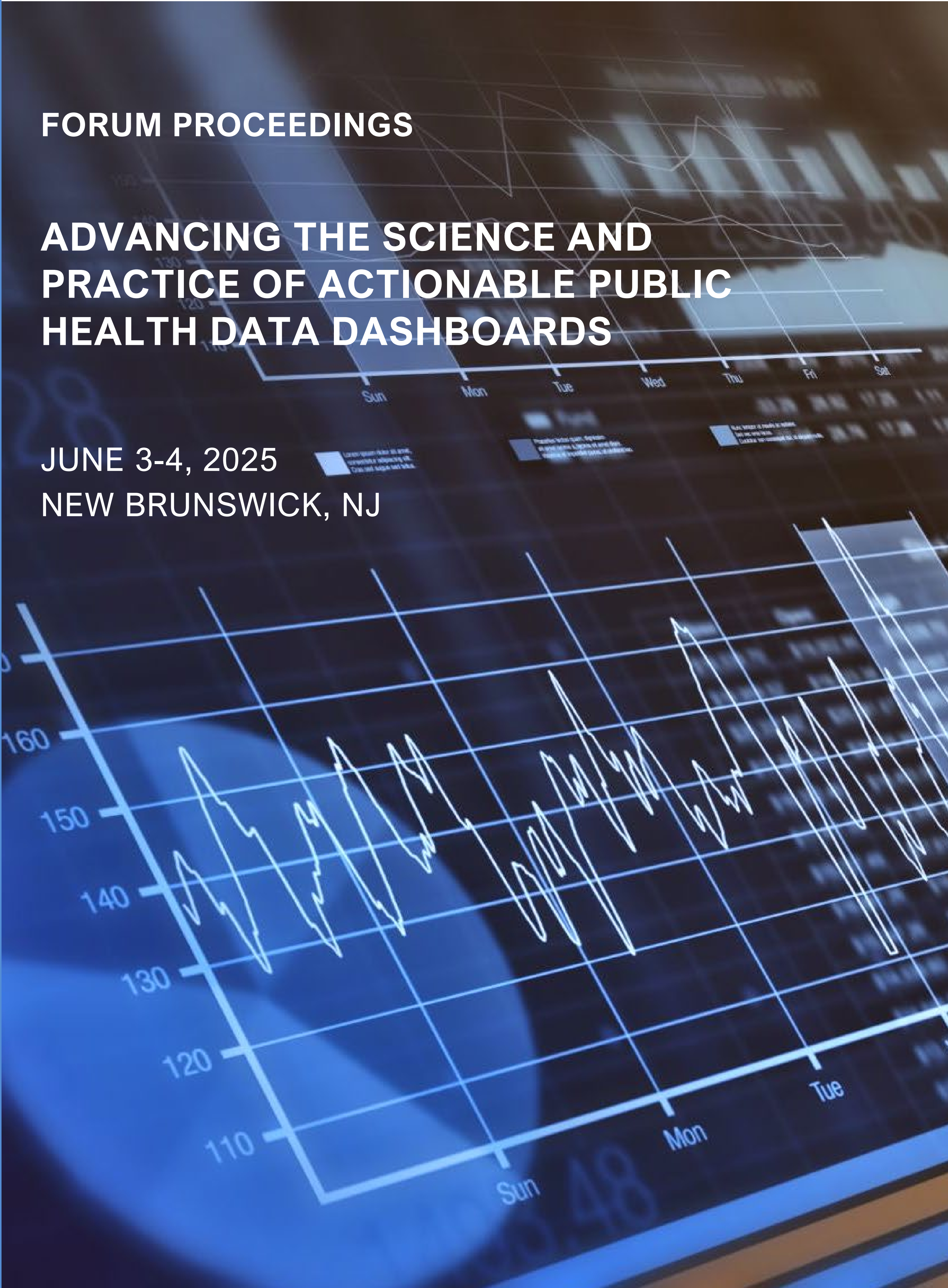

FORUM PROCEEDINGS

ADVANCING THE SCIENCE AND PRACTICE OF ACTIONABLE PUBLIC HEALTH DATA DASHBOARDS

JUNE 3-4, 2025
NEW BRUNSWICK, NJ

CONTENTS

INTRODUCTION AND ACKNOWLEDGMENTS

BACKGROUND AND RATIONALE

Timely access to relevant, comprehensive, accurate, and credible public health data is critical to supporting evidence-informed policy and practice decisions at all levels (individual, organizational, and system), whether for surveillance, monitoring and early warnings; identification, documentation, and analysis of causes and consequences of health-related disparities and inequities; assessment of needs, assets, and preparedness to mitigate or address public health challenges; or planning and implementation of effective public health interventions. Ensuring easy, robust, and equitable access to public health data remains a major focus of public health interventions and investments, and data dashboards are increasingly touted as potentially effective tools for connecting diverse groups of stakeholders and decisionmakers with trusted, timely, and relevant public health data to inform a wide range of decisions and actions.

As use of public health data dashboards is poised to become more integral to local, national, and international public health decisionmaking processes, it is imperative to proactively consider how they may be optimally designed, implemented, improved, and sustained to be actionable, i.e., both usable and useful for promoting evidence-informed, cost-effective, and equitable public health policies and practices. Available research demonstrates that dashboard actionability is a function of several intersecting factors, including data and user characteristics, design elements, decisional goal, and context (strategic, tactical, or operational) and therefore cannot be reduced to a single, standard attribute of dashboards that is applicable in all cases. Rather, actionability is achieved by design, i.e., via a deliberate, iterative process of creating, deploying, evaluating, and improving dashboards that provide an optimal match for goal, function, context, and user knowledge needs with a clear path to action. A unifying framework for guiding the design of actionable public health data dashboards does not currently exist but one is critically needed to advance the science and practice of actionable dashboard design and guide future investments.

Next, because the path from data to action involves multiple stakeholders, the process of designing and implementing actionable dashboards is bound to involve collaborations between dashboard creators and users to optimize usability (fit for form) and usefulness (fit for purpose) while minimizing potential biases and harms from use of these tools. However, the available academic and practitioner literature on the topic mostly offers prescriptions regarding this process (i.e., what should be happening) but much less by way of systematic insights regarding specific decisions, arrangements, and practices involved in setting up and maintaining optimal dashboard co-design processes (i.e., how to collaborate). Producing a basic roadmap of this process (who, what, when, and how) is an important first step in this direction.

Lastly, it stands to reason that use of actionable data dashboards can contribute meaningfully to mitigating health inequities if the process of designing and implementing actionable data dashboards itself is equity focused. Those collaborating on the design and implementation of such tools ought to be mindful of how and when health equity considerations enter or intersect with dashboard design process—from inherent biases in how data are collected and shared to how interpretations and insights are drawn and influence decisions and actions—and how best to ensure they are kept front and center throughout the process and avoiding any potential harms from use of these tools. This should also prompt designers and users to consider how dashboards may be used for mapping and leveraging assets for addressing inequities in addition to merely documenting disparities. Thus, articulating clear principles, practices, and tools for centering health equity in dashboard design and implementation processes can greatly enhance their potential to inform policy and practice decisions that advance health equities.

FORUM AIMS

The forum was held on June 3-4, 2025 on the campus of Rutgers University in New Brunswick, New Jersey. A copy of the meeting agenda and participants' biographies are included in the Appendix. The primary objective of this convening was to advance the science and practice of actionable public health dashboards by laying the foundations of a framework and a research agenda for guiding design, implementation, assessment, and sustainability of actionable dashboards. The framework is intended to synergize future research, practice, and public investments in public health data dashboards by delineating key dimensions, constructs, mechanisms, processes, and corollaries (both desirable and undesirable) of a collaborative, user-centered, and adaptive process of designing actionable data dashboards. Key themes and questions discussed were:

- Critical dimensions and affordances of actionable public health data dashboards.
- Strategies, processes, and tools for (co-)designing actional public health dashboards and assessing their implementation and impact.
- Key challenges, opportunities, and resources for building organizational and system capacity for designing, implementing, and sustaining actionable dashboards.
- Effective mechanisms for integrating use of actionable data dashboards in decisionmaking processes at various levels (individual, organization, and system) and for a range of decisions (strategic, tactical, operational).
- Guidelines and strategies for centering equity considerations in all aspects of designing and implementing public health data dashboards.

ACKNOWLEDGMENTS

We wish to express our gratitude to the speakers, panelists, moderators, and participants for their insights, suggestions, and contributions to rich discussions. We are especially thankful to our students and team members—Miriam Kim, Anna Kareeva, Adiva Khan, Justine Quow, and Natalia Herman—for their assistance with organization and notetaking, and to Danielle Yglesias and Artemis Karlsons at the Rutgers School of Communication & Information (SC&I) for their help with event logistics. Finally, we wish to thank Miranda Yates, George Hobor, and the Robert Wood Johnson Foundation for their thought partnership and generous support to planning and hosting this convening.

Itzhak Yanovitzky, School of Communication & Information, Rutgers University
Gretchen Stahlman, School of Information, Florida State University
Charles Senteio, School of Communication & Information, Rutgers University

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OPENING REMARKS

Brian Quinn, RWJF's Associate Vice President for Research, Evaluation and Learning, opened the meeting by outlining the foundation's longstanding commitment to leveraging data to advance public health. He traced the evolution of data tools developed by the foundation from bulky print reports to interactive online dashboards along three dimensions. The first is increasing the range and sophistication of audience engagement efforts which initially focused on researcher-to-researcher communication and gradually expanded to two-way communication with policymakers, community leaders, and the public. The second involves a shift toward the use of interactive technologies such as dashboards to engage with diverse audiences and the third is the proliferation of new and different data, from initial reliance on large Federal surveys and administrative data to incorporating data from diverse sources including local, state, and private sector data. Consequently, the foundation made a strategic move away from just pushing out information to engaging with stakeholders in a two-way relationship. This reflects a broader shift in public health data use, where accessibility and interactivity are essential to empower diverse stakeholders.

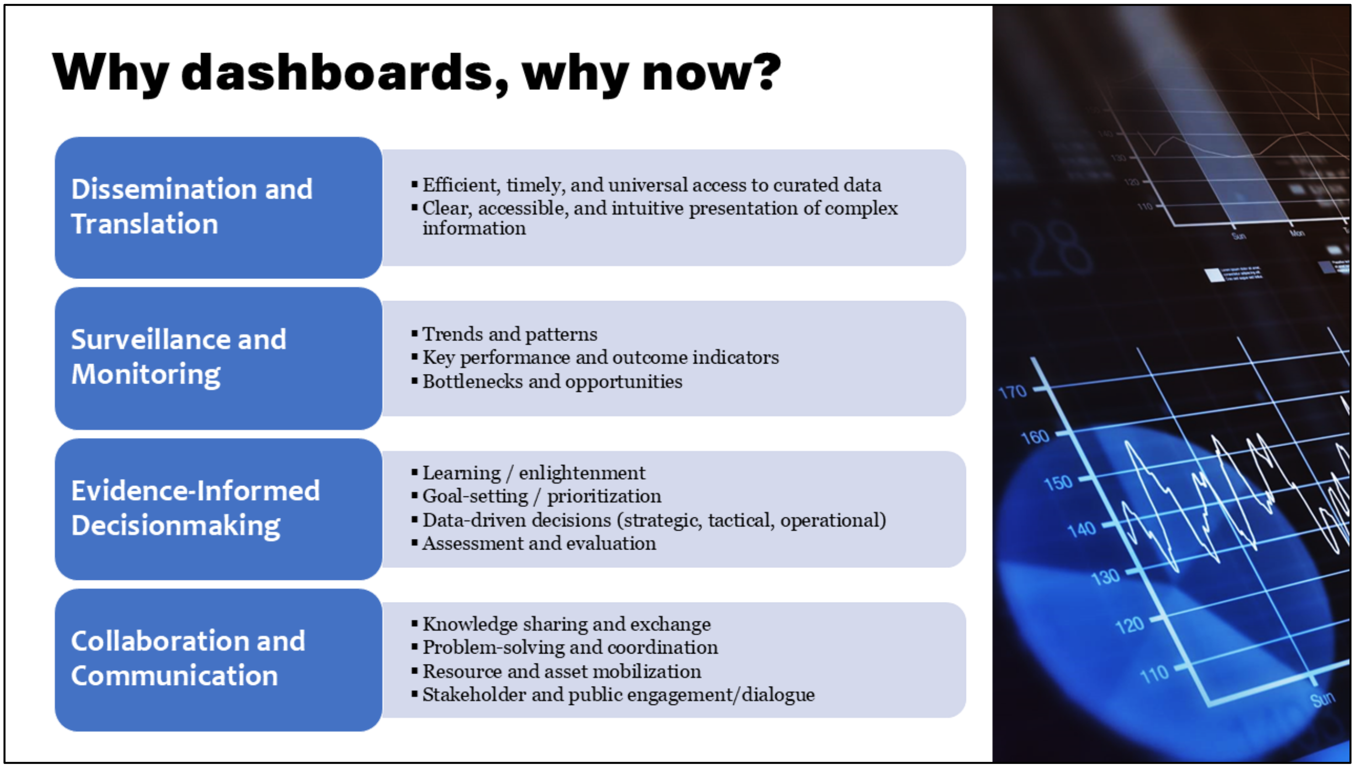
Quinn noted the sizable and important investments the RWJF made in a portfolio of data dashboards such as the County Health Rankings and the Congressional District Health Dashboard as means to sharing important information with policymakers and leaders of different stripes. However, these efforts have not always been guided by scientific knowledge regarding effective design and implementation of these tools. He noted that the "great thing about this meeting is a chance to bring together the evidence and the science to inform our thinking, not just about the aesthetics of what looks good on a website but really trying to understand how users are interacting with the information and how we can be most helpful to them."

Quinn concluded his comments by acknowledging pressing concerns about the current crisis the research community is facing due to federal funding and data availability cutbacks, highlighting RWJF's efforts to support data archival work, alternative data sourcing, and rapid response research grants for health equity-focused investigators whose large Federal grants have been cut. He ended by reaffirming the foundation's ongoing commitment and focus on health equity, standing up for public health, and supporting research.

SCIENCE AND PRACTICE OF ACTIONABLE PUBLIC HEALTH DATA DASHBOARDS: OVERVIEW AND REFLECTIONS

This presentation by the co-organizers offered a high-level overview of the current state of theory and research on public health data dashboards based on a recent scoping review and synthesis of 89 empirical case studies of public health data dashboards and a second recent study that analyzed and compared a cluster probability sample of 210 national and state public health dashboards.

Itzhak Yanovitzky (Rutgers University) started the presentation by situating the body of scholarly and professional work on data dashboards in the broader context of the knowledge-to-action challenge. He noted that the question of how to move knowledge into action (aka, knowledge translation, knowledge transfer, knowledge utilization, or knowledge mobilization) is a central focus of several established interdisciplinary fields including translational science and the science of dissemination and implementation (D&I) that are sometimes, but not always, in conversation with one another, but are still relevant to informing the scientific study and application of data dashboards. Referring to the extant literature on the topic, he noted that the rising interest in data dashboards as an instrument of moving knowledge to action is associated with the range of key functions and unique advantages they offer in comparison to other tools, including dissemination and translation, surveillance and monitoring, facilitation of evidence-informed decision-making, and the potential to foster dialogue and collaboration (see figure below).



Why dashboards, why now?

