Year in Review and Goals Forward

Advisory Panel Meeting
March 18, 2021
Josh Denny, MD, MS
Chief Executive Officer
All of Us Research Program

@AllofUsCEO

National Institutes of Health
Advisory Panel: Welcome to All of Us!!!!!
“To those individuals in the biomedical research enterprise who have endured disadvantages due to structural racism, I am truly sorry. NIH is committed to instituting new ways to support diversity, equity, and inclusion, and identifying and dismantling any policies and practices at our own agency that may harm our workforce and our science.”
—Francis S. Collins, M.D., Ph.D., NIH Director

- **NIH RFI:** Inviting Comments and Suggestions to Advance and Strengthen Racial Equity, Diversity, and Inclusion (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-21-066.html)
- Soon begin recruiting for *All of Us* leadership position: [Director of Health Equity](Link)
- UNITE actions coupled with a concrete action plan

All of Us Research Program Mission and Objectives

**Our Mission**
To accelerate health research and medical breakthroughs, enabling individualized prevention, treatment, and care for all of us.

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

**Deliver one of the largest, richest biomedical dataset ever**
that is easy, safe, and free to access.

**Catalyze the robust ecosystem**
of researchers and funders hungry to use and support it.

**Build and maintain a strong All of Us Team**
capable of achieving the program’s mission.
Status of the Program: Enrollment Numbers

374,000+ Participants
238,000+ Electronic Health Records
274,000+ Participants who have completed initial steps of the program
282,000+ Biosamples

As of March 17, 2021

https://www.researchallofus.org/data-snapshots/
Over 80% of All of Us participants are underrepresented in biomedical research.
2020 Year in Review

Paused Recruitment
Safely paused >300 sites

COPE Survey Launched and Serology Study Began
As of March 2021, more than 108k participants have completed at least one survey, >300k completions

Implementation of New Sample Collection Approaches
• Saliva collections
• Bring Your Own Kit
• Diversion Pouch
• Quest BioBox

Reactivation Began and Ongoing
In-person pause was lifted
• Data-driven guidance on site reactivation
• 95 sites are currently activated

COPE Data on Researcher Workbench
COPE data: >62k participants

COVID Response

March ● May ● July ● ● ● ● December

Major Milestones

Researcher Workbench Beta Launch
• Physical measurements
• Survey data
• EHR data

Now: 271 institutional agreements & 624 researchers accessing

Return of Genetic Ancestry and Traits Results
>37k participants sent notifications

Fitbit Data on Researcher Workbench
Fitbit data: >8k participants
COVID Participant Experience (COPE) Survey Results - from July-Sept survey

- Do you think you have had COVID-19?
  - No: 85%
  - Yes: 4%
  - Maybe: 11%

- In the past month, have recommendations for social distancing caused stress for you?
  - A lot: 7%
  - A little: 39%
  - Somewhat: 25%
  - Not at all: 30%

- Do you personally know someone who has died of COVID-19? If yes, who do you know?
  - Yes: 15.3%
  - No: 84.7%
  - Friend: 36.6%
  - Grandparent: 1.5%
  - Parent: 1.5%
  - Co-worker: 8.4%
  - Neighbour: 8.0%
  - Other: 39.7%
Key Accomplishments in 2020: Researcher Workbench Beta Launch

- Researcher Workbench Beta Launch on **May 27, 2020**
- Beta currently restricted to U.S. researchers with eRA Commons accounts
- Passport researcher model

As of March 2021:
- >270 completed Institutional Data Use and Registration Agreements (DUA)
- Median time to complete the DUA is 24 days
- >421 Workspaces created
- >624 researchers with access
All of Us Demonstration Projects: Assessing the Validity and Utility of All of Us Data

**Goal:** Fully executed research projects demonstrating the utility and validity of All of Us data timed to coincide with launch of data platform launch, *not* novel discovery work.

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**Phase 1**
[DRC] Description, Replication, Utility Assessment

**Phase 2**
[Consortium] Expanded Description, Replication, Utility Assessment

**Phase 3**
[Consortium] Future Preceding new data types

~30 projects that will all be publicly available as reusable workspaces
Demonstration Project: Antidepressants Taken by Participants with Depression

White (n=9,235)
- SSRIs 57.5%
- Desvenlafaxine 0.5%
- Duloxetine 5.4%
- Venlafaxine 7.2%
- Trazodone 7.8%
- TCAs 8.2%
- Bupropion 11.7%

Non-White (n=6,541)
- SSRIs 53.7%
- Mirtazapine 3.7%
- Venlafaxine 4.1%
- Bupropion 8.1%
- TCAs 12.6%
- Trazodone 12.7%
- SSRIs 57.5%
- Mirtazapine 3.7%
- Venlafaxine 4.1%
- Bupropion 8.1%
- TCAs 12.6%
- Trazodone 12.7%
Conclusion: Models trained with national All of Us data achieved superior performance compared to using single-center data.
Key Accomplishments in 2020: Genetic Return of Results

Non-Health Genetic Traits

Genotyping Arrays

Health-Related Genetic Traits

Whole Genome Sequencing

DRC

Launched December 2020

Launched in ~1 year

Traits

Genetic Ancestry

ACMG59

PGx

Pharmacogenomics
Non-health Trait Results

Ancestry

Genetic Ancestry
Genetic ancestry can be very interesting, but you may also learn information you didn’t expect. Learn more.

