



F O G A R T Y



An Overview of Implementation Science: What it is and what it is not!

Luke Davis, MD, MAS

Associate Professor of Epidemiology & Medicine

10 July 2024

Yale CMIPS

Center for Methods in Implementation & Prevention Science



Yale SCHOOL OF
PUBLIC HEALTH



cira

Center for Interdisciplinary Research on AIDS

A roadmap for today's talk

What is Implementation Science & Why do we need it?

Key Concepts

Frameworks & Methods

Myths & Misconceptions

Importance & Impact

A roadmap for today's talk

What is Implementation Science & Why do we need it?

Key Concepts

Frameworks & Methods

Myths & Misconceptions

Importance & Impact

Innovations: Always in the news, not always followed-through

7 of the biggest medical breakthroughs in 2023

There were major breakthroughs in Alzheimer's and sickle cell treatment.

By [Mary Kekatos](#)

December 29, 2023, 3:02 PM

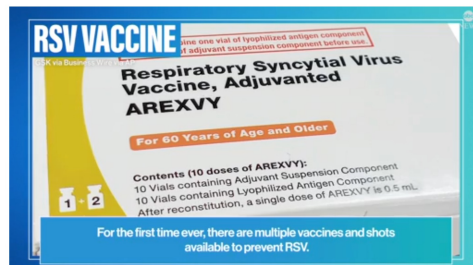
Facebook X Email Print



Top medical breakthroughs of 2023



Top medical breakthroughs of 2023



Top medical breakthroughs of 2023

The Washington Post

Unhealthy Medicine All Breakthrough, No Follow-Through

By **Steven H. Woolf**
January 8, 2006

The Knowing-Doing Gap

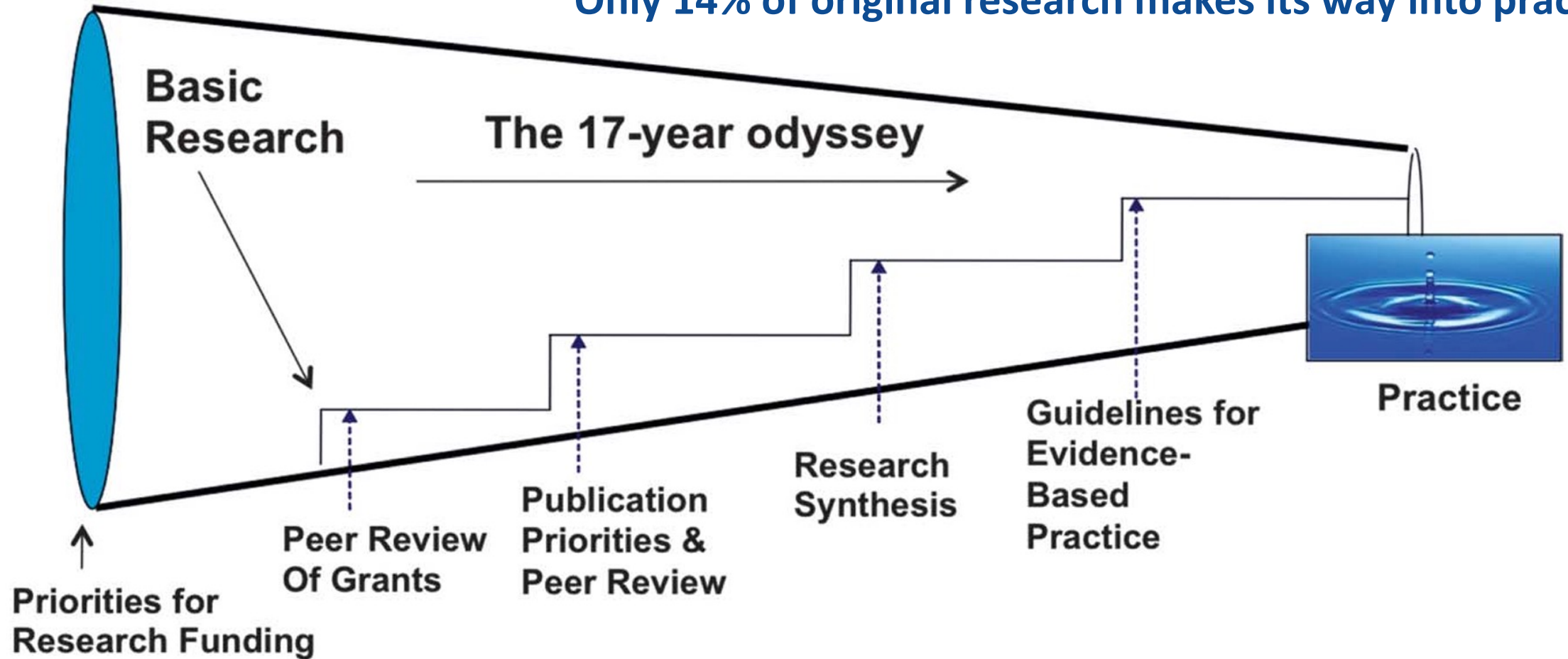
How Smart Companies Turn Knowledge Into Action

Jeffrey Pfeffer and Robert I. Sutton

HARVARD BUSINESS SCHOOL PRESS

Innovations → Practice: Too little, too late!

Only 14% of original research makes its way into practice.



Why do we need Implementation Science?



How do we define Implementation Science (IS)?

Implementation science is the **scientific study of methods** to promote the **systematic uptake of research** findings & **evidence-based practices** into routine practice.

A roadmap for today's talk

What is Implementation Science & Why do we need it?

Key Concepts

Methods & Frameworks

Myths & Misconceptions

Importance & Impact

Implementation Science: An origin story

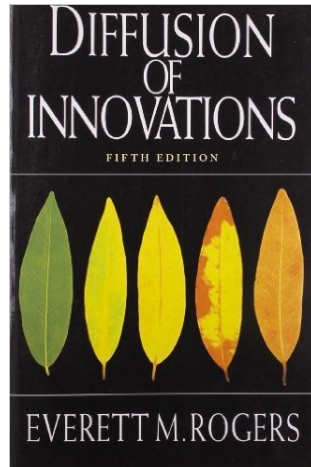
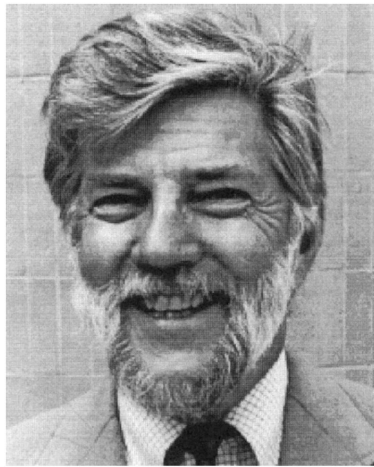
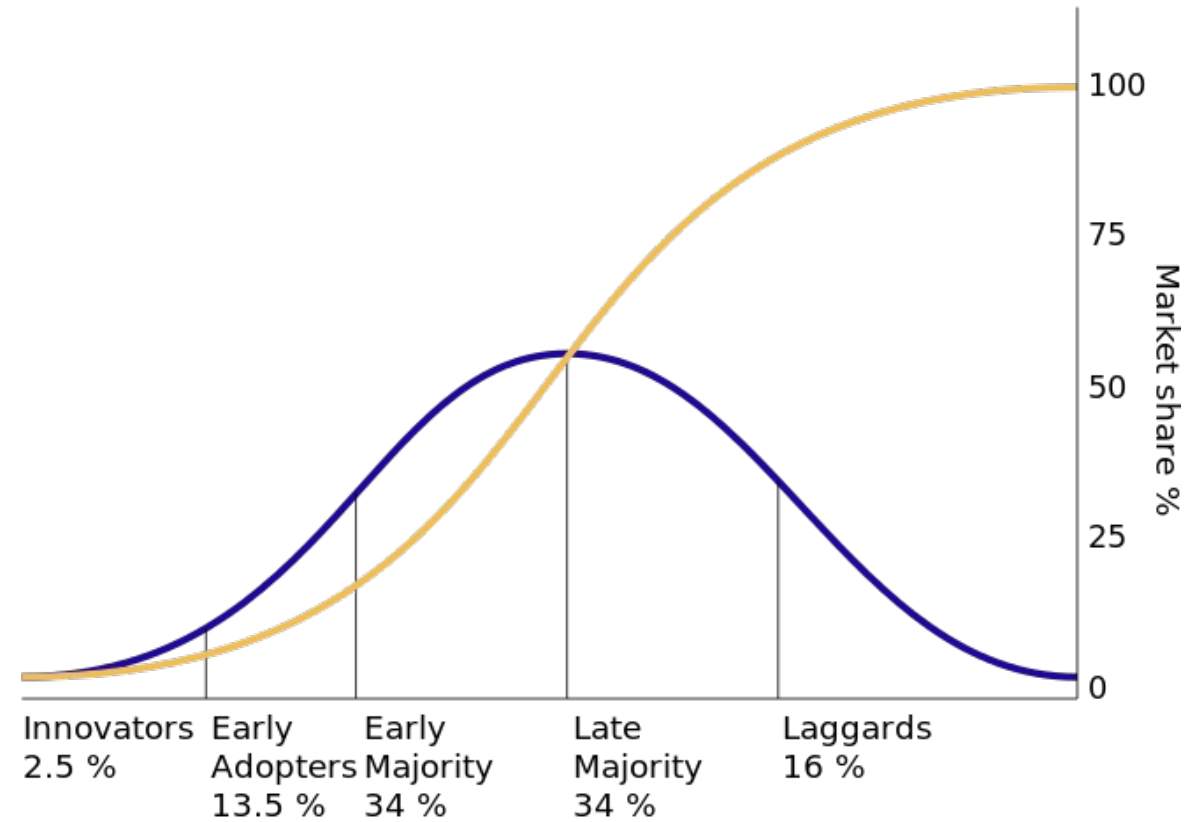
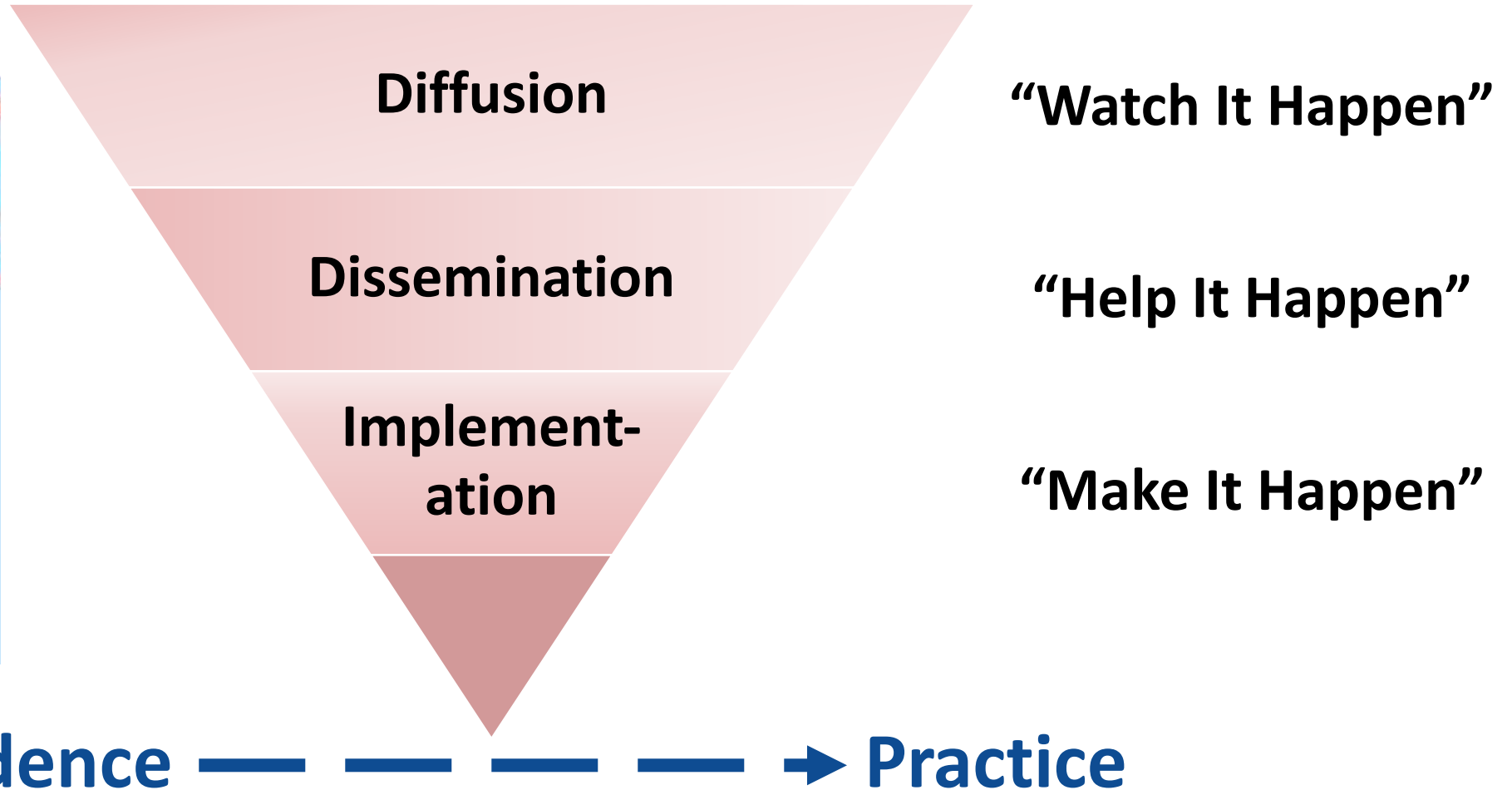


