

Implementation science + designing for dissemination

SHOBA RAMANADHAN, SCD, MPH

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

SRAMANADHAN@HSPH.HARVARD.EDU

2.25.21

Acknowledgments

Research partners: K. “Vish” Viswanath, Andy Tan, Tiffany Donaldson, Eduardo Siqueira, Carmenza Bruff, Sara Minsky

Community partners (2008 – present)

Elecia Miller and Vilma Martinez-Dominguez – City of Lawrence Mayor’s Health Task Force / City of Lawrence Community Development

Martha Velez – The Center, Lawrence

Charlotte Rackard-James – Greater Love Tabernacle

Natalicia Tracy – Brazilian Worker Center

David Aronstein and Ediss Gandelman – Boston Alliance for Community Health

Clara Savage – Common Pathways

Jamiah Tappin – Health Resources in Action

Plan for today

1. Overview of implementation science
2. Designing for dissemination
 - Participatory approaches
 - Qualitative approaches

Identify
determinants of
the health issue
of interest

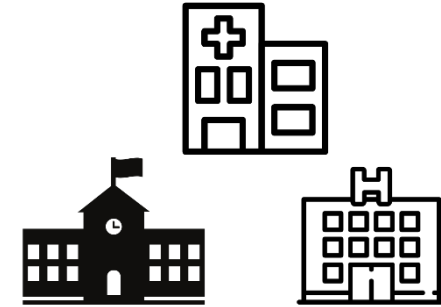
Test solutions in
controlled
settings (Efficacy)



Test solutions in
broader settings
(Effectiveness)



Test ways to
integrate solution
into practice
(Implementation
science)



Some terminology

Evidence-based intervention (EBI): subject of dissemination and implementation efforts with proven impact on health outcomes (efficacy and effectiveness)

- Programs
- Practices
- Policies

Dissemination: the intentional process to spread information and EBIs to a defined target audience

Implementation: the process of integrating an EBI into practice within an organization or system

The core of implementation science

THE THING is the evidence-based program, practice, approach, or policy

1. Does THE THING work? How solid is the evidence base? (*Effectiveness research*)
2. How can we help people/places DO THE THING? (*Implementation science*)
 - a. What about the context impacts the ability of people/places to DO THE THING? (*Implementation determinants*)
 - b. What tactics help people/places DO THE THING? (*Implementation strategies*)
 - c. What impact did we have on how well people/places DID THE THING? (*Implementation outcomes*)

1. Does THE THING work? How solid is the evidence base?

HPV vaccine efficacy in preventing persistent cervical HPV infection: a systematic review and meta-analysis

[G La Torre](#), [C De Waure](#), [G Chiaradia](#), [A Mannocci](#)... - **Vaccine**, 2007 - Elsevier

Introduction We performed a pooled analysis of randomised clinical trials (RCT) on **HPV vaccine** efficacy in preventing cervical persistent infection. **Methods** We carried out a bibliographic search on electronic databases and we selected RCT to perform the meta ...

☆ [Cited by 98](#) [Related articles](#) [All 10 versions](#)



[MMWR Morb Mortal Wkly Rep](#). 2015 Mar 27; 64(11): 300–304. PMID: [25811679](#)

Published online 2015 Mar 27.

PMCID: [PMC4584883](#)

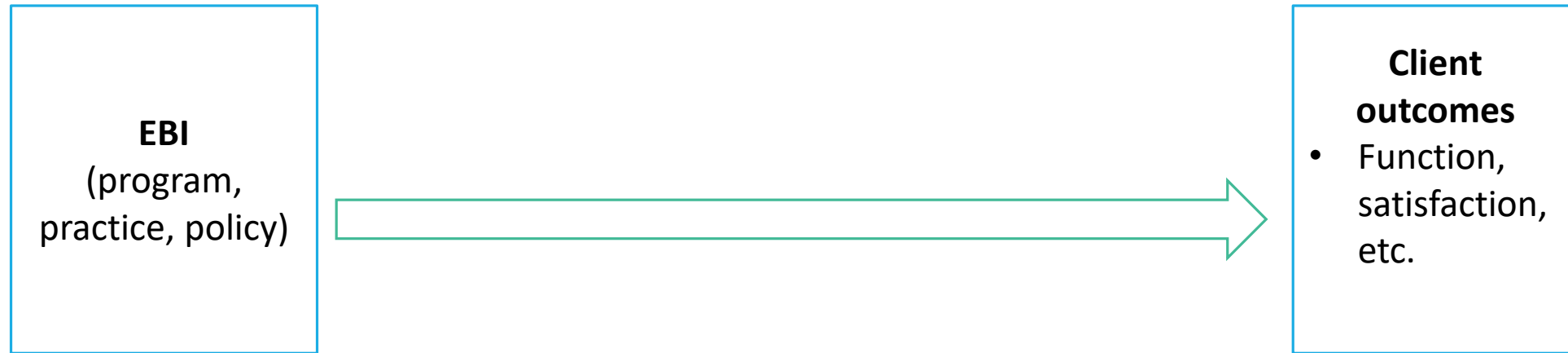
Use of 9-Valent Human Papillomavirus (HPV) Vaccine: Updated HPV Vaccination Recommendations of the Advisory Committee on Immunization Practices

