May 16-18

Montreal, Canada

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Equity and Access By Design: Lessons Learned Creating Digital Public Mental Health Interventions

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All of Us Research Program
National Institutes of Health

Talk Overview

1. Digital health landscape
2. Importance of digital health equity frameworks
3. Key considerations & lessons learned from the field

Setting the Stage: Digital Health Landscape

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Defining Digital Health

"[T]he use of information and communications technologies in medicine and other health professions to manage illnesses and health risks and to promote wellness. Digital health has a broad scope and includes the use of wearable devices, mobile health, telehealth, health information technology, and telemedicine."

Source: Ronquillo Y, Meyers A, Korvek SJ. Digital Health. [Updated 2023 May 1]. In: StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK470260/

Defining Digital Health Equity

"Achieving digital health equity entails not only ensuring access to digital infrastructure but also designing digital health solutions with the broad range of end users in mind, implementing them in ways that address the unique needs of patients who require health-related safety-net services, and evaluating their effects across a range of populations and health systems."

Source: Lyles, C. R., Wachter, R. M., & Sarkar, U. (2021). Focusing on Digital Health Equity. JAMA, 326(18), 1795–1796. https://doi.org/10.1001/jama.2021.18459

Goals of Digital Health

- Improve healthcare quality, services, & outcomes
- Enhance patient & healthcare provider experiences
- Address health disparities
- Improve population health

Source: Ronquillo Y, Meyers A, Korvek SJ. Digital Health. [Updated 2023 May 1].
In: StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK470260/

Example Digital Health Categories

- Remote sensing & wearables
- Telemedicine & health information
- Data analytics & intelligence
- Health & wellness behavior modification tools (e.g., apps)
- Bioinformatics tools (-omics)
- Patient-physician portals
- (DIY) technologies for diagnosis, treatments, & decision support
- Imaging

Source: Ronquillo Y, Meyers A, Korvek SJ. Digital Health. [Updated 2023 May 1].
In: StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK470260/

The Meteoric Rise of Digital Health

March 25, 2020

STYLE

Neighbors Are Reaching Out on Nextdoor

Homebound city dwellers are turning to a neighborhood app to connect, organize and help each other without risking physical contact.

By John Herrman

PRINT EDITION Neighborliness Enabled Through an App | March 26, 2020, Page D5

March 8, 2020

TECHNOLOGY

Surge of Virus Misinformation Stumps Facebook and Twitter

Secret labs. Magic cures. Government plots. Despite efforts by social media companies to stop it, false information about the coronavirus is proliferating around the world.

By Sheera Frenkel, Davey Alba and Raymond Zhong

PRINT EDITION Misinformation Surge on Coronavirus Stumps Facebook and Twitter | March 9, 2020, Page A8

March 19, 2020

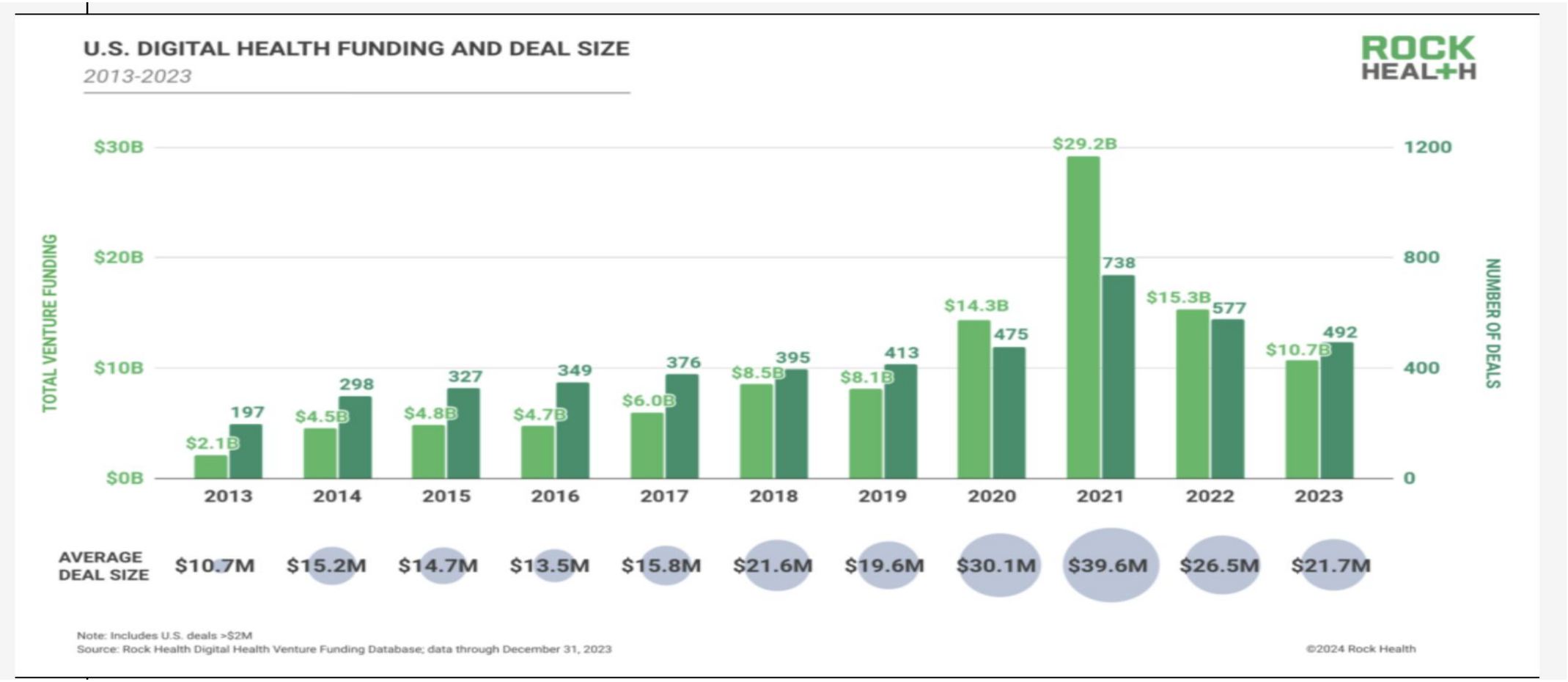
OPINION

To Fight Coronavirus, Millions More Americans Need Internet Access

Here's what the federal government must do to help.

