Conducting Research at the Intersection of HCI and Health: Building and Supporting Teams with Diverse Expertise to Increase Public Health Impact

Elena Agapie
eagapie@uci.edu
University of California, Irvine
USA

Ravi Karkar
rkarkar@cs.umass.edu
University of Massachusetts Amherst
USA

Tricia Aung
taung@uw.edu
University of Washington
USA

Eleanor Burgess
eleanor.burgess@elevancehealth.com
Elevance Health
USA

Munya Joel Chinguwa
joel@hcdexchange.org
HCDExchange
Kenya

Andrea Graham
andrea.graham@northwestern.edu
Northwestern University
USA

Pedja Klasnja
klasnja@umich.edu
University of Michigan
USA

Aaron Lyon
lyona@uw.edu
University of Washington
USA

Terika McCall
terika.mccall@yale.edu
Yale University
USA

Sean Munson
smunson@uw.edu
University of Washington
USA

Francisco Nunes
francisco.nunes@aicos.fraunhofer.pt
Fraunhofer Portugal AICOS
Portugal

Katie Osterhage
katieost@uw.edu
University of Washington
USA

ABSTRACT

CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**; **Collaborative and social computing**; • **Applied computing** → *Health informatics*; *Health care information systems.*

KEYWORDS

health research, collaborative research, team science, health impact

ACM Reference Format:
Elena Agapie, Ravi Karkar, Tricia Aung, Eleanor Burgess, Munya Joel Chinguwa, Andrea Graham, Pedja Klasnja, Aaron Lyon, Terika McCall, Sean Munson, Francisco Nunes, and Katie Osterhage. 2024. Conducting Research at the Intersection of HCI and Health: Building and Supporting Teams with Diverse Expertise to Increase Public Health Impact. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI EA '24), May 11–16, 2024, Honolulu, HI, USA.* ACM, New York, NY, USA, 6 pages. https://doi.org/10.1145/3613905.3636298

1 ABSTRACT

Research at the intersection of human-computer interaction (HCI) and health is increasingly done by collaborative cross-disciplinary teams. The need for cross-disciplinary teams arises from the interdisciplinary nature of the work itself—with the need for expertise in a health discipline, experimental design, statistics, and computer science, in addition to HCI. This work can also increase innovation, transfer of knowledge across fields, and have a higher impact on communities. To succeed at a collaborative project, researchers must effectively form and maintain a team that has the right expertise, integrate research perspectives and work practices, align individual and team goals, and secure funding to support the research. However, successfully operating as a team has been challenging for HCI researchers, and can be limited due to a lack of training, shared vocabularies, lack of institutional incentives, support from funding agencies, and more; which significantly inhibits their impact. This workshop aims to draw on the wealth of individual experiences in health project team collaboration across the CHI community and beyond. By bringing together different stakeholders involved in HCI health research, together, we will identify needs experienced during interdisciplinary HCI and health collaborations. We will identify existing practices and success stories for supporting team collaboration and increasing HCI capacity in health research. We aim for participants to leave our workshop with a toolbox of methods to tackle future team challenges, a community of peers who can strive for more effective teamwork, and feeling positioned to make the health impact they wish to see through their work.

2 BACKGROUND

HCI research in the health domain is overwhelmingly conducted in cross-disciplinary (known as "cross-functional" in industry) teams of researchers, clinicians, practitioners, patients, community members, and other stakeholders. While health work is well established

CHI EA '24, May 11–16, 2024, Honolulu, HI, USA

ACM ISBN 979-8-4007-0331-7/24/05
https://doi.org/10.1145/3613905.3636298

in CHI, it is increasingly common to use HCI and human-centered design (HCD) in health research. The National Institutes of Health (NIH), the primary agency funding health research in the United States, has invested over 200 million dollars in nearly 500 projects that adopt human-centered design approaches [6]. International development agencies and foundations are investing significant resources into the use of design for global health [2]. Several research and training centers have introduced human-centered methods to health research [7]. Promoting health outcomes through technology is a core aspect of Information Communication/HCI Technologies for Development, focusing on how to design technologies for people in low- and middle-income country settings [23].