Dissemination and Translation	▪ Efficient, timely, and universal access to curated data ▪ Clear, accessible, and intuitive presentation of complex information
Surveillance and Monitoring	▪ Trends and patterns ▪ Key performance and outcome indicators ▪ Bottlenecks and opportunities
Evidence-Informed Decisionmaking	▪ Learning / enlightenment ▪ Goal-setting / prioritization ▪ Data-driven decisions (strategic, tactical, operational) ▪ Assessment and evaluation
Collaboration and Communication	▪ Knowledge sharing and exchange ▪ Problem-solving and coordination ▪ Resource and asset mobilization ▪ Stakeholder and public engagement/dialogue

Source: Presentation by Itzhak Yanovitzky, June 3, 2025

Posing the question of whether data dashboards live up to their full potential according to the available body of research evidence, Yanovitzky highlighted several key findings that emerged from the scoping review of the literature:

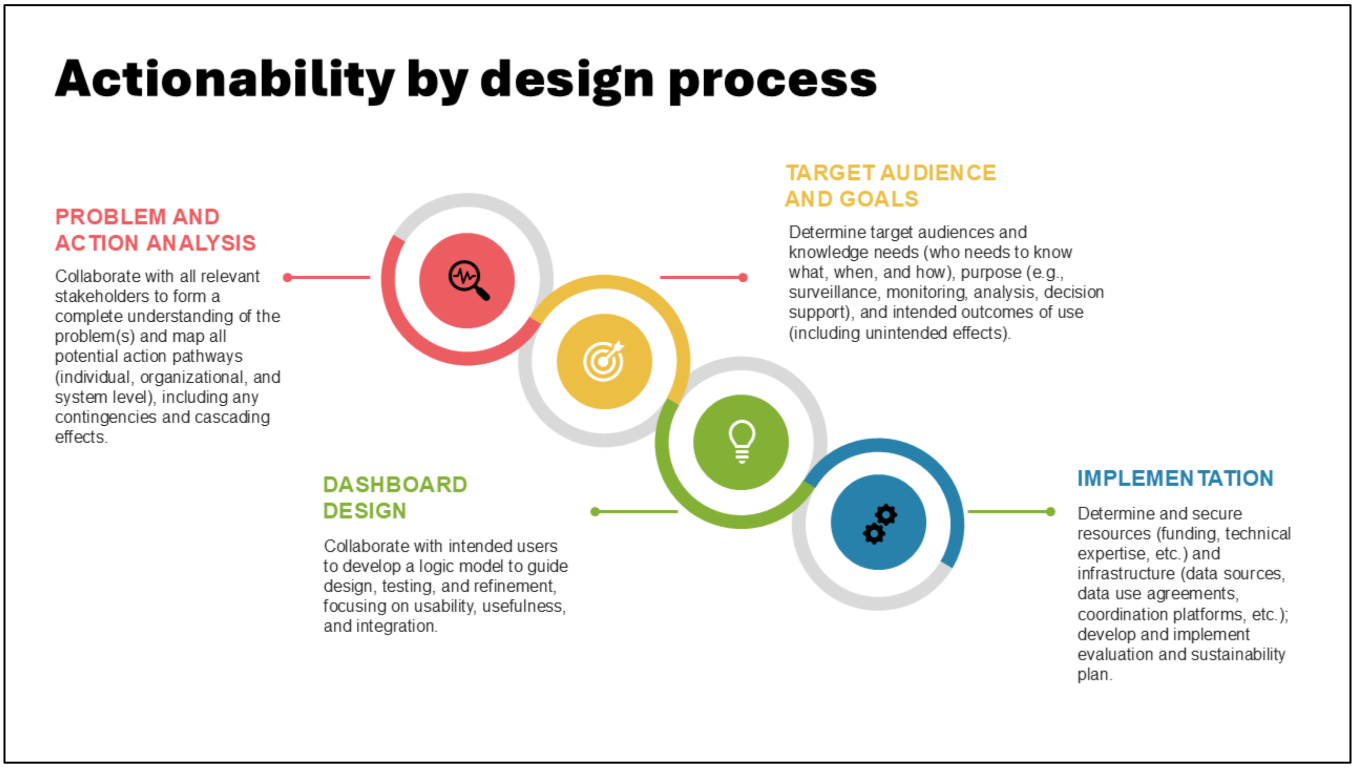
- **Creators and users:** Dashboards are predominantly developed by institutional actors like public health agencies and universities, wielding disproportionate influence on what data are shared and how. Intended users tend to be researchers and policymakers, often assuming high data literacy, while overlooking other potential user groups like advocates, journalists, and community leaders.
- **Focus and content:** Most dashboards prioritize disease surveillance and monitoring of health risks and therefore primarily use epidemiological data. Moreover, they are overwhelmingly focused on documenting and mapping disparities but not also assets that can be leveraged to address disparities.
- **Funding and sustainability:** Most dashboards are developed and implemented with grant funding and therefore are rarely maintained, sustained, or repurposed once funding runs out.
- **Design and evaluation:** There is little reliance, if any, on theories of action to guide design and implementation of public health data dashboards. Methodologically rigorous evaluations of actual use, outcomes, and impact of data dashboards are virtually non-existent, and indirect measures (e.g., web analytics) are commonly used to assess their usability and usefulness.

- **Confounding of access with use:** The prevailing presumption that granting access to data via dashboards will automatically translate to use is misguided. In reality, use is contingent on several factors, including user factors (e.g., data literacy), data characteristics (e.g., quality, accuracy and comprehensiveness), dashboard design-related factors (e.g., usability), goal or purpose of using data, the decisionmaking context (e.g., policy vs. practice, strategic vs. operational decisions), as well as the degree to which dashboards are integrated into existing workflows.

Overall, these findings point to considerable fragmentation and a lack of scientific rigor in current research on design, implementation, and utility of public health dashboards. Coherent theoretical accounts and direct empirical tests that link usability, usefulness, and use of these tools to users' decisions and actions are notably missing. The notion of dashboard actionability as a function of usability and usefulness has recently emerged to bridge between data access and use, and a more complete explication and operationalization of actionability in this context has significant potential to advance future research and practice. At the same time, actionability is not a fixed attribute of dashboards but rather emerge from the dynamic intersection of users' capacity, motivation and opportunities to use data; characteristics of available data such as relevance, timeliness, and credibility; dashboard design features and analytical affordances; as well as goals and context of data use. Actionability, therefore, can only be achieved by design, via a deliberate, iterative process of creating, deploying, evaluating, and improving dashboards that provide an optimal match for goal, function, context, and user capacity and needs with a clear path to action

Yanovitzky moved next to share key findings from a recently completed study that compared and analyzed a probability sample of state and national data dashboards using a validated coding instrument for assessing actionability (operationalized as usability and usefulness). Data were extracted from a probability sample of federal (n=58) and state (n=152) public health dashboards in summer 2024. However, as of May 2025, 17 of the 58 federal dashboards sampled (30%) were no longer accessible because they were either archived or removed to comply with policies of the Trump administration to remove from public access a multitude of federal data sources, particularly those related to climate change, public health, and social equity. Still, the overall pattern of findings emerging from this study corroborates the findings of the scoping review regarding the primary focus and content of dashboards being epidemiological surveillance and their heavy reliance on data collected by the federal government, although most state dashboards use state-level and local data in addition. However, state dashboards are more reliant on third-party applications and/or sites for designing and hosting dashboards, which may limit data presentation and customization options as well as limit access due to potential disruptions. State dashboards are comparable federal dashboards in terms of usefulness affordances (e.g., customization, clearly explicated purpose of dashboard, range of available data visualizations tools, analytical affordances, and guidelines or disclaimers regarding correct interpretation of findings) but lacking regarding their usability affordances (e.g., ease of navigation, accessibility, interactivity, and availability of technical assistance), presumably due to availability of funding and resources, but also because federal dashboards are required to adhere to a robust set of usability standards whereas state dashboards generally do not.

Yanovitzky concluded his presentation by advocating for a shift from data and user-centric design toward an actionability-centered design which implies that dashboards should be treated as a navigation instrument (i.e., connecting users with data-based insights to guide decisions and actions that advance their goals) as opposed to a translation tool. He also proposed that the process of designing actionable data dashboards be modeled after the process of designing and implementing interventions (see figure below) since it provides a set of valid, reliable, and robust tools that can be leveraged and adapted to this end.



Actionability by design process

PROBLEM AND ACTION ANALYSIS

Collaborate with all relevant stakeholders to form a complete understanding of the problem(s) and map all potential action pathways (individual, organizational, and system level), including any contingencies and cascading effects.

TARGET AUDIENCE AND GOALS

Determine target audiences and knowledge needs (who needs to know what, when, and how), purpose (e.g., surveillance, monitoring, analysis, decision support), and intended outcomes of use (including unintended effects).

DASHBOARD DESIGN

Collaborate with intended users to develop a logic model to guide design, testing, and refinement, focusing on usability, usefulness, and integration.

IMPLEMENTATION

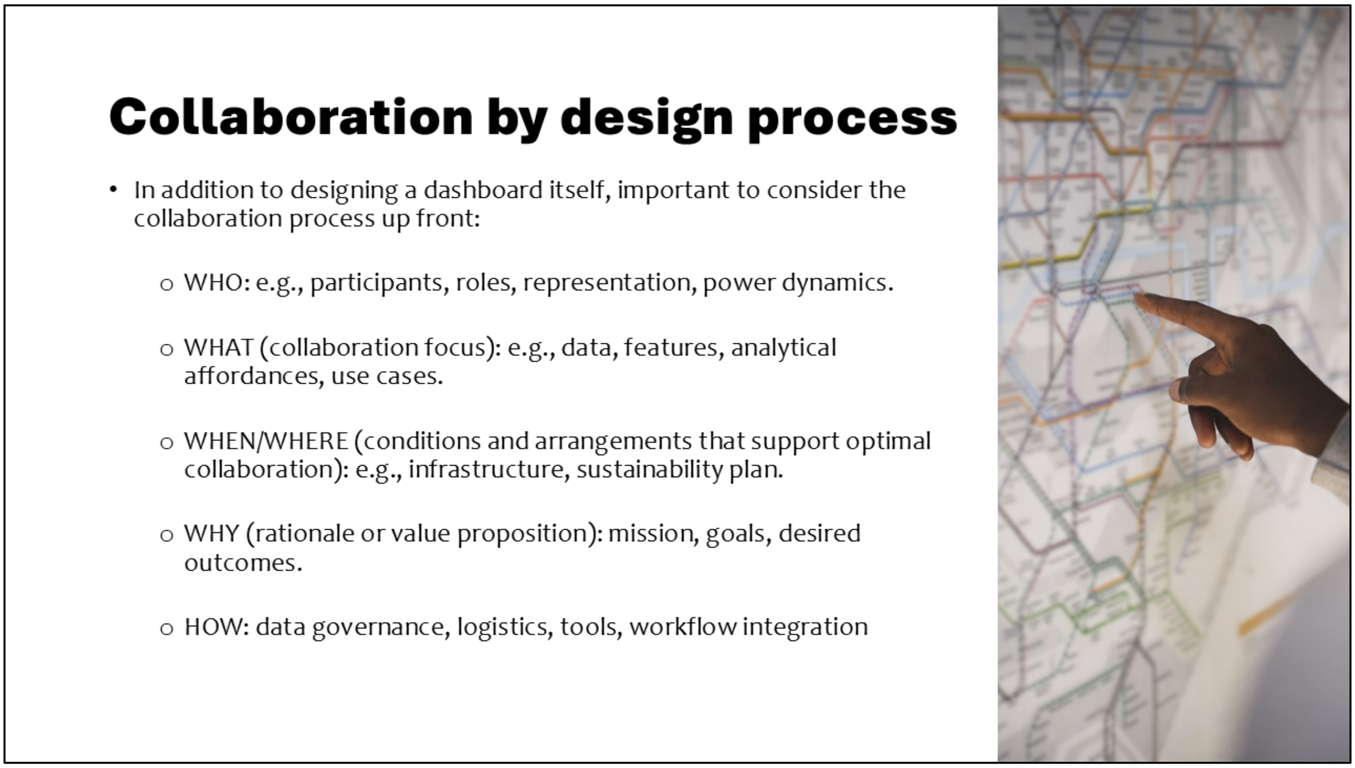
Determine and secure resources (funding, technical expertise, etc.) and infrastructure (data sources, data use agreements, coordination platforms, etc.); develop and implement evaluation and sustainability plan.

Source: Presentation by Itzhak Yanovitzky, June 3, 2025

Gretchen Stahlman (Florida State University) expanded the presentation to the collaborative dimension, noting that the process of designing for actionability necessarily requires effective collaborations among designers and users of these tools. Referring back to the findings of the scoping review and the mapping of federal and state public health data dashboards, she highlighted the fact that despite well-intentioned efforts, most dashboards studied were “creator-driven”, with limited participation of users in the design process beyond providing basic inputs or feedback. This suggests that the typical dashboard design process likely reflects the priorities of developers and funders rather than actual needs of the users and that this may adversely impact dashboard actionability. That is, a dashboard can be impressive from a technical standpoint, but if it doesn't align with real world context of decisions and needs of decisionmakers and users, it is likely to be underutilized or even misused.

Stahlman noted in addition that virtually no published study included in the scoping review fully described or assessed collaborations with users, even if it was characterized as user centered. This is surprising given that there are already several established models of data-focused collaborations such as participatory research and research-practice partnerships that can guide the formation and evaluation of ad-hoc collaborations on design and implementation of actionable data dashboards as well as for integrating a dashboard design process in existing collaborations. Reflecting on the state of the current literature, she noted that collaborations on design and implementation of dashboards are more of an afterthought rather than being integral to the design process. To illustrate this point, she shared an example of a thoughtful collaboration between a multidisciplinary team of scientists and users on the process of designing the Lyme and Tickborne Diseases Dashboard that was intentional about goals, sensitive to information needs of diverse users, and transparent about roles and responsibilities of collaborators—all of which enhance the actionability of this dashboard.

Stahlman moved next to ask about the defining characteristics of optimal collaborations on the process of designing and implementing actionable data dashboards, referencing co-design, co-production, and co-creation as models frequently touted as best-practices in the literature on the topic. A co-design process refers to ad-hoc collaborations between stakeholders to address a pre-determined problem or need. A co-production process is driven by the desire to achieve a shared outcome, whereas a co-creation process involves collaborations on all aspects of identifying and organizing to address a problem. While co-creation may be preferred given its democratizing potential, the reality is that it does not offer an optimal fit or even feasible to implement in all situations: there are instances where co-design or co-creation processes may be more appropriate to implement. Given this, Stahlman advocated adopting collaboration strategies that are tailored to focus, goals, existing relationships, stakeholders' capacity and readiness to participate, and resources available to support collaborations and avoid a one-size-fits-all approach to collaboration. To underscore this points, she referenced a recent consolidated framework for collaboration research by Calancie et al. (https://doi.org/10.1371/journal.pone.0244501), noting that this is a useful framework for considering the major ingredients and facilitators of effective collaborations (e.g., diverse composition of participants, trust, leadership structure, etc.) but less useful for guiding a process of collaboration. As an alternative, she proposed adopting a basic who-what-when-where-why-how scheme (see figure below) for configuring an optimal collaboration process in each case.