By Geoffrey Starks

U.S. Private Sector Funding for Digital Health



Source: https://rockhealth.com/insights/2023-year-end-digital-health-funding/

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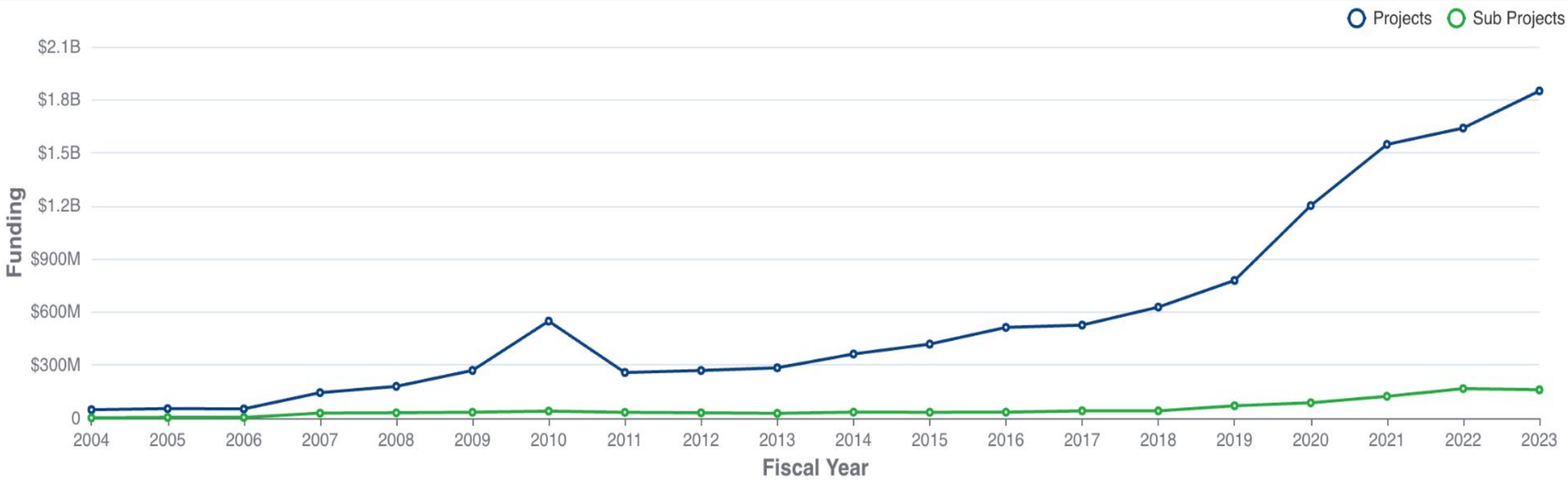
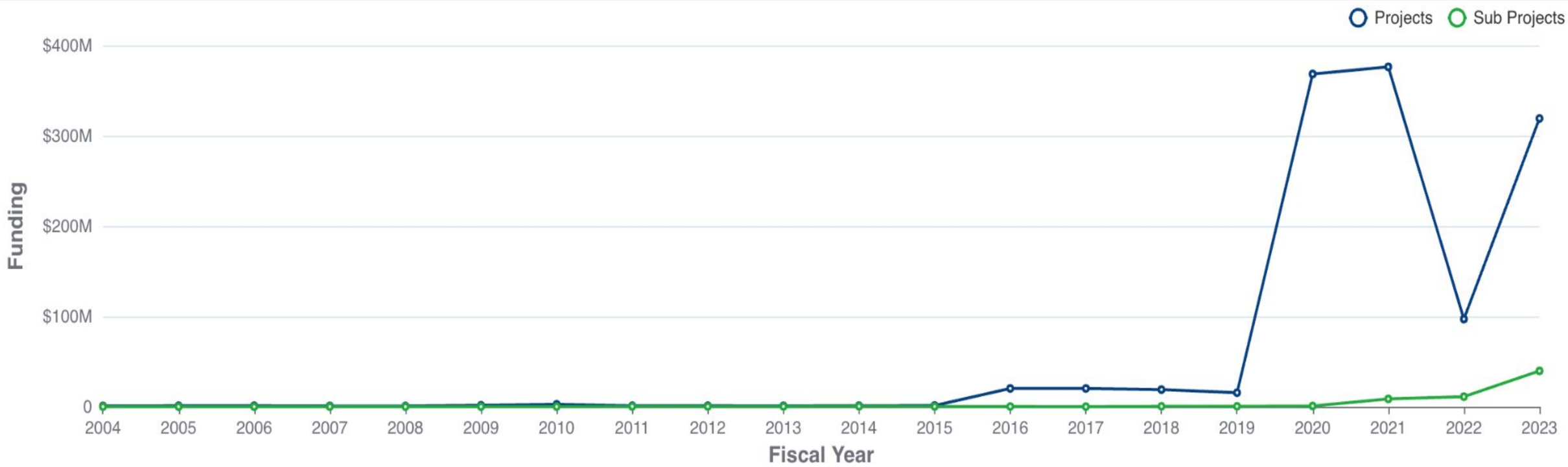
NIH Funding for Digital Health (2004 - 2023)



Note: Please note that if the hit list contains both a subproject and its parent grant, the subproject funding is already included in the parent project funding amount.