The success of such research relies on successful collaborations between HCI, health professionals and other stakeholders using HCI in health projects, and the successful integration of their goals, distinct research approaches and expertise that different team members bring. Collaboration challenges can cause divisiveness in a team and even make researchers give up on cross-disciplinary research [16, 40]. A lack of recognition, training, and support of cross-disciplinary work can deter early-career researchers in conducting such work [18]. This can harm the success of cross-disciplinary research, limiting the innovation that might result from the collaboration [18].

The organizers of this workshop have collectively engaged in decades of projects to bring human-centered design and HCI expertise to the design and evaluation of health interventions, and to bring health-science expertise into human-centered design and HCI efforts. Our team involves HCI, health, implementation science researchers, practitioners in industry and non-profits across the world. We have worked in teams developing health solutions in settings such as primary care, urban and rural contexts, schools, community centers dedicated to supporting individuals with a history of incarceration [20]. We have designed a range of technologies and interventions, from mobile applications [25, 35], web experiences, medical billing systems, and novel medical devices [24, 42], up to large-scale health interventions and accompanying strategies for launching and sustaining them [30]. We have developed frameworks, methods, and translational resources to support cross-disciplinary work [19, 28, 29, 32, 34], started initiatives to increase HCD capacity in nonprofit and governmental settings [3], identified team science research approaches to better support HCI and health collaborations [8], directed and participated in research centers at the intersection of HCD and health [4, 5], and organized prior events on tackling cross-disciplinary issues [31].

Across these projects, we have achieved several successes, both in advancing research and developing team expertise. However, we have also encountered challenges including determining how and when to best apply our expertise, when we should directly engage in projects versus support them from a greater distance, in navigating different funder priorities, and how to show appropriate impact of our work in industry settings. We believe that it is essential to delineate these challenges across many people's health technology team experiences to understand the breadth of the current state of cross-disciplinary and cross-functional collaboration. The COVID-19 pandemic has further surfaced the need and value of global collaboration to address ever-increasing health challenges, and through even more demand and possibilities for teams to emerge at a distance.

We propose this workshop to:

- **Systematically discuss the challenges that cross-disciplinary teams encounter** in successfully conducting research at the intersection of HCI and Health
- Outline a **research and practice agenda for how to better support teams** working on health problems in growing HCI capabilities.
- **Outline recipes for success** for how teams can more successfully conduct research that addresses health problems using HCI tools to improve the health of individuals and communities.

3 SEEDS FOR DISCUSSION: CURRENT CHALLENGES TO CONDUCTING SUCCESSFUL HEALTH RESEARCH IN CROSS-DISCIPLINARY MULTI-STAKEHOLDER TEAMS

Creating a cross-disciplinary team in the first place can be a challenge. Even when a team exists, team members can have different values and priorities, workflows that are not aligned, communication of results between team members [10], misaligned language [37], different timelines, different competitive expectations outside of the team or lack of face-to-face interaction [36]. When a team is forming, members need to build communication practices, shared identity, and shared conceptualization of a problem space to work together [40]. Further, teams need to operate within the infrastructure of different roles they might hold outside the team (e.g. researcher, practitioner, community member) and negotiate the different incentives and responsibilities they hold. Drawing on existing research in team science, HCI, public health, implementation science, we identify three overarching themes that include challenges and opportunities to support teams: working across disciplines, working with communities, and increasing HCI capacity in health teams. We present these three areas to jump-start the reflections of our workshop participants, expecting to grow these discussion points during the workshop.

3.1 Working across disciplines as a team

Cross-disciplinary research in HCI focused on health problems has often involved working with a health partner or clinician. Conducting health HCI research in teams can involve many challenges including conceptualizing research problems jointly throughout the research lifecycle, or balancing time spent uncovering user needs for HCI researchers with the goals of health researchers to develop interventions and evidence-driven practice [8, 11, 14]. Research approaches and outcomes between HCI and Health can be different [8, 11, 12]. Methodological differences in HCI and Health can lead to challenges in executing research. HCI emphasizes the user needs, but that can lead to designing more complex health interventions that are difficult to evaluate [33], or solutions that are too simplistic and do not account for multisectoral issues. Working in a clinical setting and building relationships with clinicians can be constrained due to complex hospital infrastructure [9, 13, 21]. Limited time with

