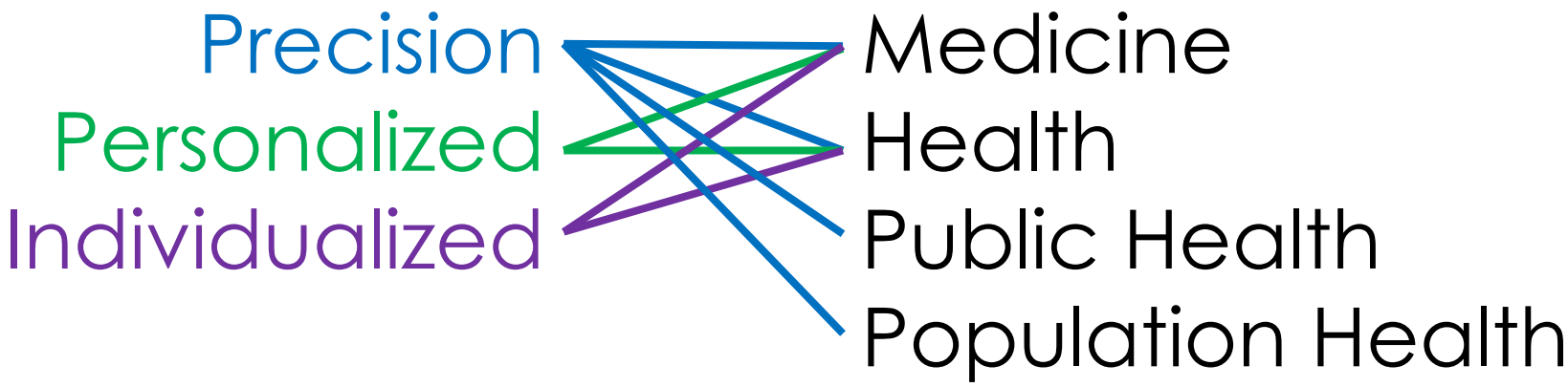
Advancing Precision Medicine for Health Equity

Julianne McCall, PhD
Director of Precision Medicine
California Governor's Office of Planning & Research

Precision Medicine is

also known as

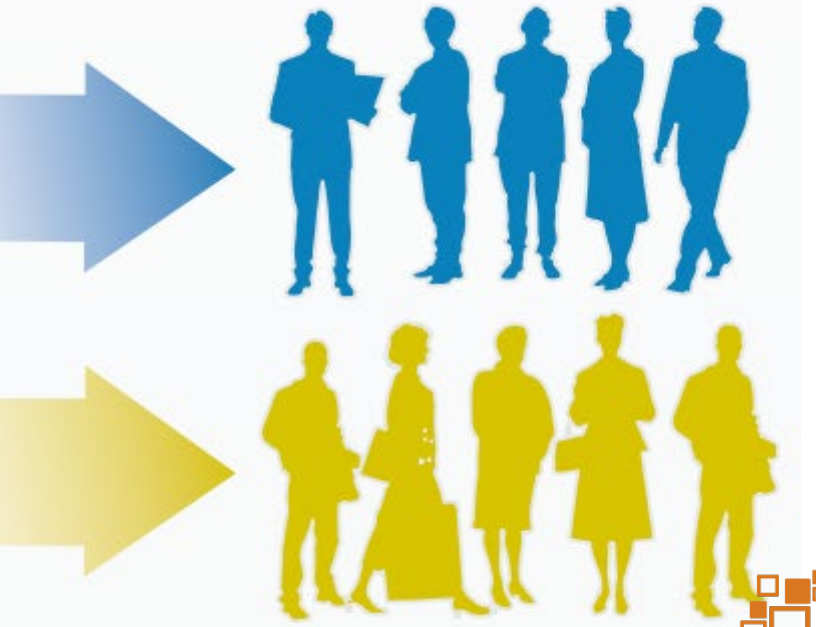


California Initiative to Advance
Precision Medicine

Tailoring of medical treatment to the individual characteristics of each patient

Traditional "One-Size-Fits-All" Approach

Precision Medicine Approach



California Initiative to Advance Precision Medicine

The Precision Medicine Spectrum

Sequencing a tumor

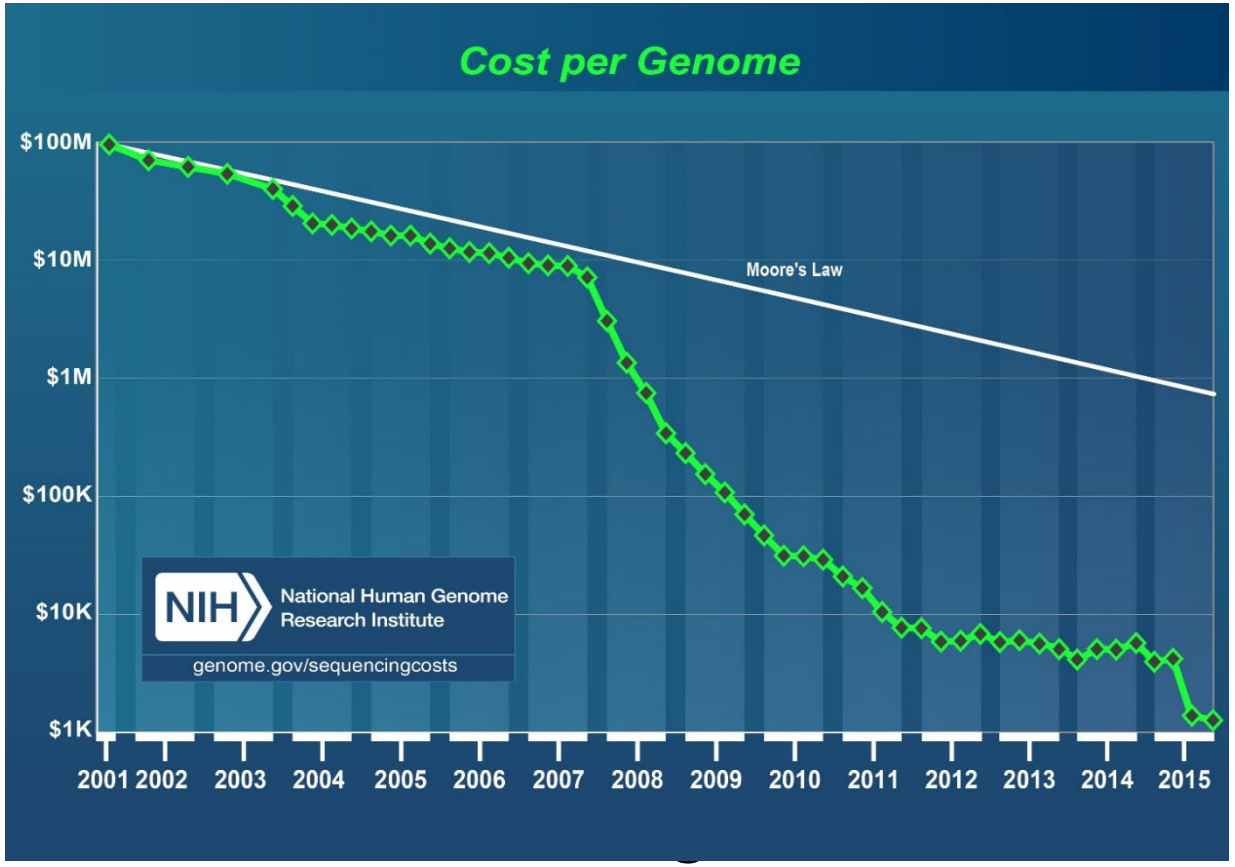
Not giving a medication that needs to be refrigerated to an unhoused person