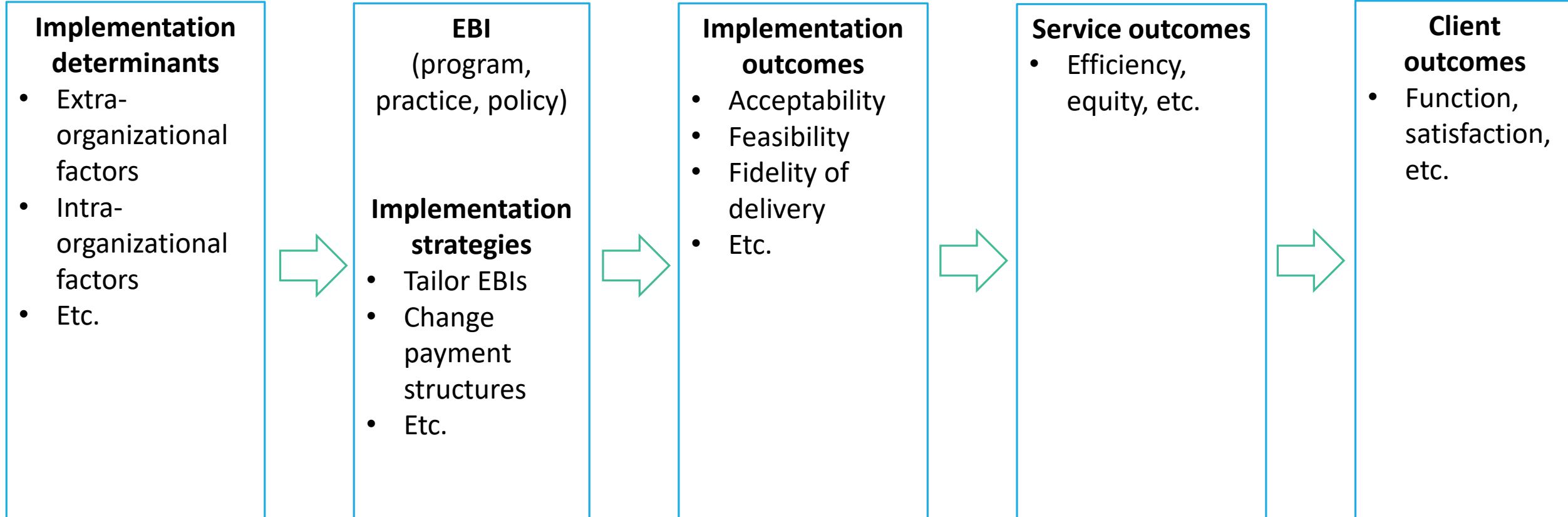
[Emiko Petrosky](#), MD,^{1,2} [Joseph A. Bocchini, Jr](#), MD,³ [Susan Hariri](#), PhD,² [Harrell Chesson](#), PhD,² [C. Robinette Curtis](#), MD,⁴ [Mona Saraiya](#), MD,⁵ [Elizabeth R. Unger](#), PhD, MD,⁶ and [Lauri E. Markowitz](#), MD²

Good starting points:

- PubMed, Google Scholar. Look for systematic reviews, meta-analyses
- Recommendations from relevant national organizations, e.g., CDC or American Cancer Society

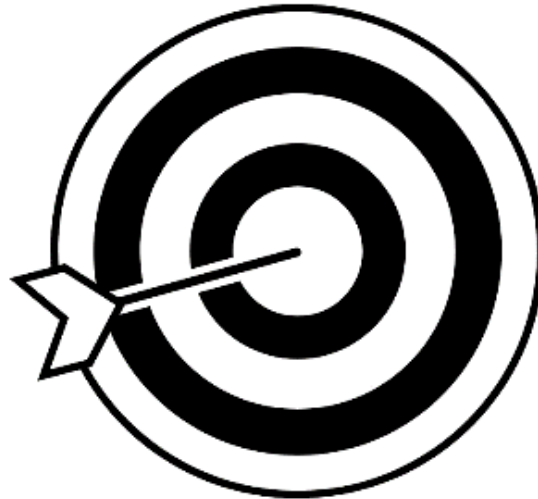
2. How can we help people/places DO THE THING?





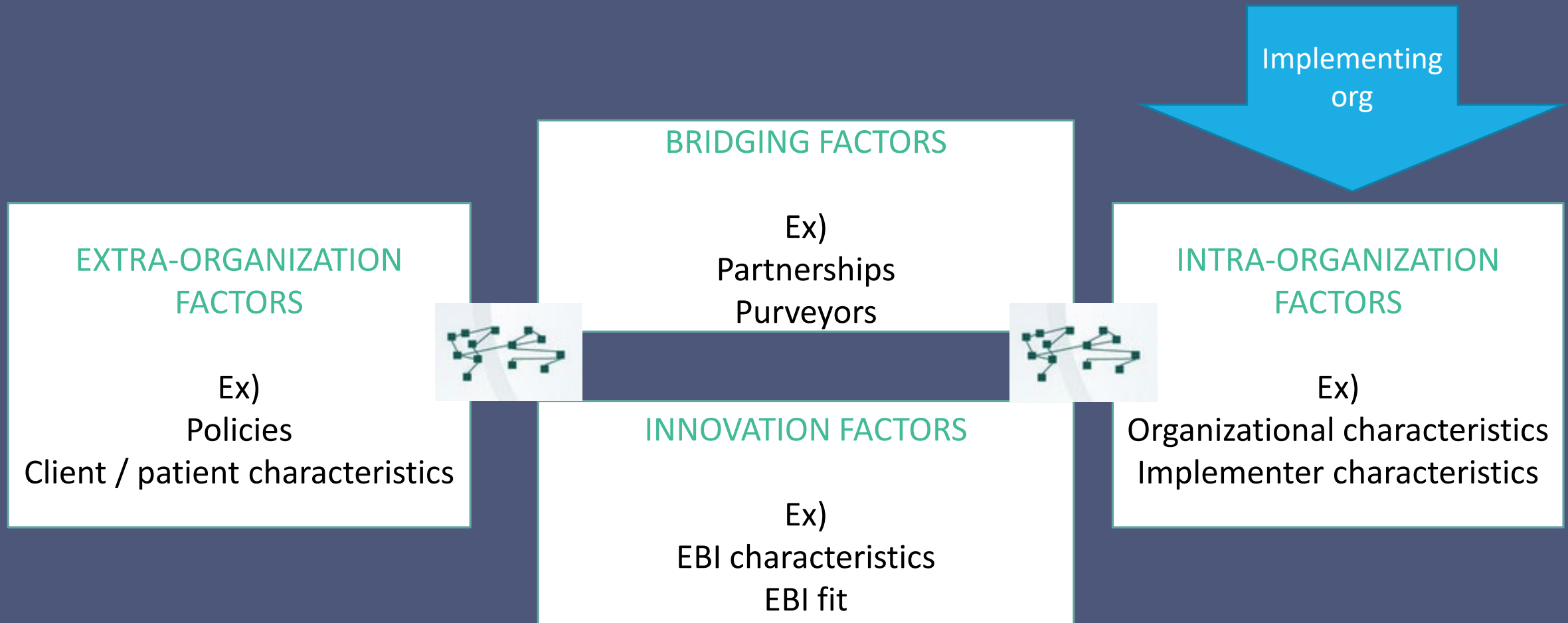
The long-term target:
Elimination of cervical
cancer and related
inequities