patients and clinicians can lead to inappropriate solutions [15, 43]. The timelines to conduct research can be misaligned due to differences in the length of field studies, evaluation of the effectiveness of health interventions, administrative delays in hospitals, software development timelines and approaches, and funding expectations [8, 14, 27, 33]. The evaluation of the effectiveness of well-established technologies in health research can be incompatible with HCI's desire for novelty [17, 33]. Academic teams are increasingly more diverse, expanding to include more and more stakeholders, such as patients, community members, staff, engineers, and industry partners, which raises new challenges about how to effectively work together, include team members meaningfully, and support their goals, as well as support the goals of the research. Some researchers are identifying ways to navigate such challenges, but they often involve individual problem-solving of how to work in a team [8]. This workshop will allow us to synthesize challenges that researchers are experiencing across the research community, and recipes for how to address them.

3.2 Working with communities as a team

Health interventions can be predisposed to risks of equity imbalances when solutions do not match the needs of community members [41]. Driven by existing HCI research practices and our own experiences, we have identified approaches for successfully working with community members [22]. Effective collaborations between HCI and health researchers should also include community members and patients as partners [39]. While researchers may act as subject matter experts, they may not have the insight gained through lived experience to create and implement successful research projects and interventions. Community members should be invited as experts to join the team from the beginning of the research and development pipeline. The valuable insights of community members are needed to: (1) provide context and make sure the team is asking the right questions and defining meaningful outcomes; (2) identify strengths within communities (e.g., resources, leaders within the community), and (3) help to define the scope of the project and reasonable expectations for participation and implementation. An environment where co-learning and co-creating with community members must be a priority when beginning the collaboration. The team must provide opportunities for community members to lead, offer compensation, and adequately acknowledge their contributions. Although there are some resource and training considerations when working with and within communities (e.g., cost and time for training), there are potential benefits of improving research quality and health outcomes, building relationships, and establishing trust within communities.

3.3 Building HCI capacity in teams with varying HCI expertise

Appropriate team member expertise lays a foundation for a team to successfully carry out a project, with emphasis on knowledge integration across team members. Research emphasizes the importance of professional development as a pathway to developing a common understanding of team member knowledge [18, 38]. We see capacity building of HCI and HCD methods, defined as strengthening skills of HCI and supporting HCI professional development opportunities, among team members who have limited HCI expertise. While HCI expertise is critical, it might not always be possible to have a researcher or even practitioner on the team, raising questions about how to increase HCI capacity on teams. Gaining expertise in design is a common request among non-HCI team members, particularly for those who intend to use HCI methods in other projects. While self-paced online courses, bootcamps, certificates, and master's degrees exist, these programs may not be aligned with health team members' needs, or cost or time prohibitive. One-off professional development training might not lead to sustained changes in practices [26]. Furthermore, training opportunities do not necessarily use case studies that are directly relevant to health team members' research or may feature methods that may not be contextually appropriate. Finally, there is also the question of what level of mastery of HCI may be appropriate for a health researcher (e.g. having basic understanding of HCI methods vs knowledge to know where to seek additional help).

4 ORGANIZERS

- **Elena Agapie, PhD (contact)** - Assistant Professor, UC Irvine. She studies and designs technologies that draw on health evidence-based interventions in ways that fit with people's lived experiences. Her research also identifies challenges and opportunities for collaboration at the intersection of HCI and Health
- **Ravi Karkar, PhD** - Assistant Professor, University of Massachusetts Amherst. His research focuses on designing, developing, and evaluating tools that can enable people to gather data and interpret personal aspects of their medical condition in the context of their day-to-day lives.
- **Tricia Aung, MSPH, MS** - PhD student, University of Washington. Cultural and contextual adaptations to design methods for improving public health in low- and middle-income countries, and advancing the intersection of implementation science and HCD/HCI.
- **Aaron Lyon, PhD** - Professor, University of Washington. Improving the accessibility and effectiveness of community-based health services, redesigning mental health interventions (e.g., psychotherapies) to improve their adoption potential, and developing implementation strategies to support innovation adoption and use.
- **Sean Munson, PhD** - Professor, University of Washington. Designing and evaluating health interventions, with a focus on using personal data to understand one's health, individually and in collaborations with family, peers, and experts.
- **Katie Osterhage, MMS** - Research Scientist at the University of Washington's ALACRITY Center. She began her career in global health; recent areas of work include health information management among older adults and access to medication treatment for Opioid Use Disorder.
- **Eleanor Burgess, PhD** - Service Design Researcher, Chief Experience Office, Elevance Health. Digital mental health and usage of AI tools including how people use technology to self-manage and maintain wellness and how people make sense of health information, make decisions, and track their health and well-being.