Collaboration by design process

- In addition to designing a dashboard itself, important to consider the collaboration process up front:
    - WHO: e.g., participants, roles, representation, power dynamics.
    - WHAT (collaboration focus): e.g., data, features, analytical affordances, use cases.
    - WHEN/WHERE (conditions and arrangements that support optimal collaboration): e.g., infrastructure, sustainability plan.
    - WHY (rationale or value proposition): mission, goals, desired outcomes.
    - HOW: data governance, logistics, tools, workflow integration

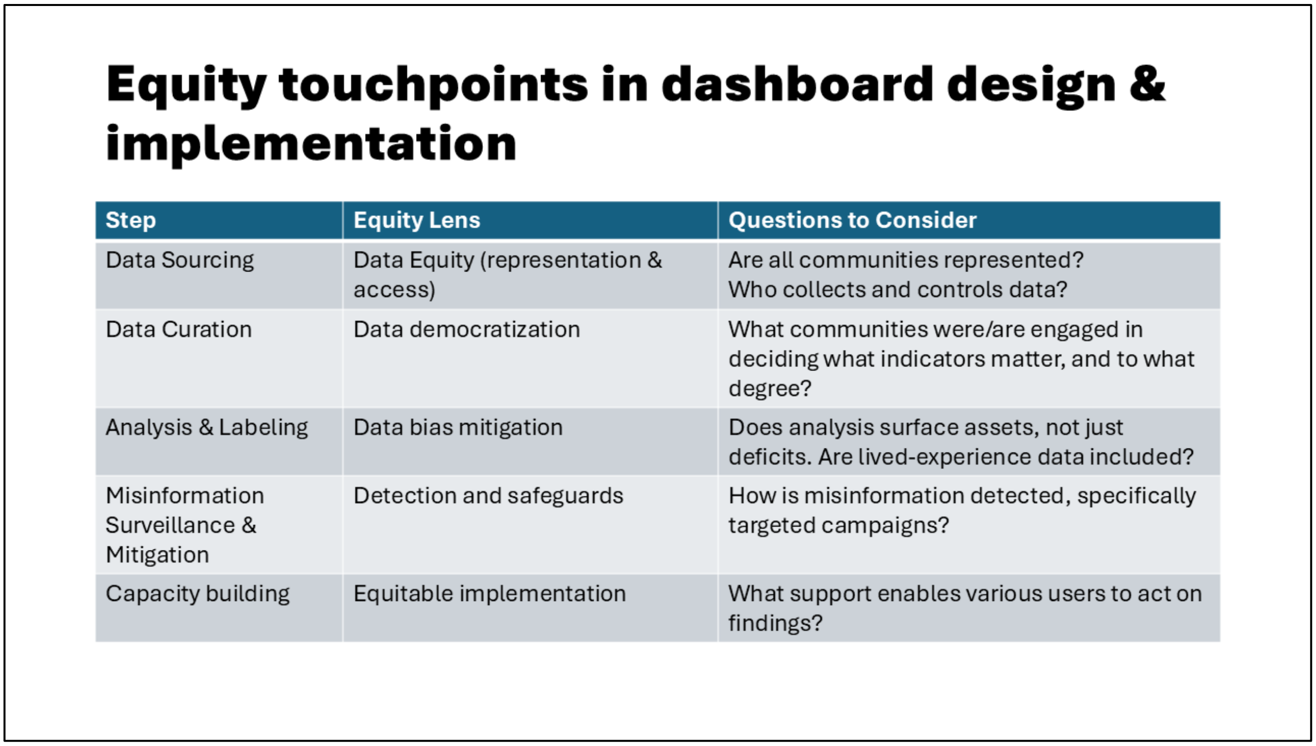
Source: Presentation by Gretchen Stahlman, June 3, 2025

Reflecting on critical gaps in current approaches to data-focused collaborations, Stahlman pointed to the sociotechnical complexity of building, maintaining, and updating data infrastructures and the importance of considering data curation, governance, and sustainability practices as integral to the process of collaborating on design and implementation of actionable data dashboards. She shared a quote from a published commentary by Shankar et al. (https://doi.org/10.1002/asi.24406): "although the popularity of dashboards and other data tracking websites is often ascribed to their power as information visualizations, they are only as effective and trustworthy as the data curation that goes into them." She concluded by inviting forum participants to engage with three questions:

- What infrastructures, policies, and investments can enable a flexible process of collaboration on design and implementation of actionable data dashboards?
- How do we assess the performance and impact of such collaborations?
- How do we design collaborations to be actionability-focused without losing sight of equity?

In the presentation that followed, **Charles Senteio** (Rutgers University) offered a critical perspective on centering equity in the process of designing and implementing actionable data dashboards. He started by noting that the results of both the scoping review and analysis of federal and state public health data dashboards underscored inequities in representation of different groups in the data used but also the primary use of dashboards for reporting inequities, which does not make them equitable. He offered a more complete definition of data equity as "unrestricted access and capacity to acquire, interpret, and utilize timely, relevant and actionable data to supports informed decisions at the individual, organizational, and system levels." This definition implies that equity is not only a function of representation and access to data but also a function of capacity to use data to inform decisions and the democratization of decisions regarding what data are collected and how they are interpreted and used to inform actions at various levels.

Reflecting on the imperative of centering equity in the design and implementation of actionable data dashboards, Senteio suggested it is useful to first map out the various points along the process of designing and implementing dashboards where equity considerations surface and then determine what they are so they are considered and addressed. Prime examples of such equity touchpoints are data sourcing, data curation, data analysis and labeling, mitigation of bias and misinformation, and capacity building as part of implementation, with each raising a different set of concerns and questions (see figure below).



Equity touchpoints in dashboard design & implementation

Step	Equity Lens	Questions to Consider
Data Sourcing	Data Equity (representation & access)	Are all communities represented? Who collects and controls data?
Data Curation	Data democratization	What communities were/are engaged in deciding what indicators matter, and to what degree?
Analysis & Labeling	Data bias mitigation	Does analysis surface assets, not just deficits. Are lived-experience data included?
Misinformation Surveillance & Mitigation	Detection and safeguards	How is misinformation detected, specifically targeted campaigns?
Capacity building	Equitable implementation	What support enables various users to act on findings?

Source: Presentation by Charles Senteio, June 3, 2025

Senteio highlighted next several existing tools in addition to participatory approaches—open-standard data models, equity-focused audits, metadata transparency and provenance logs, plain-language and multilingual interfaces, and training and technical assistance hubs—for probing and planning to address equity considerations at various touchpoints of the design process and posed critical questions about promoting equity-centered design adoption and necessary investments. He then concluded by proposing three guiding questions for forum participants to consider and discuss:

- What tools (guidelines, best-practices, etc.) can we provide to promote a process of equity-centered design?
- How do we promote adoption and institutionalization of such tools across sectors, contexts, and/or settings that design and implement public health data dashboards?
- What investments are needed to push this agenda forward?

DAY 1 ACTIVITIES

PANEL I: IMPROVING ACTIONABILITY OF PUBLIC HEALTH DATA DASHBOARDS BY DESIGN

This panel brought together **Sarah Fadem** (Rutgers University), **Gustav Verhulsdonck** (Central Michigan University), **Radhika Sood** (American Foundation for Suicide Prevention), and **Teresa Vivar** (Lazos America Unida), with **Kate Magsamen-Conrad** (University of Iowa) as moderator, to exchange perspectives and experiences regarding design approaches that are relevant to the design and implementation of actionable public health dashboards and similar tools for connecting different groups of users with timely, relevant, and actionable data-informed insights. The conversation highlighted the complexities of designing data tools that are both meaningful and accessible to diverse and often marginalized populations. Drawing from personal experience and disciplinary expertise, the panelists emphasized co-design, cultural competence, sustainability, and innovative technologies as foundational pillars for effective data dissemination. Panelists were invited to share an example of a successful URE approach and offer reflections, responding to the following prompts:

- What does “actionability” mean in the context of public health dashboards, and how can design approaches help achieve it?
- What are some common barriers to making dashboards truly useful for diverse user groups, especially those historically marginalized or underserved?
- How do we balance the need for standardized, scalable dashboards with the need for local customization and community input?
- How can we better support collaboration between designers, data scientists, public health professionals, and community members in dashboard development?

Sarah Fadem opened by underscoring the frequent neglect of understanding how people actually use data dashboards. She emphasized the value of co-design—actively involving end users and community members early in the design process—to tailor dashboards to real practice needs. She highlighted that too often dashboards are created as a default solution without truly understanding what users need or how they work in practice. Fadem stressed the importance of low-fidelity prototyping and iterative feedback before investing heavily in functional products to improve usability and adoption. She also pointed out that sustainability depends on meaningful community involvement and buy-in from the outset rather than treating dashboards as short-term, grant-dependent products.

Radhika Sood focused her comments on the value of effective communication and simplicity in data visualization. She suggested that dashboards should have clear goals about what the audience needs to know, keeping design minimalistic to avoid overwhelming users. Sood stressed the importance of customization, such as filtering data to relevant geographic areas or user groups, which increased engagement with the dashboards produced in her organization. She also advocated for plain language, visual accessibility (e.g., for color blindness), and including simple definitions to make technical information understandable. Additionally, she underscored the necessity of feedback loops where users can report what works and what doesn't to improve dashboard functionality and relevance.

Gustav Verhulsdonck added a behavioral design perspective. He discussed how cognitive habits like reliance on social proof, emotional engagement, and preference for clear, salient information influence dashboard use. He introduced concepts from digital nudging and behavioral design frameworks that can make dashboards more intuitive and motivating (e.g., McKinsey behavioral design framework, CHOICES). Verhulsdonck raised important questions differentiating static from dynamic dashboards and suggested multiple specialized types of dashboards might better serve varied needs (analytical, narrative, embedded for journalism, etc.). He was particularly positive about the potential of leveraging generative AI to personalize dashboards, enable conversational queries, and open up new possibilities for citizen science, while cautioning about issues like bias and the need for thorough "data wrangling" to get to know and interpret data.

Teresa Vivar provided vital community and cultural context. Representing New Jersey's Hispanic and Indigenous populations, she explained the critical role of building trust and accessible communication for marginalized communities. Vivar described how complex language, lack of education, and limited funding for grassroots community workers hinder data use. She shared the story of longstanding efforts where community health workers, often unpaid or informal, have been instrumental in crisis responses like COVID-19 but lacked institutional support. Vivar called for greater investment in training community members as data collaborators, for translating technical language into culturally resonant forms (including indigenous languages), and for truly inclusive partnerships where communities have agency and ownership, not just passive subjects of data collection. She drew attention to the need in creating spaces and/or structured opportunities for co-design (e.g., community councils) that build on robust community partnerships.

Collectively, these speakers repeatedly emphasized early and sustained community partnership as central to overcoming common barriers such as technical jargon, lack of relevance, and mistrust. They also advocated designing dashboards for specific user contexts and roles, not just as one-size-fits-all tools, and questioned the tendency to prioritize data completeness or scale over meaningful local customization.

In the latter part of the discussion, the panel addressed:

- **Sustainability and funding**: Panelists noted that funding often prioritizes researchers or intermediaries rather than community organizations themselves. They highlighted the importance of building relationships based on mutual trust and dignity rather than purely transactional funding models. They also suggested leveraging existing user resources and workflows to enhance value and sustainability without excessive initial investments and ongoing costs. Conceptualizing dashboards as a portfolio of tools, e.g., global master dashboards for data management paired with localized tailored dashboards, can be a cost-effective strategy.
- **The evolving role of technology**: There was a robust exchange about how generative AI and conversational data interfaces might transform dashboard use, specifically how AI could enable personalized, interactive querying that may eventually replace traditional visual dashboards but cautioning about risks like confirmation bias and insufficient data understanding.
- **Unintended users and broader use cases**: The panel discussed the potential for public health dashboards to be used by unintended groups of users such as educators and students in education settings and community groups for data literacy and analytical skill-building. This raised

questions about designing for diverse audiences with differing needs, including youth, where engagement styles differ.

- **Trust, relationship-building, and community knowledge**: Panelists discussed how long-term partnerships, reciprocity, and informal social interactions help bridge gaps between academics and communities. Others also emphasized the importance of maintaining ongoing relationships independent of specific projects to ensure rapid mobilization when opportunities arise, and suggested strategies for authentic listening such as storytelling and journey mapping to foster intellectual humility and deeper understanding of lived experiences. Ethical conduct and transparency were highlighted as key to building trust, which may require developing an ethical code for designers.
- **Addressing data gaps for small or marginalized populations**: Some of the discussion centered on the lack of formal data on Indigenous populations despite their significant presence and contributions, urging funders and researchers to allocate resources to fill these gaps and respect community knowledge as legitimate data. Panelists recognized the tension between scientific standards (e.g., sample size) and community realities, calling for innovative, community-driven research models.
- **Prioritizing data points and message clarity**: To avoid potential cognitive overload of users, it was suggested to limit data visualizations or insights to a handful of critical data points agreed upon with community users, differentiating between detailed datasets for researchers and simpler, action-oriented views for practitioners or the public.
- **Participatory design and co-design nuances**: Several panelists and attendees cautioned that true co-design means more than focus groups; it requires enabling genuine participation where community members have real influence over both the design and the way they engage with the process.

PANEL II: FUNDING AND SUSTAINING PUBLIC HEALTH DASHBOARDS

This panel brought together **Marc Gourevitch** (New York University), **Clemens Noelke** (Boston University), **Mary Feeney** (Arizona State University), and **Jim Walton** (JWalton, LLC), with **Salomon Moreno Rosa** (Envoy) as moderator, to exchange knowledge and perspectives regarding ways to fund and sustain the development, implementation, and continued improvement of actionable public health data dashboards.

Miranda Yates, Senior Program Officer at the Robert Wood Johnson Foundation, opened by framing the session's context. She introduced the topic of sustainability and long-term funding for dashboards and described the Foundation’s collaboration with Envoy (https://www.envoy.us/), a social impact consulting firm. This partnership arose from a shared recognition that dashboard creators need support in developing sustainable financial models to keep these critical tools operational.

Salomon Moreno-Rosa, Managing Director at Envoy, provided an overview of their community of practice and learning series, designed specifically to support dashboard teams in achieving financial sustainability. Over a seven-month period, Envoy hosted monthly virtual sessions with grantees covering topics like revenue diversification, budgeting, financial forecasting, and organizational development, complemented by one-on-one coaching tailored to each dashboard project’s unique challenges. Moreno-Rosa emphasized the value of combining theoretical tools with practical application, fostering peer learning, and creating a resource-rich, interactive learning hub. Envoy’s ongoing work reflects the importance of sustainability not only as financial viability but as a strategic, relational process grounded in collaboration and cohort building.

Marc Gourevitch shared insights from his experience managing the City Health Dashboard from within an academic institution. He noted that universities offer a rich environment of content expertise in methods and data visualization and provide valuable in-kind support such as legal, communication/marketing, and administrative assistance. However, direct financial investment from universities in dashboards is limited. He stressed the importance of partnership for dashboard sustainability, citing collaborations with cities, policy organizations, and advisory boards that help the dashboard remain relevant, useful, and scalable over time. Continual engagement with users and stakeholders is key to adapting to evolving local data needs.

Jim Walton spoke from the perspective of a consultant with decades of experience in community-based research and public health. He reflected on the long-standing challenge of sustaining community data initiatives and underscored the critical moment dashboards face amid shifting data environments and funding uncertainties. Walton pointed to the importance of representing the populations most affected by inequities and articulated the need to involve business, legal, and clinical stakeholders in creating sustainable products aligned with community needs. He provided a concrete example of integrating dashboards with value-based care models, whereby cost savings identified through data-driven interventions can be reinvested to maintain the dashboard, thus linking sustainability with measurable health outcomes and financial incentives.

Mary Feeney, a public affairs professor and former NSF program leader, offered a policy and funding perspective on federal government roles. She reminded the group that federal agencies have an ethical obligation to produce data as a public good accessible to taxpayers. However, federal grants are typically pilot-focused and short-term, requiring dashboards to seek sustainability beyond initial funding. Feeney noted the skepticism reviewers often have for new dashboards unless their unique value and user base are clearly articulated, stressing the importance of demonstrating viability, uptake, and technological flexibility. She also highlighted successful examples of data consortiums that combine open data with membership models and partnerships among universities, foundations, and local governments, suggesting collaborative funding portfolios as promising sustainability paths. Tracking and communicating the value and impact of dashboards was emphasized as critical for ongoing stakeholder engagement and support.

Clemens Noelke discussed pragmatic challenges from the perspective of a dashboard team navigating sustainability on the ground. He noted the technical necessity of evolving legacy databases into flexible platforms capable of supporting products for diverse clients such as government agencies and hospitals. However, governance and legal frameworks pose significant obstacles, especially when multiple institutions hold intellectual property rights and converge with foundation policies limiting certain commercial activities. To balance mission and revenue, his team licenses more granular data or enhanced services to clients under contract while maintaining free public access to core data sets. They also actively seek to convert user inquiries into paid engagements, reflecting the growing demand for technical support that strains voluntary capacity.