HPV vaccine +
cervical cancer
screening

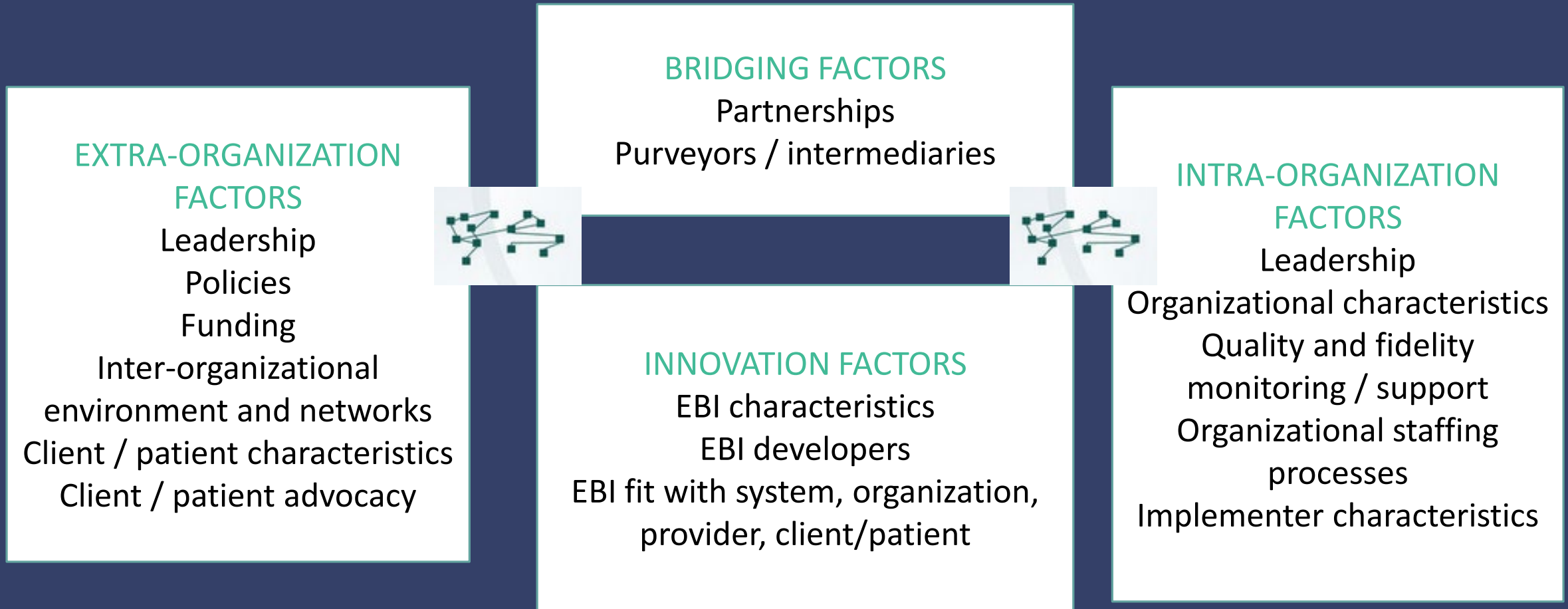


In the chat:
What barriers prevent the US from
meeting goals for delivery of HPV vaccine
and cervical cancer screening?

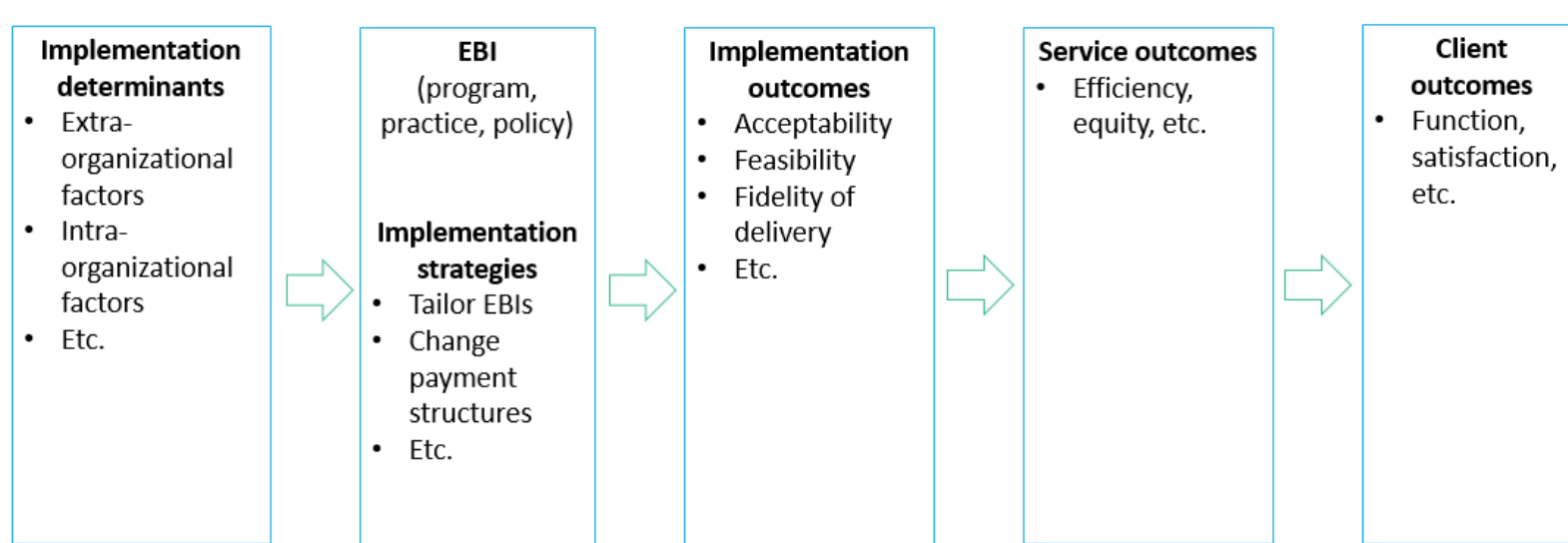
2a. What about the context impacts the ability of people/places to DO THE THING? A simplified systems perspective



Detailed version - assessed across phases of exploration, preparation, implementation, and sustainment



We propose a delivery science for AI in healthcare that rests on the following principles: (1) much of healthcare is delivered in complex adaptive systems⁹, so AI must accommodate this complexity, (2) AI should be viewed as not the end product, but rather an *enabling* component of broader solutions, and (3) solutions enabled by AI are often complex systems of people, processes, and technologies.