Source: https://reporter.nih.gov/

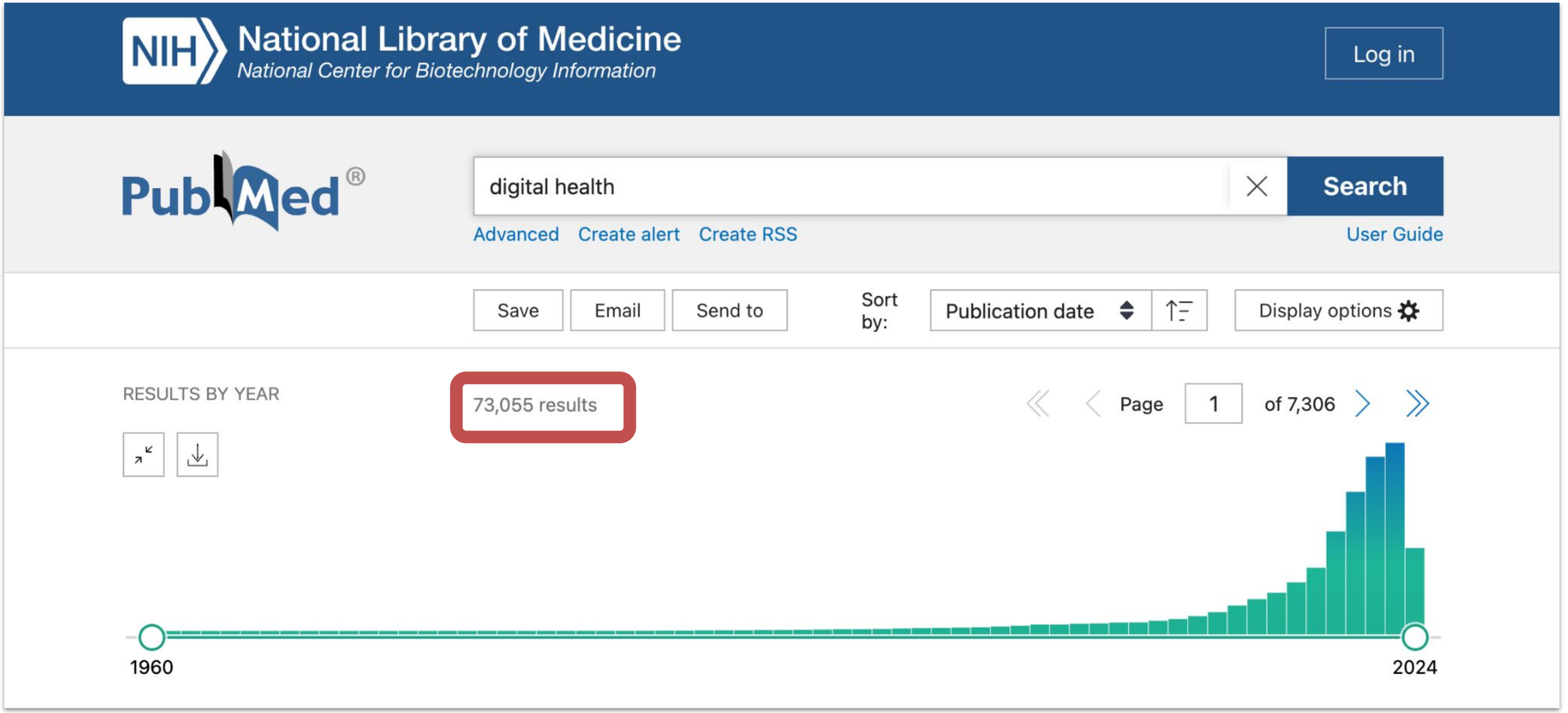
NIH Funding for Digital Health Equity (2004 - 2023)



Note: Please note that if the hit list contains both a subproject and its parent grant, the subproject funding is already included in the parent project funding amount.