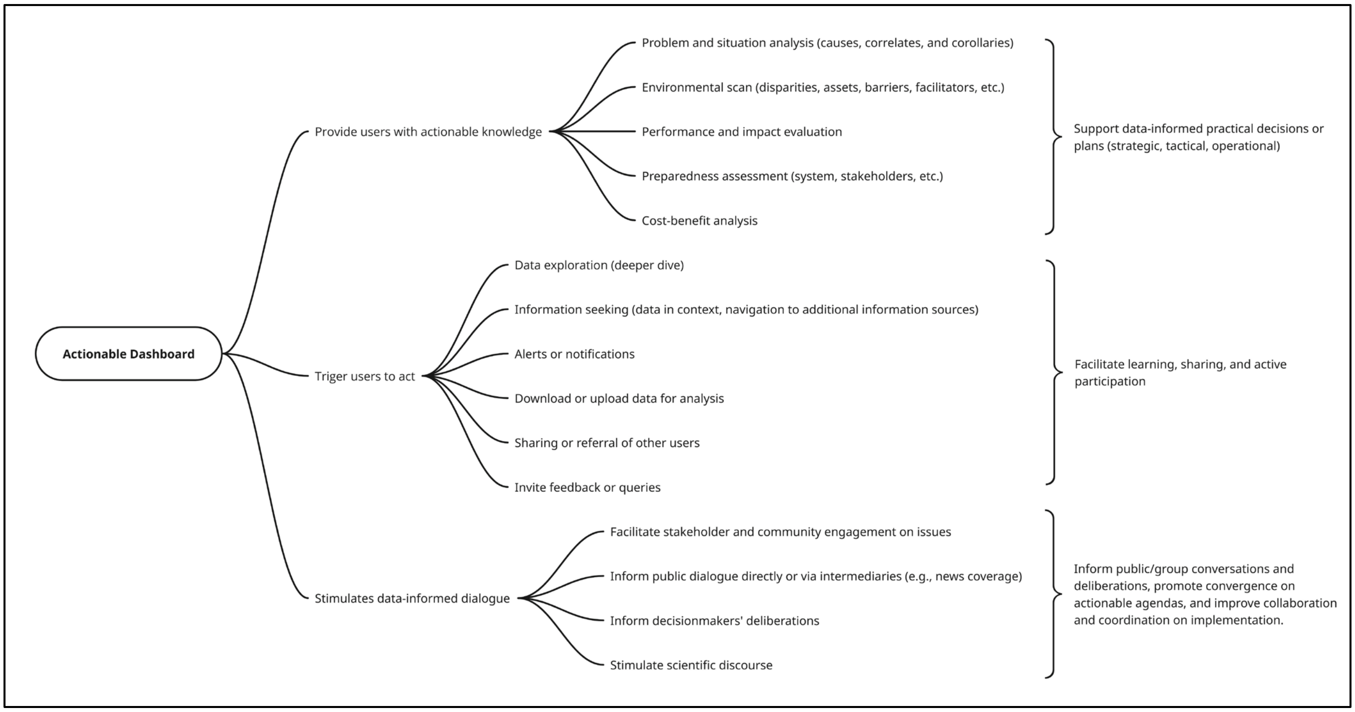
During the audience Q&A, the panelists tackled questions about data ownership, revenue diversification, and measuring dashboard impact. A few emphasized the need to look beyond traditional funding sources toward diverse clients and revenue streams, while others highlighted inherent tensions between sustaining dashboards through commercial models versus preserving open public access to federally derived data. Panelists also discussed best practices for tracking impacts, such as requiring citations, assigning digital object identifiers (DOIs), and encouraging user feedback through embedded engagement strategies.

Overall, the discussion illuminated the multifaceted nature of sustaining data dashboards as public goods amid shifting funding landscapes and evolving technical and governance challenges. Key themes included the critical role of partnerships and community engagement, the balancing act between open access and revenue generation, the strategic use of pilot funding to leverage broader support, and the imperative to clearly articulate and demonstrate value to diverse stakeholders.

BREAKOUT SESSION: ACTIONABILITY BY DESIGN

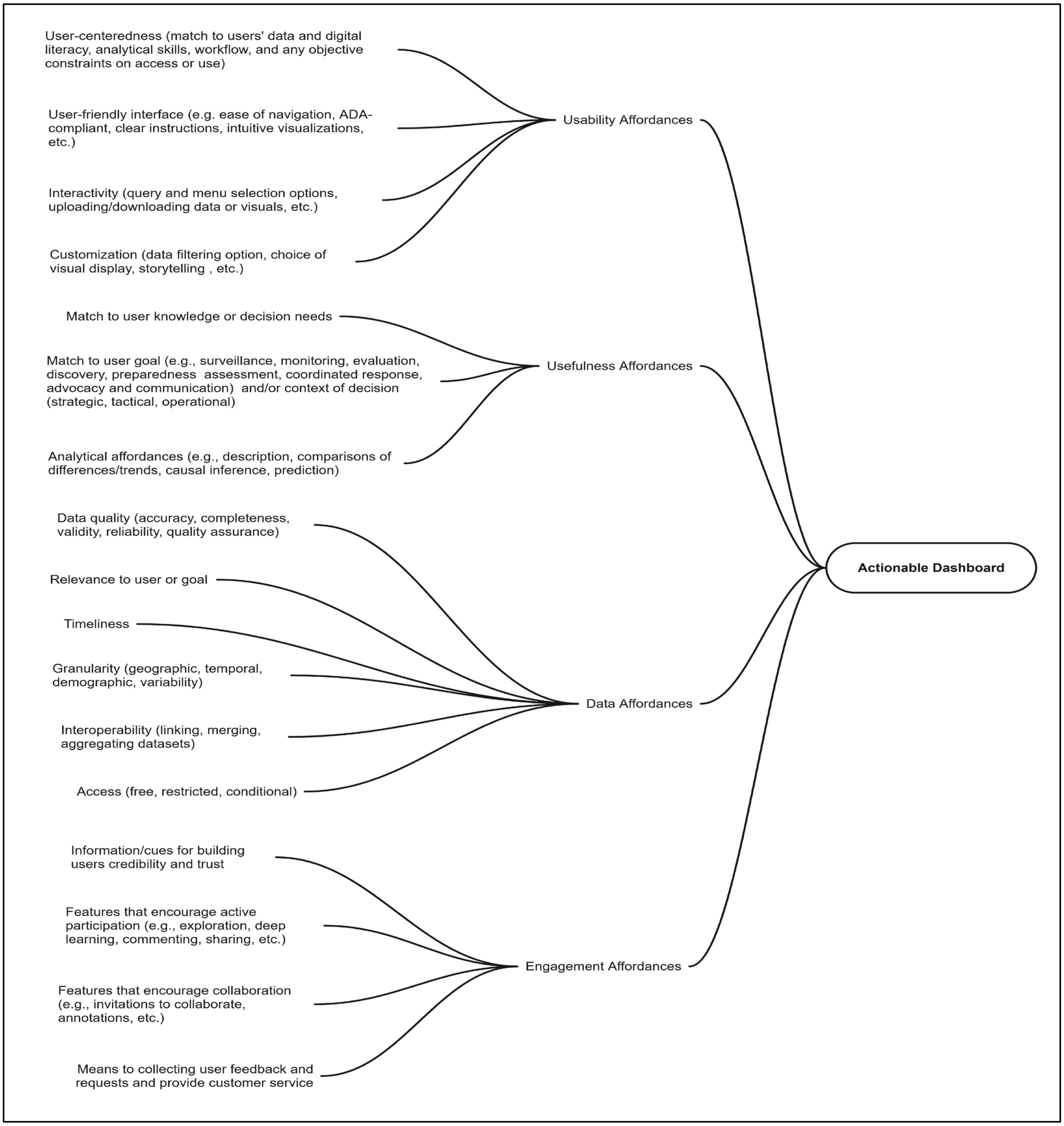
Participants in this breakout session collaborated on the task of conceptualizing and operationalizing actionability in the context of dashboard design and implementation using Miro, an online collaborative whiteboard platform. They were asked to collaborate on identifying the critical dimensions and desired properties of actionable dashboards. The initial conversations among participants and the contributions they made on Miro converged on the value of conceptually and empirically distinguishing ***actionability*** (i.e., what makes a dashboard actionable) from both ***affordances*** (design features that enable dashboards to be actionable), and ***outcomes*** (actual use and outcomes of using a dashboard).

The figure below explicates the concept of dashboard actionability based on the synthesis of themes, inputs, and ideas provided by participants.



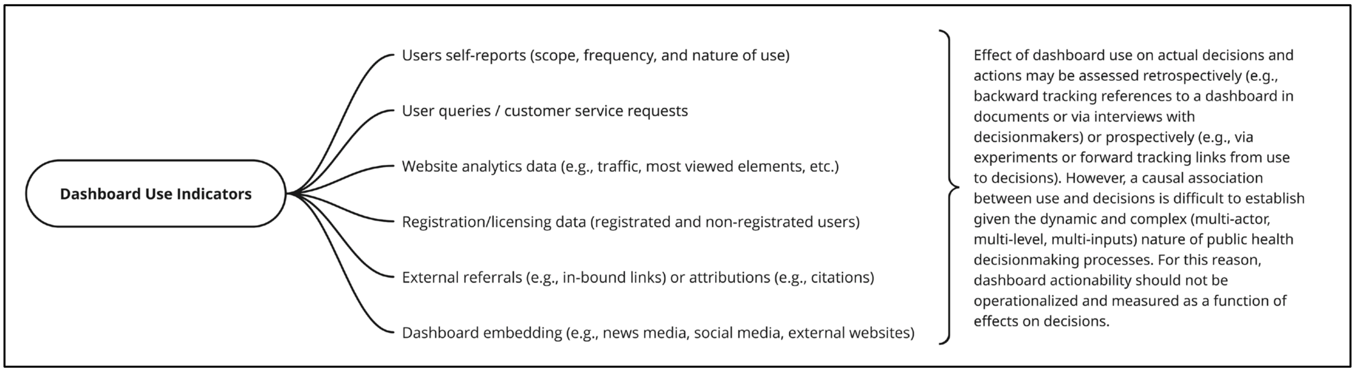
As shown in the figure, **actionable dashboards fulfill three critical functions**. First, they ***provide users with actionable knowledge or insights***, that is, information that can be used to support data-informed decisions and plans, e.g., information useful for describing and analyzing a problem, conducting an environmental scan, assessing preparedness or performance, or comparing benefits and costs of different actions. Second, ***they trigger or prompt users to act on insights*** as opposed to passively consuming information, e.g., by encouraging a deeper dive into causes or context or additional information seeking, altering users about urgent need to act, and inviting feedback and inputs. Third, when collective actions are involved, actionable dashboards ***facilitate data-informed discussions or deliberations among decisionmakers and stakeholders*** that can improve collaboration and coordination.

The next figure is a synthesis of discussions and ideas participants shared regarding **actionability affordances of dashboards** (i.e., design-related features or considerations that enable actionability).



As depicted, to be actionable, dashboards must be useful, usable, and engaging, in addition to drawing on “good” data. ***Usability-related design affordances*** include user-friendly interface, interactivity features, and customization options that are a good match to users’ data and digital literacy. These are typically addressed via user-centered design. ***Usefulness-related design affordances*** involve design elements that allow users to access the information they need or seek in accessible or digestible ways. This means dashboards that are tailored to users’ purposes or goals of using data (surveillance, evaluation, coordination, etc.), decision context or constraints, and answers sought (as a function of analytical affordances). It may also involve design and implementation of several different dashboards for a particular user group as opposed to a single, universal dashboard. ***Data-related design affordances*** refer to decisions designers make regarding data used in dashboards. In general, dashboard actionability is a function of data quality (accuracy, completeness, etc.), relevance, and timeliness but also a function of degree of public and universal access to data, data granularity, and data interoperability. Finally, ***engagement-related design affordances*** include features that can facilitate user engagement with the content of dashboards (i.e., attention, comprehension, learning, and reflection) as well as active participation and social interactions (e.g., sharing, commenting, annotating, etc.).

The final figure below synthesizes participants’ inputs and ideas regarding **indicators of dashboard use**. In general, actionable dashboards are expected to encourage use, whether ad-hoc, situational, or routine use of these tools. However, standard, valid and reliable measures of use do not yet exist. Examples of ***indirect or proxy measures of use*** proposed include website analytics indicators, user queries, registrations, external referrals and references, and dashboard embedding in external websites. ***Users accounts or self-reports on use*** are seen as more direct measure of use, although they too may be biased (e.g., recall, desirability, varying definitions of ‘use’, etc.). Regardless of measure used, participants noted that it is still very challenging methodologically to assess impact of dashboard use on users’ actual decisions and actions, whether via retrospective or prospective designs, given the complex and dynamic nature of public health decisionmaking processes.



Effect of dashboard use on actual decisions and actions may be assessed retrospectively (e.g., backward tracking references to a dashboard in documents or via interviews with decisionmakers) or prospectively (e.g., via experiments or forward tracking links from use to decisions). However, a causal association between use and decisions is difficult to establish given the dynamic and complex (multi-actor, multi-level, multi-inputs) nature of public health decisionmaking processes. For this reason, dashboard actionability should not be operationalized and measured as a function of effects on decisions.

In summary, participants readily recognized the theoretical and practical utility of actionability as a desired property of dashboards but saw considerable value in clearly distinguishing dashboard actionability from the features or attributes that make dashboards actionable (design affordances). In this way, it is possible to logically link an actionability-focused design process to actionability of a dashboard and from there to outcomes of using the dashboard, which serves of a foundation for deriving a theory of action. In addition, more theory-grounded research is needed to develop and test a valid and reliable theory inventory of measures of dashboard use and outcomes of use to be able to answer questions regarding impact of actionable dashboards on decisions and actions at various levels (individual, organization, community, and system) that facilitate adoption of practices and policies that promote equitable health outcomes.

BREAKOUT SESSION: COLLABORATION BY DESIGN

Participants in this breakout session explored the question: *How do we best collaborate for data dashboard design?* To help guide the discussion, participants were asked to use Miro to identify and depict the critical dimensions, best practices, and desired components of data-driven and/or design-focused collaboration in a “mind map”.

The discussion surfaced a strong consensus that collaboration must begin before dashboard design takes place, ideally rooted in sustained relationships and mutual trust with communities. Participants emphasized that collaboration should not be treated as a one-time event or a means to an end, but as a dynamic, iterative process that is both relational and context-sensitive. To illustrate this, one participant shared an example of a dashboard project where the design team first built an “ecosystem map” of local organizations and attended community meetings for some time before introducing design activities. This bottom-up approach was highlighted as a model for best practice.

A common critique of existing collaboration models is that they often imply a top-down process—entering a community with a solution already in mind, such as a dashboard—rather than asking, *“What kind of support can we offer?”* This led to robust discussion about the need to “listen first” and the importance of being invited into spaces rather than initiating collaboration solely on institutional terms. Participants also noted that the process of collaboration is difficult to represent using planning tools like Miro, which may oversimplify key human, organizational, and trust-building dynamics.

A recurring theme was the need for clearer guidance on the timeline of engagement. Participants emphasized that **collaboration is a process**, rather than a standard set of features and best practices. Moreover, collaborative approaches frequently start too late in the dashboard development process, missing early opportunities to shape goals and define data needs. Instead, collaboration should begin with understanding community priorities, attending standing meetings, and co-defining the problems to be addressed. Participants also called attention to language barriers, digital divides, and communication mismatches that may inhibit inclusive collaboration, particularly among marginalized populations.