What opportunities do you see for AI-enabled solutions related to implementation?

2b. What tactics help people/places DO THE THING?

Major categories of implementation strategies (73 total)

Use evaluative and iterative strategies

Provide interactive assistance

Adapt and tailor to context

Develop stakeholder interrelationships

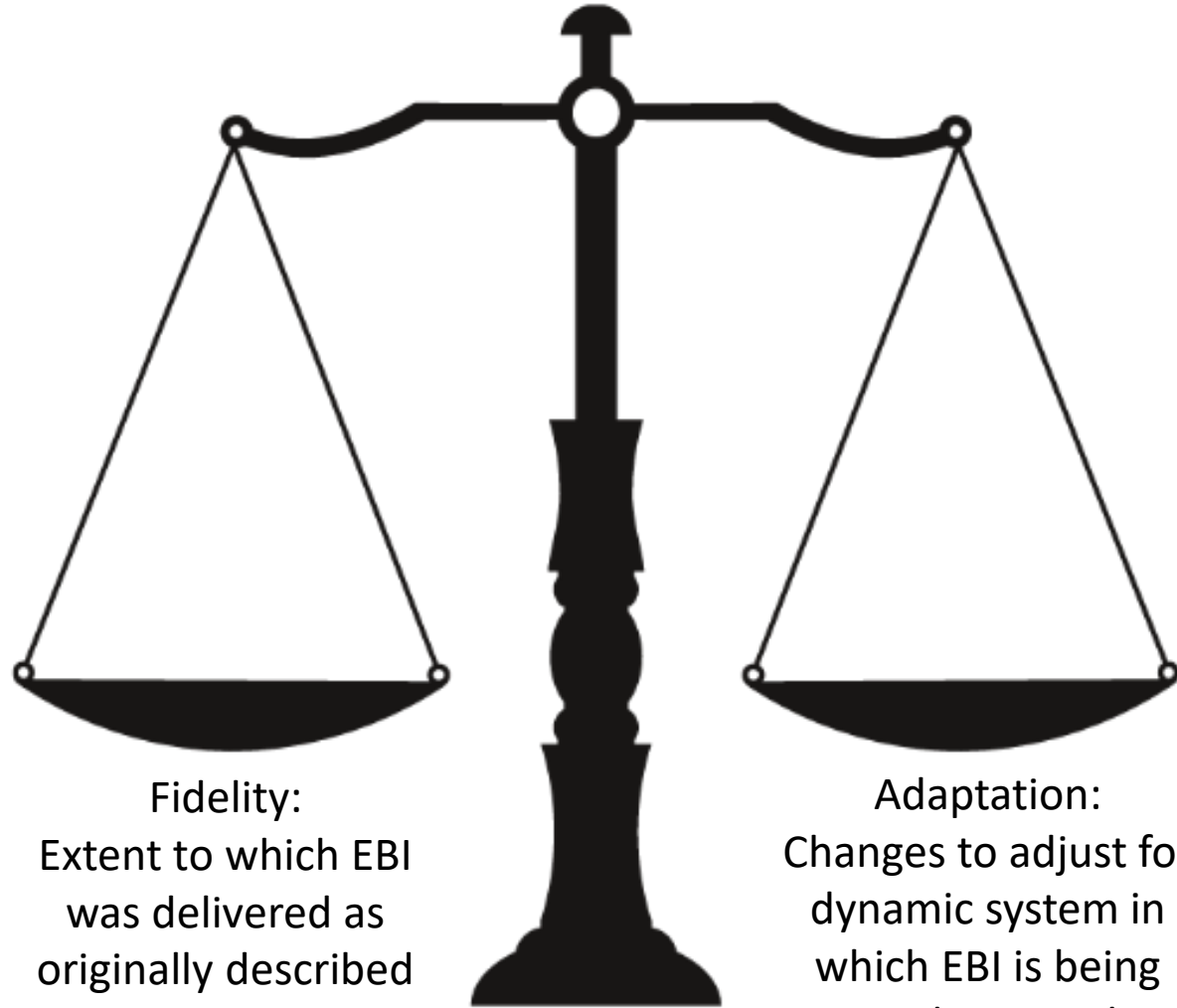
Train and educate stakeholders

Support clinicians

Engage consumers

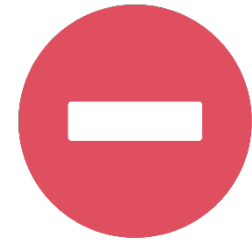
Utilize financial strategies

Change infrastructure



Fidelity:
Extent to which EBI
was delivered as
originally described

Adaptation:
Changes to adjust for
dynamic system in
which EBI is being
implemented