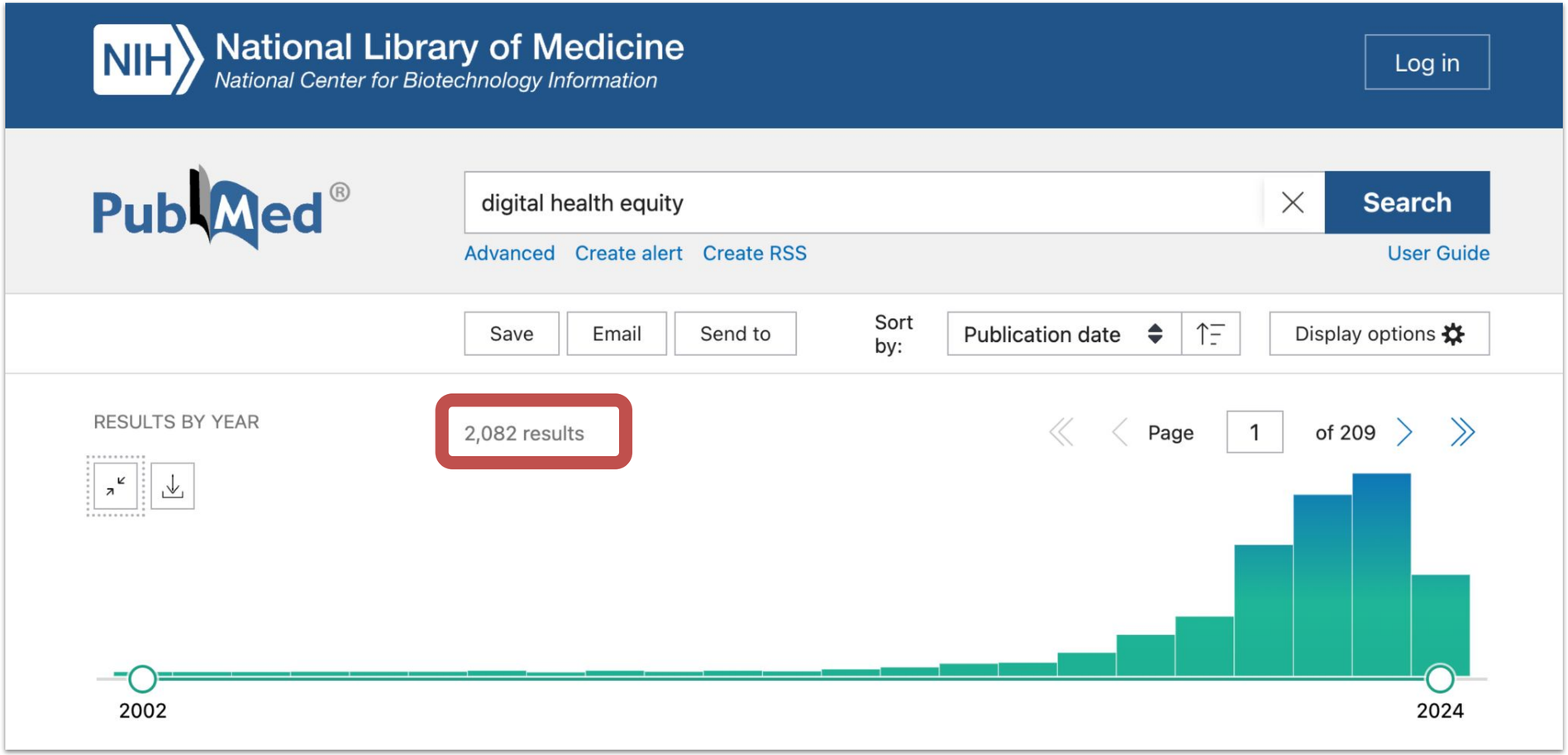
Source: https://reporter.nih.gov/

Publications for Digital Health (1960 - 2024)



Source: https://pubmed.ncbi.nlm.nih.gov/

Publications for Digital Health Equity (2002 - 2024)



Source: https://pubmed.ncbi.nlm.nih.gov/

The Importance of Digital Health Equity Frameworks

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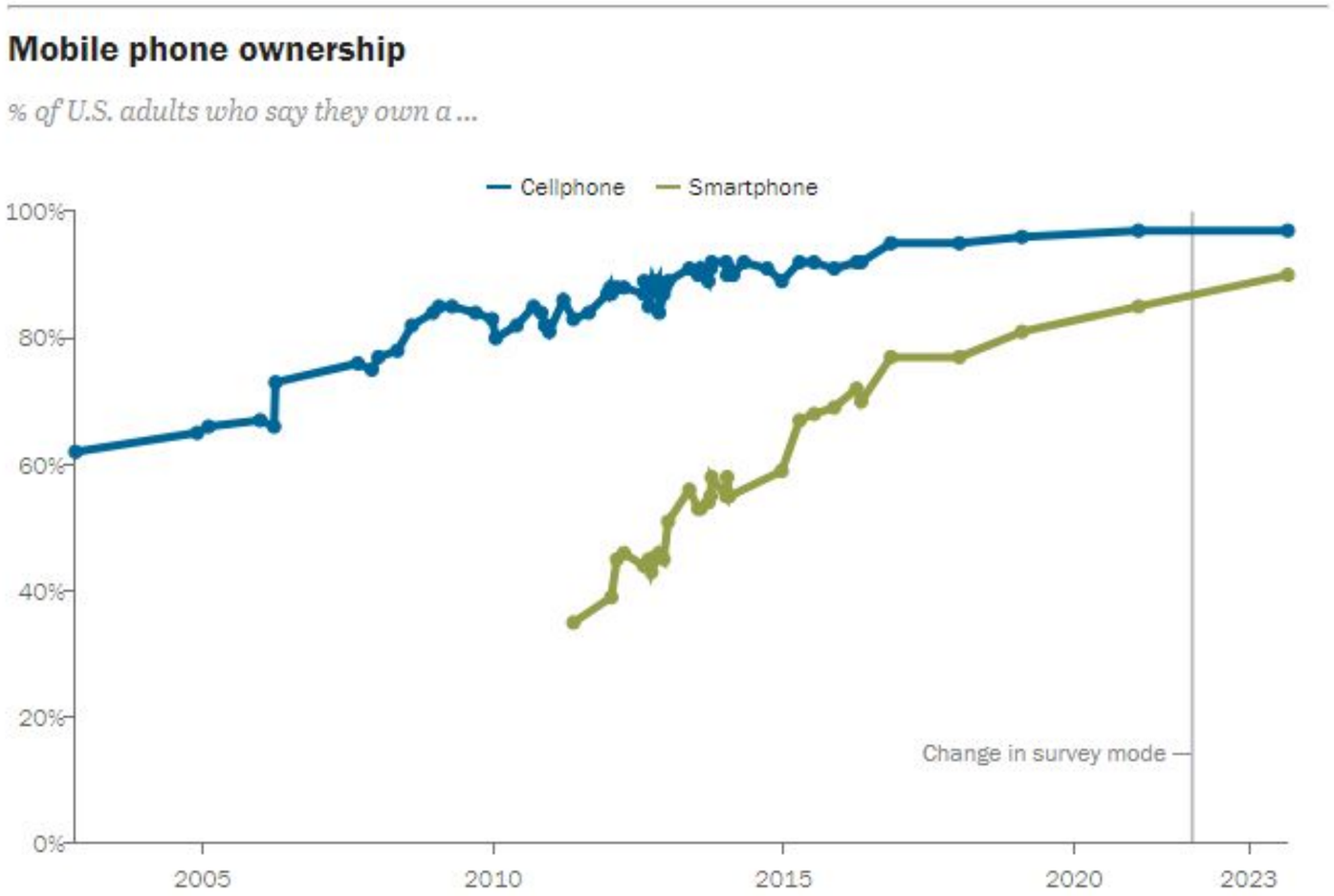
Smartphone Ownership (in the U.S.)



