

Peer Review and the Mission of NIH

*CSR Advisory Council
March 27, 2023*



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Performing the Duties of the NIH Director
Department of Health and Human Services



Topics for Today

- NIH and CSR
- Strengthening Peer Review
- NIH Budget and Funding
- Impact of NIH
- Update on UNITE
- NIH-Wide Strategic Plan for Diversity, Equity, Inclusion, and Accessibility



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NIH and CSR: A Strong and Flexible Foundation

- 1944 – National *Institute* of Health and the Public Health Service Act
 - Authorized clinical research and grants program
- 1946 – Division of Research Grants established
 - Study sections and **two levels of review**
- 1948 – National *Institutes* of Health with DRG overseeing the grants process
- 1997 – Division of Research Grants becomes the **Center for Scientific Review**

48 (Statement of the President on Signing the Public Health Service Act. July 1, 1944

THE Public Health Service Act is an important step toward the goal of better national health. A constituent of the Federal Security Agency since 1939, the U. S. Public Health Service is one of the oldest Federal agencies – and one in which the people have great confidence because of its excellent record in protecting the health of the Nation.

The Act signed today gives authority to make grants-in-aid for research to public or private institutions for investigations in any field related to the public health. It authorizes increased

NIH and CSR: A Strong and Flexible Foundation

“Establishment of the Center is designed to signal a broadening of the mission to include new emphasis on the development and implementation of innovative and flexible ways to conduct referral and review for all aspects of science.” ~ 1997



In FY2022, CSR received > 80,000 NIH grant applications

- Reviewed ~ 76% = 61,378 applications
- Engaged ~19,000 scientists as reviewers
- Held ~ 1,200 review meetings

Thank you, CSR!

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CSR Leading Efforts to Strengthen Peer Review

- **ENQUIRE evaluations** – integrating data and input from extramural scientists and NIH staff to determine whether study section focus or scope are needed to identify the highest impact science, with special attention to emerging areas of science
- **Simplifying the review framework** – refocusing reviewers on their role in assessing scientific and technical merit and reducing the impact of reputational bias
- **Changes to NRSA fellowship review** – modified review criteria and changes to the application to better identify highly promising young scientists
- **Diversifying panels** – ensuring a range of perspectives in identifying the highest impact science
- **Actions to reduce bias in peer review** – reporting avenue, bias awareness and mitigation training
- **Actions to prevent and address breaches of review integrity** – working with OER to ensure review proceeds without undue influence

With thanks to the CSR Advisory Council and multiple working groups that have helped shape these efforts!