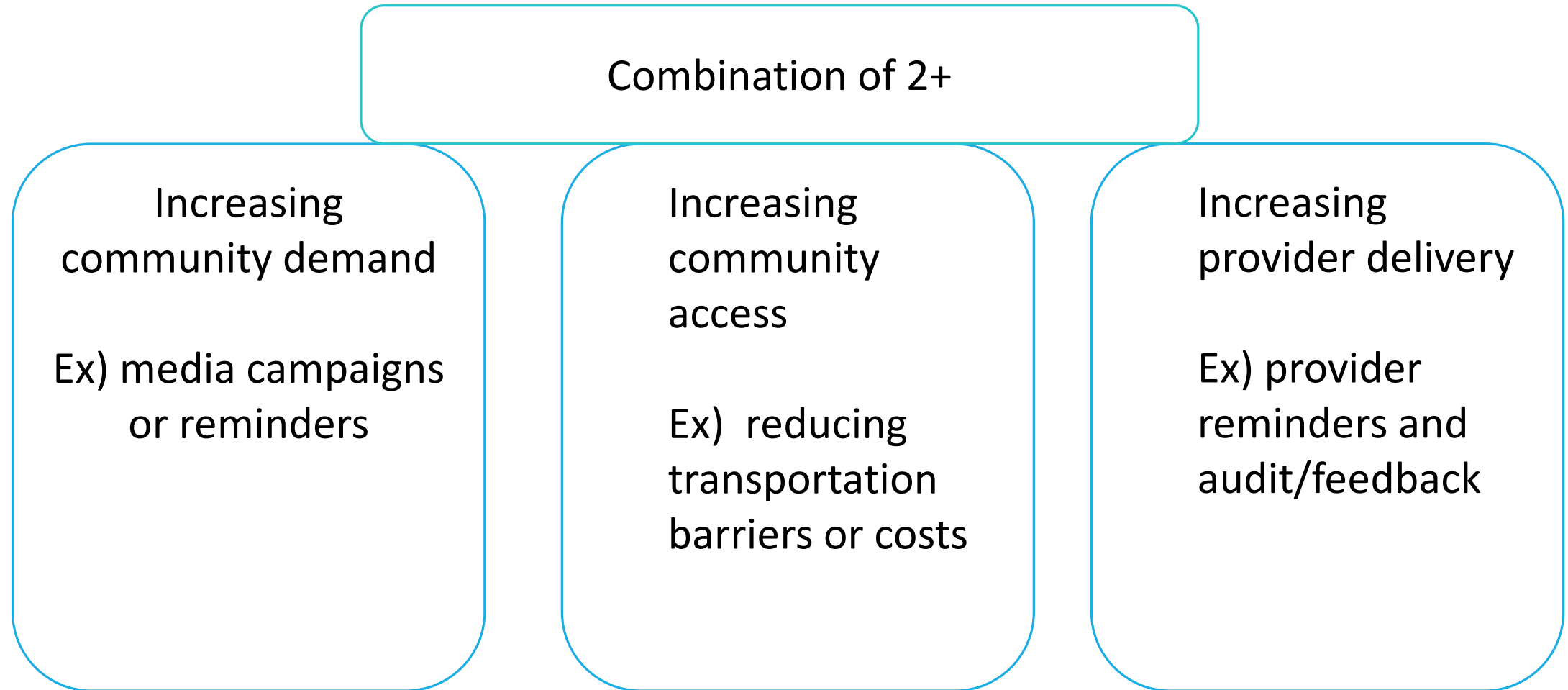


Unplanned or
inconsistent



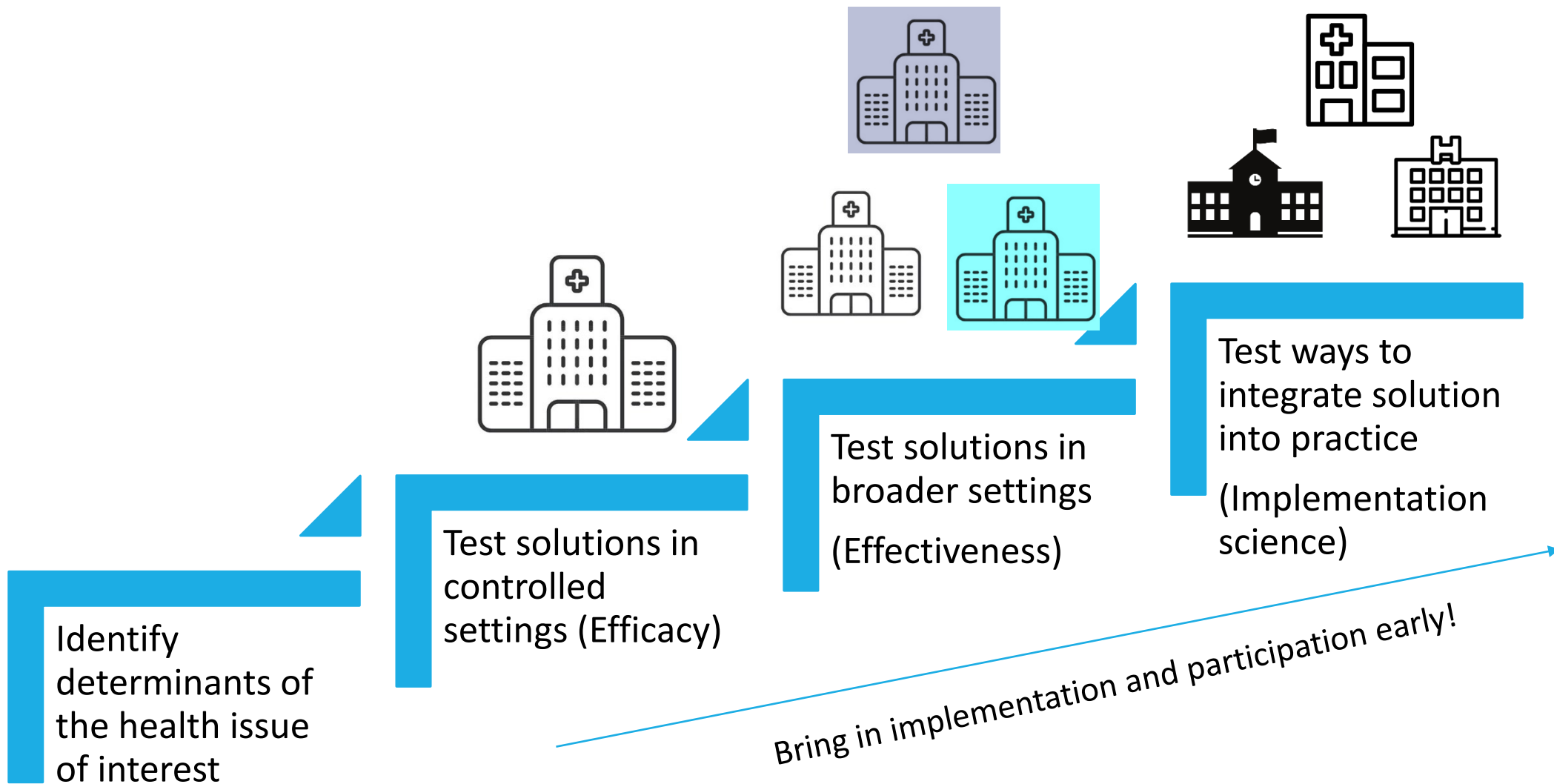
Strategic or
consistent

Back to HPV: Multi-component strategies increase vaccination rates



2c. What impact did we have on how well people/places DID THE THING?

Outcome	Other terms	Example Methods	Equity considerations embedded
Reach	Participation	Surveys, admin data	
Acceptability	Satisfaction, System readiness	Surveys, interviews	
Appropriateness	Perceived fit, Relevance, Compatibility, Suitability, Usefulness, Practicability	Surveys, interviews	
Feasibility	Utility, Suitability, Practicability, Community readiness	Surveys, admin data	
Adoption	Uptake, Utilization, Knowledge Transfer, Intention to Try	Surveys, observations, interviews, admin data	
Fidelity	Adherence, Integrity	Observation, checklist	
Cost	Cost effectiveness, cost benefit	Admin data	
Sustainability	Maintenance, institutionalization	Surveys, admin data	



Using participatory and
qualitative approaches to design
for dissemination

What could possibly go wrong?