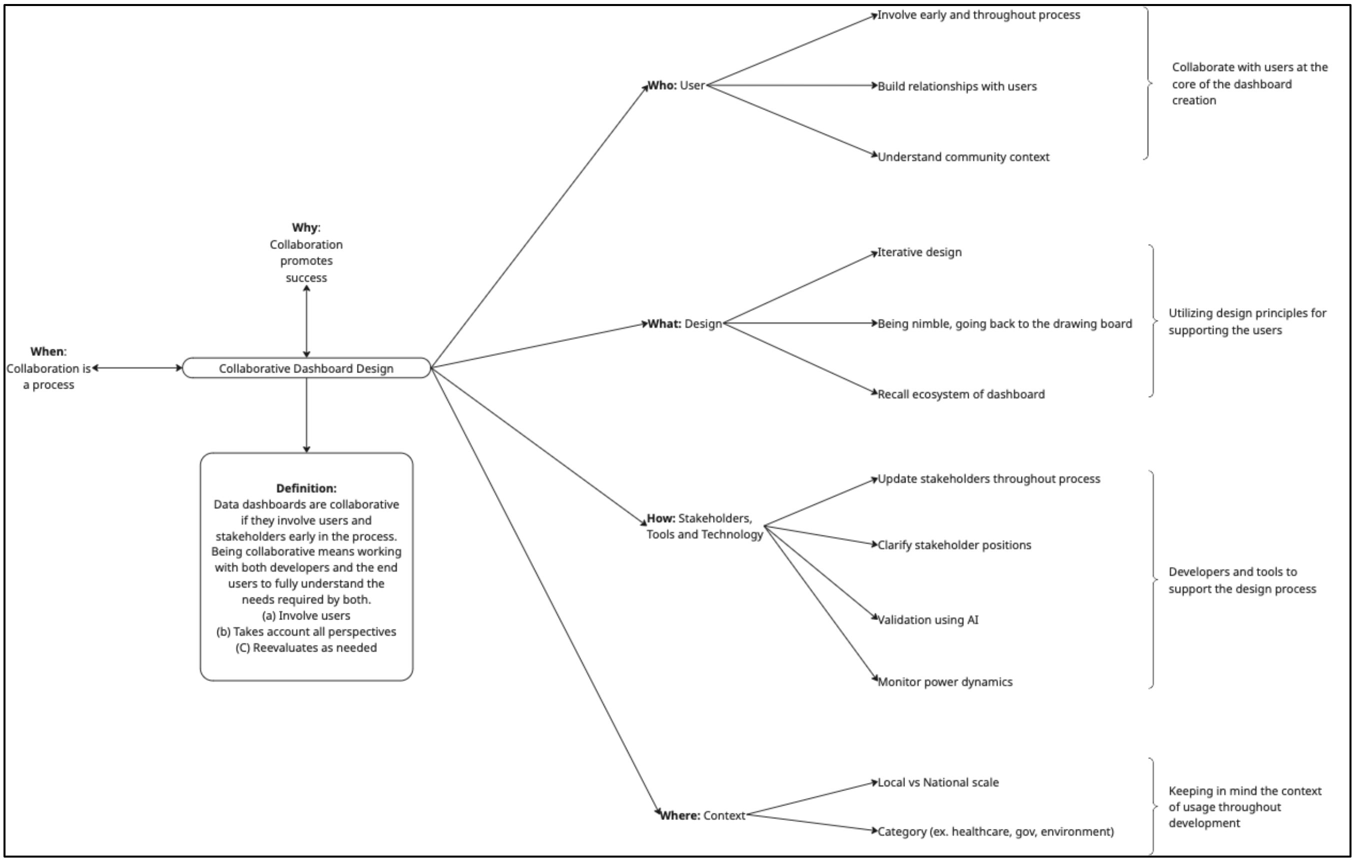
The group identified several principles for meaningful collaboration:

- **Trust and presence** are foundational—being “at the table” before a dashboard is even proposed.
- **Listening and responsiveness** are essential—collaborators should engage with communities on their terms and timelines.
- **Flexibility** is necessary—collaboration must be adapted to local contexts, capacity, and evolving relationships over time.
- **Transparency and education** matter—communities need to understand what a dashboard is, how it will be used, and whether they want one.

Participants stressed that real world enactment of collaboration best practices must be tailored to specific contexts. They proposed developing practical tools for collaboration (e.g., step-by-step guides, scenario planning exercises, templates) that reflect different starting points and capacities for communities and designers alike. One participant proposed a “dashboard of dashboards” or registry to support cross-community learning and reduce redundancy.

Finally, participants highlighted the importance of evaluating collaborations through metrics such as community participation, trustworthiness of the process, and mutual benefit. Participants also raised questions about emerging technologies, such as the use of AI in data collection or analysis, and how to integrate these tools responsibly while acknowledging power dynamics and potential bias.

While participants' inputs did not converge on a clear set of collaborative dimensions and best practices, the figure below attempts to organize and synthesize these inputs around the notion of collaboration as a dynamic process, which resonated with participants.



As shown in the figure, a collaborative dashboard design process includes several critical elements and joint decisions:

1. **User Involvement** ("Who" dashboards are designed for): This theme emphasizes the centrality of users throughout the design process. Key practices include involving users early and continuously, building authentic relationships, and understanding the specific community context. This reflects a belief expressed by participants that meaningful collaboration cannot occur without centering user voices.
2. **Design Principles** ("What" principles should be followed): Participants noted the need for iterative, flexible design processes that are responsive to user feedback. They highlighted the importance of being willing to return to the drawing board and ensuring broad ecosystem support for dashboard adoption. These principles aim to foster designs that are usable, adaptable, and aligned with real-world needs.

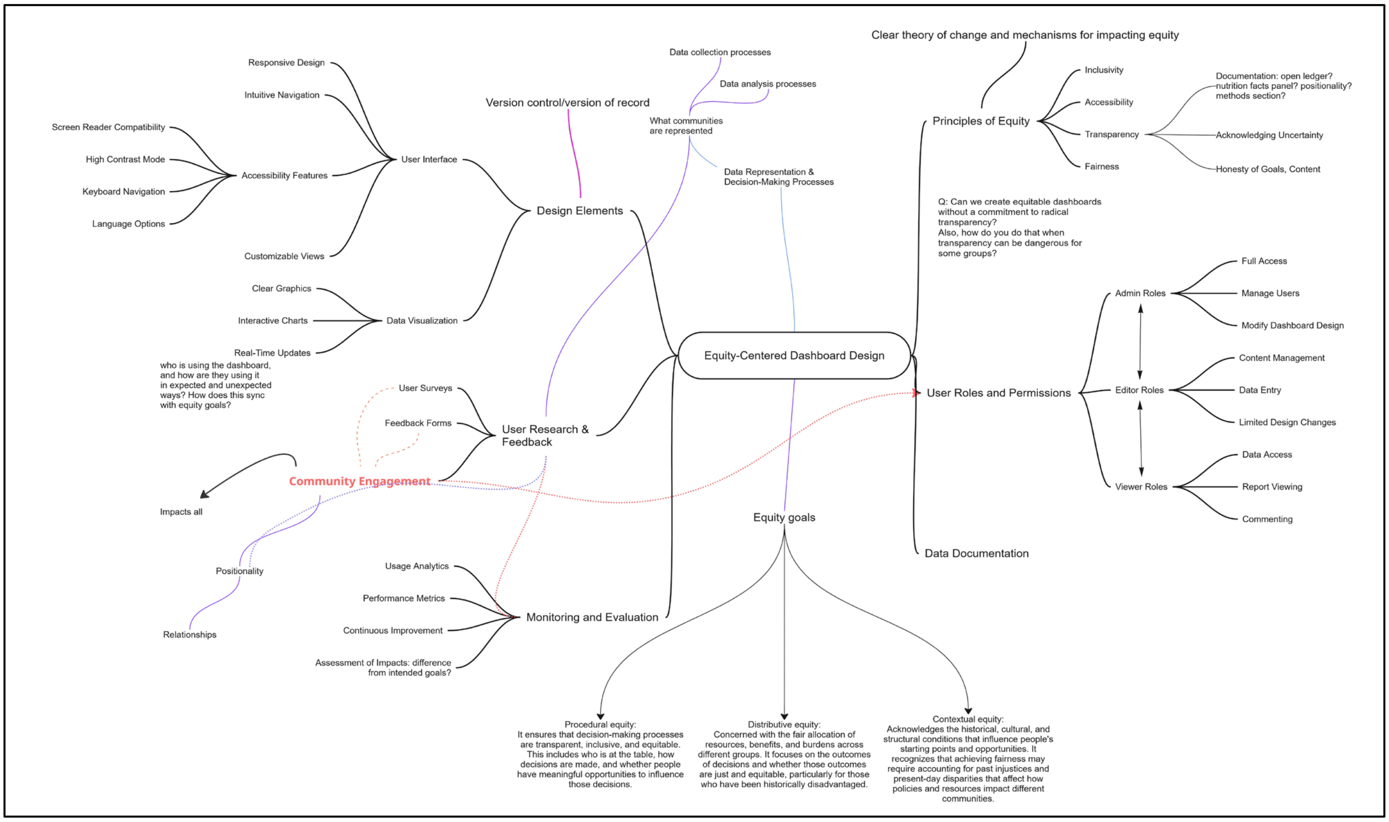
3. **Stakeholders, Tools, and Technology** (“How” the process happens): This theme outlines operational supports for collaboration. Participants emphasized updating and clarifying stakeholder roles throughout the process, responsibly incorporating emerging tools like AI by using community input for validation, and monitoring power dynamics that may affect participation and outcomes.
4. **Contextual Considerations** (“Where” collaboration and data are situated): This theme explores “where” activities are situated in space and time. Participants stressed the importance of understanding the scale and setting in which the dashboard will operate—such as differences between local versus national applications and between sectors (e.g., healthcare, government, environment). Designing with these contextual variables in mind is critical to relevance and effectiveness, and it is necessary to identify different models and best practices for collaboration that are applicable for various contexts.
5. **Time Frame** (When” collaborative activities occur): The map frames collaboration not as a discrete event, but as a process requiring sustained investment, presence, and trust. Participants argued that dashboards should not be introduced before trust is established and the design team is meaningfully embedded in community settings.
6. **Goals and Outcomes** (“Why” collaboration is important): This theme highlights the core rationale for prioritizing collaboration in dashboard design. Participants emphasized that successful dashboards are not simply the result of technical expertise or data availability, but emerge from thoughtful, inclusive, and sustained collaborative processes. Effective collaboration enhances the quality and relevance of the final product and increases the likelihood that the dashboard will be trusted, used, and maintained over time. In this sense, collaboration is a *strategic asset* that enables dashboards to fulfill their intended purpose.

In summary, the session reinforced that designing actionable public health dashboards requires not only technological and analytical skill, but also a dynamic and democratized process of collaboration that is (a) grounded in mutual respect and trust, (b) responsive to collaborators’ needs and values and sensitive to constraints they experience, (c) clear about agreed goals, rules, and desired outcomes of the collaboration, and (d) fosters collective learning and openness to differing perspectives and ideas (e.g., a learning community and/or a community of practice).

BREAKOUT SESSION: EQUITY-CENTERING BY DESIGN

Participants in this breakout session focused on the question of how to meaningfully center equity in the design of public health data dashboards. Drawing from the Miro board activity and facilitated discussions, the group explored principles, challenges, and opportunities to ensure that dashboard design processes not only avoid harm but actively promote fairness, representation, and accessibility for all users.

The discussion surfaced three foundational dimensions of equity that should guide dashboard design: procedural, distributive, and contextual equity (building on Chandra et al 2022 conception, see https://pmc.ncbi.nlm.nih.gov/articles/PMC9508440/). ***Procedural equity*** emphasizes transparency and inclusiveness in decision-making, ensuring that communities have meaningful opportunities to shape dashboard goals and functions. ***Distributive equity*** concerns the fair allocation of benefits and burdens resulting from dashboards, such as access to actionable data and opportunities for participation in data-driven decision-making. ***Contextual equity*** recognizes how historical and structural inequalities shape current realities, requiring dashboards to account for different starting points and lived experiences of diverse communities.



Participants reflected on challenges related to version control and transparency—how to convey updates, revisions, and uncertainties in data clearly, without undermining trust. Some participants pointed to the risk that dashboards might reinforce existing inequities if not thoughtfully designed, highlighting concerns about who defines data goals, how data is governed, and how accountability is maintained.

Throughout the session, participants stressed the need to prioritize community engagement at all stages of design, from defining the problem to setting data goals and evaluating impact. This includes creating roles for community partners in decision-making structures and ensuring that data literacy is fostered alongside access. Participants emphasized that engagement should go beyond traditional surveys and focus groups to include sustained dialogue, co-ownership, and iterative feedback mechanisms.

The discussion also focused on practical design features that can support equity, such as dashboards with customizable views, accessibility tools (e.g., screen reader compatibility, high-contrast modes), and the ability to represent community-defined goals and measures of success, such as "distance to goal" metrics. Participants noted the potential of qualitative data, storytelling, and narrative approaches to complement quantitative measures and surface community perspectives that might otherwise be overlooked.

Finally, the session acknowledged the need for ongoing monitoring and evaluation to assess whether dashboards are meeting their intended equity goals. This includes collecting and responding to user feedback, tracking who is using dashboards and for what purposes, and ensuring that the tools are evolving alongside the needs of the communities they serve.

DAY 2 ACTIVITIES

PANEL III: BUILDING INFRASTRUCTURE AND COLLABORATION CAPACITY FOR DESIGNING AND IMPLEMENTING ACTIONABLE PUBLIC HEALTH DATA DASHBOARDS

This panel brought together **Nick Hart** (Data Foundation), **Cindy Blitz** (Rutgers University), **Angélica Valdés Valderrama** (Ciencia Puerto Rico), **Leo Celi** (Massachusetts Institute of Technology), and **George Hobor** (Robert Wood Johnson Foundation), with **Robert Gradeck** (University of Pittsburgh) as moderator, to exchange perspectives regarding essential infrastructure and investments for supporting design and implementation of actionable data dashboards. Panelists were invited to reflect on a range of relevant dimensions of infrastructure, including data, collaboration/partnership, power structures, and funding. They were also asked to share examples or ideas on how to make an invisible infrastructure (e.g., networks of collaborators) visible and ensure infrastructure reflects community values (including issues of power and governance) and contribute to resilience.

Leo Celi emphasized the complexity of data to communities and the importance of consulting audiences before building dashboards or AI tools. He highlighted the challenge of power dynamics between experts and non-experts, pointing out how well-intentioned efforts often remain performative or tokenistic, especially around diversity, equity, and inclusion (DEI) because innovations are being rolled out in a non-neutral space where power structures exist. He advocated for grassroots, bottom-up efforts to chip away at entrenched power structures, suggesting change begin in small groups and grow organically. Concerning community participation in design of dashboards, Celi stressed the need to educate communities in data science basics to enable genuine dialogue and agency, warning against superficial participation where community members lack the tools to contribute meaningfully.

George Hobor brought a funder’s perspective, focusing on the invisible infrastructures that are essential for driving data use, such as supportive programs and programing (e.g., data challenges, coalition building), partnerships with community-based organizations, and ongoing data sourcing efforts amid the volatility of publicly available datasets. He stressed the importance of building advisory groups with equitable community representation and developing mechanisms to sustain and grow data use. Additionally, Hobor recognized the persistent challenge of data literate workforce retention in nonprofits and underscored the important role of data intermediaries in bridging this gap.

Angélica Valdés Valderrama presented the perspective of a knowledge broker working directly with community leaders who often operate without adequate funding. She emphasized the unique role of organizations like Ciencia Puerto Rico in negotiating data ownership, sharing, and creation with community partners. She challenged traditional academic notions of what counts as “data,” noting that community leaders already collect and analyze data in informal but effective ways. She advocated for reflexivity about who “the community” is and the importance of centering the voices and self-defined struggles of historically oppressed groups. Regarding key elements of a resilient partnership infrastructure, Valderrama highlighted the importance of relationships and “showing up” in the community, regenerating value (return on investment) for the community, and facilitating intergenerational knowledge transfer and leadership succession.