Source: https://www.pewresearch.org/internet/fact-sheet/mobile/

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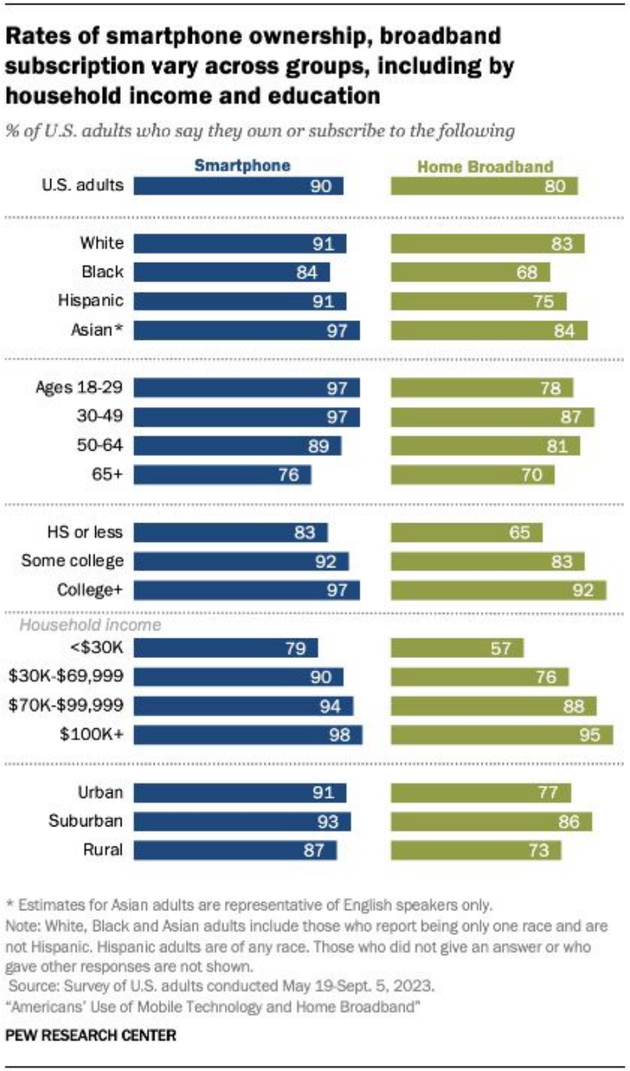
U.S. Smartphone Ownership vs. Home Broadband



Source: https://www.pewresearch.org/internet/2024/01/31/americans-use-of-mobile-technology-and-home-broadband/

Barriers to Achieving Digital Health's Potential

1. Persistence of digital infrastructure deficits & "digital redlining"
   - Digital Equity Act of 2021 is helping, but more work remains
2. Digital health innovations can exacerbate or create new health disparities - "inverse care law" (e.g., Lyles et al., 2023; The Lancet, 2021)
3. Digital health literacy identified as a "super determinant" of health, but low literacy levels limit full potential of digital health tools (Van Kessel, Wong, Clemens, & Brand, 2022)
4. Engagement is essential - yet historically underserved and vulnerable populations less likely to engage with digital health tools & resources than more privileged populations (e.g., Adedinsewo et al., 2023)

A Framework for Digital Health Equity

Domains of Influence (Over the Lifecourse)	Levels of Influence*			
	Individual	**Interpersonal**	**Community**	**Societal**
Biological	Biological Vulnerability and Mechanisms	Caregiver–Child Interaction Family Microbiome	Community Illness Exposure Herd Immunity	Sanitation Immunization Pathogen Exposure
Behavioral	Health Behaviors Coping Strategies	Family Functioning School/Work Functioning	Community Functioning	Policies and Laws
Physical/Built Environment	Personal Environment	Household Environment School/Work Environment	Community Environment Community Resources	Societal Structure
Digital Environment	Digital Literacy, Digital Self-Efficacy, Technology Access, Attitudes Towards Use	Implicit Tech Bias, Interdependence (e.g. shared devices), Patient-Tech-Clinician Relationship	Community Infrastructure, Healthcare Infrastructure, Community Tech Norms, Community Partners	Tech Policy, Data Standards, Design Standards, Social Norms & Ideologies, Algorithmic Bias
Sociocultural Environment	Sociodemographics Limited English Cultural Identity Response to Discrimination	Social Networks Family/Peer Norms Interpersonal Discrimination	Community Norms Local Structural Discrimination	Social Norms Societal Structural Discrimination
Health Care System	Insurance Coverage Health Literacy Treatment Preferences	Patient–Clinician Relationship Medical Decision-Making	Availability of Services Safety Net Services	Quality of Care Health Care Policies
Health Outcomes	**Individual Health**	**Family/ Organizational Health**	**Community Health**	**Population Health**

Source: Richardson, S., Lawrence, K., Schoenthaler, A.M. et al. A framework for digital health equity. npj Digit. Med. 5, 119 (2022). https://doi.org/10.1038/s41746-022-00663-0