Love Productions / BBC



Scott Bryan / BuzzFeed

Participatory implementation science

Ongoing, iterative approach to collaboration between researchers and stakeholders to improve research-practice linkages and create system change, improve health, and address inequities.

Builds on community-based participatory research, action research, and social ecological models.

Research for action.

Benefits of participatory implementation science

For a specific study

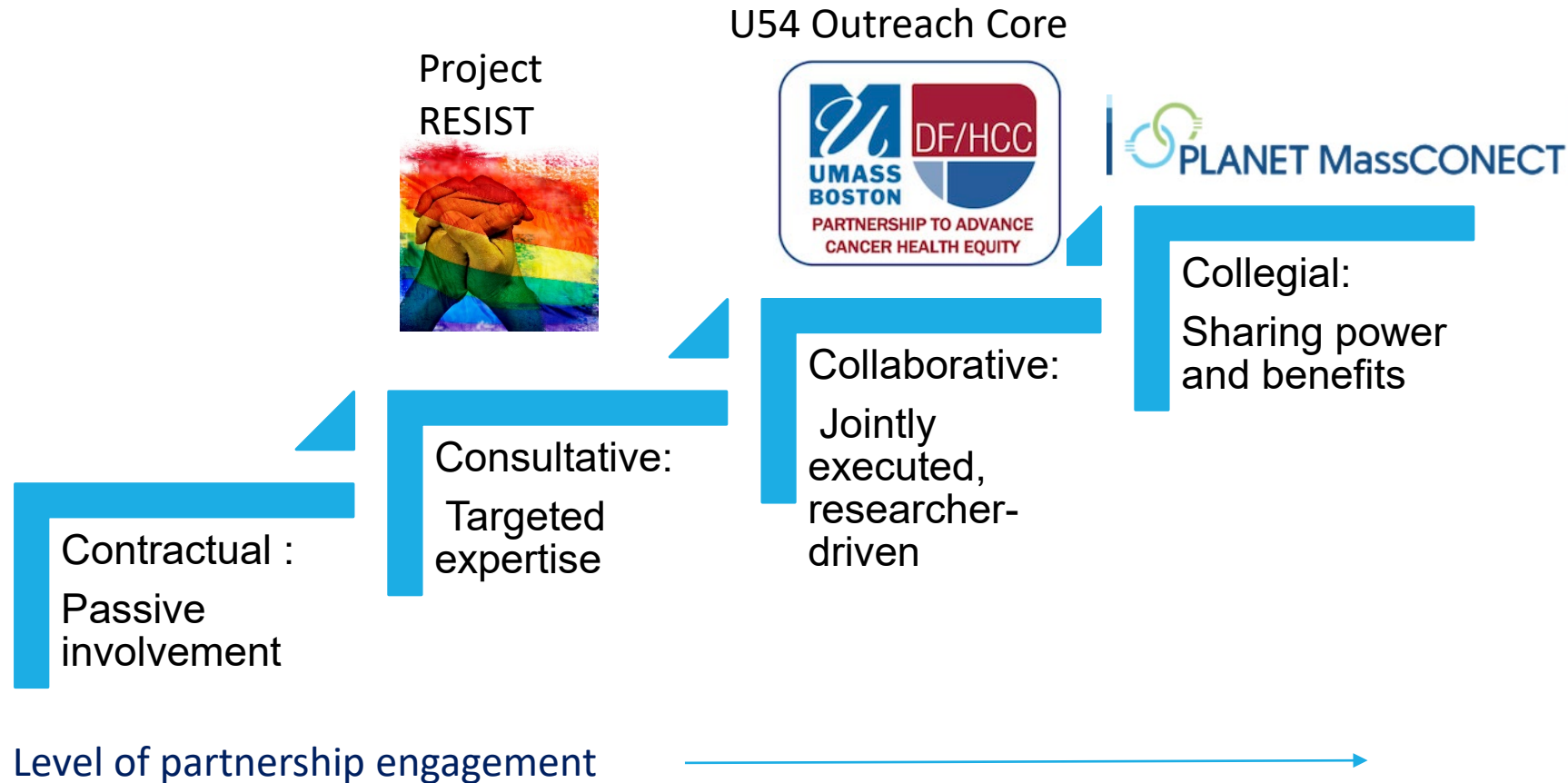


For the field

Improving the relevance and impact of IS findings

Developing infrastructure in practice settings for evidence-based implementation and IS

Unpacking the continuum



Data-driven dissemination

Formative audience research – characterizes target audiences' awareness of, attitudes towards, and adoption of an EBI + preferences for learning about it

Audience segmentation research – what are the meaningful subgroups within the audience and how should we tailor dissemination strategies to meet their needs?

Dissemination effectiveness research – which strategies are most effective?

Qualitative approaches to gather stakeholder input

Translating non-numerical data into actionable insights

Offers an opportunity to understand why something works, how it works, why there are differential impacts, etc.