Cindy Blitz emphasized co-creation as a key strategy to ensure data infrastructure aligns with partner values and integrates with workflow and professional routines, but cautioned that co-creation must be genuine, mutually beneficial, and continually negotiated throughout the process of collaborating. She stressed continuous user engagement through interpretive walkthroughs and incorporating narrative elements that amplify community voices in dashboards. Regarding the question of building a resilient infrastructure, Blitz advocated for redundancy in knowledge and roles, thorough documentation explaining the "why" behind data products, periodic reviews, and user support through training, coaching, or technical assistance. She also highlighted the importance of funders acknowledging the time and commitment necessary to build relationships with partners.

Nick Hart reflected on the state of the data landscape, pointing at significant under-staffing at federal agencies in charge of collecting and distributing data (e.g., CDC, data.gov) and structural changes (e.g., merger plans of major statistical agencies), which present challenges but also (forced) opportunities for modernization and innovation. In particular, there may be opportunities to restructure legal mandates that govern what data the federal government collects and how data are used in ways that maximize public benefits and minimize risks (e.g., to privacy). Hart underscored the need for transparency about data sources and methods to build trust, noting that there is no universal “trust mark” for data quality. He also emphasized the importance of clear communication about data provenance and maintaining knowledge around data compilation and updating, all of which are also critical to building resilience. He discussed emergent cross-sector collaborations on data and the critical role of data stories as a source of feedback about what data assets are most important and how to improve their quality.

Kadija Ferryman introduced a critical question about the nuances of embedding “community values” in data infrastructures, cautioning that not all community-held values are positive (e.g., racism, misogyny). She provoked the panel to consider how to handle communities whose values contradict ethical and inclusive standards. In response, panelists suggested fostering a community dialogue in a safe setting that invites different perspectives and encourages dissent (Celi, Valderrama), while balancing democratizing of knowledge with preserving scientific integrity (Hobor).

Itzhak Yanovitzky drew attention to the value of approaching infrastructure from the perspective of networks in addition to systems and formal structures. For example, it may be useful to consider data infrastructure as an ecosystem occupied by actors with diverse interests and roles—i.e., data creators, brokers, curators, translators, gatekeepers, etc.—who may enter partnerships or otherwise coordinate inputs to produce a robust, adaptive, and resilient data infrastructure that serves all but does not depend on decisions or actions of a single actor. In addition, it is important to consider the information and communication infrastructures needed to support design and implementation of dashboards.

BREAKOUT SESSION: ACTIONABILITY INFRASTRUCTURE

This breakout session focused on the question of what is needed and/or can be leveraged to improve actionability of public health data dashboards. Using a Miro board, participants collaborated on identifying critical gaps in current knowledge and infrastructure needed to support design and implementation of actionable data dashboards as well as existing resources and assets that may be leveraged to this end. Key themes and points raised are summarized below.

Gaps in current knowledge or research: (1) research on this topic is yet to systematically address the question of how dashboards work, for whom, under what circumstances, and with what effect. Urgently missing are theory-grounded accounts and empirical tests of causal mechanisms (both cognitive such as learning and social such as group thinking or deliberation) that link use of actionable dashboards (which itself is not well defined) to users' decisions and actions; (2) a greater emphasis should be placed from a design perspective on the integration of multimodal data (data that combines information from different sources and formats, such as text, multimedia, and sensor data) as well as qualitative data (e.g., lived experiences) into dashboards for enhancing triangulation and adequate contextualization of available evidence. This has important implications for data harmonizing and interoperability standards; and (3) there is a significant opportunity to consider and experiment with (normative) uses of generative AI to enhance actionability of data dashboards. This may involve both enhanced and streamlined user experience as well as advanced applications such as live and multilevel data streams.

Gaps in existing design/implementation practices: (1) not enough consideration is given in the design phase to sustainability and improvement of dashboards (there should be a sustainability plan in place and funders may want to require applicants to include one when applying for funding); (2) there is room to consider how dashboards fit withing a broader portfolio of data products and tools available to users based on their relative advantages and shortcomings. It also seems reasonable to consider design of multiple dashboards for a specific application of user group as opposed to a single dashboard, for example, a suite of dashboards that is optimally integrated with users' workflow; (3) with the proliferation of available public health data and the advent of AI tools for mining large datasets, it seems timely to consider how dashboards may be designed to be adaptive (i.e., an adaptive design approach); and (4) a greater emphasis should be placed on providing adequate training and technical assistance to users, specifically users with lower data and digital literacy.

Gaps in existing data infrastructure/ecology: (1) dashboard actionability is directly influenced by availability of and access to public health data, both of which may be jeopardized or disrupted when policies change. This underscores the urgent need to revisit current structures, arrangements, and investments regarding collection, curation, and governance of public health data; (2) the supply of available public health data falls short of addressing actual demand and needs of many potential users. There needs to be an established mechanism or a process for making decisions with all stakeholders about what data to collect, how to make it available to all, and how it should be used; (3) given documented challenges regarding data quality assurance, potential bias, risks to privacy, and overall lack of transparency regarding sources and methods—all of which have been shown to impact users' trust in data dashboards—it is imperative to institutionalize an independent data gatekeeping function or body to ensure ethical and equitable practices by all actors involved (researchers, data brokers, etc.); and (4) existing data collection systems are not well equipped to leverage crowdsourcing (including reciprocal crowdsourcing where users are both contributors and beneficiaries) for collecting useful public health data (e.g., behavioral, social interaction, and public sentiment data) and this seems like a missed opportunity for boosting data infrastructure.

Funding/investments for boosting actionability: (1) prioritize funding for collaborative research projects to incentivize collaboration rather than competition among dashboard designers and to identify effective team science models; (2) invest in open-access platforms and tools to scale capacity for designing, implementing, and evaluating actionable data dashboards; and (3) create funding streams for innovative projects that experiment with integration of AI applications (e.g., chatbots, data storytelling, etc.) to enhance dashboard actionability.

Key takeaways: (1) there is a rich pool of relevant interdisciplinary knowledge (e.g., in design, education, communication, implementation science, etc.) that can be leveraged to inform design and implementation of data dashboards that is largely overlooked in the existing literature on data dashboards. Building on this knowledge pool to generate and test theories of action of actionable dashboards has significant potential to advance the science of dashboard design and implementation as well as attract researchers from a broader range of disciplines and fields to contribute to this work; (2) facilitating and incentivizing collaborations, including an active community of practice, ought to be prioritized for investments and funding; and (3) there is a pressing need for all stakeholders involved to proactively deliberate a strategy or ways to ensure a robust public health data infrastructure (including logistical, financial, legal, and equity aspects) and produce a clear set of guidelines and an action plan for achieving this goal.

BREAKOUT SESSION: COLLABORATION INFRASTRUCTURE

This breakout session focused on the question of what is needed and/or can be leveraged to improve collaboration around public health data dashboard design and use. Using a Miro board, participants collaborated on identifying critical gaps in current knowledge and infrastructure-related needs and opportunities to support long-term, equitable, and effective collaborative processes. Key themes and points raised are summarized below.

Gaps in Current Knowledge or Research: (1) much of the literature on collaboration in dashboard development lacks empirical accounts and nuanced documentation of real-world challenges and solutions. There is limited research on what collaboration looks like in practice and how it unfolds across disciplines and institutions within the context of dashboard design, including frameworks for understanding how power dynamics, trust, and time constraints shape collaboration, and how to meaningfully involve community members from the earliest stages. (2) few researchers are trained in community-engaged research methods, and many struggle to recognize or work with non-academic forms of knowledge. Developing a common language for collaboration, particularly across disciplines and between academics and communities, was identified as a pressing need. (3) there is a lack of knowledge about how dashboards may influence social capital, trust, and decision-making within communities, and how collaborative processes can be evaluated and improved.

Gaps in Existing Design/Implementation Practices: (1) many collaborations appear to be episodic, top-down, and poorly aligned with community timelines and needs. Participants emphasized the importance of integrating collaboration into all phases of dashboard design and implementation as a co-creation process with shared decision-making and ownership. (2) there is a significant gap in institutional and funding structures to support collaboration as a sustained process. Researchers often face time and incentive pressures that discourage deep engagement, while IRB processes and research ethics frameworks do not always account for community leadership in data collection, governance, and dissemination. (3) there is also limited guidance on data return practices (i.e., how to return findings to communities in respectful and actionable ways), while community organizations are rarely funded or recognized as full partners, and trust is often undermined by extractive data practices.

Gaps in Existing Infrastructure/Ecology: (1) gaps exist in the human, political, and institutional infrastructure needed to support collaboration, such as a lack of investment in training programs that prepare early-career researchers and community leaders to engage across sectors and knowledge systems. (2) data infrastructure remains opaque, with communities often lacking access to the data that describe them, while collaboration requires not only data and tools, but also social infrastructure including trust, mutual understanding, and long-term presence, which is often undervalued and underfunded. (3) structural barriers including academic reward systems do not prioritize community engagement and political and philanthropic ecosystems that frequently direct funding to the same, well-resourced organizations rather than grassroots groups.

Funding/Investments for Boosting Collaboration: (1) models should be shifted to support community-initiated research and capacity building (e.g., training community research liaisons, sustaining intermediary roles). (2) recognition of research collaboration with communities in academia ought to be institutionalized and "counted" (e.g., dashboard DOIs, co-authorship, promotion, and tenure criteria). (3) collaborative data governance mechanisms should be supported, such as community IRBs or data stewardship boards, to promote equity and transparency. (4) investments should be made in ongoing relationship-building efforts, not only project-specific activities, to ensure continuity and trust. (5) spaces and incentives should be created for generational and cross-sector learning, especially training multicultural and multilingual students who can work across community and institutional contexts. (6) more inclusive dissemination strategies should be facilitated—for example, data insights shared with communities using plain language, dashboards that tell asset-based rather than deficit-based stories, and opportunities for youth and educators to engage with data tools as part of empowerment and literacy-building.

Key Takeaways: (1) collaboration in dashboard design and use must be reframed as a long-term, relational, and political process, rather than a set of discrete tasks. (2) investments in people—especially those who can act as trusted intermediaries—are as critical as investments in tools or data. (3) institutional structures and academic norms must adapt to recognize and support equitable collaboration, including through reforming incentive systems and ethics protocols. (4) building a robust infrastructure for collaboration also means redistributing power, enabling communities to lead research processes and manage their own data. (5) collaboration infrastructure must be nimble enough to respond to urgent needs (e.g., crises or funding opportunities) while also sustaining long-term trust and capacity across sectors and systems.

BREAKOUT SESSION: EQUITY-CENTERING INFRASTRUCTURE

This breakout session focused on the infrastructure needed to support equitable design, implementation, and use of public health data dashboards. Participants identified critical gaps, opportunities, and recommendations for building robust systems that ensure equity is not an afterthought but an integral part of dashboard development.

Participants emphasized that **relationship-building and trust** are the foundation of any infrastructure intended to advance equity. Investments in informal spaces for engagement, such as shared meals or community gatherings, were highlighted as vital to establishing the trust required for effective collaboration. Infrastructure for equity-centered dashboard work must prioritize long-term commitments to communities, including recognition and compensation for the time and expertise of community partners through mechanisms such as subawards.

The group identified gaps in current practices related to **education and capacity-building**. Several members agreed that, too often, communities are engaged without sufficient attention to how their data contributions will be used or how they might benefit from the resulting dashboards. Participants stressed the importance of clear, accessible communication about data use, shared goals, and expected outcomes. Thus, infrastructure should include resources and supports to enhance data literacy and ensure communities have the tools and knowledge to engage fully in decision-making processes.

Data governance and ownership emerged as critical concerns. Participants advocated for models that allow community organizations to retain ownership of their data, including data systems and transparent decision-making processes about data goals and targets. There was strong consensus that infrastructure should support community-driven approaches to data stewardship, allowing communities to set priorities and determine how data is collected, shared, and used.

To improve data equity, participants also pointed to the need for **infrastructure that enables asset-based approaches**—highlighting community strengths, not just deficits. Dashboards should incorporate multiple data streams, including qualitative and narrative data, to reflect the full complexity of community experiences and goals. Infrastructure should also support transparency about data limitations and encourage acknowledgment of uncertainty to build trust rather than erode it.

Participants noted the importance of **incentive structures** aligned with equity goals, both for organizations and individuals. Infrastructure investments should include mechanisms to support under-resourced organizations and ensure that collaborations are equitable in terms of resources, responsibilities, and benefits.

Key Takeaways: (1) centering equity in design and implementation of data dashboard requires both tangible resources (funding, technology, personnel) and intangible assets (trust, respect, shared purpose). (2) building and sustaining this infrastructure demands deliberate attention to power dynamics, community leadership, and long-term commitments to equitable processes and outcomes.

NEXT STEPS: TOWARD AN ACTIONABLE RESEARCH AGENDA

In this final activity, participants collaborated on generating ideas for collaborative research projects with significant potential to advance design and implementation of actionable data dashboards. Suggestions regarding research questions and/or projects may be organized according to common themes.

Research to improve user-centeredness

- Projects that systematically explore common barriers (capacity, motivation, and access-related) to using dashboards among different groups of users.
- Projects that experiment with strategies for building user trust in dashboards.
- Projects that compare how different groups of users think about and use data and the value they place on using data.

Research to improve design collaborations

- Projects that delineate best practices for identifying and negotiating how community values and interests are reflected in data dashboards.
- Projects that develop and assess uptake of guidelines for initiating and enabling an effective process of co-design or co-production of data dashboards (including guidelines for documenting information about the process).
- Projects that explore whether different collaboration structures are needed to support design and implementation of different types (or common use cases) of dashboards.

Research to improve affordances

- Projects that compare the utility of different models of using dashboards to crowdsourced data.
- Projects that experiment with optimal ways for integrating chat features into dashboards.
- Projects that assess the effect of gamification on improving user engagement with dashboards.
- Projects that delineate key actionability affordances of different types of dashboards.

- Projects that explore the potential of AI to become a fully reliable data intermediary or gatekeeper by pairing LLMs with data obtained from guided user dialogues that surface needs, caveats, and desired outputs, etc.

Research to assess impact

- Projects that draw lessons from failed dashboards.
- Projects that explore ways to measure the effects of dashboards on equity, broadly defined (i.e., information, empowerment, health, etc.).
- Projects that compare the relative usability and usefulness of dashboards to alternative products.

CLOSING REMARKS

Participants were invited to share final thoughts about ways to advance the science and practice of designing and implementing actionable data dashboards. A strong interest was expressed in activities and investments for facilitating a **community of practice** (CoP) of dashboard designers and users for sharing knowledge and fostering collaborations. Two specific action items proposed were creating a registry of data dashboards and organizing events (e.g., a webinar series) that bring members of this community together.

There was also a strong interest in exploring the **creation of venues or spaces for collaborating with communities on the design and implementation** of dashboards that are responsive to community needs and priorities. One way of empowering community members to actively and meaningfully participate in co-design of dashboards is to invest in education efforts that help interested members acquire basic data and digital literacy skills. Education opportunities also extend to the workforce development context, where design- and collaboration-focused training is projected to become more central to training an AI-ready workforce. This requires developing and offering an **interdisciplinary curriculum and pedagogy** that promote design and system thinking, competencies in collaboration and stakeholder engagement, and an intentional focus on equity and ethical conduct.

Lastly, a case was made for **effective advocacy and marketing** of data dashboards beyond the group of researchers, collaborators, and funders who are active in this space. Two specific action items proposed were to better articulate and communicate the value proposition of data dashboards to diverse groups of stakeholders (e.g., funders, policymakers, community members, as well as the research community) and proactively connect dashboard design and implementation to work/research done in other fields by presenting in professional meetings and conferences that share an interest in the knowledge-to-action challenge.