Key Lessons Learned for Working Toward Digital Health Equity

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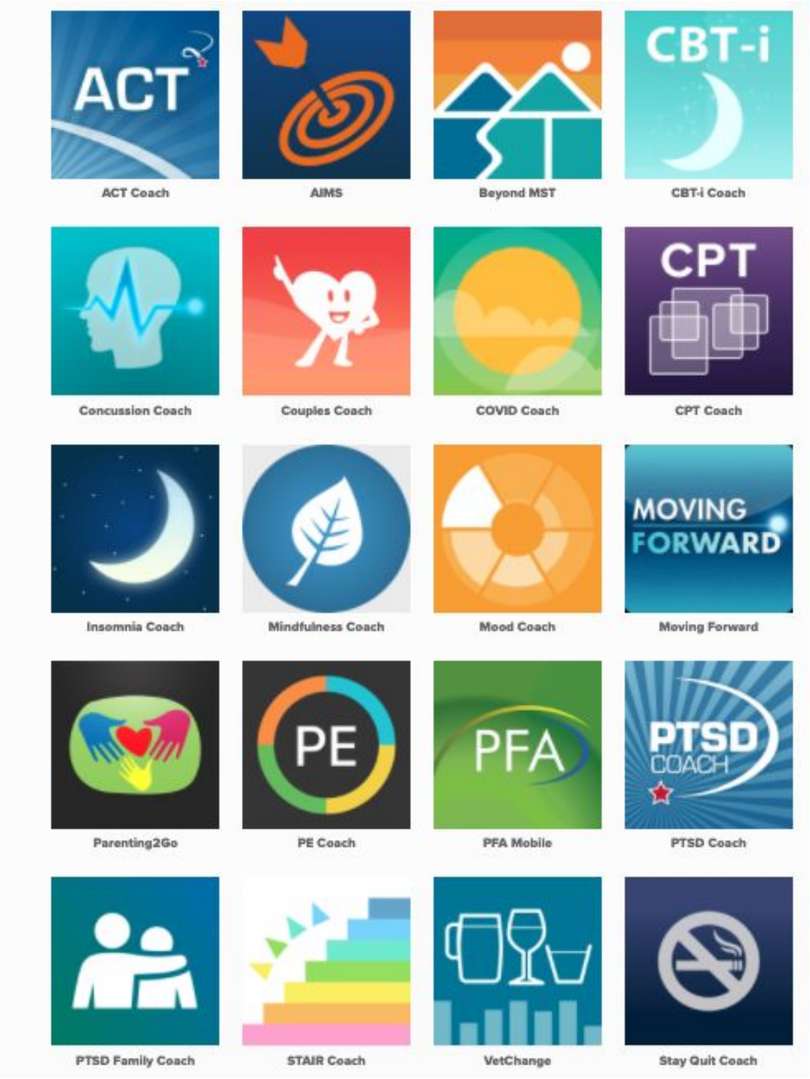
Overview of VA NCPTSD's Public Digital Health Innovation Program



- Large portfolio of mental health apps (20+)
  - Self-management and treatment companion apps
- Significant reach
  - Over 5 million app installs
- Strong data privacy protections
- Free & accessible
- Contribute to the development of a digital mental health safety net
- Evidence-informed
  - RCTs (e.g., Kuhn et al., 2017) and "in the wild" (e.g. Jaworski, et al., 2021; Kozlov et al. 2020; Owen et al. 2015)

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Suggestion 1: Equity and access must be central

- Cannot be an afterthought
- Accessibility should go beyond the bare minimum
  - Meeting Americans with Disabilities Act (ADA) Compliance and Web Content Accessibility Guidelines (WCAG) necessary but not sufficient
- Research teams, technologists, & all partners should be mission-aligned

Suggestion 2: Cultivate multidisciplinary teams

- Greater variety of disciplines, the better
- Will likely need to spend time creating shared language & understanding

Suggestion 3: Create via participatory methodologies

- Co-design: Diverse voices included directly in all aspects of the the design process (e.g., defining the problem space, possible solutions, strategies for implementation)

Question 8

Ranking

App Name Ranking

Please rank order the names, from the one you like the most to the one you like the least.

You can drag and drop the app names to move them around.

Option	Average position (mean)	Average position (median)
WellWithin	2	1
HerHealth Coach	2.9	3
WellnessforHer	3.1	2.5
Bridges	3.7	3.5
Empower Coach	4.6	5
BrightSpots	4.7	5

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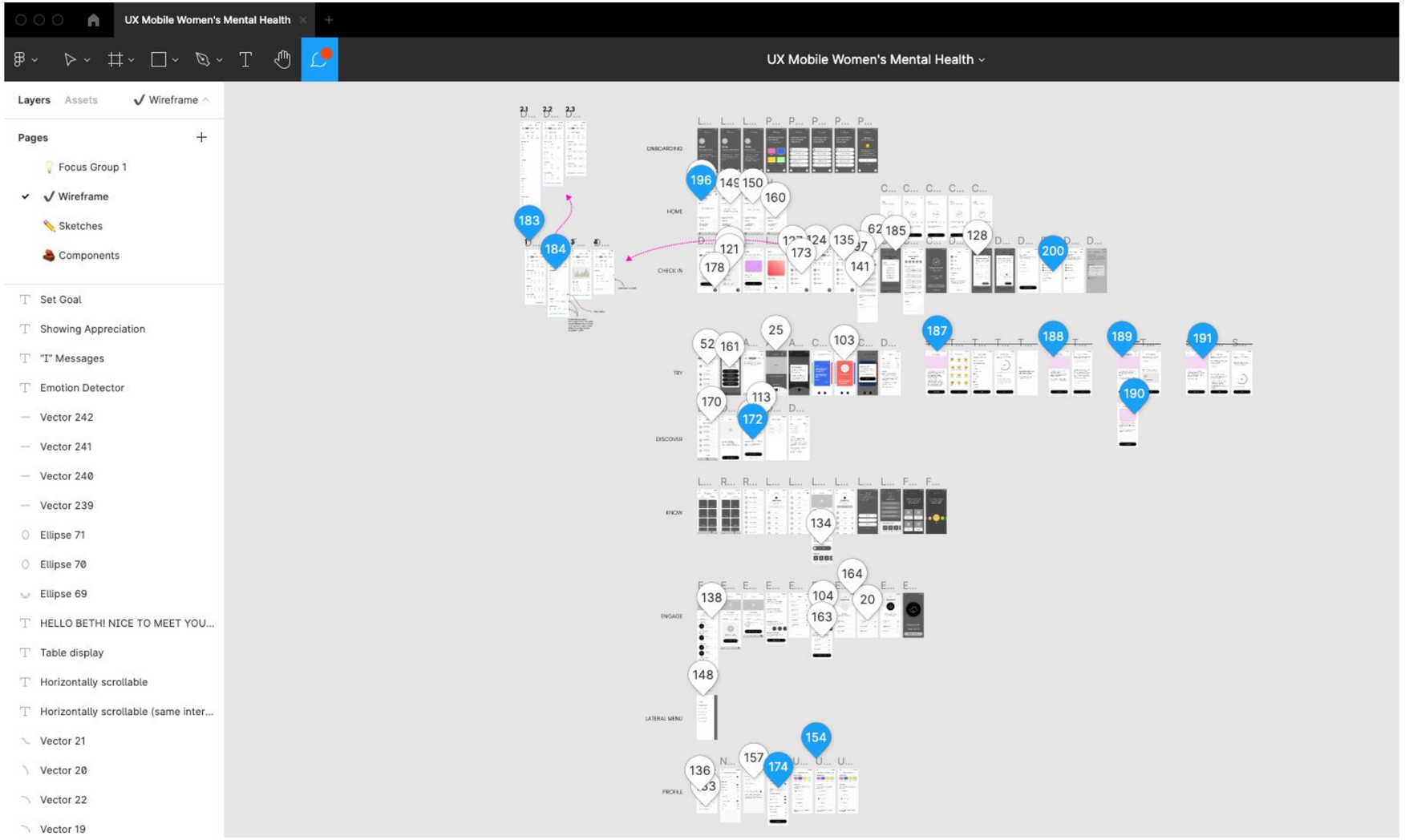
Suggestion 4: Iterate early and often