California Initiative to Advance Precision Medicine

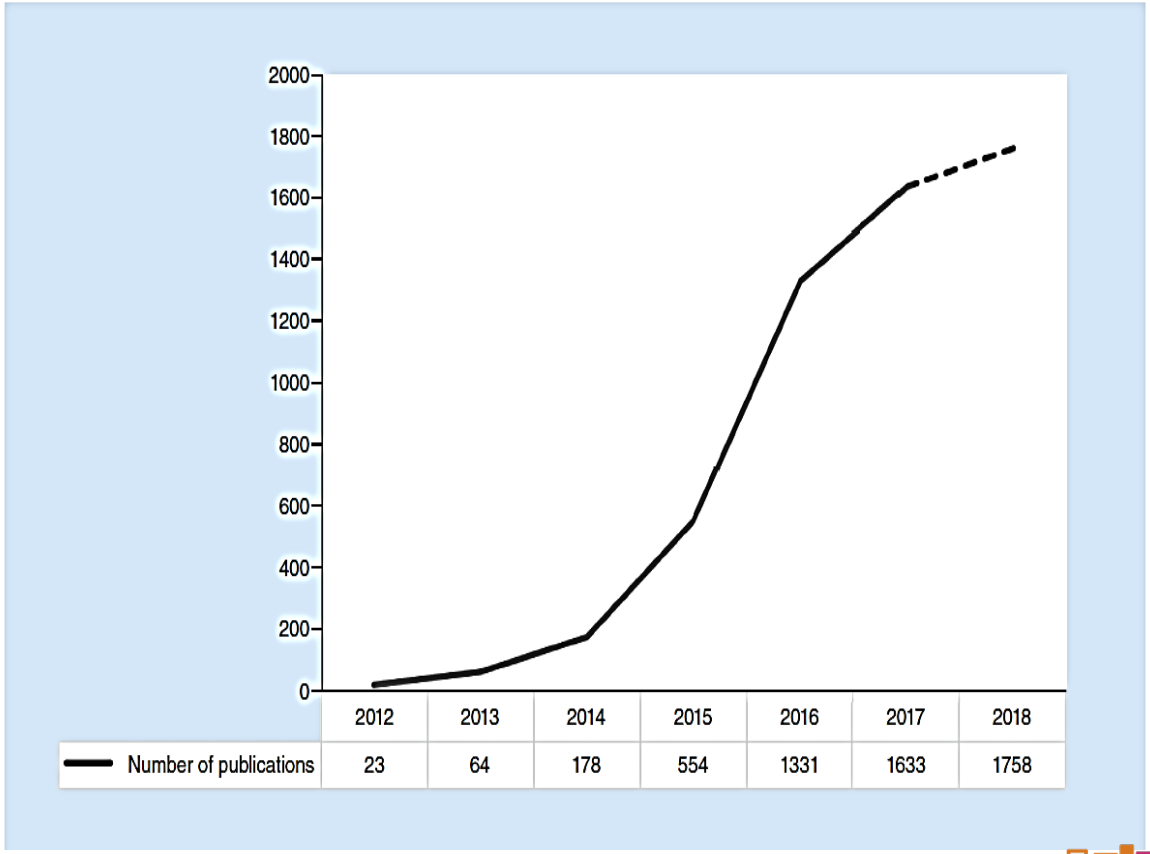
Health is complicated

Source: Kevin Patrick, MD, MS, UCSD

Why now?



Lower costs = greater access



Williams et al., 2019, *Future Medicine*

Exponential increase in research activity

California Initiative to Advance Precision Medicine

Social Determinants of Health

Economic Stability	Neighborhood and Physical Environment	Education	Food	Community and Social Context	Health Care System
Employment	Housing	Literacy	Hunger	Social integration	Health coverage
Income	Transportation	Language	Access to healthy options	Support systems	Provider availability
Expenses	Safety	Early childhood education		Community engagement	Provider linguistic and cultural competency
Debt	Parks	Vocational training		Discrimination	Quality of care
Medical bills	Playgrounds	Higher education		Stress	
Support	Walkability				
	Zip code / geography				

Health Outcomes

Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations

KFF
HENRY J KAISER FAMILY FOUNDATION

California Initiative to Advance Precision Medicine

California Initiative to Advance Precision Medicine

- Established in 2015
- $65 million state investment
- $36.5 million nonstate matching funds and leveraged resources
- Grantmaking for research projects
- Cross-sector and interagency partnerships
- **Mission to reduce health disparities**

State-Funded Research Projects

- Focus on **cross-sector partnerships** between researchers, communities, health care providers, industry, and others
- Strong emphasis on **community-researcher collaborations** to ensure research results are aligned with California communities' priorities

Completed

- Pediatric Cancer
- Multiple Sclerosis
- Infectious Disease
- Mobile Health and Depression
- Heart Disease
- Traumatic Brain Injury
- Prostate Cancer
- Genomic Disease

Current

- Cancer Disparities
- Adverse Childhood Experiences

The Collaborative Approach to Examining Adversity and Building Resilience (CARE)