- **Munya Joel Chinguwa** - Senior HCD Designer, HCDExchange. Leads and implements design work within the Global South focused on Adolescent and Youth Sexual and Reproductive Health (AYSRH), currently pivoting to Global Health.
- **Andrea Graham, PhD** - Assistant Professor & Co-Director, Center for Behavioral Intervention Technologies, Northwestern University Feinberg School of Medicine. Designing, optimizing, and implementing digital mental and behavioral health interventions.
- **Pedja Klasnja, PhD** - Associate Professor, University of Michigan. His research focuses on the development and evaluation of technologies for health behavior change and maintenance. In recent years, he has been focusing on just-in-time adaptive interventions, digital interventions that use AI algorithms to personalize intervention provision to maximize intended health outcomes and minimize user burden.
- **Terika McCall, PhD, MPH, MBA**- Assistant Professor, Yale University. Inclusive design and usability testing of digital health tools for diverse populations. Understanding the acceptability of accessing mental health services and resources through use of digital mental health tools.
- **Francisco Nunes, PhD** - Senior Researcher at Fraunhofer Portugal AICOS, concerned with understanding self-care and designing self-care technologies. He has led four consortia, of research and industry partners, to create healthcare technologies that would align with existing practices and appropriately address existing needs.

5 PRE-WORKSHOP PLANS

Participants and recruitment. We will recruit participants who have experience working in cross-disciplinary, multi-stakeholder teams involving HCI approaches focused on addressing a health research project. We will work to ensure that our workshop includes perspectives of different facets of a multidisciplinary team and covers different contexts of conducting such research (e.g., rural vs. urban, geopolitical). We plan to recruit participants via ACM and field-specific list-servs, social media channels, as well as via the organizers' professional networks to reach participants from related fields. We will leverage the networks of the organizing team that include health and implementation science researchers, communities across different countries, and include industry and non-profit organizations.

Submissions and selection process. Prospective participants will be asked to submit a 1000-word position statement based on a set of related prompts, designed to surface the experiences on which they will draw in their contributions to and participation in the workshop as well as their goals for participation, as described in the Call for participation. Regardless of prompt, participants will be instructed to write accessible [1] position papers for a broad audience, avoiding field-specific jargon, to allow participants from diverse disciplines to understand and engage with their position. Submissions will be reviewed by an interdisciplinary panel of organizers according to the following criteria: (1) involving participants who work in the health space in multidisciplinary teams (2) involving a diverse group that includes faculty, graduate students, practitioners, researchers from multiple disciplines, and those who have done substantial work in the field alongside those interested in becoming involved but have not yet made a significant contribution.

6 WORKSHOP FORMAT

We propose a synchronous, virtual event approximately one month in advance of the one-day, in person workshop at CHI 2024. While this choice splits conversations, this allows us to ensure high-quality participation in each format without being dependent on Internet connectivity or high-quality audiovisual conferencing equipment at the venue. The virtual event will last for up to three hours and focus on the following: (1) overview of team science and teamwork in HCI health research with a goal of ensuring a baseline understanding among all participants, (2) large group discussion of challenges, gaps, and opportunities for working more effectively as a team in the HCI health space, and (3) reflecting on the presentations and discussions and organizing themes to be shared during the in-person workshop at the CHI conference. Those who can attend CHI in Honolulu will then participate in a one-day in-person workshop. This in-person workshop will maximize opportunities for collaborative idea generation, creativity, and community-building. We anticipate a maximum of 35 participants. This two-stage approach is driven by previous successful workshops organized by some members of the team [31].