Table 8. Key Attributes Affecting the Speed and Extent of an Innovation's Diffusion

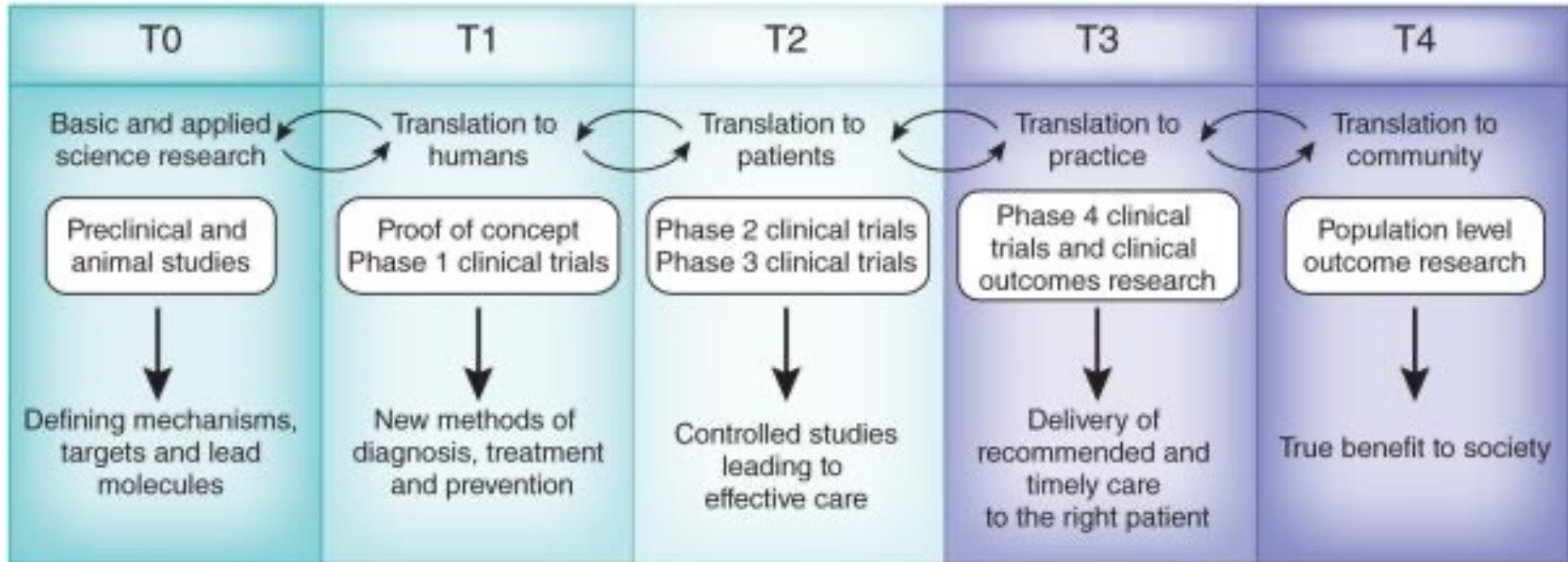
<i>Attribute</i>	<i>Key Question</i>
Relative advantage	Is the innovation better than what it will replace?
Compatibility	Does the innovation fit with the intended audience?
Complexity	Is the innovation easy to use?
Trialability	Can the innovation be tried before making a decision to adopt?
Observability	Are the results of the innovation observable and easily measurable?



Key Concept #1: Don't just watch, make change happen



Key Concept #2: IS is an iterative & translational science



— Evidence Generation —→

Implementation Science



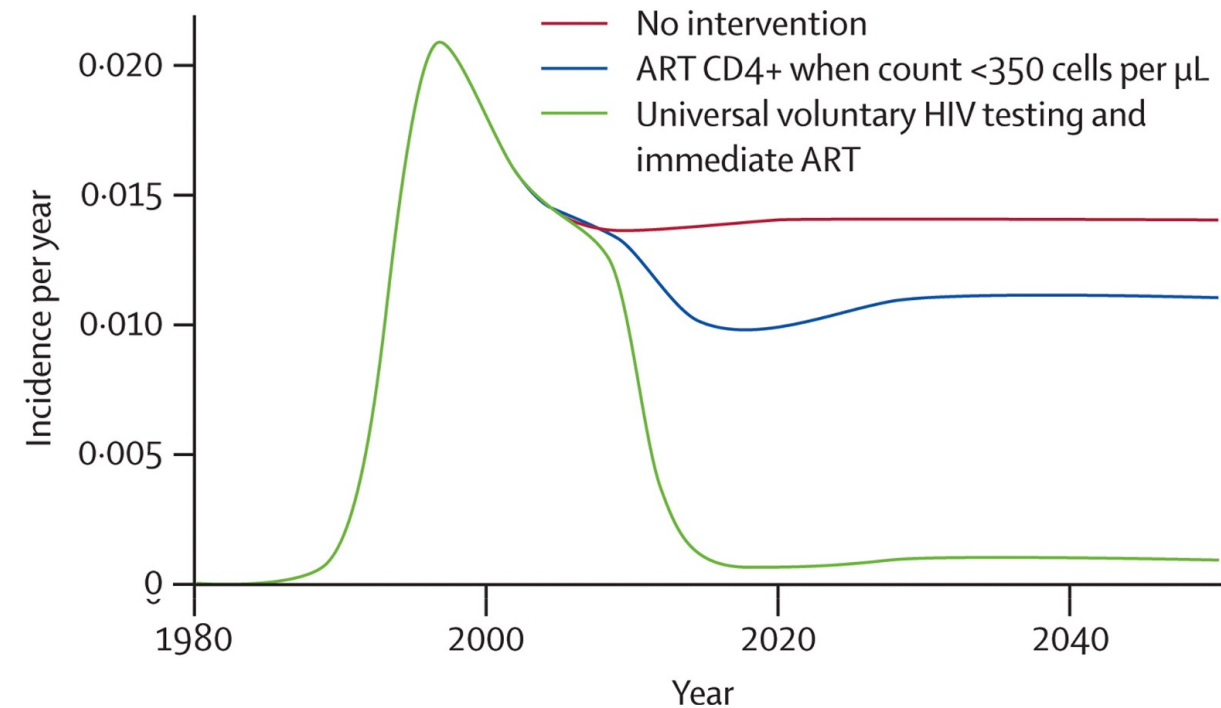
Example: HIV Treatment as Public Health Prevention



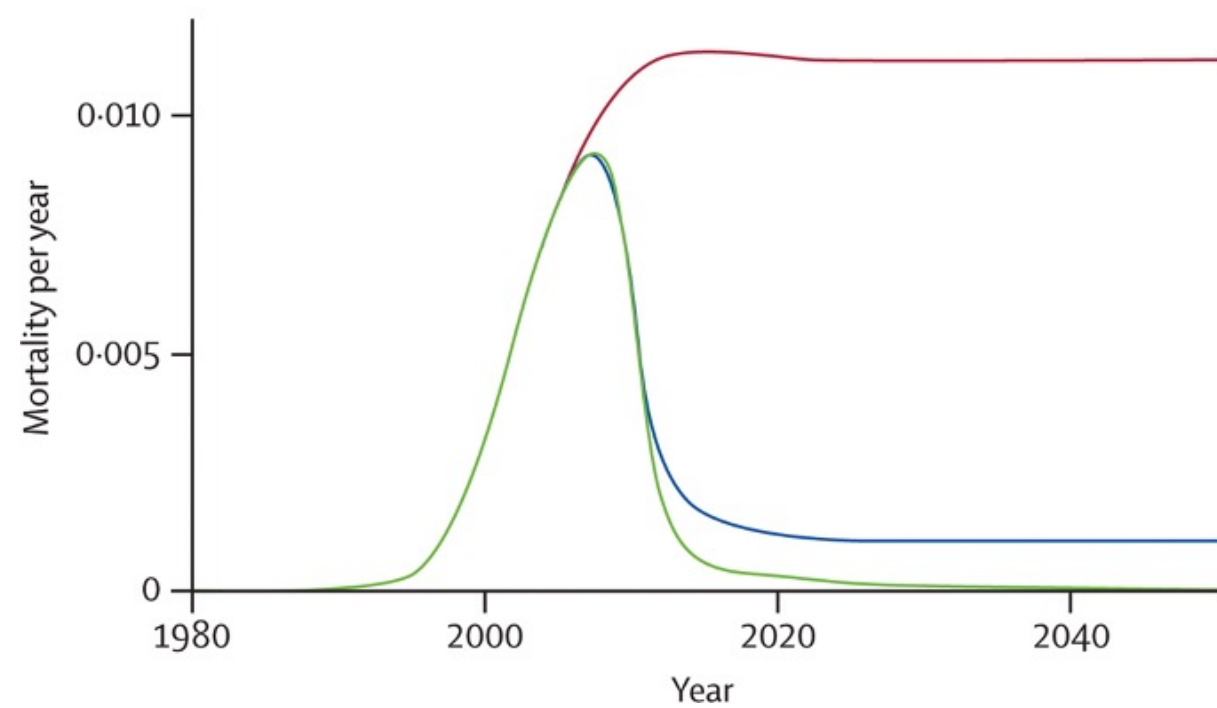
photograph by Mark Thiessen
© 1992 The NAMES Project AIDS Memorial Quilt