Lead PI: **Dr. Neeta Thakur**

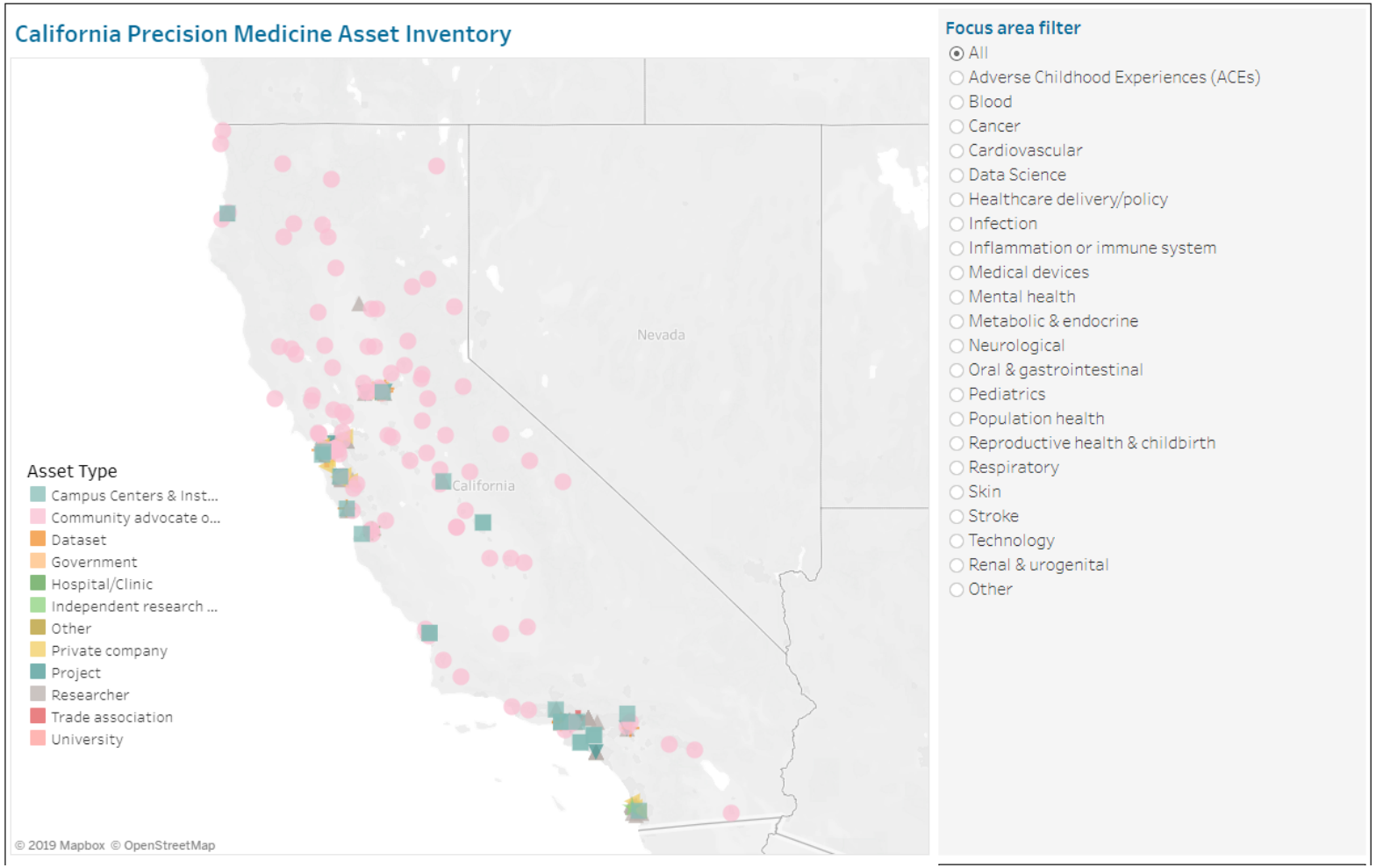
Collaborating Institutions: **UCSF Benioff Children's Hospital Oakland, University of California, Santa Barbara, Futures Without Violence**

Aims

- Help understand which children are most vulnerable to the effects of ACEs, what family and community-level factors provide the most buffering protection, and which interventions most improve child and family outcomes
- Personalize interventions to fit individual physiology and environmental circumstances

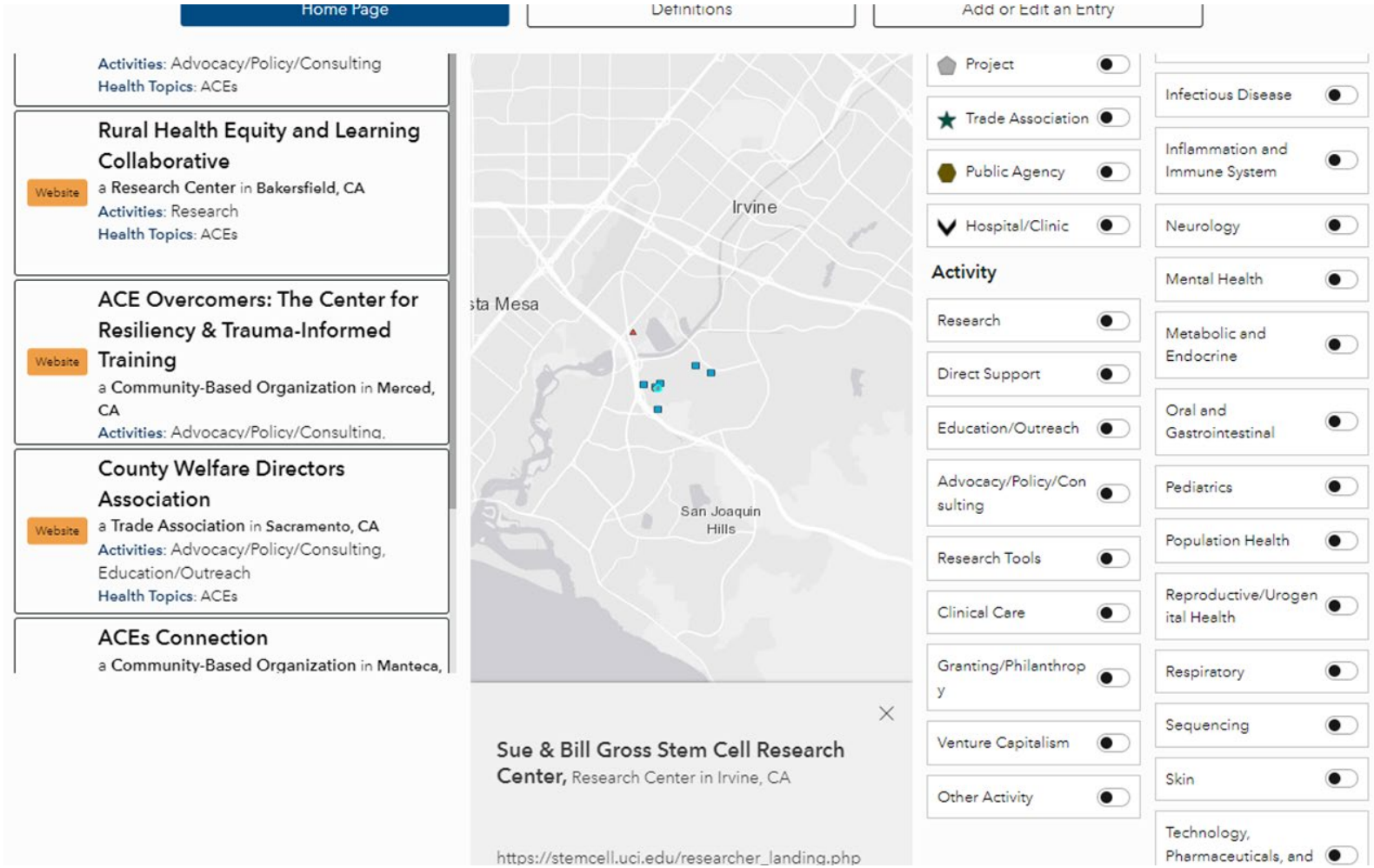
California Initiative to Advance Precision Medicine