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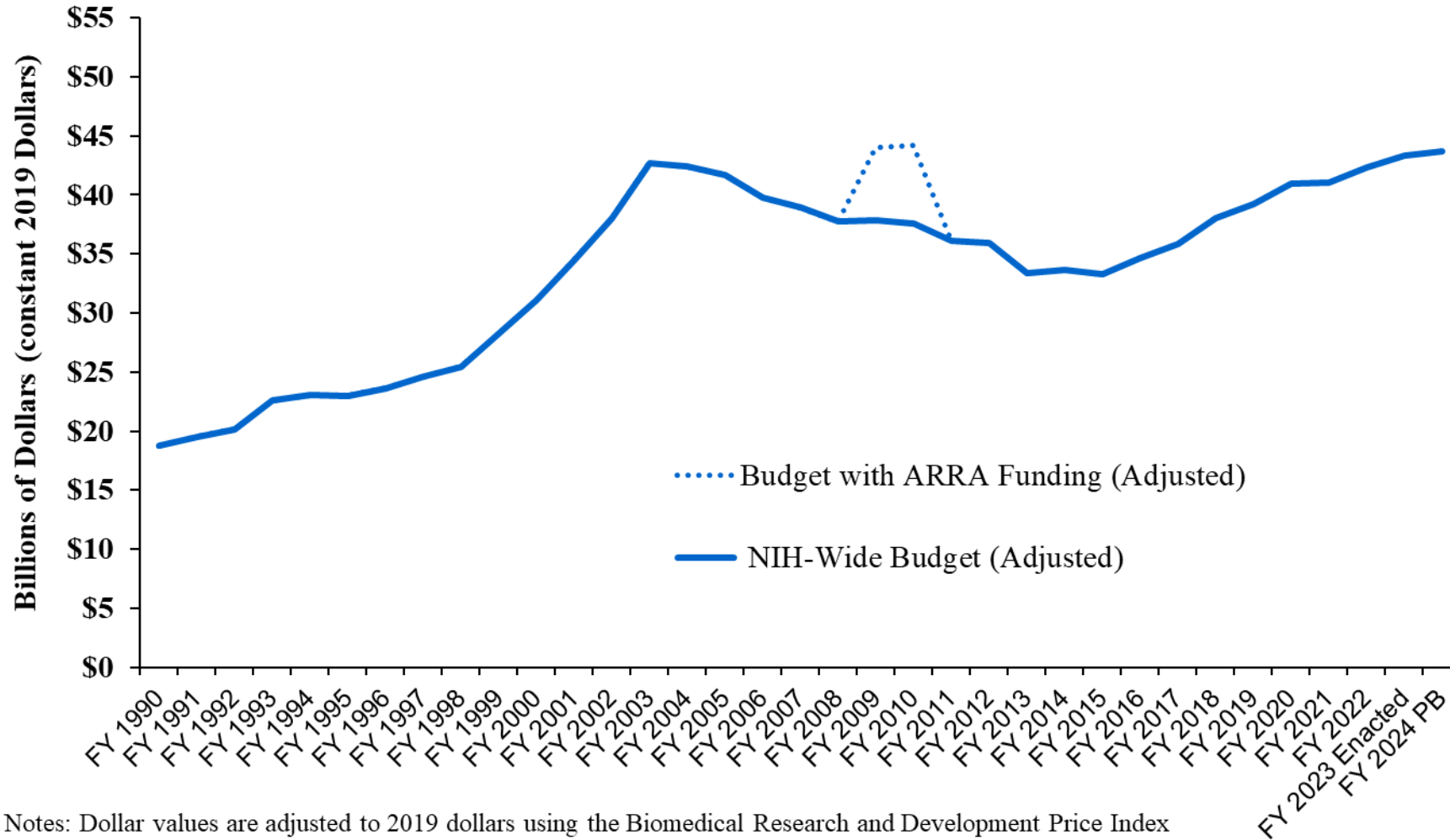
FY 2023 Appropriation and FY 2024 Request

\$ in billions	FY 2022 Enacted	FY 2023 Enacted	FY 2024 PB*
Program Level	\$46.2B	\$49.2	\$51.1B
ARPA-H (non-add)	\$1.0B	\$1.5	\$2.5B
+/- prior year	+\$3.4B	+\$3.0B	+\$1.9B
<i>*less Pandemic Preparedness mandatory proposal</i>			

- Total FY 2023 program level of \$49.2 billion, an increase of \$3.0 billion.
- Includes \$1.5 billion for the Advanced Research Projects Agency for Health (ARPA-H), now permanently located at NIH.
- General increase to the NIH Institutes/Centers of 3.8 percent.

National Institutes of Health Funding

1990-2024



Notes: Dollar values are adjusted to 2019 dollars using the Biomedical Research and Development Price Index (BRDPI), <http://officeofbudget.od.nih.gov/gbiPriceIndexes.html>.

Includes ARPA-H funding for \$1, \$1.5 and \$2.5 billion in FYs 2022, 2023 and 2024, respectively.

Sources: the NIH's Office of Extramural Research and the Office of Budget (March 2023).

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NIH Funds Scientists Across the U.S.



FY 2022
Projects: **64,947**
Funding: **\$37.1B**

Impact of NIH-Funded Research

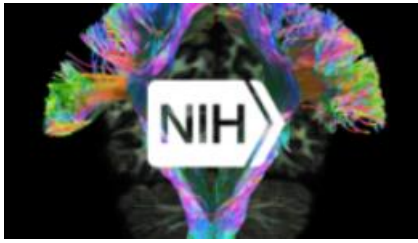
Many of NIH's high profile initiatives are reviewed by CSR

- All of Us
- **Alzheimer's Disease and Related Dementias Funding Opportunities**
- **BRAIN (Brain Research Through Advancing Innovative Neurotechnologies)**
- **Common Fund**
 - FIRST (Faculty Institutional Recruitment for Sustainable Transformation)
 - **Early Independence Award**
 - **New Innovator Award**
 - **Pioneer Award**
 - **Transformative Research Award**
- ECHO (Environmental influences on Child Health Outcomes)
- **HEAL (Helping to End Addiction Long-term)**
- INCLUDE (Investigation of Co-occurring conditions across the Lifespan to Understand Down syndromE)
- IMPROVE (Implementing a Maternal health and PRegnancy Outcomes Vision for Everyone)
- **MIRA (Maximizing Investigators' Research Award)**
- NARCH (Native American Research Centers for Health)
- TOCRS (Tobacco Centers for Regulatory Science)