T1: Modeling Treatment as Prevention in South Africa, 2007

Incidence

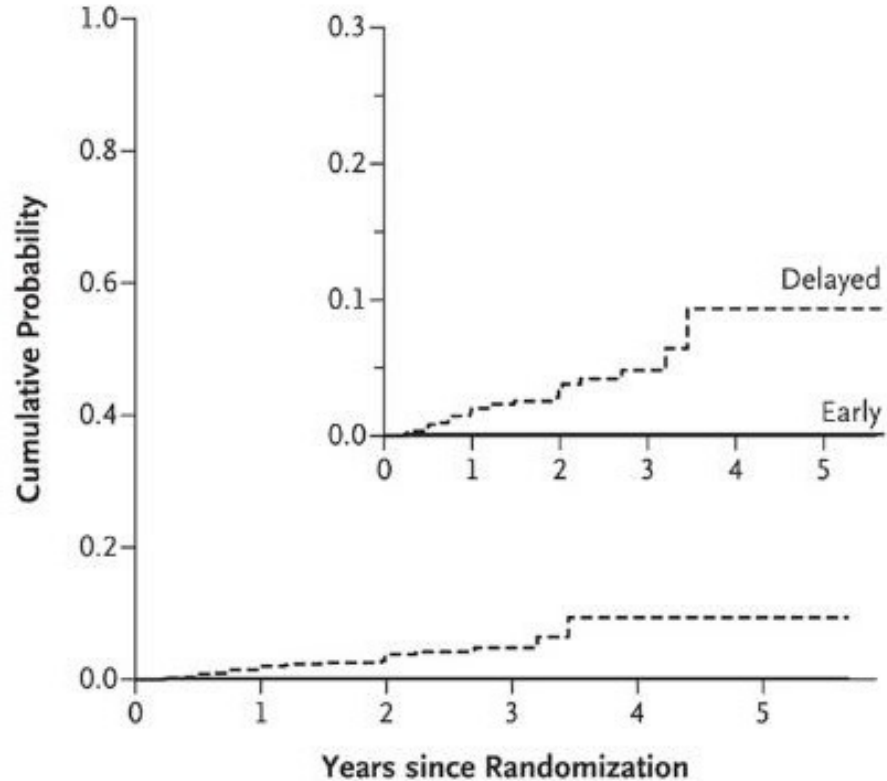


Mortality



T2: Can ART prevent HIV infection? Phase III Trial, 2011

Linked HIV Transmission



No. at Risk

Early	893	658	298	79	31	24
Delayed	882	655	297	80	26	22

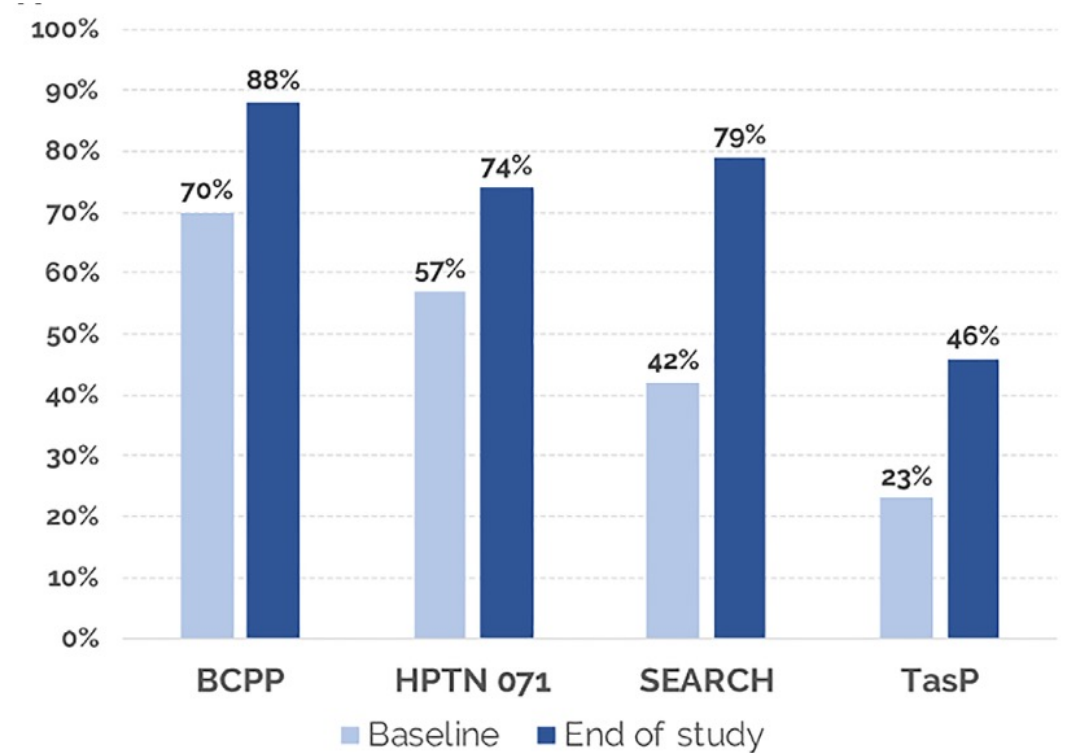
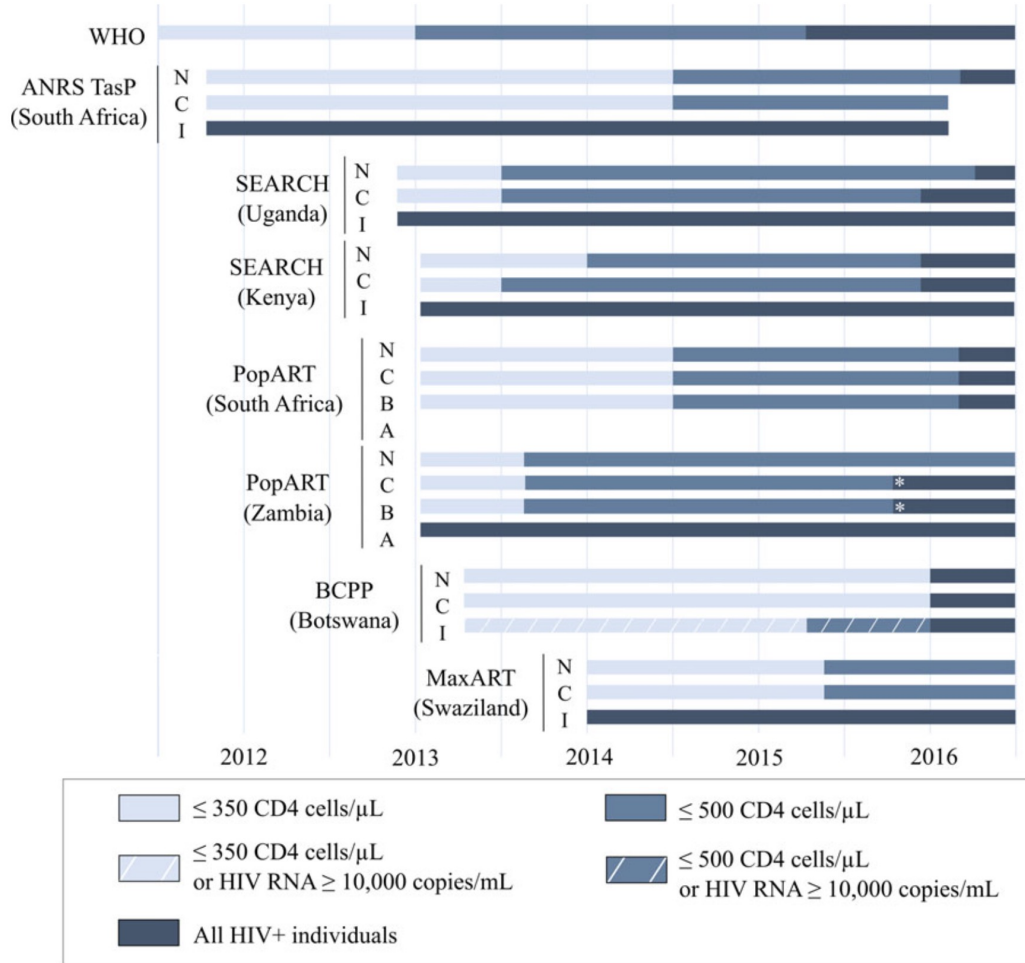
TREATMENT
IS
PREVENTION

A scientific breakthrough in 2011 showed that HIV treatment not only saves lives, but reduces the risk by

96%

of transmitting the disease.

T3: Universal Test & Treat (UTT) Effectiveness Trials, 2017



~17 years later: How to move UTT from evidence to practice?