6.1 Asynchronous engagement

All workshop information, including recruiting and submission information, the information contained in this proposal, and accepted submissions, will be available on a public website before, during, and after the workshop as both an organizing tool and record of the day's progress. In advance of the virtual workshop, we will create a Slack workspace for participants in both workshops and any co-authors on position papers who are interested in the topic but may not be able to attend. This workspace will be private, to facilitate discussion that builds toward a shared understanding across both the virtual and in-person events, and the time between and after. During the in-person event, we will rotate shared note-taking responsibilities and make informal notes available to remote participants. We will distribute a survey about accessibility needs for the events in advance and work with participants and, as needed, CHI organizers to address those needs (e.g., in-person captioners).

6.2 Virtual and In-person Agenda

Virtual workshop agenda (by workshop time):

- 0:00-1:00: Brief introductions and summary of goals (15 min). Overview of Challenges and Approaches for building managing and maintaining cross-disciplinary teams HCI and health research teams, including highlights we identify in position papers (30 min). Participants cluster what they see as key overlaps or tensions using a Miro board, generating breakout topics (15 min).
- 1:00-2:00: Break, organizers refine groups as necessary (10 min). Discussion within breakout groups about key insights from each field and topics requiring more work.
- 2:00-2:25: Rotate. Form new groups with one or more members of each breakout group to share out discussion.

- 2:30-3:00: Plenary discussion and sharing (20 min). Next steps. Participants make tiny commitments for the next six months, organizers note how discussion at this event will be carried forward into the agenda for the in-person workshop and plans for after (10 min).

In-person workshop agenda:

- 9:00–9:30: Introduction and Grounding: Brief introductions of the organizers and goals of the workshop; quick participant introductions.
- 9:30–10:15: Overviews of team science in HCI and health research, including highlights and provocations we identify in position papers, with a goal of ensuring a baseline understanding among all participants.
- 10:15–10:45: Large group discussion of challenges, gaps, and opportunities for creating more effective capable teams in the HCI health space.
- 10:45–11:15: Coffee break and informal discussion.
- 11:15–12:00: "Speed Networking:" In rotating pairs, participants discuss collectively relevant topics that they would like to explore further and establish shared interests; goal is for all participants to talk to each other.
- 12:00-12:45: Large Group Agenda-Setting: Reflecting on the presentations and speed networking discussions, the larger group synthesizes the general topics of conversation into organizing themes for the rest of the workshop.
- 12:45–1:45: Lunch: Seating arrangements to maximize new connections. Small group of organizers to spend part of this time setting up topic groups (n = 4-5) for the afternoon session.
- 1:45–3:30: Topic Breakout Groups: Participants propose discussion topics by posting them on a bulletin board and groups are formed around these topics.
- 3:30–4:30: Large Group Discussion/Reflection: Report-outs from small groups lead into discussion of major priorities moving forward and next steps.
- 4:30-5:00: Concrete Next Steps: Participants break into two groups based on their own interest in how to move forward, each facilitated by a relevant group of organizers. One group will focus on putting together outlines for the summary articles, while the other can focus on setting up new projects and collaborations.
- 6:00: Optional group dinner.

6.3 Post workshop plans

We hope to cultivate a network among scholars and practitioners with different areas of experience, to foster collaboration, and to raise collective awareness of the challenges that researchers face in engaging in HCI health collaborative work. We plan to write articles on topics such as challenges that researchers encounter when working together, recipes for success that researchers identify in working in health teams, training opportunities to increase teams abilities to use HCI. We will summarize the discussions and disseminate our findings to the broader community, e.g., through an ACM Interactions or longer survey of the field. We plan to write similar articles aimed at a health and practitioner audience for how to work with HCI researchers or practitioners, and how to increase HCI expertise. We will share those papers as Medium articles, on the workshop website, or through submissions to health venues (e.g. AMIA, SBM). We will work with our institutions' offices of media relations and communications to facilitate broad awareness and understanding of workshop results via various media channels (e.g., newsletter, departmental/university websites) and we will engage social media to further disseminate findings to scientific and public communities (e.g., via Twitter).