California Precision Medicine Asset Inventory



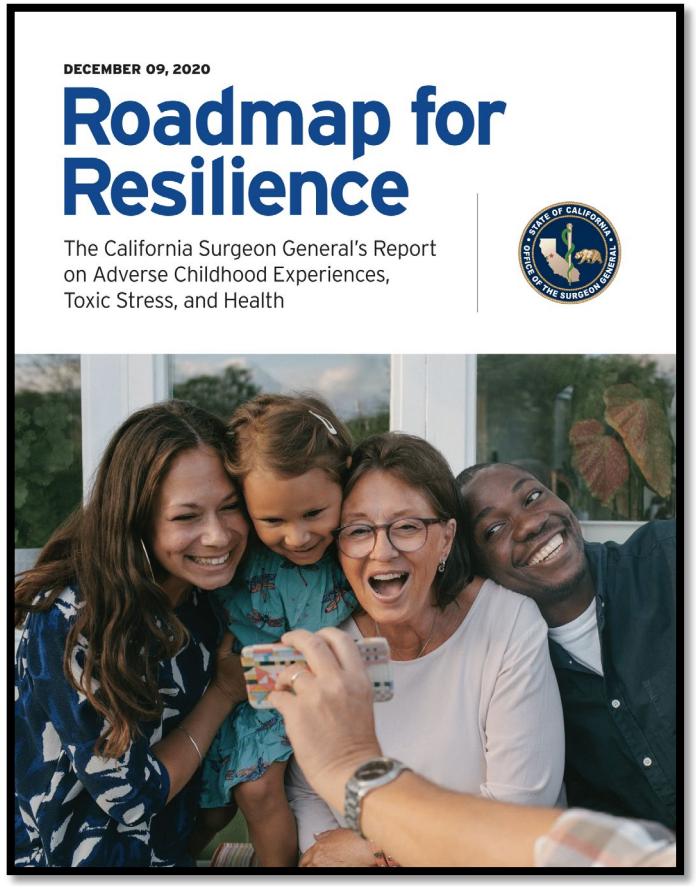
California Initiative to Advance Precision Medicine

California Precision Medicine Asset Inventory



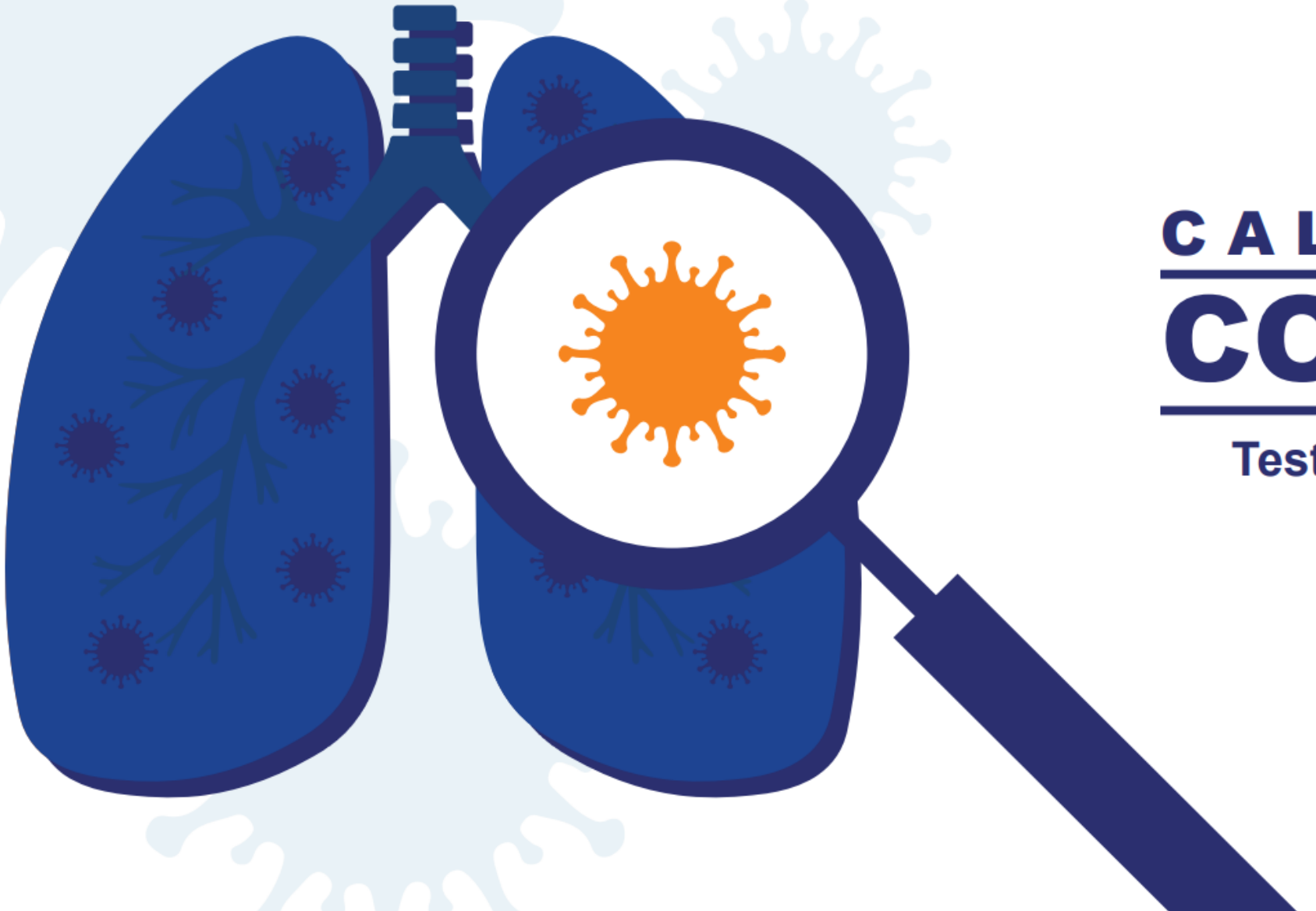
California Initiative to Advance Precision Medicine

Interagency Coordination



- Surgeon General's Trauma-Informed Primary Care Advisory Committee
- Governor's COVID-19 Testing Task Force
- CDC-CDPH Essentials for Childhood Initiative
- California Health in All Policies Task Force
- MHSOAC Cooperative Listening Sessions

California Initiative to Advance Precision Medicine



CALIFORNIA COVID-19

Testing Task Force

New in 2023: Depression Research Program

California Initiative to Advance Precision Medicine

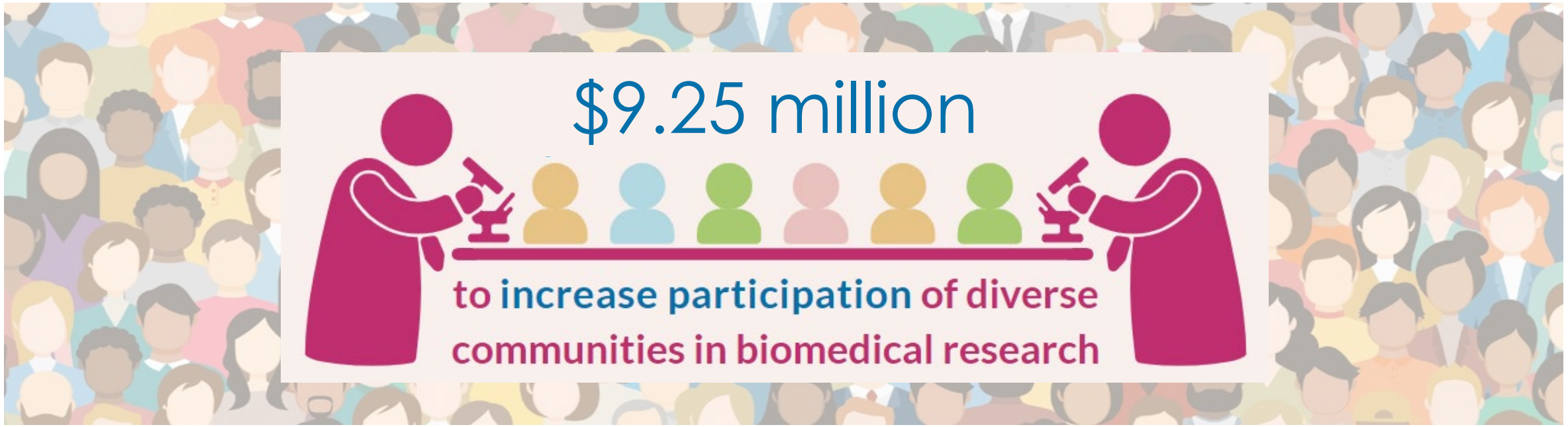
$10 million

to advance prevention, diagnosis, and treatment of depression

Mental health care for *individuals,* not an "average" patient

1. 3-5 research projects
2. Co-led by academic research institutions and CBOs / patient groups
3. 36 months, with progress reports and an expert evaluation

