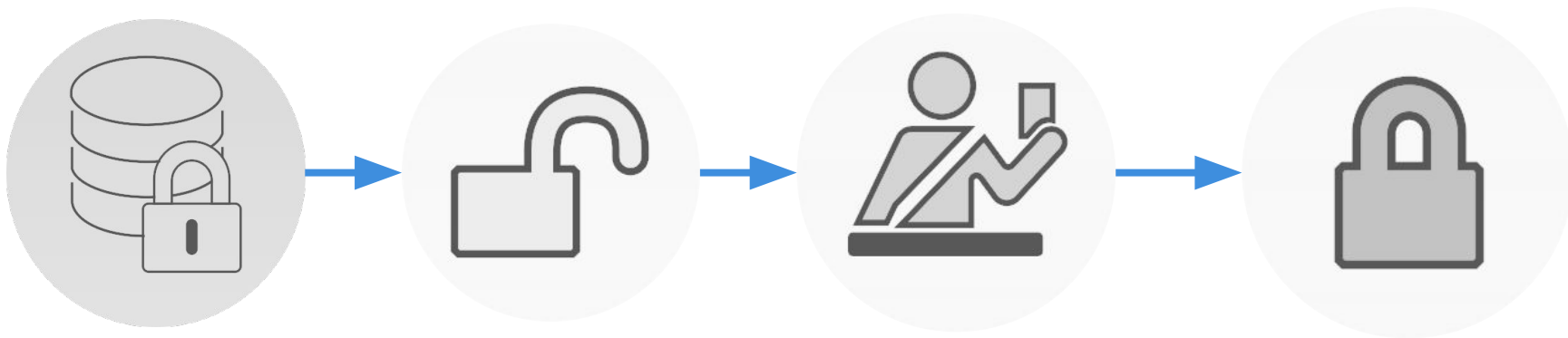
**Graduate
Student**

Michael Holmes, B.S.



Outline for Today

1. Data Overview

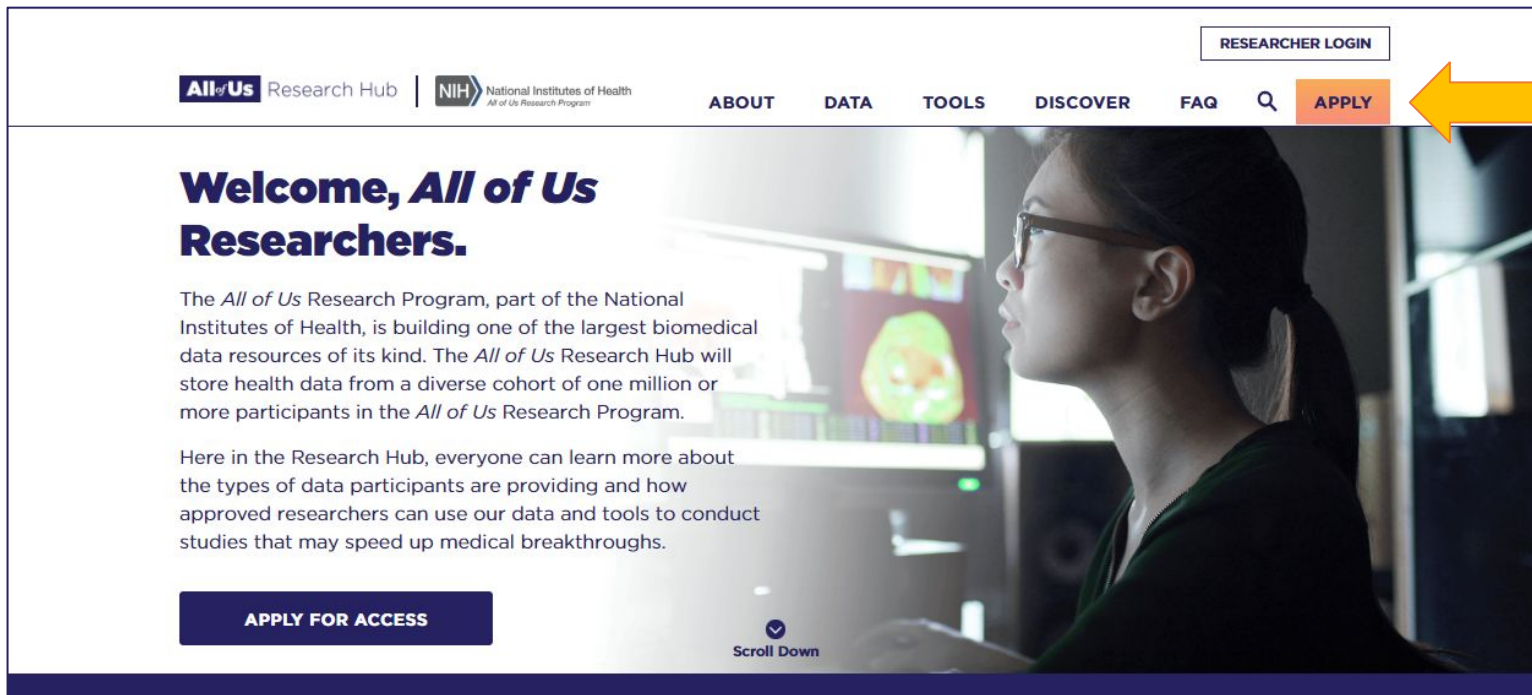


2. Live demo of researchallofus.org & Researcher Workbench

Thank you for listening!

Interested in becoming a Beta Researcher?

Visit researchallofus.org to apply!



The screenshot shows the top navigation bar of the All of Us Research Hub website. The navigation bar includes the All of Us Research Hub logo, the NIH National Institutes of Health All of Us Research Program logo, and a list of menu items: ABOUT, DATA, TOOLS, DISCOVER, FAQ, and a search icon. The APPLY button is highlighted in orange and is pointed to by a large yellow arrow. A RESEARCHER LOGIN button is also visible in the top right corner.

RESEARCHER LOGIN

All of Us Research Hub | **NIH** National Institutes of Health
All of Us Research Program

ABOUT DATA TOOLS DISCOVER FAQ **APPLY**

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APPLY FOR ACCESS

✓
Scroll Down

Acknowledgements

The *All of Us* Research Program is supported by the National Institutes of Health, Office of the Director: Regional Medical Centers: 1 OT2 OD026549; 1 OT2 OD026554; 1 OT2 OD026557; 1 OT2 OD026556; 1 OT2 OD026550; 1 OT2 OD 026552; 1 OT2 OD026553; 1 OT2 OD026548; 1 OT2 OD026551; 1 OT2 OD026555; IAA #: AOD 16037; Federally Qualified Health Centers: HHSN 263201600085U; **Data and Research Center: 5 U2C OD023196**; Biobank: 1 U24 OD023121; The Participant Center: U24 OD023176; Participant Technology Systems Center: 1 U24 OD023163; Communications and Engagement: 3 OT2 OD023205; 3 OT2 OD023206; and Community Partners: 1 OT2 OD025277; 3 OT2 OD025315; 1 OT2 OD025337; 1 OT2 OD025276.

In addition, the *All of Us* Research Program would not be possible without the partnership of its participants.