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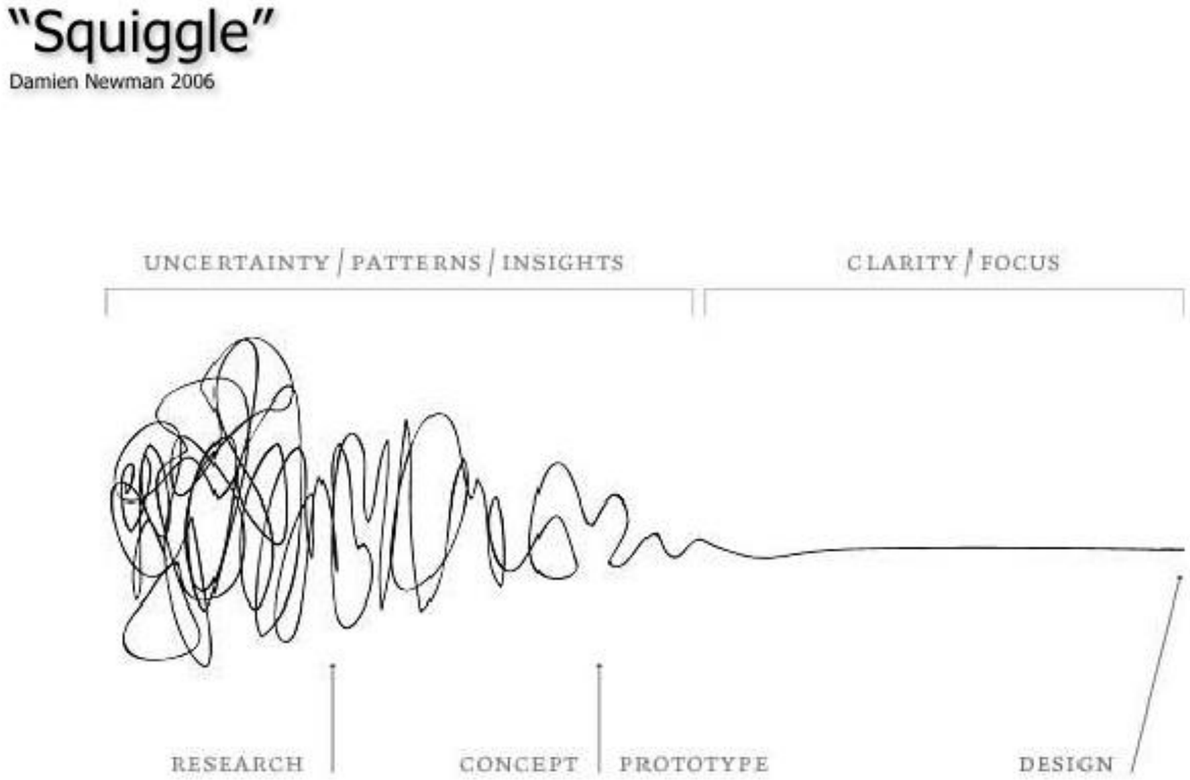
Suggestion 5: Allow space for a non-linear process(es)

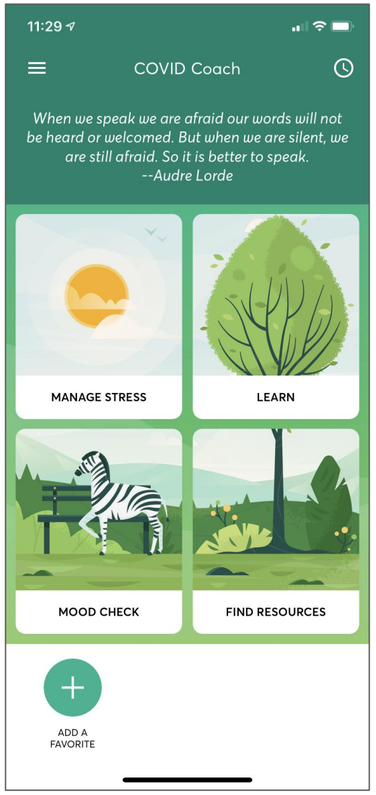


Suggestion 6: Focus on digital health literacy and engagement

- Design for promoting digital health literacy - simplicity and ease of use
- Understand what meaningful engagement looks like & meet individuals where they are at

	Frequency of Events	% of Total Key Events	Frequency of Unique Users	% of Total Users
Manage Stress Tools	325,691	70.40%	28,009	58.82%
Learn	52,123	11.27%	10,124	20.54%
Mood Check (goal tracking + assessments)	47,821	10.34%	13,510	27.40%
Find Resources	37,016	8.00%	9,418	19.10%
Total	462,651	100%	49,297	*

Observation Window = May 1, 2020 - October 31, 2020



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Suggestion 7: Ethically approach data collection & uses

- Informed consent is key, especially among historically underserved and/or vulnerable populations
- Focus on the six Vs (Wesson et al., 2022)
  - virtuosity (equity and ethics of big data)
  - volume (size of data)
  - veracity (trustworthiness of data)
  - variety (types of data)
  - value (usefulness of data for decision-making)
  - velocity (speed with which data are collected/processed)

Suggestion 8: Plan for tailored dissemination & implementation strategies from the outset

30 Days of Self-Care with COVID Coach

Quick Guide for 30 Days of Self-Care

Download the COVID Coach app and begin your 30 days of self-care today!