APPENDIX A: MEETING AGENDA AND PARTICIPANT BIOS

FORUM ON ADVANCING THE SCIENCE AND PRACTICE OF ACTIONABLE PUBLIC HEALTH DATA DASHBOARDS

MEETING AGENDA

JUNE 2, 2025

7:00 – 9:00 p.m.	Networking Reception

DAY 1: JUNE 3, 2025

8:00 – 9:00 a.m.	Breakfast
9:00 – 9:15 a.m.	Welcome and Opening Remarks *Brian Quinn*, Associate Vice President, Research-Evaluation-Learning, Robert Wood Johnson Foundation
9:15 – 10:15 a.m.	Overview and Reflections on the Current State of Science and Practice of Actionable Public Health Data Dashboards *Itzhak Yanovitzky*, *Gretchen Stahlman*, and *Charles Senteio* (co-organizers)
10:15 – 10:30 a.m.	BREAK
10:30 – 11:45 a.m.	Panel Discussion: Improving Actionability of Public Health Data Dashboards by Design • *Sarah Fadem*, *Gustav Verhulsdonck*, *Radhika Sood*, and *Teresa Vivar* (discussants) • *Kate Magsamen-Conrad* (moderator)
12:00 – 1:00 p.m.	Lunch
1:00 – 2:00 p.m.	Presentation and Panel Discussion: Funding and Sustaining Public Health Dashboards • *Marc Gourevitch*, *Clemens Noelke*, *Mary Feeney,* and *Jim Walton* (discussants) • *Salomon Moreno Rosa (Envoy)* (presenter and moderator)
2:00 – 3:00 p.m.	Breakout Sessions: Barriers and Facilitators to Design and Implementation • Table 1: Collaboration (Facilitator: Gretchen Stahlman) • Table 2: Equity-centering (Facilitator: Charles Senteio) • Table 3: Actionability (Facilitator: Itzhak Yanovitzky)
3:00 – 3:15 p.m.	BREAK
3:15 – 4:00 p.m.	Breakout Reports + Discussion
4:00 – 4:30 p.m.	Reflections on Day 1 and Adjournment
6:00 – 8:00 p.m.	Dinner

DAY 2: JUNE 4, 2025

8:00 – 9:00 a.m.	Breakfast
9:00 – 10:00 a.m.	Panel Discussion: Building Infrastructure and Collaboration Capacity for Designing and Implementing Actionable Public Health Data Dashboards • *Nick Hart*, *Cindy Blitz*, *Angélica Valdés Valderrama*, *Leo Celi,* and *George Hobor* (discussants) • *Robert Gradeck* (moderator)
10:00 – 10:15 a.m.	BREAK
10:15 – 11:30 a.m.	Breakout Sessions: Infrastructure, Capacity-Building, and Investments • Table 1: Collaboration (Facilitator: Gretchen Stahlman) • Table 2: Equity-centering (Facilitator: Charles Senteio) • Table 3: Actionability (Facilitator: Itzhak Yanovitzky)
11:30 a.m. – noon	Breakout Reports + Discussion
12:00 – 1:00 p.m.	Lunch
1:00 – 2:30 p.m.	Toward an Actionable Research Agenda • Brainstorming and discussion of research gaps and opportunities • Ideation/incubation of near-term research projects
2:30 – 3:00 p.m.	Concluding remarks, plan for deliverables, and adjournment

Participants' Biographical Sketches

Planning Committee and Organizers

Itzhak Yanovitzky, PhD
Rutgers University

Itzhak Yanovitzky (Ph.D., University of Pennsylvania) is Professor of Communication (primary appointment) and Public Health (secondary appointment) at Rutgers University. He is an expert in the areas of behavior change communication, public policymaking, translational research, and program evaluation. Professor Yanovitzky's program of research explores effective mechanisms for facilitating the use of evidence in policy and practice and building the capacity of communities to apply communication strategies and tools to promote population health. He has extensive experience partnering with collaborators across academic disciplines and sectors to address a range of public health problems, including most recent efforts to address the opioid epidemic and the rising toll of youth depression and suicide. Professor Yanovitzky is past chair of the Health Communication Division of the International Communication Association and a past member of the National Academies of Science, Engineering, and Medicine's Standing Committee on Advancing Science Communication.

Gretchen Stahlman, PhD
Florida State University

Gretchen Stahlman is an Assistant Professor in the School of Information at Florida State University. She previously served as Assistant Professor of Library & Information Science at Rutgers University. Gretchen earned her Ph.D. degree from the University of Arizona School of Information in 2020. Her current research interests broadly include scholarly and science communication, scientific information lifecycles, and sociotechnical systems supporting research infrastructures, resources, and data management. The overall purpose of Gretchen's present and future work is to inform open science and scholarly communication initiatives, as well as development of methods, services, and infrastructures for long-term information management and responsible data science. With more than 10 years of prior professional experience related to librarianship and information management, she has also worked in an academic library, and as a documentation specialist for the Atacama Large Millimeter/submillimeter Array (ALMA) telescope construction project.

Charles Senteio, PhD
Rutgers University

Charles Senteio's research focuses on improving health outcomes and patient wellness for vulnerable, minority patients through technology-enabled solutions that facilitate health information flow. A mixed methods researcher, his insights from health informatics develop and enhance innovative, scalable approaches to care delivery, with an emphasis on community-based research. Dr. Senteio has over two decades of experience in healthcare, serving as a strategic adviser to hospital systems across the U.S. and internationally interested in improving health outcomes and reducing the cost of care. His ongoing work describes ways to enhance health information exchange between patients and providers. He has published investigations to explain how physicians perceive patients' disclosure of sensitive health information and how physicians use that information to make care decisions. He has also published work describing approaches for using technology to provide health information to medically underserved populations.

Miranda Yates, PhD
Robert Wood Johnson Foundation

Miranda Yates, is a Senior Program Officer for Research-Evaluation-Learning at the Robert Wood Johnson Foundation (RWJF). With a background in developmental psychology, youth civic engagement, and community-based participatory research and evaluation, she works closely with RWJF's Healthy Children and Families strategic portfolio. Prior to joining RWJF, Miranda was Assistant Executive Director of Strategy, Evaluation, and Learning at Good Shepherd Services (GSS), a youth and family development organization in New York City. Before GSS, she was a Regional Director at the Covenant House Institute charged with promoting evidence-based practice and developing research partnerships. With James Youniss, she co-authored *Community Service and Social Responsibility in Youth* and *Roots of Civic Identity: International Perspectives on Community Service and Activism in Youth.* Miranda has a BA in History from Georgetown University and a Ph.D. in Developmental Psychology from The Catholic University of America. She completed a postdoc at Brown University's Center for the Study of Race and Ethnicity in America.

George Hobor, PhD
Robert Wood Johnson Foundation

George Hobor, who joined the Robert Wood Johnson Foundation in 2017, is working to promote healthy, more equitable communities. He is committed to building the capacity of the nonprofit and public sectors to use data and research in their program and policy development, and to advancing a broader conception of health that extends beyond the health care system. George describes his work as "using the power of data and research to find solutions to social-economic conditions that affect community health, such as residential segregation, housing security, and social mobility." Previously, George served as the Healthy Communities director for the Louisiana Public Health Institute (LPHI). In this role, he developed and implemented data-driven projects that helped nonprofit organizations and governmental departments address the challenges of climate change, economic downturns, natural disasters, and other shocks. George's background also includes research on building stronger, healthier communities in the Northeast and Midwest and the role of social capital and networks in facilitating adaptation and change and addressing the social determinants of health. George received his MA in political science from the Maxwell School of Citizenship and Public Affairs at Syracuse University and earned a PhD in sociology from the University of Arizona.

Miriam Kim
Rutgers University

Miriam Kim is a recent graduate of Rutgers University-New Brunswick with a BA in Information Technology & Informatics and English. She has previously assisted Drs. Stahlman and Yanovitzky on a RWJF-funded project that mapped and assessed the current landscape of research and practice on public health data dashboards and is a co-author on several peer-reviewed publications outlining the methodology developed by the team and key research findings. She currently serves as Project Coordinator on a new RWJF-funded project that continues and expands this work with additional research support and technical assistance responsibilities.

Speakers and Participants

Cynthia L. Blitz, PhD
Rutgers University

Dr. Cynthia L. Blitz is the Executive Director of the Center for Effective School Practices (CESP) and a Research Professor at the Rutgers University Graduate School of Education (RU-GSE). She specializes in advancing evidence-based practices that bridge the gap between research, practice, and policy. An expert on research-practice partnerships (RPPs) and professional learning communities (PLCs), Dr. Blitz's work frequently involves forming, maintaining, or otherwise supporting effective data-driven collaborations and partnerships and strategies for promoting the institutionalization of data-informed decision-making routines. Dr. Blitz holds a Ph.D. in Social Welfare from the University of Pennsylvania and an M.A. in Applied Anthropology from American University.

Leo Celi, MD, MPH, MSc
Massachusetts Institute of Technology

Leo Celi is the principal investigator behind the Medical Information Mart for Intensive Care (MIMIC) and its offsprings, MIMIC-CXR, MIMIC-ED, MIMIC-ECHO, and MIMIC-ECG. With close to 100k users worldwide, an open codebase, and close to 10k publications in Google Scholar, the datasets have undoubtedly shaped the course of machine learning in healthcare in the United States and beyond. His group has written 3 open-access textbooks: "Secondary Analysis of Electronic Health Records" in 2016, "Global Health Informatics: Principles of eHealth and mHealth to Improve Quality of Care" in 2017, and "Leveraging Data Science for Global Health" in 2020. The first has been downloaded close to 2 million times and translated into Mandarin, Spanish, Korean and Portuguese. The group has created two open online courses, "Global Health Informatics" and "Collaborative Data Science for Healthcare". Finally, Dr. Celi and his team have organized over 50 datathons in 25 countries, bringing together students, clinicians, researchers, and engineers to leverage data routinely collected in the process of care.

Sarah Fadem, PhD
Rutgers University

Sarah Fadem is a Postdoctoral Fellow in the Department of Family Medicine and Community Health at Rutgers Robert Wood Johnson Medical School. Dr. Fadem holds a Master's in Integrated Product Design and a Ph.D. in Health Communication, and she specializes in human-centered and co-design methods. Her research aims to develop context-sensitive interventions that facilitate the understanding and application of complex information in real-world care delivery settings.

Mary Feeney, PhD
Arizona State University

Mary Feeney is Frank and June Sackton Chair and Professor in the School of Public Affairs. She is a Fellow of the National Academy of Public Administration. Feeney's research focuses on public management, nonprofit management, and science and technology policy. Feeney previously served as the Program Director for the Science of Science: Discovery, Communication and Impact program at the National Science Foundation (2021-2024). She has published more than 75 peer-reviewed journal articles in public administration, higher education, and science and technology policy.

Kadija Ferryman, PhD
Johns Hopkins University

Kadija Ferryman is an anthropologist who studies the race, ethical, and policy dimensions of health risk prediction tools. Dr. Ferryman is Core Faculty at the Berman Institute of Bioethics and Assistant Professor in the Department of Health Policy and Management at the Johns Hopkins Bloomberg School of Public Health. Before her training as an anthropologist, Ferryman began her professional career as a policy researcher at the Urban Institute in Washington, DC. She has published in journals such as the New England Journal of Medicine, the American Journal of Bioethics, and the Journal of the American Informatics Association. Dr. Ferryman received her BA in anthropology from Yale University and her PhD in anthropology from the New School for Social Research.

Lauren Gardner, PhD
Johns Hopkins University

Lauren Gardner is the Alton and Sandra Cleveland Professor in the Department of Civil and Systems Engineering at Johns Hopkins Whiting School of Engineering and holds a joint appointment in the Bloomberg School of Public Health. She is the creator of the interactive web-based dashboard used by public health authorities, researchers, and the public around the globe to track the outbreak of the novel coronavirus beginning in January 2020, infecting more than 47 million and killing more than 1.2 million people worldwide. Gardner specializes in modeling infectious disease risk focusing holistically on virus diffusion as a function of climate, land use, human behavior, and mobility. She has received research funding from NIH, NSF, NASA, and the CDC, and various Australian federal funding organizations. Prior to joining JHU in 2019, Gardner was a senior lecturer in civil engineering at the University of New South Wales (UNSW) Sydney, in Australia. She received her BSArchE in architectural engineering, her MSE in civil engineering, and her PhD in transportation engineering at the University of Texas at Austin.

Marc N. Gourevitch, MD, MPH
New York University

Marc N. Gourevitch is the Muriel and George Singer Professor of Population Health, and from 2012-2024 served as founding Chair of the Department of Population Health at NYU Langone. The focus of Dr. Gourevitch's work is on developing approaches that leverage both healthcare delivery and policy- and community-level interventions to advance the health of populations. Dr. Gourevitch leads the City Health Dashboard and the Congressional District Health Dashboard initiatives, funded by the Robert Wood Johnson Foundation, to equip city, community and Congressional leaders with an accurate understanding of the health of the populations they serve, including social, economic, and environmental drivers, to support population health improvement.

Robert Gradeck, MA
University of Pittsburgh

Robert Gradeck has spent his career helping people find and use civic information. He manages and co-founded the Western Pennsylvania Regional Data Center (WPRDC) at the University of Pittsburgh. The WPRDC is an inclusive open data partnership between the University, Allegheny County, and the City of Pittsburgh. WPRDC helps to inform many community initiatives in the areas of health, housing, environmental protection, transportation, and social justice. He is a member of the Civic Switchboard project, which helps libraries and library workers become participants in civic data initiatives, Co-PI for the CKAN Pathways to Enabling Open Source Ecosystems project, co-leads the Black Equity Coalition’s Data Justice Working Group, is a fellow in the Actionable Intelligence for Social Policy’s Equity in Practice Learning Community, participates in the

National Neighborhood Indicators Partnership, and finished third in the 2021 Pennsylvania Farm Show butter sculpture competition.

Dylan Halpern, MA
University of Chicago

Dylan Halpern is the Technical Lead of the Open Spatial Lab and a full-stack engineer at the University of Chicago’s Data Science Institute (DSI). He specializes in open-source tool development, geospatial data science, and interactive data visualization. His research interests span urban analytics, urban ecology, and public health, with publications covering topics such as spatial access, mobility patterns, and data uncertainty. At the DSI, Dylan leads technical collaborations with nonprofit organizations to build sustainable data tools and analyses that expand capacity and generate insights on pressing social issues. His design and engineering work has been featured in the Venice and Seoul Biennales for Architecture and Urbanism, earned an Emmy for Outstanding Interactive Media Documentary, and has been recognized in Fast Company's Innovation by Design Awards for Data Design and Pandemic Response. Dylan’s academic background focuses on urban design and civic technology. He holds a master’s degree from MIT’s Department of Urban Studies and Planning and was a Fulbright Research Fellow in São Paulo, Brazil.

Nick Hart, PhD
Data Foundation

Nick Hart is President & CEO of the Data Foundation, a renowned advocate for evidence-informed policymaking and open data practices worldwide. With expertise in U.S. policies related to data, evaluation, statistics, science, and privacy, Dr. Hart previously served at the White House Office of Management and Budget and as Policy and Research Director for the U.S. Commission on Evidence-Based Policymaking. A fellow at the National Academy of Public Administration and Bipartisan Policy Center, Dr. Hart has testified before Congress and the European Commission and authored numerous publications including two books: "Evidence-Building and Evaluation in Government" (2022) and "Evidence Works" (2019). He holds appointments to multiple advisory committees, including GAO's Yellow Book Council. Dr. Hart is an adjunct professor at George Washington University and earned his Ph.D. in program evaluation from GWU after completing Master's degrees in Environmental Science and Public Administration at Indiana University.