New in 2023: Equitable Participation in Research



Ensure medical progress benefits *all* Californians by:

1. Launching a cross-sector public-private collaborative to improve outreach strategies for research participation
2. Engaging more researchers from underrepresented backgrounds
3. Advancing the science of community engagement in research

California Initiative to Advance Precision Medicine

ARPA-H Nationwide Health Innovation Network

The new U.S. Advanced Research Projects Agency for Health

ARPA-H

President Biden's vision

"ARPA-H will pursue ideas that break the mold on how we normally support fundamental research and commercial products in this country."

- President Biden Remarks, March 18, 2022

ARPA-H

Mission

Accelerate better health outcomes for everyone.

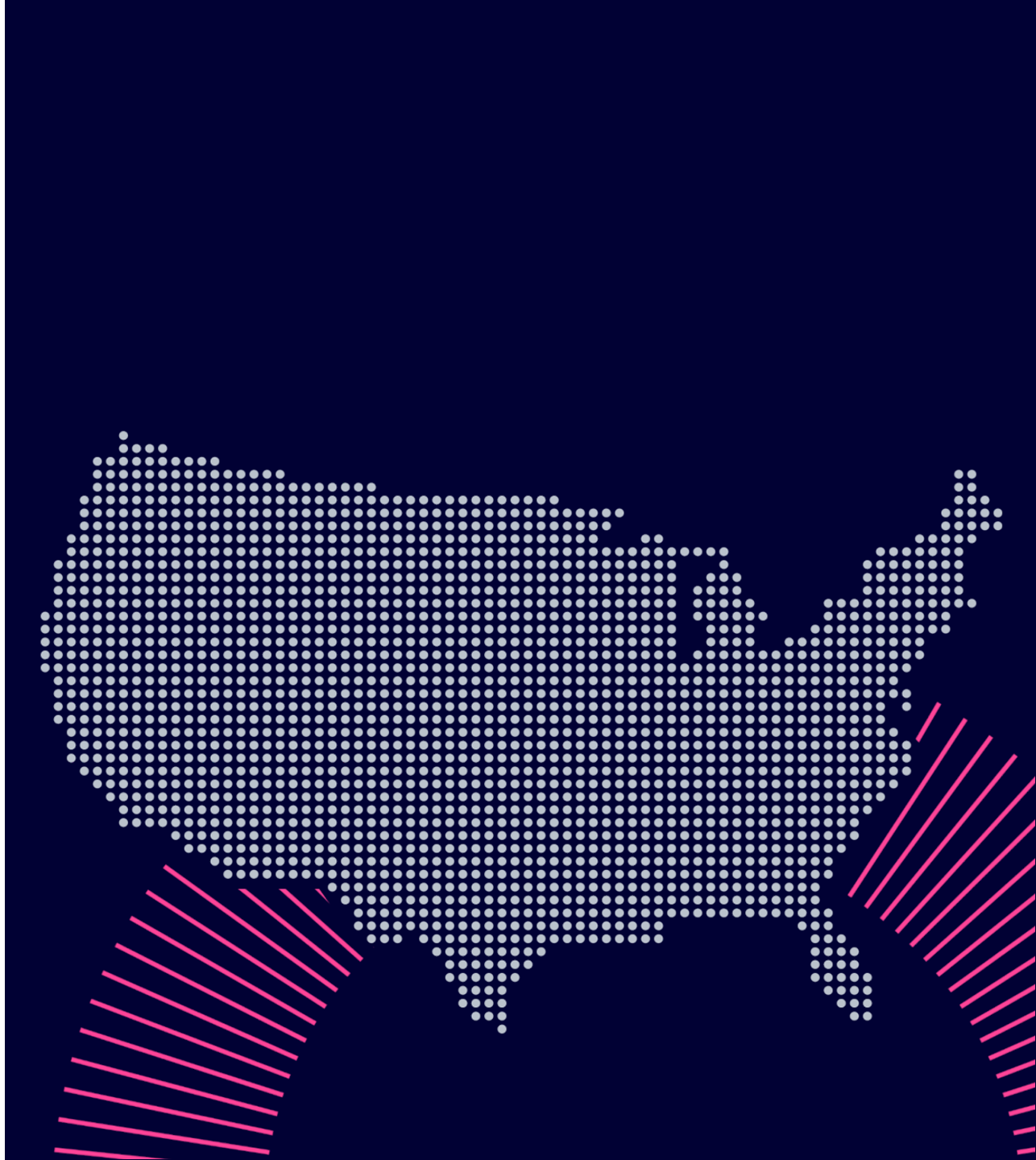
ARPA-H

The Challenge

Many Americans live too far from healthcare centers.

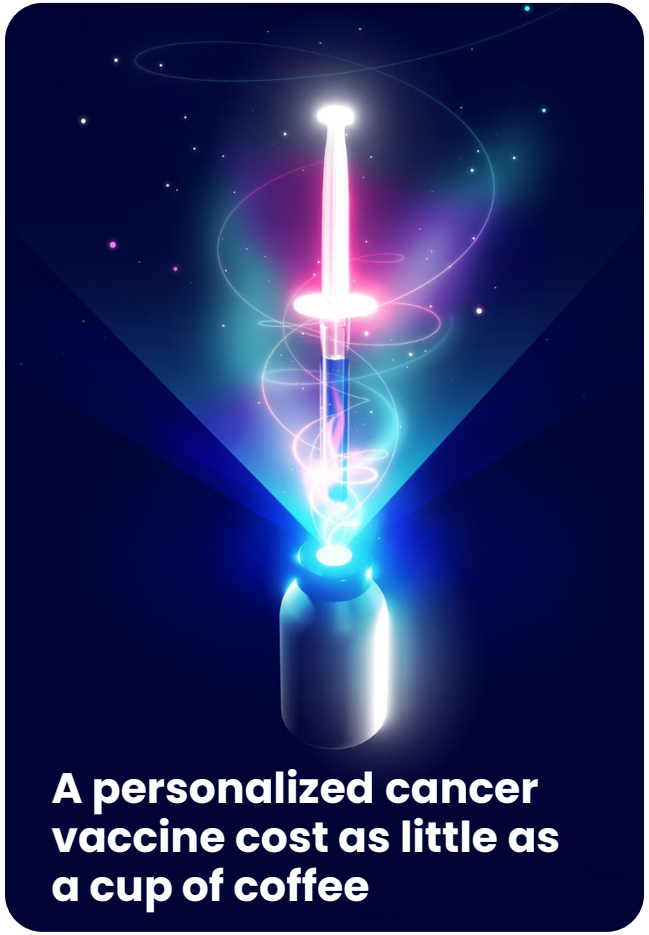
Biotech centers aren't co-located with customers that need treatment the most.