Gives voice to a diversity of stakeholders

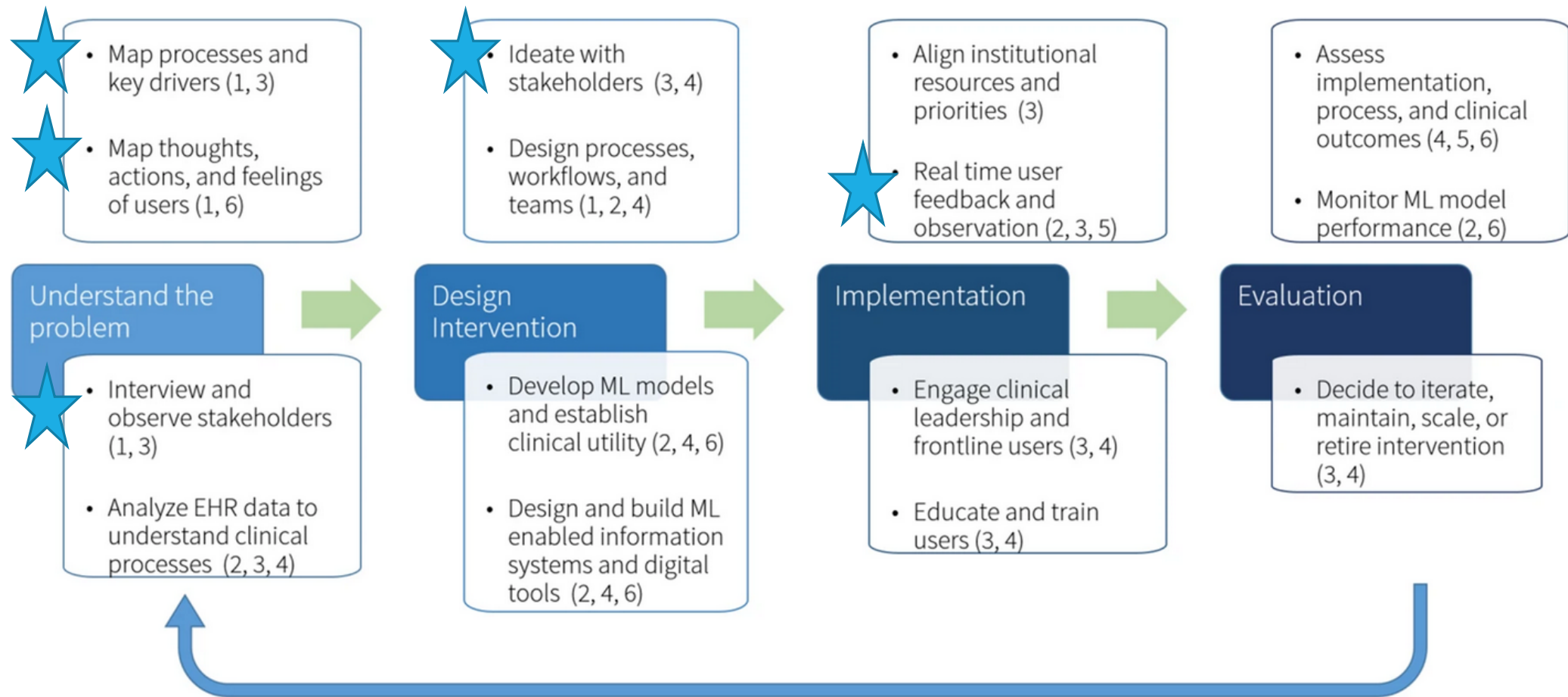
What we often see

Common forms

- Ethnography (including rapid ethnography)
- Key informant interviews
- Focus group discussions
- Site observations

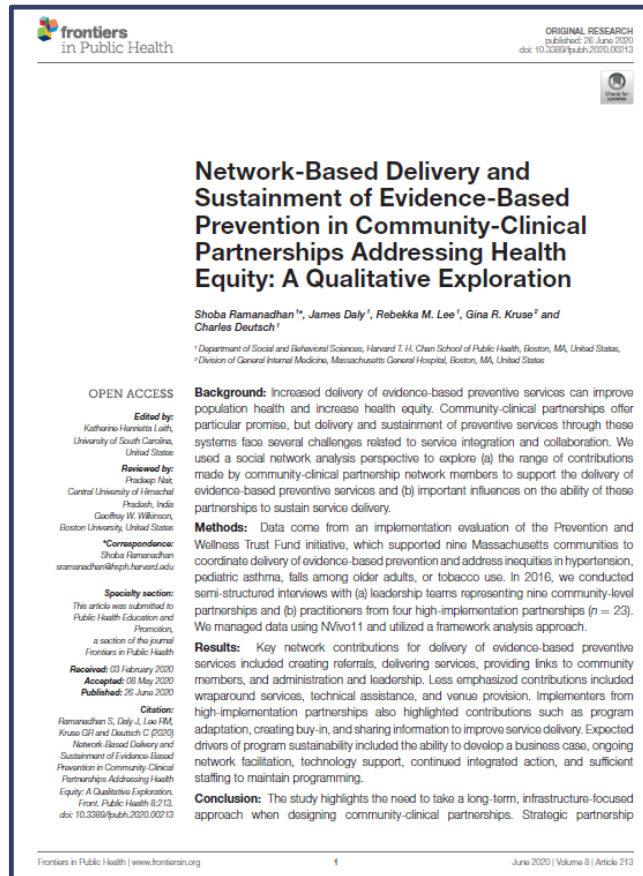
Analysis is often pragmatic (versus wholly exploratory)

Often linked to quantitative data for mixed-methods projects
(see Palinkas, L. A. (2014). *Journal of Clinical Child & Adolescent Psychology*, 43(6), 851-861)



Methods from process improvement, design thinking, data science, information technology, and implementation science are combined into an iterative participatory process to build an AI enabled system for improving advance care planning. The expertise used across the different disciplines are as follows: (1) user experience design, (2) data science, (3) healthcare operations, (4) clinical informatics, (5) evaluation, and (6) ethical integrity assessment.