WHO / UNAIDS Global Estimates, 2019



Fast-Track Targets

by 2020

90-90-90

HIV treatment

500 000

New HIV infections or fewer

ZERO

Discrimination

by 2030

95-95-95

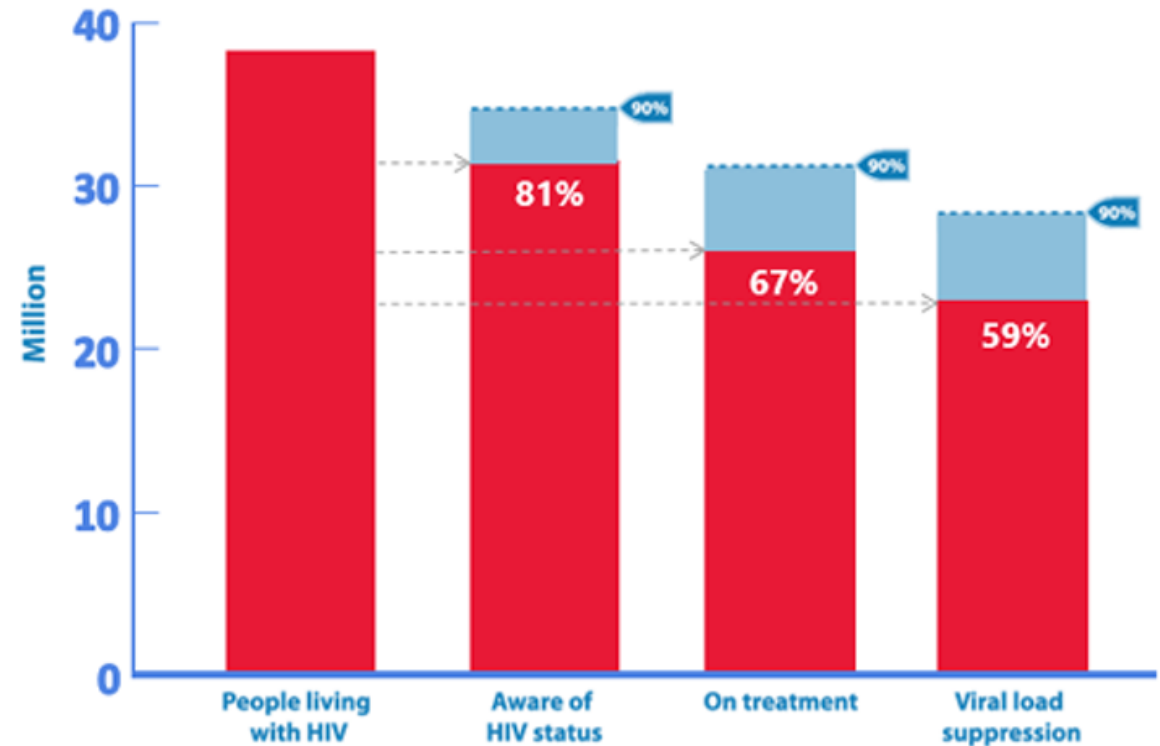
HIV treatment

200 000

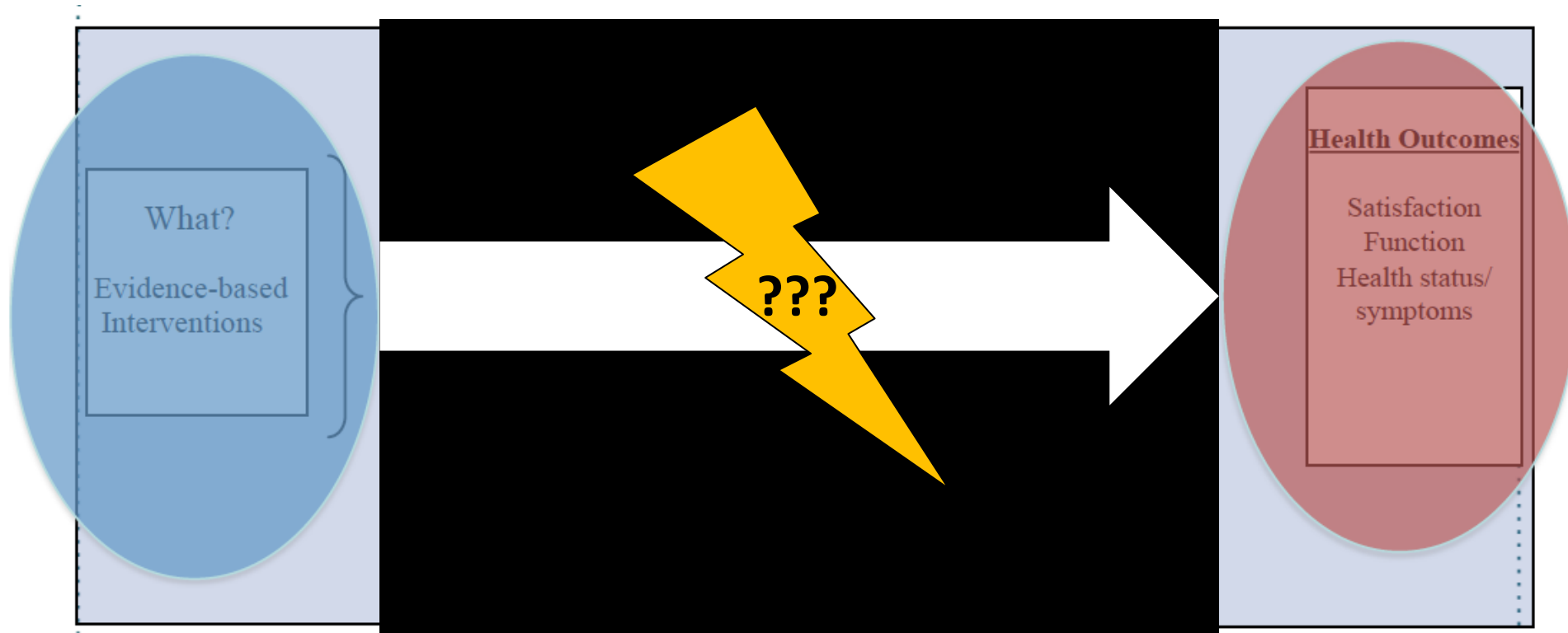
New HIV infections or fewer

ZERO

Discrimination

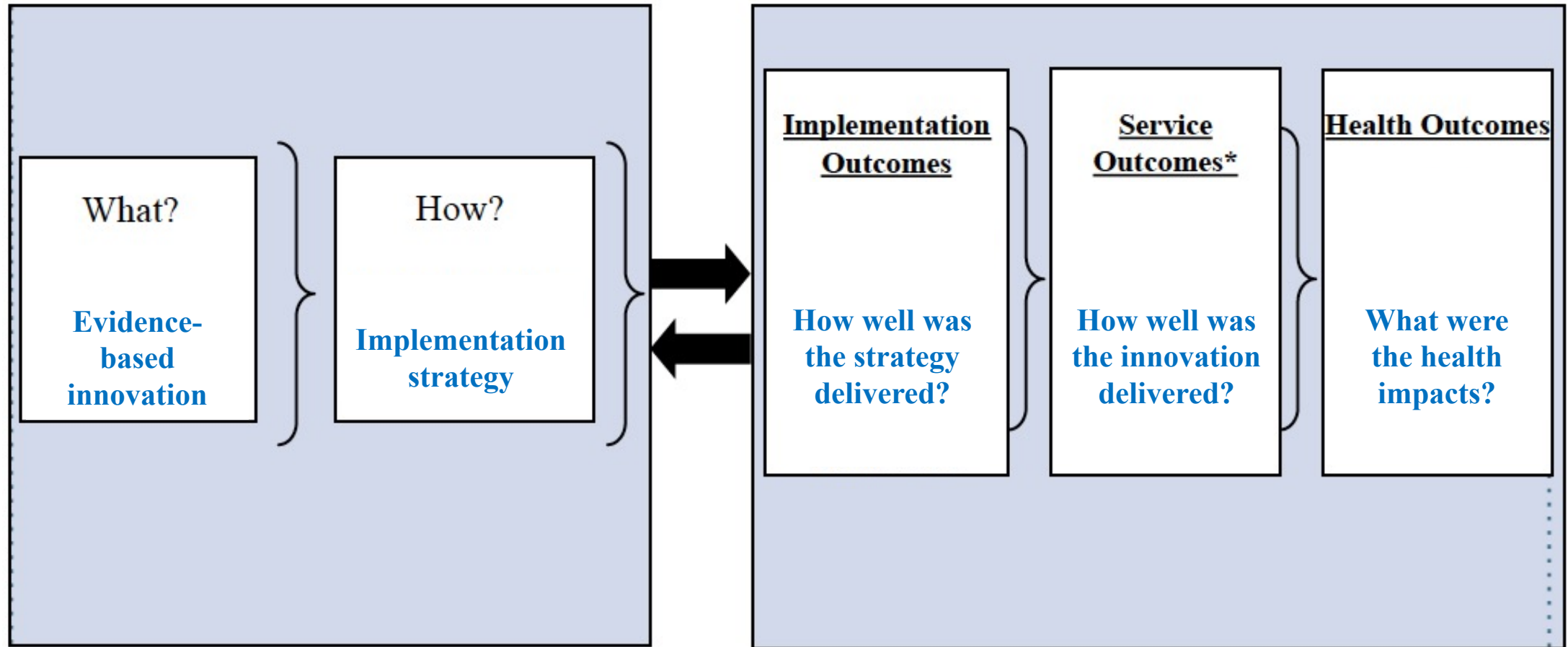


Key Concept #3: We must be able to measure implementation

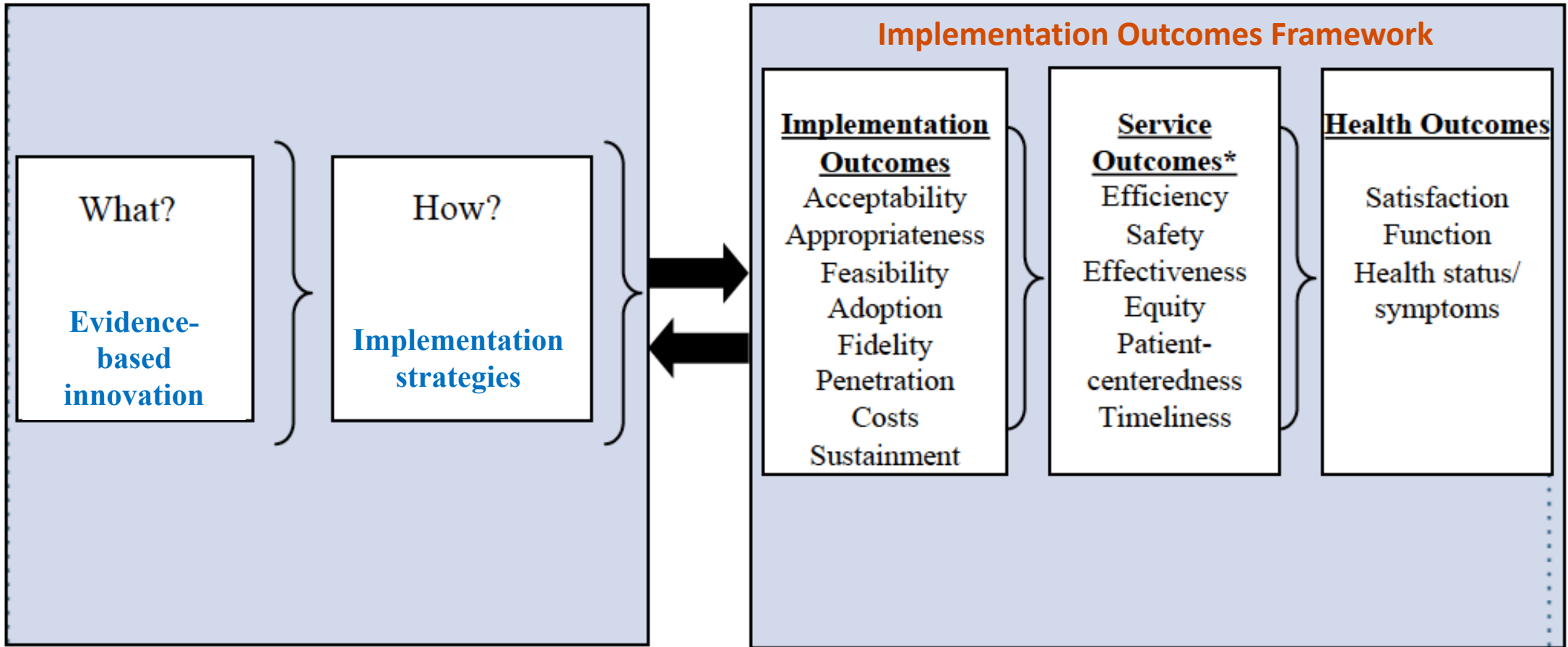


If implementation does work, we won't know how.
If implementation does not work, we won't know why.

A process evaluation asks key questions for IS...



...and implementation outcomes help answer those questions.



A roadmap for today's talk

What is Implementation Science & Why do we need it?