7 CALL FOR PARTICIPATION

Researchers have started to identify challenges and gaps in developing research programs and projects at the intersection of HCI and health. This workshop aims to bring together stakeholders in this research space to articulate a research agenda to enhance practices for addressing such gaps. We invite position papers that address prompts such as:

- What challenges have you encountered while working in cross-disciplinary multi-stakeholder teams on projects at the intersection of HCI and health? What strategies have you discovered that have been effective at dealing with these challenges (e.g. in building, starting, or maintaining collaborations)?
- What experiences do you have developing cross-disciplinary research team capabilities for engaging in HCI, as they plan, launch, or work to sustain projects?
- How do you navigate forming a cross-disciplinary partnership involving both HCI and health scholars, versus when do you try to increase the capability of a team in the other field?

Position papers should be written in language approachable to people working across fields, follow guidelines for accessible PDFs, and be under 1,000 words (any format). Selected participants will be a diverse group including faculty, students, practitioners, researchers from relevant fields, and those who have done substantial work in the field, alongside those interested in becoming involved but who have not yet made a significant contribution. Accepted submissions will be shared on https://sites.uci.edu/hcihealthteams/. Submission details are included on the website. At least one author must participate in 1. the remote workshop (date TBD) and/or 2. the in-person workshop, and must register for at least one day of the conference.

ACKNOWLEDGMENTS

This work is supported by the US National Institute of Mental Health award P50MH115837, the US National Institute of Health award 1P50MH126219, and the National Science Foundation award IIS-2233738. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the National Science Foundation.

REFERENCES

[1] Retrieved on October 12, 2023. Accessible Writing Guide. "https://www.sigaccess.org/welcome-to-sigaccess/resources/accessible-writing-guide/".
[2] Retrieved on October 12, 2023. Design for Health Consortium. "https://www.designforhealth.org/".
[3] Retrieved on October 12, 2023. HCDExchange. "https://hcdexchange.org/".
[4] Retrieved on October 12, 2023. Northwestern University ALACRITY Center. "https://cbits.northwestern.edu/our-research/nimh-alacrity-center/index.html".
[5] Retrieved on October 12, 2023. University of Washington ALACRITY Center. "https://www.uwalacrity.org/".
[6] Retrieved on September 8, 2021. NIH grants including HCI approaches. "https://reporter.nih.gov/search/Aac-SUWwXkGnSTGfCqxA4g/projects".

[7] Retrieved on September 8, 2021. NIH Training and Center Grants Including HCI approaches. "https://reporter.nih.gov/search/xesAWWCm_0Wxwn9tbg0BzQ/projects".

[8] Elena Agapie, Shefali Haldar, and Sharmaine G Poblete. 2022. Using HCI in Cross-Disciplinary Teams: A Case Study of Academic Collaboration in HCI-Health Teams in the US Using a Team Science Perspective. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (2022), 1–35.

[9] Deepti Aggarwal, Thuong Hoang, Bernd Ploderer, Frank Vetere, Rohit Ashok Khot, and Mark Bradford. 2020. Lessons Learnt from Designing a Smart Clothing Telehealth System for Hospital Use. In *32nd Australian Conference on Human-Computer Interaction*. 355–367.

[10] Aruna D Balakrishnan, Sara Kiesler, Jonathon N Cummings, and Reza Zadeh. 2011. Research team integration: What it is and why it matters. In *Proceedings of the ACM 2011 conference on Computer supported cooperative work*. 523–532.

[11] Ann Blandford. 2018. Lessons from working with researchers and practitioners in healthcare. *Interactions* 26, 1 (2018), 72–75.

[12] Ann Blandford. 2019. HCI for health and wellbeing: challenges and opportunities. *International journal of human-computer studies* 131 (2019), 41–51.

[13] Ann Blandford, Erik Berndt, Ken Catchpole, Dominic Furniss, Astrid Mayer, Helena Mentis, Aisling Ann O'kane, Tom Owen, Atish Rajkomar, and Rebecca Randell. 2015. Strategies for conducting situated studies of technology use in hospitals. *Cognition, technology & work* 17, 4 (2015), 489–502.