Alzheimer's Disease and Related Dementias

- **Modeling amyloid accumulation to try to predict AD progression** – Algorithms that use positron emission tomography (PET) brain scans could model amyloid accumulation and estimate the age at which amyloid began to accumulate (Betthausen TJ, et al. 2022)
- **Working towards an early diagnostic test for AD** – a method to detect beta-amyloid oligomers in patients' blood (Shea D, et al. 2022)
- **Big data approaches to connect AD to clinical characteristics** – electronic medical records used to identify key differences in pathology and clinical data between men and women with AD. Advanced computer algorithms could validate or identify patterns of associations (Tang AS, et al. 2022)





The BRAIN Initiative

- **Treatments to restore function after stroke** – Spinal cord stimulation may restore arm and hand mobility after stroke (Powell MP, et al., 2023)
- **Discovery of anatomical structures with implications for brain disease** – A newly discovered mesothelial membrane, the subarachnoidal lymphatic-like membrane (SLYM), covers the brain. This structure is part of the glymphatic system and maintains its own native population of immune cell (Møllgard K, et al., 2023)
- **Emerging fields of neuroscience** – Connectomics aims to map connections among neurons in the brain. Differences in connectomes could be correlated with behavioral differences across individuals (Wei-Chung Allen Lee, Harvard Medical School)
- **Possible new treatments for Parkinson's Disease** – Adenosine, a key neurotransmitter involved in Parkinson's Disease, found to serve as a 'brake' to dopamine (Ma, L, et al. 2022)

HEAL - Helping to End Addiction Long-term

- **Preventing chronic post-surgical pain** in adolescents through development of pain coping skills using cognitive behavioral therapy (Rabbitt, JA, et al., 2021)
- **Deep brain stimulation for severe opioid addiction** – ongoing research to test DBS as a strategy for opioid use disorder that has not responded to other treatments (Ali Rezai, West Virginia University)
- **A whole-health approach for treating opioid addiction and mental illness** – testing a treatment model that involves a range of providers – clinical care staff including a case manager and specialists, nurses, social workers, counselors, and peer recovery coaches (David Smelson, University of Massachusetts Medical School, Worcester)



High Risk, High Reward Initiatives



- **Racial disparities in access to clean drinking water**
(Martinez-Morata, I, et al., 2022)
- **Racial disparities in barriers to glaucoma treatment**
(Delavar, A, et al., 2022)



- **Modeling mutations to better predict breast cancer outcomes**
(Caswell-Jin, JL, et al., 2019)
- **Robotic-directed evolution to create new proteins**
(Piatkevich, KD, et al., 2018)



- **Rapid, accurate virus testing of patient samples**
(Paria, D, et al., 2022)
- **Understanding viral characteristics necessary to infect human cells**
(Li, T, et al., 2021)

NIH DIRECTOR'S



TRANSFORMATIVE
RESEARCH
AWARD

- **Destruction of circulating cancer cells to prevent spread**
(Lihong Wang)
- **Treatment of mitochondrial disease with hypoxia**
(Peng Yin)

MIRA - Maximizing Investigators' Research Award

Race/Ethnicity Breakdown of NIGMS R01 and R35 PIs by Cohort

FYs 2019-2021 Only



Table 4: Review Process by Race/Ethnicity Grouping, ESI MIRA

	White	Asian	Underrepresented	Unknown/Withheld/Multiple	P-Value
Apps Received (N)	832	456	126	152	NA
Apps Received (% of Total)	53%	29%	8%	10%	NA
% Reviewed Within Group	90%	87%	87%	87%	0.2
% Discussed Within Group	60%	58%	58%	59%	0.9
Mean Score	41.8	40.7	43.7	41.5	0.5
Awards (N)	322	168	44	53	NA
% Scored Apps Awarded	65%	64%	60%	60%	0.7
% Reviewed Apps Awarded	43%	42%	40%	40%	0.9