To download the app, open your smartphone camera and scan the QR code. Follow the prompts to go to the App Store or Google Play, download the app, and install it. Each day, open the app and follow the steps below for recommended tools that you can try!

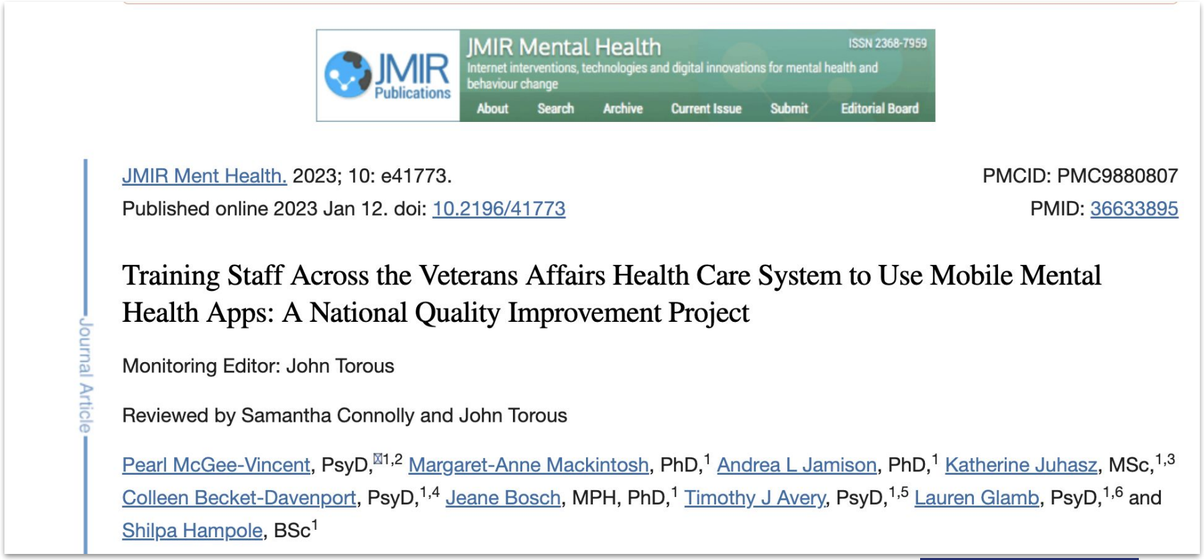
Readings can be found in the Learn section. All tools can be found in Manage Stress.

Day 1	Practice Deep *Breathing* tool	Day 16	Try a tool in *Creating Space for Myself* section
Day 2	Track *Well-Being* in Mood Check	Day 17	Practice *Finding Meaning* tool
Day 3	Read *What to Expect* in *Staying Well*	Day 18	Try *Showing Appreciation* tool
Day 4	Enable *Daily Inspiring Quote* with clock icon	Day 19	Try a tool in *Sleep Struggles* section
Day 5	Read Sleep in *Staying Balanced*	Day 20	Practice *Mindful Walking* tool
Day 6	Read *Facing Xenophobia and Racism* in *Staying Safe*	Day 21	Practice *Change Your Perspective* tool
Day 7	Read *Physical Activity* in *Staying Balanced*	Day 22	Try one suggestion in *Daily Rituals* tool
Day 8	Review *Crisis Support* options in *Find Resources*	Day 23	Practice *My Feelings* tool
Day 9	Practice *Body Scan* tool	Day 24	Try *Re-Connecting with My Partner* in *Relationship Tools*
Day 10	Set a personal goal in *Mood Check*	Day 25	Read about helping your children in *Staying Together*
Day 11	Try *"I" Messages* in *Relationship Tools*	Day 26	Browse available resources in *Find Resources*
Day 12	Practice *Thought Shifting* tool	Day 27	Try one suggestion in *Connect with Others* tool
Day 13	Try an activity from Indoor *Activities with Kids* tool	Day 28	Practice *Positive Imagery* tool
Day 14	Practice *Self-Compassion* tool	Day 29	Practice *Grounding* tool
Day 15	Try *Soothing Images* tool	Day 30	Read *Staying Strong* in *Staying Well* section

Questions or comments?
Email: MobileMentalHealth@va.gov

National Center for PTSD

1



JMIR Publications

JMIR Mental Health
ISSN 2368-7959
Internet interventions, technologies and digital innovations for mental health and behaviour change
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Journal Article

JMIR Ment Health. 2023; 10: e41773.
Published online 2023 Jan 12. doi: 10.2196/41773
PMCID: PMC9880807
PMID: 36633895

Training Staff Across the Veterans Affairs Health Care System to Use Mobile Mental Health Apps: A National Quality Improvement Project

Monitoring Editor: John Torous

Reviewed by Samantha Connolly and John Torous

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Designing for Equity & Access: Suggestion Summary

1	Equity and access must be central
2	Cultivate multidisciplinary teams
3	Create via participatory methodologies
4	Iterate early and often
5	Allow space for a non-linear process(es)
6	Focus on digital health literacy & engagement
7	Ethically approach data collection & uses
8	Plan for tailored dissemination & implementation strategies from the outset

Concluding Thoughts

1. Designing for equity and access has the potential to improve overall quality of digital health tools
    - May also have a significant economic impact - in the U.S., health disparities cost an estimated $93 billion in excess medical care costs annually (Rock Health, 2024)
2. Multi-level determinants of digital health equity require more research (Lyles et al., 2023)
3. Meaningful partnerships are just as impactful as specific technologies
    - Technology is always evolving - relationships persist over time
4. Digital health equity → digital health inclusion and justice (Figueroa et al., 2022; Rodriguez et al., 2022)

Thank you!

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