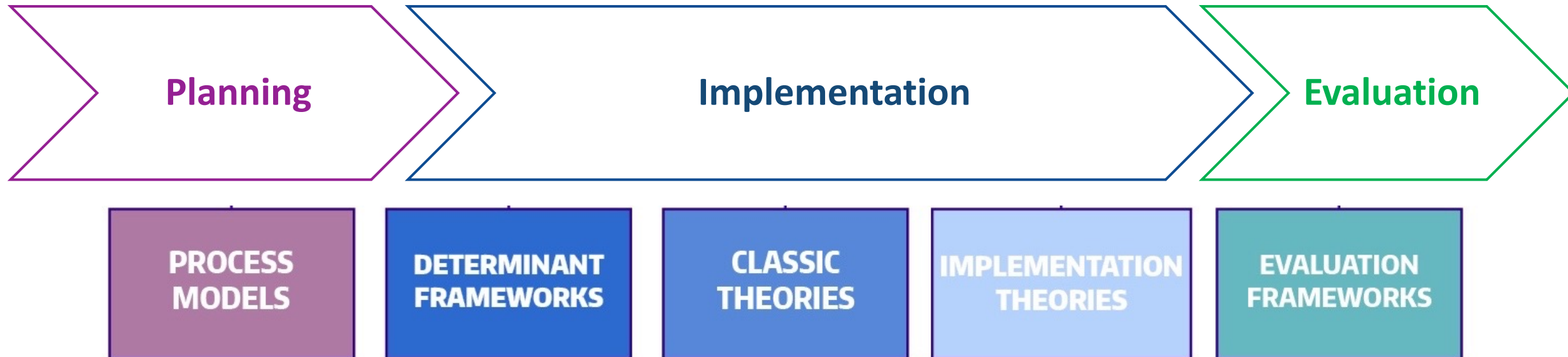
Key Concepts

Frameworks & Methods

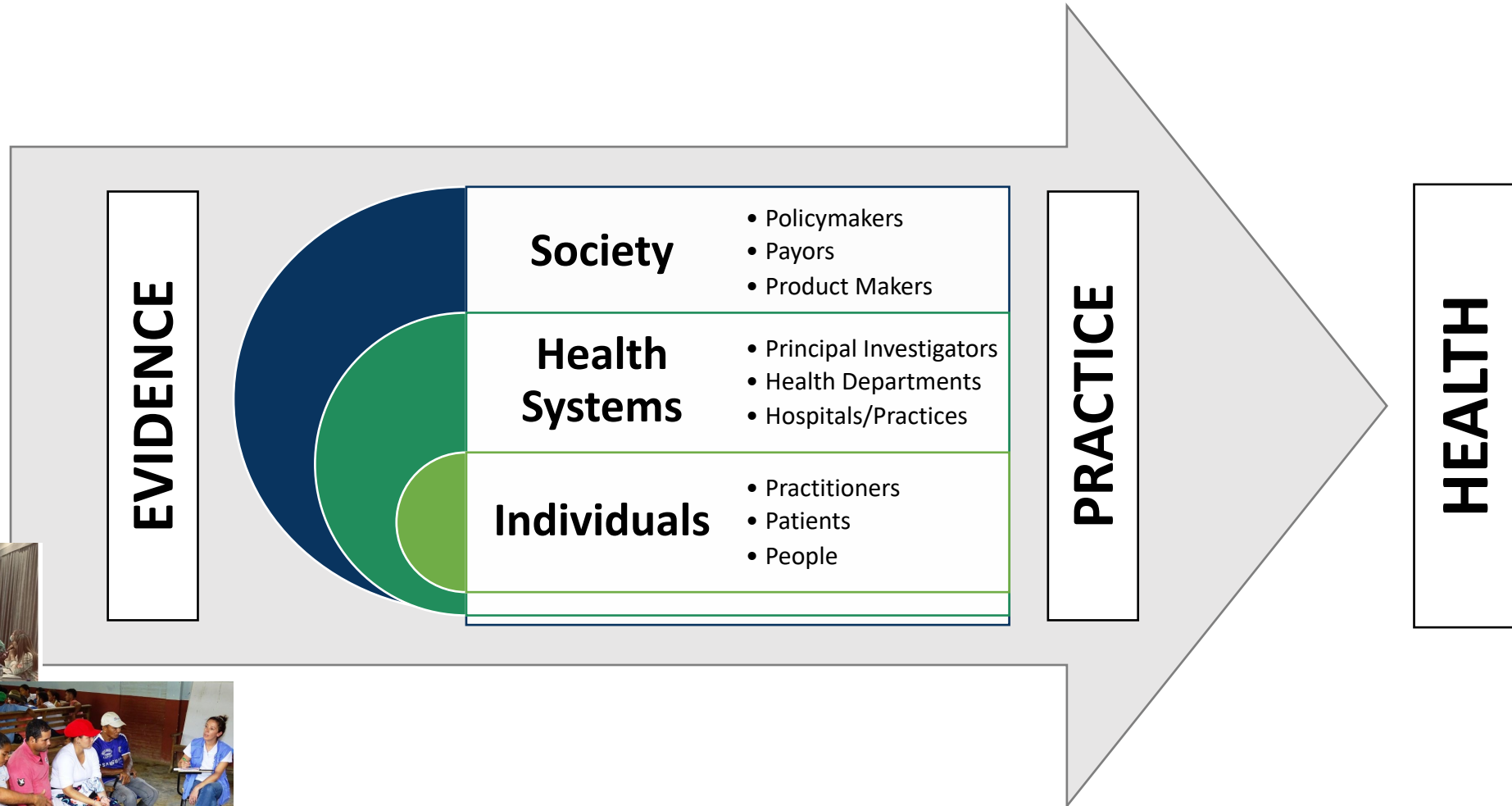
Myths & Misconceptions

Importance & Impact

Theories, models, & frameworks help guide implementation

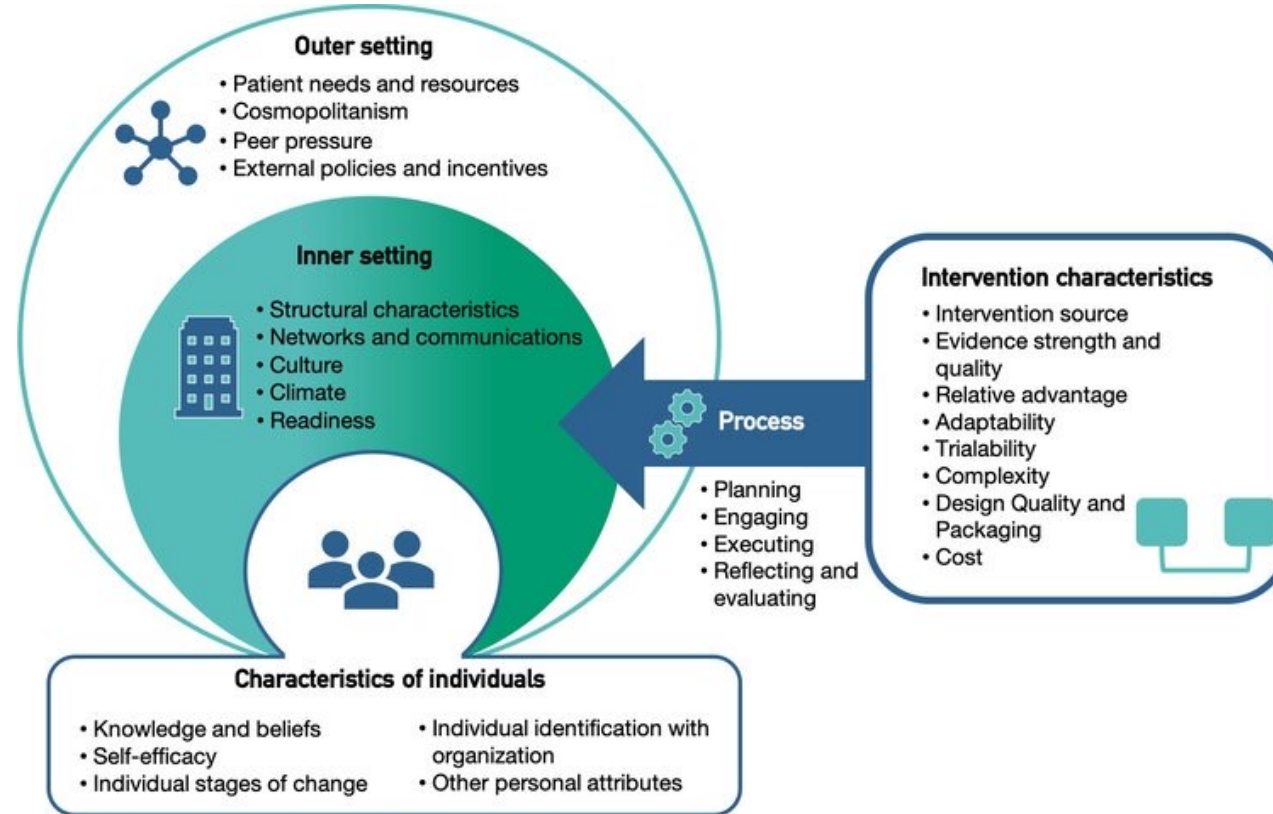


Planning: Engage stakeholders at multiple levels



Planning: Identify barriers & assessing readiness

Consolidated Framework for Implementation Research (CFIR)



Key Methods: Qualitative & Mixed Methods



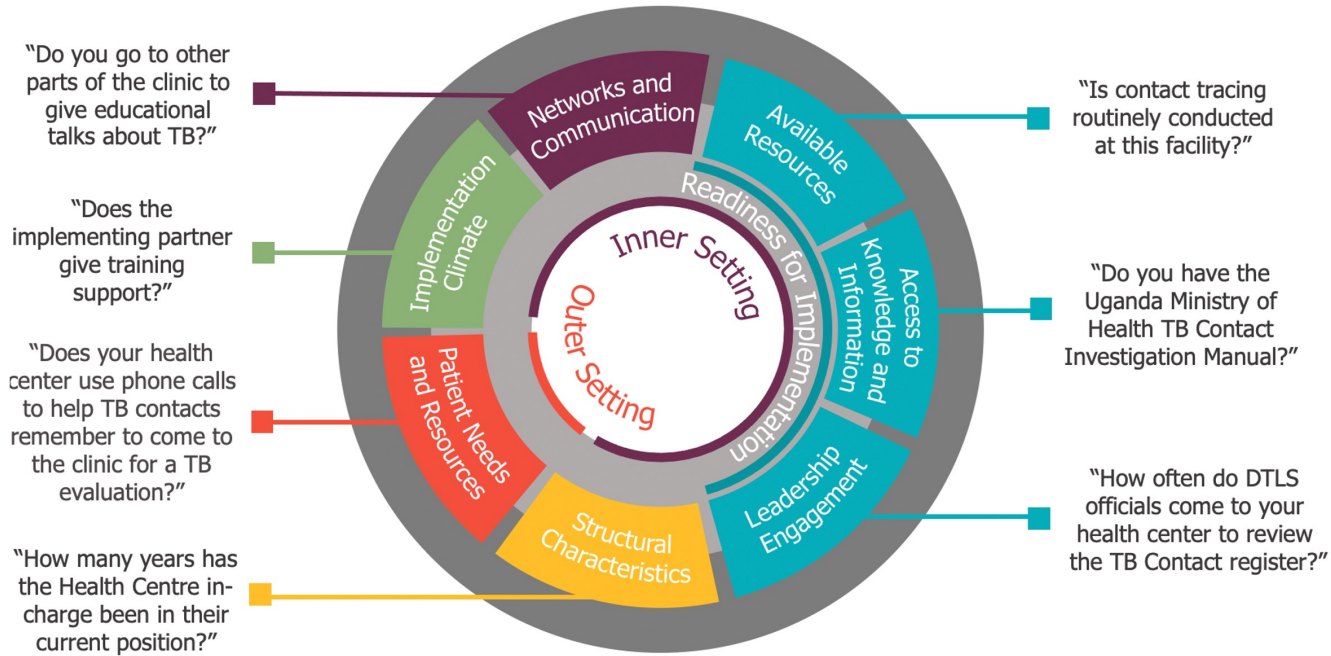
QUALITATIVE METHODS IN IMPLEMENTATION SCIENCE