[14] Ann Blandford, Jo Gibbs, Nikki Newhouse, Olga Perski, Aneesha Singh, and Elizabeth Murray. 2018. Seven lessons for interdisciplinary research on interactive digital health interventions. *Digital health* 4 (2018), 2055207618770325.

[15] Lorraine R Buis and Jina Huh-Yoo. 2020. Common Shortcomings in Applying User-Centered Design for Digital Health. *IEEE Pervasive Computing* 19, 3 (2020), 45–49.

[16] Lisa M Campbell. 2005. Overcoming obstacles to interdisciplinary research. *Conservation biology* 19, 2 (2005), 574–577.

[17] Franceli L Cibrian, Elissa Monteiro, Sabrina EB Schuck, Michele Nelson, Gillian R Hayes, and Kimberley D Lakes. 2022. Interdisciplinary Tensions When Developing Digital Interventions Supporting Individuals With ADHD. *Frontiers in Digital Health* 4 (2022).

[18] National Research Council et al. 2015. Enhancing the effectiveness of team science. (2015).

[19] Alex R Dopp, Kathryn E Parisi, Sean A Munson, and Aaron R Lyon. 2019. A glossary of user-centered design strategies for implementation experts. *Translational behavioral medicine* 9, 6 (2019), 1057–1064.

[20] Marisol Foumakoye, Meredith Campbell Britton, Emile Ansari, Monya Saunders, Terika McCall, Emily A Wang, Lisa B Puglisi, T Elizabeth Workman, Qing Zeng-Treitler, Yin Ying, et al. 2023. Personal Health Libraries for People Returning From Incarceration: Protocol for a Qualitative Study. *JMIR Research Protocols* 12, 1 (2023), e44748.

[21] Dominic Furniss, Rebecca Randell, Aisling Ann O'kane, Svetlena Taneva, Helena Mentis, and Ann Blandford. 2014. Fieldwork for healthcare: guidance for investigating human factors in computing systems. *Synthesis Lectures on Assistive, Rehabilitative, and Health-Preserving Technologies* 3, 2 (2014), 1–146.

[22] Gillian R Hayes. 2011. The relationship of action research to human-computer interaction. *ACM Transactions on Computer-Human Interaction (TOCHI)* 18, 3 (2011), 1–20.

[23] Melissa R Ho, Thomas N Smyth, Matthew Kam, and Andy Dearden. 2009. Human-computer interaction for development: The past, present, and future. *Information Technologies & International Development* 5, 4 (2009), pp–1.

[24] Ravi Karkar, Rafal Kocielnik, Xiaoyi Zhang, Jasmine Zia, George N Ioannou, Sean A Munson, and James Fogarty. 2018. Beacon: Designing a portable device for self-administering a measure of critical flicker frequency. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 2, 3 (2018), 1–27.

[25] Ravi Karkar, Jessica Schroeder, Daniel A Epstein, Laura R Pina, Jeffrey Scofield, James Fogarty, Julie A Kientz, Sean A Munson, Roger Vilardaga, and Jasmine Zia. 2017. Tummytrials: a feasibility study of using self-experimentation to detect individualized food triggers. In *Proceedings of the 2017 CHI conference on human factors in computing systems*. 6850–6863.

[26] Kevin M King, Michael D Pullmann, Aaron R Lyon, Shannon Dorsey, and Cara C Lewis. 2019. Using implementation science to close the gap between the optimal and typical practice of quantitative methods in clinical science. *Journal of abnormal psychology* 128, 6 (2019), 547.

[27] Predrag Klasnja, Sunny Consolvo, and Wanda Pratt. 2011. How to evaluate technologies for health behavior change in HCI research. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 3063–3072.

[28] Predrag Klasnja, Eric B Hekler, Elizabeth V Korinek, John Harlow, and Sonali R Mishra. 2017. Toward usable evidence: optimizing knowledge accumulation in HCI research on health behavior change. In *Proceedings of the 2017 CHI conference on human factors in computing systems*. 3071–3082.

[29] Predrag Klasnja, Eric B Hekler, Saul Shiffman, Audrey Boruvka, Daniel Almirall, Ambuj Tewari, and Susan A Murphy. 2015. Microrandomized trials: An experimental design for developing just-in-time adaptive interventions. *Health Psychology* 34, S (2015), 1220.