Zhe He, PhD
Florida State University

Dr. Zhe He is Director of the Florida State University Institute for Successful Longevity and a Professor in the School of Information (iSchool). He is also Director of Biostatistics, Informatics, and Research Design (BIRD) Program in the UF-FSU Clinical and Translational Science Award Hub. His research expertise includes machine learning, natural language processing, and knowledge representation. The overarching goal of his research is to improve population health and advance biomedical research through the application of informatics and data science. His research has been funded by the National Institute on Aging, National Library of Medicine, National Institute of Mental Health, and Agency for Healthcare Research and Quality.

Abel N Kho, MD
Northwestern University

Dr. Kho is an Internist and Professor of Medicine and Preventive Medicine in the Northwestern University Feinberg School of Medicine where he is the Founding Director of the Center for Health Information Partnerships (2015) and the Institute for Artificial Intelligence in Medicine (2020). His research focuses on integrating diverse data (e.g. electronic health records, administrative data, geospatial data) for a range of health applications including computational phenotyping, estimating population level disease burden, and quality improvement. He was a founding member and serves as overall Principal Investigator for the Chicago Area Patient Centered Outcomes Research Network (CAPriCORN). He has received funding for his research from NIH, NSF, DARPA, PCORI, CDC, CMS, ONC, AHRQ, and several Foundations, published extensively, and mentored numerous students and trainees. He is an internationally recognized expert in privacy preserving record linkage, having published the first large scale real-world application of this method for which he was assigned a patent, and co-founded a startup which was subsequently acquired by Datavant. He is an elected Fellow of the American College of Medical Informatics and recipient of the Donald A.B. Lindbergh Award for Innovation in Informatics.

Marynia Kolak, PhD
University of Illinois Urbana-Champaign

Dr. Kolak is a health geographer and GIScientist integrating a socio-ecological view of health, spatial data science, and a human-centered design approach to investigate regional and neighborhood health equity. She is an Assistant Professor at the Department of Geography & GIScience at the University of Illinois at Urbana-Champaign and is Vice Chair at the Health & Medical Geography Specialty Group at the American Association of Geographers. Leading the Healthy Regions & Policies Lab, they serve as the PI for the SDOH & Place, Opioid Environment Policy Scan, ChiVes, and US Covid Atlas projects.

Mia Liza A. Lustria, PhD
Florida State University

Dr. Mia Liza A. Lustria is a Professor at the School of Information and chairs the Sub-Committee for the Ph.D. in Information Program. She also has courtesy appointments with the School of Communication (College of Communication and Information), the Department of Behavioral Sciences and Social Medicine (College of Medicine), and the Public Health Program (College of Social Sciences and Public Policy). Lastly, she serves as an affiliate faculty for the Center for Translational Behavior Science, and the Institute for Successful Longevity. She earned a Ph.D. in Communication from the College of Communication and Information at the University of Kentucky. Prior to pursuing her doctorate and joining FSU, she was an assistant professor at the College of Development Communication at the University of the Philippines Los Banos where she also earned her M.S. and B.S. degrees in Development Communication. Dr. Lustria has 20+ years of research experience in eHealth and mHealth intervention approaches. She has a successful record of peer-reviewed publications and funded interdisciplinary research focused on the design and evaluation of technology-based behavior change interventions. She has ongoing research collaborations with faculty at the College of Medicine, the College of Social Work, and the Institute for Successful Longevity on various eHealth research projects targeting at-risk and vulnerable populations.

Kate Magsamen-Conrad, PhD
University of Iowa

Kate Magsamen-Conrad is a Professor at the University of Iowa. Her award-winning research addresses social injustices, aiming to affect social change. Her work is focused on affecting lives, theoretically and methodologically strong, published prolifically in prestigious journals, and recognized internationally. She has received more than 30 awards celebrating her dedication to innovative research, transformative leadership, and impactful teaching. Her work has been funded by numerous grants, including from the National Institutes of Health. Recently, she received a Presidential Citation from the National Communication Association for her significant contributions to transforming the communication discipline into a more community- and culturally-centered space.

Ben Miyamoto
The Pew Charitable Trusts

Ben Miyamoto is a manager for Pew's evidence project, leading the engagement and network management strategies for the Impact Funders Forum. He also leads workgroups focused on improving funder practice and strengthening research on research impact. Before joining Pew, Miyamoto was director of chapters, membership, and learning at the Scholars Strategy Network, a national, chapter-based organization for researchers committed to improving policy and strengthening democracy with research. Miyamoto holds a bachelor's degree in philosophy and theology from Boston College.

Clemens Noelke, PhD
Boston University

Clemens Noelke is associate research professor at BU School for Social Work and research director for the diversitydatakids.org project at the Institute for Equity in Child Opportunity & Healthy Development. For diversitydatakids.org, Noelke supervises development and dissemination of data products and led the development of the Child Opportunity Index 2.0 and 3.0. His research focuses on the measurement of neighborhood opportunity for children and on equity-focused research applications of the Child Opportunity Index. He is a sociologist by training with a focus on social stratification, public health, neighborhoods, and quantitative methods. His research has been published in leading academic journals including the American Journal of Epidemiology, American Journal of Public Health, Environmental Research, European Sociological Review, JAMA Pediatrics, Health Affairs, Pediatrics and Social Science and Medicine. Noelke's work has been featured in national and international media, including Axios, CNN, The New York Times, NPR, Politico, Time Magazine, The Washington Post, Globe and Mail, USA Today, and The Economist. Prior to joining diversitydatakids.org, Noelke was a David E. Bell postdoctoral fellow at the Center for Population and Development Studies at the Harvard T.H. Chan School of Public Health. He holds doctorate and master's degrees in sociology from the University of Mannheim, Germany.

Alejandra Piers-Torres
Envoy

Alejandra is a Manager of Strategy & Philanthropy at Envoy. She brings experience in local government, public/private partnerships, and program development to support social impact initiatives. Alejandra holds a BA in International Relations and Hispanic Studies from Brown University.

Brian Quinn, PhD
Robert Wood Johnson Foundation

Brian C. Quinn brings his extensive background in health policy analysis and innovative program development to his work as the Foundation's Associate Vice President for Research and Evaluation. In this role, he helps lead a team dedicated to understanding and measuring the key health and health care issues that are part of the Foundation's strategy, as well as assessing the Foundation's organizational performance. Prior to being named associate vice president for Research and Evaluation, Quinn was the team director of the Foundation's Pioneer Portfolio, which promotes innovative projects marked by their ability to affect transformational change in health and health care. He was also instrumental in establishing the Foundation's initial perspectives and approaches to the issue of global health. Quinn holds a PhD in health services and policy analysis from the University of California, Berkeley, and a BA in economics from Colby College in Maine. His training includes a certificate of study from the London School of Economics and Political Science.

Salomon Moreno Rosa
Envoy

Salomon is a Managing Director at Envoy. He uses his background and expertise in nonprofit administration and organizational development to inform philanthropic advising and strategic planning engagements that help drive operational goals and advance team and program outcomes. Salomon holds Masters of Public Administration and Education Policy from the University of Pennsylvania.

Radhika Sood, PhD
American Foundation for Suicide Prevention

As Director of Data Analytics at the American Foundation for Suicide Prevention, Radhika leads data collection, management, analysis, visualization, and communication efforts that drive organizational strategies. With a Ph.D. and MPH and over 15 years of experience in program planning, implementation, evaluation, and research, she excels in developing indicators and evaluation tools, conducting rigorous program evaluations, and translating data into actionable strategic insights and compelling narratives.

Elizabeth Talmont, DNP, ANP-BC
Planned Parenthood of Northern, Central, and Southern New Jersey

Elizabeth earned all of her nursing degrees from Rutgers University, including a Doctorate of Nursing Practice, and is a practicing adult nurse practitioner. She has worked at Planned Parenthood for over 25 years, both at her home affiliate, PPNCSNJ, and the national office. In her role as the Chief Projects Officer, she oversees the Patient Navigation program, the Research Department, in addition to a variety of clinical or patient-focused projects. She maintains a clinical practice and is proud to defend and protect people's rights and access to sexual and reproductive health.

Rothschild Toussaint
Envoy

Rothschild is an Associate in the Strategy & Philanthropy sector at Envoy. He brings experience in economic and community development, affordable housing, research, and policy analysis. He employs a mixed methods research and data-driven approach to tackling complex social challenges. Rothschild holds a BA in Economic Geography from Dartmouth College.

Angélica Valdés Valderrama, MS
Ciencia Puerto Rico

Angélica Valdés Valderrama is an expert in policy and program research and evaluation. She is a social scientist trained in qualitative, quantitative, and mixed-methods research in political science, agricultural economics, and public health nutrition, with a focus on equity. She is a current Civic Science Fellow (Rita Allen Foundation) with Ciencia Puerto Rico, leading a retrospective evaluation of the implementation and outcomes of Pilot 1.0 (2022-2023) and concurrently developing an evaluation for Pilot 2.0 (2025) of the Laboratorio de Ciencia Comunitario (Community Science Laboratory). She is currently a doctoral candidate at the Friedman School of Nutrition Science and Policy at Tufts University. Her research focuses on assessing innovations and emerging technologies for federal nutrition programs (SNAP and WIC) and food retail options through a health equity lens.

Gustav Verhulsdonck, PhD
Central Michigan University

Gustav Verhulsdonck is an associate professor in Business Information Systems at Central Michigan University, where he teaches in the Applied Business Communication program. His research interests are user experience design, intercultural communication, mobility, data analytics and artificial intelligence. He has worked as a technical writer for International Business Machines (IBM) and as a visiting researcher for the University of Southern California's Institute for Creative Technologies. He also worked as a consultant for clients such as the National Aeronautics and Space Administration (NASA) and the U.S. Army Research Laboratory. His research has appeared in the Journal of Business and Technical Communication, Technical Communication Quarterly, Computers and Composition, and ACM's Communication Design Quarterly. He is co-author (together with Jason Tham, Texas Tech University and Tharon Howard, Clemson University) of UX-Writing: Designing User-Centered Content (Routledge, 2023).

Teresa Vivar
Lazos America Unida

Teresa Vivar is a dedicated community-based participatory researcher and a passionate advocate for health equity. As the Executive Director of Lazos America Unida and a key member of Fuerza Migrante, she has been instrumental in amplifying the voices of Latino and Indigenous communities. Her work focuses on empowering women, promoting justice, and fostering community engagement through innovative approaches, including motivational video content. Teresa's commitment to inclusive public health practices and her extensive experience in community health work make her a valuable contributor to discussions on enhancing the actionability of public health data dashboards.

James Walton, DO, MBA
President of JWalton, LLC

James (Jim) Walton President of JWalton, LLC, a healthcare consultancy firm with expertise in physician-owned value networks, accountable care organizations, and safety net care delivery focused on sustainability in patient-centered healthcare financing and delivery redesign. Prior positions include President and CEO of Dallas-based Genesis Physicians Group, comprised of more than 1,650 physician members representing more than 50 specialties. He also served as CEO of Genesis' joint-venture Accountable Care Organization, Genovista Health, a physician-led, clinically integrated network engaged in population health management and value-based contracting with Medicare, Medicaid, and commercial populations in North Texas. Prior to joining Genesis, Dr. Walton held executive leadership roles within Baylor Health Care System from 1996–2013, including Chief Health Equity Officer and VP/Medical Director of Baylor Community Care. Dr. Walton is a 1982 graduate of the University of North Texas Health Sciences Center and completed his MBA at the University of Michigan in 2009. In 2022, he was appointed to the Physician-Focused Payment Model Technical Advisory Committee (PTAC), an independent federal advisory committee physician-focused payment models.

Research Team Members

Anna Kareeva
Rutgers University

Anna Kareeva is a graduate student at the Rutgers Business School in Computer and Information Science with a concentration in User Experience Design. Anna graduated with a BA degree in Information Technology from Rutgers University in 2022. She has extensive experience as a Business Analyst and in other product-related roles. She is collaborating with Dr. Gretchen Stahlman on this work, utilizing her prior skills in user experience and design.

Rachel Horvath
Rutgers University

Rachel Horvath is a third-year Ph.D. Candidate at Rutgers University Department of Political Science advised by Dr. Katherine McCabe. Rachel earned her Bachelor of Arts in Political Science and Psychology at Lycoming College in Williamsport, PA. Her research interests include social media and politics, with specific interests in social media as a non-traditional news source and a venue for social movement activism.

Adiva Khan
Rutgers University

Adiva Khan is in her third year at Rutgers University majoring in Political Science and double minoring in Economics and Critical Intelligence. She began conducting research through the Lloyd C Gardner Fellowship where she began working with Professor Charles Senteio on her project discussing how artificial intelligence can perpetuate racial bias in the healthcare sector. She is also working with Charles to investigate the feasibility of international research collaboration. Adiva's interests in research stem from her active participation in IMUNA and IDIA—two Model United Nations nonprofit organizations—where she has been able to research pertinent global issues such as human and drug trafficking and collaborated with individuals to discuss and craft solutions. By combining her passions for diplomacy, public policy, and social equity, Adiva aims to advance approaches to addressing public health challenges with a nuanced approach.

Justine Quow
Rutgers University

Justine Quow is in the fourth year of her Ph.D. program at Rutgers University School of Communication and Information. Justine is advised by Professor Itzhak Yanovitzky. Her research interests are health communication and community engagement. Specifically, her scholarship aims to bridge health systems and underserved communities through community engagement. Her dissertation research project explores the roles of communication in forming, sustaining, and evolving data-driven collaborations.

APPENDIX B: PARTICIPANT SUGGESTED RESOURCES

Design Principles and Strategies

- ***Decision Support System (DSS) Design***: Power, D.J. (2002). Decision Support Systems: Concepts and Resources for Managers. Westport, CT: Quorum. (Chapter 4 in particular; Open Access copy available HERE).
- ***Behavioral Design Primer (Interaction Design Foundation)***: https://www.interaction-design.org/literature/topics/behavioral-design.
- ***Dashboard Design:*** Bach, B., Freeman, E., Abdul-Rahman, A., Turkay, C., Khan, S., Fan, Y., & Chen, M. (2022). *Dashboard design patterns*. IEEE transactions on visualization and computer graphics, 29(1), 342-352. DOI: 10.1109/TVCG.2022.3209448.

Building Data Capacity via Collaborations

- Research-Practice Partnerships | William T. Grant Foundation (https://rpp.wtgrantfoundation.org/).
- Keller, S., Nusser, S., Shipp, S., & Woteki, C. E. (2018). Helping communities use data to make better decisions. *Issues in Science and Technology*, *34*(3), 83-89. https://issues.org/helping-communities-use-data-to-make-better-decisions/.
- The Urban Institute's Elevate Data for Equity Project (https://www.urban.org/elevate-data-equity/data-capacity-tools).

Data Infrastructure

Monitoring and News

- Federal Data Forum - new online community hosted by the Population Reference Bureau will foster connection and collaboration among federal data users across sectors and states.
- American Statistical Association is monitoring federal statistical systems.
- America's Data Index - Monitoring America's federal data infrastructure from dataset availability and new releases to planned and unplanned changes to collections.
- Roadmap to the Census 2030 - guiding document of milestones and actions leading to the goal of a "complete count" of all persons in the US during the 2030 Census, includes 2025 milestone updates
- wearethedata.us - Data Disaggregation Action Network (D-DAN) - works to advance and implement federal and state policies as they relate to disaggregation by race and ethnicity through the engagement and empowerment of communities. They have a listserv you can sign up for.

Contribute to the conversation

- America's Essential Data. The group aims to document "the value that data produced by the federal government provides for American lives and livelihoods." You know we love a data impact story, and their team has been developing a framework for telling your data story.

Centralized data preservation efforts

- Library Innovation Lab Team, Harvard Law School Library
- Data Rescue Project
- University of Illinois SDOH and Place Data Discovery App https://sdohplace.org/search