1. Engaging stakeholders
2. Identifying barriers & facilitators
3. Assessing readiness for implementation
4. Tailoring interventions to local context
5. Evaluating implementation processes

Example

- Goal: Assess readiness for implementation of TB contact investigation
- Design: Parallel, convergent mixed methods
- Instruments:
 1. Facility survey: CFIR + SARA
 2. Key informant interviews: TB unit staff

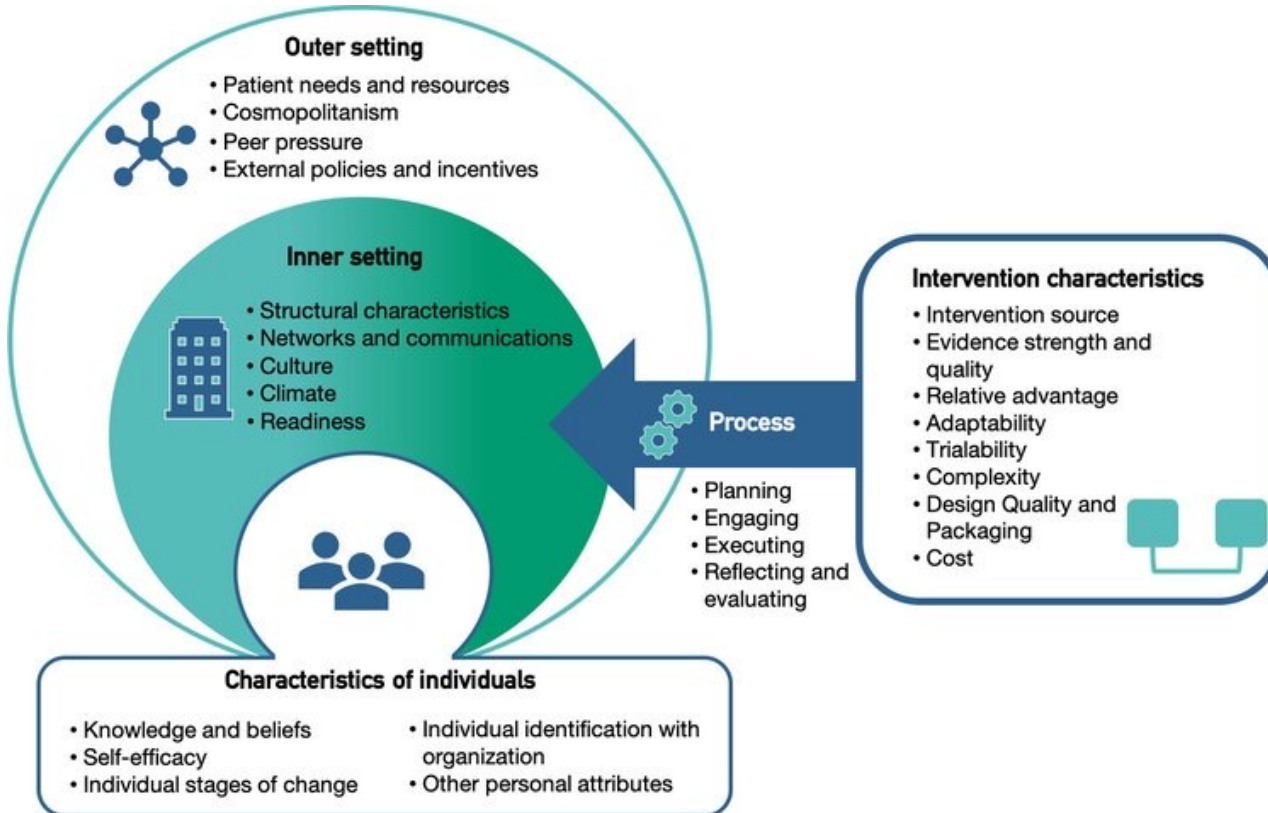
Example: Qualitative Interviews + Quantitative Survey



CFIR Construct	Health Facility Attributes	% (n=28)
Available Resources	Conducting contact tracing outside home	38% (10/26)
	Trained staff on national TB CI guidelines	50% (14/28)
Leadership Engagement	Regular supervisory visits for contact investigation from District TB Officer	71% (20/28)
	On-site access & adherence to guidelines	25% (7/28)
Structural Characteristics	New clinic leadership in past 3 years	46% (13/28)
Patient Needs & Resources	Give education & counseling to TB patients	71% (20/28)
	Same-day TB testing and result allocation	64% (18/28)
	Provide social support for contacts	82% (23/28)
Implementation Climate	Receive training support from implementing partners	96% (27/28)
Networks & Communication	TB educational outreach	100% (28/28)

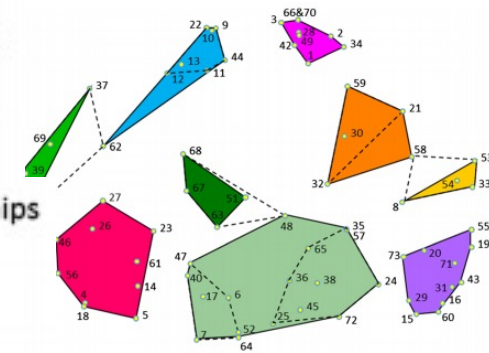
Implementation Mapping: Choose implementation strategies

Consolidated Framework for Implementation Research (CFIR)



Expert Recommendations for Implementing Change (ERIC)

- Engage consumers
- Use evaluative & iterative strategies
- Change infrastructure
- Adapt & tailor to the context
- Develop stakeholder interrelationships
- Utilize financial strategies
- Support clinicians
- Provide interactive assistance
- Train & educate stakeholders

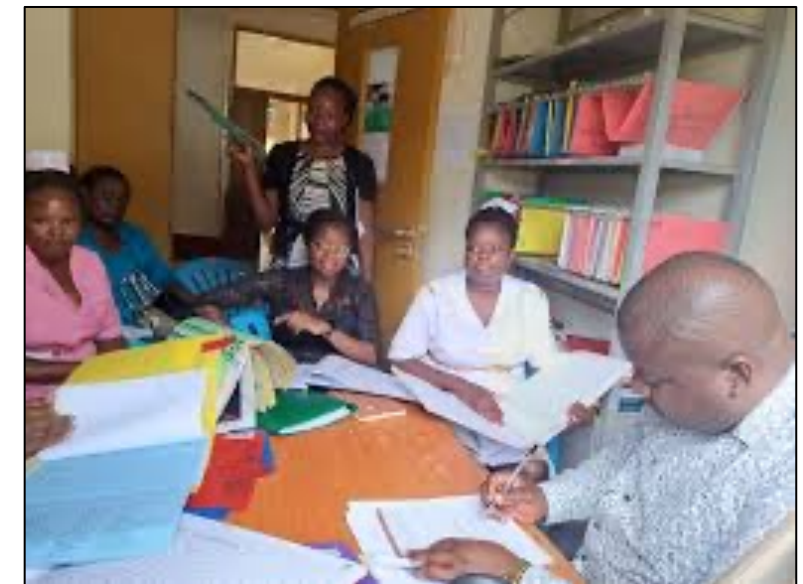
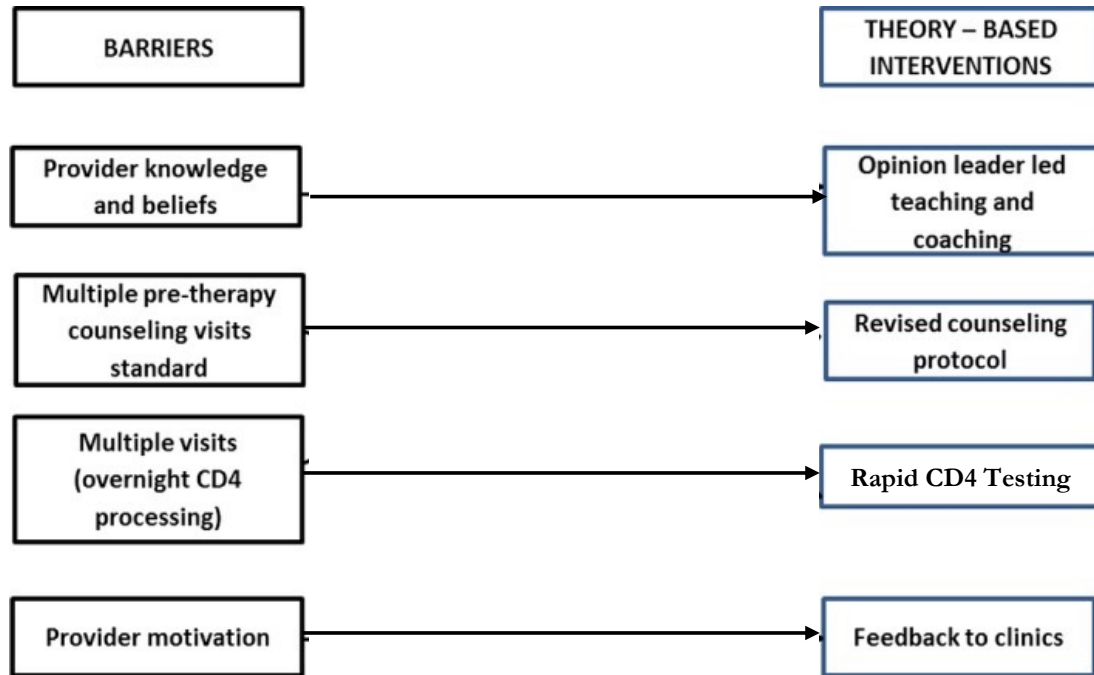


Example: Implementation Mapping, Uganda 2013

RESEARCH ARTICLE

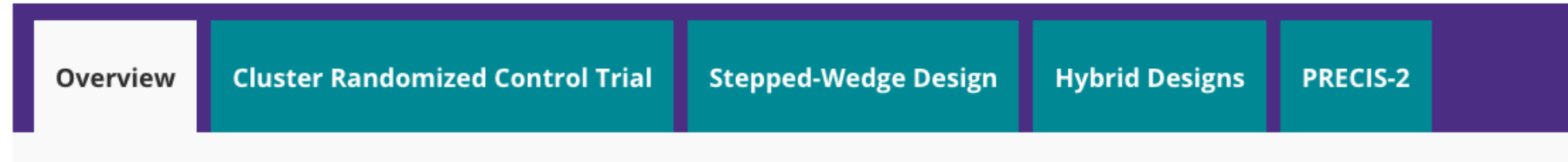
Understanding uptake of an intervention to accelerate antiretroviral therapy initiation in Uganda via qualitative inquiry