[30] AR Lyon, SA Munson, BN Renn, DC Atkins, MD Pullmann, E Friedman, and PA Areán. [n. d.]. Use of human-centered design to improve implementation of evidence-based psychotherapies in low-resource communities: protocol for studies applying a framework to assess usability. JMIR Res Protoc. 2019 Oct 09; 8 (10): e14990. doi: 10.2196/14990.

[31] Aaron Lyon, Sean A Munson, Madhu Reddy, Stephen M Schueller, Elena Agapie, Svetlana Yarosh, Alex Dopp, Ulrica von Thiele Schwarz, Gavin Doherty, Andrea K Graham, et al. 2023. Bridging HCI and Implementation Science for Innovation Adoption and Public Health Impact. In *Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–7.

[32] Aaron R Lyon and Kelly Koerner. 2016. User-centered design for psychosocial intervention development and implementation. *Clinical Psychology: Science and Practice* 23, 2 (2016), 180.

[33] Lena Mamykina, Arlene M. Smaldone, Suzanne R. Bakken, Noemie Elhadad, Elliot G. Mitchell, Pooja M. Desai, Matthew E. Levine, Jonathan N. Tobin, Andrea Cassells, Patricia G. Davidson, et al. 2021. Scaling Up HCI Research: from Clinical Trials to Deployment in the Wild.. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–6.

[34] Alex Mariakakis, Ravi Karkar, Shwetak N Patel, Julie A Kientz, James Fogarty, and Sean A Munson. 2022. Using Health Concept Surveying to Elicit Usable Evidence: Case Studies of a Novel Evaluation Methodology. *JMIR Human Factors* 9, 1 (2022), e30474.

[35] Terika McCall, Megan Threats, Malvika Pillai, Adnan Lakdawala, and Clinton S Bolton III. 2022. Recommendations for design of a mobile application to support management of anxiety and depression among Black American women. *Frontiers in Digital Health* 4 (2022), 1028408.

[36] Gary M Olson and Judith S Olson. 2000. Distance matters. *Human–computer interaction* 15, 2-3 (2000), 139–178.

[37] Judith S Olson and Gary M Olson. 2013. Working together apart: Collaboration over the internet. *Synthesis Lectures on Human-Centered Informatics* 6, 5 (2013), 1–151.

[38] Michael O'Rourke, Stephen Crowley, Bethany Laursen, Brian Robinson, and Stephanie E Vasko. 2019. Disciplinary diversity in teams: integrative approaches from unidisciplinarity to transdisciplinarity. In *Strategies for team science success: Handbook of evidence-based principles for cross-disciplinary science and practical lessons learned from health researchers*. Springer, 21–46.

[39] Malvika Pillai, Ashley C Griffin, Clair A Kronk, and Terika McCall. 2023. Toward Community-Based Natural Language Processing (CBNLP): Cocreating With Communities. *Journal of Medical Internet Research* 25 (2023), e48498.

[40] Maritza R Salazar, Theresa K Lant, Stephen M Fiore, and Eduardo Salas. 2012. Facilitating innovation in diverse science teams through integrative capacity. *Small Group Research* 43, 5 (2012), 527–558.

[41] Tiffany C Veinot, Jessica S Ancker, Heather Cole-Lewis, Elizabeth D Mynatt, Andrea G Parker, Katie A Siek, and Lena Mamykina. 2019. Leveling up: on the potential of upstream health informatics interventions to enhance health equity. *Medical care* 57 (2019), S108–S114.

[42] Philip Vutien, Richard Li, Ravi Karkar, Sean A Munson, James Fogarty, Kara Walter, Michael Yacoub, and George N Ioannou. 2022. Evaluating a Novel, Portable, Self-Administrable Device ("Beacon") That Measures Critical Flicker Frequency as a Test for Hepatic Encephalopathy. *Official journal of the American College of Gastroenterology| ACG* (2022), 10–14309.

[43] Lucretia Williams, Gillian R Hayes, Yuqing Guo, Amir Rahmani, and Nikil Dutt. 2020. HCI and mHealth wearable tech: A multidisciplinary research challenge. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–7.