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UNITE Progress Report



- Describes NIH’s actions to **identify and address structural racism** that may exist within NIH and in the biomedical and behavioral research enterprise
- Developed in collaboration with UNITE co-chairs, committees, and stakeholders
- Focuses on **health disparities** and **minority health research**, the internal **NIH workforce**, and the **external research workforce**—topics that intersect and enable greater transparency, accountability, and communication across NIH and the biomedical and behavioral community

Focus Area 1: Elevating Health Disparities and Minority Health Research Across Institutes and Centers

GOAL	ACTIVITIES
Increase funding of HD/MH research projects and expand research capacity at MSIs	<ul style="list-style-type: none">• Launch Transformative Research to Address Health Disparities and Advance Health Equity initiative• Release relevant FOAs
Improve NIH-wide transparency, accountability, and sustainability regarding HD/MH research funding	<ul style="list-style-type: none">• Developed automated method to more precisely characterize, analyze, and track HD/MH portfolio• Expand MeSH terms related to social determinants of health
Enhance community-driven health disparities research and structural interventions through 10-year investment (~\$400M)	<ul style="list-style-type: none">• Aided design of FY23 Community Partnerships to Advance Science for Society initiative

Focus Area 2: Promoting Equity in the NIH-Supported Biomedical Research Ecosystem

GOAL	ACTIVITIES
Support, develop, and retain diverse scientific talent in all career stages and across all groups	<ul style="list-style-type: none">• Launched Faculty Institutional Recruitment for Sustainable Transformation (FIRST) program• Expanded Science Education Partnership Awards (SEPA)
Incentivize institutions to create research environments that promote and value DEIA	<ul style="list-style-type: none">• Planned and solicited public comment for DEIA Institutional Prize
Break down systemic and structural barriers that lead to certain group remaining underrepresented in the scientific workforce	<ul style="list-style-type: none">• Creation of new initiatives to support extramural DEIA efforts (3 at NIGMS) and enhance MSI capacity (NIMHD)• Will support institutions to conduct organization climate assessments and conduct needs assessments

Focus Area 3: Promoting Equity in the Internal NIH Workforce

GOAL	ACTIVITIES
Create coordinated anti-racism advisory body with representation from all ICs to guide NIH-wide efforts to address organizational issues to promote equity	<ul style="list-style-type: none">• Established NIH-wide Anti-Racism Steering Committee• Generated new initiative to enhance outreach regarding NIH job opportunities to ensure broad range and diversity of applicants
Identify areas that lead to apparent inequities and provide interventions or policy changes to mitigate identified issues	<ul style="list-style-type: none">• Guided development of NIH IC and OD Racial & Ethnic Equity Plans

Focus Area 3: Promoting Equity in the Internal NIH Workforce

GOAL	ACTIVITIES
Enhance transparency and accountability of NIH-internal workforce metrics to assess progress toward equity goals	<ul style="list-style-type: none">• Published data on demographic composition and profiles of NIH workforce
Recognize and celebrate staff of all levels and across all workforces	<ul style="list-style-type: none">• Establish task force to recommend changes to NIH Director's Awards• Spearheaded The Power of an Inclusive Workplace Recognition Project
Provide skill development opportunities with a focus on equity throughout the workforce	Developed career development opportunity for staff at GS-11 and lower levels

Focus Area 4: Improving Accuracy and Transparency of Racial and Ethnic Equity Data

GOALS	ACTIVITIES
Gather robust, recent baseline data on scientists' needs and experience pertaining to racial and ethnic equity to affirm UNITE directions and guide future developments	<ul style="list-style-type: none">• UNITE RFI (>1,100 responses)• Conducted 14 listening sessions with extramural community to understand needs and priorities (>1,300 attendees)
Improve transparency and accountability in communicating UNITE progress to partners, stakeholders, and the public	<ul style="list-style-type: none">• Developed, launched, and maintained public-facing Data Dashboard• Launched UNITE Co-Chairs' Corner with monthly updates• Communicate UNITE news and updates via GovDelivery• UNITE LinkedIn Page• Promote events, news, published articles, and DEI content on the Ending Structural Racism (ESR) website and intranet