Traits

Bitter taste perception
Learn what your genes can tell you about your ability to taste bitter things.

Cilantro preference
Smell and taste work together to influence your cilantro preference.

Earwax type
Flaky or sticky? Earwax type is encoded in your genes.

Lactose intolerance
Your genes code for lactase, which helps you digest milk.

Cilantro preference

Some people like the taste of cilantro and others think it tastes like soap.

What we looked at and why

We looked at a place in your DNA that influences if you have a slightly higher chance of liking or disliking cilantro. The percent of people across the world who dislike cilantro ranges from 3-21%.^2

- People who have slightly higher chances of liking cilantro may find it fragrant and citrusy.
- People who have slightly higher chances of disliking cilantro may find it soapy or moldy.

This place in your DNA only predicts a small amount of your chances of liking or disliking cilantro. Environmental and other genetic factors also play a role.

Scientific details

OR6A2 makes a sensor in the nose that helps us perceive smells. Changes near OR6A2 may impact whether you find cilantro fragrant and citrusy, or soapy or moldy.¹

DNA Marker* Gene Your result*
rs72921001 Near OR6A2 C A

* Each of your parents provides you with a nucleotide at this position, but we don't know which parent gave you which nucleotide.
Genetics Engagement Module (GEM): Return of Results

- **37k participants sent notifications** (email, push, and SMS based on participant preference)
- **>70% have viewed any GEM results**
  - 87% viewed **any trait result**
  - 97% viewed their **genetic ancestry result**

**Soft Launch:** November 2nd

**Public Announcement:** December 10th, [press release](#) and [NIH Director’s Blog](#)
All of Us Roadmap

May 2019
Public Tier Data: Data Browser Launch

May 2020
Launch of Researcher Workbench: Public Beta Launch

December 2020
Updated data: COVID-19 data, Fitbit data

Expected Late 2021
Controlled Tier data with initial genomics release and expanded COVID-19 data

Future:
Clinical Notes, Data Linkages, Biospecimen access, Participant Recontact

December 2020
Return of Genetic Results
Ancestry and Traits Results

Q2 2021
COVID-19 Serology return of results

Expected 2022
Health Related Genetic Results (ACMG59)

Researcher Workbench data
Return of Results to Participants
Future Data and Results
The First All of Us Ancillary Study: Nutrition for Precision Health
Powered by the All of Us Research Program

Goal: To develop algorithms to predict individual responses to foods and dietary patterns based on microbiome, physiological, metabolic, behavioral, cognitive, and environmental data, and leverage existing All of Us genomic, EHR, and survey data.

1. Examine responses to baseline diet
   10,000 All of Us participants

2. Examine responses to 3 short-term intervention diets in free-living controlled feeding studies
   1,000-2,000 Module 1 participants

3. Examine responses to 3 short-term intervention diets in domiciled controlled feeding studies
   500-1,000 Module 1 participants

https://commonfund.nih.gov/nutritionforprecisionhealth
All of Us Community and Provider Partner Network (as of December 2020)
All of Us Consortium Members (beyond community partners, as of December 2020)

HPO Network
(Health Care Provider Organizations)

- All of Us Consortium Members
- Beyond community partners, as of December 2020
- The Participant Center
- Communications & Engagement
- HPO Network
- RMCs
- Illinois Precision Medicine Consortium (CAPMC)
- 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
- FQHCs (Federally Qualified Health Centers)
- VA Medical Centers

Participant Technology Systems Center (PTSC)

- Biobank
- Data & Research Center (DRC)
- Genomics Partners
- Participant Technology Systems Center (PTSC)
- Biobank
- Data & Research Center (DRC)
- Genomics Partners

Universities and Research Institutes
- UC San Diego Health
- UCI Health
- UC Davis Health
- CEDARS-SINAI
- USC University of Southern California
- Northwestern Medicine
- Partners
- Penn Medicine
- Ohio State University
- University of Chicago Medicine
- Massachusetts General Hospital
- Stony Brook Medicine
- NorthShore University Health System
- Rush University Medical Center
- UTHSC San Antonio
- UI Health
- The University of Arizona Medical Center
- HealthPartners
- C. Bennett and Debra Wright Center for Clinical and Translational Research
- The University of Arizona
- Banner Health
- Virginia Commonwealth University
- Emory University
- Morehouse School of Medicine
- Medical University of South Carolina
- Columbia University Medical Center
- New York Presbyterian Hospital
- Weill Cornell Medicine
- Harlem
- University of Arizona
- The University of Arizona
- Banner Health
- Community Health Center, Inc.
- Sun River Health
- U.S. Department of Veterans Affairs

Sponsors
- BlueCross BlueShield
- fitbit
- DXC technology
- Medscape
- waves
- Quest Diagnostics
- Scripps Research Translational Institute
- Walgreens
- WebMD
- RTI International
- Wondros