Example: Gathering data to meet researcher and policymaker needs

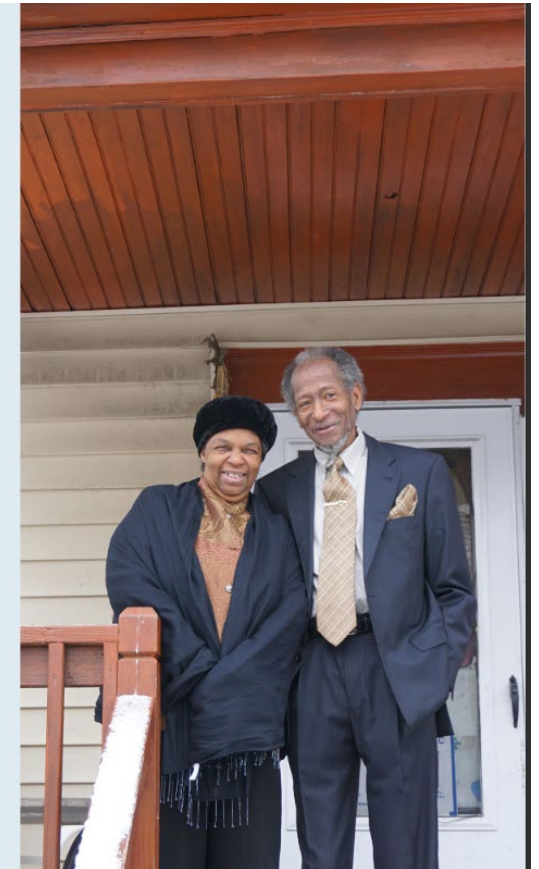


MEET ARNETTA

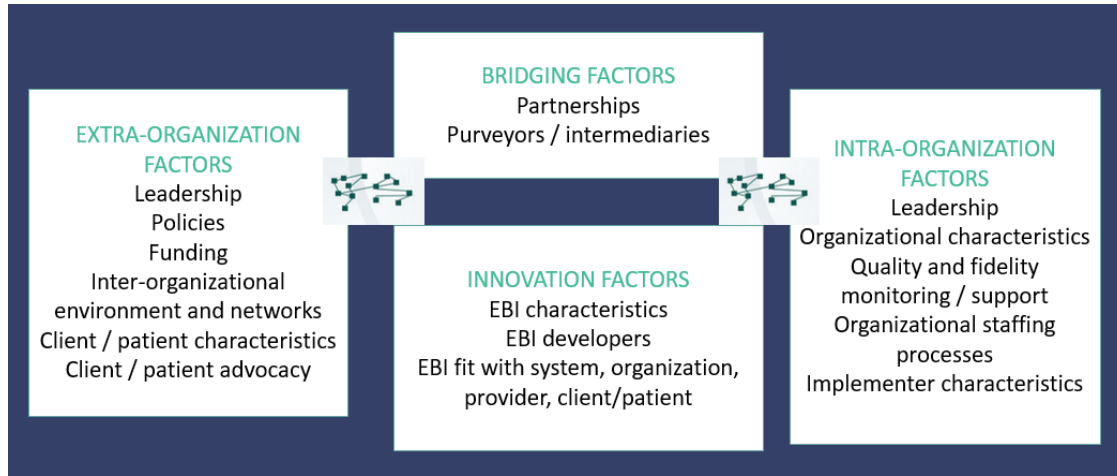
Arnetta Baty, age 64, is a woman of conviction. She runs a business with her husband Carl, called Rounding the Bases, Inc., which is a recovery-oriented program in Dorchester. They are both fierce advocates in their community.

Arnetta tries to maintain a full life, despite experiencing more than 10 falls in the past year alone. Her last bad fall happened in her bathroom, slipping into a vent and damaging her hip and leg. She also lives with several other health conditions such as diabetes, lung disease, asthma, and poor eyesight. But, Arnetta is aware of the burden and possible consequences of just one fall. She's seen her mother experience terrible falls and knows that "...it's the fall that puts someone in the hospital."

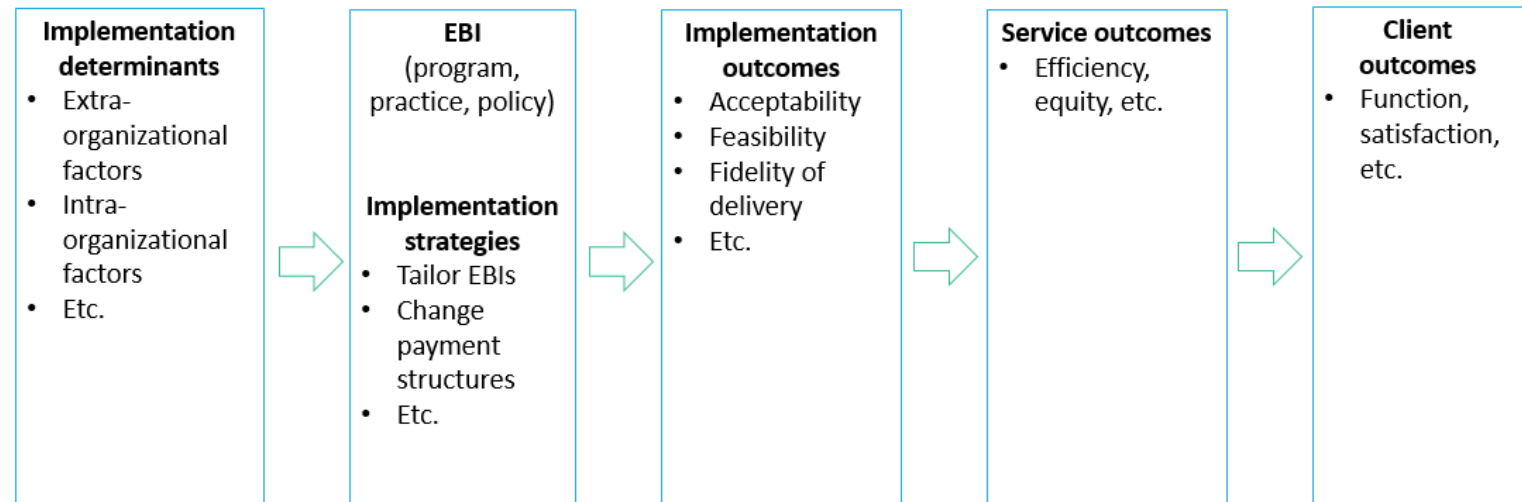
Through PWTF, the Batys met Tammy, a Community Health Worker through Boston Senior Home Care, who conducted a home safety assessment. This led to several practical improvements, such as securing handrails on the outside of their home, raising the bathroom toilet seat, and installing bathtub grab bars. Gratiified by the assistance of Tammy, Arnetta recommended the program to 10 of her friends and even her 94-year-old mother. She's also enrolling in the Matter of Balance class through PWTF.



Diversity of stakeholders



Who are key stakeholders for your work? What different needs will you need to address?



Useful resources

Harvard Implementation Science Working Group: email Trang Nguyen (trnguyen@hsph.harvard.edu) to be added to the listserv

Implementation science journal (<https://implementationscience.biomedcentral.com/>)

- You can search for research protocols to get a sense of study designs

CDC Community Guide (<https://www.thecommunityguide.org/>)

- Summaries and action points from systematic reviews

SAMHSA Evidence-based Practice Resource Center (<https://www.samhsa.gov/resource-search/ebp>)

- Evidence-based programs and evidence syntheses for mental health and substance use topics

Widely used implementation science framework: <https://cfirguide.org/>

Introductory videos for implementation science

- <https://www.youtube.com/channel/UCJhGTpULmVIENeYHPDy-jLg/videos>
- Full set of National Cancer Institute training videos, with new videos being added now: <https://cancercontrol.cancer.gov/is/training-education/TIDIRC-open-access>