Numerous diseases disproportionately impact vulnerable populations.

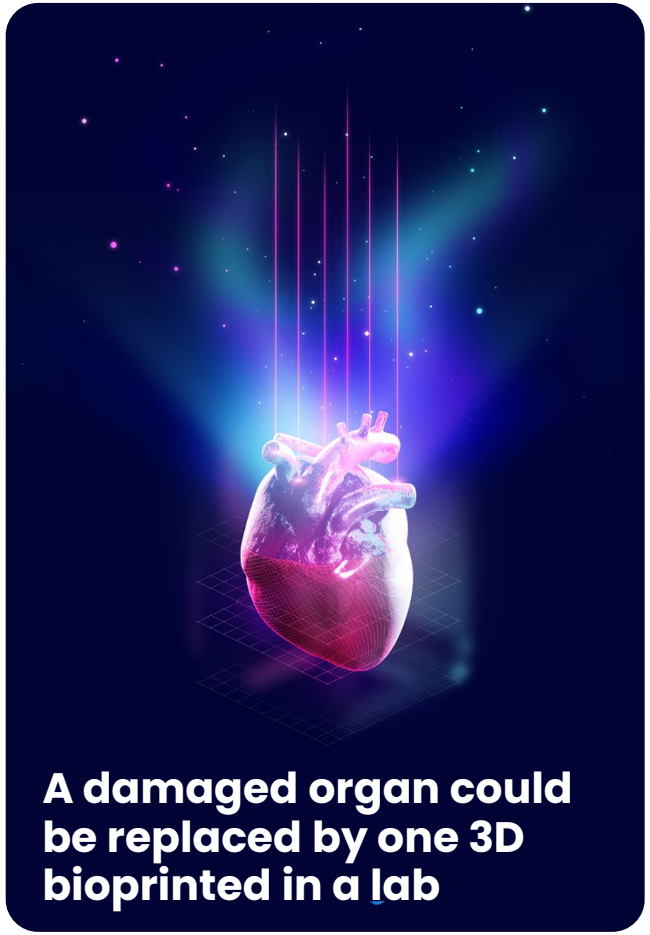


ARPA-H

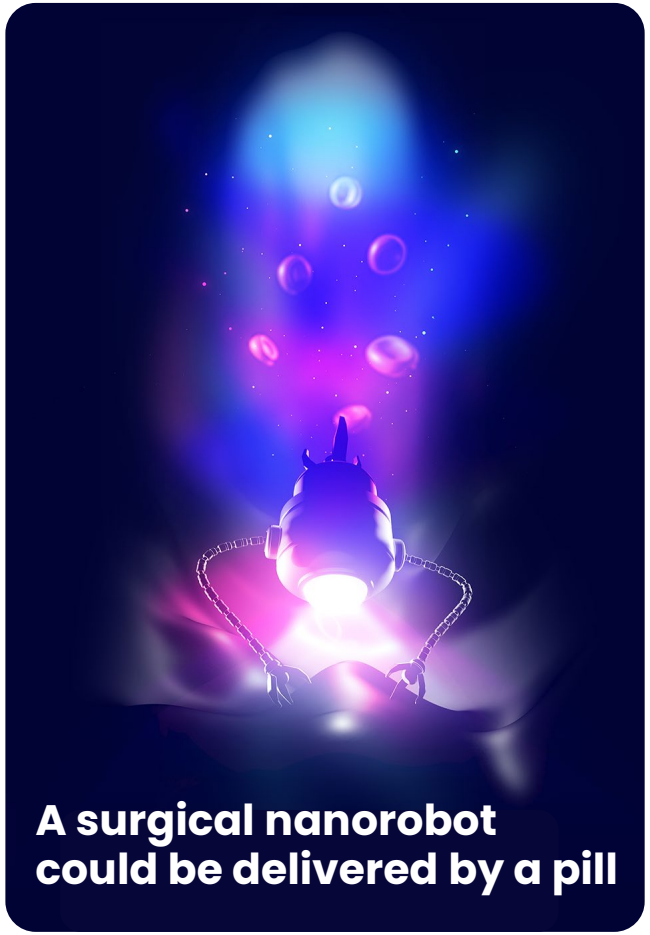
Imagine if...



A personalized cancer vaccine cost as little as a cup of coffee



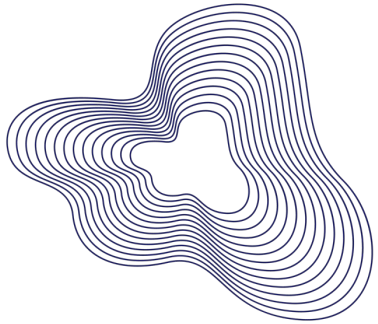
A damaged organ could be replaced by one 3D bioprinted in a lab



A surgical nanorobot could be delivered by a pill

ARPA-H

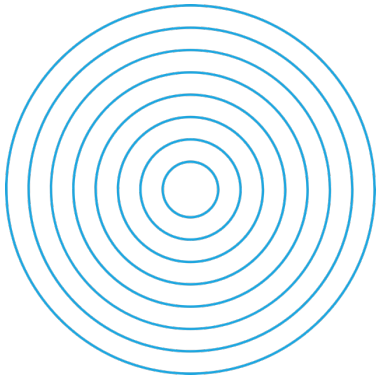
Initial Mission Focus Areas



Health Science Futures

Expanding what's technically possible

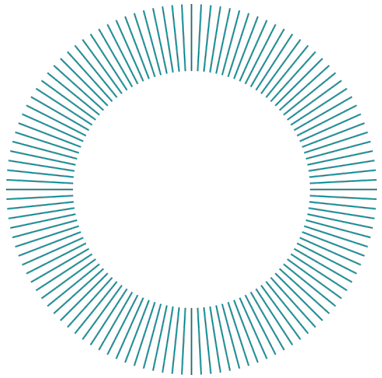
Accelerate advances across research areas and remove limitations that stymie progress towards solutions. These tools and platforms apply to a broad range of diseases.



Scalable Solutions

Reaching everyone quickly

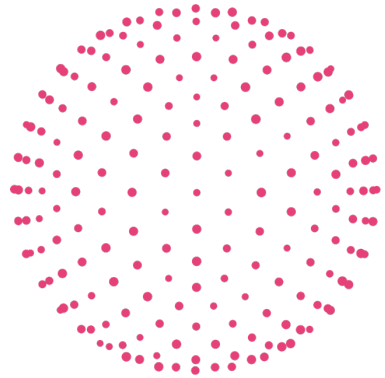
Address health challenges that include geography, distribution, manufacturing, data and information, and economies of scale to create programs that result in impactful, timely, and equitable solutions.



Proactive Health

Keeping people from being patients

Preventative programs will create new capabilities to detect and characterize disease risk and promote treatments and behaviors to anticipate threats to Americans' health, whether those are viral, bacterial, chemical, physical, or psychological.