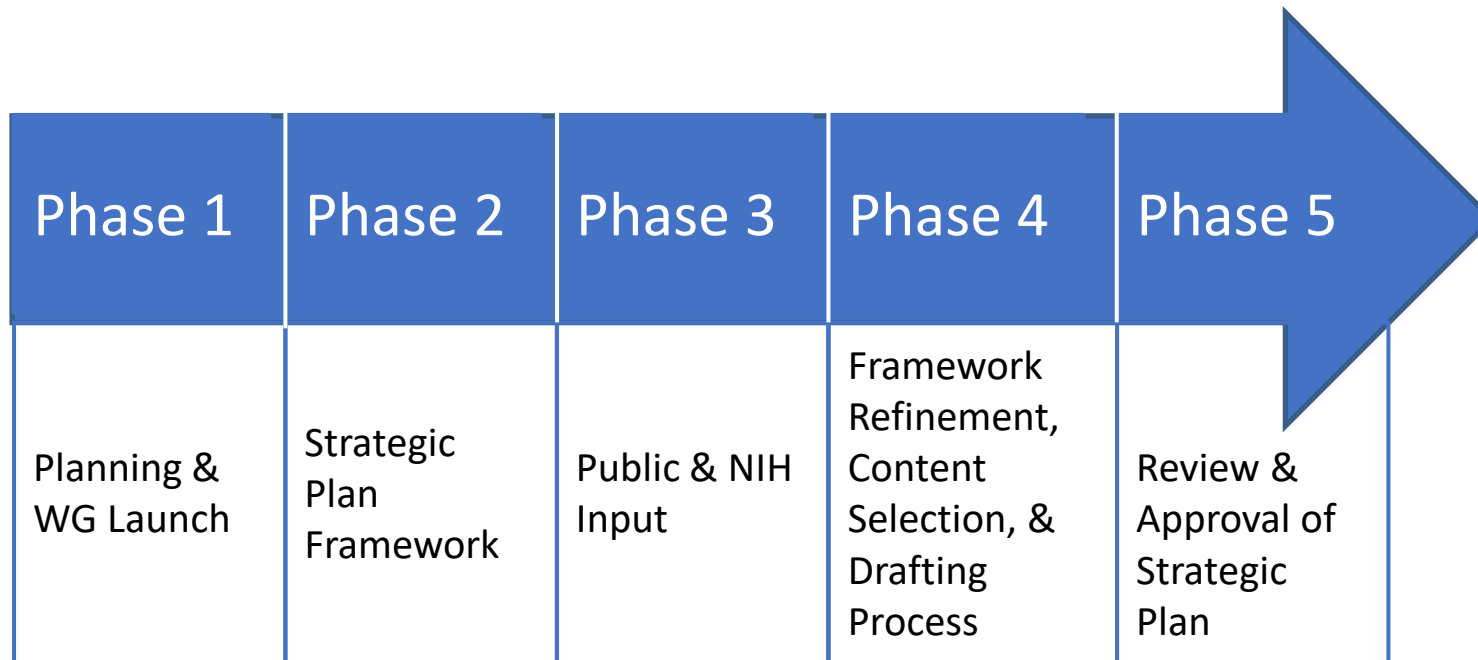
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Process & Timeline