Fred C Semitala^{1,2,3}, Carol S Camlin⁴, Jeanna Wallenta⁵, Leatitia Kampiire³, Richard Katuramu³, Gideon Amanyire^{2,3}, Jennifer Namusobya², Wei Chang⁵, James G Kahn⁵, Edwin D Charlebois⁶, Diane V Havlir⁶, Moses R Kamya^{1,2,3} and Elvin H Geng⁶

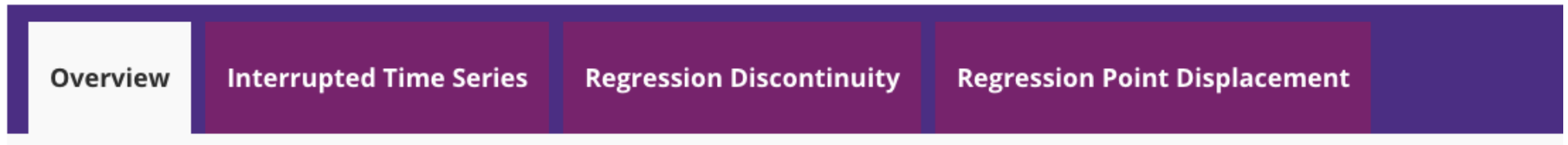


Evaluation: Choose a study design

Randomized Control Trials



Quasi-Experimental Designs

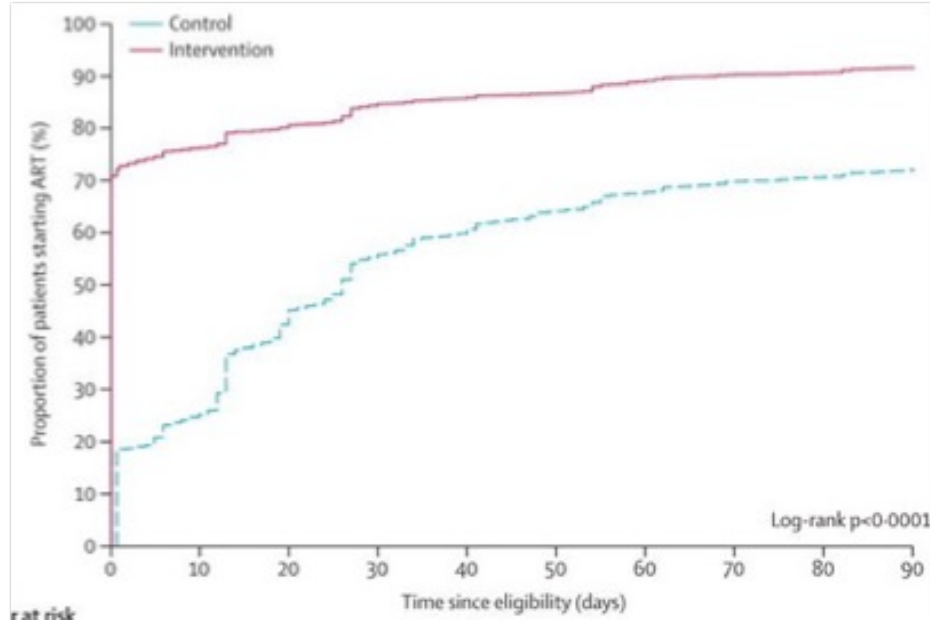


T4: Streamlined Implementation of ART (START) Trial, 2016

Effects of a multicomponent intervention to streamline initiation of antiretroviral therapy in Africa: a stepped-wedge cluster-randomised trial



Gideon Amanyire, Fred C Semitala, Jennifer Namusobya, Richard Katuramu, Leatitia Kampire, Jeanna Wallenta, Edwin Charlebois, Carol Camlin, James Kahn, Wei Chang, David Glidden, Moses Kamya, Diane Havir, Elvin Geng



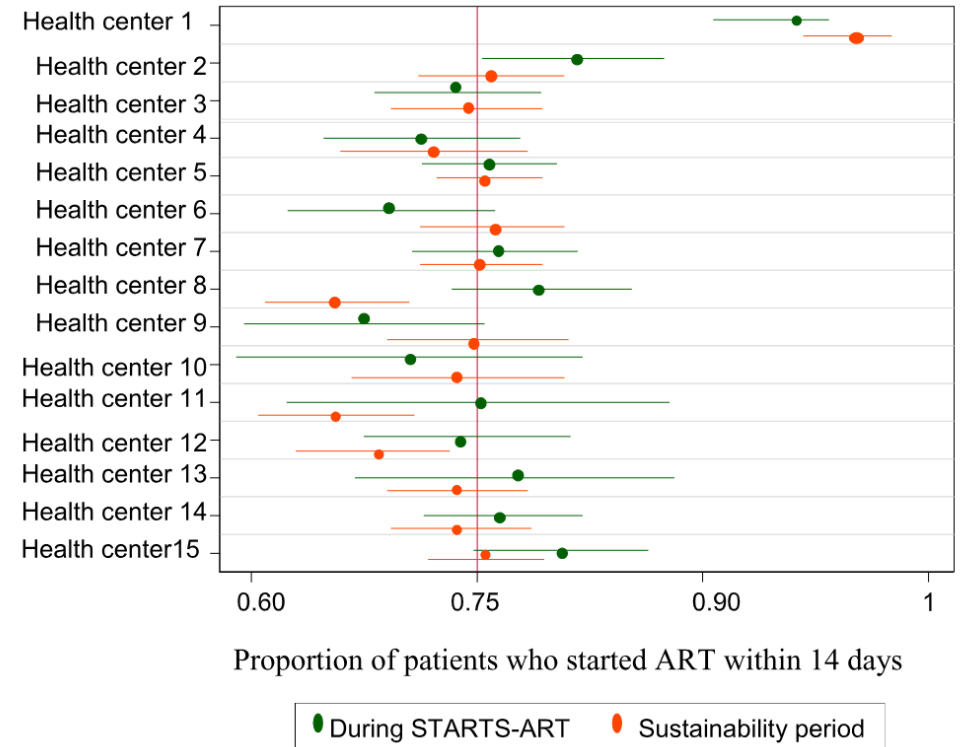
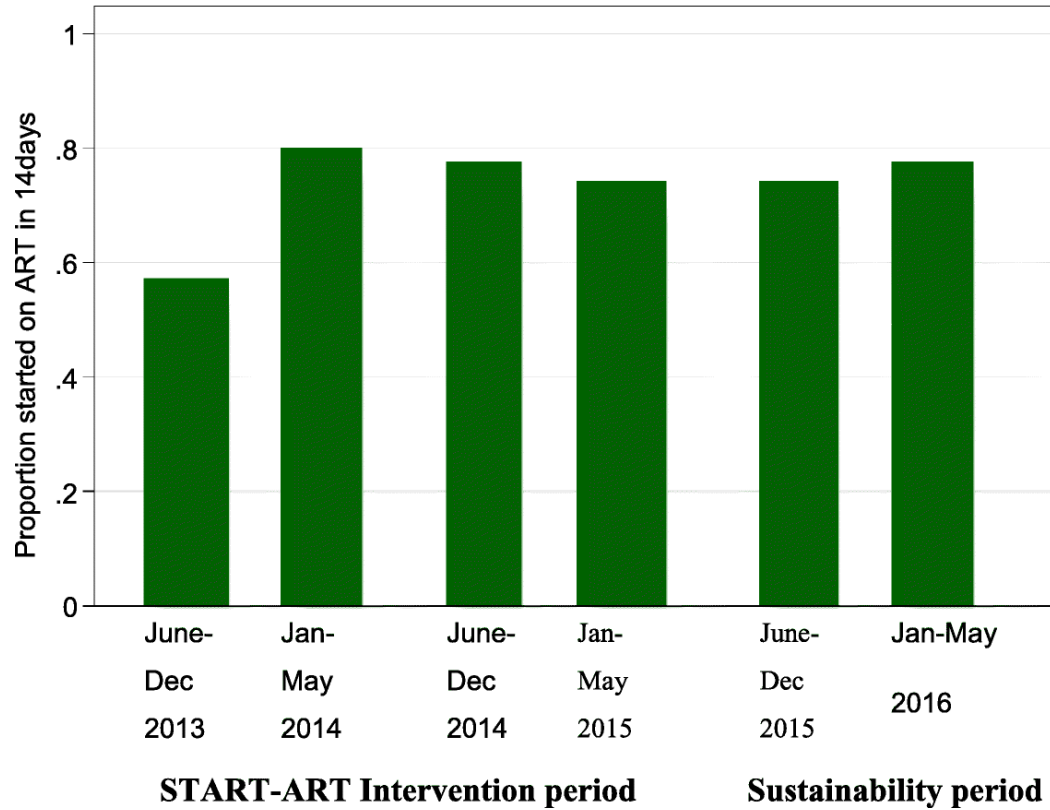
Cluster	Study Period				
	1	2	3	4	5
1	Control	Intervention	Intervention	Intervention	Intervention
2	Control	Control	Intervention	Intervention	Intervention
3	Control	Control	Control	Intervention	Intervention
4	Control	Control	Control	Control	Intervention

Evaluate fidelity, adaptation, and sustainability



Sustainability: START Trial Follow-up

Bar graph showing proportion of patients initiated on ART within 14 days



A roadmap for today's talk

What is Implementation Science & Why do we need it?