Resilient Systems

Building integrated healthcare systems

Create capabilities, business models, and integrations to weather crises such as pandemics, social disruption, climate change, and economic instability. Systems are sustained between crises—from the molecular to the societal—to achieve better health outcomes.

ARPA-H

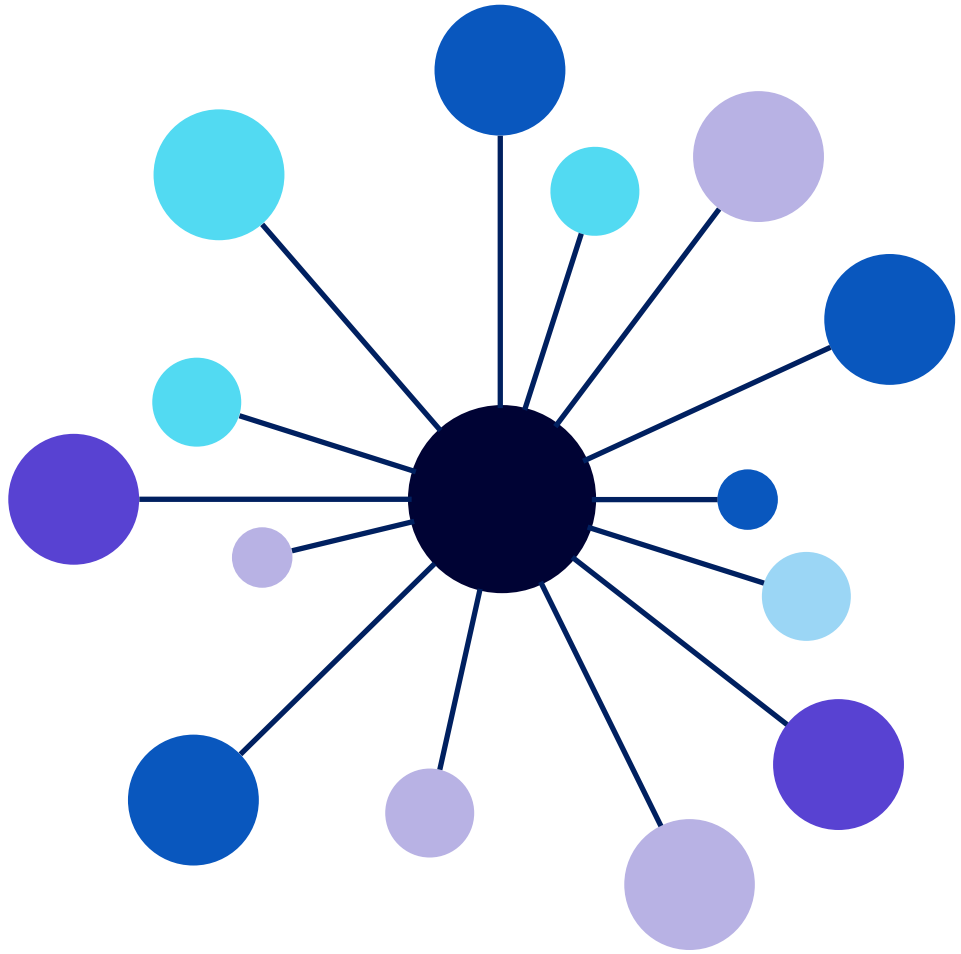
The Hub and Spoke Model

To create a national health innovation network

The **2023 Consolidated Appropriations Act** directs the agency to establish sites in **at least three geographic areas**.

The hub and spoke model will form a **network of people, institutions, and capabilities** across the country.

- **Hub**: To ensure the active transition of health innovation in an expedient, cost-effective, accessible and sustainable manner that reaches all Americans.
- **Spoke:** To ensure that Americans in every community benefit from ARPA-H solutions. Spokes are connected to appropriate hubs on an ongoing basis.

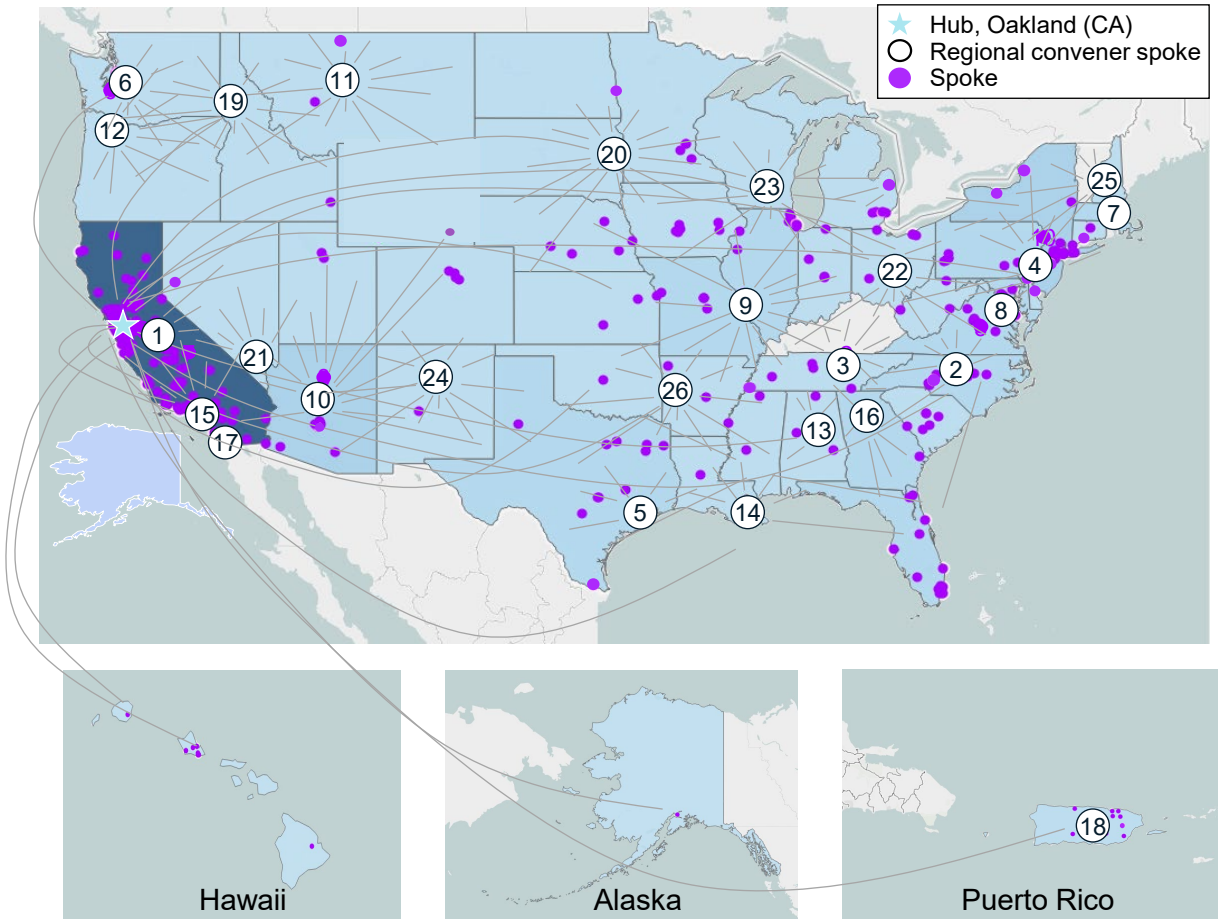


ARPA-H

Health BRIIDGE

Bringing Research, Innovation and
Investors to Drive Growth and Equity

Our candidate network centers geographic and demographic diversity to advance equitable solutions