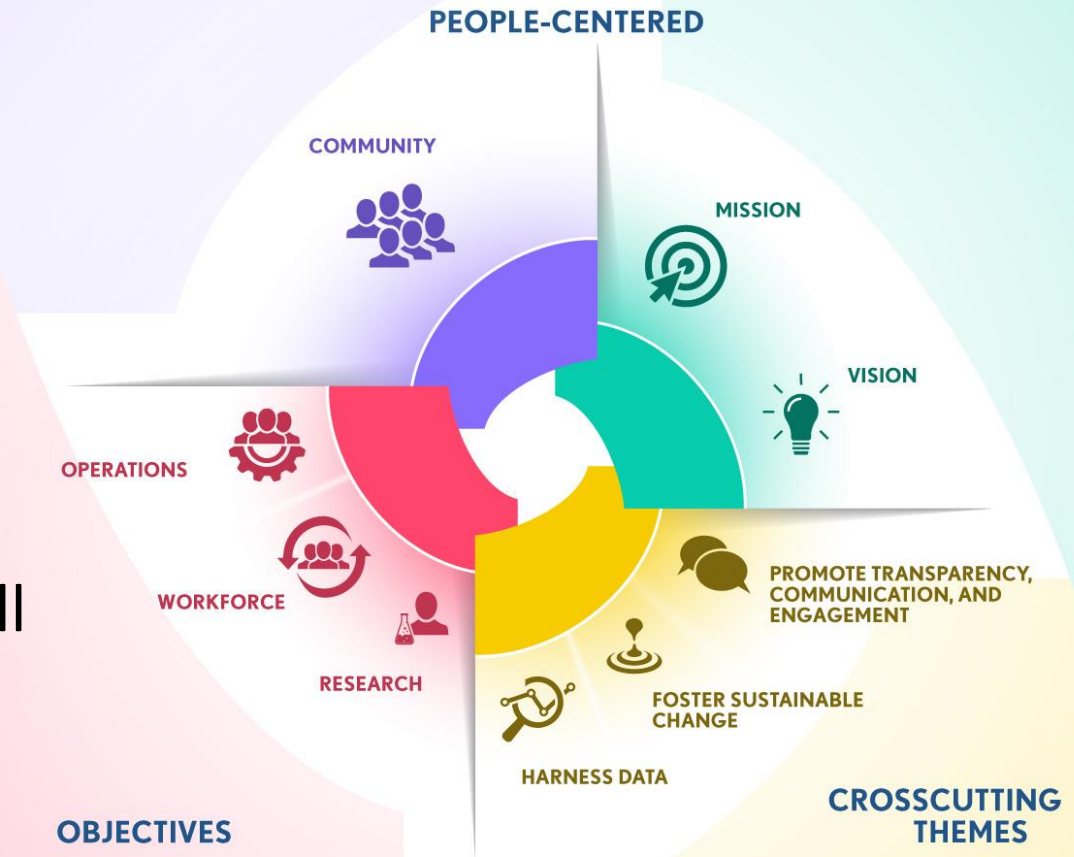
Summer
2021



**Plan published
March 20, 2023**

NIH DEIA Strategic Plan: Mission & Vision

- **Mission:** NIH will embrace, strengthen, and integrate diversity, equity, inclusion, and accessibility (DEIA) across all NIH activities in service of the NIH mission.
- **Vision:** NIH will be a people-centered organization, where the workforce and research priorities reflect our Nation's diversity, and all people feel a sense of belonging as they advance the NIH mission.



NIH DEIA Strategic Plan: Framework



Objective 1: **Grow and Sustain DEIA through Structural and Cultural Change**



Objective 2: **Implement Organizational Practices to Center and Prioritize DEIA in the Workforce**



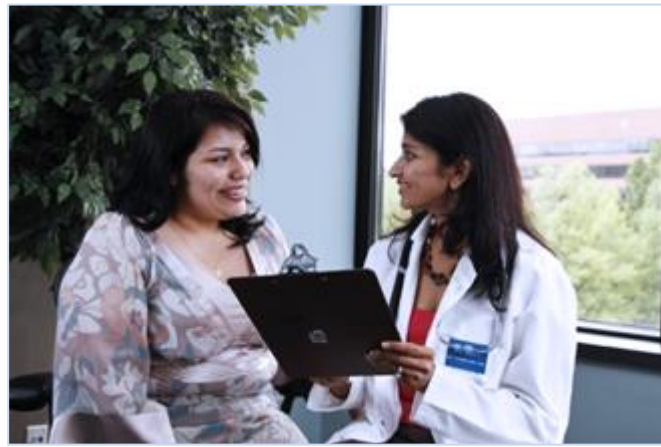
Objective 3: **Advance DEIA through Research**

NIH DEIA Strategic Plan: Cross-Cutting Themes

- **Promote Transparency, Communication, and Engagement to Advance DEIA**
 - Share information with the NIH community and offer platforms and forums for the community to share their knowledge, perspectives, and lived experiences with NIH
 - Communicate in ways that are accessible to the community
- **Foster Sustainable Change to Advance DEIA**
 - Implement structural changes in a broad and sustained way to foster an environment where actions become effectively ingrained in the NIH culture
- **Harness Data to Advance DEIA**
 - Use data to inform internal decision-making and to fulfill NIH's promise to be accountable to the public
 - Consider the kinds of metrics and data needed to measure progress, including baseline data
 - Use a common set of validated metrics and measures to allow for standardizing and streamlining DEIA data collection and analyses
 - Data should be easily accessible and align with FAIR data principles

ACD WGD Subgroup on Individuals with Disabilities Report

- Recommendations from group of subject matter experts endorsed by ACD on 12/9/22
- NIH is now evaluating those recommendations to determine what is actionable in the short, medium, and long-term.



NIH...

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Turning Discovery Into Health