Key Concepts

Methods & Frameworks

Myths & Misconceptions

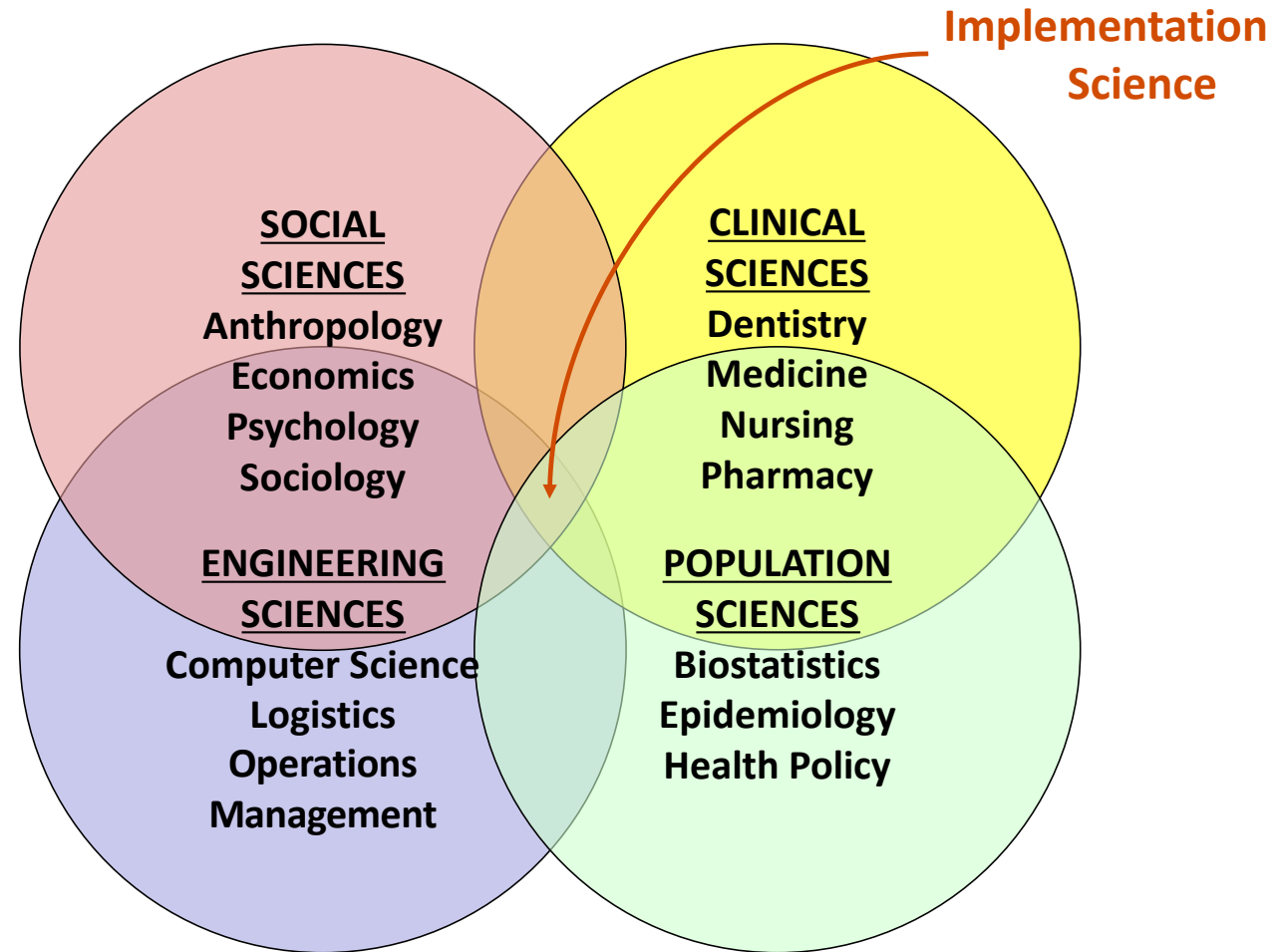
Importance & Impact

Top Myths & Misconceptions about Implementation Science

- “I don’t know anything about implementation science”
- “Implementation science is not a science”
- “It’s too early to think about implementation”

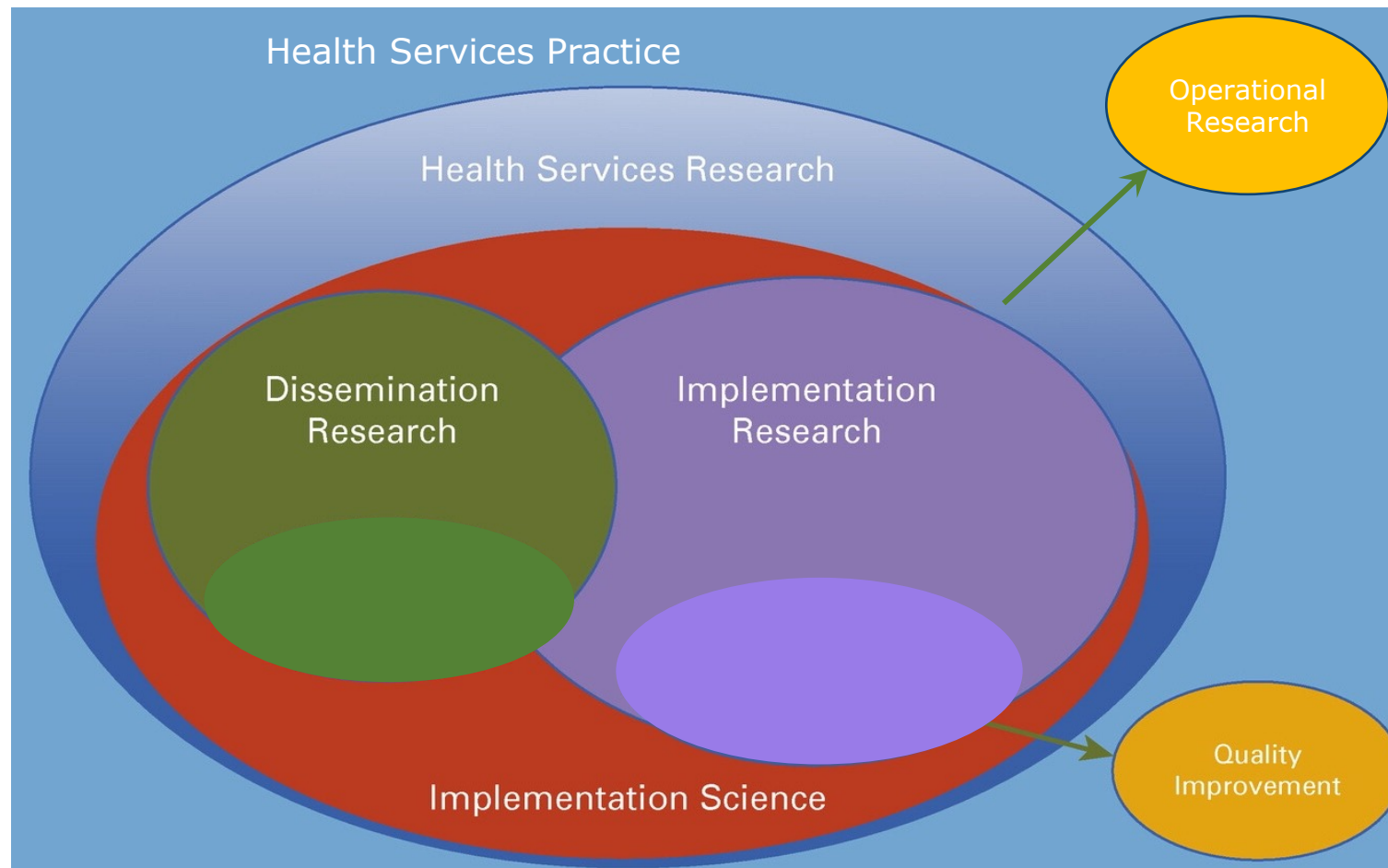
The capacity for implementation science often already exists

~~"I don't know anything about implementation science"~~



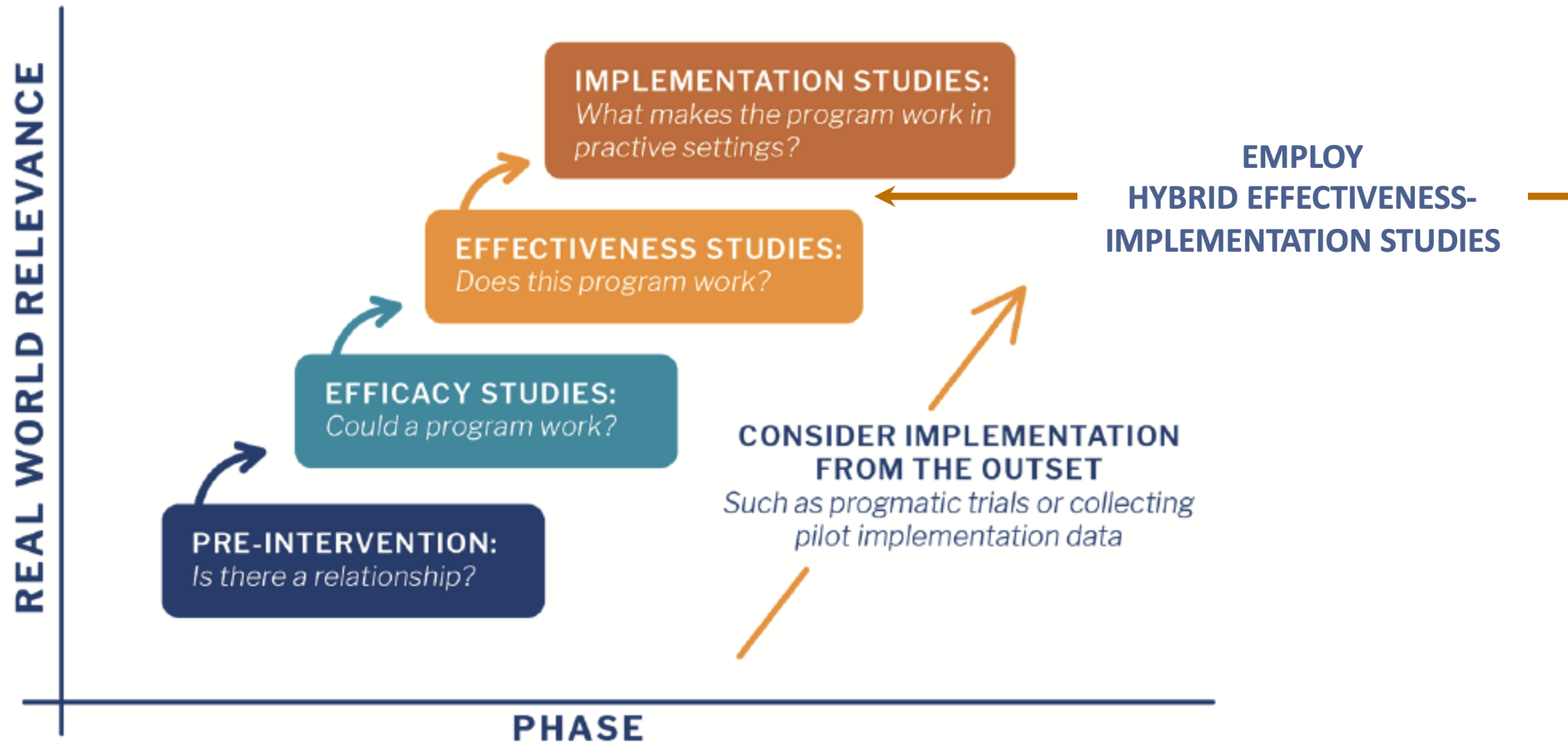
IS seeks practical, generalizable knowledge on implementation

~~"Implementation science is not a science"~~



“It’s never too early to think about implementation”

~~“It’s too early to think about implementation”~~



A roadmap for today's talk

What is Implementation Science & Why do we need it?

Key Concepts

Methods & Frameworks

Myths & Misconceptions

Importance & Impact

What are we learning?

COMMENTARY

The Science of Improvement

Donald M. Berwick, MD, MPP, FRCP

“Where is the randomized trial?” is, for many purposes, the right question, but for many others it is the wrong question, a myopic one.

A better one is broader: “What is everyone learning?”

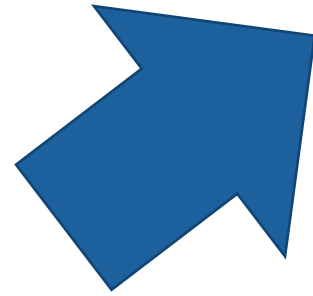
Learning Health Systems



Systematically gather and create evidence.

Apply the most promising evidence to improve care.

Thank you & let's scale the heights of D&I Science together!



Questions?