Regional Conveners

1. UC Merced
2. North Carolina Research Campus
3. University of Tennessee Health Science Center-Oak Ridge National Lab Center for Biomedical Informatics
4. University City Science Center
5. Texas Medical Center (TMC)
6. Washington State Academy of Sciences
7. Biolabs
8. America's Frontier Fund
9. BioSTL
10. Greater Phoenix Economic Council
11. McLaughlin Biosciences Institute
12. Oregon Bioscience Association
13. Southern Research
14. Tulane Innovation Institute
15. Larta
16. Georgia Institute of Technology
17. UC San Diego
18. Universidad Ana G Méndez
19. WWAMI - University of Idaho
20. South Dakota State University
21. University of Nevada Las Vegas
22. Ohio State University Research Institute at Nationwide Children's Hospital
23. University of Wisconsin School of Medicine and Public Health
24. Los Alamos National Laboratory
25. Dartmouth College
26. Plug and Play

Health BRIIDGE

- **170+ member spokes across the US** including Hawaii, Alaska and Puerto Rico
- 7,000+ unique locations

Regional Convener spokes will partner closely to

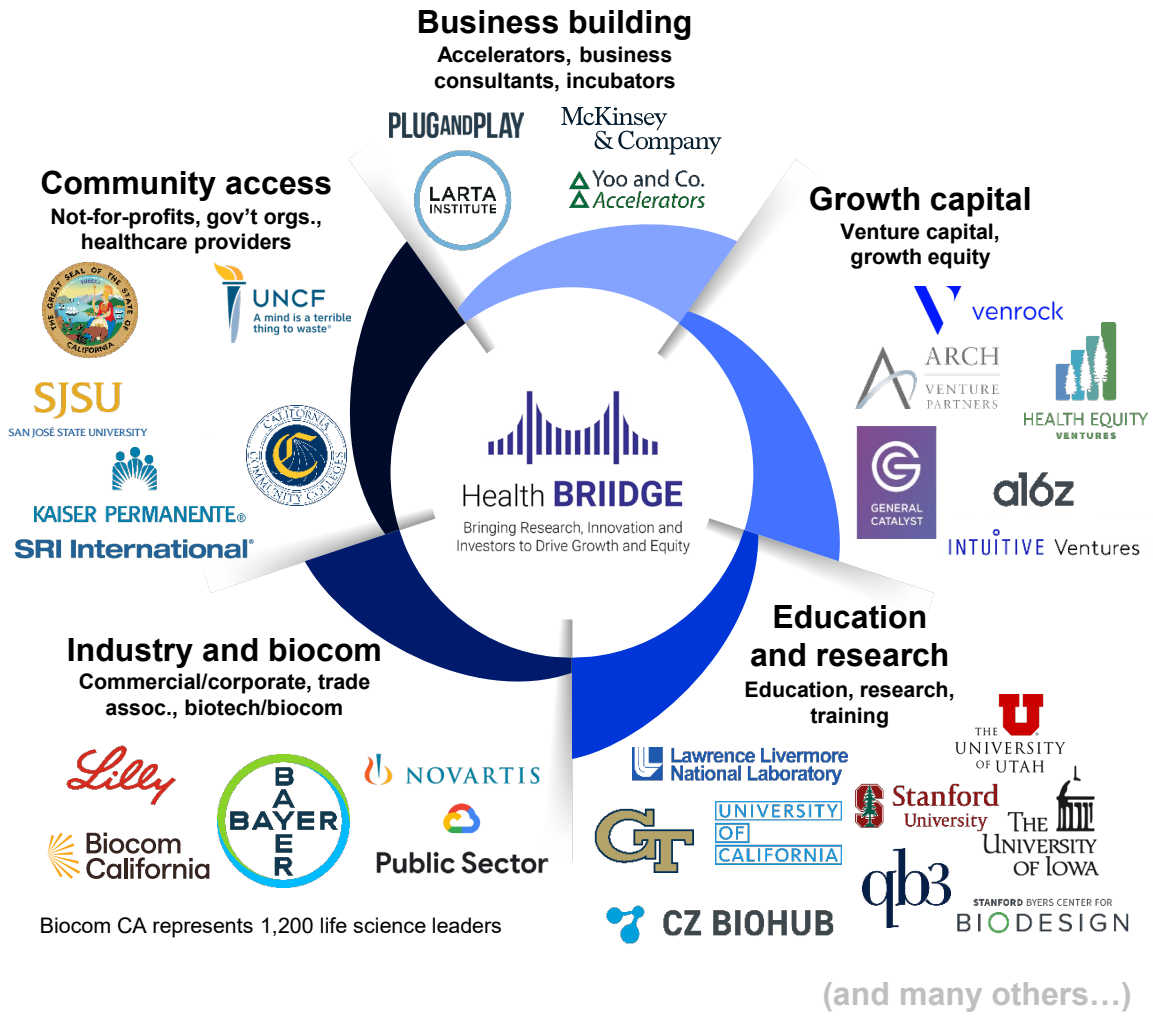
- **Advise the hub on the unique health challenges** that exist across respective regions
- Advise hub on **needs, expertise, and capabilities** existing in the region
- Hold at **least 2 in-person events per year** with the regional ecosystem (open to all spokes in the region)
- Attend a **monthly check-in with hub and other regional conveners**, including rotating meeting hosts among the regional conveners to provide feedback on consortium progress (open to all current and potential spokes)

Network members bring capabilities needed to support ARPA-H researchers and stakeholders

Customers
Healthcare Providers
Patient Groups

Performers
Academia
Industry

Stakeholders
Federal Partners
State and local partners
Private Investors
NGOs



Health **BRIIDGE**

Each member brings a unique set of **skills, expertise, and resources** to the table, contributing to the collective strength of our collaborative network

Our network creates **a flywheel of diverse expertise, cutting-edge technologies, and deep industry** knowledge to drive impactful health innovations

HBC offers the following member spokes who bring the **capabilities to support the following notional activities**:

- Launch Lab Space: 70
- Entrepreneurial Mentorship and Support: 83
- Business Development and Networking: 20
- Commercialization Services: 61
- Education and Training: 70
- Immersion Experiences: 82
- Health Ecosystem Listening Sessions: 82
- Data Commons for Health Outcomes Measurement and Longitudinal Analysis:110**
- Other transition support: 164

With **capabilities across the entire innovation lifecycle**, we can leverage economies of scale to tackle challenges, forge strategic partnerships, and revolutionize healthcare for individuals and diverse communities

**Data Commons capabilities are bi-directional, with key spokes providing tech infrastructure while all members provide data from communities

Public benefits of research

2018 SOR Report: Optimizing public benefits from state-funded research

California Initiative to Advance Precision Medicine

Thank you

California Governor's Office of Planning and Research

julianne.mccall@opr.ca.gov | www.opr.ca.gov/ciapm/